Republic of Kenya

Reversing the Trends
The Second National Health Sector Strategic Plan

CLINICAL MANAGEMENT AND
REFERRAL GUIDELINES
Volume II

Clinical Guidelines for Management and Referral of Common Conditions at Levels 2–3: Primary Care

Ministry of Medical Services
Afya House
PO Box 30016 – GPO
Nairobi 00100, Kenya
Email: ps@health.go.ke

Ministry of Public Health & Sanitation
Afya House
PO Box 3469 – City Square
Nairobi 00200, Kenya
Email: psph@health.go.ke

www.health.go.ke

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The Ministry welcomes comments and queries from users of this publication. Please send feedback to:
Office of the Director of Medical Services
Afya House
PO Box 3469 – City Square
Nairobi 00200, Kenya

Clinical Management and Referral Guidelines – Volume II:
Clinical Guidelines for Management and Referral of Common Conditions at Levels 2–3: Primary Care

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Afya House
PO Box 3469 – City Square
Nairobi 00200, Kenya
http://www.health.go.ke
Email: dms@health.go.ke; dps@health.go.ke

Edited by: Margaret Crouch

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P.O. Box 1868 00100
Tel: 22247191/317871
Email: soloworld@wananchi.com

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List of Abbreviations

ACT	Artemesinin combination treatment
AGN	Acute glomerulonephritis
AIDS	Acquired immune deficiency syndrome
AMI	Acute myocardial infarction
APH	Antepartum haemorrhage
ART	Anti-retroviral therapy
ARV	Anti-retroviral drug
BBA	Born before arrival
BPE	Benign prostate enlargement
CPD	Cephalopelvic disproportion
CHEW	Community health extension worker
CHW	Community health worker
CPD	Cephalopelvic disproportion
CSOM	Chronic suppurative otitis media
DIC	Disseminated intravascular coagulophy
DOTS	Directly observed therapy, short course
DUB	Dysfunctional uterine bleeding
DVT	Deep vein thrombosis
EFA	Education for All
FFP	Fresh frozen plasma
FP	Family planning
GIT	Gastrointestinal tract
GOK	Government of Kenya
GORD	Gastro-oesophageal reflux disease
HBC	Home-based care
HIV	Human immunodeficiency virus
HZO	Herpes zoster ophthalmicus
IEC	Information, education and communication
ITN	Insecticide treated net
IUCD	Intrauterine contraceptive device
JRA	Juvenile rheumatoid arthritis
KEPH	Kenya Essential Package for Health

KEPI	Kenyan Expanded Programme of Immunization
KMC	Kangaroo mother care
LLIN	Long-lasting insecticidal net
MDGs	Millennium Development Goals
MDR	Multiple drug resistant (TB)
MOH	Ministry of Health
MOMS	Ministry of Medical Services
MOPHS	Ministry of Public Health and Sanitation
MVA	Manual vacuum aspiration
NGI	Non-gonococcal infection
NHSSP II	Second National Health Sector Strategic Plan 2005–2010
OSCC	Oral squamous cell carcinoma
PAC	Post-abortion care
PDA	Patent ductus arteriosus
PEP	Post-exposure prophylaxis
PID	Pelvic inflammatory disease
PLWHA	Person/people living with HIV/AIDS
PMTCT	Prevention of mother to child transmission (of HIV)
PPH	Postpartum haemorrhage
RVF	Recto-vesical fistula
SSSS	Staphylococcal scalded skin syndrome (Ritter's disease)
STI	Sexually transmitted infections
TB	Tuberculosis
TBA	Traditional birth attendant
TMJ	Temperomandibular joint
TOF	Tracheo-oesophageal fistula
TT2	Tetanus toxoid
UNICEF	United Nations Children's Fund
UTI	Urinary tract infections
VCT	Voluntary counselling and testing
VSD	Ventricular septal defect
VVF	Vesico-vaginal fistula
WHO	World Health Organization
WRA	Woman of reproductive age

Contributors to This Volume

CONTRIBUTORS

Prof. Ezekiel M. Wafula, MB.ChB (Nairobi), M.Med (Nairobi), Associate Professor and Consultant Paediatrician, Department of Paediatric and Child Health, University of Nairobi, project editor

Prof. Nicholas A. Othieno Abinya, MB.ChB (Nairobi), M.Med (Nairobi), Associate Professor, Department of Medicine, Section of Oncology, Aga Khan University Hospital

Prof. Joseph G. Karanja, MB.ChB (Nairobi), M.Med (Nairobi), Associate Professor and Consultant Obstetrician and Gynaecologist, Department of Obstetrics and Gynaecology, University of Nairobi

Prof. Dan C.O. Kaseje, MB.ChB (Nairobi), MPH, PhD, Professor of Community Health, Great Lakes University, Kisumu

Prof. Rachel Musoke, MB.ChB (East Africa), M.Med (Makerere), FABM, Associate Professor and Consultant Paediatrician and Neonatologist, Department of Paediatrics and Child Health, University of Nairobi

Prof. Stephen W.O. Ogendo, MB.ChB (Nairobi), M.Med (Nairobi), FCS (ECSA), Associate Professor and Consultant Cardiothoracic Surgeon, Department of Surgery, University of Nairobi

REVIEWERS

Dr. Kirtida Acharya, Endocrinologist (Diabetes), MP Shah Hospital

Dr. John Aduda, Kenya Medical Supply Agency

Dr. Maureen Ambetsa, Med Sup, Nakuru

Dr. Dianne Amojong, Machakos Level 5

Dr. K. Chesang, WHO

Dr. Sarah Chuchu, Provincial Pharmacist – Nairobi Province

Dr. Samuel Gatere, MOMS – Mathari Hospital

Dr. Esther Getambo, Ministry of Medical Services (MOMS)

Dr. Michael M. Gichangi, MOMS

Dr. Evans Imbuki, New Nyanza Provincial General Hospital

Dr. Anne Indalo University of Nairobi Pharmacy Department

Dr. Alice Inyangala, MOMS/Pharmacy

Prof. Francis D. Juma, UON-Faculty of Medicine

Mr. John Kabanya, Clinical Officer, Clinical Officers Council

Dr. Charles Kamotho, Thika District Hospital

Mrs. Lydia Karimuria, Ministry of Public Health and Sanitation (MOPHS), Division of Child and Adolescent Health

Mrs. Mercy Kasina, Ministry of Health, Department of Nursing

Dr. Harrison Kiambati, Head Technical Planning, MOMS

Dr. Humphrey Karamagi, Technical Officer, Health System Development, WHO Kenya

Dr. David Kiima, Diretor of Mental Health, MOMS, Division of Mental Health

Mr. Titus M. Kilika, MOMS

Dr. Kilonzo, head of surgery, Machakos level 5 hospital

Dr. Sylvester J.N. Kimaiyo, Moi Teaching and Referral Hospital (MTRH)

Dr. Francis M. Kimani, Director of Medical Services, MOMS

Dr. Maureen Kamene Kimenye, Ministry of Health, NASCOP / PASCOs

Mr. Julius Kimitei

Mr. Michael Kisoo, Chief Clinical Officer, MOMS

Mr. Alex K. Kisyanga, Ministry of Medical Services

Dr. Ndinda Kusu, Clinical Pharmacist, Management Sciences for Health/ Strengthening Pharmaceutical Systems

Dr. William K. Maina, Ministry of Health, Division of Non Communicable Diseases (DNCD)

Dr. Beth Maina, Paediatrician, Embu Level 5

Dr. John Jao Majimbo, Clinical Pharmacist, KPA

Dr. Wekesa Masasabi, Head, MOMS, Dept. of Surgery

Dr. Johnson Masese, Clinical Pharmacist, Provincial General Hospital – Kakamega

Dr. Jane Masiga, Clinical Pharmacist, Medical Equipment & Drug Supplies

Dr. Chris Masila, Programme Pharmacist, MOPHS/Division of Leprosy, Tuberculosis and Lung Diseases (DLTLD)

Dr. Josephine Maundu, Clinical Pharmacist, Management Sciences for Health/ Strengthening Pharmaceutical Systems

Dr. Regina Mbindyo, National Professional Officer, Essential Drugs & Medicines, WHO

Bernard M. Mbogoh, Ministry of Health, Department of Environmental Health

Dr. Josphat N. Mbuva, Head, Essential Med Mgt, MOMS/Pharmacy

Dr. Tom Menge, Toxicologist, Kenyatta National Hospital

Dr. Njeri Mucheru, Head Policy Dev & Review, MOMS/Pharmacy

Dr. Simon W. Mueke, MOMS Division of Obstetric and Gynaecology, Dept of Medicine

Dr. Joseph Wahome Mukundi, Pharmacist, Meru District Hospital

Dr. Stephen Muleshe, MOMS Dept of Standards and Regulatory Services

Mr. Stephen M. Muneene, Ministry of Health, Curative & Rehabilitative Health Services

Dr. Assumpta Muriithi, National Professional Officer, Child and Adolescent Health

Prof. Rachel Musoke, University of Nairobi

Mr. James Botela Muthui, Ministry of Medical Services

Dr. Robert Mwangi, Clinical Pharmacist, Provincial General Hospital – Nyeri

Dr. Jonah Mwangi, Med Sup – Thika

Dr. Hilda Nderitu, Embu Level 5 - Clinical Pharmacist

Dr. Jacky Ndinda, Clinical Pharmacist, Rift Valley Provincial General Hospital

Mrs. Florence Ng'ang'a, Ministry of Health, Curative & Rehabilitative Health Services

Dr. George Ngatiri, Provincial Medical Officer, Central Province

Dr. Bibiana Njue, MOMS – Pharmacy and Poisons Board

Dr. Andrew J. Nyandigisi, Ministry of Public Health and Sanitation, Division of Malaria Control

Dr. Mary A. Ochola, Dentist, Chair, Medicines and Therapeutic Committee, Port Reitz District Hospital

Mr. Alfred J.B. Odhiambo, Chief Clinical Officer, Ministry of Health

Dr. Isaaq Odongo, Head, Internal Medicine, MOMS Department of Medicine

Dr. Margaret Oluka, Pharmacologist, UON-School of Pharmacy

Dr. Victor Ombeka, Ministry of Health, Division of Leprosy, Tuberculosis and Lung Diseases (DLTLD)

Dr. Elizabeth Ominde-Ogaja, Department of Pharmacy, Ministry of Medical Services

Dr. Enoch Omonge, Clinical Pharmacologist, Kenya Medical Association

Dr. Joab Omondi Osumba, Machakos Level 5

Dr. Geoffrey Otumu, ENT Surgeon, Chair, Medicines and Therapeutic Committee, Kisii Level 5

Dr. Charles Ouma, Management Sciences for Health/Strengthening Pharmaceutical Systems

Dr. George Owiti, Chair, Medicines and Therapeutic Committee, Moi Teaching and Referral Hospital

Chris Rakuom, Chief Nursing Officer, MOMS

Dr. Nelly Rangara, Head Clinical Pharmacy Services, MOMS/Pharmacy

Dr. Gunturu Rivathi, Microbiologist, Aga Khan Hospital

Dr. Hardika Shah, Clinical Pharmacist, Pharmaceutical Society of Kenya

Dr. Ahmed Tawakal, Deputy Chief Pharmacist, Mater Hospital

Mary Wachira, Ministry of Health, Nutrition – NASCOP

Dr. Lois Wagana, Internal Medicine, Nyeri Level 5

Dr. Annah Wamae, Ministry of Health, Division of Child Health

Dr. Wandegu, Meru District Hospital

Mrs. Belina Wasike, Ministry of Health

Dr. Herman Weyenga, MOPHS, Division of Leprosy, Tuberculosis and Lung Diseases (DLTLD)

COORDINATORS

Persons responsible for coordinating the elaboration of the guidelines

Dr. Francis M. Kimani, Director of Medical Services

Dr. S. Sharif, Director of Public Health and Sanitation

Dr. Humphrey Karamagi, Technical Officer, Health Systems Development, WHO Kenya

Dr. Harrison M. Kiambati, Head, Sector Planning, Ministry of Medical Services

Dr. Elizabeth Ominde-Ogaja, Deputy Pharmacist, Head Appropriate Medicine Use Department of Pharmacy, Ministry of Medical Services

Foreword

Following the articulation of the 1994 National Health Policy Framework, the Ministry of Health published the National Drug Policy, the Essential Drug List, and Clinical Guidelines and Referral Strategy. All these are important building blocks of the elaboration of the Kenya Essential Package for Health (KEPH) subsequently mooted in the second National Health Sector Strategic Plan (NHSSP II – 2005–2010). This volume is one of a three-volume set that comprises the latest edition of the Clinical Guidelines.

Intended as neither prescriptive nor restrictive, the guidelines are facilitative, enabling, and foundational. They provide a firm base for the attainment of equity and high standards in health care and the development of rational procurement and use of drugs by all prescribers, dispensers, hospital managers, and patients.

The guidelines are for the use of all clinicians and nurses who have the primary responsibility for diagnosis, management, and referral of outpatients and inpatients. They are also very useful to interns, medical students, clinical officers, pharmacists, and nurses in training – and generally to health professionals working in the clinical setting and especially those in rural health services where it might be the only reference book.

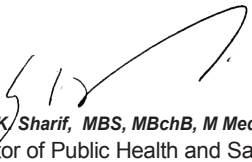
The revision has been widely consultative, incorporating recent advances in disease management and emerging medical challenges of the 21st century. Efforts have been made to include the most recent recommendations of the Ministry of Medical Services (MOMS) and the Ministry of Public Health and Sanitation (MOPHS) with inputs from specialized disease programmes, community health and the World Health Organization (WHO).

On behalf of the Ministry of Medical Services and the Ministry of Public health and Sanitation, many thanks are accorded to WHO, and to all contributors, reviewers, and the editors who have worked so hard to make the third edition of the guidelines a reality. We would like to acknowledge the technical guidance

provided by WHO in compiling these revised clinical and management guidelines, and the financial support for the process from the EC/ACP/WHO partnership USAID-MSH/SPS (Management Sciences for Health/Strengthening Pharmaceutical Systems) on meeting the health targets of the Millennium Development Goals (MDGs).

The regular and consistent use of the guidelines by clinicians, nurses and other health proffessionals countrywide can be expected to improve health care in Kenya and encourage the rational use of available drugs and thus contribute albeit in a modest way towards the realization of Vision 2030 of "creating an enabling environment for the provision of sustainable quality health care that is cost effective and accessible to all Kenyans".

Dr. Francis M. Kimani
Director of Medical Services



Dr. S. K. Sharif, MBS, MBchB, M Med DLSHPM, MSc
Director of Public Health and Sanitation

Preface

The clinical guidelines the sector has been utilizing were developed in 2002. Since then, the sector has put in place a strategy to respond to declining trends in health impact observed over the previous decade. This updated edition of the guidelines represents part of that strategy, in particular by taking cognisance of the changes introduced by the Kenya Essential Package for Health (KEPH), with its emphasis on distinct levels of care – including the community – to be provided to defined cohorts of the human life-cycle. The new edition thus addresses key shortcomings in the previous versions that limited the ability of clinicians to provide a comprehensive package of effective health care.

Specifically, the guidelines have been updated in relation to:

- Defining care protocols by level of service delivery, recognizing the fact that the skills and facilities for care differ at the different levels of health care.
- Making available a clear, separate volume for management of conditions at the community level, in recognition of the fact that good health is nurtured – or destroyed – primarily at individual and household levels, rather than at the health facilities.
- Providing greater elaboration of the identification and preparation for referral of clients in case the presenting condition or state doesn't allow for management at the level where the client has presented.
- Updating management protocols to address current existing conditions and potential threats to the health of Kenyans.
- Including a process for monitoring and reviewing the guidelines.

For ease of reference and use, the guidelines are presented in 3 volumes:

- Volume 1: Management Guidelines for Level 1 (Community)
- Volume 2: Management Guidelines for Levels 2 and 3 (Primary Care)
- Volume 3: Management Guidelines for Levels 4–6 (Hospitals)

It is the hope of the sector that these guidelines will serve the users well as a

guide for the appropriate care expected to be delivered at each respective level in the health system, thus facilitating the realization of the Kenya Essential Package for Health at all levels. Any information that could be of use in improving the management protocols is welcome, and can be provided directly to the Office of the Director of Medical Services in the Ministry of Medical Services.

Introduction

Kenya's health sector aims to prevent ill health, and where this cannot be done, to address the medical and social implications of the resulting ill health. Clinical management relates to this by ensuring efficient and effective management of the implications of ill health. It complements the public health services by ensuring that a specified quality of essential medical care is made available as needed, when needed, and in appropriate amounts.

Rationale for Revision of Clinical Guidelines

The sector last issued revised clinical guidelines in 2002. The guidelines defined management approaches for the key conditions that were expected to be afflicting the Kenyan population at that time. The guidelines had a number of weaknesses, however, including the following:

- The health sector lacked a clear, comprehensive, evidence-based approach to service delivery. Such an approach is important as it provides the overall guidance for the services the sector intends to provide, plus the process for delivering the services.
- The mechanism for monitoring and updating the clinical guidelines was not clear. As a result, the new management protocols that have come up since the guidelines were developed have not been incorporated, such as for avian influenza, management of multi-drug resistant tuberculosis (MDR/XDR TB), use of artemesinin combination treatment (ACT) for management of malaria, use of anti-retroviral drugs (ARVs) in HIV management, non-communicable diseases, and injuries/violence management, among others.
- Guidelines for preparation and management of clients for physical referral were not included.

Besides these more or less innate shortcomings, the clinical guidelines predated the approach to service delivery grounded in the framework of 6 life-cycle cohorts and 6 levels of care, as set out in the second National Health Sector

Strategic Plan ((NHSSP II – 2005–2010).[1] Thus they did not take into consideration the new approach that calls for different capacities and different functions at the different service levels in the country. Significantly, there was no guidance on management of services at the community level, and the lack of a referral framework is a drawback that has become more apparent as the care level approach has become institutionalized. These updated guidelines attempt to address these shortcomings. In addition, they are aligned to the comprehensive multilevel service delivery approach defined by the Essential Package for Health (KEPH).[2]

Comprehensive Service Delivery Approach

The review of the 1st National Health Sector Strategic Plan (NHSSP I) in 2004 highlighted, amongst other issues, evidence of stagnating or downward trends in health indicators, especially in the key areas of maternal, newborn, and child health. To respond to this worrying trend, the health sector in Kenya initiated an accelerated reform process to halt, and then reverse, this trend.

The reform process is enshrined in NHSSP II, which states the midterm goal of the health sector as "To reduce health inequalities and reverse the downward trends in health-related outcome and impact indicators". The plan's defined strategic objectives are to:

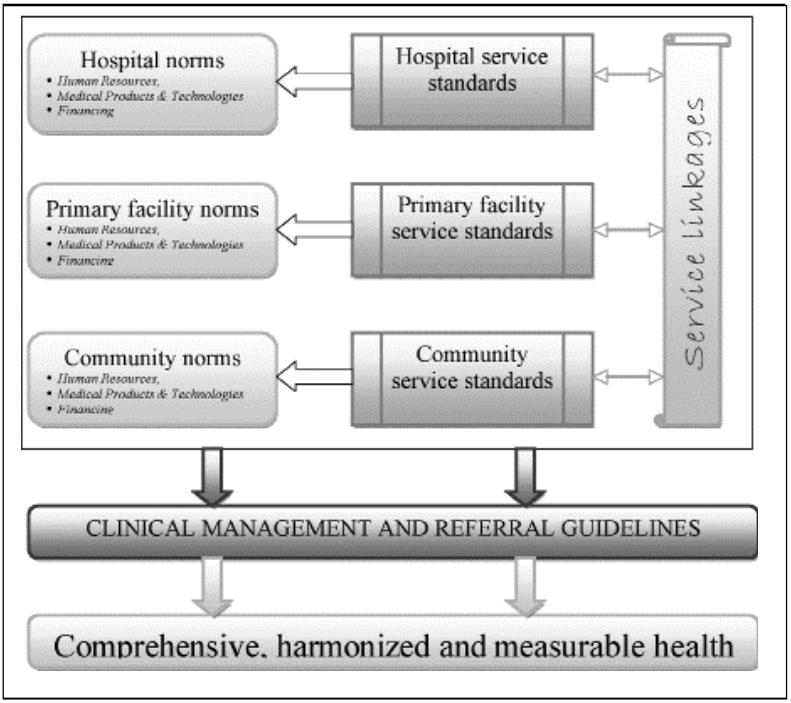
- Increase equitable access to health services;
- Improve the quality and the responsiveness of services in the sector;
- Improve the efficiency and effectiveness of service delivery;
- Foster partnerships in improving health and delivering services; and
- Improve financing of the health sector.

As part of the reform process, the sector elaborated clear operational approaches to enable it to achieve its strategic objectives, as well as health service norms and standards.[3] Investment plans now guide multi-year investment priorities for different key areas of the sector. [4] The comprehensive service delivery approach is one of these operational approaches (refer to Figure A).

A comprehensive service delivery approach is based on provision of guidance – at community, dispensary/health centre, and hospital levels of care – on services to be provided, service standards to be attained, service inputs (human resource,

[1] Ministry of Health, *Reversing the Trends – The Second National Health Sector Strategic Plan of Kenya: NHSSP II – 2005–2010*, Nairobi, Kenya, 2005.
[2] Ministry of Health, *Reversing the Trends: The Second National Health Sector Strategic Plan of Kenya – The Kenya Essential Package for Health,* Nairobi, Kenya, 2007.
[3] Ministry of Health, *Reversing the Trends: The Second National Health Sector Strategic Plan – Norms and Standards for Health Service Delivery in Kenya,* Nairobi, Kenya, 2006.
[4] *Ministry of Medical Services Strategic Plan 2008–2012,* Ministry of Medical Services, Nairobi, Kenya, July 2008; *Ministry of Public Health and Sanitation Strategic Plan 2008–2012,* Ministry of Public Health and Sanitation, Nairobi, Kenya, December 2008.

Figure A: The comprehensive approach to health care service delivery



infrastructure, equipment) to be applied, and cross linkages of services. This comprehensive approach guides not only the investment priorities for service delivery at the administrative level, but also the form and content of clinical management.

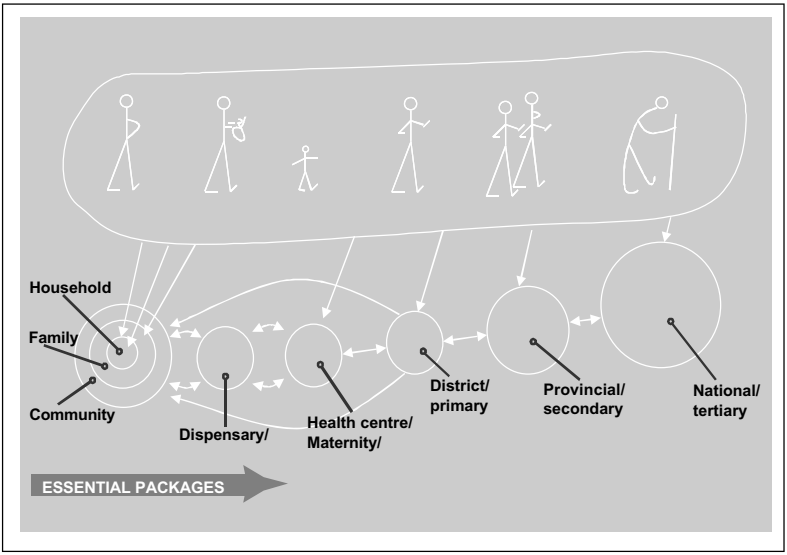
The services to be provided for each level of care are defined in the Kenya KEPH). A particular focus of the package is the community level.[5] The service linkages are defined in the Sector's Referral Strategy. These documents together describe the overall strategic approach for the sector, and are further elaborated.

The Kenya Essential Package for Health

KEPH is a life-cohort based approach to the delivery of health care services. Its main focus is to define the priority services that will ensure a healthy population at 6 distinct levels of the health system – from the community level up to tertiary

[5] Ministry of Health, *Taking the Kenya Essential Package for Health to the Community: A Strategy for the Delivery of Level One Services,* Nairobi, Kenya, 2006.

Figure B: The KEPH system



hospitals – for each of 6 defined life cohorts. As a result, it defines in a comprehensive manner, the services the sector is to prioritize so as to maintain health at all the different stages of life.

The diagram in Figure B illustrates the 6 life-cycle cohorts defined by KEPH: pregnancy and the newborn (up to 2 weeks); early childhood (to 5 years); late childhood (6–12 years); adolescence and youth (13–24 years); adulthood (25–59 years); and the elderly (60+ years). The diagram also illustrates the linkages of the 6 levels of care that KEPH defines:

- Level 1: Community: Village/households/families/individuals
- Level 2: Dispensaries/clinics
- Level 3: Health centres, maternities, nursing homes
- Level 4: Primary hospitals – District and subdistrict hospitals
- Level 5: Secondary hospitals – Provincial hospitals
- Level 6: Tertiary hospitals – National hospitals

The expected services to be provided are described in Table A. The KEPH has the following key characteristics:

- The package puts emphasis on health (rather than disease), on rights (rather than needs), and on community empowerment to exercise their rights.
- It identifies and redefines 6 distinct functional levels of care. The community level is recognized as the first level of care where major decisions are made and interventions are done that have an immediate impact. The focus at the community level is on the promotion of family practices that preserve and promote health.

Table A: KEPH strategic Interventions, by level and life-cycle cohort

Level 1 (Community)	Level 2 (Dispensary/ clinic)	Level 3 (Health centre)	Level 4 (Primary/ district/subdistrict hospital)	Level 5 (Secondary/ provincial hospital)	Level 6 (Tertiary/ national hospital)
Cohort 1: Pregnancy, delivery and newborn (to 2 weeks)					
Equip targeted communities with current knowledge and facilitate appropriate practices and attitudes leading to safe pregnancy and delivery of a healthy newborn	Ensure that health facilities are equipped to provide very basic ANC and refer all deliveries (regardless of risk analysis)	a) Ensure that health centres are equipped to provide basic essential obstetric care b) Enhance health systems support for delivery of quality obstetric and newborn care c) Establish a functional supportive supervision system to ensure quality assurance d) Develop outreach programmes to serve "hard-to-reach" populations	Ensure that facilities are equipped to provide essential comprehensive obstetric care	Ensure that facilities are equipped to provide essential obstetric care	Ensure provision of facilities to adequately manage mothers and newborn referred from lower levels
Cohort 2: Early childhood (0–5 years)					
Equip the community and health care providers with knowledge about the prevention of common childhood diseases and disabilities; and facilitate appropriate practices and attitudes leading to healthy child growth and development	a) Develop an outreach programme to serve "hard-to-reach" populations b) Strengthen the promotion and prevention of common childhood illnesses, impairments, and disabilities c) Strengthen case management and surveillance of common childhood illnesses d) Establish a functional supportive supervision system to ensure quality assurance	a) Strengthen the prevention of common childhood illnesses, impairments, and disabilities b) Strengthen case management & surveillance of common childhood illnesses c) Enhance the health systems support for delivery of quality child health services d) Establish a functional supportive supervision system to ensure quality assurance e) Develop outreach programmes to serve the "hard-to-reach" populations	Ensure availability of facilities to diagnose and appropriately manage sick children	Recognize and appropriately manage a sick child	Ensure provision of facilities to adequately manage children referred from lower levels

Continued

Table A, *continued*

Level 1 (Community)	Level 2 (Dispensary/ clinic)	Level 3 (Health centre)	Level 4 (Primary/ district/subdistrict hospital)	Level 5 (Secondary/ provincial hospital)	Level 6 (Tertiary/ national hospital)
Cohort 3: Late childhood 6–12 years)					
Equip the child with relevant knowledge and skills that promote healthy lifestyle, including psycho-social development	a) Develop an outreach programme to serve hard-to-reach populations b) Strengthen the promotion and prevention of common illnesses, impairments, and disabilities in late childhood c) Strengthen the case management and surveillance of common late childhood illnesses d) Establish a functional supportive supervision system to ensure quality assurance	Facilitate and support caregivers and community in the provision of a safe environment for child survival, growth, and development	a) Ensure that the health team is able to recognize and appropriately manage a sick child and where necessary refer b) Facilitate rehabilitative care for disabilities, and integration of children with disabilities (CWDs)	Strengthen provincial hospitals to diagnose and manage complicated childhood medical and surgical conditions	Ensure provision of facilities to adequately manage children referred from lower levels
Cohort 4: Adolescence and youth (13–24 years)					
Equip the youth with knowledge and life skills, and facilitate creation of a supportive environment to enhance adoption of healthy lifestyles for themselves and the community	Create an enabling environment for young people that discourages harmful practices, encourages psycho-social development, and prevents disease and injuries	Create an enabling environment for young people that discourages harmful practices and prevents disease and injuries	a) Ensure availability and access to quality youth-friendly services to encourage appropriate care seeking amongst the youth b) Ensure provision of rehabilitative services for substance abusers	a) Ensure provision of comprehensive rehabilitative services for youth drug abusers b) Ensure access to quality youth-friendly referral services for management of complicated medical and surgical conditions	Ensure provision of facilities to adequately manage youth referred from lower levels

Continued

Table A, *continued*

Level 1 (Community)	Level 2 (Dispensary/ clinic)	Level 3 (Health centre)	Level 4 (Primary/ district/subdistrict hospital)	Level 5 (Secondary/ provincial hospital)	Level 6 (Tertiary/ national hospital)
Cohort 5: Adulthood (25–59 years)					
Equip adults with knowledge and skills to facilitate creation of a supportive environment to enhance adoption of healthy lifestyles for themselves and the village	Provide information on and encourage utilization of recommended services for disease/injury prevention and facilitate creation of supportive environment to enhance adoption of healthy lifestyle.	Equip health facilities with staff who are able to conduct general medical and reproductive care assessment, disease/injury prevention and refer complicated cases to the district hospital	Ensure accessibility to quality curative services for adults with acute and chronic conditions	Ensure access to quality services for the diagnosis and management of complicated medical and surgical conditions	Ensure provision of facilities to adequately manage seriously ill adults referred from lower levels
Cohort 6: Elderly (60+ years)					
Equip the elderly persons, the community and health care providers with relevant knowledge on common old age diseases, impairments and disabilities in old age; and how to improve quality of life and enhance longevity	a) Provide information on and encourage utilization of recommended services for disease/injury prevention b) Refer difficult cases to the health centre	a) Provide information on and encourage utilization of recommended services for disease/injury prevention b) Refer cases to district hospital	a) Ensure early recognition and appropriate management of acute and chronic illnesses/ injury as per recommended guidelines b) Provide appropriate comprehensive and special rehabilitation to older persons with chronic illnesses and disabilities at all levels	Ensure provision of facilities for the diagnosis and management of severe illnesses in old age	Ensure provision of facilities to adequately manage seriously ill older persons referred from lower levels

- Its overall thrust is on revitalizing health promotion and preventive care at the first 3 KEPH levels.
- It defines health needs at each level of human development – from birth to old age – and identifies comprehensive and cost-effective interventions required at each stage of the human life cycle.
- It recognizes the packages of health care services per level of care to be rendered by both public and private health service providers.

KEPH is expected to improve the quality of services at levels 1–4 so that clients have confidence in these levels of care, thus resulting in increased client utilization of the lower level health facilities. KEPH is also expected to improve the networking of providers and facilities at the different levels of the health system thereby ensuring continuity of care for those who need the services provided at the higher levels of the system.

Sector Norms and Standards

Norms and standards defined to guide the provision of KEPH services are a statement of the human resource, infrastructure, equipment, and financing inputs necessary to ensure efficient and effective delivery of health care services to the population in Kenya. Service delivery standards relate to the expectations of each level of care with regard to service delivery and the types of human resources needed to provide these expectations. Service delivery norms define the quantities of these resource inputs needed to efficiently, effectively, and sustainably offer the service delivery package. These norms and standards are defined on the basis of the following principles:

- ***Units of service delivery:*** The focus is on the function, as opposed to the physical level, as the function may also be provided by a higher level facility.
- ***Equity in access and utilization:*** All inhabitants of the country and its respective districts have equal right not only to access health services, but also to use them equally for equal need.
- ***Relevance and acceptability:*** Health care needs to be rooted in the cultural and social reality of the communities and to include user satisfaction in the health care delivery equation.
- ***Continuity of care:*** Care should be viewed in a continuum, from the start of the illness or the risk episode until its resolution irrespective of the level at which care is sought. This means that a functional referral and counter-referral system should exist to make sure that services are availed.
- ***Integration of care:*** Every contact is used to ensure that a comprehensive set of defined services is made available.
- ***A comprehensive/holistic approach:*** Health services need to consider all the dimensions of the persons and their environment, and maintain a permanent interaction and dialogue with clients.

- ***The involvement of individuals, households, and communities:*** Involvement is expressed in people taking up responsibility for their own health; it provides them with a sense of ownership of all they undertake relating to their health.

Referral Strategy

The categorization of KEPH into the 6 levels of care is primarily meant to rationalize the delivery of health services within the health system, for efficiency in the use of existing resources. The implication of this, however, is that the health service delivery unit a client may have direct access to may not be able to adequately manage their health care needs. The referral system is intended to address this shortcoming. A referral system is defined as a mechanism to enable clients' health needs be comprehensively managed using resources beyond those available where they access care. It is based on the premise that while capacity for health service delivery has to be rationalized around different levels of care, the services received by clients should not be determined only by the services available where they access care, but rather by the full scope of care the health system is able to provide in the country.

An effective referral chain, therefore, provides the linkages needed across the different levels of the health system – from level 1 (community) to level 6 (national hospitals). These linkages ensure that a given health care need of a client can be addressed irrespective of the level of the health system at which the client first physically accesses care. The referral system can thus be likened to an "elevator/lift" in a multistory building: facilitating forwards and backwards management of clients across different floors (levels of care).

The referral strategy thus guides the sector on building an effective referral system that responds to the needs of rural and poor populations, thereby contributing to the realization of Vision 2030, and the Millennium Development Goals (MDGs)

Process of Elaborating the Clinical Management Guidelines

This revision of the clinical management guidelines has been carried out in an extensive 3-year consultative process over 2006–2008. The process has been coordinated by the Government's top management in the Ministries in Health, through the offices of the technical directors – Director of Medical Services and Director of Public Health and Sanitation.

Technical coordination of the revisions was structured around the key disciplines of Medicine, Surgery, Obstetrics/Gynaecology, and Paediatrics. A lead technical

specialist from each of these areas was in charge of coordinating the internal consultation process in each of these areas. In addition, pharmacy specialists were involved to review and guide the definition of the medicines and medical products included in the management protocols, ensuring that the management protocols are harmonized with the Essential Medicines List.

Four stakeholder consultations were held over the 3 years, to ensure that the management protocols being defined were in line with the overall policy direction from the programme and Ministry levels, and that their implementation is feasible. These involved management and technical specialists in each of the respective areas, from the public and non public sectors.

Description of the Revised Clinical Management Guidelines

In line with the process described above, this new addition of the clinical management guidelines is based on the latest orientation for each condition expected to afflict the population in Kenya. These are both for conditions in existence, plus conditions that are recognized as threats to the population.

Management descriptions are comprehensive, based on the expected capacity at each level of care. Descriptions of each condition are set out in terms of how it presents, physical and laboratory investigations for diagnosis, and the appropriate management, including when referral is to be made.

The referral management includes:
- Identifying signs during client management that indicate referral should be considered.
- Preparing the client for referral.
- Arranging the required logistics for referral at the referring and receiving facility, plus during transport.
- Ensuring the receipt and emergency management of the client who has been referred.
- Managing the referred client by the referring facility when they return.

For relevance, alignment with the service delivery approach, and ease of use, the guidelines are presented in 3 volumes representing the major levels of care:
- Volume I: Clinical Management and Referral Guidelines for Community Care – Corresponding to level 1 of the health care system
- Volume II: Clinical Management and Referral Guidelines for Primary Care – Corresponding to levels 2 and 3 of the health care system
- Volume II: Clinical Management and Referral Guidelines for Hospital Care – Corresponding to levels 4–6 of the health care system

The Process of Physical Referral

Critical Inputs to Have at the Facility to Expedite Referral

Input category	Type of input	Description of needs	
		Description	Number
Equipment	Emergency tray Emergency room 4x4 ambulance Motorized bicycle		
Staff			
Supplies		Referral forms	3-month supply

Referral Instruments

1. Preparation of a client for referral
1.1 Referral for a pregnant mother
1.2 Referral of a child with a medical problem
1.3 Referral for a child with a surgical problem
1.4 Referral for an adolescent, adult, or elderly patient for a medical problem
1.5 Referral for an adolescent, adult, or elderly patient for a surgical problem

2. Handling of a client during referral
2.1 Referral for a pregnant mother
2.2 Referral of a child with a medical problem
2.3 Referral for a child with a surgical problem
2.4 Referral for an adolescent, adult, or elderly patient for a medical problem
2.5 Referral for an adolescent, adult, or elderly patient for a surgical problem

3. Receipt and emergency management of a client who has been referred
3.1 Referral for a pregnant mother
3.2 Referral of a child with a medical problem
3.3 Referral for a child with a surgical problem
3.4 Referral for an adolescent, adult or elderly patient for a medical problem
3.5 Referral for an adolescent, adult or elderly patient for a surgical problem

4. Follow up of a client who has been referred back
4.1 Referral for a pregnant mother
4.2 Referral of a child with a medical problem
4.3 Referral for a child with a surgical problem
4.4 Referral for an adolescent, adult, or elderly patient for a medical problem
4.5 Referral for an adolescent, adult, or elderly patient for a surgical problem

PART I
Internal Medicine and Related Disciplines

IN THIS SECTION:

1. Acute Injuries, Trauma, and Selected Emergencies

1.1 Anaphylaxis

Occurs as allergic reaction to allergens facilitated by mediators in a sensitized individual. Allergens may be drugs, food, sera, stings, and intravascular contrast media.

Clinical Features
Include pruritus, urticaria, respiratory distress (due to laryngeal oedema, bronchospasm), and hypotension.

Management
- Avoid offending agents.
- Address airway, blood pressure and cardiac status.
- Administer adrenaline 0.2–0.5mg IM repeated every 10–15 minutes for 3 doses.
- Administer aminophylline 6mg/kg IV over 20 minutes if there is wheezing
- Administer antihistamine:
  - Chlorpheniramine 10mg IV slowly. IM/SC then continued 10mg 8 hourly for 24–48 hours (children 0.1mg/kg)
  - 100mg IV is of secondary value but useful to prevent delayed recurrences
- Observe patients with mild to moderate reaction, e.g., urticaria or mild bronchospasm, for at least 6 hours because attacks may recur after full recovery.
- Give nebulized oxygen ***OR*** bronchodilators, e.g., salbutamol.

Referral/Admission
Level 2 refer, level 3 admit where possible, in the case of:
- Severe reactions, e.g., hypotension, severe bronchospasm (especially with orally ingested antigens). Severe reactions require intravenous fluid replacement with normal saline and close monitoring, especially BP and urinary output.

1.2 Cardiac Arrest

This is due to asystole, ventricular fibrillation, and cardiovascular collapse in extreme arterial hypotension. There is absence of heart sounds and of carotid and femoral pulses. There may be associated apnoea and cyanosis.

☛ **Cessation of circulation requires immediate treatment.**

Optimal chances of survival are achieved when cardiopulmonary resuscitation begins within 4 minutes of the arrest, and when advanced cardiac life support

including intubation, intravenous medications, and defibrillation is started within 8 minutes.

1.2.1 MANAGEMENT

Airway

Clear airway immediately. Vomitus and secretions should be aspirated or removed with fingers or handkerchief.

Ventilation

Inflate lungs with air or oxygen by:

- mouth-to-mouth ***OR***
- mouth-to-nose insufflation ***OR***
- bag and mask devices (ensure thoraco-abdominal motion).

Circulation

Cardiac Massage

Carry out external cardiac massage (compressions) by applying appropriate pressure over the sternum. One breath should be interposed between every 4 to 5 cardiac compressions.

Defribrillation

Use standard defibrillators delivering 200–360 J and biphasic defibrillators delivering 150–200 J.

Drugs

Administer intravenous adrenaline 1mg bolus, repeated every 3 to 5 minutes, ***OR*** vassopressin 40 IU by intravenous push, ***OR*** amiodarone 300mg in 20–30ml normal saline.

Admit/Refer

- Undertake thorough investigation and treatment of the underlying cause.
- For level 2, observe closely and refer immediately.
- For level 3, admit for observation then refer to a higher level immediately.

1.3 Shock

This is circulatory insufficiency and becomes irreversible if not promptly corrected. Shock may be either hypovolaemic shock or septic shock.

1.3.1 HYPOVOLAEMIC SHOCK

This condition is caused by the loss of intravascular fluid volume. Decreased blood and/or fluid leads to decreased diastolic filling pressure and volumes.

Causes

- Haemorrhage
- Severe burns: Rapid plasma loss from damaged tissues when over 25% of the body surface area (BSA) is involved

- Endotoxaemia makes matters worse
- Dehydration
- Vomiting and diarrhoea (cholera and enterocolitis)
- Septicaemia
- Intestinal obstruction (mechanical or paralytic ileus)

Clinical Features
The patient becomes cold, clammy, drowsy, and tachypnoeic. There is cold sweat and restlessness. Blood pressure may become unrecordable. The skin is pale and cold with collapsed peripheral veins, with a tachycardia. The urinary output is an indicator of renal blood flow, and will fall significantly. Temperature is subnormal (less than 35°C).

Investigations
- Hb and PCV
- Urea and electrolytes
- Blood sugar
- Group and cross-match blood
- Blood gas analysis if possible
- Blood cultures

Management
Once shock is suspected, the medical staff taking care of the patient should initiate appropriate and coordinated emergency management.
- Treat the primary problem, e.g., control haemorrhage, endotoxaemia, etc.
- Secure a large intravenous line; do a cut-down if there is no accessible peripheral line.
- Use a central venous pressure line if available.
- Start infusion of isotonic saline (normal saline), or run 2 litres fast in an adult.
- Group and cross-match blood before you give plasma expanders (dextran 70, etc.).
- Transfuse in cases of blood loss, or shock due to burns.
- If shock is due to vomiting or diarrhoea, replace continuing fluid loss.
  - Adults: 1 litre 6 hourly Hartmann's solution or even normal saline.
  - Continue with IV fluids till shock reversed and cause treated.
- Closely monitor vital signs.
- Monitor urinary output.
- Administer broad spectrum bactericidal antibiotics if septic shock is suspected.
- Continue maintenance until shock is reversed and the cause is reversed. If condition does not improve refer to higher levels.

1.3.2 SEPTIC SHOCK

This condition is due to systemic sepsis and may result in hypotension or multiple organ failure.

Clinical Features
Initially “warm shock”: increased heart rate, diaphoresis, warm skin. Later “cold shock”: decreased cardiac output; cool vasoconstricted skin.

Complications
- Pulmonary oedema
- Renal failure
- Disseminated intravascular coagulopathy (DIC)

Investigations and Diagnosis at Level 3
- Hb, WBC, platelets, urea and electrolytes, creatinine
- Blood sugar culture and sensitivity (blood and body fluids)

Management – General
- Resuscitate with normal saline or dextran 70. Large volumes may be required but watch for heart failure.
- Monitor pulse and BP hourly.
- Catheterize and monitor urine output hourly. If less than 20ml/hr after adequate fluid replacement, give frusemide 80mg IV STAT.
- Administer oxygen via face mask
- Determine and treat the cause.

Management – Pharmacological
- Commence resuscitation measures immediately the patient is seen.
- Start empirically on:
  - Benzyl penicillin 4 mega units IV every 6 hours
  - + gentamicin 80mg IV 8 hourly
  - + metronidazole 500mg IV 8 hourly ***OR*** 1g suppositories rectally 8 hourly.
- Start oral metronidazole 400mg 8 hourly as soon as patient is able to swallow.

Use of other antibiotics will depend on source of infection and culture and sensitivity results.

Refer
Make the decision to refer if the case is complicated, especially if urinary output starts falling; serum urea, creatinine, and potassium begin to rise; or there is evidence of any other organ failure despite attention to adequate hydration with brisk electrolyte balancing, and antimicrobial administration. The onset of disseminated intravascular coagulopathy should always be anticipated.

1.4 Stings and Bites

Insect and animal bites can cause serious reactions, even death, and need to be treated with care.

1.4.1 BEE STING

Bee sting causes sharp pain followed by intense itching. Signs subside within a few hours. In hypersensitive individuals, anaphylaxis may occur (see Section 1.1,

anaphylaxis). Other patients may experience delayed reactions usually after 0–14 days. In case of severe reaction to a sting,

- Ensure the stinger is removed; scrape out, do not pull with tweezers as this can release more poison.
- Administer antihistimine if patient is allergic.
- Relieve pain with aspirin or paracetamol, and relieve itching with an appropriate lotion or a paste of bicarbonate of soda and water.

1.4.2 BITE BY A SUSPECTED RABID ANIMAL (RABIES)

Any mammalian animal may carry rabies. Saliva from a rabid animal contains large numbers of the rabies virus, which is inoculated through a bite, any laceration, or a break in the skin. Rabies is almost universally fatal once clinical features appear. It is therefore important to prevent the onset of symptoms. The incubation period is 10 days to 1 year with an average of 1–2 months. This period is adequate to allow immunization.

Management

Immediate Local Care

- Thorough irrigation with copious amounts of saline solution
- Cleansing with a soap solution debridement
- Administration of antibiotic
- Administration of tetanus toxoid
- Infiltrate the wound with rabies immunoglobulin

☛ **Suturing and skin grafting of bite wounds MUST be delayed, and be done at a higher level.**

Indication for Anti-Rabies Vaccine

- Bites from wild animals
- Bites from UNPROVOKED domestic animal
- Bites from a sick looking domestic animal, whether immunized or not
- Severe injury (multiple or deep puncture wounds), or any bites on the head, face, neck, hands or fingers
- Laboratory findings of Negri bodies in the brain of the involved animal
- Persons at high risk of exposure.

Immunization

Pre-exposure prophylaxis should be provided to persons at high risk of exposure such as laboratory staff working with rabies virus, animal handlers, and wildlife officers:

- Three full intramuscular doses of 1ml on days 0. 7 and 28 in the deltoid area.

Post exposure prophylaxis of previously vaccinated persons:

- Local treatment should always be given. Post exposure prophylaxis should consist of 2 booster doses either intradermally or intramuscularly on days 0 and 3 if they have received vaccination within the last 3 years. Otherwise, a full course of rabies vaccine.

Post Exposure Prophylaxis

- Passive immunization: Give human rabies immunoglobulin as a dose of 20 IU/kg of body weight infiltrated around the wound and 20 IU/kg given IM in gluteal region. This is followed by a course of rabies vaccine.
- Intradermal schedule: Give 1 dose (0.1ml) at each of 2 sites, either the forearm or the upper arm, on days 0, 3, and 7 and 1 dose at 1 site on days 30 and 90.
- Intramuscular schedule: Administer 1 dose (1ml) on days 0, 3, 7, 14, and 28. All IM injections should be made in the deltoid region or in small children in the anterolateral area of the thigh muscle.

1.5 Poisoning

Can be acute or chronic. Acute poisoning is often life threatening and should always be treated as an emergency even if the immediate threat to life does not appear real. Table 1.1 summarizes the clinical features and treatment of a number of common acute poisonings.

Clinical Monitoring

- Blood pressure measurement
- Urine output (1–2ml/kg/hr); catheterize
- Nasogastric suction in abdominal conditions
- Blood glucose levels
- Hb or PCV daily and correct appropriately

Treat renal complications appropriately. More importantly, treat the cause of the hypovolaemia to pre-empt these complications. Remember to consult in this very dire emergency.

Prevention

- Public education about farm or household chemicals known to cause accidental, para-suicidal, or suicidal poisoning.
- Parent education about NOT storing such substances in soft drink or juice bottles, and keeping them out of reach and sight of children.

Table 1.1: Clinical features and treatment of common acute poisonings

Substance	Clinical features	Recommended action
1. Household agents and industrial chemicals		
Kerosene (paraffin)	Nausea, vomiting, cough, pulmonary irritation, difficulty in breathing; headaches, loss of consciousness	• Remove contaminated clothing; wash exposed skin with water and soap.Activated charcoalMaintain airways and respiratory support • DO NOT INDUCE VOMITING or perform gastric lavage
Carbon monoxide, e.g., car exhaust, charcoal jiko	Headache, dizziness, confusion, slurred speech, convulsions, coma; symptoms vary with percentage of carboxyhaemoglobin	• 100% oxygen • Hyperbaric oxygen

Continued

Table 1.1, *continued*

Substance	Clinical features	Recommended action
Corrosives,e.g., acids, alkalis, hydrogen peroxide	Excruciating pain in the mouth, pharynx, epigastric area; dysphagia, vomiting and haematemesis; later develops laryngeal oedema and obstruction, oesophageal perforation; long-term: Stenosis of oesophagus	• Liberal water or milk orally • Analgesic injection to relieve pain • DO NOT INDUCE VOMITING • DO NOT PERFORM LAVAGE
Methanol	Intoxication, drowsiness, muscle weakness, blurred vision, photophobia, papilloedema blindness, coma, cerebral oedema, cardio-respiratory depression, seizures,DEATH	• IV sodium bicarbonate • 10% Ethanol in 5–10% dextrose as oral or IV infusion • Loading dose 0.7g/kg over 1 hour Maintain at 0.1–0.2g/kg/hour up to ethanol level of 100mg/dl
2. Pharmaceuticals		
Paracetamol	Nausea, vomiting, altered mental status, abdominal pain, evidence of liver failure (elevated transaminases)	• Gastric lavage within 1 hour • Activated charcoal • Antidotal therapy with N-acetylcysteine for up to 72 hours
Chloroquin	Convulsions, cardiac arrhythmia, cardiac arrest	• Gastric lavage • IV diazepam for convulsions • Refer if in coma
Digoxin	Arrhythmias, ventricular fibrillation, anorexia,nausea, vomiting,confusion, amblyopia	• Discontinue drug,administer potassium • Treat arrthymias with lidocaine ***OR*** phenytoin • Antidigoxin FAB fragments
Iron tablets, e.g., FeSO4, vitamins with iron	Vomiting, abdominal pain, pallor, cyanosis, diarrhoea, shock	• Emesis • Gastric lavage • Desferrioxamine 1g IV 15/kg/hour max 80mg in 24 hours
Opiates, narcotics (drugs of abuse)	Drowsiness, pinpoint pupils, shallow respiration, spasticity, respiratory failure	• Do not give emetics • Gastric lavage • Activated charcoal • Naloxone 5µg/kg IV to awaken and improve respiration • IV fluids to support circulation
Isoniazid	CNS stimulation, seizures,coma	• Emesis, gastric lavage • Diazepam • Pyridoxine (1mg for 1mg ingested up to 200mg) • Sodium bicarbonate for acidosis
Warfarin	Generalized bleeding, with intracranial haemorrhage being most serious	• Vitamin K 10mg IV STAT + OD for 5 days • Transfuse fresh blood

Continued

Table 1.1, *continued*

Substance	Clinical features	Recommended action
3. Pesticides		
Organo-phosphates, e.g., diazinon, dimethoate	Headaches, weakness, vomiting, colicky abdominal pain,profuse cold sweating, hypersalivation, muscular twitching, fasciculations, diarrhoea, tenesmus, convulsions, dyspnoea with bronchoconstriction,meiosis, bilateral crepitations	• Decontaminate (see above). • Remove contaminated clothing; wash exposed skin with water and soap. DO NOT INDUCE VOMITING. • IV atropine 2–4mg STAT, repeat after 10–20 min until full atropinization (pulse 100–120, dilated pupils) and maintain on SC atropine 4–6 hours x 24–48 hours. • Pralidoxime (PAM) 1–2g (children 30mg/kg) STAT, repeat 4 hourly, 12–24 hours depending on response
Rodenticides, e.g., zinc phosphide	Severe abdominal pain, nausea, vomiting and diarrhoea; strong garlic smell; severe respiratory distress; myocardial injury	Supportive: • Maintain airways • Assist ventilation • Observe for pulmonary oedema
Rodenticide (anticoagulant based)	Generalized bleeding, with intracranial haemorrhage being most serious	• Vit. K 10mg IV STAT • Transfuse fresh blood
Acaricides, e.g., Amitraz	Weakness, difficulty breathing, convulsions, coma	• Remove contaminatedclothing; wash exposed skin with water and soap. DO NOT INDUCE VOMITING. • IV sodium bicarbonate
Herbicides, e.g., Paraquat	Oral/pharyngeal inflammation, later multi-organ failure within hours or days depending on dose. Later interstitialpulmonary oedema and fibrosis. Multi-organ failure or pulmonary oedema invariably leads to death!	• Lethal dose as low as 10ml • Gastric lavage with 50–100g activated charcoal 4 hourly until patient improves
Organochlorines, e.g., DDT, aldrin, dieldrin	Excitement, tremors, convulsions with respiratory failure due to convulsions	• IV diazepam for convulsions • Gastric lavage if within 1 hour • Survivors beyond 48 hours almost invariably recover
4. Others		
Lead: e.g., lead salts, solder, toys, paints, and painted surfaces	Thirst, abdominal pain, vomiting, diarrhoea, encephalopathy following ingestion of suspicious substance	• Eliminate source of poisoning Chelation with Dimercaprol (BAL) Inj 4mg/kg and combined with calcium sodium editate (EDTA) with close monitoring for renal functionDMSA (oral succimer) Treatment over long periods (months to years)
Mercury	Acute: gastroenteritis,vomiting, nephritis, anuria, delayed GI motility Chronic: gingivitis, mental disturbances, neurodeficits, pneumonitis	• Gastric lavage • Activated charcoal • Penicillamine • Haemodialysis for renal failure • Look out for GIT perforation • Lungs: supportive care

2. AIDS and Sexually Transmitted Infections

2.1 HIV/AIDS

HIV infection is caused by one of two related retroviruses, HIV-1 and HIV-2, resulting in a wide range of clinical manifestations. Transmission requires contact with body fluids containing infected cells or plasma. HIV is present in blood, semen, vaginal secretions, breast milk, saliva, CSF, and wound exudates (see Table 2.1). The virus progressively destroys the body's immune functions, leading to opportunistic infections and tumours. It is these opportunistic infections and tumours that give the manifestations of this disease.

Table 2.1: Modes of transmission and preventive measures for HIV infection

Mode of transmission	Preventive measures
Sexual intercourse: vaginal intercourse (majority of cases), anal or oral sex	Practice abstinence Avoid risky sex practices like casual and multiple partners Use condoms Treat STIs promptly and effectively (STIs increase risk of HIV transmission)
Mother to baby: In utero, during childbirth, breastfeeding (30–40% transmission rate)	Advise counselling and testing Give ARV (nevirapine) to both mother and infant
Blood transfusion	Ensure that all blood is screened before transfusionArrange autologous transfusions where possible
Contaminated instruments: Needles, skin piercing instruments	Ensure that sterile needles are used at all times Ensure that instruments for ear piercing, circumcision, tattooing, etc., are sterile.For needle drug addicts, do not share needles

2.1.1 CLINICAL MANIFESTATIONS

These vary from asymptomatic carrier states to severe debilitating and fatal disorders related to defective cell-mediated immunity. AIDS (acquired immune deficiency syndrome) is the end stage of the spectrum of disease and is characterized by life threatening opportunistic infections and neoplasms.

The manifestations of HIV infection are many and present in all disciplines of medicine. Some of these are skin, respiratory system, GIT, and nervous system.

SKIN

Dermatological manifestations are probably the commonest. The diseases may be infective (bacterial, fungal, viral), reactive (eczema, hypersensitivities), or neoplastic. The most common ones are:

- Herpes zoster (shingles)
- Seborrhoeic dermatitis
- Molluscum contagiosum
- HIV-associated pruritis
- Chronic Herpes simplex or HSV ulcers
- Psoriasis
- Kaposi's sarcoma

Management
- For treatment of dermatological conditions, refer to specific areas in these guidelines.
- For Kaposi's sarcoma, refer to treatment guidelines in level 4 and above.
- For chronic Herpes simplex or HSV ulcers, use/advise antiseptic soaps or saline baths and topical acyclovir cream or systemic acyclovir tabs, 800mg PO 5 hourly for 10 days. Administer antibiotics for secondary bacterial infections.

GASTROINTESTINAL TRACT

Candidiasis

Caused by yeast or fungus, Candida albicans is the commonest agent. It is usually a normal inhabitant of mucosal surfaces but overgrows with increasing immune deficiency.

Presentation

Appears as white, milk-like, removable plaques on the oral mucosa – oral thrush – white coating on hard or soft palate and tongue; causes dysphagia if oesophagus involved; occurs in late disease.

Management
- Nystatin 100,000 units 4 times daily after food for 7 days
- Ketoconazole 200mg or 400mg OD for 7 days.
- Diarrhoea of more than 1 month's duration is often caused by shigella, salmonella, or amoeba; can also be caused by the HIV itself (slim or wasting disease).

RESPIRATORY SYSTEM

Pulmonary tuberculosis (PTB) cases have increased since the advent of the HIV/AIDS epidemic. The risk of reactions to anti-TB therapy is higher in HIV positive patients, thus thiacetazone (in thiazina) is to be avoided (see Section 7.3.3, TB). Pneumocystis carinii pneumonia is less frequent than in the western world.

Neurological Features
- Headaches (progressively worsening)
- Mental deterioration., seizures
- Meningitis including cryptococcal meningitis
- CMV encephalitis
- Sensory disturbances

General Features
- Fever, constant or recurrent
- Unexplained weight loss of >10% of body weight
- Chronic malaise or fatigue
- Enlarged lymph nodes at 2 or more extra-inguinal sites for more than 3 months

Investigations
- Rapid tests: 2 parallel tests with 2 different kits. A third kit can be used as tie breaker. Alternatively, use a double ELISA.
- Routine screening for HIV: People should be encouraged through VCTs and DCT/ PITC to learn their serostatus – and what to do once they know.

2.1.2 HIV TESTING AND PATIENT EDUCATION

- Pre-test and post-test counselling: HIV test should not be done without first counselling the patient, unless under emergency situations.
- Everyone should know:
  - How HIV is transmitted
  - How one can avoid getting infected
  - That HIV *CANNOT* be transmitted by shaking hands or touching people with AIDS; sneezing or coughing; eating food, drinking water or sharing utensils; from infected insect bites; from using contaminated toilets or latrines.

HIV-negative patients/clients need to know:
- That one can be in the window period (i.e., time between infection with HIV and development of detectable antibodies).
- That a negative result today does not mean that a person cannot acquire HIV if exposed.

HIV-positive patients need to know the following:
- They can transmit the infection to their sexual partner(s), and to their unborn baby in utero (if the patient is pregnant).
- Their health can deteriorate faster if they acquire other infections, including STIs.
- Their health can deteriorate faster if they take alcohol excessively, smoke, have poor nutrition, and have multiple sexual partners.
- Condoms, as generally used, are roughly 70–80% effective in preventing acquisition and transmission of HIV and other STIs. Proper education on condom use can increase the effectiveness of the condom to 90%.
- Pregnancy hastens the progression of disease and up to 40% of babies born to HIV infected mothers will acquire the infection. Contraceptive advice should be given. Intrauterine contraceptive devices (IUCD – the Coil) are known to predispose to pelvic inflammatory disease (PID) and hence are discouraged.

2.1.3 STAGING OF HIV/AIDS

The World Health Organization (WHO) defines 4 stages or phases in the progression of HIV and AIDS, as shown in Table 2.2.

2.1.4 MANAGEMENT OF HIV/AIDS

General Management

- Eat a well-balanced diet, get good rest, and take regular exercise.
- Minimize alcohol consumption and smoking.
- Pay prompt attention to any health problem.
- Seek social support through counselling, support groups of other HIV patients/ clients.

Pharmacological Management of HIV/AIDS

The main aim of anti-retroviral drug treatment (ARV/ART) is to suppress the viral load, achieve reconstruction of the immune system, and hence improve quality of life. Combination therapy using anti-retroviral drugs started from levels 3 and above, can be continued at lower levels, but in consultations with higher levels. Refer to Table 2.3 for standardized ARV regimes for adults and adolescents.

Principles of Treatment

- Ensure patient compliance through counselling and follow up.
- Use combination therapy of 3–4 drugs.
- Advise on nutritional support as an important component of management.
- Advise on ART – so far no drug or herb has been shown to eliminate the virus from the body. Some drugs have been shown to slow the multiplication of the virus and thus improve quality of life and delay the progression of the disease.
- Refer for anti-retroviral treatment to higher levels.

Treatment in Tuberculosis Patients

- Avoid ARVs in intensive phase: D4T + 3TC and EFV (800mg per day)
- NB: Protease inhibitors are contraindicated when rifampicin is used.

Table 2.2: WHO classification of HIV and AIDS clinical stages (adults and adolescents)

Clinical stage I – Asymptomatic

- Persistent generalized lymphadenopathy

Clinical stage II – Early (mild disease)

- Weight loss <10% body weight
- Minor skin infections
- Herpes zoster
- Recurrent upper respiratory infections

Clinical stage III – Intermediate (moderate)

- Weight loss >10% body weight, chronic diarrhoea, fever, oral candida, TB, severe bacterial infections

Clinical stage IV – Late (severe disease)

- HIV wasting syndrome, CMV, Pneumocystis carinii pneumonia, toxoplasmosis
- Kaposi's sarcoma, HIV encephalopathy

Table 2.3: ARV standardized regimes In Kenya (adults and adolescents)

1st line:	D4T or AZT+ 3TC + NVP or EFV For pregnant women and those likely to get pregnant give D4T + 3TC + NVP
2nd line:	ddI + ABC + lopinavir with ritonavir (kaletra) (needs refrigeration), alternatively – nelfinavir ***OR*** TDF + ABC + Lopinavir/ritonavir (kaletra)

2.1.5 PREVENTION OF MOTHER TO CHILD TRANSMISSION

Refer to Part IV, Obstetrics and Gynaecology, which deals with prevention of mother to child transmission of HIV/AIDS.

2.1.6 POST-EXPOSURE PROPHYLAXIS

- Low risk: AZT/3TC within 72 hours for 28 days.
- High risk: AZT/3TC/indinavir within 72 hours for 28 days.

☛ **Refer to higher level for appropriate post-exposure prophylaxis.**

2.1.7 OPPORTUNISTIC INFECTIONS AND OTHER MANIFESTATIONS

Appropriate management of the specific infection is covered in the relevant chapter and should be looked up.

☛ **Most opportunistic infections in HIV/AIDS are treatable. Patients respond well and are able to resume work.**

2.2 Sexually Transmitted Infections (STIs)

These are communicable diseases and usually transmitted through sexual contact. Other forms of transmission of these diseases include vertical transmission from mother to child in utero, during birth or soon after birth and blood transfusion, or via contaminated needles, syringes, specula, gloves, and skin piercing and cutting instruments. Clinical manifestations of these conditions depend on the offending organism and are numerous.

☛ **Accurate diagnosis and effective treatment of STI are essential and cost-effective HIV/AIDS prevention strategies.**

Management

- Give full course of appropriate drug therapy – see Table 2.4 and Figure 2.1 on urethritis.
- Follow up the patient.
- Provide health education and counselling.
- Manage the sexual contacts, including contact tracing, diagnosis, treatment, health education and counselling.
- Refer to higher level for complications.

☛ **Each and every treatment of STI must include the 4 C's.**

THE 4 C's OF STI MANAGEMENT

- ✓ Compliance with the full drug course and follow-up
- ✓ Counselling on safer sexual behaviour
- ✓ Condoms, used properly and consistently
- ✓ Contact tracing, partner treatment, and notification

Patient Education

- Avoid multiple or anonymous partners, prostitutes or any other person with
- multiple sex partners.
- Use condoms correctly, e.g., avoid oil-based lubricants.
- Avoid alcohol or drug abuse, as these may lead to irresponsible sexual behaviour.

Clinical Features and Treatment Summary

For more detailed descriptions see clinical features of specific conditions below.

2.2.1 GONORRHOEA AND URETHRAL DISCHARGE

Clinical Features

Discharge in anterior urethra with dysuria or urethra discomfort. Caused by gonococcal infection in 90% of cases. The other 10% are non-gonococcal infections (NGIs) mainly due to Chlamydia trachomatis and to less a extent trichomonas or Herpes simplex. In 5–10%, there is a mixture of gonorrhoea and NGIs. In addition, infection of the glans (balanitis) or prepuce (posthitis) by Candida albicans can lead to discharge. Otherwise:

- Gonorrhoea: Abundant pus-like discharge, incubation period 3–10 days.
- NGI: Mucoid or serous discharge, scanty, usually seen in morning, incubation 10–14 days.

Investigations

- Diagnosis in male is usually clinical, but if confirmation is required a urethral smear is done.
- Gram stain showing pus cells and intracellular Gram-negative diplococci is 95% accurate.

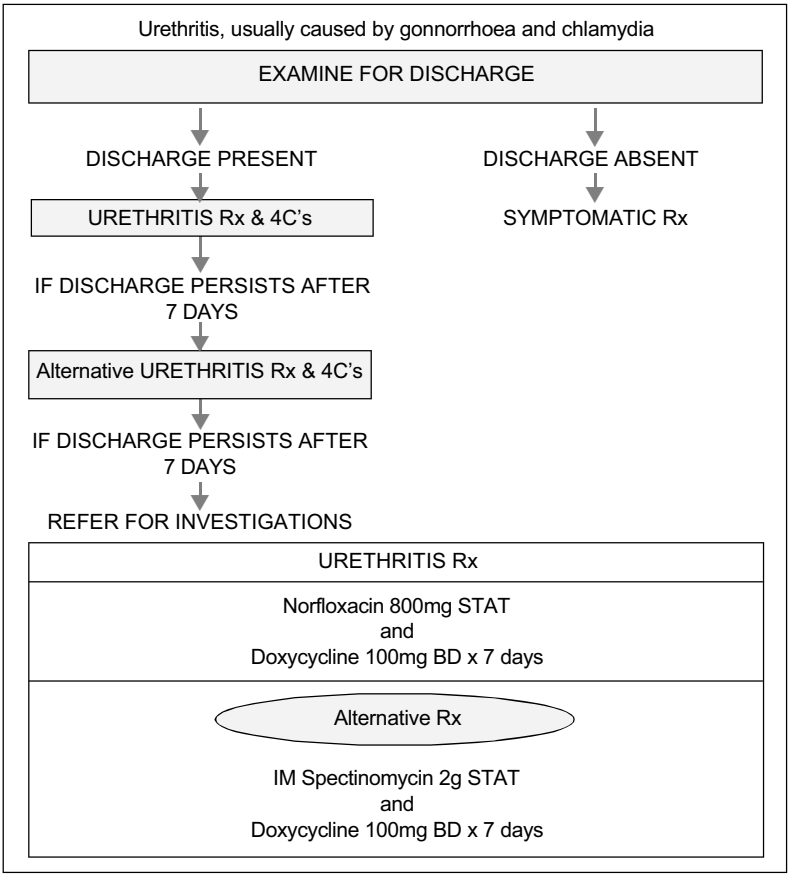
Management

Refer to Table 2.4 and Figure 2.1.

Table 2.4: Management – Gonorrhoea and other urethritis (levels 2–4)

Diagnosis	First line treatment	Second line treatment
Gonorrhoea – Adults	Amoxicillin 3g orally + Probenecid 1g orally ***OR*** Amoxicillin-clavulanate 625mg orally + probenecid 1g orally ***OR*** Ciprofloxacin 500mg orally ***OR*** Ofloxacin 400mg orally ***OR*** Ceftriaxone 250mg IM STAT	Kanamycin 2g IM STAT ***OR*** Cefuroxime 1g orally ***OR*** Azithromycin 2g orally
Pregnancy	As above	As above
Non-gonococcal & chlamydia urethritis – Adults	Doxycycline 200mg STAT followed by 100mg daily x 7 days	Erythromycin 500mg orally QDS x 7 days
Pregnancy	Erythromycin 500mg orally QDS x 7 days	

Figure 2.1: Decision flow chart for urethral discharge



2.2.2 GENITAL DISCHARGE IN THE FEMALE

Causes of vaginal discharge include Candida vulvovaginitis (monilia or thrush), trichomonas vaginitis, and bacterial vaginosis. Endocervical discharge can be caused by gonorrhoea, Chlamydia trachomatis, and Mycoplasma hominis.

CANDIDA VULVOVAGINITIS (MONILIA OR THRUSH)

Common infection of the vulva and vagina caused by the fungus Candida albicans. It is not always transmitted by sexual intercourse. Predisposing factors are diabetes mellitus, systemic antibiotics, pregnancy, hormonal oral or injectable contraceptives, and decreased host immunity.

Clinical Features
Vaginal discharge is creamy and thick (curd like), associated with itching, burning, and soreness during micturition and sexual intercourse. There is erythema, excoriation, and fissures. Diagnosis is mainly clinical.

Investigations
Wet mount is prepared by putting a drop of the discharge onto a glass slide and adding a drop of saline or 10% potassium hydroxide (KOH) and covering with a cover slip. Examine under low-power microscope. Candida albicans is identified by pseudohyphae and spores.

Management
- Apply gentian violet 1%, once daily for 3 days (use cotton wool balls or speculum).
  OR
- Insert Nystatin pessaries high in the vagina 1 BD for 7 days.
- Apply Nystatin cream to vulva BD for 14 days.
  OR
- Insert Clotrimazole pessaries 1 OD for 6 days.
- Also treat partner with application of cream.

Prevention
People who get recurrent infection should be given concurrent prophylactic treatment whenever broad-spectrum antibiotics are prescribed.

TRICHOMONAS VAGINITIS
"Trich" is a common cause of vaginal discharge. Caused by Trichomonas vaginalis, a flagellated protozoan, it is mainly sexually transmitted.

Clinical Features
Symptoms depend on the severity of the infection and include a frothy, greenish-yellow, foul-smelling discharge. Other features are vaginal soreness, dyspareunia, and post-coital spotting. Infection usually involves the vulva, vagina, and cervix, which may appear reddish and swollen. Diagnosis is mainly clinical.

Investigations
- Wet mount preparation demonstrates flagellated protozoa.
- Trichomonas may also be noted on urine microscopy or pap smear.

Management
- Metronidazole 200mg–400mg TDS for 7 days. The same dose for the male partner. Alcohol consumption to be avoided during treatment with metronidazole. Drug to be avoided during first trimester of pregnancy. In pregnancy use tinidazole pessaries.
- Tinidazole 2g STAT. The same dose for the male partner.

BACTERIAL VAGINOSIS

This is usually associated with Gardnerella vaginalis.

Clinical Features

Vaginal discharge greyish-white in nature with a characteristic fishy odour that increases in intensity after sexual intercourse. Not usually associated with soreness, irritation, pruritus, burning sensation, or dyspareunia. Diagnosis is usually clinical.

Investigations

- Wet mount preparation, which will show vaginal epithelial cells with adherent clusters of Gram-negative bacilli or coccobacilli (CLUE CELLS).
- Whiff-test in which a drop of discharge is mixed with a drop of KOH, which gives a characteristic fishy odour.

Management

- Treat both patient and male partner.
- Metronidazole 400mg TDS for 7 days (avoid alcohol).

CERVICITIS

About one-third of all women presenting with vaginal discharge have cervicitis. The commonest causes of endocervicitis are gonorrhoea, chlamydia, trichomonas, and Herpes simplex virus.

Clinical Features

Cloudy-yellow vaginal discharge that is non-irritating, non-odorous, and mucoid. There may also be inter-menstrual or post-coital spotting or both. There may also be dyspareunia or pelvic discomfort or both. Cervical mucosa appears inflamed with focal haemorrhages. Cervix is friable and bleeds easily on touch. Vesicular herpetic lesions will be found on vulva, vagina, and cervix. Abdominal and bimanual pelvic examination should be done to rule out pelvic inflammatory disease.

Investigations

- Wet mount preparation: Look for pus cells, trichomonas and yeasts.
- Gram-stain of the discharge of endocervical swab (Neisseria gonorrhoea shows Gram-negative intracellular diplococci).
- Culture for gonorrhoea or chlamydia if available.
- Pap smear after treatment.

Management

See Figure 2.2, Vaginal discharge flow chart.

Give norfloxacin 800mg STAT then 400mg BD for 7 days.

- Doxycycline 100mg BD
- Metronidazole 2g STAT

DYSURIA IN THE FEMALE

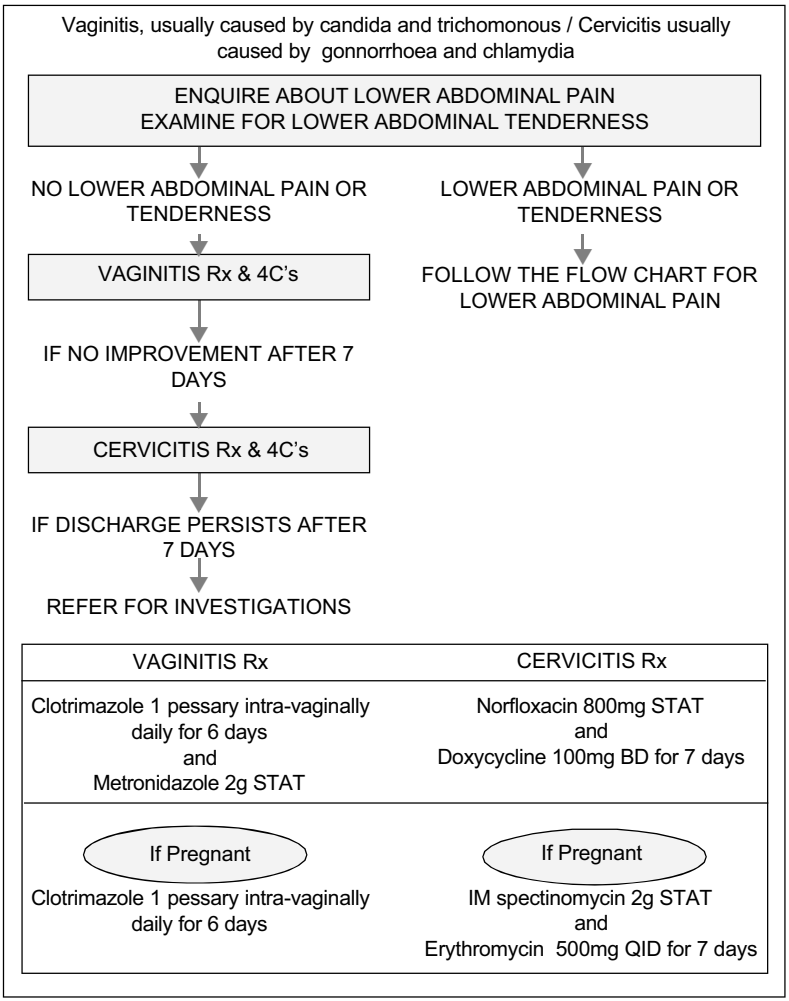
Can result from urinary tract infection, vaginitis, or cervicitis. See relevant sections of manual for clinical features, investigations and management. Gonorrhoea should be considered for patients at high risk for STIs.

LOWER ABDOMINAL PAIN IN THE FEMALE

Clinical Features

Lower abdominal pain is often due to pelvic inflammatory disease (PID – see

Figure 2.2: Flow chart for vaginal discharge



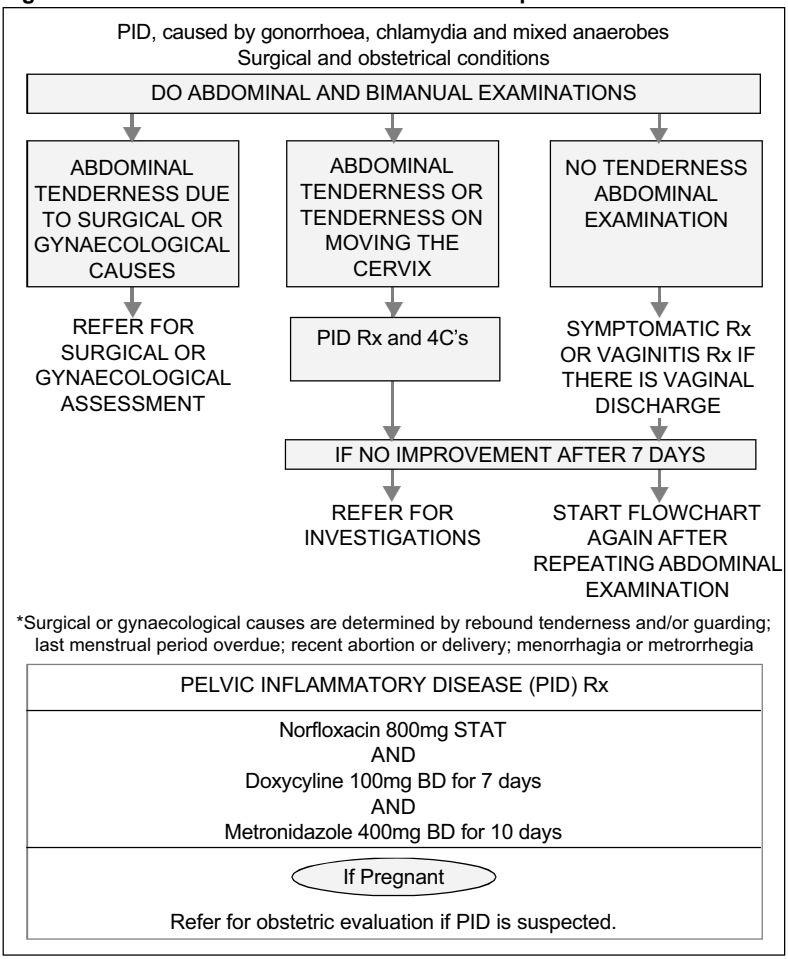
Chapter 54). It must be differentiated from urinary tract infection, ectopic pregnancy, threatened abortion, appendicitis, and other causes of acute abdomen.

- **Abdominal and pelvic examinations must be done on all cases of lower abdominal pain in women.**

Management

- See Figure 2.3 and relevant sections of manual.

Figure 2.3: Decision chart for lower abdominal pain in women



GENITAL ULCER DISEASE

Clinical Features

These are summarized in Table 2.5 for the more common ulcers.

Management

See flow chart in Figure 2.4 and management summary in Table 2.6.

BUBOES OR SWOLLEN INGUINAL GLANDS

Buboes are enlarged lymph nodes in the groin. They may be associated with an ulcer in the genital area or on the lower limbs. Refer to genital ulcer disease.

Clinical Features

- **Lymphogranuloma venerium:** Several nodes matted together on one or both sides, usually without suppuration.
- **Chancroid tender fluctuant bubo** that suppurates, leaving an undermined inguinal ulcer should be aspirated before suppuration.

Investigations

Serology for syphilis should always be performed.

GENITAL WARTS

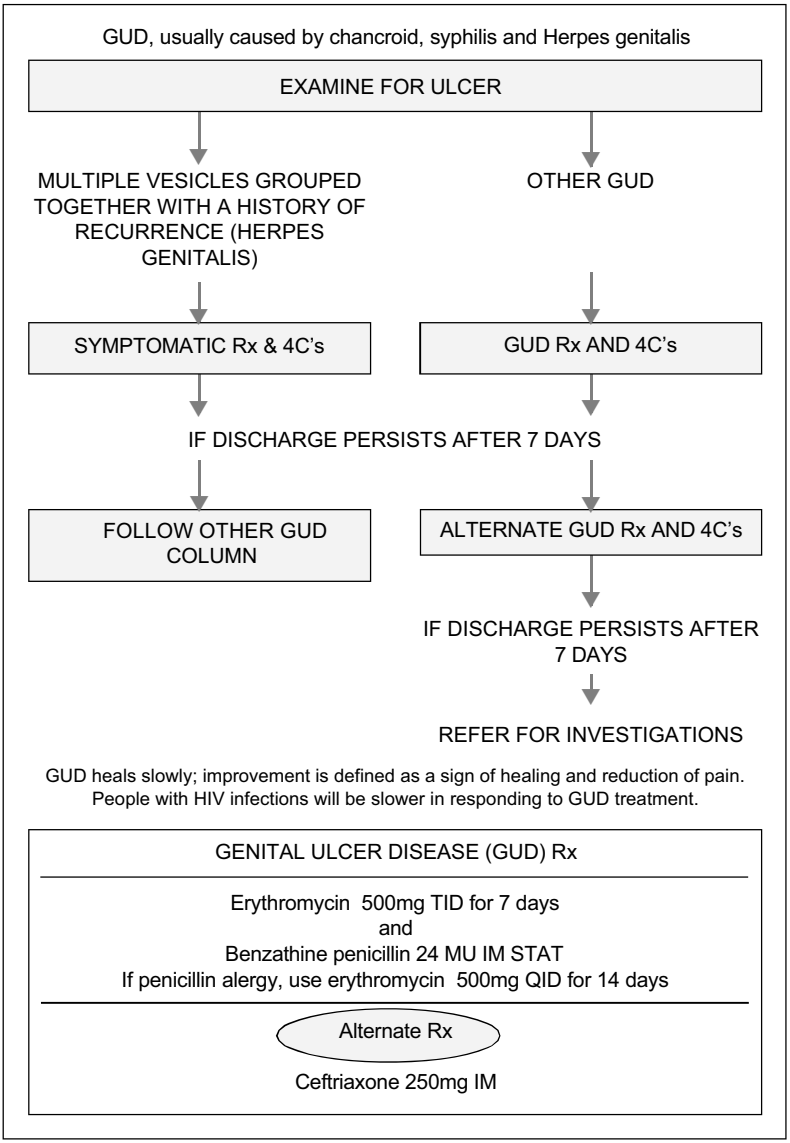
Clinical Features

- Condyloma acuminatum (Human papilloma virus): Cauliflower-like warts. May be single or multiple on the vulva, vagina, perineal area, penis, urethra, and sub-prepucial. Vaginal discharge, pain, bleeding on coitus or touch may occur.

Table 2.5: Clinical features and probable causes of genital ulcers

Clinical features	Probable diagnosis & cause
Single, painless, relatively clean ulcers without pus Incubation period up to 3 weeks Painless lymphadenopathy	Primary syphilis chancre T. pallidum
Multiple, soft, deep, tender ulcers with profuse pus Incubation period 1 week Very painful lymphadenopathy, which can be fluctuant Disfiguration of the genitalia Secondary infection	Chancroid H. ducreyi
Multiple shallow and tender ulcers May start as vesicles grouped together. Itchy Incubation period 1 week Tender lymphadenopathy, may be recurrent, rarely suppurative	Herpes genitalis H. simplex
Single, small and transient ulcers Incubation period 1–2 weeks Lymphadenopathy; several glands may be matted together Fistula and stricture formation	Lymphogranuloma venerium (LGV) C. trachomatis
Large, beefy ulcers Variable incubation period None or rarely lymphadenopathy	Granuloma inguinale Calymmatobacterium granulomatis (Donovan bacilli)

Figure 2.4: Flow chart for genital ulcer disease (GUD)



- Molluscum contagiosum (Pox group virus): Umbilicated multiple papules with whitish, cheesy material expressed when squeezed. Secondary infection and spread to other sites may occur.

☛ **Secondary syphilis should be ruled out when evaluating genital venereal warts**

Management

- Carefully apply podophyllin 25% in tincture of benzoin to each wart, protecting the normal surrounding skin with petroleum jelly.
- Wash off the podophyllin thoroughly 1–4 hours later. Repeat 1–2 times weekly.
- If there is no regression after 4 applications, refer to higher level.

Table 2.6: Treatment of selected STIs, including GUD

Diagnosis	First line treatment	Second line treatment
Chancroid Adults	Trimethoprim 160mg/sulphamethoxazole 800mg 4 tablets once a day x 2 days ***OR*** cotrimoxazole (comprising 80mg trimethoprim/400mg of sulphamethoxazole) 8 tablets daily x 2 days. Buboes, if present, should be aspirated and not incised and drained	Erythromycin 500mg orally QDS x 7 days ***OR*** ceftriaxone 250mg IM STAT ***OR*** ciprofloxacin 500mg BD x 3 days
Pregnancy/allergy	Erythromycin 500mg orally QDS x 7 days ***OR*** Ceftriaxone 250mg IM STAT ***OR*** Ciprofloxacin 500mg BD x 3 days	
Early syphilis	Early syphilis (less than 1 year duration) Benzathine penicillin 2.4 MU weekly x 2 weeks. *OR* Procaine penicillin (PP) 600,000 units IM OD x 10 days	
	In penicillin allergy use: Tetracycline capsules 500mg QDS x 15 days *OR* Erythromycin 500mg QDS x 15 days. *OR* Doxycycline 100mg OD x 15 days	
Late syphilis (more than 1 year)	Procaine penicillin (PAM) 600,000 units IM OD x 14 days ***OR*** Benzathine penicillin 2.4 MU weekly x 4 to 5 doses	
In pregnancy	Use either one of the penicillin preparations or erythromycin (see above). If erythromycin is used, the neonate should be treated soon after birth.	
Congenital syphilis	Aqueous crystalline penicillin G 25,000 units/kg IM, twice a day for a minimum of 10 days *OR* Aqueous procaine penicillin G 50,000 units/kg/day IM OD for a minimum of 10 days	
Herpes genitalis	Lesions should be kept clean by washing the affected sites with soap and water and careful drying. Acyclovir 200mg orally 5 times daily for 7–10 days only reduces the symptoms and their duration and does not prevent recurrences. It is expensive.	
Lymphogranuloma venereum	Tetracycline 500mg QDS x 14 days ***OR*** Erythromycin 500mg QDS x 14 days ***OR*** Doxycycline capsules 100mg BD x 14 days ***OR*** Sulphamethoxazole 1g orally BD x 14 days	
Granuloma inguinale	Tetracycline capsules 500mg QDS x 10 days ***OR*** Erythromycin 500mg QDS x 10 days ***OR*** Cotrimoxazole 2 tablets twice daily x 10 days ***OR*** Streptomycin 750mg daily x 10 days	

3. Cardiovascular Diseases

3.1 Introduction

These are the diseases and disorders of the heart and blood vessels. They include rheumatic heart disease, coronary heart diseases, hypertension, and deep venous thrombosis (DVT), among others.

Heart failure occurs when the heart is unable to supply sufficient output for the metabolic needs of the tissues, in face of adequate venous return. Common causes of heart failure are hypertension, valvular heart disease, ischaemic heart disease, anaemia, and pulmonary thromboembolism.

Clinical Features
Tachycardia, gallop rhythm, raised JVP, dependent oedema, tender hepatomegaly, orthopnoea, fatigue, exercise intolerance, and basal crepitations.

Common precipitating factors of heart failure in cardiac patients must be considered in treatment of acutely ill patients: poor compliance with drug therapy; increased metabolic demands, e.g., pregnancy, anaemia; progression of underlying disease, e.g., recurrent myocardial infarction, uncontrolled hypertension; cardiac arrhythmias; pulmonary embolism; infective endocarditis; infection, e.g., pneumonia.

Investigations
Refer for investigations.

Management – General
- Restrict physical activities.
- Order bed rest in cardiac position.
- Administer oxygen by mask for cyanosed patients.
- Restrict salt intake, control fluid intake, and measure urine output.
- Measurement weight daily.
- Refer to higher level.

3.2 Acute Myocardial Infarction (AMI)

AMI is caused by the complete or partial occlusion of a coronary artery and requires prompt hospitalization and extensive care management.

Clinical Features
Chest pain: Severe, retrosternal/epigastric crushing or burning or discomfort. Discomfort radiates to neck and down the inner part of the left arm lasting at least 20 minutes to 7 hours. Occurs at rest and is associated with pallor, sweating, arrhythmias, pulmonary oedema, and hypotension. May also occur with physical activity.

Management
- Support and maintain vital functions.
- Carry out cardio-pulmonary resuscitation (CPR).
- Administer 100% oxygen.
- Refer immediately to higher level.

3.3 Acute Rheumatic Fever

This is an acute, systemic connective tissue disease related to an immune reaction to untreated group A beta haemolytic streptococcus infection of the upper respiratory tract. The initial attack of acute rheumatic fever occurs in most cases in children aged 3–15 years. The major complication of this disease is the cardiac involvement, which can eventually lead to severe heart valve damage. This is the commonest cause of heart disease in Kenyan children.

Clinical Features
- Major criteria: Migrating polyarthritis, carditis (signs of cardiac failure, persistent tachycardia, pericardial rub, or heart murmurs), Sydenham's chorea, erythema marginatum, and subcutaneous nodules.
- Minor criteria: Past history of rheumatic fever, raised ESR, fever, arthralgia.
- Diagnosis: 2 major and 1 minor or 1 major and 2 minor manifestations.

Investigations
- Refer to higher level for further investigation.

Management
- Refer to higher level for management.

Prevention
- Early treatment of streptococcal sore throat with Benzathine penicillin 1.2 mega units STAT dose ***OR*** phenoxymethylpenicillin 125–250mg TDS for 10 days.

Prophylaxis
- Previous acute rheumatic fever without carditis: Give benzathine penicillin 1.2 mega units monthly for 5 years or up to the age of 18 years whichever is longer ***OR*** erythromycin 125–250mg BD for 5 years for those sensitive to penicillin.
- Previous acute rheumatic fever with carditis: Benzathine penicillin 1.2 mega units ***OR*** erythromycin 125–250mg BD for those sensitive to penicillin for life.
- Patient education: Emphasize need for follow up for prophylaxis.

3.4 Rheumatic Valvular Heart Disease

This is a complication of rheumatic fever. The main site of pathology is on the valves. There may be mitral stenosis, mixed mitral valve disease (both stenosis and incompetence), mitral incompetence, and/or aortic stenosis and

incompetence. Dyspnoea, palpitations, or heart murmurs may occur depending on the valvular lesion. Patients may be asymptomatic and may be discovered to have the lesion during routine examination or during periods of increased demand such as pregnancy or anaemia. Patients may present also with congestive cardiac failure.

Investigations
Refer to higher level.

Management
Refer.

Prophylaxis
- ***Rheumatic fever:*** All patients with a history of rheumatic fever should be given prophylaxis for recurrences, for life, with: Benzathine penicillin 1.2 mega units IM monthly ***OR*** amoxicillin 125–250mg PO BD ***OR*** erythromycin 125–250mg PO BD.

- ***Infective endocarditis prophylaxis:*** In addition to rheumatic fever prophylaxis the following are required:
  - Dental procedures: Amoxicillin 3.0g PO 2 hours before procedure and 1.5g PO 6 hours after the initial dose.
  - If penicillin allergy: Erythromycin 1g PO 2 hrs before procedure then half the dose 6 hours after the initial dose.
  - Lower gastrointestinal and genitourinary procedures: Amoxicillin 2g IM 30 minutes before procedure and 6 hrs after the initial dose + gentamicin 1.5mg/kg IM 30 minutes before procedure and 8 hrs after the initial dose.

Patient Education
- Emphasize need for follow up.
- Advise female patients on contraception.

Complications
- Congestive cardiac failure
- Pulmonary oedema
- Bacterial endocarditis

3.5 Hypertension

Hypertension is diagnosed when blood pressure (BP) reading is greater than 140/90mmHg on 3 separate readings.

Clinical Features
Majority of patients are asymptomatic. Occasionally patients may present with early morning occipital headaches, dizziness or complication of hypertension, e.g., renal failure, stroke, and heart failure. Majority of patients have essential hypertension. Table 3.1 summarizes the degrees of hypertension.

Table 3.1: Classification of hypertension

	Systolic (mmHg)		Diastolic (mmHg)
Optimal	<120	and	<80
Normal	<130	and	<85
High-normal	130–139	or	85–89
Stage 1 hypertension (mild)	140–159		90–99
Stage 2 hypertension (moderate)	160–179		100–109
Stage 3 hypertension (severe)	≥ 180		≥ 110

Note: Hypertension classification is based on the average of > 2 readings taken at each of two or more visits after initial screenings.

Investigations
Refer to higher level.

Management – General
Aim to reduce diastolic BP to 90mmHg; individualize treatment depending on age. Not all patients with hypertension need drug treatment. Non-pharmacological management includes:

- Weight reduction in obese patients
- Low salt diet
- Advising patients to give up smoking
- Regular dynamic exercises
- Low fat diet

Management – Pharmacological
Summary of plan for care in hypertension:
The choice of combination is no longer important. Presently, one combines multiple drugs from different classes starting at very low doses and where indicated, considering lipid lowering treatment in combination with antihypertensives to achieve a blood pressure of below 140/90mmHg. Refer to Table 3.2 for choices and dosages of drugs.

Table 3.2: Drug regimens for hypertension

Drugs	Daily dosages
Diuretics	
Thiazide diuretics	
– Hydrochlorothiazide (HCTZ)	6.25–25mg
– Chlorthalidone	6.25–25mg
Idapamide	1.25–5mg
Metalazone	2.5–5mg
Loop diuretics	
Frusemide	20–160mg
Bumetamide	0.5–2mg
Ethacrynic acid	25–100mg
Torsemide	2.5–20mg

Continued

Table 3.2, *continued*

Drugs	Daily dosages
Potassium sparing diuretic	
Amiloride	5–20mg
Triamtrene	25–100
Spironolactone	125–200mg
β-*blockers*	
Acebutolol	200–800mg
Atenolol	25–100mg
Metoprolol	50–200mg
Nadolol	20–320mg
Pindolol	10–60mg
Propranolol	40–160mg
Timolol	20–60mg
β/α-*blockers*	
Labetolol	200–1200mg
Carvedilol	6.25–50mg
Calcium channel blockers	
Amlodipine	2.5–10mg
Nifedipine XL	30–120mg
Felodipine	2.5–20mg
Nicardipine SR	30–120mg
Diltiazem CD	120–540mg
Verapamil HS	120–480mg
ACEIs	
Captopril	25–150mg
Enalapril	2.5–40mg
Lisinopril	10–80mg
Ramipril	2.5–20mg
Angiotensin receptor blockers	
Candersatan	8–32mg
Losartan	25–100mg
Valsartan	80–320mg
α-*blockers*	
Prazosin	1–40mg (2–3 divided doses)
Phenoxybenzamine	20–120mg (2 doses)
Sympatholytic agents	
Clonidine	0.2–1.2mg
Methyldopa	250–1000mg
Reserpine	0.05–0.25mg
Direct vasodilators	
Hydralazine	25–200mg
Minoxidil	2.5–100mg

3.6 Hypertensive Crisis

Sudden or sustained diastolic BP of more than 120mmHg with papilloedema, progressive decrease in renal function, and evidence of neurological dysfunction. Aim of treatment is to achieve diastolic BP of 100–110mmHg. BP should be

controlled within 1 hour in order to prevent permanent damage. However, rapid decrease of BP should be avoided to reduce risk of cerebral hypoperfusion.

Management
Refer to higher level.

Patient Education
Untreated hypertension has a high mortality rate due to: renal failure, stroke, coronary artery disease, and heart failure.

3.7 Pulmonary Oedema

This is an acute medical emergency caused by an increase in pulmonary capillary venous pressure leading to fluid in the alveoli, usually due to acute left ventricular failure.

Clinical Features
Breathlessness, sweating, cyanosis, frothy blood tinged sputum, respiratory distress, rhonchi, and crepitations.

Investigations
Refer to higher level.

Management – Pharmacological
This must be immediate:
- Prop up patient in bed.
- Administer 100% oxygen 3.5–5/L/min.
- Give IV frusemide 40mg initial, repeat with higher dose every 20–30 minutes to 200mg maximum total dose (see Section 38.2 for paediatric doses)
- If not already on digoxin, digitalize except if due to myocardial infarction (see Section 3.2).
- Give IV aminophylline 250–500mg slowly.
- Refer to higher level.

3.8 Deep Vein Thrombosis

Commonest site for DVT is the calf of the lower limbs followed by the pelvis. (See also Section 53.3.7, on DVT in pregnancy.)

Clinical Features
Pain usually of sudden onset; warmth on palpation, local swelling, tenderness. An extremity diameter of 2cm or greater than the opposite limb from some fixed point is abnormal. In DVT related to pregnancy and its complications as risk factors, the left lower limb is involved in over 80% of the cases. Diagnosis is mainly clinical.

Investigations
Refer.

Management – General
- Control pain.
- Promote venous drainage:
  - Order bed rest.
  - Elevate involved limb.
  - Place the foot of the bed in a slightly elevated position (Trendelenburg's).
- Apply warm packs around involved limb.
- Encourage limited extension and flexion of involved limb.
- Encourage early ambulation as soon as pain and inflammation begin to resolve.

Management – Pharmacological
Refer.

Complications
Watch out for the following complications:
- Recurrent thrombosis
- Pulmonary embolism

4. Central Nervous System

4.1 Headache

Headaches are due to activation of the primary afferent fibres that enervate cephalic blood vessels, chiefly meningeal or cerebral blood vessels. Headache is commonly secondary to some other cause, although a great percentage have no identified cause, being referred to as primary headache disorders. Examples of the latter are migrainous headaches, cluster headaches, and tension headaches. In these cases history and physical examination are usually adequate to arrive at the diagnosis.

Treatment
Can be nonpharmacological and pharmacological. The former includes behaviour and life style modifications such as:
- Avoiding certain foods known to trigger migrainous headaches.
- Adopting consistent sleeping patterns.
- Minimizing environmental stress.

Pharmacologic treatment may involve administration of:
- Analgesics like paracetamol.
- NSAIDs, ergotamine, and valproic acid for migraine.
- Oxygen inhalation or sumatripan and ergotamine tartrate for cluster headaches.
- NSAIDs and tricyclic antidepressants such as amitriptyline for tension headaches.

Secondary headaches are treated with analgesics plus treatment of the primary cause.

4.2 Seizure Disorders

Epilepsy is a clinical syndrome characterized by the presence of recurrent seizures. Seizures are a result of excessive electrical impulse discharge of cerebral neurones.

Classification
Seizures are classified as partial and generalized, with each having sub categories.

- Partial seizures
  - Simple partial seizures; can be motor, sensory and sensory-motor (consciousness not impaired)
  - Complex partial seizures; starting with an aura (later impairment of consciousness) and often accompanied by automatic behaviour
- Partial seizures becoming progressive (Jacksonian seizures) or generalized.
- Generalized seizures
  - Initially generalized:
    - Absence seizures
    - Tonic seizures
    - Myoclonic seizures
    - Tonic-clonic seizures
    - Clonic seizures
    - Atonic seizures

Clinical Features
Meticulous history from patient and reliable witness is critical in diagnosing a seizure disorder. Ask about the prodromal phase, aura, and the type, duration, and frequency, and the age of the patient at onset of seizures. Details about the post ictal phase are important. Ask about precipitating factors, for example alcohol use. Perform a thorough physical examination including fundoscopy in newly diagnosed cases.

Investigations
Refer.

Management – First Aid
During an epileptic attack:

- Place patient in the left lateral position with head turned to the same side.
- Remove or loosen tight fitting clothing around the neck.
- Remove dentures.
- Do not attempt to insert any instrument into the mouth to prevent tongue biting as this may have already happened.
- Try to shield patient from too many eager observers.
- Allow seizure to complete its course without physically attempting to hold down the patient. However, remove patient from danger, e.g., fire.

After an attack:

- Investigate patient as outlined above and start on therapy.

Management – General

- Treat underlying diagnosed condition if possible, e.g., hypoglycaemia, meningitis
- Establish firm diagnosis before starting therapy. Note that most patients can be started on therapy as outpatients.
- Start therapy if patient has had 2 or more seizures within 1 year.

NB: Treatment is usually life long. Therapy may be discontinued after a seizure free period of at least 2 years. Reduce dose gradually over many months. Sudden discontinuation of drugs may precipitate status epilepticus. Complex partial seizures will require lifelong drugs.

Management – Pharmacological

- Start therapy with 1 drug, usually phenobarbitone.
- Increase dosage at regular intervals until seizures are controlled or side effects appear.
- If side effects appear and seizures are still not controlled, introduce other drugs and taper off the first drug. Refer to Tables 4.1 and 4.2 for drug choices and regimens.

☛ **Refer if underlying metabolic cause is suspected or raised intracranial pressure is present.**

Table 4.1: Drugs of choice for common seizures

Partial	First drug	Other drugs
Simple	Phenytoin	Carbamazepine, valproic acid, gabapentin
Complex	Carbamazepine	Phenytoin, valproate, gabapentin, zonisamide
Secondarilygeneralized	Phenytoin	Lamotrigine, valproate, carbamazepine
Generalized	First drug	Other drugs
Absence	Ethosuximide	Valproic acid, clonazepam, valproate, lamotrigine
Tonic-clonic, clonic	Phenobarbitone	Carbamazepine, phenytoin, lamotrigine
Tonic	As above	As above
Atonic	As above	As above
Myoclonic	Clonazepam	Nitrazepam, valproic acid, phenobarbitone, carbamazepine

Table 4.2: Drug regimens for seizure disorders

Drug	Dose	Frequency
Phenobarbitone	60–240mg	Once daily
Phenytoin	50–400mg	Once daily * ***toxicity develops rapidly***
Carbamazepine	400–1400mg	In 2–3 divided doses
Sodium valproate	600–2400mg	In 3 divided doses
Ethosuximide	20–40mg/kg/day	In 2 divided doses
Clonazepam	1–12mg	Once daily

Drugs used at maximum recommended dose should be withdrawn if seizures are not controlled

Patient Education
- Avoid becoming drunk, especially drinking spree during weekends.
- Eat at regular intervals.
- Manage stress, as stress, physical or mental, may precipitate a seizure.
- Avoid sleep deprivation.
- Never swim alone and take all precautions when swimming.
- Avoid operating heavy or sharp-edged machinery.
- To prevent burns, make a protective shield around *jikos* (braziers).

4.3 Status Epilepticus

This is a succession of seizures in which the patient does not regain consciousness between attacks. It could be due to partial, complex partial, absence, tonic-clonic, or clonic. Only the last two are life threatening.

Clinical Features
Patient is not able to talk, the short tonic phases are not clear and the patient appears in continuous clonic phase. May be in respiratory embarrassment with cyanosis or may be hypoglycaemic.

Management – Supportive
- Place patient in the left lateral position with head turned to the same side.
- Do NOT attempt to put anything into the patient's mouth to stop the biting of the tongue. You are likely to cause more damage.

Management – Pharmacological
- Give IV (not IM) diazepam 10mg STAT, repeat if there is no response. The injection rate should not be faster than 3 minutes. If still no response, put 80mg in 500ml of normal saline, adjust rate to control seizures. Repeat after 15 minutes if not controlled.
- Consider rectal diazepam 10–20mg, which may be as effective. **Use rectal solution at 0.5mg/kg.** Other useful drugs include:
  - Phenobarbitone: Loading dose of phenobarbitone - 10mg/kg IV at a rate of 100mg/minute. Maintenance 1–5mg/kg/day PO or IV 3–6mg/kg IM BD or TDS. Then maintenance 1–5mg/kg/day.
  - IV Phenytoin (with glucose-free solution): Loading dose 18–20mg/kg. Infusion not to exceed 50mg/minute. Maintenance 300–500mg/day.

4.4 Stroke

Stroke is a group of diseases that are of abrupt onset and cause neurological damage. The majority result from interrupted supply of blood to the brain (ischaemic), while about 10–15% arise from haemorrhage into the brain substance or its surrounding spaces (haemorrhagic).

4.4.1 ISCHAEMIC STROKE

Ischaemic stroke commonly arises from mural thrombi forming at the site of atherosclerotic lesions, blocking blood flow. Alternatively, ulceration or rupture of an atherosclerotic plaque may lead to the formation of a clot and distal

embolization, or, still, haemorrhage into an atherosclerotic plaque may obstruct the artery. Commonly, emboli arise from the left side of the heart, from mural thrombi, vegetations from infected heart valves, or arrhythmias. Paradoxical emboli can arise from venous circulation and access cerebral circulation through right to left cardiac shunts.

Clinical Features
Rapid onset of neuronal malfunction referable to the area of the brain for which the blood supply is disrupted.

Diagnosis
From history and physical examination

Investigations
Refer to higher level.

Management
Refer to higher level.

4.4.2 HAEMORRHAGIC STROKE

Hypertension and vascular malformations are the commonest causes of haemorrhagic stroke, both subarachnoid and intracerebral haemorrhages, and are associated with very high mortality.

Clinical Features
Intense headache of sudden onset, commonly associated with elevated blood pressure. In half of patients there is transient alteration of the level of consciousness, commonly going into coma. If there is subarachnoid bleed, there are features of meningism including stiff neck and a positive Kernig's sign.

Diagnosis
History and physical examination usually suggest the diagnosis.

Investigations
Refer urgently to higher level.

Management
Refer urgently to higher level.

5. Endocrine System

5.1 Diabetes Mellitus

Diabetes mellitus is recognized by chronic elevation of glucose in the blood (hyperglycaemia). It is classified into two types:

- ***Type 1 (Insulin dependent diabetes mellitus):*** Usually occurs in children and young adults and is associated with ketoacidosis. These patients are insulinopenic and require insulin to sustain life.

- ***Type 2 (Non-insulin dependent diabetes mellitus):*** Usually afflicts adults, a large number of whom are obese and tend to have elevated blood pressure (metabolic syndrome).

Presentation

Commonest symptoms are polyuria, polydipsia, polyphagia, and weakness. Wasting tends to occur in type 1 diabetes, while obesity may predominate in type 2. Sequelae of target organ damage in the kidneys, blood vessels, heart, nerves, and eyes may be the main manifestations.

Investigations

- Blood glucose:
  - Fasting venous blood glucose more than 7.8mmol/L on more than one random occasion
  - Blood glucose more than 11.1mmol/L in symptomatic patients
- Urinalysis – for protein, sugar, ketones

Management

Aims of management:

- To abolish symptoms of diabetes
- To correct hyperglycaemia, glycosuria
- To prevent and manage complications

General management:

- Manage as outpatient preferably in the diabetic clinic or medical clinic.
- Dietary modification is important in both types 1 and 2.
- Consult nutritionist as dietary modification must be individualized.
- Food composition: Carbohydrate 50–60% in complex form, e.g., brown rice, whole grain cereals, beans, peas, etc.; protein 10–20%; fat 25–30%. Vegetable protein sources include soya beans, lentils, and beans.
- Fibre in diet can prolong absorption of sugar. Fibre containing foods include beans, legumes and bran
- Artificial sweeteners, e.g., saccharin and aspartate, are helpful in maintaining a palatable diet.
- Strict adherence to meals schedule is important.
- Type 1 diabetes mellitus patients experience weight loss and will gain weight with therapy. Aim for calorie intake of 35 Kcal/kg body weight to maintain ideal body weight.
- Type 2 diabetes mellitus patients are often obese, and such patients' caloric restriction of 15–20 Kcal/kg body weight is recommended. Exercise is important because modest weight reduction in obese diabetic patients leads to improved glycaemic control.

Pharmacological management:

Oral hypoglycaemics

- First generation sulfonylureas:
  - Chlorpropamide 125–500mg PO OD max. 500mg/day should be started if response to dietary modification is inadequate (nocturia, blood sugar more

than 14mmol/L). Dose adjustment should be gradual (weekly) to avoid hypoglycaemia.
  - Tolbutamide 500–3,000mg/day in 2–3 divided doses
  - Tolazamide 100–1,000mg/day in 1–2 divided doses
- Second generation sulfonylureas:
  - Glibenclamide
  - Glipizide 5–40mg/day in 1–2 divided doses
  - Glimepiride 1–8mg/day in one dose
- Biguanides:
  - Metformin 500–2,550mg/day in 2–3 divided doses
  - Glyburide 250–2,000mg/day in 2 divided doses
- Alpha-glucosidase inhibitors:
  - Acarbose 75–300mg/day in 3 divided doses
  - Miglitol 75–300mg/day in 3 divided doses
- Thiazolidinediones:
  - Pioglitazone 15–45mg/day in 1 dose
  - Rosiglitazone 4–8mg/day in 1–2 doses

Insulin is indicated in type 2 DM if:
- Oral hypoglycaemic drugs are not effective, e.g., persistent polyuria, hyperglycaemia.
- Ketonuria occurs.
- Infection occurs.
- Other complications, e.g., renal failure are present.
- Patient undergoes surgery.

☛ **Refer patient for admission for insulin therapy.**

☛ **Hypoglycaemia should be considered in all diabetic patients who present with altered consciousness or coma.**

5.1.1 TYPE 1 DIABETES MELLITUS

Usually present with diabetic keto-acidosis (DKA). Patients with type 2 DM can also present with DKA especially in situations of stress such as infection or neglect of therapy. Clinical features include intense polydipsia, abdominal pain, vomiting, dehydration, acidotic breathing, or coma.

Investigations
- Urinalysis should reveal ketonuria and glycosuria
- Blood sugar should show hyperglycaemia.

Management
- DKA is a medical emergency and should be treated as such. Not all patients with DKA are in coma.
- Fluid replacement: Initiate fluid replacement with normal saline then change to 5% dextrose alternating with normal saline when blood sugar is between 12.0 and 14.5mmol/L. If severely dehydrated continue normal saline and 5% dextrose together.
- For further management of DKA refer.

☛ **Take blood for glucose and give 20ml of 50% dextrose immediately.**

Patient Education
- Teach patients how to avoid foot injury.
- Hospital occupational therapist should advise patients on foot care.
- Patients with any injury, however minor, should seek medical advice.
- Patients should eat regularly.
- Patients should carry sweets or glucose and chew them if they experience any symptoms of hypoglycaemia.
- Patients should always carry "Diabetic Alert" card with them.
- Patients should join diabetes support groups.

☛ **All diabetics with complications such as diabetic foot should be referred.**

Psychosocial support
Patients with diabetes undergo a lot of stress. There is need for psychosocial support, for both the patient and the caregivers.

5.1.2 COMPLICATIONS OF DIABETES MELLITUS

The main complication is hypoglycaemia, which occurs when blood glucose is lower than 4mmol/L.

- General management of hypoglycaemia
  - Give sugar-containing soft drinks, snacks or sweets
  - Monitor blood sugar every 15 minutes until blood glucose is 6–8mmol/L
- Pharmacological management of hypoglycaemia
  - IV 50% dextrose bolus 25–50ml (children 1–2ml/kg)
  - IM/IV/SC glucagon: <30kg – 0.5mg STAT dose; 30kg – 1mg STAT dose
- Give 5 or 10% dextrose fluid as a continuous infusion for normal maintenance of fluid requirements for age (refer to Section 6.1, on diarrhoeal diseases).

5.2 Diseases of the Pituitary Gland and Adrenals

Pituitary gland disorders can be either pituitary hyperfunction or hypofunction. These are reflected in disorders of thyroid (e.g., goitre), adrenals, and ovarian functions.

5.2.1 GOITRE

Enlargement of thyroid gland.

Classification
- Simple goitre can be diffuse or nodular. It is usually caused by lack of iodine or defects in the synthesis of thyroxine hormone.
- Toxic goitre may be diffuse or nodular. Produces excess thyroxine (T3, T4) and manifests with signs and symptoms of thyrotoxicosis.
- Neoplastic goitre can be benign or malignant.
- Thyroiditis, e.g., Hashimoto's disease.
- Infection related goitres: These are rare goitres and may be caused by tuberculosis or syphilis.

Clinical Features
Most patients are asymptomatic. Pressure symptoms consist of engorged neck veins, dysphagia, stridor, hoarseness. In hyperthyroid patients' signs and symptoms include weight loss, diarrhoea, heat intolerance, sweating, tachycardia, heart failure, tremors, eyelid lag, exophthalmos, and menstrual disorders.

Investigations
Refer to higher level.

Management
Refer to higher level.

5.3 Adrenocortical Disorders

These can be either underproduction or overproduction of glucocorticoids or mineral corticoids, leading to hypofunction or hyperfunction status.

5.3.1 GLUCOCORTICOID EXCESS (CUSHING'S SYNDROME/ DISEASE)

Arises from a pituitary adenoma production excessive amounts of ACTH, which results in excess cortisol production. Cushing's syndrome can also arise from exogenous administration of glucocorticoids or endogenous excess production of cortisol by the adrenal glands.

Clinical Features
Clinical features include weight gain, moon face, hypertension, skin striae, hirsutism, acne, easy bruisability, hyperpigmentation, glucose intolerance, plethora, proximal muscle weakness, menstrual dysfunction, osteopaenia, hypokalaemia and metabolic alkalosis.

Diagnosis
Refer to higher level.

Management
Refer to higher level.

5.3.2 ADRENAL INSUFFICIENCY

Commonly caused by infections like TB, autoimmune conditions and neoplasms. Patients commonly present with features of weakness , weight loss, diarrhoea, vomiting, hypotension and darkening of skin palms and recent scars.

Diagnosis and Management
Refer to higher level.

6. Gastrointestinal Conditions

6.1 Diarrhoeal Diseases

Diarrhoea is defined as occurrence of at least 3 loose or watery stools in a day. Diarrhoeal diseases may be broadly classified as:

- ***Dehydration:*** This is the loss of body fluid and electrolyte balance.
- ***Dysentery:*** This is bloody diarrhoea.
- ***Persistent diarrhoea:*** This is diarrhoea that has lasted for 14 days or more.

Management

Rehydration Protocol

Dehydration is the major cause of death from diarrhoea. Management is aimed primarily at evaluation, prevention, and treatment of dehydration. Table 6.1 summarizes the clinical evaluation of dehydration and Table 6.2 shows the protocol. In using Table 6.2, bear in mind:

- The volumes indicated are guidelines only.
- Rehydration must be evaluated in terms of clinical signs, not in terms of volume of fluids given.
- If necessary, the volumes given below can be increased or else the initial high rate of administration can be maintained until there is clinical improvement.
- Periorbital oedema is a sign of fluid overload in infants or hypernatreamia in those on ORS.

Table 6.1: Clinical signs of dehydration

Clinical feature	Mild dehydration	Moderate dehydration (2 signs present)	Severe dehydration (≥2 signs present)
General appearance: Older children and adults	Thirsty, alert	Thirsty, alert	Generally conscious, anxious, cold extremities, clammy, cyanosis, wrinkled skin of fingers, muscle cramps, dizzy if standing
Pulse	Normal	Rapid	Rapid, thready, sometimes absent
Respiration	Normal	Deep, sometimes rapid	Deep and rapid
Systolic BP	Normal	Normal	Low, sometimes unmeasurable
Skin elasticity	Normal: fold of pinched skin disappears at once	Decreased	Fold disappears very slowly (>2 seconds)
Eyes	Normal	Sunken	Severely sunken
Tears	Present	Absent	Absent
Mucous membranes (test mouth with a clean finger)	Moist	Dry	Very dry
Urine output	Normal	Reduced, urine dark	Anuria, empty bladder
% of body weight loss	1–5%	6–9%	10% or plus
Estimated fluid deficit	10–50ml/kg	60–90ml/kg	100ml/kg

- Maintenance therapy should begin as soon as signs of dehydration have resolved, but not before.
- The patient should return to health worker if no improvement in 3 days or if the following conditions develop: many watery stools, very poor drinking, repeated vomiting, fever, marked thirst, and blood in stool. Also if the caregiver is not happy with the condition.

Fluid Maintenance Therapy

- Fluid to be given after correction of dehydration.
- Adapt redehydration treatment to the clinical status of the patient.
- ORS should constitute about two-thirds of the fluid intake until diarrhoea stops.
- Other liquids such as plain water, rice water, uji, mala, etc., can also be given.
- Thirst is the best guide for maintenance fluid therapy in older children and adults. They should drink as much ORS (and other liquids) as they desire.

Maintain Nutrition

It has been shown that there is no physiological reason for discontinuing food during bouts of diarrhoea and that continued nutrition is beneficial. Continued feeding should be encouraged. In addition, the patient should eat fresh fruit or mashed bananas to provide potassium, which is lost with the dehydration.

Management – Pharmacological

Note that 50–60 % of acute gastroenteritis is viral. Also note the following:

- Always treat the fever and consider other diseases associated with diarrhoea (e.g., malaria, otitis media, pneumonia).
- Use antimicrobial drugs (see Table 6.3) ***only*** as follows:
  - Antibiotics only for dysentery and suspected cholera with severe dehydration.
  - Antiprotozoal drugs (e.g., metronidazole) for suspected amoebiasis only.
  - After antibiotic treatment of bloody diarrhoea has failed or faeces shows trophozoites of E. histolytica.
  - Antiparasitic drugs for giardiasis when diarrhoea has lasted over 14 days and cysts or trophozoites of giardia are seen in faeces.

Table 6.2: Rehydration protocol

Degree of dehydration	Age	Type of liquid	Volume to give	Rate
Mild	All	ORS	50ml/kg	In 4 hours
Moderate	All	ORS	100ml/kg	In 4 hours
Severe	Older children and adults	Hartmann's solution, Ringer's lactate	110ml/kg	In 4 hours: at first as rapidly as possible until a radial pulse is palpable

NOTES: (a) Initially, adults can usually ingest up to 750ml of ORS/hour, and older children 300ml/hour. (b) If Ringer's lactate or Hartmann's solution are not available, use:

- Half-strength Darrow's solution
- Normal saline with sodium bicarbonate and potassium chloride added
- Normal saline diluted to half-strength with 5% glucose (dextrose)

☛ **None of these solutions is as effective as Ringer's lactate or Hartmann's solution.**

Table 6.3: Antibiotics used in the treatment of diarrhoea

Aetiology/Clinical features	Management
Cholera: Very profuse watery diarrhoea (rice-water stools), frequent vomiting	**Doxycycline:** 100mg BD x 7 days ***OR*** **Erythromycin:** 250mg QDS x 5 days
Shigella dysentery: Blood & mucus in stools, cramps, tenesmus, fever	**Cotrimoxazole:** 960mg BD x 5 days **Amoxicillin:** 500mg QDS x 5 days Tabs Ciprofloxacin 500mg OD x 5 days
Intestinal amoebiasis: Acute amoebic dysentery: As with shigella, but usually no fever (except amoebic liver abscess)	**Metronidazole:** 800mg TDS x 5–10 days ***OR*** Tinidazole 2g OD for 3 days
Acute giardiasis: Prolonged diarrhoea, often marked eructation (belching), flatulence	**Metronidazole:** 800mg TDS x 5–10 days ***OR*** Tinidazole 2g OD for 3 days

Prevention

- Proper sanitation: Provision of safe drinking water in sufficient quantities and disposal of faeces.
- Hygiene during food preparation. Remember the 4C's; Clean hands, Clean food, Clean utensils, Clean storage.
- Cholera vaccine.

6.2 Gastritis

This is an acute ulceration of the stomach, usually multiple lesions, non-recurrent, and self-limiting.

Aetiology

Drugs (NSAIDs), alcohol, acute stress associated with massive burns, head injuries.

Clinical Features

Epigastric pain with or without vomiting. May follow ingestion of drugs and herbal preparations. Heartburn may be a feature. Examination reveals tenderness in the epigastrium and the regions around it.

Investigations

Not always necessary if cause is obvious. Otherwise, refer to higher level.

Management

- Treat the primary disease, e.g., head injury, renal failure.
- Avoid drugs known to cause ulceration.
- Magnesium trisilicate tabs 2–4 QDS or frequently ***OR*** mist antacids 30ml 1 hour and 3 hours after meals. Adjust dose according to pain.
- Role of triple therapy (see Section 6.4, below, on peptic ulcer disease).

6.3 Gastro-Oesophageal Reflux Disease (GORD)

Physiological process characterized by effortless movement of gastric contents from the stomach to the oesophagus. Symptoms and pathology occur when the oesophageal mucosa has excessive contact with gastric contents as a consequence of continual failure of anti-reflux mechanism.

Clinical Features

- Heartburn is the characteristic symptom of GORD, with or without regurgitation of gastric contents into the mouth
- There is pain on swallowing hot drinks or alcohol.
- Oesophagitis causes bleeding, which can be massive.
- Peptic stricture causes gradually progressive dysphagia.
- Aspiration of gastric contents can result in aspiration pneumonia.
- Oesophageal ulcers cause same type of pain as gastric or duodenal ulcer.

Diagnosis

- Detailed history points to the diagnosis.
- Refer suspected cases for further investigations and management.

6.4 Peptic Ulcer Disease

Ulceration of gastroduodenal mucosa that has tendency to be chronic and recurrent. Can be duodenal or gastric.

Clinical Features

- ***Duodenal ulcer***
  - Epigastric pain, typically at night and when hungry
  - May present for the first time with complications [see later in this section]
  - Wide individual variation in symptoms and food that give pain
  - 95% of duodenal ulcers are caused by Helicobacter pylori (H. pylori).

- ***Gastric ulcer***
  - Epigastric pain, worse with food
  - Other features as in duodenal ulcer above

Investigations

- Stool for occult blood
- Refer for further investigation.

Management

- Avoid any foods that, to the patient's experience, give pain.
- Avoid obviously acidic foods, e.g., cola drinks.
- Limit alcohol intake and smoking.
- Bed rest in acute attacks.
- Avoid gastric irritating drugs (NSAIDs).

- Give magnesium-based antacids or combined magnesium-aluminium compounds, liquid preferred. Maximum dose is 6 tablets a day. Adjust dose to limit pain. If no response, give cimetidine 800mg or ranitidine 300mg nocte for 4–6 weeks then 400mg/150mg, respectively, as maintenance.
- Use the following triple therapy to eradicate H. pylori :
  - **Regime I:**
    - Omeprazole 20mg BD 14 days
    - Clarithromycin 500mg BD 14 days
    - Amoxicillin 1g BDS for 14 days
  - **Regime II:**
    - Omeprazole 20mg BD 14 days
    - Amoxicillin 1g BD for 14 days
    - Metronidazole 400mg TDS 14 days

☛ **Other PPI such as esomeprazole can be used instead of omeprazole. Refer if all the above fail.**

Complications
Haematemesis, obstruction, perforation, penetration to the pancreas, malignancy.

6.5 Upper GIT Bleeding

Bleeding from the GIT above the ligament of Treitz.

Aetiology
- Oesophageal varices
- Gastritis and gastric ulcers
- Duodenal ulcers
- A-V malformation
- Malignancies – stomach and oesophagus
- Mallory-Weiss syndrome
- Polyps

Clinical Features
Vomiting of fresh bright blood or coffee-ground vomitus (haematemesis). Forceful vomiting followed by haematemesis suggests gastroesophageal junction tear. Excessive alcohol intake or ingestion of anti-inflammatory drugs may suggest erosive gastritis, while previous epigastric pain suggests peptic ulcer. In massive haemorrhage, blood may appear per rectum.

Investigations
Refer to higher level.

Management
- Set up large IV line, start infusion of normal saline.
- Refer immediately.

6.6 Lower GIT Bleeding

This may be frank bleeding (haematochezia) or occult bleeding, depending on the cause.

Common Causes
- Haemorrhoids
- Anal fistula and fissures
- Tumours:
  - Benign: polyps, leiomyoma, fibromas
  - Malignant
- Infections
  - Bacterial: shigella, campylobacter, salmonella
  - Protozoa: amoebiasis
  - Parasite: schistosomiasis
- Trauma
- Angiodysplasia
- Inflammatory bowel disease (Crohn's disease and ulcerative colitis)
- Diverticular disease
- Bleeding disorders.

Investigations and Management
Refer.

☛ **No physical examination is complete without a rectal examination.**

6.7 Viral Hepatitis

This is a liver inflammation caused by viruses, including hepatitis A, B, C, D (delta), and E. Hepatitis A and D are transmitted through the faecal–oral route while the rest are by blood and blood products. The Hepatitis A virus causes an acute hepatitis, which is usually self limiting, while the rest can go to the chronic stage. Chronic B and C infections can lead to cirrhosis and hepatocellular carcinoma.

Clinical Features
Symptoms and signs of acute hepatitis include yellowness of eyes, fever, nausea, anorexia, vomiting, right upper quadrant pain. Physical examination reveals upper abdominal tenderness.

Diagnosis and Management
Refer.

Prevention
- Hygiene
- Precaution in handling biological fluids and laboratory equipment
- Vaccination against Hepatitis A and B

6.8 GIT Parasitic Infestations

6.8.1 AMOEBIASIS

An infection usually of the colon caused by Entamoeba histolytica. Most cases can be prevented if at level 1 strict attention is paid to personal hygiene, availability of clean, uncontaminated water, environmental sanitation, and proper waste disposal.

Clinical Features

Amoebic dysentery, amoebic liver abscess, amoebiasis, and "vague" abdominal complaints. Asymptomatic cyst carrier.

Investigations

- Stool for microscopy – trophozoites with ingested RBCs and cysts of Entamoeba histolytica in amoebic dysentery

Management

- Amoebic dysentery:
  - Correct dehydration.
  - Give metronidazole 800mg TDS for 5 days.
- Amoebic liver abscess
  - Give metronidazole 1.4g OD for 3–5 days.
  - Refer pointing abscesses for surgical drainage.
  - For amoebiasis and "vague" abdominal complaints, remember:
    - Where amoebiasis is common, there is a tendency to blame any abdominal complaints on amoeba. Usually these patients have cysts in stool but no evidence of invasive disease, e.g., ingested RBC in trophozoite.
  - Exclude other causes of abdominal pain.
- Asymptomatic cyst carriers:
  - Treat cyst carrier only if patient is a food handler.
  - Use diloxanide furoate 500mg twice daily for 10 days, or a combination of diloxanide furoate with metronidazole (entamizole) 1 tab 3 x day for 10 days.

Prevention

- Provide safe drinking water and sanitary disposal of faeces are important preventive measures.
- Ensure regular examination of food handlers and appropriate treatment when necessary.

6.8.2 INTESTINAL WORMS

These comprise a large group of parasitic cestodes, schistosomes, flukes, nematodes, and filarial worms. Only nematodes are dealt with in this section. They include hookworm disease, ascariasis, enterobiasis, trichuriasis, trichostrongyliasis, anisakiasis, capillariasis, and gnathostomiasis. Still, only the common ones are highlighted (refer to tables 6.4 and 6.5, respectively, for clinical features and management of these intestinal worm infections).

Table 6.4: Common intestinal worms – Features and investigations

Worms	Clinical features	Investigations
Ascaris lumbricoides (roundworms): Large round, cream coloured worms that live in the small intestines	▫ Infection by swallowed embryonated eggs ▫ Loeffler's syndrome ▫ Mild bouts of recurrent colic ▫ The mother has seen the worm in stool or vomitus ▫ Complications such as obstruction, vomiting may occur	Stool for ova
Hookworms	▫ "Ground itch" ▫ Features of anaemia (iron deficiency)	Stool for ova Haemogram
Trichuris trichiura (whipworms)	▫ Diarrhoea with blood ▫ Rectal prolapse ▫ Anaemia ▫ Wasting	Stool for ova Worms may be seen adhering to rectal mucosa
Strongyloides stercoralis	Most infections are asymptomatic but the following may occur: ▫ Larva currens (buttocks) ▫ Soiling of innerwear with stool ▫ Hyperinfection syndrome ▫ Diarrhoea ▫ Gram-negative septicaemia ▫ Bacterial peritonitis ▫ Encephalitis	Direct stool microscopy (motile larvae, adult worms
Enterobius vermicularis oxyuriasis (pin worm) Synonyms: Threadworm, pinworm, seatworm. The worm is 4mm long and is just visible to the human eye	Mode of spread *Auto-infection:* ▫ Direct anal to mouth transfer via the fingernails ▫ Retro- infection; eggs may hatch into larvae at the anal-rectal area. Then larvae move retrogradely to the caecum. *Cross infection:* ▫ Contamination of fingers by clothing, objects, toilet seats, etc. ▫ By inhaling and swallowing eggs in the dust ▫ Main presentation: perianal and perineal itching. Migrating larvae may cause: ▫ Vaginitis, vulvitis, salpingitis, and peritonitis ▫ Irritation, insomnia may occur	Stool for ova Ova can be obtained from the perianal region by use of adhesive tape
Taenia saginata (beef tapeworm)	▫ Non-specific symptoms, irritability ▫ Segment may be passed with stools ▫ Egg in stools	Stool for ova (motile proglottides)

Table 6.5: Management of intestinal worm infections

Worms	Adult doses
Ascaris lumbricoides (roundworm)	Mebendazole 500mg STAT ***OR*** Albendazole 400mg STAT ***OR*** Levamisole 2.5mg/kg as a single dose
Ancylostomatidae spp. (hookworm)	Mebendazole 500mg STAT ***OR*** Albendazole 400mg STAT ***OR*** Levamisole 2.5mg/kg as a single dose
Trichuris trichiura (whipworm)	Mebendazole 500mg STAT ***OR*** Albendazole 400mg STAT
Strongyloides stercoralis	Albendazole 400mg BD x 3 days
Enterobius vermicularis (pinworm)	Mebendazole 500mg STAT Levamisole 2.5mg/kg as a single dose REPEAT AFTER 10 days
Taenia saginata (beef tapeworm)	Niclosamide 2g: 1g before breakfast, 1g 1 hour after breakfast Praziquatel dose/albendazole 400mg once daily for 3 days

☛ **HOOKWORM – Anaemia develops if iron intake is low and infection is significant. If patient fails to respond to therapy consider other causes, e.g., blood loss, poor compliance.**

Prevention

Appropriate prevention depends on the particular worm. In general:

- Providing safe water .
- Washing hands and trimming fingernails.
- Changing innerwear and bed sheets frequently.
- Using latrines.
- Wearing shoes, sandals.
- Keeping livestock away from human dwellings.

7. Infections (Selected) and Related Conditions

7.1 Parasitic Infections

Parasitic, bacterial, fungal and viral infections are leading causes of morbidity and mortality. Accurate diagnosis and appropriate, cost-effective treatment are essential. Individual infections are discussed depending on their clinical importance.

7.1.1 MALARIA

Malaria parasites are usually transmitted by the bite of an infected female anopheles mosquito. Plasmodium falciparum is the commonest in Kenya and is associated with significant morbidity and mortality. The other species are: P. malariae, P. vivax, and P. ovale.

Clinical Features

Uncomplicated Malaria

Classically malaria presents with paroxysms of fever, chills, rigors and sweating. Other features include: malaise, headache, myalgia, joint pains, refusal to feed, nausea, vomiting, abdominal discomfort, and diarrhoea.

Severe Malaria

Severe malaria presents with a combination of most of the above plus either one or more of the following:

- Parasitaemia >5%
- Anaemia Hb <5g %
- Cerebral malaria manifesting as confusion, stupor, convulsions or coma
- Jaundice
- Hyperpyrexia, temperature >39°C
- Hypoglycaemia (blood sugar <2.2mmol/L)
- Pulmonary oedema
- Disseminated intravascular coagulopathy (DIC – spontaneous bleeding)
- Malaria haemoglobinuria (cola coloured urine)
- Oliguria
- Hypovolaemic shock
- Fluid electrolyte imbalance

Investigations

- OPD cases:
  - Thick blood smear for malaria parasites (may require several slides)
- Inpatient cases:
  - Thin blood smear for parasite count, species identification and RBC morphology: haemoglobin, blood sugar, urinalysis

☛ ***A negative slide does not necessarily rule out malaria.*** Where cerebral malaria is suspected appropriate therapy must be instituted promptly. Exclude other diseases, e.g., meningitis, that may present with similar features. Do not assume a positive slide explains the cause of a febrile illness: 20–30% of the normal population in endemic parts of Kenya will have positive slide for malaria parasites without symptoms and signs of malaria.

Management

Refer to Table 7.1 for a summary of the management of uncomplicated malaria in children.

Table 7.1: Uncomplicated malaria in children

Weight of patient	Number of tablets per dose	Content of artemether (A) + lumefantrine (L)	Doses required for treatment
5–14kg	1	20mg A + 120mg L	Twice per day for 3 days
15–24kg	2	40mg A + 240mg L	Twice per day for 3 days
25–34kg	3	60mg A + 360mg L	Twice per day for 3 days
35+ kg	4	80mg A + 480mg L	Twice per day for 3 days

Severe Malaria

- Prompt diagnosis and management of the specific complication is vital. Quinine is the recommended treatment for severe malaria.
- Quinine injection given as a loading dose of 20mg/kg IM injection then refer. Where referral not possible, continue with a maintenance dose of 10mg/kg 8 hourly. ***OR***
- Artemether injection as loading dose 3.2mg/kg IM injection then 1.6mg/kg maintenance dose until the patient can take oral therapy, then put on a full course of AL.

Management – General

- Maintain fluid and electrolyte balance especially if there has been significant fluid loss.
- Monitor output: Output should be at least 30ml per hour. If hydration is inadequate and oliguria persists, give frusemide 40–80mg IV STAT.
- Convulsions: Use diazepam 0.3mg/kg IV/IM ***OR*** rectal 0.5mg/kg ***OR*** paraldehyde 0.2ml/kg IM.
- Hypoglycaemia: Monitor blood glucose regularly. Large doses of dextrose may be required: 25% at 2ml/kg or 50% at 1ml per kg.
- Anaemia: Monitor Hb regularly. Transfuse if Hb is less than 5g% AND patient develops cardiorespiratory distress (grunting, nasal flaring, chest indrawing, heart failure).
- Check blood slide for malaria parasites daily to confirm if parasitaemia is falling.

Management – Specific Level 3

The management of adults with severe malaria must be appropriate to each complication that develops. Quinine is not contraindicated in pregnancy. Fluid and antimalaria drugs are given as for children. IV quinine should be given as follows:

- As first dose, give 20mg/kg in ½ litre of fluid in 5% dextrose over 4 hours (max 1,200mg).
- Then give 10mg/kg in ½ litre of fluid over 4 hours (max 600mg) 8 hours after commencing the initial dose repeat 10mg/kg 8 hourly until the patient can take orally.
- Change to oral AL full dose or oral quinine to complete 7 days therapy.
- Assessment of fluid should be monitored regularly including urine output.

Monitoring Response

It is similar to that for children with special attention to the complications.

- If patient cannot be weighed: Assume a loading dose of 900mg, followed by 600mg 8 hourly. Monitor for and correct hypoglycaemia with 50% dextrose (1ml/kg).

☛ **Each infusion of quinine should be given over 4 hours.** Use quinine IM if IV drip cannot be monitored or if you fail to get IV access. Quinine hydrochloride may be given IM in emergencies as shown in Table 7.2.

Table 7.2: Dosage of intra-muscular injection of quinine hydrochloride

Weight range (kg)	Volume of quinine injection (ml)	No. of injection sites
31 – < 36	3.2	2
36 – < 41	4.0	2
41 –< 46	4.5	2
46 – < 51	5.0	2
51 –< 56	5.5	2
56 – < 60	6.0	2
60 +	6.0	2

Dilution to 100mg/ml:
Use 10ml sterile syringe. Draw up 4ml of sterile water for injection. Then into the syringe, draw up 600mg (2ml) from an ampoule of quinine and shake. The syringe now contains 100mg quinine per ml.
NOTE: Each injection should not be more than 3ml per injection site.

The dose for adults above 60kg should not exceed 600mg.
- Quinine hydrochloride may be given IM in emergencies.
- Oral quinine may be introduced intragastrically by NG tube in situations when parenteral quinine is not available.

Refer patient if the following conditions are present or persist:
- Patient is in renal failure – oliguria and rising blood urea. Or any major complication.
- Case is complicated and you have no general support facilities (IV, blood transfusion): coma, convulsions, signs of renal involvement (oliguria).

Chemoprophylaxis
- Anti-malaria prophylaxis should be given to the following groups when going to malaria prone areas:
  - All non-immune visitors to malarious areas:
    - Long-term residence >4 weeks
    - Short-term residence <4 weeks
  - Patient with sickle cell disease and thalassaemia
  - Children with impaired immunity (e.g., HIV, leukaemia)
  - Patients with hyperimmune malaria syndrome, leukaemia or splenectomy
  - Pregnant women (minimum of 2 IPT doses)
- Chemoprophylaxis regimen:
  - General: Current recommended antimalaria prophylaxis for those at risk is mefloquine 250mg given weekly starting 2 weeks before travel to a malaria endemic area and continued for up to 4 weeks after return to a non malarious area.

Patient Education
- Seek early treatment for fever.
- Cover exposed skin in the evenings.
- Use long lasting insecticide treated nets (LLINs) – especially for children below age 5 years and pregnant women.

- As a community effort, participate in indoor residual spraying (IRS) in epidemic prone areas, clear brush around dwellings, empty/drain mosquito breeding places (stagnant pools, discarded containers, old tyres, coconut shells, etc.).

7.1.2 TRYPANOSOMIASIS (SLEEPING SICKNESS)

It is a zoonotic disease caused by Trypanosoma brucei, which is transmitted by bites of tsetse fly (glossina spp). There are 2 types in Africa: T. brucei rhodesianse (East Africa) and T. brucei gambiense (West Africa).

Clinical Features
Disease caused by T. brucei rhodesianse is an acute febrile illness complicated by myocarditis and meningoencephalitis that is rapidly fatal if not treated. T. brucei gambiense causes a chronic debilitating illness with mental deterioration and physical wasting.

Management
Refer all suspected cases.

7.1.3 LEISHMANIASIS

VISCERAL LEISHMANIASIS

Disease caused by Leishmania species. Visceral leishmaniais (kalaazar) is caused by Leishmania donovani. It is transmitted by a sandfly, which has an animal reservoir in domestic dogs and other canines.

Clinical Features
Presents with a massive enlargement of spleen and liver, as well as wasting despite a good appetite. It occurs as an opportunistic infection in the immunocompromised.

Management
Refer all suspected cases.

CUTANEOUS LEISHMANIASIS

Not common in Kenya. Caused by Leishmania tropica.

Clinical Features
Presents as ulcers or skin lesions that may be confused with fungal disease or even neoplasm.

Management
Refer all suspected cases.

7.1.4 TOXOPLASMOSIS

Caused by T. gondii. Common in immunocompromised persons. Transmitted by blood products, ingestion of contaminated foods, tissue and organ transplantation, and laboratory accidents.

Clinical Features
Presents with lymphadenopathy, CNS, and ocular manifestations.

Management
Refer all suspected cases.

7.1.5 SCHISTOSOMIASIS

Infection with blood flukes of the genus Schistosoma, which may cause chronic disease of intestines, liver, and genitourinary tract. Adult flukes are white worm-like creatures that inhabit parts of the venous system of humans. All need a molluscan intermediate host. Important species of schistosomiasis in Kenya are: S. haematobium and S. mansoni. Adult worms live and copulate within the veins of the mesentery. For S. mansoni, the sexually mature ones are found mainly in the intestinal veins , while those of S. haematobium are mainly located in the venous plexus of the genitourinary tract. Some eggs may penetrate the intestinal or bladder mucosa and are passed in faeces or urine.

Eggs hatch in fresh water, liberating cercariae that multiply in snails (intermediate host) and produce thousands of cercariae. These penetrate human skin within a few minutes after exposure and transform into schistosomes, which develop into sexually active adult worms in the intestinal veins or venous plexus of genito-urinary tract depending on the species. The life span of adult worms ranges from 3 to 37 years. S. haematobium is common along the coastline, Tana River, Kwale, and Lamu. S. mansoni is widespread, particularly in Machakos, rice schemes, and parts of Nyanza – and even Nairobi.

Clinical Features
Acute dermatitis and fever after exposure is a rare presentation. Occasionally transverse myelitis and convulsions may occur. In the case of S. mansoni, chronic schistosomiasis may result in portal hypertension, splenomegaly, anaemia, and oesophageal varices. Terminal haematuria, dysuria, progression to obstructive uropathy, and bladder cancer may occur in the case of S. haematobium. Metastatic eggs can be found in other organs such as the spinal cord and brain. Salmonella infection in patients with schistosomiasis is difficult to eradicate until the schistosomiasis has been treated. Salmonella infection may present as recurrent pyrexia.

Investigations
- S. mansoni: Stool for ova, use concentration or Kato technique
- S. haematobium: Urine for RBC and for ova of S. haematobium hatching test

Management
Praziquantel 40mg/kg BD for a day (effective against all types).
NB: Patients should be examined for living eggs; if positive, re-treat.

7.1.6 FILARIASIS

Arthropod-borne diseases caused by thread-like nematodes that in their mature adult stage reside in lymphatic or connective tissue (see Table 7.3 for a summary).

Management
- Refer all suspected cases.

Prevention
Vector control: Avoid bites of mosquitoes, ticks, fleas, mites, and other vectors.

Table 7.3: Summary of species, vectors, and pathologies for filariasis disease

Species	Vector	Pathology
Wuchereria bancrofti	Mosquitoes	Lymphatic (elephantiasis) and pulmonary
Brugia malayi	Mosquitoes	Lymphatic (elephantiasis) and pulmonary
Brugia rimori	Mosquitoes	Lymphatic (elephantiasis)
Onchocerca volvulus	Black fly	Skin, eye, and lymphatics
Loa loa	Deer fly	Allergy
Mansonella perstans	Midges	Allergy
Mansonella streptocerca	Midges	Skin
Mansonella ozzardi	Midges	Vague

7.2 Viral Diseases

7.2.1 MEASLES
Measles occurs mainly in children. Although it is rare in adults, in this case it carries much higher mortality rates.

For full description see paediatric section.

7.2.2 VIRAL HAEMORRHAGIC FEVERS
As summarized briefly in Table 7.4, these are viral infections characterized by fever and haemorrhage.

☛ ***Refer all suspected cases immediately.*** **Notify the district Medical Officer of Health.**

Table 7.4: Summary of viral haemorrhagic fevers

Condition	Vector	Clinical manifestations and diagnosis	Management
Yellow fever	Aedes mosquitoes	Severe fever Jaundice Vascular permeability, shock, and DIC Diagnosis: Blood and liver examination for viruses	Treatment is supportive
Dengue fever	Aedes mosquitoes	Severe fever Vascular permeability, shock, and DIC	Treatment is supportive

Continued

Table 7.4, *continued*

Condition	Vector	Clinical manifestations and diagnosis	Management
Dengue fever, cont.		Diagnosis: RT-PCR for virus	
Tick borne diseases	Ticks	Severe fever Vascular permeability, shock, and DIC Diagnosis: Blood and tissue examination	Treatment is supportive
Congo Crimean fever	Contaminated materials	Severe fever Vascular permeability, shock, and DIC	Treatment is supportive
African haemorrhagic fevers: Marbug and Ebola viruses		Fatal haemorrhage, fever, rash, hepatic and pancreatic inflammation. Diagnosis: ELISA	Treatment is supportive

7.3 Bacterial Infections

7.3.1 MENINGITIS

An acute inflammation of the pia and arachnoid coverings of the brain with spread into the cerebro-spinal fluid (CSF). Most commonly due to invasion by bacteria (Pyogenic meningitis), and less so to viruses (Aseptic meningitis), tubercle bacilli (Tuberculous meningitis), or fungi (Fungal meningitis). The commonest bacterial organisms are Streptococcus pneumoniae (Pneumococcus), Haemophilus influenzae, and Neisseria meningitidis (Meningococcus), but almost any other bacteria may be involved depending on the circumstances of the invasion and the age of the person. Predisposing factors are low immunity, prematurity and septicaemia; infections in the nose, sinuses, ears, throat and lungs; penetrating injuries of the skull and spinal column; and congenital malformations of the brain and spine. Meningococcal meningitis often occurs in epidemics.

Clinical Features

Neck stiffness, positive Kerning's sign, altered level of consciousness, headaches, fever, vomiting, convulsions, photophobia are common features.

☛ **If meningitis is suspected refer urgently to level 4 or above.**

7.3.2 TETANUS

Neurological disorder characterized by muscle spasms due to endotoxin produced by Clostridia tetani. Tetanus occurs in several clinical forms including generalized, neonatal and localized disease.

Clinical Features
Trismus (lock jaw), opisthotonos (rigid arching of back muscles), dysphagia, laryngospasm. Diagnosis is mainly clinical.

Management.
Refer all suspected cases.

Prevention
People with open wounds should be given 2 doses of tetanus toxoid at least 4 weeks apart. Only 1 dose if immunized during the last 3 years and adequate surgical toilet is carried out.

7.3.3 TUBERCULOSIS

Tuberculosis is caused by Mycobacterium tuberculosis (M-TB). This is commonly M-TB hominis, but M-TB bovis also causes human infections Transmission is by droplet infection through coughing and sneezing. The bovine type is mainly contracted by drinking unpasteurized milk. The incidence of TB is on the increase because of its association with HIV/AIDS, poverty, malnutrition, and overcrowding.

Clinical Features
Most cases of tuberculosis in Kenya (80%) are pulmonary. Features of pulmonary tuberculosis are cough for 3 weeks or more, haemoptysis, chest pain, fever and night sweats, weight loss, and breathlessness.

Extrapulmonary tuberculosis symptoms depend on the organs affected. TB adenitis manifests as lymphadenopathy, TB arthritis as painful swollen joints, TB meningitis as meningitis with features of meningitis, TB peritonitis as ascites, and TB pleural as pleural effusion.

Investigations
- For level 2 refer to level 3 and above for investigation.
- Sputum for AAFB at level 3. If 3 consecutive specimens are negative, start on a broad spectrum antibiotic if not yet on any, then refer to higher level for further investigations.

Management – General
The success of tuberculosis treatment depends on strict adherence to WHO's DOTS strategy: Directly observed treatment short-course. Management of TB involves:
- Follow national treatment guidelines.
- Ensure adequate supply of drugs.
- Use correct regimens and dosages.
- Ensure regular patient attendance.
- Always supervise initial phase of treatment.
- Trace defaulters promptly.
- Maintain accurate patient information and clinic attendance records.

Management – Pharmacological

Classification of TB Patients

Patients are classified into the following groups for epidemiological and treatment reasons depending on the site, microbiology, severity of disease, and history of previous treatment. These same categories are used in TB register for reporting:

- New (N): Patient who has never been treated before.
- Relapse (R): Patient who received treatment and was declared cured, but now has TB again.
- Transferred in (TI): Patient who was initially registered in another district and has now reported to continue treatment.
- Treatment resumed (TR): Patient who interrupted treatment, and was declared "out of control" but is now resuming treatment.
- Other (O): Other types of patients, e.g., failure cases put on re-treatment.

Short Course Chemotherapy (SCC)

SCC is given to all TB patients registered by the National Leprosy and Tuberculosis Programme (NLTP). Different SCC regimens are used for the different categories of tuberculosis.

In the first 2 months (initial phase of treatment) the drugs should be administered under the direct observation of either a health care provider in a health facility or another reliable member of the household or community.

Drugs and tools for registration and reporting should be available before treatment is started. Admit if patient is too ill or DOTS cannot be ensured. During the continuation phase the patients should collect a 4-week supply of drugs for daily self-administration at home.

Treatment Regimens and Drug Dosages

The treatment regimen for new adult smear-positive patients and other seriously ill cases of TB, e.g., TB meningitis, miliary TB, and TB of vital organs, is summarized in Table 7.5. The re-treatment regimen summarized in Table 7.6 applies to relapse (R), treatment failure (F), or treatment resumed (TR) patients with active TB disease and who have a positive sputum smear or culture result: 2SRHZE/1RHZE/5RHE. The dosages, according to body weight, of the different anti-tuberculosis drugs used are shown in Table 7.7.

Table 7.5: 2RHZE/4RH regimen for new/seriously ill TB patients

Schedule/Drugs	Intensive phase	Continuation phase
Schedule of treatment	Daily treatment with appropriate patient support, including DOTS, for 2 months	Daily treatment with appropriate treatment support, including DOTS, for 6 months
Drugs used	Ethambutol (E)+ Rifampicin (R)+ Isoniazid (H)+ Pyrazinamide (Z) +	Ethambutol (E) and Isoniazid (H), 6 months. *OR* Rifampicin (R) and isoniazid (H), 4 months

Key: E = Ethambutol; H = Isoniazid; R = Rifampicin; S = Streptomycin; Z = Pyrazinamide.

Table 7.6: 2SRHZE/1RHZE/5RHE regimen for relapsed, failed, and resumed TB patients

Schedule/drugs	Intensive phase		Continuation phase
Schedule oftreatment	Daily treatment with appropriate patient support for 2 months	Daily treatment with appropriate patient support for 1 month	Daily treatment with appropriate patient support for 5 months
Drugs used	Streptomycin (S) + Ethambutol (E) + Rifampicin (R) + Isoniazid (H) + Pyrazinamide (Z)	Ethambutol (E) + Rifampicin (R) + Isoniazid (H) + Pyrazinamide (Z)	Ethambutol (E) + Rifampicin (R) + Isoniazid (H)

Table 7.7: Drug dosages for varying pretreatment weights and drug formulations

Drug	Formulation	Pre-treatment weight		
		Over 55kg	40–54kg	30–39kg
Streptomycin	Intramuscular injection	1g	0.75g	0.50g
Rifampicin 150mg Isoniazid 75mg Pyrazinamide 400mg Ethambutol 275mg	4-FDC tablet RHZE	4	3	2
Rifampicin 150mg Isoniazid 75mg Pyrazinamide 400mg	3-FDC tablet RHZ	4	3	2
Rifampicin 150mg + Isoniazid 75mg	2-FDC tablet RH	4	3	2
Rifampicin 150mg + isoniazid 75mg +	Tablet E	4	3	2
ethambutol 275mg (RHE)	Tablet EH	2	2	2

Caution

- **Pregnant mothers and patients older than 40 years should not be given more than 0.75g of streptomycin per daily injection.**
- **Do not exceed 600mg of rifampicin per day.**

Treatment of TB in HIV/AIDS Patients

HIV increases a person's susceptibility to infection with M. tuberculosis. In individuals infected with M. tuberculosis, HIV is a potent cause of the progression from tuberculosis infection to disease. Dissemination of TB is common in HIV infected children. TB meningitis, miliary tuberculosis, and widespread tuberculosis lymphadenopathy occur.

Complications of TB

These include haemoptysis (coughing up blood), spontaneous pneumothorax, bronchiectasis, lung fibrosis, and lung abscess.

Acquired Drug Resistant TB
Acquired drug resistance results from inappropriate use of one drug or poor adherence to treatment. This suppresses the growth of organisms susceptible to the drugs, but encourages the multiplication of isolated strains with spontaneous drug resistance.

Multiple Drug Resistant TB (MDR-TB)
This refers to resistance to both rifampicin and isoniazid as a consequence of poor adherence to recommended treatment regimens by clinicians and patients. Resistance is further associated with increasing poverty and the HIV/AIDS epidemic. MDR-TB is confirmed on culture and sensitivity.

Prevention of MDR-TB
- By strengthening TB programmes.
- By ensuring directly observed therapy whenever rifampicin is used.
- By using fixed dose combination tablets containing rifampicin.

☛ **Refer all drug-resistant TB patients to higher level for appropriate management.**

7.3.4 SALMONELLA INFECTIONS

Disease caused by the following salmonella: Salmonella typhi and Salmonella paratyphi A, B, and C commonly cause enteric fever. Salmonella enteritis causes gastroenteritis.

TYPHOID FEVER
Systemic disease caused by S. typhi. Typhoid bacilli are shed in the faeces of asymptomatic carriers or in the stool or urine of those with active diseases. Transmission of typhoid fever is via contaminated food or water by:
- Direct contamination by faeces or urine.
- Flies from faeces to food.
- Healthy carriers who are food handlers.
- Health personnel through inadequate hygiene when changing soiled linen.
- Healthy carriers who can shed organisms for more than one year.

Clinical Features
These include high fever, headaches, anorexia, weight loss, diarrhoea, constipation, abdominal tenderness, changes in sensorium, splenomegaly, relative bradycardia, Rose Spots (blanching lesions). A high index of suspicion for typhoid is required when investigating any patient with unexplained fever.

Investigations
- Widal test: Fourfold rise in spared specimen acquired two weeks apart suggest S. typhi infection. Rising titres of O antigen are significant.
- NB: Only titres of O antibody of 1:160 or more are significant. The diagnostic gold standard should be isolation of bacilli in cultures.

Management
- Chloramphenicol: (2–4g in adults ***OR*** 50mg/kg body weight per day in children) for 2 weeks
- Cotrimoxazole: 4 tabs BD for 2 weeks
- Amoxicillin 4–6g or 100mg/kg/day in 3 divided doses for 2 weeks
- Ciprofloxacin: 500–750mg BD for 14 days
  OR
- Ofloxacin: 400mg BD for 14 days
  OR
- Norfloxacin: 400mg BD for 14 days
  OR
- Ceftriaxone: 1g OD IV for 7–14 days

Complications
Refer if patient is not improving or is deteriorating.

Prevention
- Heath education
- Vaccination:
  - Live attenuated oral vaccine 4 capsules given on alternate days. Avoid antibiotic for 1 week. NB: contraindicated in immunosuppression cases.
  - Typhim VI vaccine – single dose 0.5ml IM (70% efficacy boost every 2–3 years.

7.4 Other Selected Infections and Related Conditions

First and second line antibiotics for a selection common infections are summarized in Table 7.8.

Table 7.8: Antibiotics for selected common infections

Diagnosis	First line treatment	Second line treatment
Acute rheumatic fever	Benzathine penicillin	Erythromycin
Acute osteomyelitis	Clidamycin Cloxacillin + gentamicin	Cloxacillin + chloramphenicol
Cellulitis	Cloxacillin	
Conjunctivitis (bacterial)	Tetracycline eye ointment	Chloramphenicol eye drops
Dysentery (shigella)	Ciprofloxacin	Ceftriaxone
Ludwig's angina	Benzyl penicillin	
Otitis media	Cotrimoxazole	Amoxicillin
Pneumonia (mild)	Cotrimoxazole	Amoxicillin
Pneumonia (severe)	Benzyl penicillin + gentamicin	Ceftriaxone Amoxicillin + clavulinate
Septic arthritis	Cloxacillin + gentamicin	Amoxicillin + gentamicin
Urinary tract Infections		
Lower	Cotrimoxazole	Cotrimoxazole
Upper (outpatient)	Amoxicillin + clavulin	Ciprofloxacin
Upper (inpatient)	Gentamicin	

8. Musculoskeletal Conditions

8.1 Arthralgia, Non-Specific

Joint pain without features of inflammation.

Clinical Features
General malaise, joint pains, joint mobility not affected, joint not red, not warm, not tender or only slightly tender. Usually it is a feature of another illness and careful systemic examination is warranted.

Investigations
None except for the illness of which arthralgia is a feature.

Management
- Acetylsalicylic acid 300–600mg 6–8 hourly (children 75–100mg/kg/day QDS) ***OR***
- Paracetamol 1g TDS (children 40mg/kg/day QDS)

8.2 Gout/Acute Gout

A metabolic disorder due to hyperuricaemia. Causes are primary or secondary (e.g., myeloproliferative, lymphoproliferative disorders, haemolytic anaemia, polycythaemia; tumour lysis syndrome following cytotoxic therapy and thiazide diuretics).

Clinical Features
Excruciating joint pain, usually a single joint and commonly the big toe. Pain becomes more severe as attack progresses, but subsides spontaneously in about 4 days. Tophi are found primarily in the pinna and overlying olecranon bursa. There is erythema and warmth over the affected joint.

Management
- Diclofenac 50mg 3 times daily orally ***OR***
- Indomethacin 75mg orally STAT, then 50mg QDS till 24 hours after relief, then 50mg 8 hourly for 48 hours then 25mg 8 hourly for 48 hours. ***OR***
- Naproxen 375 / 500mg orally twice a day.
- Several other NSAIDs may be used as long as side effects, especially renal and gastrointestinal are taken into consideration.
- Refer if not improving.

8.3 Osteoarthritis

This is a degenerative joint disease characterized by cartilage degeneration and bone hypertrophy at the articular margins. It is chronic but does present commonly with acute-on-chronic flares.

Clinical Features
Pain, stiffness, immobility and "cracking" of the joints. Pain worse towards the end of the day. Joint tenderness, bony swelling, loss of full range of movement, and crepitus on movement, Heberden's nodes. Joints commonly involved are cervical and lumbar spine, the knees and hips, as well as the hands and feet. It may also occur secondarily in response to severe or chronic joint injury (e.g., after fractures).

Management
- Resting of joints, including use of crutches (involve physiotherapist here)
- Acetylsalicylic acid 300–900mg TDS
- Indomethacin 25–50mg TDS
- Others are:
  - Nonselective NSAIDs combined with gastric mucosal protectant
  - Pure analgesics such as tramadol
  - Refer if medical therapy fails to relieve pain or if surgery is contemplated.

8.4 Rheumatoid Arthritis

Systemic disease of unknown aetiology, which is symmetrical, peripheral, polyarthritic, most commonly involving the small joints of hands, wrists, metatarsophalangeal joints, ankles, knees and cervical spine.

Clinical Features
- ***Articular:*** Symmetrical peripheral polyarthritis mostly of small joints (warm, painful, stiff, swollen). Stiffness worse in the morning. Muscle wasting. Deformity, ulnar deviation, boutonniere deformity.
- ***Extra-articular:*** fever, weight loss, lassitude, anaemia, subcutaneous nodules, splenomegaly, lyinphadenopathy, keratoconjuctivitis, pericarditis, pleuritis.

Management
- Physiotherapy
- Occupational therapy
- Drugs
- Acetylsalicylic acid 600–900mg 8 hourly (children 75–100mg/kg QDS), 6 or 4 hourly preferably after food ***OR*** with antacid ***OR*** indomethacin 25–50mg
- TDS (not recommended in children)
- Other NSAIDs
- Refer if
  - Deformities are present (seek surgical opinion)
  - Disease not responding to non-steroidal anti-inflammatory drugs (NSAIDs)
  - Systemic organ involvement.

8.4.1 JUVENILE RHEUMATOID ARTHRITIS (JRA)

Clinical Features
Arthritis beginning at or before the age of 16 years. Similar to adult rheumatoid arthritis (RhA). Tends to affect large and small joints and may interfere with growth and development.

Management
Refer to higher level.

9. Neoplasms

Neoplasms can be benign or malignant. Malignant neoplasms are also referred to as cancers. They most commonly present as swellings, and at times pain and malfunction of the affected organs or tissues. Neoplasms can occur in any age group. Refer to a higher level.

☛ **Patients with suspected malignancies should be urgently referred to appropriate consultants for diagnostic examinations and treatment.**

10. Haematologic Conditions

10.1 Anaemia

Patients with anaemia have a reduction in total red blood cell mass, decreased concentration of red cell (RBC) and haemoglobin (Hb) in the peripheral blood, and a corresponding decrease in the oxygen carrying capacity of the blood. In Kenya, anaemia is generally accepted as Hb < 10g%. Degrees of anaemia are categorized as *mild anaemia* at haemoglobin levels of Hb 8–10mg, *moderate anaemia* at Hb 6–7g, *severe anaemia* at Hb 4–5g, while *very severe anaemia* at below Hb 4g. The following are normal Hb levels:

- Males: 13.5–17.5g/dl
- Females: 12.0–16.0g/dl

Common causes of anaemia in Kenya are:

- Haemolysis due to infections especially malaria and haemoglobinopathies, especially sickle cell disease.
- Iron deficiency due to chronic blood loss, nutritional deficiency and intestinal parasites, e.g., hookworm.
- Bone marrow depression (aplastic anaemia).

Clinical Features
Meticulous history is essential, e.g., history of previous hospitalization for sickle cell, blood loss due to menorrhagia. Clinical features include irritability, listlessness, anorexia, easy fatigability, and pallor of the mucous membranes (conjunctivae, lips, tongue), nail beds, and palms. There may be splenomegaly and a short, soft, apical “haemic” systolic murmur. Severe cases may present in heart failure and shock.

Investigations
- Full haemogram/Hb estimation
- Thin blood film examination for cell morphology and blood parasites
- Stool for ova of helminthes, occult blood
- Urinalysis

Management
Identify the cause and treat:
- Malaria:
  - Give a full course of an appropriate antimalaria drug. Thereafter give antimalaria prophylaxis (see Section 7.1.1, on malaria) for 3 months. If the spleen is palpable, continue prophylaxis until it is not palpable.
- Iron: Give iron orally if:
  - the anaemia is mild or moderate Adults: ferrous sulphate 200mg TDS
  - If patient is not able to tolerate oral iron or if compliance is poor consider iron dextran as total dose infusion.
  - Dose of iron dextran (Adults) iron (mg)=(normal - patients Hb) x weight (kg) x 2.21 + 1,000. Give as total dose infusion. This also replenishes body stores of iron.
- Folic acid: Give to all patients who have malaria and anaemia. Dose is 5mg once daily.
- Hookworm treatment: Give albendazole 400mg STAT for adults.
- Sickle cell anaemia:
  - Folic acid, malaria prophylaxis (see Section 7.1.1, malaria)
  - Do not give blood transfusion unless patient develops cardiorespiratory distress (nasal flaring, intercostal or subcostal retractions, heart failure, grunting).
- Refer all patients if:
  - There is severe anaemia.
  - There is active and severe bleeding.
  - The anaemia (any degree of severity) is accompanied by pneumonia, heart failure, dizziness, confusion, oedema.

10.2 Sickle Cell Disease (Anaemia)

A chronic haemolytic anaemia found mainly in Nyanza, Western, and Coast provinces, characterized by sickle-shaped RBCs as a result of homozygous inheritance of HBS. In HBS, amino-acid valine is substituted for glutamic acid in position 6 of the b-chain. This Hb polymerizes at sites of low partial pressures of oxygen (PO2) and the RBCs assume the “sickle shape”; they adhere to vascular endothelium and plug small capillaries and arterioles leading to occlusion and infarction. Because sickled RBCs are fragile and cannot withstand the trauma of circulation, haemolysis occurs in the small blood vessels. These abnormal RBCs are also destroyed within the spleen.

Clinical Features
- Impaired growth and development
- Susceptibility to infections (malaria, H. influenza, pneumonococcal)

- Anaemia and mild jaundice
- Hepatosplenomegaly in young children
- Bone pain (especially long bones in children)
- Pain and swelling of the hands and feet (hand and foot syndrome)
- Arthralgia with fever may occur
- A vascular necrosis of the femoral head is common
- Severe abdominal pain with vomiting
- Occlusion of major intracranial vessels may lead to haemiplegia, cranial nerve palsies and other neurological deficits
- Acute chest syndromes (sudden onset of fever, chest pain leukocytosis and pulmonary infiltrates on x-ray), which may be fatal
- Tower shaped ("bossing") skull

Investigations
- Full haemogram to include peripheral smear, Hb
- Sickling test

Management
Refer to a higher level.

SICKLE CELL CRISIS
There are 3 types: thrombotic (vaso-occlusive, painful or infarctive), aplastic (sequestration), and haemolytic.

Management of the crises
- Give IV or oral fluids.
- Administer analgesics regularly. In the acute phase if pain is severe, give narcotic analgesics (e.g., Pethidine 0.5–2mg/kg 4 hourly).
- Treat infections vigorously and promptly if present.
- Give prophylaxis for malaria only if patient is paying brief visits to malaria endemic areas.
- Give supplementary folic acid but AVOID iron.

11. Conditions in Pregnancy

11.1 Anaemia In Pregnancy

This is a major obstetric problem in Kenya. In severe anaemia the pregnancy is in danger of abortion, premature labour, or IUFD, while in very severe anaemia the mother's life is also in danger. Most cases are due to iron deficiency resulting from dietary deficiency, or blood loss from hookworm infestations, haemolysis due to malaria, and sickle cell disease. Anaemia can also result from folate deficiency due to inadequate intake, and from haemolysis following malaria infection. Iron deficiency and folic acid deficiency often occur together causing "Dimorphic Anaemia".

Clinical Features
General weakness, dizziness, pallor, and oedema. Haemolytic anaemia may be associated with jaundice and hepatosplenomegaly.

Investigations
- Full haemogram (Hb, PCV, PBF)
- Stool for hookworm ova and schistosomal ova, where applicable
- Urine for urobilinogen and schistosomal ova, where applicable
- Blood slide for malaria parasites
- Sickling test

Principles of Treatment
Manage as indicated in Table 11.1, with the aim of:
- Raising Hb (oral or parenteral haematinics, transfusion).
- Eradicating cause: Correct dietary deficiency, treat malaria, treat hookworms, give haematinics with ferrous sulphate 200mg TDS and folic acid 5mg OD if dietary deficiency exists.
- Preventing recurrence.

Table 11.1: Management of anaemia in pregnancy

Severity	Hb (g%)	Management
Mild	8–10	Treat cause Oral haematinics, as for prophylaxis
Moderate	6–7	As above
Severe	4–5	Refer
Very severe	Below 4	Refer

Prevention
- Prophylaxis iron throughout pregnancy
- Prophylaxis antimalarial (see Section 10.6, malaria in pregnancy)

11.2 Cardiac Disease In Pregnancy

In Kenya, this is often of rheumatic heart disease origin, involving the valves.

Clinical Features
- History of rheumatic fever in childhood, known rheumatic heart disease. Features of dyspnoea.
- Palpitations, body oedema, cough, easy fatigability, evidence of heart enlargement, murmurs, thrills, left parasternal heave, raised jugular venous pressure, tachycardia. Hepatomegaly, ascites and basal crepitations may be present.

Investigations
- Routine antenatal profile (Hb, VDRL, blood group, urinalysis)
- Urine for microscopy and culture and sensitivity

Management
- Refer to higher level for management.

11.3 Diabetes in Pregnancy

Diabetes mellitus is a metabolic disorder characterized by hyperglycaemia.

Clinical Features
- ***Overt diabetes:*** If not already diagnosed the symptoms include polydipsia, polyuria, weight loss, blurred vision, lethargy. Glycosuria is common but not diagnostic.
- ***Gestational diabetes:*** This will occur in 1–5% of pregnancies. Historical risk factors include previous gestational diabetes, family history of diabetes, previous macrosomic infant, previous unexplained still birth, polyhydramnios, obesity, advanced maternal age. Glycosuria may be present but is not diagnostic.
- ***Complications of diabetes:*** These include chronic hypertension and nephropathy, pregnancy-induced hypertension, foetal macrosomia, intrauterine growth retardation, polyhydramnios, foetus distress, and foetal hypoglycaemia.

Investigations
- Postprandial blood glucose level

Management
Refer to higher level for appropriate management.

11.4 Malaria in Pregnancy

Falciparum malaria is particularly dangerous in the pregnant women. The clinical features of malaria in pregnancy depend to a large extent on the immune status of the woman, which in turn is determined by her previous exposure to malaria. (Refer also to Section 7.7.1, malaria.)

Clinical Features
- Non-immune (women from endemic area): These have a high risk of maternal perinatal mortality. Clinical features include acute febrile illness, severe haemolytic anaemia, hypoglycaemia, coma/convulsions, and pulmonary oedema. Abortion, intrauterine death, premature labour, and intrauterine growth retardation are other complications.
- Semi-immune (women from endemic area): These may be asymptomatic, despite placental infection. They may develop severe anaemia and deliver low birth weight babies. It is more common in primigravidae than multigravidae. One of the dangers of malaria in these settings is that it is not detected or suspected. Antimalarials should form part of the case management of all women with severe anaemia who are from an endemic area, irrespective of whether they have a fever or a positive blood slide (see Section 11.1, above, anaemia in pregnancy).

Investigations
- As for malaria

Management – Supportive
- Check blood sugar regularly as hypoglycaemia is a common problem in women with severe disease.
- Correct dehydration.
- Carry out evacuation if incomplete/inevitable abortion.
- Deliver if foetal death or established labour.

Management – Pharmacological
- For clinical disease it is essential to use the most effective antimalaria drug available.
- Immediate treatment is essential.
- For uncomplicated disease: Oral quinine 600mg TDS for 7 days
- For severe or complicated disease: Quinine IM as 15–20mg/kg body weight or 900–1,200mg. Give oral glucose and then refer to level 4–6.
- Other drugs that can be used for treatment in pregnancy in the second and third trimesters are artemisinin derivatives.

11.5 Puerperal Psychosis

The following aspects in the patient's history may help to identify high-risk patients and are helpful in facilitating early identification of patients with puerperal psychosis:
- Family history of major psychological illness of close relative, e.g., mother.
- Major emotional complications during and after a previous pregnancy.
- "Reaction" of current pregnancy.
- "Fear" of labour from a previous experience.
- Traumatic childhood.
- Deprivation of emotional support during adult life, e.g., single mother.
- Severe prolonged or multiple somatic symptoms with no apparent organic cause during current or preceding pregnancy.
- Major sustained mood changes or repeated rapid mood swings or abnormal sleep patterns.
- Refer to Mental Illness chapter for clinical features and management.

12. Lower Respiratory Tract Conditions

12.1 Pneumonia – Adults

This is consolidation of the lung parenchyma due to infection.

Clinical Features
Breathlessness, cough with or without sputum which may be rust coloured, fever, pleuritic chest pain. Bronchial breathing, reduced chest movements,

reduced breath sounds, tachypnoea, crackles and percussion dullness. Features less pronounced in the elderly patients.

Classification
- ***Primary:*** Occurring in a previously healthy person living in the community. This is usually lobar due to pneumonococci. Usually a very short history.
- ***Secondary:*** Develops in association with prior respiratory' disease, immunocompromised patients, debilitated patients, alcoholics, or post operative patients.

Investigations
- Haemogram – PBF, WBC
- Sputum microscopy

Management – Community acquired pneumonia
- For outpatients:
  - Amoxicillin 500mg TDS for 7 days
  - If penicillin allergy present: Erythromycin 500mg QDS for 7 days.
  - Alternative antibiotics include cotrimoxazole and tetracycline. Analgesics: Paracetamol ***OR*** aspirin

- Refer if:
  - Cyanosis is present.
  - Respiratory distress ***(RR*** >25 per minute) is present.
  - Heart failure or pleural effusion is present.
  - More than one lobe is involved.
  - There is poor response as outpatient.
  - Patient is dehydrated.
  - Secondary pneumonia is suspected.

12.2 Asthma (Adults)

A clinical syndrome characterized by increased responsiveness of the tracheobronchial tree to a variety of stimuli. This results in airway obstruction that varies in severity either spontaneously or as a result of treatment.

Clinical Features
Patients present with breathlessness, wheezing, and cough with tenacious sputum.

Examination shows:
- ***Mild attack:*** Wheezing, pulse less than 100/min, BP normal, RR less than 20/min.
- ***Moderate:*** Wheezing with cough, sweating, pulse 100–120, RR 20–30/min, and normal BP.
- ***Severe:*** Cyanosis, pulse 120/min, RR 30/min, pulsus paradoxicus, respiratory distress in upright position; may have a silent chest.

- ***Chronic:*** Mild attack (see above) all the time.
- ***Status asthmaticus:*** Moderate or severe attack not responding to conventional therapy or persisting for more than 12 hours.

Management

- ***Mild:*** SC adrenaline 0.5ml of 1:1,000 concentration STAT, repeat after 20–30 minutes if there is no response (up to a total of 3 doses). If there is response, discharge on salbutamol 4mg TDS for 1 week ***OR*** theophylline 200–250mg BD or TDS. Inhaled medium acting B2 agonist such as albuterol, terbutaline, dibuterol, or metaproterenol.
- ***Moderate:*** Adrenaline as above up to 3 doses or salbutamol inhalation 2 puffs every 20 minutes till response or patient gets tremors. If no response IV aminophylline 6mg/kg slowly over 15 minutes, and then 0.9mg/kg/hr. If there is good response, discharge on salbutamol 4mg TDS for 1 week ***OR*** theophylline. If no response, treat as severe asthma. Oral and inhaled corticosteroid, or antileukotriene, or inhaled theophylline. Inhaled B agonist should be added to any of these as needed.

☛ **Refer if there is no response or condition deteriorates.**

- ***Severe asthma:*** Treat as above then refer.

- **Maintenance treatment:** Salbutamol 4mg TDS orally or salbutamol inhaler or steroid inhaler. If poor response, give oral theophylline 100–200mg TDS. If response is still poor, refer to physician.

- ***Status asthmaticus:*** Refer to higher level for appropriate management.

12.3 Chronic Obstructive Pulmonary Disease

Clinical syndrome of chronic dyspnoea and cough with expiratory airway obstruction produced by either chronic bronchitis or emphysema.

Clinical Features

Chronic productive cough for many years with slowly progressive breathlessness that develops with reducing exercise tolerance. Tachypnea, purse-lip breathing, use of accessory muscles of respiration. Chest hyper-resonance, breath sound decreased, wheezes with or without rhonchi. Cyanosis may be present. Note absence of clubbing.

In acute exacerbations, symptoms worsen and the sputum becomes yellow or may increase in quantity.

Management

Refer.

13. Other Common Conditions

13.1 Coma

Coma is a state in which the patient is unarousable and unresponsive to external stimulation. In profound coma, brain stem and myotatic reflexes may be absent. Coma noticed for the first time is always an emergency. It is only after the cause is known and its implications are understood that it may be treated otherwise.

Aetiology
Infections (malaria, meningitis, encephalitis), trauma, tumours, cerebro-vascular accidents, diseases (diabetes, epilepsy, liver failure), drugs (alcohol, methyl alcohol, barbiturates, morphine, heroin), chemicals, and poisons (see Section 1.9, poisoning).

History
Detailed history from relative or observer to establish the cause if known or witnessed. The circumstances and temporal profile of the onset of symptoms is of critical importance in ascertaining the cause of the coma. Use of drugs and pre-existing diseases are important.

Examination
- Secure a patent airway.
- Determine if cardiac output is adequate (BP, pulse rate)
- Evaluate and monitor according to Glasgow Coma Scale (refer to Section 44.1.3, head injury).
- Monitor temperature, pulse, respiratory rate and their pattern
- Consider leads to possible causes:
  - Hypothermia: Occurs in alcohol, barbiturate, and sedative poisoning, hypoglycaemia, and hypothyroidism.
  - Hypotension: Occurs in internal haemorrhage, myocardial infarction, septicaemia, alcohol or barbiturate poisoning.
  - Hyperventilation with a change in pulse rate may signify increased intracranial pressure.
  - Hypertension may signify hypertensive encephalopathy or a cerebrovascular accident.
  - Fever occurs in systemic infection with meningitis or encephalitis.
  - Neck stiffness could signify meningitis, subarachnoid haemorrhage, or cerebral malaria.
- Determine the muscle tone and deep tendon reflexes. Note any asymmetry.

Investigations
Vary according to findings but generally include:
- Blood slide for malaria parasites
- Blood sugar

Management (to be initiated at any level where it occurs).
- Monitor vital signs.
- Maintain adequate airway.
- Ensure adequate circulation - always fix a large IV canula immediately in anticipation of drug administration.
- Refer immediately.

13.2 Fever

An elevation of core body temperature above the normal circadian (daily) range. Normal body temperature in adults 18–40 years is 36.8°C ± 0.4°C. Substances that cause fever are called pyrogens. Fever accompanies a wide variety of illnesses and need not always be treated on its own. In general, the cause should be ascertained before therapy as far as possible.

Management – General
- Consider the following conditions, which merit lowering the temperature on their own: Precipitation of heart failure, delirium/confusion, convulsions, coma, malignant hyper pyrexia or heat stroke, when the patient is extremely uncomfortable.
- Treat the cause.
- Administer acetylsalicylic acid injection or tablets ***OR*** paracetamol tablets.

☛ **Fever alone is not a reason to give antibiotics.**

Management – Fever of Unknown Origin
This describes fever of more than 3 weeks duration, the cause of which is not apparent after at least one week of intensive investigations. Assessment should include observation of the fever pattern, detailed history and physical examination, laboratory tests, and non-invasive and invasive procedures. This definition excludes common short self-limiting infections and those that have been investigated and diagnosed within 3 weeks.

☛ **Refer to higher level for appropriate management.**

13.3 Jaundice

Yellow colouration of skin and mucous membranes due to excess bilirubin. Serum bilirubin >2mg% (34.2µmol/L). In general terms, hyperbilirubinaemia may be pre-hepatic, hepatic, and post-hepatic.
- **Pre-hepatic:** Due to excess intravascular release of bilirubin by haemolysis.
- **Hepatic:** Due to hepatocyte dysfunction (faulty uptake, metabolism, or excretion of bilirubin).
- **Post-hepatic:** Due to impaired removal of bilirubin from biliary system (e.g., common bile duct obstruction, intrahepatic cholestasis).
- **Common causes include:** Viral hepatitis, haemolytic anaemia (e.g., sickle cell, malaria), cirrhosis, biliary obstruction, hepatoma, drug induced (e.g., alcohol, isoniazid).

Clinical Features
Meticulous history and physical examination are important before ordering investigations. History should include exposure to hepatotoxic drugs for pre-existing known haematological disorder. History of anorexia, nausea, and aversion to smoking is suggestive of viral hepatitis, while history of dark urine, pale stool, and pruritus is suggestive of obstructive jaundice. Physical examination should include observation for the presence of spider naevi, gynaecomastia, loss of axillary hair, parotid gland enlargement, and ascites, which is suggestive of cirrhosis. Splenomegaly is suggestive of parenchymal liver disease or haemolytic jaundice.

Investigations
- Blood slide for malaria parasites. Jaundice in a patient with malaria is a medical emergency.
- Urine – Bilirubin:
  - Absence of bilirubin in a patient suggests haemolytic anaemia.
  - Presence of bilirubin suggests hepatobiliary jaundice
- Urine – Urobilinogen:
  - Excessive urobilinogen suggests haemolysis. Urobilinogen is absent in obstructive jaundice

Management
Refer to higher level for proper management.

13.3.1 OBSTRUCTIVE JAUNDICE

This refers to jaundice caused by obstruction of bile in the biliary tree (post-hepatic jaundice). Causes include:
- Intraluminal (within the lumen) include gallstones that dislodge from the gallbladder and are impacted in common bile duct (CBD), helminthiasis (ascaris and liver flukes).
- Mural (within the wall of ducts) due to inflammation, benign and malignant tumours of bile duct wall, e.g., cholangiocarcinoma, cholangitis, etc.
- Extramural (outside the walls) include choledochal cysts enlarged lymph nodes of any cause, and carcinoma of the pancreas.
- Other possible causes are congenital biliary atresia, iatrogenic trauma to the ducts during surgery (especially cholecystectomy), and strictures after cholangitis and cholecystitis.

Clinical Features
- Painless jaundice, with pruritus that can be severe; jaundice progresses steadily.
- Distended gall bladder, which is present in 60% of carcinoma of the head of the pancreas.
- Anorexia, which is usually present.
- Diarrhoea that is troublesome, with foul smelling pale stool.
- Dark urine, history of flatulence, and dyspepsia in fat females are suggestive of gall stones.

Management
- Refer to higher level for appropriate management.

13.4 Lymphadenopathy

An abnormal increase in size or altered consistency of lymph nodes. It is a manifestation of regional or systemic disease. The following common diseases are associated with lymph node enlargement:
- Infectious diseases
  - Viral diseases; HIV
  - Bacterial infections; pyogenic infections, tuberculosis .
- Malignant diseases
  - Haematological; Hodgkin's and non-Hodgkin's lymphoma
  - Metastatic tumours to lymph nodes; head and neck, breast, prostate
- Immunological disease
  - Connective tissue disorders.

Clinical Features
Clinical features depend on underlying cause.

Management
Refer to higher level for appropriate management.

14. Skin Diseases

14.1 Eczema

14.1.1 ATOPIC DERMATITIS

Clinical Features
An acute, subacute but usually chronic pruritic inflammation of the epidermis and dermis often occurring in association with a personal or family history of hay fever, asthma, allergic rhinitis, or atopic dermatitis. Onset is within the first year in 60% of patients, and usually in the first 2–3 months of life.

It commonly presents with the following skin lesions: erythema, papules, scaling, excoriations, and crusting. Pruritus is the cardinal feature of eczema and the constant scratching leads to a vicious cycle of itch-scratch-rash-itch. Subsequently the skin becomes thickened (lichenified) presenting mainly on cheeks and extensor surfaces of limbs of an infant. It later localizes on the flexural areas of the limbs in both older children and adults. The natural history is that the disease clears with age in the majority of children.

Management
- Parents should be educated on the disease and its natural history and be advised to avoid precipitating factors, e.g.:

- Avoid synthetic clothing.
- Avoid any food substance that seriously aggravates the eczema.
- Avoid letting the skin to dry excessively, e.g., by using harsh soaps like bar soaps, Sunlight, Ushindi, etc. NB: One should use normal toilet soaps. No need to use medicated soaps.
- Avoid any of the petroleum jelly products on those who react (Vaseline, Ballet, Valon, Ideal, etc.)

- Chlorpheniramine maleate can be used to alleviate itch.
- Topical steroids are the mainstay treatment. Use of the mildest steroid that controls the problem is advocated.

NB: If the body surface area involved is extensive (e.g., 50% and over) or the disease is very severe, refer to a specialist (at levels 4 and above) who may choose to use systemic steroid.

The main complications of infection need prompt treatment, e.g., bacterial, fungal, and viral. As with other atopic conditions, stress may aggravate eczema and thus older children should be encouraged to try to avoid stress.

14.1.2 CONTACT DERMATITIS

Acute or chronic inflammation produced by substances contacting the skin and causing toxic (irritant) or allergic reactions.

- **Primary irritants:** Acids, alkalis, soaps, detergents, acetone, etc.
- **Allergic contact dermatitis:** Topical drugs, plants, shoes, clothing, metal compounds, dyes, and cosmetics (including nail polish). Sensitivity to latex in gloves is a particular problem for many health workers, and sensitivity to latex condoms may preclude their use by some men.

Clinical Features

Lesions may be acute vesicles or weeping subacute erythema, or dry and scaly with papules or chronic lichenified (thickened) excoriated and hyper pigmented rash. The lesions may take the shape of the contact with the offending item, for example shoes, watch, gloves, etc., but may be asymmetric and not having any particular outline.

Management

- Identify and remove causative agent.
- Drain large blisters but do not remove tops (roofs).
- Apply gauze or thin cloths dipped in water or normal saline.
- Apply topical 1% hydrocortisone ointment for dry lesions and cream for wet lesions.

14.2 Psoriasis

This is a common papulosquamous skin disease that occurs in 2–3% of the general population.

Clinical Features
Clinical presentations are erythematous macules, papules, or plaques that are usually covered with silvery scales.

Management
- Refer to higher level for appropriate management.
- Treatment involves the use of topical therapy with corticosteroids, anthralin,
- calcipotrio, tazarotene and tar.

14.3 Bacterial Infections

14.3.1 IMPETIGO CONTAGIOSUM
A contagious intradermal infection caused by streptococcus or staphylococcus. Commonly associated with poor hygiene, crowded living conditions, and neglected minor trauma. Frequently complicates scabies, purpura urticaria, insect bites. Presents as bullous lesions that rupture and crust on the face, arms, legs, and buttocks.

Management
- Local treatment by cleaning with normal saline.
- Topical antibiotics for fucidic acid and bacitracin or silver sulphadiazine.
- Systemic antibiotics: Only for extensive lesions (ampicillin/cloxacillin, erythromycin).

14.3.2 BULLOUS IMPETIGO
Common in neonates (pemphigus neonatorum) although any age can be affected. Caused by staphylococcal infection. Affects mainly axilla and groin. Causes large bullae containing pus and clear serum; these rupture easily leaving raw areas. Does not form crusts as in impetigo contagiosum.

Treatment
- Treat as above.
- Refer if patient is toxic or septicaemia is suspected.

Patient Education
- Spreads easily in schools.
- Isolate and treat infected individuals.
- Separate towels and bath facilities.

14.3.3 STAPHYLOCOCCAL SCALDED SKIN SYNDROME (SSSS) – RITTER'S DISEASE
Toxin-mediated epidermolytic disease leading to detachment of superficial epidermal layers to resemble scalding. Mainly occurs in children under 2 years of age. Severity varies from localized form (bullous impetigo) to generalized form of epidermolysis. Also found in immune-compromised adults and in renal failure.

Clinical Features
- Vesicles that are flaccid; gentle lateral pressure causes shearing off
- leaving raw areas.
- Focus of infection may be found in the nose, umbilical stump, purulent conjunctivitis, otitis media, nasopharyngeal infection.

Management
- Refer to higher level for appropriate management.

14.4 Superficial Fungal Infections

The dermatophyte infections are caused by fungi (genus microsporum, trichophyton and epidermophyton) and thrive on non-viable keratinized tissue of the skin (stratum, stratum corneum, hair, nails). Sources of infection include other persons, animals such as puppies or kittens, and more rarely the soil. Nomenclature is "tinea" followed by the Latin name of the appropriate part.

Clinical Features
- ***Tinea pedis (athlete's foot):*** Scaling or maceration between toes particularly the fourth interspace. Causative organism is T. rubrum and/or T. interdigitalae. Hot humid weather and occlusive footwear are predisposing factors.
- ***Tinea cruris:*** An erythematous and scaly rash with distinct margin extending from groin to upper thighs or scrotum. Itching may be severe. Common in males.
- ***Tinea corporis (body ringworm):*** Characteristically annular plaque with raised edge and central clearing with variable levels of scaling and itching.
- ***Tinea capitis (scalp ringworm):*** Mainly disease of children and has spontaneous recovery at puberty in normal circumstances. Scaling, itching, and loss of hair are common also *Mashillingi*. Scarring, alopecia may result.
- ***Tinea anguum:*** Involves the nails and presents with nail discolouration and subungual hyperkeratosis (friable debris).

Investigations
- Direct microscopy of skin scale in 20% potassium hydroxide mounted on a slide to demonstrate hyphae.

Management
- For wet lesions (in skin folds), apply gentian violet 0.5% paint daily and when the lesions dry apply Whitfield's ointment BD until 1 week after lesions have healed.
- Griseofulvin 500mg daily with food as single dose for 1 month (in children 10mg/kg).

14.5 Parasitic Infestations

14.5.1 SCABIES

Scabies is caused by the human itch mite (Sarcoptes scabiei) and spreads through intimate personal contact, facilitated by overcrowding, poor hygiene, and sexual promiscuity. Transmission via bedding or clothing is infrequent (the mites do not survive for a day without host contact).

Clinical Features

- Intense itching, worse at night or after hot shower
- Burrows occur predominantly on the finger webs, the wrist flexor surfaces, elbow and axillary folds, and around the areolae of the breasts in females, the genitals especially male, along the belt line and buttocks.
- Secondary infection causes urticarial papules, crusts and pustules.

NB: The burrow is a fine, wavy scaly line (0.5–1cm long) with a small papule/ vesicle at the end.

Diagnosis

- Demonstration of typical burrows: this may be difficult
- Microscopy of skin scrapings (avoid KOH) and demonstrate the mite, ova or faecal pellets.

Management

The following is recommended for management of scabies:

- Apply to the entire skin (from the neck down) 25% Benzyl benzoate emulsion (use 12.5% in children) days 1 and 2 without bathing. On day 3 bathe and apply again.
- Apply 5–10% sulphur ointment.

The nonspecific measures against scabies include the following:

- Maintain good personal hygiene.
- Use antihistamines for pruritus.
- Put the clothing used by the affected individual(s), including bedding and mattresses, in the sun.
- Treat secondary bacterial infections using cloxacillin in severe cases.
- Treatment of the whole family and as many personal contacts as possible for scabies at the same time.

14.5.2 JIGGERS/TUNGA PENETRANS

Diagnosis is not a problem, but educating the community on treatment is mandatory. Management includes:

- Extract the jiggers with clean pin.
- Suffocate jiggers by soaking feet in liquid paraffin or kerosene.
- Give tetanus toxoid.
- Dust earthen floors with insecticide powders – this is highly recommended.
- Keep the patient comfortable and give adequate analgesia.

- Offer supportive feeding..
- Restore normal health and independence.

14.6 Pellagra (Niacin Deficiency)

Occurs in dietary deficiency (starvation, alcoholism, or deranged absorption or utilization) and in isoniazid therapy, in various diarrhoeal conditions, and in liver cirrhosis. An increasing number of patients are now seen amongst prisoners in Kenya.

Clinical Features
Presents with characteristic features of dermatitis, diarrhoea, dementia. Other features include weight loss, anorexia, fatigue, malaise, pruritus, burning, dysphagia, nausea, diarrhoea, vomiting, impaired memory, confusion, and paranoid psychosis.
Skin lesions are limited to exposed areas of the face, neck, hands, and feet. Mucous membranes show scarlet stomatitis and scarlet red tongue. Patients with pellagra may die if they are not treated.

Management
- High protein diet
- Multivitamin tablets or syrup
- Niacinamide 100–300mg in 3 divided doses daily.

14.7 Seborrhoeic Dermatitis

An inflammatory scaling disease of the scalp, face, and occasionally other areas with high density of oil glands (axilla, upper chest, anogenital areas).

Clinical Features
Symptoms develop gradually as:
- Dry or greasy diffuse scaling of scalp (dandruff) with pruritus.
- Yellow- red scaling papules in severe cases found along the hairline, external auditory canal, the eye brows, conjunctivae, and naso-labial folds.
- Does not cause hair loss.
- Cradle cap (thick yellow crusted scalp) in newborns.

NB: Severe seborrhoeic dermatitis is found in neurological disorders (Parkinson's disease) and HIV infection.

Management
- Control scaling by 2% salicylic acid in olive oil
- Wash hair with shampoos containing selenium sulphide, sulfur, and salicylic acid, or tar shampoos daily until dandruff is controlled. (More recently ketaconazole shampoo is excellent.)
- Apply topical steroids, e.g., a mild lotion of 0.01% fluocinalone acetate.

- Treat superimposed bacterial, fungal, or viral infections; these are prevalent in HIV patients.
- Refer to higher level for patients who do not respond to treatment.

14.8 Dermatological Emergencies

14.8.1 ERYTHEMA MULTI FORME SYNDROME

A common problem due to increased prevalence of HIV/AIDS. It is an infiltration into the dermo-epidemial junction by mononuclear cells leading to vesicles, generally found in the extremities, palms, and soles in the mild form of disease. In severe forms, widespread mucosal involvement occurs (Steven's-Johnson syndrome), which may last 1–2 months with a high mortality.

Causes range from idiopathic (50% have no known causes), to reactions from drugs (e.g., sulphanamides, phenytoin, barbiturates, penicillins, thiacetazone, etc.). Other possible causes are infections viral (Herpes simplex), streptococcal, and mycoplasma, and underlying malignancies.

Clinical Features

- In severe form the mucous membranes are always involved, with extensive bullae formation and systemic symptoms of fever and prostration.
- Cheilitis and stomatitis interfere with feeding, while vulvitis in females and balanitis in males lead to difficulties in micturition.
- Keratitis as a result of conjunctivitis.
- Epidermal necrolysis: A This is a life threatening condition.

Management

- Refer to higher level for appropriate management.

14.8.2 EXFOLIATIVE DERMATITIS

Synonyms: Exfoliative erythroderma syndrome, erythroderma.

Clinical Features

Serious, life threatening reaction pattern of the skin characterized by generalized and confluent redness with scaling and associated systemic toxicity, generalized lymphadenopathy, and fever. The disease presents as an acute and also as a chronic one. More than 50% of patients have a history of pre-existing dermatosis, commonly eczematous dermatitis (atopic, contact), psoriasis, drug reaction. They may also have pre-existing leukaemia, lymphoma, or other malignancy.. In up to 10–20% no probable cause is identified.

Constitutional symptoms include fatigue, weakness, anorexia, weight loss, malaise, and feeling cold with (shivering), as well as clinically red appearing skin that is thickened and with scaly lesions having no recognizable borders. Oedema of lower legs and ankles may occur. When palms and soles are involved there is thickening and fissuring. There tends to be alopecia (hair loss, but not uniform) and nails tend to be shed. Prognosis is guarded, making this a medical problem

that should be dealt with using a modern inpatient dermatology facility and personnel. The disease has many multi-systemic complications.

Management
- Soaks in a warm bath.
- Bland emollients: Liquid paraffin, emulsifying ointment
- Nursing care: Single room, keep warm, etc.
- Systemic management:
  - Supportive – Fluid, electrolyte, protein replacement.
  - Systemic steroid used under specialist care are prednisone or prednisolone 0.5mg/kg/day in 2 divided doses.
- Confirmation of primary skin disorder by skin biopsy.
- Note: Erythroderma may be purely secondary to HIV infection.

15. Genito-Urinary Diseases: Urinary Tract and Renal Conditions

15.1 Urinary Tract Infections

Main causes include:
- Normal GIT bacteria: E. coli (75%), strep faecalis, klebsiella.
- Organisms causing UTI, particularly where there is congenital malformation of the urinary tract: Proteus vulgaris, Pseudomonas sp.
- Rarely: Staphylococcus.

Predisposing factors:
- Obstruction in the urinary tract due to prostatic enlargement, pregnant uterus, calculi (stones), vesicoureteric reflux, cervical prolapse, cystocele, tumours.
- Diabetes mellitus.
- Catheterization of bladder.

Investigations should consist of a urinalysis: >10 WBC/mm^3 in uncentrifuged urine midstream or catheter specimen.

15.1.1 LOWER URINARY TRACT INFECTION

This includes infection of the urinary bladder (cystitis), urethra, prostate, or ureters.

Clinical Features
Painful micturition (dysuria). Painful desire to pass urine although the bladder is empty (strangury). Frequency. Cloudy and sometimes foul smelling urine.

Investigations
Urinalysis reveals pus cells, haematuria, and urinary casts.

Management
- Encourage a lot of oral fluid.
- Single dose regimens (uncomplicated lower UTI):
  - Amoxicillin 3g PO STAT ***OR***
  - Cotrimoxazole 4 tabs PO STAT
- Administer short course of antibiotics:
  - Cotrimoxazole: Adult – 2 tabs BD for 7–14 days
  - Children – 48mg/kg/day in 2 divided doses
    OR
  - Amoxicillin: Adult – 500mg TDS for 7–14 days
  - Children – 50mg/kg/day in 3–4 divided doses
    OR
  - Nitrofurantoin: 100mg TDS for 7–14 days
    OR
  - Norfloxacin: 200mg 12 hourly for 7 days
    OR
  - Amoxicillin/clavulanic acid: 250mg (amoxyllin dose) Q8h for 5–7 days
- Refer if evaluation reveals underlying urinary tract abnormality.

15.1.2 UPPER URINARY TRACT INFECTION (ACUTE PYELONEPHRITIS)

Acute inflammation of the parenchyma and pelvis of the kidney.

Clinical Features
Loin (lumbar) pain and tenderness. Dysuria. Strangury. Frequency. Cloudy urine. Fever (temperature 38–40°C). Vomiting.

Investigations
Urinalysis: Microscopy for pus cells organisms and casts

☛ ***The urine specimen should reach the laboratory within 2 hours of voiding or be refrigerated at 4°C for a period not exceeding 24 hours.***

Management
- Give a lot of fluids orally or intravenously if vomiting.
- Administer cotrimoxazole:
  - Adult – 2 tabs BD for 10–4 days
  - Children – 48mg/kg/day in 2 divided doses
    OR
  - Amoxicillin 500mg TDS for 10–14 days
- Give paracetamol 1g PO QDS as needed for fever or pain.
- If admitted, give IV gentamicin (adjust according to urea/creatinine) + IV ampicillin
  OR
  - Ceftazidinme 1g Q 12 hourly IV
    OR
  - Cefuroxime 750mg IV Q 8 hourly

OR

- Amikacin 15mg/kg/day IV

OR

- Ciprofloxacin 200mg IV 12 hourly

OR

- Norfloxacin 400mg PO 12 hourly.

- Admit (levels 3 to 5) if:
  - Temperature is greater than 38°C.
  - Kidney is palpable.
  - There is costovertebral tenderness (may suggest renal or perinephric abscess).
  - Patient is vomiting.
  - Compliance of patient is doubtful.
- Refer if:
  - There is NO response in 48 hours
  - Bacteria are not cleared at end of treatment.
  - There is suspicion of renal abscess.
  - Recurrent attacks occur: more than 3 in one year.

15.2 Renal Disease Signs and Symptoms

15.2.1 HAEMATURIA

- Among the causes are:
  - Infections (urinary tract infection, tuberculosis, schistosomiasis),
  - Acute glomerulonephritis,
  - Trauma,
  - Meatal ulcers,
  - Blood disorders (bleeding disorders, leukaemia, purpura, scurvy, sickle cell disease),
  - Tumours, and
  - Congenital abnormalities.
  - Haematuria is a serious sign of disease and should be aggressively investigated.
  - Refer to higher level urgently for appropriate management.

15.2.2 PYURIA

The finding of more than 10 white blood cells per high-power field on a urine specimen is suggestive of urinary tract inflammation. Pyuria as an isolated finding is almost commonly associated with bacterial urinary tract infection. When associated with haematuria or proteinuria, pyuria is suggestive of parenchymal renal disease such as glomerulonephritis or interstitial nephritis. Sterile pyuria is often due to TB; cultures for TB recommended.

15.2.3 HYPERKALAEMIA

Serum potassium levels persistently above 5.5mmol/L. Usually, there are no clinical consequences until the levels rise to 6mmol/L and above.

- Causes include:
  - Acute renal failure
  - Severe chronic renal failure
  - Use of potassium retaining drugs (e.g., spironolactone, triamterene, ACE inhibitors)
- Consequences include:
  - Muscle weakness
  - Abdominal distension
  - Tingling of the face, hands and feet
  - Irregular pulse
  - Heart block
  - Increased amplitude of the T-wave on the ECG
- Refer to higher for appropriate management.

15.2.4 HYPOKALAEMIA

Serum potassium levels persistently below 3.5mmol/L.

- Causes include:
  - Inadequate dietary intake (rare)
  - Gastrointestinal fluid loss (vomiting, diarrhoea, fistulae, paralytic ileus)
  - Renal loss (diuretics, uncontrolled diabetes mellitus)
  - Systemic metabolic alkalosis
  - Dialysis
- Clinical features:
  - Muscle weakness
  - Tetany
  - Fatigability
  - Thirst
  - Polyuria
  - Paralytic ileus
  - Cardiac arrhythmias
  - Elevated serum bicarbonate
  - Low serum chloride
  - ST segment depression and appearance of V waves on ECG
- Refer to higher level for appropriate management.

15.2.5 AZOTAEMIA

This is the accumulation of nitrogenous waste products such as urea and creatinine due to loss of the excretory functions of the kidney.

15.2.6 ABDOMINALLY PALPABLE RENAL MASSES

Causes include nephroblastoma, polycystic kidneys, horseshoe kidneys, neuroblastoma, and hydronephrosis.

Always refer to higher level for appropriate management.

15.3 Acute Glomerulonephritis

This is an inflammatory renal disease commonly following streptococcal infection of skin and tonsils.

Clinical features include smoky haematuria or tea coloured urine. Oedema, puffiness of the eyes more noticeable in the morning. The oedema is seldom severe or generalized. Back pain. Hypertension commonly presenting as headaches, visual disturbances, vomiting, and occasionally pulmonary oedema with dyspnea; convulsions and coma due to encephalopathy. Evidence of primary streptococcus infection, most often as an acute follicular tonsillitis with cervical adenitis and less often as skin sepsis. Altered urine output; occasionally there will be oliguria followed by diuresis (oliguric and diuretic phases).

☛ **Refer to higher level for appropriate management.**

15.4 Acute Renal Failure

Acute or subacute decline in the glomerular filtration rate and/or tubular function characterized by rapid accumulation of nitrogenous waste products, e.g., urea and creatinine. Among the clinical features are low or no urine output (sometimes may be normal), oedema, heart failure, hypertension, hyperkalaemiam, acidosis, rising blood urea, and creatinine. Refer to Table 15.1 for a summary of the aetiology of renal failure.

Table 15.1: Aetiologies of acute renal failure

Type	Examples
Pre-renal acute renal failure	Vomiting, diarrhoea, burns, diuretic treatment, peritonitis, pancreatitis, heart failure, liver disease with ascites.
Diseases of renal arteries and veins	Direct trauma to renal vessels, dissecting aortic aneurism.
Intrinsic renal:	Post-infective glomerulonephritis
Glomerulonephritis	Related to drugs, e.g., methicillin, ibuprofen, gentamicin
Acute interstitial nephritis	
Acute tubular necrosis	Following volume depletion and due to toxins Following
Intratubular obstruction	volume depletion and due to toxins, rhabdomyolysis, multiple myeloma, uric acid nephropathy
Obstruction of collection system	Bladder outlet obstruction, bilateral ureteral obstruction, ureteral obstruction in a single kidney

The diagnostic work-up should cover patient history, physical examination and a careful review of medical records and medications (e.g., gentamicin use). Presence of swelling and oedema of muscles may indicate rhabdomyolysis; abdomen or flank pain may indicate obstruction to urine flow or inflammation of the kidneys.

☛ **Refer to higher level for appropriate management.**

15.5 Chronic Renal Failure

The term chronic renal failure describes the existence of irreversibly advanced and usually progressive renal failure. Causes include:
- Chronic glomerulopathies
- Hypertension
- Chronic interstitial nephritis
- Diabetes mellitus

Among the important manifestations of chronic renal failure are:
- **Biochemical:** Acidosis, hyperkalaemia, elevated blood urea, elevated serum creatinine
- **Cardiovascular:** Pulmonary oedema, hypertension, pericarditis and cardiac tamponade, heart failure
- **Skeletal:** Bone pain and fractures (rare)
- **Nervous system:** Encephalopathy (confusion, convulsions), peripheral neuropathy
- **Haematological system:** Anaemia, excessive bleeding, e.g., from gums, skin, nose
- **Skin:** Itching (pruritus), darkening of skin.

Suspect chronic renal failure if:
- Previous history of renal disease, e.g., acute nephritis or nephrotic syndrome, is present.
- There is known history of hypertension.
- There is known history of diabetes mellitus.
- High blood urea and serum creatinine.
- Some of the systemic manifestation listed above are present.

☛ **Refer to higher level for appropriate management.**

15.6 Nephrotic Syndrome

A preschool and school age renal disease characterized by generalized oedema, proteinuria and hypo-albuminaemia. Causes include idiopathic/unknown in majority of cases. Congenital in rare cases. Secondary cause may be post acute glomerulonephritis, plasmodium malaria, allergy, e.g., bee stings, heavy metal poisoning (e.g., mercury and lead), urinary tract infection.

Clinical features include:
- Oedema: Marked to massive oedema. Ascites and pleural effusion may occur.
- Proteinuria: Marked proteinuria.
- Hypoproteinaemia: Low serum albumin in blood.
- Hyperlipidaemia.

Investigations should cover:
- Urinalysis
- 24 hour urine for protein
- Serum protein
- Urea and electrolytes
- Serum cholesterol

☛ **Refer to higher level for appropriate management.**

16. Mental Disorders

16.1 Acute Confusion (Acute Psychosis)

Sudden onset of mental symptoms in an otherwise previously normal person.
Aetiology involves:
- Organic causes: Cerebrovascular accidents (CVA), brain tumours, subdural haematomas, brain abscess, infections, acute meningitis, encephalitis, malaria, HIV
- Metabolic/toxic causes: Metabolic derangements, e.g., DKA, hypogylcaemia, drug intoxication
- Psychiatric causes: Schizophrenia, depression and manic episode

Clinical Features
A good history and physical examination are essential. The patient may be ill-looking, not appreciating surroundings, not alert, not aware of time, place or who they are. They may also be unable to remember and may forget easily, with poor attention and concentration. They may have visual/auditory hallucinations or delusions (grandiose or paranoid) or may be aggressive and excited. They may also have illusions (e.g., a stick is mistaken for a snake). In general, symptoms get worse at night.

Investigations
HB, blood slide for MPS, sugar

Management – General
Identify and manage physical (underlying) causes.

Management – Pharmacologic
Chlorpromazine 50–100mg TDS ***OR*** haloperidol 5–10mg TDS.

☛ **Refer if no physical cause is found (to a psychiatrist for treatment of schizophrenia, mania, or depression).**

16.2 Alcohol Withdrawal (Delirium Tremens)

Clinical Features
Suspect if a patient with acute psychosis also has history of excessive drinking, tremors, weakness, restlessness, insomnia, hallucinations (visual), profuse perspiration. May develop features of withdrawal when admitted to hospital for another disease.

Investigations
- Blood sugar to exclude hypoglycaemia

Management
- Sedate the patient:
  - Diazepam 10–40mg QDS for the first 24 hrs and then gradually taper off. Aim of therapy is to sedate until patient is calm.
  - Refer for admission in level 4 and above
  - Give supportive care:
  - Give multivitamins containing folic acid.
  - Manage head trauma and treat pneumonia, both of which are common in alcohol abusers.
  - Treat specific disorders symptomatically, e.g., cirrhosis, neuropathy.
  - Treat seizures with diazepam IV.
  - Give 50ml of 50% dextrose to correct hypoglycaemia.
  - Avoid long-term use of sedatives as they may lead to addiction.

☛ **Delirium tremens has a high mortality if not diagnosed and treated early.**

Patient Education
- Counsel the patient; abstinence may be essential.
- Encourage healthy diet.
- Involve the family in the long-term management.
- Encourage participation in 12-step programmes for both the abuser and the family members.

16.3 Substance Abuse Related Disorders

These are syndromes arising out of repeated maladaptive use of substances – substance being defined as any chemical with brain altering properties. They are characterized by significant impairment of psychological, social, and occupational functioning as observed over a 12-month period. Commonly abused substances in Kenya include tobacco, Cannabis sativa, khat (miraa), opioids (heroin), cocaine, and solvents (glue, petrol, wood varnish). Substance-related syndromes include intoxication, dependence, withdrawal, psychosis, mood disorders, anxiety, sleep disorders, sexual disorders.

More broadly, substance abuse can result in co-dependence, broken families, child abuse, road traffic casualties, generational substance abuse. Medical personnel need to be alert to abuse-related problems when treating family members.

High Risk Groups
- 12–20-year-olds
- Patients with primary mental disorders
- Upwardly mobile professionals trying "keep up".
- Children of parents who are substance abusers.

16.3.1 SUBSTANCE ABUSE BY THE ADOLESCENT

Usually present with a self-neglect, slovenliness, deteriorating school performance, excessive sleeping, rough appearance, increasing and unexplained demand for money from care givers, involvement in petty crime (pilfering), running away from home in addition to aforementioned substance-related disorders.

☛ **Refer to higher level for appropriate management.**

16.3.2 MANAGEMENT OF SELECTED SUBSTANCES OF ABUSE

OPIOID DETOXIFICATION

Opioids abused include heroin, morphine, dihydrocodeine and pethidine. Tolerance develops rapidly and withdrawal features include agitation, lethargy, sweating, goose-flesh pimples, running nose, shivering, musculo-skeletal pains, diarrhoea and abdominal cramps. These effects peak at 48 hours and subside over a period of 10 days. Owing to the highly addictive nature of opioids, admission to hospitals is necessary for effective management.

Management – Pharmacological
- For agitation, use diazepam 20–80mg PO daily to be tapered off in 10 days.
- For the parasympathetic upsurge, use clonidine 0.15mg to 3mg PO daily for 10 days.
- For any behaviour tending towards assault, use haloperidol 5–10mg TDS PO ***OR*** chlorpromazine 50–100mg TDS as necessary.
- For pain, use paracetamol 1g PO every 3 hours as necessary.

CANNABIS DEPENDENCE

Chronic users may develop psychosis, anxiety, mood disorders, and a withdrawal state. Admission is usually necessary for initiating abstinence. Treatment of the psychiatric complications is the same as for the primary syndromes.

KHAT (MIRAA) DEPENDENCE

Chronic users ("2 kilos" or more per day) may develop anxiety, mood disorders, and schizophrenia-like psychosis. Abstinence is to be encouraged. Treatment of the related psychiatric disorders is the same as for the primary syndromes.

SOLVENT ABUSE

Solvents are mainly abused by street children and the homeless. They have powerful euphoriant properties. Chronic users may develop organ damage (liver, heart, kidney), as well as neurological damage. Patient education is vital. Involve family and relevant authorities in rehabilitation.

16.4 Anxiety

An unpleasant, vague, and diffuse feeling of apprehension. It is an alerting signal. Usually the threat is unknown and patient's functioning becomes impaired. Pathological anxiety includes panic disorder, which may be dramatic in presentation; phobias, which are fears that are out of proportion; obsessive compulsive disorder, which is characterized by an irresistible urge to act; and generalized anxiety disorder.

Clinical Features

The patient presents with an empty feeling in the stomach, lightness in chest, pounding heart, perspiration, urge to void, non-exertion dyspnoea, blurred vision, hyper reflexia, dizziness, and light-headedness. Hypertension (transient) may be noted with some restlessness (e.g., pacing). A good history and physical examinations are of crucial importance. It is important to exclude physical causes like thyrotoxicosis, pheochromocytoma, hypoglycaemia, and temporal lobe epilepsy.

Management

- Correct hypoglycaemia, if present
- For uncomplicated anxiety, initiate calming therapy:
  - Reassure patient
  - Benzodiazepines, e.g., diazepam 20mg/24 hrs. Taper off once symptoms abate.
- Refer for:
  - Investigations to exclude organic causes; thyrotoxicosis, temporal lobe epilepsy, etc.
  - Complicated anxiety with presence of phobias, panic attacks, etc. Start on benzodiazepines and consult psychiatrist for:
  - Psychotherapy
  - Behaviour therapy
  - Other pharmacological interventions, which may include selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants, and monoamiine oxidase inhibitors (MAOIs).

16.5 Post Traumatic Stress Disorder

A common anxiety disorder that develops after exposure to a terrifying event or ordeal in which grave physical harm occurred or was threatened. This gives rise to both psychological and social effects.

Psychological effects are those that affect different levels of functioning including cognitive (perception and memory as a basis for thought and learning), affective (emotions), and behavioural. "Social effects" pertain to altered relationships with the family and community networks, and the impact on the economic status.

Clinical Features
In the acute phase, these may include intrusive flashbacks, grief reaction, denial, disbelief, numbness, restlessness, anxiety, social withdrawal, and uncontrollable crying.

Management
- Provide psychological first aid for those showing acute distress. This is an informal, non-clinical intervention that entails:
  - Basic, non-intrusive care with a focus on listening but not asking to talk.
  - Showing empathy by validating the person's feelings.
  - Reminding the distressed person that what they are feeling is a normal reaction to an abnormal situation, and that it is expected that the uncomfortable or bothersome feelings or painful symptoms will disappear over time.
  - Assessing needs and ensuring that these needs are met.
  - Encouraging but not forcing friendships, companionship and otherwise positive interactions with others. For example, if the person is ready, help him or her to join a social activity group.
  - Providing as much factual information as possible about access to services and any plans for the affected communities that may have been made.
- Refer to higher level for appropriate management.

16.6 Psychosexual Disorders

These range from the criminal sexual behaviour such as rape/sexual assault and paedophilia to the deviant (homosexuality/lesbianism, sex change, and transvestism – tendency to appear to be of different sex).

Management
Refer to higher level for appropriate management.

16.7 Conversion Syndromes

These are mental disorders in which there is a psychogenic disturbances of either motor or sensory function in some parts of the body.

Clinical Features
- May present as paralysis of a part of the body, tremors, blindness, deafness, seizures, aphonia. The severity of disability fluctuates and the patient fails to exhibit the seriousness the disability accords.
- A good psychiatric history may reveal the source of conflict.
- A thorough physical examination should be done, even though the patient seems normal.

☛ **Refer to higher level for appropriate management.**

16.8 Depression

The primary and dominant characteristic is a change in mood, consisting of depressive mood with characteristic changes in behaviour, attitude, thinking efficiency, and physiological functioning.

Clinical Features
Dysphoric mood characterized by sadness, crying spells, or irritability. Negative views of self, the environment and the future, indicated by guilt, loss of interest, difficulties in concentrating, or suicidal thoughts. There is insomnia with loss of, or increase in, appetite. There may be weight loss or gain with multiple somatic complaints, e.g., fatigue, weakness, headaches, backache, etc. A meticulous history is important as under-diagnosis is common and patients suffering from depression are often missed and receive inadequate/inappropriate treatment. Many depressed patients have a precipitating factor, e.g., loss of income or spouse/partner/child, or are on drugs that produce depression as a side effect, e.g., methyldopa.

Management – General
Most patients are managed as outpatients. It is important for the care provider to maintain a positive and hopeful attitude towards the patient and if possible to involve the relatives in the management of the patient, especially to improve compliance. Sessions with a psychologist or counsellor may be called for.

Management –Pharmacological
Antidepressants:
- Amitriptyline 50–150mg daily: Start with 75mg on the first day and increase by 25mg weekly.
  OR
- Maprotiline 25–75mg/day initially, and aim at 100–300mg/day.
  OR
- Fluoxetine 20mg OD: Start with 75mg on the first day and increase by 25mg weekly.
  OR
- Phenelzine 15–45mg/day initially, and aim at 45–75mg/day.

Give antidepressants at bedtime to reduce day time sedation. This timing may improve patient compliance. Antidepressants take about 2 weeks to take effect. If medications are effective, they should be continued for 3 months and then reduced at 25mg/week.

Failure to respond to therapy may due to:
- Poor compliance
- Inadequate dosage
- Misdiagnosis
- Inadequate therapeutic trial (usually 6 weeks).

Refer for
- Re-evaluating the diagnosis.
- Instituting chronic treatment (prophylaxis) in those with recurrent serious depression.
- Changing to second generation antidepressants, e.g., maprotiline, monoamine oxidases inhibitors.
- Considering electroconvulsive therapy (ECT).

Patient Education
- Inform the patient that there will be a delay of 2 weeks before beneficial effects of treatment are experienced.
- Explain about the side effects, e.g., dry mouth, constipation, hypotension, daytime sedation (drowsiness).
- Warn patient about dangers of alcohol consumption.
- Review the patient at least once every 2 weeks until maintenance dose is reached and then once a month until total drug withdrawal or as necessary.
- Involve the relatives in long term management.

☛ **Do not give large prescriptions to patients.** There is risk of suicidal overdose. Drug II administration should be monitored while at home.

16.9 Bipolar Mood Disorder (Manic Episode)

The primary characteristic is a change in mood consisting of a sense of wellbeing and enhanced, even exaggerated, self-esteem.

Clinical Features
The clinical features include hyperactivity that is usually goal oriented, over generosity, extravagance, disinhibition (promiscuity, drug abuse), irritability, accelerated speech, infectious elated congruent mood, grandiose delusions, enhanced/exaggerated self-esteem, insomnia, and weight loss (no time for food). In severe forms patients appear disorganized, and may be violent; legal involvement may be necessary in their management. History and physical examination are essential; it is necessary to establish whether the patient was ever depressed in the past.

☛ **Refer to higher level for appropriate management.**

16.10 Schizophrenia

A form of mental illness characterized by loss of contact with reality, hallucination, delusions, abnormal thinking, flattened effect and disturbed work and social function, occurring in a setting of clear consciousness, memory, and orientation.

Clinical Features
The clinical features include withdrawal and generalized loss of interest in the environment, with thought disorder. The normal association of ideas is lost and

there is characteristic incongruency of affect. There are also delusions, hallucinations in any sensory modality, and disturbances in behaviour and motor function, e.g., grimacing, odd postures.

History obtained from the patient and relatives is most important. Continuous signs of illness should be present for 6 months at some point in the patient's life, with some clinical features at the time of diagnosis.

Management – General

- Apply both psychological and social approaches.
- Use psychiatric community nurses and social workers in involving family to understand the illness and help with rehabilitation of the patient into community activities. Importance of drug compliance should be explained to relatives and patients.

Management – Pharmacological

- If the patient is severely disturbed, admit and give:
  - Chlorpromazine 100–200mg IM and then start on oral chlorpromazine 100–200mg TDS
  - Perphenazine 8–64mg/day orally
  - Fluphenazine 2.5–40mg orally daily
  - Trifluoperazine 1–5mg orally daily
  - Haloperidol 2–25mg orally daily
  - Thioridazine 25–80mg orally daily
  - Thiothixene 2–5mg orally daily
- Manage mildly disturbed patient as outpatient:
  - Give chlorpromazine 100mg TDS ***OR*** haloperidol 5mg TDS. If patient was diagnosed as a schizophrenic and missed taking the drugs, restart the drug as before.
  - Maintenance therapy: Chlorpromazine 100–200mg TDS ***OR*** haloperidol 5–10mg TDS
  - Onset of extra pyramidal side effects: reduce dose and start on benzhexol 2.5–5mg TDS
- For patients who are not dependable about taking oral drug, use available depot preparations:
  - Fluphenazine decanoate 25mg IM monthly
  - Haloperidol decanoate 50mg IM monthly
  - Clopenthixol decanoate 200mg IM monthly
  - Flupenthixol decanoate 40mg IM monthly.
- Caution: Aim to use lowest dose that is therapeutic in cases of long-term use to minimize risk of side effects.

Refer if

- Poor compliance.
- Inadequate dosage/therapeutic treatment up to 6 weeks.
- Misdiagnosis.

☛ **Electroconvulsive therapy (ECT) can be administered for refractory cases.**

☛ **Admit if patient is severely disturbed, violent, or catatonic.**

Patient Education
- Compliance with therapy is important to prevent relapses.
- Relatives should bring the patient to the hospital at early signs of relapse.
- Drugs may have to be taken for a long time depending on response.

16.11 Sleep Disorders

Insomnia is difficulty in initiating or maintaining sleep, leaving the patient feeling unrested. Insomnia can be a symptom of many other psychiatric and physical disorders, as well as menopause, all of which should be excluded. Rule out use of addictive drugs (caffeine, etc.). The insomnia itself can be disturbing because people worry about it.

Management
- Give hypnotics, e.g., diazepam 5–10mg nocte for 1–2 weeks and then taper off.

☛ **Caution: Avoid chronic use (over 30 days) of hypnotics.**

- Advise patient to adhere to a consistent sleeping schedule, to avoid food at bedtime (except for a glass of warm milk or something soothing), to listen to soothing music before bedtime, etc.
- Refer if no response in 4 weeks.

Other Sleep Disorders
Hypersomnia (narcolepsy/cataplexy): Complains of excessive sleep without any demonstrable cause.

Management
- Forced naps at regular times of the day.
- Methyl phenidate 30mg morning and 20mg midday until symptoms disappear, maximum dose 60mg daily.

16.12 Suicide Attempts

Unsuccessful attempt to end one's own life.

Clinical Features
Suicide threats. May occur in the following conditions: depression, schizophrenia, under influence of alcohol/drugs, under severe social problems or stress, personality disorder. Often the attempted suicide itself is the first symptom.

☛ **Take suicide threats seriously; the next attempt may be successful. Refer to higher level for appropriate management.**

PART II
Paediatrics and Related Disciplines

IN THIS SECTION:

17. Paediatric Emergencies

17.1 Recognizing a Seriously Ill Child (Triage)

It is important that all health care workers learn to quickly recognize a child needing emergency care as soon as the child is brought to a health facility. Fortunately, this depends on a few clinical features that are easy to learn with practice.
Parents/caregivers may have tried to treat the child at home or the child may have fallen sick quickly. They are advised to come to the health care facility as soon as possible if the child is weak, not able to drink, has severe diarrhoea, cold hands and feet, very high fever or convulsion

17.2 Causes of Cardiorespiratory Arrest after Neonatal Period

- Fluid loss: Diarrhoea, blood loss, burns.
- Fluid maldistribution: Anaphylaxis, septic shock, cardiac disease
- Respiratory distress: Pneumonia, asthma, foreign body (obstructed airway)
- Respiratory depression: CNS infections, convulsions, poisoning.
- Trauma can also be a cause.

☛ **In addition to the items listed above, severe malnutrition is a common cause of death in young children.**

Figures 17.1 and 17.2 assist you to triage and manage these children as they arrive at the health facility. Management in all these states includes the ABC's: Airway, Breathing, Circulation.

17.3 Summary of Steps Taken: ABCD of Resuscitation

☛ **Always have a resuscitation tray ready.**
- Airway/breathing: Start immediate treatment to restore breathing
- Circulation: Restore circulating blood volume by giving 20ml/kg of Ringer's lactate or normal saline over 15 minutes. Repeat until pulse returns; this may be repeated up to 4 times.
- Convulsions: Give anticonvulsants if child is convulsing.
- Carry out emergency investigation if you are able: Blood glucose, blood smear, haemoglobin.
- Reassess every 15–30 min until stabilized following the same format – airway, breathing, circulation.
- When ventilation and massage are effective, carotid and femoral pulses become palpable, pupils constrict, and the colour of mucous membranes improves.
- NOTE: External cardiac massage (chest compressions): Apply appropriate pressure over the sternum:

- For newborn or small infants effective cardiac output can be produced by applying maximum pressure with the tip of 2 fingers placed on the sternum just below the intermammary line or hands round the infant's chest.
- For larger infants and small children, use the heel of 1 hand over the sternum 1 finger breadth above the xiphisternum.
- For big children the heel of the right hand is placed over the heel of the left hand to provide the strength of both arms and shoulders. Hands are placed 2 finger breadths above the xiphisternum.

◆ Refer urgently after stabilizing the child. During transport ensure adequate airway, breathing, and circulation. Make sure you write a comprehensive report of what you have done to the receiving hospital clinician.

Figure 17.1: Triage of sick children

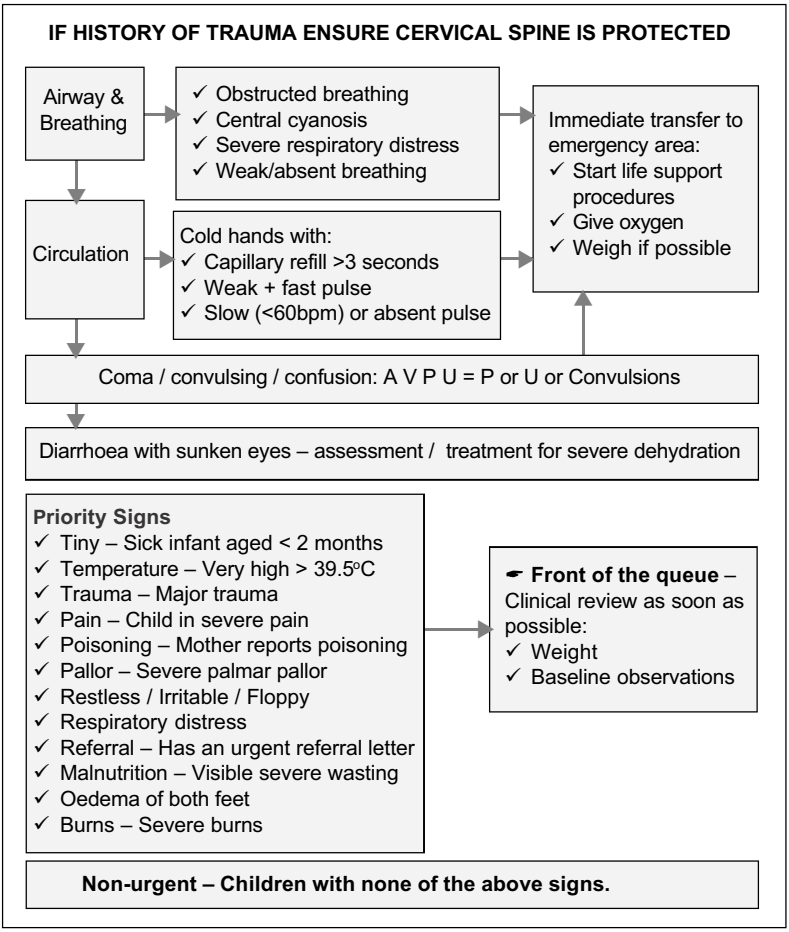
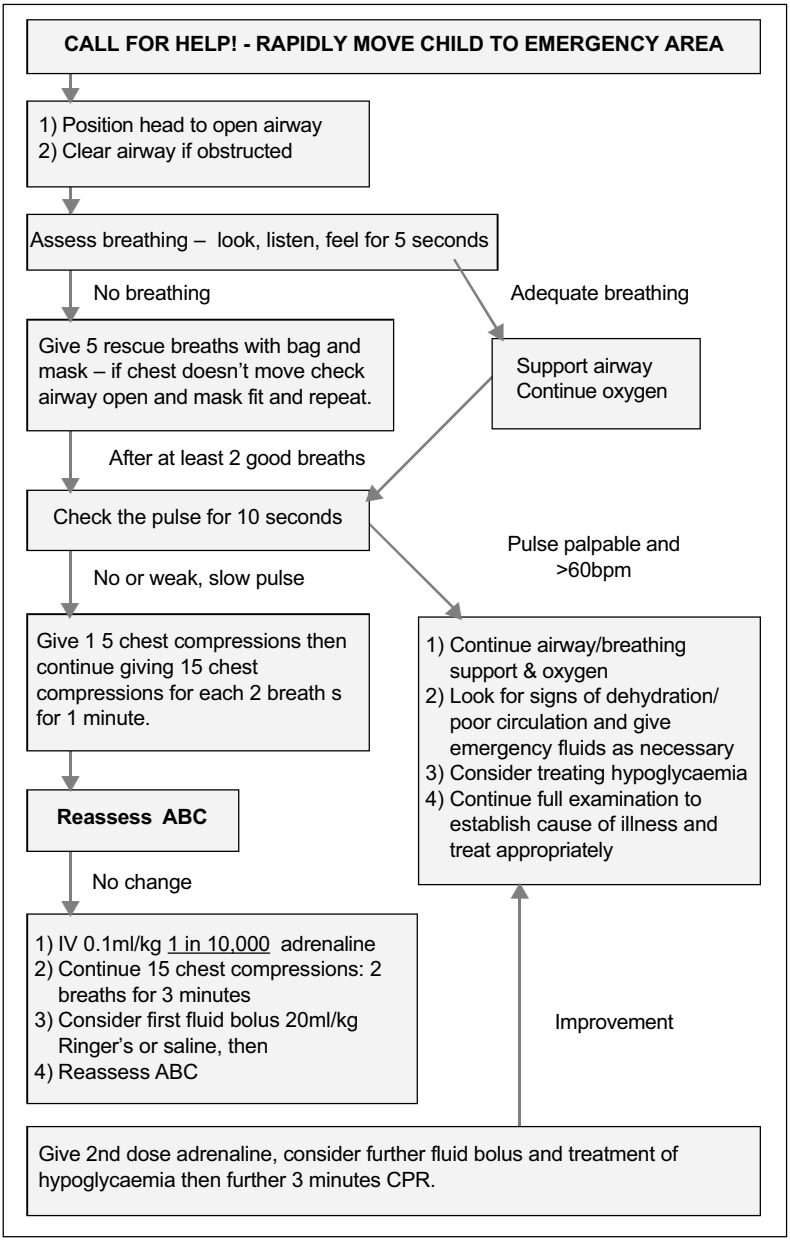


Figure 17.2: Basic life support – Cardio-respiratory collapse



17.4 Shock

Causes of shock include
- Bleeding
- Severe infection (septic shock)
- Severe dehydration
- Cardiac disease
- Trauma

Clinical Features
- Cold hands
- Capillary refill >3 seconds
- Weak fast pulse

☛ **Children with these signs are in shock and need emergency treatment.**

Treatment
For a child without severe malnutrition:
- Infuse 20ml/kg of normal saline or Ringer's lactate as rapidly as possible.
- Reassess and give a second dose if there is no improvement. You may need 2 or 3 repeats to restore circulating blood volume.

For a child with severe malnutrition:
- Give 15ml/kg of Ringer's lactate with 5% dextrose or half normal saline with 5% dextrose and infuse over 1 hour.
- After resuscitation, refer urgently for admission. Monitor vital signs during the journey and continue IV fluids.

17.5 Anaphylaxis

This is an allergic reaction to drugs, food, stings, etc., in a sensitized individual.

Clinical Features
These include extensive skin rash, pruritus, urticaria, respiratory distress that may be accompanied by a wheeze or a stridor (due to laryngeal oedema or bronchospasm), and hypotension.

Management
Parents and care givers are advised to take to a health care facility as soon as possible any child with extensive skin rash or difficulty in breathing.
- Follow the ABC of resuscitation. In addition, do the following:
  - Adrenaline: give IM 0.01ml/kg of 1:1,000 solution; or 0.1ml/kg of 1:10,000 solution. Can be repeated every 15 minutes for 3 doses.
  - Aminophylline 5mg/kg IV over 20 minutes if there is wheezing
  - Nebulized bronchodilators, e.g., salbutamol
  - Antihistamine

- Chlorpheniramine 0.1mg/kg IV slowly. Then continue IM/SC 8 hourly for 24–48 hours, hydrocortisone 4mg/kg IV is of secondary value but useful to prevent delayed recurrences

- Subsequently, continue to observe patients with mild to moderate reaction, e.g., urticaria or mild bronchospasm, for at least 6 hours because attacks may recur after full recovery.
- Refer all children with severe reactions, e.g., poor circulation, severe bronchospasm.
- Continue intravenous fluid replacement, and closely monitor during transfer.

☛ **Avoid offending agents. Inform parent/child the cause of reaction so as to know and to avoid the offending agent in future**

17.6 Choking

Infants and young children can easily choke on any number of things. Often they are playing with seeds, buttons, or any small object, which when put in the mouth easily goes the wrong way. All health care providers should learn how to dislodge the objects and it would be good if the parents are taught the procedure. This is because the procedure may be required urgently: by the time the child arrives at the health facility they may have already choked to death. Figures 17.3 and 17.4 show how this is done.

Advise parents that someone needs to keep an eye on toddlers and crawling babies at all times. They won't necessarily be able to hear the baby choking.

Figure 17.3: How to manage the choking infant

a) Back slaps

b) Chest thrusts

1. Lay the infant on your arms or thigh in a head down position..
2. Give 5 blows to the infant's back with heel of hand (Figure 17.3a).
3. If obstruction persists, turn infant over and give 5 chest thrusts with 2 fingers one on top of the other, one finger breadth below nipple level in midline. (Figure 17.3b)
4. If obstruction persists, check infant's mouth for any obstruction that can be removed.
5. If necessary repeat the sequence with back slaps again.

Figure 17.4: How to manage the choking child

1. Give 5 blows to the child's back with heel or hand with the child sitting, kneeling or lying (Figure 17.4a).
2. If obstruction persists, go behind the child and pass your arms around the child's body. Form a fist with one hand. Immediately below the child's sternum place the other hand over the fist and quickly press upwards into the abdomen (Figure 17.4b). Repeat this Heimlich manoeuvre 5 times.
3. If obstruction persist check child's mouth for any obstruction that can be removed.
4. If necessary repeat the sequence with back slaps again.

a) Slapping the back to clear airway obstruction in a choking child

b) Heimlich manoeuvre in a choking older child

18. Diarrhoeal Diseases

Causes of diarrhoea in children include:
- Young children <5 years: Rotavirus, E. coli
- All ages except neonates: Shigella, cholera, salmonella spp., amoeba, giardia, Candida.
- Others: Lactose intolerance, food poisoning.

Clinical Features
Diarrhoea is defined as occurrence of at least 3 loose or watery stools in a day. Diarrhoeal illness is classified for dehydration, presence of blood in the stool and duration.

Definitions
- ***Acute watery diarrhoea:*** Watery stools lasting less than 14 days.
- ***Dysentery:*** The presence of fresh blood in the diarrhoeal stool.
- ***Persistent diarrhoea:*** Diarrhoea that has lasted for 14 days or more.
- ***Dehydration:*** Loss of water and electrolytes.

The major cause of death from diarrhoea is dehydration, especially in infants and young children. Management of diarrhoea is aimed primarily at evaluation, prevention, and treatment of dehydration.

18.1 Acute Watery Diarrhoea

Assess for signs of shock; if present manage as outlined above in Section 17.4. Then classify diarrhoea in young children as given in Figure 18.1, and rehydrate as shown in Table 18.2. For older children, the clinical evaluation of dehydration is summarized in Table 18.3, and the rehydration protocol in Table 18.4.

Table 18.1: Assessment, classification, and management of diarrhoea in children below 5 years

Age of child	No dehydration (2 signs or more)	Some dehydration (2 signs)	Severe dehydration
Young infants 1 week – <2 mon	Normal	Sunken eyes Restless/irritable Skin pinch goes back slowly	Lethargic/unconscious Sunken eyes Skin pinch goes back very slowly (>2 sec)
2 months – 5 years	Normal	Thirsty Restless/irritable Skin pinch goes back slowly Eyes sunken	Lethargic/unconscious Sunken eyes Not able to drink or drinking poorly Skin pinch goes back very slowly (>2 sec)

Table 18.2: Rehydration protocol for young children

Degree of dehydration	Age	Where	Type of liquid	Volume to give	Rate
No dehydration	1 week – 2 months	Home	ORS	50–100ml	After every bout of diarrhoea
Plan A	≥2 months – 5 years	Home	ORS	100–200ml	After every bout of diarrhoea
Some dehydration **Plan B**	1 week – 5 years	Health unit	ORS	75ml/kg	4 hours, then reassess
Severe dehydration	1 week – 2 months	Health unit	Ringer's lactate or Hartmann's solution	100ml/kg	30ml/kg in 1 hr 70ml/kg in 5 hrs
Plan C	2 months – 5 years	Health unit	Ringer's lactate or Hartmann's solution	100ml/kg	30ml/kg in ½ hr 70ml/kg in 5 hrs

Table 18.3: Clinical evaluation of dehydration in older children

Clinical features	Mild dehydration	Moderate dehydration (2 signs present)	Severe dehydration (2 signs present)
General appearance: Older children and adults	Thirsty, alert	Thirsty, alert	Generally conscious, anxious, cold extremities, clammy, cyanosis, wrinkled skin of fingers, muscle cramps, dizzy if standing
Pulse	Normal	Rapid	Rapid, thready, sometimes absent
Respiration	Normal	Deep, sometimes rapid	Deep and rapid
Systolic BP	Normal	Normal	Low, sometimes unmeasurable
Skin elasticity/ skinpinch	Immediate recoil	**Decreased**	**Fold disappears very slowly** (>2 seconds)
Eyes Tears	Normal Present	**Sunken** Absent	**Severely sunken** Absent
Mucous membranes (test mouth with a clean finger)	Moist	Dry	Very dry
Urine output % of body weight loss	Normal 1–5%	**Reduced, urine dark** 6–9%	**Anuria, empty bladder** 10% or plus
Estimated fluid deficit	10–50ml/kg	60–90ml/kg	100ml/kg

Table 18.4: Rehydration protocol for older children

Degree of dehydration	Age	Type of liquid	Volume to give	Rate
Mild	All	**ORS**	50ml/kg	In 4 hrs
Moderate	All	**ORS**	100ml/kg	In 4 hrs
Severe	Older children	Hartmann's solution, Ringer's lactate	110 ml/kg	In 4 hrs: at first as rapidly as possible until a radial pulse is palpable

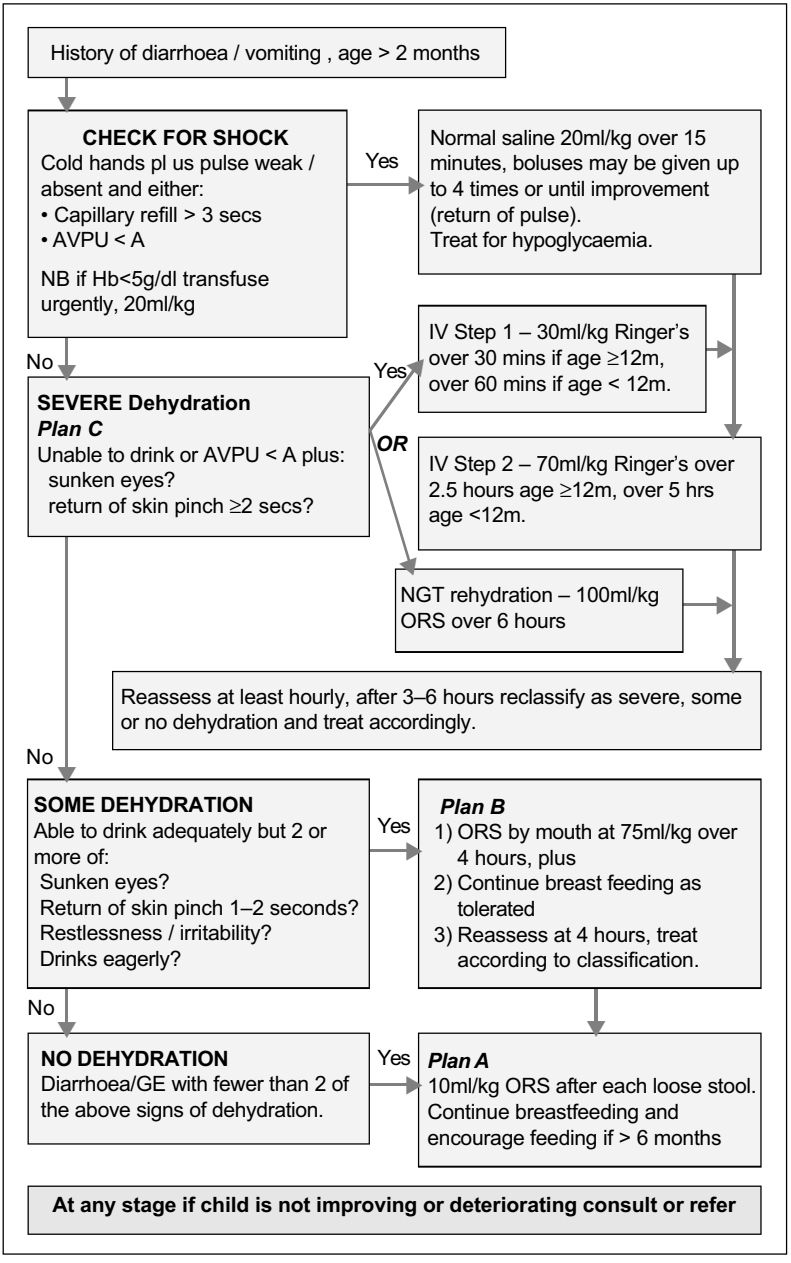
NOTES: (a) Initially, older children can drink 300 ml/hour. (b) If Ringer's lactate or Hartmann's solution is not available, use normal saline.

18.2 Diarrhoea/GE Protocol (Excluding Severe Malnutrition)

- Antibiotics are NOT indicated unless there is dysentery or persistent diarrhoea and proven amoebiasis or giardiasis.
- Diarrhoea > 14 days may be complicated by intolerance of ORS – worsening diarrhoea – if seen change to IV regimens.
- All cases to receive zinc.

Management of diarrhoea and rehydration are illustrated in Figure 18.1, and summarized in the subsequent text.

Figure 18.1: Diarrhoea management protocol for young children



Management - Rehydration Protocol For All Ages (Summary)
For children with severe dehydration:
- Consider the volumes indicated as guidelines only.
- Evaluate rehydration in terms of clinical signs, NOT in terms of volume of fluids given.
- Monitor the child with shock every 15–30 minutes until pulse is palpable. Thereafter monitor other signs of dehydration.
- If signs of severe dehydration persist, repeat the rehydration in plan C.
- If improving and child can drink, start ORS (about 5ml/kg/hr) Show the mother how to give ORS.
- Evaluate preferably every hour hours until signs of dehydration disappear (usually within 4 hrs).
- If diarrhoea is severe (> 1 stool every 2 hrs), continue with IV fluids.
- For other children, continue ORS (Plan A).

Fluid to be given after correction of dehydration:
- Up to 2 years: 50–100ml for every stool passed
- 2–5 years: 100–200ml for each loose stool
- 5 years and above: 300ml and more as desired. Thirst is the best guide for maintenance fluid therapy in older children.
- If child vomits wait 10 minutes and give same volume slowly.
- Periorbital oedema is a sign of fluid overload.
- If this occurs, stop the ORS and give plain water or breast milk in breastfeeding children.

All children under 5 years give zinc for 10–14 days
- Up to 6 months 10mg/day
- 6 months and above 20mg/day

Ask caregiver to return to health facility if no improvement in 3 days or if the patient develops the following:
- Many watery stools, very poor drinking, repeated vomiting, fever, marked thirst, and blood in stool.
- Also if the caregiver is not happy with the child's condition.
- At any stage if child is not improving or deteriorating, consult or refer.

Management - Nutrition
It has been shown that there is no physiological reason for discontinuing food during bouts of diarrhoea and that continued nutrition is beneficial to all children. Continued feeding should be encouraged.

- Under 6 months: Breastfeed on demand as soon as baby is able to feed
- 6–24 months: Breastfeed on demand and offer complementary food.
  - ORS should constitute about two-thirds of the fluid intake until diarrhoea ceases
- 2 years and above: Family foods can be eaten while continuing ORS:
  - Give cereal or starchy food mixed with some vegetable or protein foods.
  - Give fresh fruit or mashed bananas to provide potassium.

- Give food-based fluids (soups, enriched *uji, madafu, mala*) during the oral rehydration phase.
- Give an extra meal per day for 2 weeks after recovery.
- Give vitamin A if child has not received a dose in the last 3 months.

Management – Pharmacological

☛ **Note that 50–60 % of acute gastroenteritis in young children is viral.**

- Anti-diarrhoea drugs (e.g., absorbents) and antiemetics are contraindicated in children.
- If child has fever consider other diseases associated with diarrhoea (e.g., malaria, otitis media, pneumonia).
- Antimicrobial drugs should be used for children only as follows:
  - Antibiotics only for dysentery and suspected cholera.
  - Antiprotozoal drugs: metronidazole for:
    - Amoebiasis only after antibiotic treatment of bloody diarrhoea has failed or faeces shows trophozoites of E. histolytica.
    - Giardiasis when diarrhoea has lasted over 14 days and cysts or trophozoites of giardia are seen in faeces.
- Antibiotics for specific intestinal infections are listed in Table 18.5.

☛ **Most acute diarrhoea in children is viral and does NOT require antibiotics.**

Table 18.5: Antibiotics used in the treatment of diarrhoea

Aetiology/Clinical Features	Management
Cholera: Very profuse watery diarrhoea (rice-water stools), often vomiting	Children >8 yrs: Doxycycline 4–5mg/kg x 2–3 days 2nd line chloramphenicol 50–100mg/kg/day Q6hr for 3 days
Shigella dysentery: Blood & mucus in stools, cramps, tenesmus, fever	Ciprofloxacin20–30mg/kg/day Q12hr (max 1.5g/day

18.3 Persistent Diarrhoea

This is diarrhoea that starts acutely but lasts 14 days or more. It can be watery or with blood. The degree of dehydration assessed as in acute diarrhoea. Causes include: malnutrition, occult infections, HIV, candidiasis, amoebiasis, giardiasis

Note: Persistent and prolonged diarrhoea predisposes to malnutrition, especially if the nutritional status was borderline.

Management

Management for dehydration is the same as that for acute diarrhoea. Then:

- Treat underlying condition if present.
- Do not give antibiotics unless there is specific indication.
- Refer all children with severe dehydration and when diarrhoea persists despite treatment.

Feeding Recommendation for a Child with Persistent Diarrhoea

- Successful diet is characterized by:
  - Weight gain
  - Adequate food intake according to age
  - Disappearance of diarrhoea

If still breastfeeding, give more frequent, longer breastfeeds, day and night.

- If not breastfeeding, use fermented milk products such as *mala* or yoghurt or any other high protein but low lactose food or drinks as these are tolerated better. The aim is to give 110 calories/kg/day, of which 10% is protein. Use locally available food.
- For other foods, follow feeding recommendations for the child's age. Ensure adequate intake.
- Encourage the child to feed.
- Give an extra meal per day and continue until one month after diarrhoea has stopped.
- Give micronutrients: Multivitamin supplements, vitamin A, folate, iron, zinc.

18.4 Prevention of Gastrointestinal Tract (GIT) Infections

- ***Adequate nutrition:*** Breastfeeding exclusively up to age 6 months, and continued together with adequate complementary foods up to age 2 years.
- ***Food hygiene:*** All food consumed by the whole household must be prepared and stored hygienically. This also depends on the availability of a safe and adequate water supply. Water for drinking to be boiled or treated with chlorine (household bleach, e.g., Jik).
- ***Environmental sanitation:*** Disposal of wastes (human and household) in the homes and communal areas is essential. Practise hand washing after using the toilet, after changing baby's nappy, and before preparing/eating food. Teach children, even young children, to wash their hands regularly.
- ***Managing food handlers:*** Food handlers should be examined regularly, especially in schools, and when necessary treated appropriately.

19. Fever

Fever is a common but non specific presenting sign in children. Any child with a temperature of 37.5^{o}C or above is said to be febrile. Fever accompanies a wide variety of illnesses and need not always be treated on its own. In general, the cause should be ascertained before therapy as far as possible.

Clinical Features

History should take into account the duration, place of residence or travel to areas of high malaria transmission, pain on passing urine, pain in the ears, and whether there is a rash or not. A thorough physical examination to find localizing signs should also be done.

Fever without localizing signs can be due to:
- Malaria, septicaemia, urinary tract infection, or HIV

Fever with localizing signs can be due to:
- Ear or throat infection, pneumonia, septic arthritis or osteomyelitis, meningitis,
- Skin and soft tissue infection

Fever with a skin rash is commonly due to:
- Viral infections
- Meningococcal infection

Fever lasting longer than 7 days can be due to:
- Abscesses, infective endocarditis, tuberculosis, HIV, salmonella infections,
- Any chronic infection or inflammatory conditions or malignancies.

Management – General
- Ask parent to reduce clothing to a minimum in all cases.
- Ensure adequate fluid intake.
- Ensure adequate nutrition.
- If fever is high (>39°C) or child in pain, give paracetamol (see Table 19.1).
- Treat the cause if identified.
- Give an antimalarial if at risk (refer to Section 20, below, on malaria).
- Review child after 5 days.
- Ask parent to return any time if child not improving or getting worse.

Table 19.1: Paediatric paracetamol doses, every 6 hours

Age	Weight(kg)	500mg tablet	l20mg/5ml syrup
2–12 months	6–9	¼	2.5–5ml
12 months up to 3 years	10–14	¼	5–10ml
3–5 years	15–19	½	10ml

☛ **Fever alone is not a reason to give antibiotic except in a young infant (age less than 2 months).**

Management – Specific
Identification of the cause is the key to management and helps to prevent over use of specific drugs, e.g., antibiotics or antimalarials.

Management of Fever at the Community Level
Since most of the cases of fever occur at the community level, it is essential to train health care providers and caregivers where applicable on early recognition and prompt initiation of treatment at the community level. This includes not only the use of the appropriate antimalarial, but also the use of other methods to control the fever. The patient should be taken immediately to a health facility if there are any features of severity as described in the section on severe malaria below.

20. Malaria

Malaria parasites are usually transmitted by the bite of an infected female anopheles mosquito. Plasmodium falciparum is the commonest type in Kenya and is associated with significant morbidity and mortality. The other species are: P. malariae, P. vivax, and P. ovale.

Clinical Features

Uncomplicated Malaria

- Classically malaria presents with paroxysms of fever, chills, rigors, and sweating
- Other features include: Malaise, headache, myalgia, joint pains, refusal to feed, nausea, vomiting, abdominal discomfort, and diarrhoea.

☛ **Remember not all fevers are due to malaria. These signs are nonspecific.**

Severe and Complicated Malaria

This presents with a combination of most of the above plus either one or more of the following:

- Severe anaemia (Hb <5g/dl)
- Lethargy or altered unconsciousness or coma
- Generalized convulsions
- Jaundice
- Hypoglycaemia (blood sugar <2.2mmol/L)
- Respiratory distress, pulmonary oedema
- Acidosis
- Disseminated intravascular coagulopathy (DIC – spontaneous bleeding)
- Malaria haemoglobinuria (cola coloured urine)
- Oliguria
- Shock
- Fluid electrolyte imbalance

20.1 Diagnosis of Malaria

Children under 5 years old

- In high malaria endemic areas, any child with fever or history of fever should be presumptively classified and treated as malaria. The use of parasitological diagnosis is not a prerequisite for treatment.
- In low malaria endemic areas, any child with fever or history of fever in the absence of measles, running nose, or any other identifiable cause of fever should be presumptively classified and treated as having malaria. The use of parasitological diagnosis is recommended where possible.

Older children >5 years of age

- In all patients 5 years and above with fever or history of fever the use of parasitological diagnosis is recommended.

- At health facilities where malaria diagnostics (microscopy or RDT) are not available, patient with fever or history of fever in whom the health worker strongly suspects malaria and has eliminated other possible causes of the fever, should be presumptively classified and treated as malaria.

20.2 First Line Treatment of Uncomplicated Malaria

Treatment for All Age Groups

- The recommended first line treatment for uncomplicated malaria in Kenya is artemether-lumefantrine currently available as a co-formulated tablet containing 20mg of artemether and 120mg of lumefantrine. This is administered as a 6-dose regimen given over 3 days (see Table 20.1).
- Malaria patients with HIV/AIDS should be managed according to the same regimen.
- In children below 5kg (under 2 months of age), malaria is not a common cause of fever. Evaluation of other causes should be undertaken. Where malaria is diagnosed, the recommended treatment is oral quinine.

Table 20.1: Dosing schedule for artemether-lumefantrine

Body weight	No. of tablets recommended at approximate timing (hours) of dosing (each tablet contains 20mg A and 120mg L)					
	0 h	8 h	24 h	36 h	48 h	60 h
5–14kg (<3 yr)	1	1	1	1	1	1
15–24kg (4–8 yr)	2	2	2	2	2	2
25–34kg (9–14 yr)	3	3	3	3	3	3
>34kg (>14 yr)	4	4	4	4	4	4

NB: The regimen can be expressed more simply for ease of use at the programme level as follows: The second dose on the first day should be given anytime between 8 and 12 hours after the first dose. Dosage on the second and third days is twice a day (morning and evening).

20.3 Counselling, Supportive Treatment, and Follow Up

For all patients the following counselling messages should be provided

- Explain dosing schedule: Use probing questions to confirm patient's understanding.
- Emphasize that all 6 doses must be taken over 3 days even if patient feels better after few doses.
- Directly observe the first treatment dose.
- If vomiting occurs within 30 minutes after drug administration, repeat the dose.
- Advise that a rtemether-lumefantrine should preferably be taken with a meal.
- Advise caregiver to bring the patient back to the nearest health facility immediately if the condition deteriorates at any time, or if symptoms have not resolved after 3 days.

Supportive treatment

- Fever management: In cases of hyperpyrexia (temp >39.5°C) administer an antipyretic. The recommended options are paracetamol or ibuprofen.
- Encourage adequate fluids and nutrition: Caregivers should be encouraged to give extra fluids and where applicable continue breast feeding. Feeds and fluid should be administered in small quantities at frequent intervals, especially when the child is still very sick.

Treatment failure

Treatment failure can be defined as a failure to achieve the desired therapeutic response after the initiation of therapy. Treatment failure is not synonymous with drug resistance. Treatment failure may result from poor adherence to treatment, unusual pharmacokinetic properties in that individual, or drug resistance. Treatment failure could also arise because of a wrong diagnosis and thus initiation of the wrong treatment. In evaluating a patient with treatment failure, it is important to determine whether the patient vomited previous treatment or did not complete a full treatment course.

Treatment failures should be suspected if patient deteriorates clinically at any time or symptoms persist 3–14 days after initiation of drug therapy in accordance with the recommended treatment regimen.

Development of symptoms 14 days after initiation of therapy where there has been prior clearance of symptoms should be considered as a new infection and be treated with the first line drug.

☛ **Remember that not all fevers are due to malaria. A fever that does not respond to adequate antimalarials may be due to other causes.**

20.4 Second Line Treatment for All Age Groups

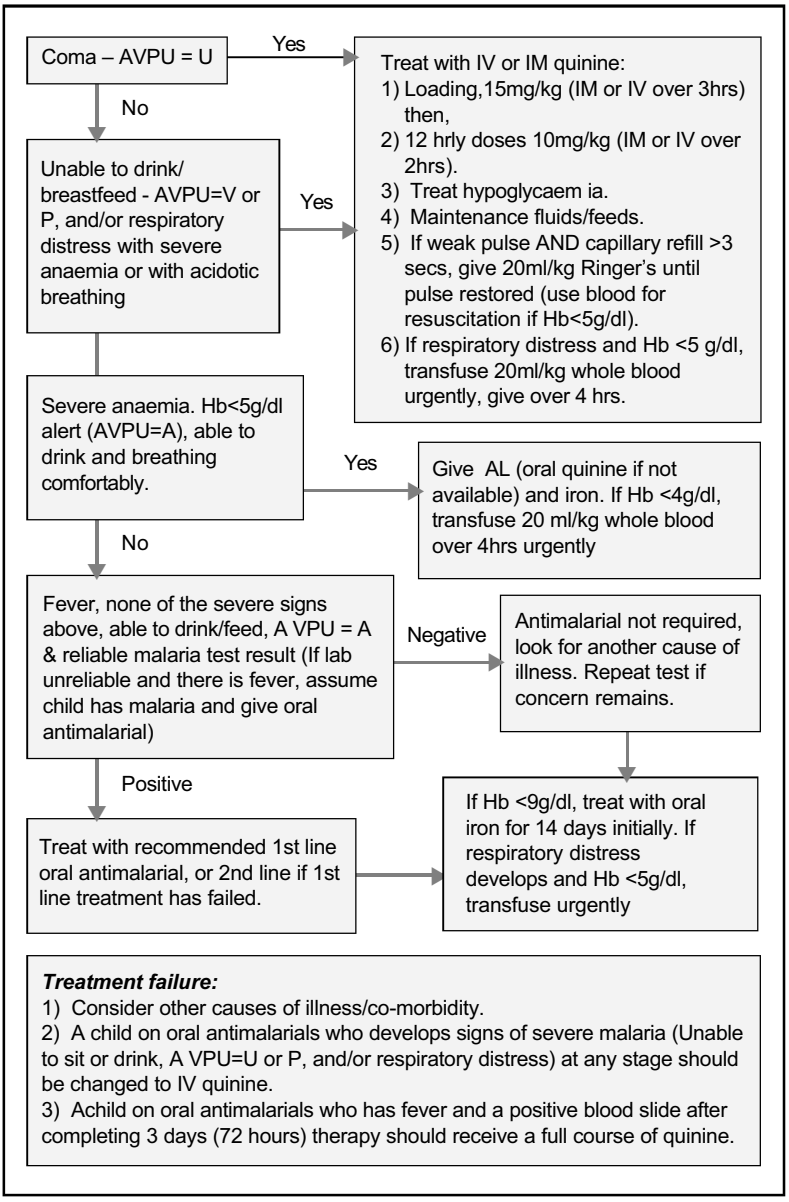
The recommended second line treatment for uncomplicated malaria in Kenya is oral quinine. This is administered as a daily dose of 30mg/kg in 3 divided doses of 10mg/kg for 7 days (refer to Table 20.2).

Table 20.2: Dosing schedule for quinine tablets

Quinine sulphate 200mg		Quinine 300mg salt (sulphate, dihydrochloride, hydrochloride)	
Weight in kg	No of tabs	Weight in kg	No of tabs
4–7kg	1/4	6–11kg	1/4
8–11kg	2	12–17kg	1/2
12–15kg	3/4	18–23kg	3/4
16–23kg	1	24–35kg	1
24–31kg	1 1/2	36–47kg	1 1/2
32–39kg	2	48kg and above	2

For children below the lowest weight category, the dosage of quinine is 10mg/kg and the tablets should thus be reconstituted into syrup based on the weight of the patient.

Figure 20.1: Management of complicated malaria



20.5 Management of Complicated Malaria

- Carry out emergency care (see Chapter 17, paediatric emergencies).
- Secure airway, breathing, circulation.
- After stabilization, give pre-treatment drugs and transfer urgently.
- Correct hypoglycaemia if present. Treat convulsions if present. Measures for unconscious patients.
- Administer IM quinine (Figure 20.1 and Tables 20.3–20.4) 15mg/kg – loading dose.

Malaria Treatment in Malaria Endemic Areas

If a high quality blood slide is negative, then only children in coma or those with severe anaemia should be treated presumptively for malaria.

Table 20.3: Dosage of intra-muscular injection of quinine dihydrochloride after dilution to 50mg/ml (for younger children up to 30kg)

Weight range(kg)	Volume of quinine injection (ml)	No. of injection sites
< 5 1.0	1	
5– < 8	1.5	1
8– < 11	2.0	1
11– < 13	2.5	1
13–< 16	3.0	1
16–< 19	3.5	2*
19– < 21	4.0	2*
21– < 23	4.5	2*
23– < 26	5.0	2*
26– < 29	5.5	2
29– 30	6.0	2

* Inject half to each thigh

Table 20.4: Dosage of intra-muscular injection of quinine dihydrochloride after dilution to 100mg/ml (older children above 30kg)

Weight range (kg)	Volume of quinine injection (ml)	No. of injection sites
31– < 36	3.2	2
36– < 41	4.0	2
41– < 46	4.5	2
46– < 51	5.0	2
51– < 56	5.5	2
56– < 60	6.0	2
60 +	6.0	2

Dilution to 100mg/ml:

1. Use 10ml sterile syringe.
2. Draw up 4ml of sterile water for injection. Then into the syringe, draw up 600mg (2ml) from an ampoule of quinine and shake.
3. The syringe now contains 100mg quinine per ml.
4. NOTE: Each injection should not be more than 3ml per injection site.
5. The maximum dose is 600mg.

☛ **Oral quinine via NG tube can be used when parenteral quinine is not available.**

20.6 Prevention of Malaria

Chemoprophylaxis

Anti-malaria prophylaxis should be given to the following groups:

- All non-immune visitors to malarious areas use mefloquin or proguanil
- Long-term residence >4 weeks
- Short-term residence <4 weeks

Use proguanil for

- Patients with sickle cell disease and thalassaemia
- Patients with tropical splenomegaly syndrome or splenectomy

Chemoprophylaxis regimes

- Proguanil (daily dosing), as shown in Table 20.5.
- Non immune visitors: Start daily one week before arrival and continue for 4 weeks after leaving malarious area.
- Others use indefinitely.

Table 20.5: Dosage schedule for proguanil (daily PO)

Age	Dose
< 1yr	25mg (¼ tablet)
1–4 yrs	50mg (½ tablet)
5–8 yrs	75mg (¾ tablet)
9–12 yrs	100mg (1 tablet)
Adult	200mg daily (2 tablets)

Reduce Chances of Being Bitten by Mosquitoes

- Insecticide treated nets (ITNs): In high malaria areas it is recommended that all sleep under ITNs but especially children under age 5 years.
- Use wire mesh to reduce entry of mosquitoes into the house.
- Use insect repellents, especially for visitors.
- Cover exposed skin in the evenings.
- Participate in indoor residual spraying programmes in epidemic prone areas.

Vector control

- Encourage all households to clear bushes around the house, drain any stagnant water, and avoid throwing away containers that may collect water.

Patient Education

- Seek early treatment for fever and remember that not all fevers are due to malaria.
- Always seek medical care if the fever does not respond to antimalarials.
- If they take antimalarials, complete the dose as prescribed to prevent development of resistance.

21. Measles

Also called rubeola, measles is one of the commonest childhood infectious exanthems. Measles is never subclinical, but the severity of the disease is related to the infective dose of the virus and the nutritional status of the child. Crowding tends to increase spread of the disease.

Clinical Features
Incubation 7–10 days. Fever. Catarrhal phase 2–3 days with cough, red eyes and runny nose followed by maculopapular rash. Assess for danger signs, clouding of the cornea, or extensive mouth ulcers.

Management
Uncomplicated Measles
- Give vitamin A to all children
- Review after 2 days and look for complications (eye, ear, mouth ulcers, pneumonia)

Complicated Measles
- Treat complications:
  - Conjunctivitis: With tetracycline eye ointment; review after 2 days. If improving ask mother to complete treatment. If not improved, refer.
  - Acute otitis media: With cotrimoxazole or amoxicillin. Review after 5 days.
  - Mouth ulcers: With nystatin gell or drops if child has thrush.
  - Pneumonia: See Section 24.7, on pneumonia.
  - Malnutrition: Commonly follows an infection of measles. It is precipitated by anorexia, stomatitis, fever, vomiting, diarrhoea, and other complications. Also important are frequent harmful cultural practices that impose fasting upon a child with measles.
- Counsel caregivers on the importance of nutrition. Increasing the frequency of feeding (an extra meal per day over the usual feeding) after measles illness is very important to help the child regain lost weight adequately
- Refer all children with danger signs or those who fail to respond to outpatient treatment.
- If the child has no indication for referral take blood and send for confirmation.

Prevention
Immunization
Measles is preventable. Immunizations are given to infants who are 9 months or above, irrespective of whether they have suffered from measles/measles like illness. Measles immunization should be given to infants 6 months and above in the following circumstances:
- Siblings of a child with measles illness
- Children living in crowded places, refugee camps, children's homes
- Children admitted to hospital for any condition (age 6–9 months)
- Children in a locality with measles epidemic

Education
Advice to mothers/caregivers should include:
- Ensure all her children are fully immunized.
- Child should attend under 5 years children clinic on discharge.

☛ ***All children 9 months of age or older who are not immunized against measles and are brought to a health facility for any reason should be immunized and given Vitamin A supplements before leaving that facility.***

22. Meningitis

An acute inflammation of the pia and arachnoid coverings of the brain with spread into the cerebro-spinal fluid (CSF). It is important to diagnose and start treatment early in order to prevent complications. The predominant causative bacterial organisms (pyogenic meningitis) vary with the age of the child. Haemophilus influenzae commonly affects children under 5 years, while Streptococcus pneumoniae (pneumococcus) tends to be more common after age of 5 years. Hib immunization, however, is reducing the incidence of meningitis due to H. influenzae. Viruses (aseptic meningitis), Tubercle bacilli (tuberculous meningitis) or fungi (fungal meningitis) also cause meningitis. Neisseria meningitidis (meningococcus) tends to cause meningitis in epidemics and affects all ages.

Predisposing factors for meningitis in children are: low immunity, prematurity, septicaemia, infections in the nose, sinuses, ears, throat and lungs penetrating injuries of the skull and spinal column and congenital malformations of the brain and spine.

Clinical Features
In a child >2 months, these include Fever, refusal to feed, vomiting, repeated convulsions, irritability, altered level of consciousness, headaches, photophobia, neck stiffness, and positive Kerning's sign.

Young children may also have bulging anterior fontanelle and high pitched cry. Signs of increased intracranial pressure include sutural daistasis, increased head circumference, unequal pupils, focal neurological signs and irregular breathing. Patients presenting late in the progression of the disease may have decelabrate rigidity or opisthotonos. The onset of tuberculous meningitis is more gradual and non specific. Child may complain of headache, vomiting, and poor feeding for several days before features of meningitis appear. Gradually the child becomes stiff and loses consciousness

Complications
These include subdural effusion, hydrocephalus, blindness, deafness, secondary epileptic seizures, mental retardation, and cerebral palsy. The child may also have retarded physical development.

Management
- Investigation and treatment should be done in higher level facility where admission and appropriate management are possible. Initiate treatment immediately (See Figure 22.1).
- Refer all patients to higher level if meningitis is suspected.

23. Altered Consciousness or Convulsions

A detailed history from parent or caregiver to establish the cause and duration is crucial. The convulsion should be described in detail.

Aetiology
Infections (malaria, meningitis, encephalitis), trauma, tumours, cerebro-vascular accidents, complications of diabetes mellitus, epilepsy, liver failure, drug ingestion, poisoning and shock

Clinical Features
- The child should be put on the side to avoid aspiration.
- Clinically diagnostic abnormalities should be noted as the following emergency paediatric care is instituted:
  - Assess airway, breathing, and circulation.
  - Assess level of consciousness.

Complications
These include subdural effusion, hydrocephalus, blindness, deafness, secondary epileptic fits, mental retardation and cerebral palsy. The child may also have retarded physical development.

Management
- Investigation and treatment (Figure 23.1) should be done in higher level facility where admission and appropriate management are possible.
- Children older than 5 years can be assessed using the Glasgow coma scale.

☛ **Refer all patients if meningitis is suspected. Initiate treatment immediately.**

Treatment of Convulsions
- If the child is convulsing:
  - Resuscitate as needed and give anticonvulsants (see flow chart)
  - When the child is stable: Refer. Continue observing airway and breathing, as well as position during transfer.
- For convulsions in the first 1 month of life:
  - Treat with phenobarbitone 20mg/kg STAT. A further 5–10mg/kg can be given within 24 hours of the loading dose (maximum 30mg/kg in 24 hrs). Maintenance doses of 5mg/kg daily.

Figure 22.1: Flowchart for assessment and management of meningitis

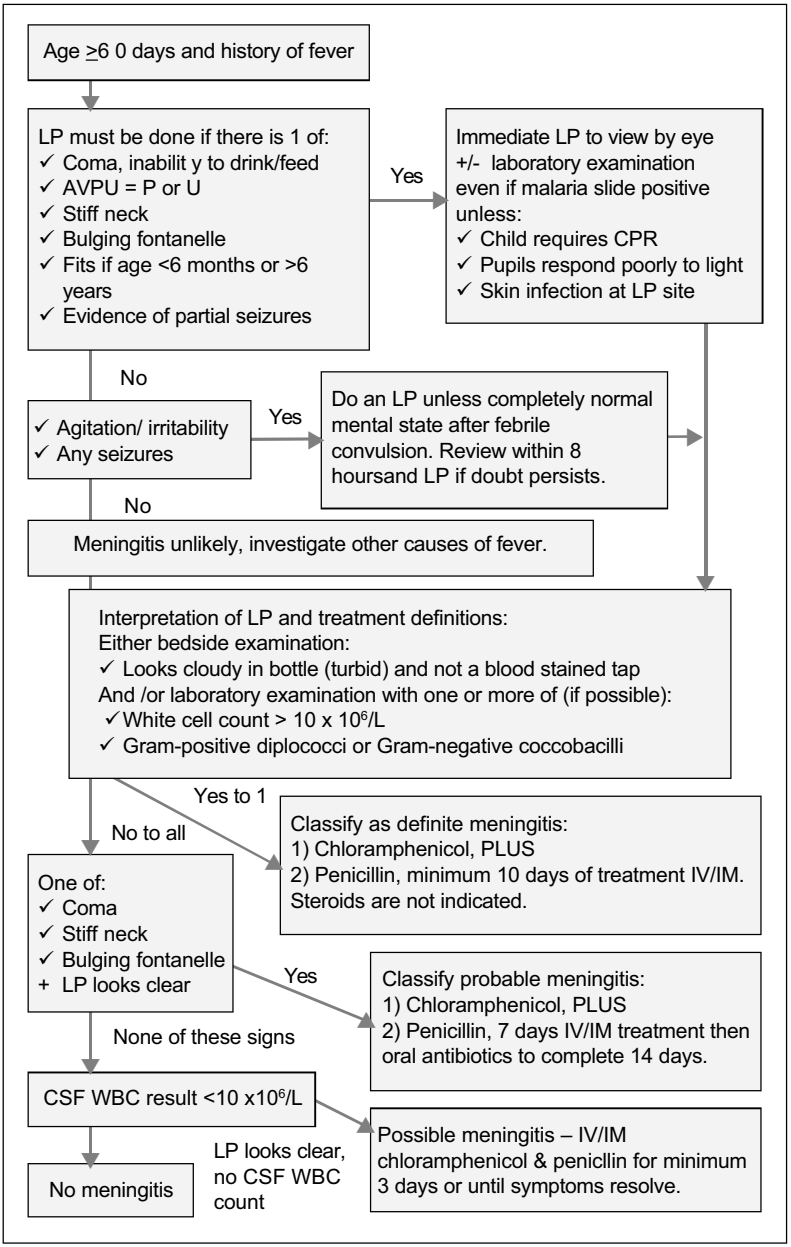
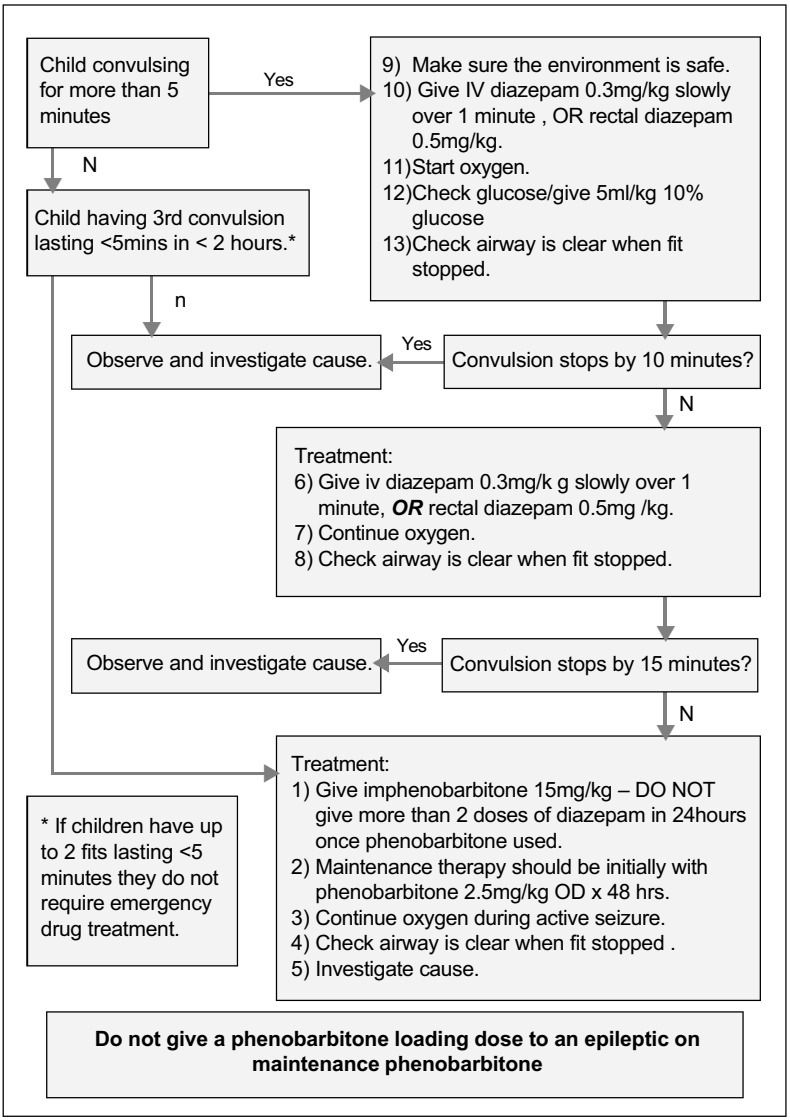


Figure 23.1: Flowchart for management of convulsing child



24. Respiratory Diseases

Acute respiratory infections are common and have varying severity. Severe forms are responsible for high mortality in children under 5 years. Early diagnosis and proper treatment of pneumonia is essential to reduce mortality.

24.1 Acute Upper Respiratory Tract Infections

These include the common cold (acute rhinitis, coryza), and present as an acute, usually afebrile, viral infection of the respiratory tract with inflammation of all the airways including the nose, paranasal sinuses, throat, larynx, and often the trachea and bronchi.

Causes
Among these are rhinoviruses, influenza viruses, parainfluenza viruses, respiratory syncytial viruses, corona viruses, adenovirus, and Coxsackie viruses.

Clinical Features
Nasal obstruction, watery rhinorrhoea, sneezing, sore throat, cough, watery red eyes, headache and general malaise.
Most children with these features do not present to health facility. Young infants may have difficulty in breastfeeding due to blocked nostrils.

Management
Most colds resolve spontaneously in 7–10 days. The following are recommended:
- Avoid aspirin, which may increase the risk of Reye's syndrome in children
- Avoid cough and cold remedies in the form of antihistamines, cough suppressants, expectorants, and mucolytics.
- Advise that treatment includes:
  - Analgesics, e.g., paracetamol if febrile.
  - Adequate fluid intake.

Patient Education
- The child's nose should be cleared regularly and the child should be returned to the health facility if their condition gets worse.
- The child should be kept warm, breastfed frequently, and the nose cleared if it interferes with breastfeeding.
- The child should be brought back to the health facility if breathing is difficult or feeding becomes a problem.

☛ **Note: Antibiotics are of no value in viral infections.**

24.2 Pharyngitis and Tonsillitis

Acute inflammation of the pharynx and tonsils caused by streptococcus, viruses and occasionally diphtheria.

Clinical Features
Sore throat, painful swallowing, general malaise, fever, body aches, rhinitis. In children, vomiting and abdominal pain may be present. Tender cervical or submandibular lymph nodes usually indicate streptococcal infection.

☛ Look for membrane in case of diphtheria.

Complications
Streptococcal infection include otitis media, rheumatic fever with or without carditis.

Management
- If conjunctivitis is present, consider viral infection and treat symptomatically at home.
- If there are yellowish spots or membrane on tonsils or tender lymph nodes, treat as streptococcal infection at home with amoxicillin. (If patient is allergic to penicillin use erythromycin.)
- Refer if child develops:
  - Severe difficulty in breathing.
  - Has suspected diphtheria.

24.3 Deep Neck Infection

These are infections (cellulitis or abscesses) in the potential spaces around the neck, e.g., peritonsillar space, retropharyngeal space, submandibular space and parapharyngeal space.

Management
Start on systemic antibiotics, e.g., amoxicillin + clavulanic acid, then refer because of the risk of airway obstruction.

☛ **Treatment with antibiotics for LESS THAN 7 days may NOT prevent Rheumatic fever.**

24.4 Diseases of the Adenoids

Adenoid hypertrophy commonly occurs in children. It may be due to simple enlargement, to inflammation, or to both. It is the size of the mass relative to the nasopharyngeal space rather than the absolute size that is important.

Clinical Features
Nasal obstruction leading to mouth-breathing, difficulty in breathing and eating, drooling of saliva, snoring and toneless voice. Other features are persistent nasal discharge, cough, cervical adenitis. Mental dullness and the apathy may be marked. Eustachian tube obstruction leads to deafness.

Management
Refer all suspected cases to higher level for appropriate management.

24.5 Sinusitis

This is usually a complaint following a URTI or is seasonal. It can be acute or chronic. It can be infective or allergic in origin.

Clinical features
Child will have pain over affected sinus.

Management
- If the nasal discharge is purulent, with nasal obstruction, an early nocturnal cough, and inflamed nasal mucosa, treat with antibiotics for a week.
- If the nasal discharge is watery, with nasal obstruction, sneezing, and pale/bluish nasal mucosa, treat with antihistamines.
- For children who have bilateral purulent nasal discharge of more than 10 days duration, treat with amoxicillin for 7 days. If the purulent nasal discharge is unilateral, exclude foreign body especially in young children.
- Refer if child does not respond to treatment

24.6 Conditions Presenting with Stridor

Stridor is a harsh sound heard during inspiration when there is narrowing of the upper airways. including oropharynx, subglottis, larynx, and trachea.

Conditions presenting with stridor include:
- Viral croup including that due to measles
- Retropharyngeal abscess
- Foreign body inhalation
- Diphtheria
- Pressure on the airways by masses in the neck or mediastinum
- Congenital laryngeal anomaly

Clinical Features
- ***Viral group:*** Barking cough, hoarse voice, respiratory distress if obstruction is severe (tachypnoea, supraclavicular, suprasternal, subcostal, and intercostal inspiratory retractions, cyanosis). Fever in 50% of children. Signs of measles if it is the cause.
- ***Retropharyngeal abscess:*** Swelling in the neck, difficulty in swallowing, drooling, fever.
- ***Foreign body:*** History of choking, sudden of onset respiratory distress.
- ***Diphtheria:*** Severe neck swelling, membrane on throat and tonsils.
- ***Congenital anomaly:*** Stridor from birth.
- ***Pressure on airways:*** Obvious masses in neck or mediastinum on x-ray.

Management
- Mild croup can be treated at home: encourage adequate intake of fluids and feeding according to age.

- Ask the mother to bring child back immediately if she notices difficulty in breathing or feeding.
- Refer all children with respiratory distress.
- Foreign body: ***This may be life threatening*** if main airway is blocked. Action should be immediate if the child is to survive (see Section 17.6, choking).

24.7 Lower Respiratory Tract Infections: Pneumonia

24.7.1 PNEUMONIA IN CHILDREN AGED BELOW 5 YEARS

Clinical Features in Infant Aged Less than 2 Months

Pneumonia, sepsis, and meningitis in infants less than 2 months of age can rapidly lead to the death of the infant. Specific symptoms may be lacking. These conditions should be suspected if any of the following are present:

- Stopped feeding well (if feeding well before)
- Convulsions
- Abnormally sleepy or difficult to wake
- Stridor in calm child
- Wheezing
- Fever (38°C or more) or low body temperature (below 35.5°C)
- Severe chest indrawing
- Fast breathing (60 per minute or more)
- Central cyanosis (of the tongue)
- Grunting
- Apnoeic episodes
- Distended and tense abdomen

Clinical Features in Child Aged 2 months – 5 years

- The following are important to find out about in history:
  - Duration of cough or difficulty in breathing
  - Choking or sudden onset in a previously well child
  - Exposure to someone with TB
  - Known HIV infection
  - Family history of asthma
  - Presence and duration of fever
- The following features are danger signs and their presence makes the illness very severe:
  - Not able to drink or breastfeed
  - The child had convulsions or is convulsing now
  - Abnormal sleepiness (lethargy) or difficult to wake (unconscious)
- Examination should be carried out in a calm child to determine the following:
  - Respiratory rate (breaths per minute)
  - Lower chest indrawing
  - Stridor
  - Wheeze

NOTE: Presence or absence of either fever or crepitations (rales) on auscultation are NOT reliable clinical features for diagnosing pneumonia in young children.

The features listed above are more sensitive in identifying these diseases and facilitating their effective intervention.

Severe malnutrition
Evaluate carefully to make a diagnosis of the cause of cough or difficult breathing, which might be caused by a number of conditions that include the following: Pneumonia and its complications (pleural effusion, empyema, pneumothorax), malaria, cardiac disease with cardiac failure, severe anaemia, foreign body aspiration, and tuberculosis infection.

Management for Acute Respiratory Infection and Pneumonia
See Figure 24.1, ARI/Pneumonia protocol for children aged 2 months to 4 years, and Table 24.1, which provides a guide to fast breathing cutoff points.

Classification of Pneumonia (Age 2 Months – 5 Years)
- ***Very severe pneumonia:*** Presence of any one danger sign or central cyanosis or severe respiratory distress. Auscultatory signs of pneumonia or presence of complications
- ***Severe pneumonia:*** Presence of one of the following – lower chest retraction, flaring alae nasi, grunting. Auscultatory signs of pneumonia but no signs of very severe pneumonia.
- ***Non severe pneumonia:*** Child with fast breathing, signs of pneumonia on auscultation but no signs of severe or very severe pneumonia

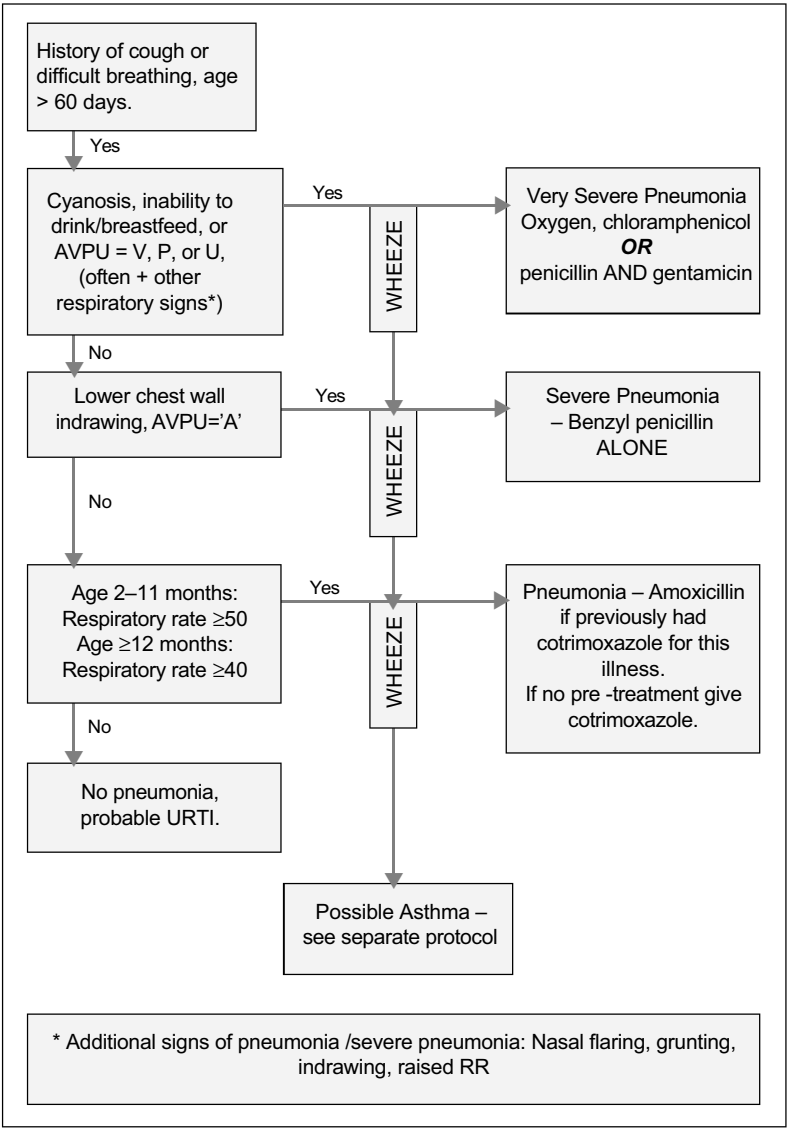
☛ **Management of pneumonia depends on age and severity.**

Non Severe Pneumonia in Children over 2 Months of Age
- Treat as outpatient – Use amoxicillin 25–50mg/kg/day
- Give first dose of antibiotic in clinic
- Instruct mother on how to give the antibiotic for the five days at home (or to return to clinic for daily procaine penicillin injection).
- Ask mother to bring the child for review after 2 days or earlier if child gets worse (see danger signs).
- If child can be treated as outpatient advise mothers:
  - Feed the child during illness
  - Increase feeding after illness
  - Clear the nose if it interferes with feeding
  - Increase fluids: Offer the child extra drink, increase breastfeeding

NO Pneumonia: Cough or Cold
A child classified as having NO Pneumonia: Cough or Cold, should be monitored at home on home treatment. However, the caregiver should be told to bring the child quickly back to the health facility if the child develops any of the following:
- Breathing becomes difficult
- Breathing becomes fast
- Child is not able to drink
- Child becomes more sick.

☛ **Refer all infants and children with severe disease and any child not responding to treatment**

Figure 24.1: ARI/Pneumonia protocol for children aged 2 months to 4 years



Counselling Parents
All parents should be informed about child's illness and what to do to prevent recurrence. They should be encouraged to seek medical attention early in the disease to prevent severe features which are associated with poor outcomes and are more difficult and costly to treat.

Table 24.1: Fast breathing cut off points

Age	Fast breathing
Under 2 months (young infant)	60 breaths per minute or more
2 months up to 12 months	50 breaths per minute or more
>12 months up to 5 years	40 breaths per minute or more

24.7.2 PNEUMONIA IN CHILDREN OLDER THAN 5 YEARS

Children older than 5 years are less likely to suffer from pneumonia than the younger children, unless they have another underlying condition. In a previously well child, the causative organism in this age group is usually pneumococci leading to consolidation of the lung parenchyma (lobar pneumonia). Organisms vary if child is immunocompromised, has chronic lung disease, developed pneumonia operatively or after aspiration, or is debilitated.

Clinical Features
- ***Lobar pneumonia:*** Breathlessness, cough with or without sputum which may be rust coloured, fever, pleuritic chest pain. Bronchial breathing, reduced chest movements, reduced breath sounds, tachypnoea, crackles, and percussion dullness.
- ***Non lobar pneumonia:*** The clinical features are similar to those of lobar pneumonia except that there is no bronchial breathing. Complications are similar to those for younger children.

Management – Non Severe Pneumonia
- Treat as outpatient:
  - IM benzyl penicillin STAT, then amoxicillin for 7 days.
  - If penicillin allergy present: Erythromycin for 7 days.
  - Analgesics: paracetamol ***OR*** aspirin.
  - Child should be reviewed after 5 days.
- Instruct parents to bring the child back to the health facility earlier if condition worsens or there is no response after 2 days.
- Refer to higher level for appropriate management if:
  - Cyanosis is present
  - Respiratory distress (RR >25 per minute) is present
  - Heart failure or pleural effusion is present
  - More than one lobe is involved
  - There is poor response as outpatient
  - Patient is dehydrated
  - Child has additional problems

24.8 Conditions Presenting with Wheeze

A wheeze is a high pitched sound during expiration due to narrowing of the small airways. Infection or an allergic reaction can cause narrowing of the airways.

Clinical Features
The following clinical features are commonly noted: wheezing sound from the chest, prolonged expiratory phase of respiration, increased effort at expiration, diminished air entry on auscultation, lower chest indrawing, recurrent cough especially at night, hyper-inflated chest, and cyanosis in severe cases. When wheezy coughs occur repeatedly, the child is considered to have asthma. Wheezing may or may not be complicated by pneumonia of bacterial or viral aetiology.

Conditions That Present with Wheeze
- Bronchiolitis: Child less than 2 years of age. Seasonal outbreaks. Caused by Respiratory syncytial virus in most cases. It is not relieved by rapid acting bronchodilators. Secondary bacterial infections are common.
- Wheeze associated with coughs and colds. Responds to bronchodilators.
- Foreign body: May have history of choking, but may have occurred unnoticed. No response to bronchodilators.
- Fever and crepitations in the chest.
- Asthma: Recurrent wheeze with or without upper or lower respiratory infections. Good response to bronchodilators.

Management of Children with First Episode of Wheeze
- Give a rapid-acting bronchodilator – salbutamol via metered dose inhaler two puffs (200mcg) with or without a spacer according to age. Spacer can be made using a 1-litre plastic container (see Figure 24.2). If inhaler is not available use nebulizer, 2.5ml salbutamol in 2–5ml of normal saline. If neither is available give adrenaline 0.05ml/kg of 1:1,000 solution subcutaneously.
- Assess response after 15 minutes. Signs of response are:
  - Less respiratory distress
  - Less lower chest retraction
  - Improved breath sounds
- Manage according to the cause and severity
  - Bronchiolitis: Classify and treat as for pneumonia under age 5 years.

Figure 24.2: Inhaler with a spacer. If unaffordable, use a plastic 750ml or 1 litre soft drink bottle

- Wheeze associated with cough or cold: Treat at home.
- Foreign body: FB with partial airway obstruction will need removal via bronchoscopy.

Management of a Child with Asthma (Children with Recurrent Wheezing)

- First episode and no respiratory distress: Treat at home with inhaler or oral salbutamol.
- Respiratory distress or recurrent wheeze: Response to a rapidly-acting bronchodilator is an important part of the assessment of a child with recurrent wheezing to determine whether the child can be managed at home or should be admitted for more intensive treatment. Rapid acting bronchodilator should be given as above and the child's condition assessed 30 minutes later. If respiratory distress has resolved – the child should be treated with inhaler at home. The mother should be taught how to use the inhaler. If inhaler is not possible, then oral salbutamol should be used (see Table 24.2).
- Refer for admission if still distressed with or without cyanosis.

Table 24.2: Treatment of child with wheeze

Rapid acting bronchodilator		Oral salbutamol 3 times daily for 5 days		
		Age or weight	2mg tablet	4mg tablet
Subcutaneous epinephrine (adrenaline) (1:1,000 = 0.1%)	0.01ml/kg bodyweight	2–12 mon (10kg)	2	¼*
Salbutamol inhaler in a spacer 750–1,000ml	2 puffs per dose. 1 dose in 10 min.	12 mon to 5 yrs (10–19kg)	1	
Nebulized salbutamol 5mg/ml				
Under 1 yr	0.5ml salbutamol in 2.0ml sterile water			
>1 yr	1.0ml salbutamol in 2.0ml sterile water			

Note:
(a) In all cases use of inhaler is better and cheaper than nebulizer or oral salbutamol.
(b) Steroids should be used early. Oral steroids are as effective as parenteral ones.
(c) When this is done aminophylline is rarely needed.
(d) Fluids should be limited to two thirds of the daily requirement.
(e) Antibiotics should be given only if there are clear signs of infection.
(f) Adrenaline is only used if use of inhaler is not possible.

24.9 Status Asthmaticus

This is a clinical diagnosis defined as increasingly severe asthma that is not responsive to usual drugs. Child is too breathless to feed or talk and there is severe chest retraction and tachypnoea. There may also be features of respiratory failure:

- Altered consciousness
- Poor respiratory effort
- Silent chest
- Cyanosis

☛ **Refer urgently for admission. Child may need ICU care.**

During transfer:
- Monitor vital signs every 15–30 minutes.
- Administer oxygen by intranasal catheter flow rate of 1–2 litres per minute.
- Ventilate if necessary using bag and mask.

24.10 Long-Term and Home Care of Asthma

This depends on severity:
- Mild intermittent: Daytime symptoms <2 per week and night <2 per month
  - Care: Short/rapid-acting bronchodilators as needed.
- Mild persistent: Daytime symptoms >2 per week and <1 per day; night >2 per month
  - Care: Long-time medication – Low dose inhaled corticosteroids daily.
  - Attacks: Short/rapid-acting bronchodilators.
- Moderate persistent: Daily symptoms and night >1 per week
  - Care: Long term medication – Low to medium dose inhaled corticosteroids daily with or without long-acting bronchodilator.
  - Attacks: Short/rapid-acting bronchodilators.
- Severe persistent: symptoms continuous during day and frequent at night
  - Care: Long-term medication – Daily high dose inhaled corticosteroids and long-acting bronchodilators with systemic steroids if needed.
  - Attacks: Short-acting bronchodilators.

Important to note:
- Clear and preferably written instructions on how and when to use the inhaler at home.
- Report immediately to a health facility when home treatment is ineffective.
- Avoid or reduce triggers/allergens in the home
- Advise that a child in school with exercise induced attacks should use the inhaler before exercise.

24.11 Children Presenting with Chronic Cough

Definition: Cough lasting 14 days or more.

Clinical Features
General signs include fevers, poor weight gain or weight loss, Other features depend on the specific cause. The following conditions are associated with chronic cough:
- Tuberculosis
- Asthma
- Foreign body aspiration, usually children under 5 years. Parents may not remember history of choking. Unilateral wheeze, or pneumonia with poor response to antibiotics suggests diagnosis.
- HIV infection: In addition, these children have chronic chest signs with clubbing of fingers and toes but usually no cyanosis.

- Bronchiectasis: Purulent sputum, bad breath, finger clubbing
- Lung abscess: Reduced breath sounds over affected part
- Heart disease: Due to either congestive failure or recurrent pneumonias

Management
More details for respective clinical features are found in the respective sections for the diseases listed above. Management is specific to the underlying disease.

☛ **Refer all children to a higher facility for appropriate management.**

25. Poisoning

Accidental poisoning is common in children under 3 years of age. Usually a previously well child suddenly falls sick. For the older child, especially the adolescent, it may be a suicide attempt.

Common poisons include: Paracetamol, aspirin, pesticides (organophosphates), kerosene (paraffin). Other poisons include drugs being taken by any member of the family.

25.1 Principles of Management

General Principles
Parent/caregiver is encouraged to try to identify the type of poison the child has taken, and if possible to carry the container to the health facility. Do not give the child anything to drink and do not make the child vomit. In the case of insecticides like diazinon, remove the child's clothing and give the child a bath. In all cases, parents should be encouraged to take the child to a health facility as soon as possible.

Note that most childhood poisoning is preventable by putting drugs and dangerous chemicals out of sight and reach of children.

Take full history and try to identify the poisoning agent. Severe poisoning requires hospital admission for appropriate management.

Decontamination
- Stomach: Do not induce vomiting. A gastric lavage is possible if poison was ingested within an hour of presentation to the health facility. Activated charcoal if available can be given. Gastric decontamination is contraindicated in unconscious patients or those who have ingested corrosives or kerosene.
- Skin: Remove clothing and wash thoroughly
- Eyes: Irrigate with water or saline.
- Give specific antidote if indicated.

25.2 Paracetamol Poisoning

Clinical Features
Four stages of paracetamol poisoning are recognized if a child has ingested 140mg/kg or more:
Stage 1: First 24 hrs – Anorexia nausea and vomiting
Stage 2: 24–48 hrs – Signs of hepatic dysfunction – jaundice, bleeding
Stage 3: 72–96 hrs – Peak liver dysfunction with possible hepatic encephalopathy
Stage 4: 4 days–2 weeks – Resolution of liver dysfunction

Management
Gastric emptying and administration of activated charcoal are most effective if done within 1–2 hrs of ingestion.

☛ **Refer urgently if the child is symptomatic.**

25.3 Kerosene (Paraffin) Poisoning

Clinical Features
Features depend on amount ingested and if there is aspiration. Aspiration results in severe respiratory distress due to pulmonary oedema. Absorbed kerosene leads to encephalopathy with varying degrees of altered consciousness.

Management
Refer child for admission.

25.4 Organophosphate (e.g., Diazinon) Poisoning

Clinical Features
Headaches, weakness, vomiting, colicky abdominal pain, profuse cold sweating, hypersalivation, muscular twitching, fasciculations, diarrhoea, tenesmus, convulsions, dyspnoea with bronchoconstriction, constricted pupils (meiosis), bilateral crepitations.

Management
- Decontaminate skin (see above).
- Gastric lavage.

Refer to higher level urgently for appropriate management.

25.5 Prevention of Home Accidents and Poisoning

Every parent is encouraged to keep dangerous items including kerosene and drugs out of sight and reach of young children. Protect children from fires. Avoid leaving small children locked up in houses. Do not store pesticides and other potentially harmful liquids in soft drink bottles.

26. Neonate and Young Infant (0–2 Months)

26.1 Routine Care at Delivery

Dry the baby with a clean cloth. While drying observe breathing, muscle tone, and colour. If all appears normal, remove the wet cloth and wrap baby in a dry one. Give to the mother to initiate breastfeeding. Breastfeeding should start within the first hour of life to ensure good positioning and attachment. Cover baby well to prevent over-cooling. ***If not breathing, initiate resuscitation as shown in Figure 26.1.***

For babies not requiring resuscitation do the following:
- Initiate breastfeeding within an hour of birth.
- Weigh the baby.
- Keep warm next to mother (skin to skin is the best way of keeping baby warm)
- Instil tetracycline eye ointment within 1 hr in both eyes and given only once.
- Examine carefully to exclude congenital malformation.

26.2 Postpartum Care of the Normal Newborn

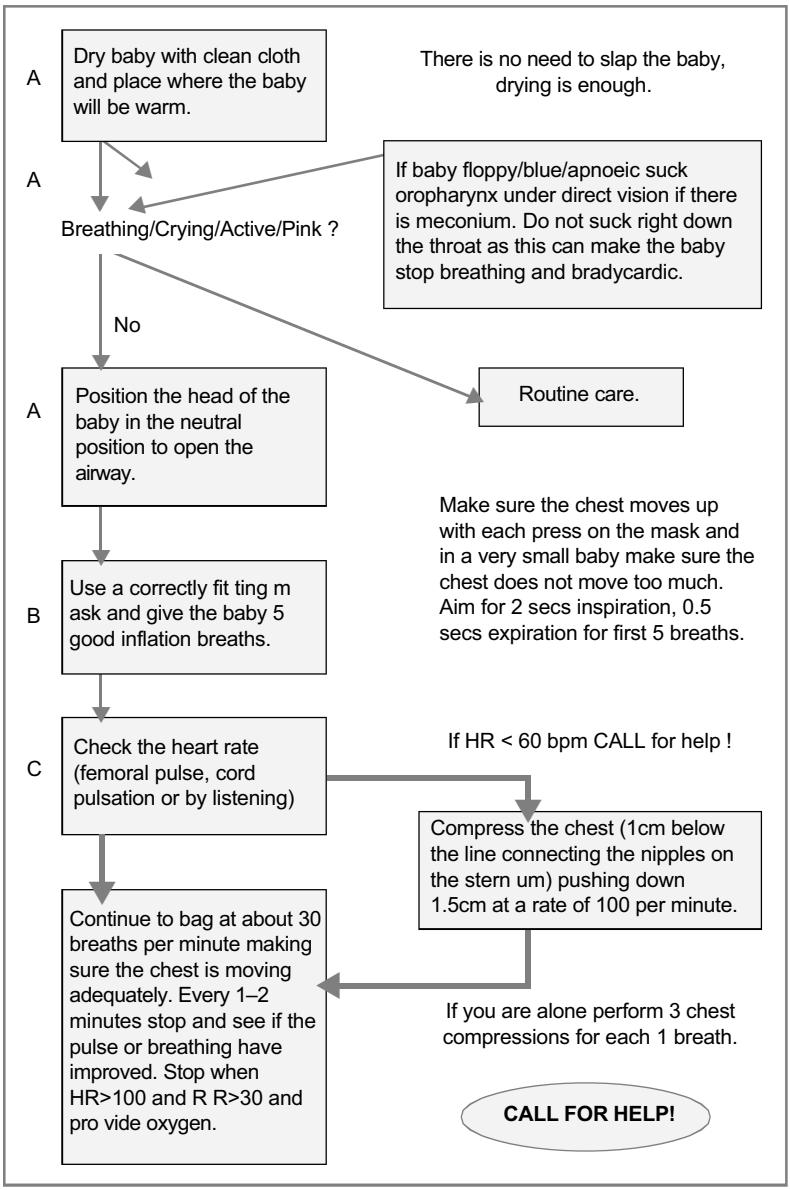
The infant should join the mother as soon as possible. The following are important:
- Encourage exclusive breastfeeding (no water).
- Feed babies on demand, at least 8–12 times/24 hrs.
- Encourage HIV-positive mothers who have chosen not to breastfeed to cuddle their babies.
- Observe cord for bleeding and keep it clean.
- Give OPV '0' and BCG.
- On discharge: Counsel the mother on cord care and breastfeeding at home and tell her to bring baby back immediately if she notices a problem, e.g., poor feeding or jaundice.
- Teach the mother about cord care. She needs to know that babies often acquire infection through the cord. If she delivers in the community, cutting of the cord with clean instrument is needed. After delivery harmful practices need to be discouraged. Mothers should keep the cord dry until it drops off.

26.3 Neonatal Asphyxia and Resuscitation

A newborn who fails to establish regular breathing and appears blue and or pale is likely to have asphyxia. Anticipate asphyxia in all high risk pregnancies or if there is irregular foetal heart, foetal bradycardia or tachycardia, and meconium stained liquor during labour. Occasionally asphyxia occurs unexpectedly.

☛ **All persons conducting deliveries should be able to resuscitate a baby at birth. Always be prepared to resuscitate.**

Figure 26.1: ABC's of neonatal resuscitation – Call for help!



Clinical Features
APGAR scoring (Table 26.1) can be used for assessing the degree of asphyxia.

Table 26.1: APGAR scoring

Clinical Features	Score		
	0	1	2
Heart rate (per minute)	Absent	Less than 100	Over 100
Respiration effort	Absent	Irregular, slow	Regular
Muscle tone	Limp (floppy)	Some flexion of arms, legs	Well flexed, active motion
Reflex irritability (nasal catheter)	No response	Some motion, grimace	Cries
Colour	Blue, pale	Pink body, blue extremities	Completely pink

Management
Management is dependent on the APGAR of the baby. The management recommended at the various APGAR scores is indicated below:
- Apgar score 7–10: None. Do not suction baby.
- Apgar score 5–6: Give oxygen.
- Apgar score 0–4: Initiate resuscitation with bag and mask.
- If the mother had received pethidine: Give naloxone 0.01mg/kg/IV STAT

Harmful practices in handling a baby who is not breathing include slapping the baby, holding baby upside down, and pouring cold water. These should not be practised. The act of drying the baby is enough stimulation. After resuscitation refer the baby to a facility that can deal with complications. Keep the baby warm throughout the journey by using "kangaroo mother care" (Section 26.11.1).

Complications
The following complications are known to occur:
- Convulsions
- Apnoea or irregular breathing
- Respiratory distress
- Poor feeding
- Floppiness
- Cerebral palsy if still neurologically abnormal at 1 week of age.

26.4 Birth Injuries

Difficult deliveries may lead to birth injuries

Clinical Features
Common injuries requiring no treatment include:
- Caput succedaneum – Oedema over presenting part.
- Massive oedema of scalp.
- Conjunctival haemorrhage.

- Subgaleal/aponeurotic haemorrhage – Fluctuant swelling on the head not limited by suture lines. Can be extensive to cause anaemia and jaundice.
- Cephalohaematoma – Firm but fluctuant swelling limited by suture lines. Takes very long to resolve.

Injuries that require attention include those to the nerves and bones, among others:

- Nerve injuries
  - Erb's palsy – injury to the upper roots of the brachial plexus: affected limb held extended at the elbow and forearm pronated.
- Fractures
  - Clavicle – mother notes the baby cries on being lifted and after a few days swelling along the affected clavicle.
  - Femur or humerus – affected limb swollen and very painful on movement. There is pseudo paralysis.
- Less common but serious injuries include the following:
  - Intracranial – Can be subdural or intracerebral: baby is lethargic with signs of raised intracranial pressure; may have convulsions.
  - Intrathoracic – Presents with respiratory distress.
  - Intrabdominal – Usually ruptured liver either subcupsular or haemoperitoneum. If severe, baby shows features of hypovolaemic shock without obvious evidence of external bleeding; consider intrabdominal haemorrhage.

Management

- Caput succedenum, and massive oedema of scalp do not need any special treatment.
- Severe scalp bleed requires no specific treatment. Never aspirate as this predisposes to infection. If anaemia is severe, transfusion may be needed.
- Refer all nerve and bone injuries and any suspected internal injury.

26.5 Born before Arrival (BBA)

This is a baby born either at home or on the way to the health facility. Most mothers will not have had a skilled attendant at delivery. Sometimes when the delivery was at night there may be a lapse of several hours before presenting to the health facility.

Management mirrors that for a baby born at the facility. First weigh the baby and assess for danger signs (see below). Then do the following, if the baby is stable:

- Keep baby warm if cold.
- Ensure the cord is properly clamped and not bleeding.
- Do a thorough physical examination.
- Clean the cord with spirit.
- Apply 1% tetracycline ointment in both eyes once.
- Initiate breastfeeding unless the baby is unable to breastfeed.
- Treat any underlying condition.

- **Refer any baby with danger signs to higher level for appropriate management.**

26.6 Organizing Care of Sick Baby 0–2 Months

- Ensure that all small babies do not wait in the queue.
- Arrange for babies to be seen quickly.
- Assess baby for danger signs before general administrative procedures.
- Manage the danger signs.

Place the baby in a warm environment, weigh the baby, establish IV access, and manage accordingly:

Respiration:

- Not breathing (apnoea) or gasping (respiratory rate <20/minute): Start resuscitation immediately.
- Respiratory distress: Rate >60/minute, chest retraction, grunting, central cyanosis – give oxygen by nasal prong or nasal catheter

Shock:

- Shock can be due to severe blood loss at birth, or dehydration through failure to feed, vomiting or diarrhoea. Dehydration is covered in the section on diarrhoea. For the baby who has lost a lot of blood there will be severe pallor in addition to signs of shock.
- Signs of shock: Cold hands and feet; capillary refill >3 seconds (this may be difficult to elicit in a baby with severe blood loss because of severe pallor); altered consciousness.
- For both causes restore circulating blood volume by giving normal saline or Ringer's lactate at 20ml/kg intravenously as rapidly as possible. Reassess and if still in shock repeat the dose. For the baby that has bled, get blood as quickly as possible and transfuse.

Unconscious/convulsing/spasms:

- These could be due to serious bacterial infection, birth asphyxia, neonatal tetanus, or bilirubin toxicity.
- Establish the cause through history and treat accordingly. Control convulsions using phenobarbital preferably IV 10– 20mg/kg; give slowly while watching breathing.

Unable to breastfeed:

- Causes include: Serious bacterial infection, birth asphyxia, or low birth weight (preterm baby). Give dextrose 10ml/kg IV or nasogastric tube to prevent or treat hypoglycaemia immediately. This can be followed by giving breast milk as soon as possible according to the condition of the baby.

Very or extremely low birth weight:

- Refer or admit urgently for specialized care. If referring, the "Kangaroo" mother position (Section 26.11.1) can be used to keep baby warm during the

journey; pass a nasogastric tube and give expressed breast milk to prevent hypoglycaemia.
- All babies with danger signs will need admission to a unit that can treat them. Transfer by the quickest means available, preferably an ambulance so that you can administer oxygen if the baby has breathing problems.

☛ **NEVER TRANSFER A BABY BEFORE STABILIZATION. THE BABY MAY DIE ON THE WAY.**

26.7 Serious Bacterial Infections and Meningitis

Clinical Features
There may be history of maternal fever, prolonged rupture of membranes, and foul smelling amniotic fluid. There may be danger signs and the infant may also have deep jaundice, abdominal distension or extensive septic skin lesions.

☛ **Up to 30% of neonates with late onset sepsis will have meningitis without the obvious features of bulging fontanelle or neck stiffness.**

Management
- Parents are advised to seek medical care as soon as a small baby falls sick.
- Refer for admission URGENTLY.
- Give expressed breast milk before transfer to prevent hypoglycaemia.
- Keep baby warm (kangaroo care, Section 26.11.1).
- Give pre-referral penicillin and gentamicin.

Complications of Meningitis
The following neurological sequelae occur: Hydrocephalus, blindness, mental retardation, hearing loss, motor disability, abnormal speech patterns.

Prevention
The following preventive measures are important:
- Increased and improved prenatal care
- Clean, atraumatic delivery
- Regular cleaning and decontamination of equipment
- Sound hand-washing principles by all personnel handling babies
- Regular surveillance for infection
- Early exclusive breastfeeding

26.8 Other Infections

- Skin: May have a few to extensive skin lesions. If few lesions, they tend to
- occur in flexures and are easily missed. If few lesions, treat as outpatient with either amoxicillin or cloxacillin. Refer if lesions are extensive; treat as for serious bacterial infection.
- Eye infection: Treat with tetracycline eye ointment for 5 days.

- Umbilical sepsis: Presents with pus discharge, foul smell, and redness around the umbilicus. If child has no systemic signs treat as outpatient; clean the umbilicus with antiseptic and show mother how to clean at home. Review baby after 5 days or earlier if systemic signs develop. If there is periumbilical redness, the baby needs to be treated with antibiotics. Give amoxicillin 50mg/kg/day for 5 days. If baby has systemic signs refer for admission.

26.9 Respiratory Distress

Respiratory distress occurs when there is failure to maintain adequate exchange of oxygen and carbon dioxide by the lungs for a variety of reasons. It is characterized by a respiration rate of 60/minute or more (tachypnoea), expiratory grunt, chest or subcostal recession, cyanosis, and flaring of alae nasi.

The causes of respiratory distress include:
- Respiratory distress syndrome (RDS)
- Pneumonia
- Aspiration of meconium or feeds
- Transient tachypnoea of newborn
- Congenital heart disease, and rarely
- Congenital anomalies of the oesophagus, airways, or diaphragm

Clinical Features That May Assist in Diagnosis
- Respiratory distress syndrome is most common in premature babies, but can occur in infants of diabetic mothers and following Caesarean section.
- Pneumonia: May be suspected with a history of prolonged rupture of membranes (more than 12 hours) and maternal fever, offensive liquor, or vaginal discharge. These are features of sepsis in the mother.
- Meconium aspiration: Meconium stained liquor and staining of skin, nails, and cord.
- Transient tachypnoea of newborn: Difficult to differentiate from RDS but usually in term/near term babies. Resolves within 24 hours.
- Cardiac lesion: May or may not have murmurs depending on the defect.

Management
Refer to higher level for appropriate management. Meanwhile, stabilize the baby as outlined under serious bacterial infection.

26.10 Apnoeic Attacks

These are cessation of breathing for 15–20 seconds, often accompanied by bradycardia. Apnoeic attacks are most commonly due to prematurity, but may accompany sepsis, hypoglycaemia, hypoxaemia, hypothermia, and hyperthermia.

Clinical Features
Apnoea, bradycardia and cyanosis. Features of the predisposing condition.

Management
- Re-establish breathing by gentle stimulation. If poor response ventilate using bag and mask.
- Establish IV access if possible and give 5ml/kg 10% dextrose.
- Avoid oral feeding to prevent aspiration.
- Refer to higher level for appropriate management.

26.11 Low Birth Weight and Preterm Infant

Definitions
- Low birth weight: Weight less than 2,500g at birth.
- Very low birth weight: Weight below 1,500g at birth.
- Extremely low birth weight: Weight below 1,000g at birth.
- Preterm: An infant who has not finished 37 weeks of intrauterine life at birth.

Problems Associated with Prematurity
- Poor thermal regulation, hypothermia
- Respiratory problems: RDS, apnoeic attacks, aspiration
- Feeding problems leading to hypoglycaemia
- Infections
- Hyperbilirubinaemia
- Anaemia of prematurity
- Congenital malformations

General Management
Babies weighing 2,000—2,499g can be cared for as normal weight babies. Some of them may have feeding difficulties. Observe for a day or two before discharging from maternity ward.

Babies weighing 1,750–1,999g need extra care. Kangaroo mother care will provide enough warmth unless the baby has another problem. They are usually able to breastfeed adequately, but some may tire quickly and may need tube or cup feeding.

Babies weighing below 1,750g are at increased risk of respiratory distress, infection, apnoea, and hypothermia, and are usually not able to feed especially if very low birth weight. They need to be admitted to a specialized area that will cater for their needs. For these babies, treat any intercurrent problem and when they stabilize, start kangaroo mother care.

Thermal Environment
- Keep baby dry and well wrapped and nurse away from open windows.
- Avoid unnecessary exposure.
- Keep the room warm (at least 25^{o}C).

26.11.1 KANGAROO MOTHER CARE (KMC)
KMC is cheap and easy to carry out in many facilities. Use KMC when you have a stable LBW baby.

KMC consists of:
- Kangaroo position – Skin to skin contact between mother's breasts or those of any other adult female.
- Breastfeeding.
- Follow up to ensure adequate growth and development.

Procedure for KMC:
- Mother wears a dress that opens to the front.
- Baby wears nappy/diaper, cap, and socks.
- Let the mother sit comfortably on a chair.
- Mother opens the dress.
- Place the naked baby in frog like posture on mother's chest between her breasts.
- Secure baby firmly but not too tight with a cloth round mother and baby.
- Breast feed frequently. Top up with cup if not able to suck adequately.
- Mother in recliner position during rest and sleep.
- Monitor growth at least 3 times per week.

26.11.2 FLUID AND FEED MANAGEMENT

- Encourage mother to breastfeed frequently if baby is able. Check positioning and attachment.
- Ensure adequate intake by calculating the requirement per day. Calculation of feeds/ fluids: Start with 60ml/kg/day on day 1. Increase by 20–30ml per day to a maximum of 180–200ml/kg /day if using breast milk. For formula or IV fluid, do not exceed 180ml/kg. A rough guide is given in Table 26.2.
- Record all intake (oral and IV) and check every 6 hrs to see if the desired intake is achieved.
- Feeding should be done within the first hour of birth to avoid hypoglycaemia.
- Give micronutrients: multivitamins a preparation containing 400IU of vitamin D as soon as enteral feeding is established
- Includeiron supplement 6mg/kg/day after age of 4 weeks.
- Refer to higher level for appropriate management any baby not able to feed.

Table 26.2: Feeding chart for preterm and low birth weight babies: Amount of milk to give every 3 hours (ml)

Birth weight (kg)	Age in days							
	1	2	3	4	5	6	7	8 or more
1.0–1.4	8	10	15	20	25	30	30	35
1.5–1.9	10	15	20	25	30	40	45	50
2.0–2.4	15	20	30	35	40	50	55	65
2.5–2.9	20	25	35	40	50	60	70	75
3.0–3.4	20	30	40	50	60	70	70	75
3.5–3.9	25	35	45	60	70	80	80	80

Note: Introduce feeds as soon as possible; preferably no later than 24 hrs after birth. Monitor weight at least 3 times a week. Weight gain after the first week is 15g/kg/day.

26.12 Anaemia of Prematurity

Anaemia occurring after the first week and often much later. It is due to a number of factors, including:
- Deficiency of haematinics
- Blood loss associated with repeated investigation
- Intracranial haemorrhage
- Erythropoietin deficiency

Management
- Treat with iron and folic acid.
- Refer for transfusion if:
  - Symptomatic: poor weight gain, recurrent apnoea, congestive cardiac failure, ***OR***
  - Hb <8g/dl

Prevention
Limit blood loss; give prophylactic iron starting from 4–6 weeks of age.

26.13 Infants of Diabetic Mothers

Clinical Features
Size at birth will depend on the degree of diabetic control in the mother as well as the stage. Hence the baby may be large, appropriate, or small for the gestation age.

Complications
These include perinatal asphyxia and injury, hypoglycemia, hypocalcaemia, hyperbilirubinaemia, respiratory distress syndrome (RDS), polycythaemia, and feeding problems.

General Management
Diabetic mothers should deliver in hospital where problems of the baby can be dealt with. Appropriate management of such mothers includes:
- Close cooperation between obstetrician and paediatrician.
- Maintenance of normoglycaemia in the mother. [see. diabetes in pregnancy]
- Decision on timing of delivery is made in consultation with the obstetrician.

In case the mother delivers outside the hospital, the baby should be fed within one hour after delivery and then 3 hourly until the baby has been transferred to the hospital.

26.14 Disorders of Glucose Metabolism

Hypoglycaemia is a common problem but there are no specific clinical features. Hypoglycemia should be suspected in low birth weight infants, infants born small

for gestational age, infants of diabetic mothers, and any sick infant especially if the infant is not feeding well.

Steps to take to prevent hypoglycaemia include:
- Ensure early and adequate feeding for all babies.
- Give IV 10% dextrose 5ml/kg and feed the baby to help maintain normal level.

☛ **Refer all suspected infants to higher level for appropriate management.**

26.15 Neonatal Jaundice

26.15.1 PHYSIOLOGICAL JAUNDICE

Many babies have some jaundice in the first week of life. This is referred to as physiological jaundice.

Characteristics
- Appears on about the third day.
  - Peak levels 5–8mg/dl (85–135µmol/L) occur in term babies.
- Reduces to normal in about a week.
  - Peak levels of 10–12mg/dl (170–205µmol/L) in preterm babies.
- Falls to normal about 10 days.

☛ **Serum bilirubin levels >12mg/dl in term babies and >15mg/dl (>255 µmol/L) in preterm require investigation.**

Management
- Refer the baby for confirmation.
- Ensure adequate feeding and hydration.
- If jaundice is physiological, only observation is required.

26.15.2 ACUTE NON-PHYSIOLOGICAL JAUNDICE

A common condition, this is caused by:
- ABO incompatibility: Mother group O, baby A or B or AB
- Rhesus incompatibility: Mother Rh-negative, baby Rh-positive
- Sepsis

In ABO and Rhesus incompatibility, jaundice may appear from the first day, whereas in sepsis it may appear any day.

Hepatitis may be due to infection by Hepatitis B virus, congenital syphilis, and cytomegalovirus. Baby may show features of the specific infection, especially syphilis.

Complications
Bilirubin toxicity (Kernicterus): Brain damage due to deposition of bilirubin in the brain. Bilirubin toxicity presents with lethargy, poor feeding and vomiting, opisthotonos, seizures, and coma. Death may result. If the baby survives, mental

retardation, cerebral palsy, hearing loss and learning disorders are known sequalae.

Management

- ***Refer the baby for admission.***

26.15.3 PROLONGED NEONATAL JAUNDICE

Prolonged neonatal jaundice is due to hepatitis or biliary obstruction. In obstructive jaundice the stools are pale and the urine very dark.

- ***Refer urgently to higher level for appropriate management. For biliary atresia, surgery is best done within 6 weeks of birth to prevent hepatic damage.***

26.16 Congenital Anomalies

26.16.1 HYDROCEPHALUS

This is an increase in the volume of cerebro-spinal fluid (CSF) within the ventricular system and may be communicating or non-communicating.

Clinical Features

There is a uniform enlargement of the head before birth causing obstructed labour or developing insidiously after birth. There are prominent dilated scalp veins, wide, bulging and tense fontanelles, brow overhangs the roof of orbit, there is a “cracked-pot” sound when the head is percussed (McEwen’s sign), a clear margin of sclera beneath the upper lid (setting sun sign) and wide sutures. Nystagmus is common and transillumination is positive later. In isolated hydrocephalus there is usually no neurological deficit. But if there was intrauterine infection then it may be accompanied by other defects.

Management

In order to prevent brain damage, early evaluation and diagnosis is essential. The baby therefore needs to be referred as soon as possible to a specialized unit.

26.16.2 NEUROTUBE DEFECTS

These are the commonest CNS anomalies. The defect can occur in any part of the CNS starting from the head and down the spine. The abnormalities vary from the extreme anencephaly, through encephalomyelocoele and encephalocoele, to spina bifida with or without myelocoele or meningomyelocoele.

HEAD DEFECTS

Anencephaly is the complete absence of the brain apart from the brain stem, while encephalocoele and encephalomyelocoele are most commonly occipital but can be frontal.

SPINA BIFIDA

This results from failure in development of vertebral arches and is frequently associated with mal-development of the spinal cord and membranes. There are two main types: Spina bifida occulta and spina bifida cystica.

Spina Bifida Occulta

Many cases are asymptomatic and are undiagnosed. There may be tell-tale signs on the back such as lipoma, dimple, tuft of hair (hypertrichosis), naevus, and telangiectasia.

In other cases the patient may present with nocturnal enuresis, foot-drop, persistent urinary tract infections due to neurogenic bladder and recurrent meningitis due to a communicating dermal sinus.

Spina Bifida Cystica

In addition to the defect in the spine, there is an obvious mass on the back that may be a meningocoele (that is, a bulge of the meninges usually covered with skin), or meningomyelocoele (a bulge of the meninges that contains neural tissue). As a consequence, there is paralysis below the level of the lesion with or without incontinence of stool and/or urine.

Management

- Management requires a multidisciplinary team approach including surgeons, paediatrician, and physical therapists.
- The patient should therefore be referred to a specialized centre for care.
- Appropriate sterile dressing of the open lesions is necessary to prevent infection.
- The parents should be counselled carefully so as to accept the child and be aware of what can be done.

Prevention

- Pre-pregnancy folate supplementation is known to reduce chance of recurrence.

26.16.3 CLEFT LIP AND PALATE

Clinical Features

Cleft lip results from abnormal development of the medial nasal and maxillary processes. This may present as unilateral, bilateral or median cleft lip (rare). The clefts may be complete or incomplete. Cleft palate results from a failure of fusion of the two palatine processes. These again may be unilateral, bilateral or median. Cleft lip and cleft palate may occur singly or in combination.

Effects on Functions/Complications

- Sucking and swallowing is greatly affected. This predisposes a child to malnutrition.
- Speech development is impaired.
- Hearing impairment due to recurrent acute or chronic otitis media.

Management
Counsel the parents and explain when repair will be done

Timing of repair
Operations for cleft lip may be done soon after birth or between 6 and 12 weeks. Cleft palate repair is best at 12–15 months. If repair is delayed it is important to ensure adequate nutrition. The baby with isolated cleft lip may be able to breastfeed but one with bilateral cleft lip and palate has difficulties in swallowing. Teach the mother how to feed the baby without choking. Isolated cleft palate can be fitted with a prosthesis while waiting for repair.

The aim of treatment is to prevent or diminish the complications and hence achieve:
- Normal appearance
- Well aligned teeth
- Normal sucking and swallowing
- Normal speech and normal hearing.

☛ **Refer to a higher for appropriate management. All children with cleft lip and palate should be referred to a specialist. The parents must be assured that the results of operation are good.**

26.16.4 TRACHEO-OESOPHAGEAL FISTULA (TOF)
This is an anomaly in the development of the oesophagus involving a proximal atresia with a distal tracheo-oesophageal fistula.

☛ **This condition is an emergency. It must be diagnosed within the first 24 hours of birth. Diagnosis is best done before the baby is fed to prevent aspiration of feeds.**

Clinical Features
Tracheo-eosophageal fistula is suspected:
- When there is history of polyhydramnios.
- When saliva drools continuously from the mouth.
- Where there is respiratory distress.

For such a baby exclude TOF before feeding is initiated. If feeding is inadvertently started in such a baby:
- Attacks of coughing and cyanosis (choking) are likely to occur.
- The abdomen is likely to be distended especially at the epigastrium (due to swallowed air in the stomach).

Management
Appropriate management of such a child includes:
- Not feeding the baby enterally.
- Keeping the baby warm.
- Instituting intermittent suction/continuous drainage using the N/G tube to clear

the secretions from the pouch.
- Turning the baby to the side if possible to facilitate drainage.
- Placing the baby in the head-up position to prevent gastric juice reflux.
- Initiating intravenous infusion with 10% dextrose solution.

☛ **Arrange for urgent transfer:** The baby should be transported under the above circumstances to a specialist centre equipped for this type of operation.

☛ **It is important to communicate on telephone with the respective surgeon before any movements are made.**

26.16.5 ANORECTAL MALFORMATIONS

Clinical Features

In anal atresia (imperforate anus), the child is born without an anal opening. This should be detected during the routine examination of a newborn. The mother may also report failure of the baby to pass stool. Congenital abnormalities are frequently multiple; a careful general examination of the baby is an important prerequisite.

Management

The baby should be referred to a specialized centre for surgical management. In the meantime, the following should be done:
- Nasogastric suction should be maintained until the baby arrives at the referral hospital.
- Intravenous fluids should be initiated and maintained until the baby arrives in the referral hospital.
- The baby should be kept warm.

27. Ear, Nose, and Throat Conditions

27.1 Acute Otitis Media

An acute inflammation of the middle ear, usually suppurative, occurring after an upper respiratory tract infection, rhinitis and sinusitis. The commonest organisms are Streptococcus pneumoniae and H. influenzae.

Clinical Features

This is most common in children under 5 years. There is pain in the ear, loss or impairment in hearing with or without ear discharge. There is also loss of appetite and fever. Examination shows signs of URTI, fever, hyperemic oedematous tympanic membrane with loss of normal contours. Purulent discharge with perforation (central) may be present.

Complications include mastoiditis and meningitis.

Management
This includes:
- Analgesics: Paracetamol 10mg/kg 8 hourly for 5 days.
- Antibiotics: Amoxicillin 25–50mg/kg 8 hourly for 5 days ***OR*** erythromycin 30–50mg/kg for 5 days.
- If there is perforation, treat as in chronic otitis media. Review after 5 days; if not improved continue antibiotic therapy for 5 more days.
- Refer if:
  - There is no response to treatment.
  - There are signs of complications: meningitis, mastoiditis.

27.2 Chronic Suppurative Otitis Media (CSOM)

Clinical Features
Discharging of pus from one or both ears for more than 2 weeks following untreated or unresolved acute otitis media with a central perforation. The discharge is usually not foul smelling. There is also impaired hearing. Recurrent ear discharge usually occurs after URTI. Secondary infection may be present with Gram-negative bacteria, yeast, and fungi.

Investigation
Carry out HIV test

Management
- If no antibiotics were administered recently, treat with antibiotics as in acute otitis media.
- Show the mother how to dry the child's ear by wicking:
  - Roll a piece of clean absorbent cloth or cotton wool into a wick and insert it gently into the child's ear.
  - Roll the wick in the ear, then remove it and replace with a clean wick.
  - Watch the m other repeat this until the wick is dry when it comes out. Tell the mother to continue to dry the ear by wicking at home at least 4 times a day, until the wick stays dry and perforation closes. Tell her that nothing should be left in ear between treatments. The child should not go swimming until the ear heals.
- Reassess the child weekly. If the mother needs assistance in keeping the ear dry, reassess more frequently.

Refer to ENT specialist if:
- The patient develops mastoiditis.
- There is no improvement after 4 weeks.
- The patient has hearing impairment; the patient will benefit from tympanoplasty.
- Patient complains of headache, earache, vertigo, or facial paralysis: This indicates complications.

27.3 Mastoiditis

Infection of the mastoid air cells and mastoid bone occurring as a complication of acute otitis media or chronic otitis media.

Clinical Features
A painful swelling above the ear in children under 2 years of age. A painful swelling behind the ear in older children. There may be preceding otitis media and mastoid tenderness, with fever. There may be sagging of the posterosuperior meatal wall.

Complications
These include facial nerve palsy, meningitis and brain abscess.

Management
Refer urgently to higher level for appropriate management.

27.4 Otitis Externa

Inflammation of external ear most commonly due to bacteria, but may also be due to fungi, e.g., Candida (whitish) or aspergilla (blackish) or Herpes zoster virus. It may also occur in generalized allergic and seborrhoeic states. The commonest bacterial organisms responsible are Streptococcus pneumoniae, Staphylococcus aureus, Ps. pyocyanea, B. proteus, and E. coli.

Clinical Features
Fever is uncommon. There is pain and tenderness accentuated by movement of the tragus. Pre or post auricular or cervical lymphadenitis may be present. Obliteration of the canal lumen may occur due to inflammation, causing deafness. There may be ear discharge with or without itching.

Management
- Admission is NOT necessary
- Relieve pain; give analgesics such as paracetamol
- In severe cases, e.g., a boil/furuncle give antibiotics:
  - Benzyl penicillin 50,000 units/kg IM STAT followed by oral amoxicillin for 5 days
  - Gentamicin ear drops or 2% acetic acid ear drops.
- Fungal otitis externa (otomycosis is treated with fungicides, e.g., Clotrimazole 1% drops applied 8-hourly for at least 10 days.
- Allergic (eczematous) otitis externa is treated with antihistamine drugs and hydrocortisone ointment or drops:
  - Chlorpheniramine 0.4mg/kg/day BD in children.
  - Hydrocortisone ointment or drops apply BD.

27.5 Epistaxis

Clinical Features
Bleeding through the nose, (usually 90% from a plexus of veins in Little's areas) due to nose-picking, trauma (fall in games, assault, etc.), nasal and paranasal neoplasms, nasal infection, systemic derangements, e.g., acute fevers, hypertension, renal disease with uraemia, abnormalities of blood clotting, and foreign bodies in the nose.

Investigations
Usually none unless systemic disease is suspected.

Management
- Immediate: Sit the patient up (to avoid aspiration); pinch the nose for 10–20 minutes. This is usually sufficient to stop bleeding
- Apply ice or cold packs on the bridge of the nose.
- Remove clots with suction catheter, then pack the nose:
  - Apply xylocaine nasal spray then pack (preferably using Tiley's forceps) with ribbon gauze or narrow strip of gauze impregnated with liquid paraffin.
  - Start packing from the floor of the nose towards the roof.
  - Ensure the pack fits lightly, as this is most effective. Do not use adrenaline.
  - Remove the paraffin pack should be within 24–48 hours.
  - Put a patient with a nasal pack on a broad spectrum antimicrobial, e.g., cotrimoxazole or amoxicillin for 7 days
- Refer for admission if:
  - Bleeding is uncontrolled.
  - Patient requires fluid replacement or blood transfusion.
  - Patient requires in-patient management of the underlying causative factor.
- Treat the underlying cause.

27.6 Foreign Bodies in Nose and Ears

Young children may push any object into the nose or ears. If a parent notices this, the best thing to do is not to struggle with the child as this may push the object even further in. Sometimes the object is noted several days after it was inserted, in which case there may be a nasal or ear discharge. Take child to a health facility that has health workers who are capable and equipped to remove the object without causing injury to the child.

27.6.1 FOREIGN BODIES IN THE EARS

The types of foreign bodies inserted include metallic pieces (hair clips, smooth pellets, needle, etc), wooden pieces, (e.g., match sticks), vegetable matter (e.g., seeds), or insects.

Clinical Features
There is obvious history of foreign body insertion into the ear. The child may have conductive deafness, ear pain, discharging from the ear, may experience

disturbing noise (if insects involved) and bleeding from the ear (especially following traumatic insertion of a foreign body by the child).

Management
- Most foreign bodies can be removed fairly easily with crocodile forceps, a hook, or an ear probe, or by suction and gentle syringing with warm, clean water
- Rounded objects may be pushed further into the ear and rupture the eardrum. Do not attempt to remove a foreign body from the ear if you have difficulty in removing it.

Refer in presence of the following:
- A complication such as perforation of eardrum.
- Foreign body in the middle ear is suspected.
- The foreign body is deeply seated in the external auditory meatus.

27.6.2 FOREIGN BODIES IN THE NOSE

Occurs usually in children. The foreign bodies include animate objects (e.g. maggots, regurgitated roundworms, etc) and inanimate ones, for example vegetable (peas, beans, nuts), non-vegetable materials (for example pencils, paper, sponge, buttons, beads, pebbles, nuts, screws).

Clinical Features
There may be pain, sneezing and epistaxis or unilateral nasal discharge with nasal obstruction. There may also be pyrexia or headache especially with animate foreign bodies.

Unilateral purulent nasal discharge in children should be regarded as due to a foreign body until proven otherwise. Nasal examination is crucial for diagnosis of this condition.

Management
For animate foreign bodies, remove the object (for example roundworm) with forceps and then instil lignocaine 10% solution into the nasal cavities to kill those that are not dead (maggots, worms). Repeat twice a week for 6 weeks. Refer to higher level for appropriate management if the foreign body is difficult to remove or appropriate instruments are not available.

27.6 Wax in the Ear

Advise patients and parents to leave wax to come out of the ear on its own instead of attempting to remove with ear buds because these attempts may cause impaction of the wax in the ear.

Rarely if the wax is causing impaired hearing it may need removal. Refer if hearing impairment occurs.

27.7 Foreign Body in the Oesophagus

The commonest objects are coins in children, fish bones or meat in any age. Psychiatric patients may have many more types of foreign bodies in the oesophagus.

Clinical Features
Patients present with pain in retrosternal area and/or in the back, dysphagia, drooling of saliva in the mouth, regurgitation of food, dyspnoea and hoarseness if there is laryngeal oedema from compression by the foreign body, and localized tenderness in the lower part of the neck.

Management
Refer patient for oesophagoscopy and removal of the foreign body.

27.8 Laryngotracheal Trauma

These can be blunt or penetrating injuries. The priority is to secure and maintain an airway. Then refer urgently to an ENT specialist for endoscopy and repair.

27.9 Allergic Rhinitis

This is IgE-mediated rhinitis characterized by seasonal or perennial sneezing, rhinorrhoea, nasal congestion, pruritus, and often conjunctivitis and pharyngitis. Symptoms vary in severity from day today or hour to hour.

Management
- Avoid the allergen (precipitating factor).
- Administer antihistamines: Chlorphenamine 0.35mg/kg in children in 4 divided doses.

Refer to specialist if:
- There is gross nasal obstruction (hypertrophied inferior turbinates).
- There are polyps.
- There is sinusitis.
- There is deviated nasal septum.

27.10 Parotid Masses

These may be true parotid swellings (e.g., parotitis, parotid abscess, cysts, tumours, etc.) or pseudoparotomegaly due to swellings in nearby structures (e.g., hypertrophy of the masseter, jaw swellings, parapharyngeal masses, lymph node enlargement, facial nerve tumours, etc.). Parotid swellings may also occur in other systemic conditions (e.g., malnutrition, diabetes mellitus and HIV/AIDS) Infective masses may be associated with other features of infection like

fever, pain, local inflammation or discharge from the opening of the parotid duct. In children the commonest infection is mumps. Most parotid swellings are painless unless infected or malignant. Presence of facial nerve palsy is highly suggestive of a malignant process.

Viral parotitis may not require more than analgesics and bed rest. In the presence of bacterial infection, give amoxicillin.

Refer the patient:
- Where an underlying systemic disease is the causative factor for parotomegaly.
- If there are masses that may require surgical intervention.

27.11 ENT Manifestations of HIV/AIDS

27.11.1 CHRONIC EAR INFECTIONS

In children chronic otitis media and parotid enlargement are the commonest manifestations. Other manifestations include:
- Infections: These can be viral, bacterial or fungal, for example rhinitis, sinusitis, pharyngitis, glossitis, tonsillitis, laryngitis, parotitis, deep neck space cellulitis, abscesses, otitis externa, otitis media, and labyrinthitis.
- Tumours: There is an increase in head and neck cancers associated with HIV/AIDS, especially Kaposi's sarcoma and lymphomas.
- Others: Adenoid hypertrophy, oropharyngeal and oral ulcers, atrophic rhinitis, lymphadenopathy, parotid cysts, otitis media with effusion, vertigo, deafness, tinnitus, and cranial nerve palsies.

Management
Refer child to a comprehensive care centre for diagnosis and treatment.

27.11.2 HEARING IMPAIRMENT

In the paediatric age group, pay special attention to children born prematurely, those with low birth-weight, difficult delivery, yellowness of eye (neonatal jaundice), or whose mothers who had febrile illness during pregnancy, and those treated for meningitis.

Do not ignore parents' complaint of a child not hearing or a child who is slow to develop speech. Use changing voice intensity to assess grossly the state of hearing. If there is suspicion of hearing loss, refer at whatever age. A child who does not hear can be helped at any age but the earlier the better.

28. Selected Infections and Related Conditions

28.1 Septicaemia

This is suspected when there is fever with no localizing signs. Causes include Staphylococcus aureus, meningococcus, and salmonella group. Severity may vary and some children affected by this condition may be severely ill.

Investigations
Diagnosis is that of exclusion by doing the following investigations:
- Full blood count (shows leucocytosis and neutrophilia)
- Blood smear for malaria (negative)
- Urinalysis (negative)
- Blood culture (positive)

Management
Refer child to higher level for appropriate evaluation and management.

28.2 Septic Arthritis and Osteomyelitis

Infections of the bone or joints are common in children. They commonly follow septicaemia although occasionally may result from a penetrating injury. In children with sickle cell disease, more than one bone may be affected.

Clinical Features
- The affected child looks sick and may be toxic. There is fever and limitation of movement of the affected limb. The affected limb is hot and extremely tender. The child may resist examination because of pain.
- Delay in treatment will result in bone or joint destruction. In the case of osteomyelitis a chronic discharging sinus may develop.

Management
Refer all suspected cases to higher levels for appropriate management.

28.3 Salmonella Infections: Typhoid Fever

The organisms Salmonella typhi and Salmonella paratyphi A, B, and C, commonly cause enteric fever or typhoid fever, while Salmonella enteritis causes gastroenteritis.

Typhoid fever is a systemic disease and caused by Salmonella typhi. Salmonella bacilli are shed in the faeces of a symptomatic carriers or in the stool or urine of those with active disease.

Transmission
Transmission of the Salmonella bacilli is via contaminated food or water. This may occur through:
- Direct contamination by faeces or urine.
- Flies from faeces to food.
- Through healthy carriers especially if they are food handlers.
- Health personnel through inadequate hygiene when changing soiled linen.

Clinical Features
The patient may have high fever, headaches, anorexia, weight loss, diarrhoea, constipation, abdominal tenderness, changes in sensorium, splenomegaly, relative bradycardia and Rose spots (blanching lesions). High index of suspicion is required when handling any patient with unexplained fever. The clinical picture tends to be atypical in infants, who may develop shock and hypothermia.

Complications
The complications for typhoid fever include intestinal haemorrhage and/or perforation, with resultant acute abdomen, and “chronic carrier status”.

Management
Refer any child with persistent fever to higher level for appropriate management.

Prevention
Preventive measures for typhoid fever include the following:
- Using wholesome drinking water (water boiled for 10 minutes or chlorinated).
- Using pasteurized milk.
- Screening food handlers for typhoid and treating those infected, including healthy carriers.
- Ensuring proper hygiene while preparing or/and handling foods.
- Ensuring hygienic waste disposal.
- Vaccination (refer if not available):
  - Live attenuated oral vaccine 4 capsules given on alternate days. Avoid antibiotics for 1 week NB: contraindicated in immuno-suppression cases.
  - Typhim VI vaccine – Single dose 0.5ml IM (70% efficacy; booster dose needed every 2–3 years).

28.4 Fever of Unknown Origin

This refers to fever of more than 3 weeks duration and whose cause is still unknown in spite of at least one week of intensive investigations. This definition excludes common conditions of shorter duration and/or where the cause of the fever has already been determined.

Assessment of such a patient should include observation of the fever pattern, detailed history and physical examination, laboratory tests and non-invasive and invasive procedures.

Common Conditions Manifesting as Fever of Unknown Origin
Most cases of prolonged obscure fever are due to well known diseases. Aggressive diagnostic effort is recommended, as most of them are treatable. Do not just shift from one antibiotic to another because this confuses the picture even more. It may even be better to stop every treatment and watch for a few days.

Infections
- Tuberculosis – The commonest cause of pyrexia of unknown origin in Kenya. Miliary tuberculosis may not be visible on chest x-ray until the disease is well advanced. Tuberculosis in other body sites like the central nervous system or abdominal lesions may be difficult to diagnose early.
- Infections due to some bacterial infections, such as salmonellosis and brucellosis.
- Deep seated bacterial abscesses like intracranial, intra-abdominal, and hepatic abscesses.
- Infective endocarditis.
- Some slow viruses, the commonest of which is HIV.
- Visceral leishmaniasis.

Neoplasms
Lymphomas are the commonest among the neoplastic causes of pyrexia of unknown origin. Diagnosis may be difficult if lesions are deep seated retroperitoneal nodes.

Immunological Disorders
These include:
- Juvenile rheumatoid arthritis and
- Systemic lupus erythematosus.

Management
Refer all patients you are not sure of diagnosis.

28.5 Antibiotic Guide to Bacterial Infections

Bacterial infections are a leading cause of morbidity and mortality. Accurate diagnosis and appropriate, cost-effective treatment are essential. Incorrect and over use of antibiotics facilitates the development and growth of drug resistant bacteria; treating infections due to such bacteria is difficult. Specific treatments for the various infections are discussed under their respective headings.

Generally the following should be taken into account:
- The organisms responsible for infections depend on the age of the victims.
- The management of the infections depend on their severity.
- Underlying conditions like immune depression determine the bacterial infections involved and the type of treatment required.
- The organisms and the treatment for community acquired infections differ from those for hospital acquired ones.

- Antibiotic dosage and the side effects vary with age.
- Drug sensitivity to antibiotics is constantly changing.
- Treatments should be given using correct doses for the various conditions, and compliance with drug administration should be encouraged for complete treatment. Left over drugs should be discarded to avoid poisoning.

28.6 Paralysis (Acute Flaccid)

Common differential diagnosis include:
- Poliomyelitis
- Acute transverse myelitis
- Spinal cord injury
- Guillain Barré syndrome
- TB spine (not always acute)
- Neoplasms of spine or cord

All of the above except poliomyelitis will have sensory loss

28.6.1 POLIOMYELITIS

- About 195 out of every 200 infections are asymptomatic.
- Abortive poliomyelitis: This presents as a brief febrile illness with malaise, anorexia, nausea, vomiting, sore throat, constipation, coryza, cough, and diarrhoea.
- Non-paralytic poliomyelitis: This form presents with the symptoms of abortive poliomyelitis with more intense headache, nausea, and vomiting, with bladder paralysis and constipation that are both transient.
- Paralytic poliomyelitis: Occurs in 0.5% of infections. The symptoms are similar to those of non-paralytic polio with additional weakness and pain of one or more muscle groups. Flaccid paralysis may involve one or more limbs as well as respiratory muscles. Transient bladder paralysis and bowel atony is common. Paralysis may be precipitated by IM injection. After the acute phase muscular atrophy ensues due to denervation. There is no sensory loss.

Investigations
Stool specimen for viral culture and typing. The stool should be kept and transported to KEMRI laboratory under vaccine temperatures.

Management
- Avoid IM injections during epidemics or in suspected cases.
- Refer patients with paralytic features.

Prevention
- Immunization: On routine and National Immunization Days (NIDs).
- Active surveillance and mopping up.
- It is hoped that polio will be eradicated in the near future with intensified childhood immunization combined with successful disease surveillance.

☛ **For purposes of polio eradication, notify the local Medical Officer of Health of any acute flaccid paralysis**

28.7 Tetanus

Neurological disorder characterized by muscle spasms due to endotoxin produced by Clostridia tetani. Tetanus occurs in several clinical forms including generalized, neonatal and localized disease.

Clinical Features
These features include inability to open the mouth (trismus, or lock jaw), generalized muscle spasms initially on stimulation but may subsequently be spontaneous. There may also be opisthotonos (rigid arching of back muscles), dysphagia, laryngospasm with difficulty in breathing and there is no loss of consciousness. The port of entry for the infection in neonates is the umbilicus while in older children it can be thorn pricks, cuts or burns, or foot injuries from stepping on nails or broken glass.

Management
Refer urgently to higher level for appropriate management.

Prevention
- Against neonatal tetanus:
  - Pregnant mothers should receive tetanus toxoid 2 doses at least 4 weeks apart as early as possible in pregnancy. They should then receive one booster dose at every subsequent pregnancy for a total of 5 doses.
  - Mothers with a baby with neonatal tetanus should be given neonatal toxoid immunization.
- People with open wounds should be given adequate surgical toilet and should in addition receive 2 doses of tetanus toxoid at least 4 weeks apart. Only 1 dose of tetanus toxoid is given if patient was immunized during the last 3 years and adequate surgical toilet has been done.

☛ **All patients who recover from tetanus should be immunized.**

28.8 Tuberculosis

Tuberculosis is caused by Mycobacterium tuberculosis that is also referred to as Acid-Alcohol Fast Bacilli (AAFB) because of its staining properties. Transmission is by droplet infection through coughing and sneezing. Children almost always get infected from an adult living in the same household. The incidence of TB is on the increase and this is partly due to its association with HIV/AIDS, poverty, malnutrition, and overcrowding, which are all increasing.

Clinical Features
Most cases of tuberculosis in Kenya (80%) are pulmonary. Features of pulmonary tuberculosis include cough for 2 weeks or more, chest pain, fever, night sweats, weight loss and breathlessness. A persistent cough may be the earliest indication of TB infection.

Extra pulmonary tuberculosis is common in children and its symptoms depend on the organs that are affected. Symptoms include TB adenitis (or lymphadenopathy), TB arthritis (with painful swollen joints), TB meningitis (with signs of meningitis) TB peritonitis (with ascites), and TB involving the pleura (with pleural effusion).

A high index of suspicion is important in diagnosis of TB in children, who seldom produce sputum and often have non-specific symptoms.

Diagnosis of Tuberculosis in Children
The key elements for diagnosis of TB in children include:
- A history of contact with an adult who has TB or long standing cough is useful
- Smear microscopy (3 specimens – spot, early morning, and spot) for those children who can produce sputum. Sputum induction should be carried out for those who cannot.
- Gastric lavage for AAFB in children (taken early morning).
- Tuberculin skin testing (Mantoux test).
- Chest x-ray.
- HIV testing.

The use of the Jones criteria to assist in diagnosis is shown in Table 28.1.

Preventing TB in Children
BCG Vaccination
☛ **Although not totally protective, BCG reduces the risk of severe/ complicated TB.**

Preventing Tuberculosis in Exposed Children
- TB in children is always contracted from an adult in close contact with the child. All children in households where an adult has been diagnosed to have TB should be screened for TB and appropriately managed. In addition, all adults from households where a child has been diagnosed to have TB should be screened for TB and appropriately managed.
- A healthy newborn with a mother who is still sputum positive should be started on isoniazid prophylaxis immediately and the prophylaxis continued for 3 months. If a repeat sputum evaluation for the mother is found to be negative for TB, isoniazid should be stopped and the baby given BCG. If the sputum is found to be still positive, continue isoniazid prophylaxis for 9 months. It should be ensured that the mother is taking the drugs
- If a parent started on treatment for tuberculosis has a child under 5 years, the child should have a Mantoux test carried out on them. If the Mantoux is positive the child is infected and should receive full treatment for tuberculosis. If the Mantoux is negative, the child should be started on isoniazid prophylaxis at 10mg/kg body weight for 3 months. The Mantoux test should be repeated at 3 months. If the Mantoux test is more than 5mm the child should be receive prophylaxis for a further 3 months. If the test is negative, isoniazid prophylaxis should be stopped and the child given BCG vaccination after 3 days.

Table 28.1: Paediatric tuberculosis score chart

a.) Scoring

(Circle box and write score in the right-hand column)

Clinicalfeature	Score for each feature			Total
	0	3	1	
Duration of illness	Less than 2 weeks	More than 4 weeks	2–1 weeks	_____
Nutritional status (weight for age)	More than 80%	Less than 60%	Between 60 and 80%	_____
Family history of tuberculosis	No family history	Sputum positive and family history	Reported by family history	_____

b.) Diagnosis of tuberculosis in children

Feature	Score
Positive sputum smear	7
Family history positive for TB	2
Tuberculin test result 15mm or more (in unvaccinated child)	3
Enlarged painless lymph nodes, sinus present	3
Night sweats, unexplained fever	2
Abnormal chest x-ray	2
Malnutrition not improving after 4 weeks treatment	3
Angle deformity of spine	4
Firm, non fluid, non traumatic swelling of joint	3
Unexplained abdominal swelling or ascites	3
Change in temperament, seizures or coma	3

c.) Interpretation of the score

Score obtained	Interpretation	*Action required*
3 or less	TB unlikely	No action needed
3 to 4	TB probable	Further investigation recommended
5 to 6	TB likely though not definite	Initiate TB treatment;further investigations recommended
Over 7	TB definite	Institute treatment

Management

Refer all suspected cases of TB to higher level for appropriate management. The success of tuberculosis treatment depends on strict adherence to treatment. WHO DOTS (directly observed treatment short-course) can be used if adherence is uncertain. The following are the general guidelines for TB management:

- Follow National Guidelines.
- Ensure adequate supply of drugs.
- Use correct regimens and dosages.
- Ensure regular patient attendance.
- Always supervise initial phase of treatment.
- Trace defaulters promptly.
- Maintain accurate patient information and clinic attendance records.

Management – Pharmacological

In order to provide optimum treatment to patients with tuberculosis, such patients are classified into groups.

Classification of TB patients

Patients are classified into the following groups for epidemiological and treatment purposes depending on the site, microbiology, severity of disease, and history of previous treatment. These classifications are also in TB register for reporting.

- New (N): Patient who has never been treated before.
- Relapse (R): Patient who has received treatment and was declared cured but now has TB again.
- Transferred in (TI): Patient who was registered in another district/clinic initially and has now reported to continue treatment.
- Treatment resumed (TR): Patient who interrupted his/her treatment, and was declared "out of control", but is now resuming treatment.
- Other (O): Other types of patients, e.g., failure cases put on retreatment.

Short course chemotherapy (SCC)

- SCC is given to all TB patients registered by the National Leprosy and Tuberculosis Programme (NLTP). Different SCC regimens are used for the different categories of tuberculosis patients.
- Treatment in the first two months (initial phase of treatment) should be administered under direct observation by either a health care provider in a health facility or another member of the household or community.
- Drugs and tools for registration and reporting should be available.
- before treatment is started. Patient is admitted they are very ill or DOTS cannot be ensured. The continuation phase (4–6 months duration) in principle is (or should be) available in all government and NGO health facilities. The patients should collect a supply of drugs enough for four weeks, for daily self-administration at home. The patient should be brought back to the health facility for evaluation and supply of more drugs before the drugs run out.

Treatment Regimens and Drug Dosages

Table 28.2 shows treatment regimen for new adult smear-positive patients and other seriously ill cases of TB, e.g., TB meningitis, miliary TB, and TB of vital organs: 2ERHZ/6EH.

Table 28.2: Treatment regimen for new/seriously ill adult TB patients: 2ERHZ/6EH

Phase	Intensive phase	Continuation phase
Duration	Two months; supervised daily	Six months: dailyself-administration
Drugs used	Ethambutol (E), Rifampicin (R) Isoniazid (H), Pyrazinamide (Z)	Ethambutol (E), Isoniazid (H)

Table 28.3 shows re-treatment regimen for relapse (R), treatment failure (F), or treatment resumed (TR) with active TB disease and who have a positive sputum smear or culture result: 2SRHZE/1RHZE/5RHE.

Table 28.3: Re-treatment regimen for relapse (R), treatment failure (F), or treatment resumed (TR): 2SRHZE/1RHZE/5RHE

Phase	Intensive phase		Continuation phase
Duration	Daily supervised for 2 months	Daily supervised for 1 month	Daily self- administration for 5 months
Drugs used	Streptomycin (S) , Ethambutol (E) Rifampicin (R), Isoniazid (H), Pyrazinamide (Z)	Ethambutol (E), Rifampicin (R), Isoniazid (H), Pyrazinamide (Z)	Ethambutol (E), Rifampicin (R), Isoniazid (H),

Table 28.4 shows treatment regimen for new smear-negative and extra-pulmonary tuberculosis patients younger than 15 years: 2RHZ/4RH. Table 28.5 shows treatment dosages for children 15 years of age or under.

Table 28.4: Treatment regimen for new TB patients younger than 15 years: 2RHZ/4RH

Phase	**Intensive phase**	**Continuation phase**
Duration	Daily for 2 months (once a week supervised)	Daily self-administration for 4 months
Drug used	Rifampicin (R), isoniazid (H), pyrazinamide (Z)	Rifampicin (R), isoniazid (H)

Table 28.5: Treatment dosages for children under 15 years of age

Drug	Initial phase (2 months) mg/kg/day (maximum)	Continuation phase (4–6 months)
Isoniazid	5–10 (300)	5mg/kg/day
Rifampicin (R)	10–20 (600)	10mg/kg/day
Pyrazinamide (Z)	25–40 (2,000)	
Streptomycin (S)	15–20 (1,000)	

Drug dosages	**Formulation**	**Pre-treatment weight**		
		Over 55kg	**40–54kg**	**30–39kg**
Streptomycin	IM injection	1g	0.75g	0.50g
Rifampicin 150mg, Isoniazid 75mg, Pyrazinamide 400mg	Combination tablet	4	3	2
Rifampicin 150mg, Isoniazid 75mg	Combination tablet	4	3	2
Ethambutol 400mg, Intensive phase	Tablet	22–3	12–2	12
Ethambutol 400mg, Isoniazid 150mg	Combination tablet	2	2	2

CAUTION

- Ethambutol should not be given to children (see side effects).
- Do not exceed 600mg of rifampicin per day.

Tuberculous Meningitis

Initial phase consists of 4 drugs that include streptomycin. Duration of treatment is 9 months.

Review of the patient should be done 2 weeks after initiation of therapy and at end of intensive phase. Thereafter, reviews should be carried out monthly. Each review evaluates symptoms, adherence, side effects, and weight gain. Refer to higher level for appropriate management if:

- Patient not responding to treatment.
- Patient has extra pulmonary tuberculosis

Treatment of TB in HIV/AIDS Patients

HIV increases a person's susceptibility to infection with Mycobacterium tuberculosis. In individuals infected with M. tuberculosis, HIV is a potent cause of progression of tuberculosis infection to disease.

In HIV infected children, dissemination of TB is common. TB meningitis, miliary tuberculosis and widespread tuberculous lymphadenopathy occur. Diagnosis of TB in HIV infected children can be very difficult as the clinical features of the two diseases are almost identical. There are several chest conditions that may mimic TB, and the tuberculin test may be negative despite TB infection. When in doubt treat for TB but non response may mean it was not TB in the first place. Do not keep the child on TB drugs indefinitely. Check that the drugs used for highly active antiretroviral therapy (HAART) are compatible with TB drugs.

Acquired Drug Resistant TB

Acquired drug resistance results from inappropriate use of one drug or poor adherence to treatment. This suppresses the growth of organisms susceptible to the drugs but encourages the multiplication of isolated strains with spontaneous drug resistance.

Multiple Drug Resistant TB (MDR-TB)

This is resistance to both rifampicin and isoniazid as a consequence of poor adherence to recommended treatment regimens by clinicians and patients. This resistance is further associated with increasing poverty and the HIV/AIDS epidemic. MDR-TB is confirmed on culture and sensitivity. MDR-TB can be prevented by:

- Strengthening TB programmes.
- Ensuring directly observed therapy whenever rifampicin is used.
- Using fixed dose combination tablets containing rifampicin.

☛ **Refer all drug-resistant TB patients to a TB specialist for confirmation and management**

28.9 Rabies

Although not common, rabies is a devastating disease and is almost universally fatal once clinical features appear. It is therefore important to prevent onset of symptoms. The incubation period is 10 days to 1 year with an average of 1–2 months. This period is adequate to allow immunization.

Clinical Features
Initially, there is restlessness and paraesthesia at the site of the wound. Subsequently, the patient develops maniacal behaviour and may demonstrate violent behaviour; the patient also develops dysphagia and hydrophobia. Finally, repeated convulsions develop with hyperpyrexia and flaccid paralysis that ends in death in about 5 days from onset of symptoms.

Management
Rabies has no cure. The management is basically supportive and includes:
- Strict barrier nursing.
- Avoid bites from the patient.
- Sedation.
- Administration of fluids and feeding.
- Since even supportive care cannot be given on an outpatient basis, the patient should be referred for admission to provide such management.

28.10 HIV Infection in Children

HIV infection is now a common problem in children. The majority of children acquire the infection from the mother either during pregnancy, delivery or through breastfeeding (mother to child transmission), but a few are infected sexually through rape and still fewer through blood transfusion. The rate of progression of HIV children once infection has occurred is in two forms: one form progresses rapidly and the patients die within two years from birth (these termed rapid progressors) while the other form progress slowly over a few to several years before becoming symptomatic (these are termed slow progressors)

There are now several programmes in the country that address the HIV/AIDS disease. People should be encouraged to use voluntary counselling and testing (VCT) centres to know their status so that appropriate interventions can be instituted at an early stage for those who are infected so as to reduce morbidity and mortality.

28.10.1 PREVENTION OF MOTHER TO CHILD TRANSMISSION (PMTCT)

Without intervention, 20–45% of mothers infected with HIV transmit the infection to their babies. If intervention is carried out for these mothers, transmission can be reduced to 5% or even less.

Prevention of HIV/AIDS is centred around:

- Diagnosis of infection in the parents; routine testing of both parents is recommended.
- Good quality obstetric care:
  - Ensuring adequate maternal nutrition in pregnancy
  - Staging the degree of immunosupression for pregnant women so that those with a CD4 count of <350 or in clinical stage 3 or 4 are started on HAART; this is important for their own health and that of the foetus.
  - Avoiding prolonged rupture of membranes (>4 hours).
  - Ensuring a clean, atraumatic delivery.
  - Giving mother ARV during pregnancy, and/or labour and postnatally to the baby. The drugs currently in use are zidovudine and nevirapine. It is important to use the currently recommended ARVs.
- Counselling on feeding option for the baby. Counselling is best done antenatally to allow parents to choose the best option according to their socio-economic and other social factors.

28.10.2 FEEDING OPTIONS FOR HIV INFECTED WOMEN

Exclusive breastfeeding for 6 months is the first option. In this method of feeding, the seropositive mothers breastfeed their babies exclusively for 6 months. Then the baby is tested for HIV infection using PCR, if it is possible. If the baby is not infected, advise the mother to wean the baby over several days. The baby then can get other types of milk with complementary feeding. If the baby is infected, then she can continue breastfeeding together with complementary foods. If a mother stops breastfeeding and cannot afford any other milk for her baby after 6 months it will be necessary to teach her how to heat treat her breast milk. Otherwise the baby will develop malnutrition.

Replacement feeding is the second option. This means not breastfeeding but using another type of milk exclusively for 6 months and introducing other feeds at 6 months while continuing the milk. The present WHO recommendation is that when replacement feeding is acceptable, feasible, affordable, sustainable, and safe (AFASS) then mothers should avoid breastfeeding. If this is not possible, mothers should be counselled on how to safely breastfeed.

Recent studies from Africa, however, indicate that replacement feeding is associated with increased morbidity and mortality even when formula milk is provided by the government. In light of findings from these studies, it appears that it is in the best interest of the child to breastfeed rather than use formula milk.

All mothers should be counselled to avoid mixed feeding, i.e., combining breast milk with other milks, liquids, or food unless they heat treat the breast milk.

28.10.3 CARE OF HIV EXPOSED INFANTS

Care of an infant exposed to HIV consists of the following:

- Initiate cotrimoxazole prophylaxis at 6 weeks
- Continue feeding counselling at all visits
- Ensure immunization according to KEPI schedule
- Give vitamin A according to national guidelines

- Monitor growth: The growth curve should be evaluated: if the baby is not gaining weight appropriately despite nutrition counselling, the baby may be HIV infected and should be referred to a facility that can carry out the tests to confirm infection (PCR or CD4 counts).
- Test non breastfeeding baby at 6 weeks of age and repeat at 3 months. A negative PCR result for both tests suggests that the baby is most probably not infected. For a breastfeeding baby, breastfeeding has to be stopped and the test done 6 weeks to 3 months later; if the test is negative, the baby is not infected. However, the baby needs to be followed up till 12–18 months of age.
- Conduct HIV antibody test i between 12 and 18 months. If it is negative, the child is followed up in the normal MCH clinic. If the test is positive, the child should be referred to nearest HIV comprehensive care centre.

28.10.4 CARE OF HIV INFECTED CHILDREN

Unfortunately, most parents do not know their HIV status in pregnancy and consequently the diagnosis of HIV in children tends to be made late. Early signs of HIV infection are also often missed by the primary health care provider. Many of the severe illnesses that occur as complications of HIV/AIDS disease are also the common in non infected children. Consequently, healthy workers do not realize that they might be occurring as complications for HIV/AIDS.

Diagnosis

Diagnosis of HIV infection is made by an antibody test, in the form of a Rapid test or an Elisa test for all children aged above 18 months. Diagnosis can also be made by virological (antigen) test using the PCR; this is a confirmation test for infection in children below 18 months

Ideally, all children attending MCH should be tested for HIV to facilitate early intervention and appropriate management.
All children requiring admission should be tested to minimize missing of infected children and to facilitate optimum care.

HIV infection can be suspected in the presence of the following:

- Chronic otitis media
  - Persistent parotid enlargement
  - Slow growth or weight loss that fails to respond to adequate nutrition
  - Non specific skin rashes
- In more advanced disease, the following features are usually noted:
  - Recurrent serious infections, e.g., pneumonia
  - Persistent or recurrent fevers
  - Severe and recurrent oral thrush
  - Recurrent and persisted diarrhoea
  - Herpes zoster
  - Neurological dysfunction either delayed or regressed milestones
  - Failure to thrive

☛ **It is advisable to encourage all adults with HIV and on treatment to bring their children for testing even if they think the children are not infected.**

Refer the patient if:
- HIV infection cannot be confirmed.
- Child diagnosed to have HIV, so that they can be taken care of in a comprehensive care centre, where also CD4 counts can be done.

HIV Staging in Children

Two approaches are taken to determining the phase or stage of HIV infection. The immunological approach, based on age specific CD4 counts, is summarized in Table 28.6. The second approach, by WHO, defines the following clinical staging:

Stage 1:
- Asymptomatic
- Persistent generalized lymphadenopathy

Stage 2:
- Skin eruptions that include recurrent/extensive lesions that may be infections due fungi or Molluscum contagiosum virus, or may be immunological like seborrheic dermatitis (eczema) and any non specific dermatitis.
- Herpes zoster
- Recurrent or chronic upper respiratory and/or ear infections
- Parotid enlargement
- Recurrent oral infections
- Hepatosplenomegaly

Stage 3:
- Moderate malnutrition (-2SD or Z score) not responding to therapy
- Unexplained persistent diarrhoea
- Oral candidiasis (outside neonatal period)
- Unexplained persistent or recurrent fevers
- Severe recurrent pneumonias (>2 episodes in 12 months)
- HIV related chronic lung disease
- Symptomatic lymphoid interstitial pneumonitis
- Pulmonary or lymph node TB
- Systemic varicella infection
- Unexplained anaemia, neutropaenia, thrombocytopaenia

Stage 4:
- For a child <18 months of age: 2 or more of the following: oral candidiasis, severe pneumonia, failure to thrive or sepsis
- For a child of any age:
  - Severe wasting, stunting, or malnutrition not responding to therapy
  - Pneumocystis jiroveci pneumonia (PCP)
  - Extra pulmonary TB
  - Candidiasis of oesophagus, trachea or lungs
  - HIV associated cardiomyopathy, or nephropathy, or encephalopathy
  - Kaposi's sarcoma or other lymphomas
  - Unusual bacterial, fungal or viral infection

Table 28.6: Immunological stages: Based on age specific CD4 counts

Stage	<12 months (%)	12–35 months (%)	36–59 months (%)	5 years & above (Cells/Cm)
Not significant	>35	>30	>25	>500
Mild	30–35	25–30	20–25	350–499
Advanced	25–34	20–24	15–24.	200–349
Severe	<25	<20	<15	<200 or <15%

Management

Mother and child and any other infected family members should access care preferably in the same setting. If the clinic only caters for children then adult members must be referred to an appropriate clinic

Nutrition for Affected Children. Ensure adequate diet for age of the child. Energy needs are higher than non HIV infected children. Many infected children have poor appetite needing the parent or care giver to vary and experiment on foods offered. Nutritional supplementation may be necessary especially micronutrients.

Prevent PCP with Daily Cotrimoxazole. Pneumocystis carinii pneumonia should be prevented in all HIV infected children by administering cotrimoxazole to them daily in the dosages indicated in Table 28.7.

Table 28.7: Daily cotrimoxazole dosages to prevent Pneumocystis carinii pneumonia

Weight (kg)	Syrup 240mg/5ml	Tablet 480mg	Tablet 960mg
1–4	2.5ml	¼ tab	-
5–8	5ml	2 tab	¼ tab
9–16	10ml	1 tab	2 tab
17–30	15ml	2 tabs	1 tab
>30	20ml	2 tabs	1 tab
Adolescent/Adult	2 tabs	1 tab	

Treat Inter-Current Conditions (Opportunistic Infections). Patients with any complications or coexisting disease should be treated for the condition using the recommended guidelines for the condition. Those more severely ill or with various complicating illnesses should be appropriated referred for appropriate management.

Pneumocystis Jiroveci Pneumonia (PCP). The following clinical features are shown by children with Pneumocystis carinii pneumonia, now called Pneumocystis jirovechi pneumonia:

- Low grade fever
- Severe respiratory distress
- Normal auscultatory findings

- Poor response to standard antibiotics
- Severe hypoxaemia

Toxoplasmosis. Children with this condition have features of encephalitis.

Antiretroviral Therapy (Comprehensive Care Centre). This is indicted when the child is in clinical stage 3 or 4 irrespective of immunological stage, or the child has severe immunosupression irrespective of the clinical stage. Before a child is started on ARVs, adherence counselling is done to help the parent or guardian understand:

- The treatment that is required and the side effects of the treatment.
- Correct administration of the drugs and the need to give the drugs every day.
- That treatment is for life.

Before ARVs are started the following investigations need to be carried out:

- Full blood count
- Liver function tests (alanine transferase)
- Renal function (creatinine)
- CD4 count
- Viral load if possible

First Line ARV Therapy. This is summarized in Table 28.8.

Table 28.8: First line ARVs

Child characteristics	Recommended regimen
A. No previous exposure to NVP	
Age < 3 years & weight < 10kg	AZT + 3TC + NVP
Age> 3 years & weight > 10kg	AZT + 3TC + NVP OR EFV
B. Child exposed to single dose NVP	
All ages	AZT + 3TC + LPV/r

Note: Use d4T instead of AZT for a child with haemoglobin< 8g/dl.
Children on TB therapy stop NVP and give ABC if < 3 years or EFV if > 3 years. If the diagnosis of TB is made before start of ARVs, treat the TB first unless the clinical or immunological stage is very advanced. Monitor response by clinical and laboratory parameters, adherence, and side effects.

Treatment Failure

Treatment failure can be considered only when a child has been on treatment for at least 6 months or 24 weeks.

The following features constitute treatment failure:

- ***Clinical:*** Poor growth or weight loss after gaining, recurrence of severe infections, neuro-developmental delay or regression.
- ***Immunological:*** Drop in CD4 count below level for age, >50% peak or below baseline.
- ***Virological:*** Failure to achieve significant suppression load or progressive increase in viral load after significant suppression.

Second Line Therapy. This is summarized in Table 28.9. Note the following:
- Second line therapy should not be introduced in a rush.
- Adherence to the first line drugs should always be determined.
- First line therapy should not be discontinued before second line drugs are available.

Table 28.9: Second line therapy

1st line regimen	2nd line regimen
AZT + 3TC + NVP or EFV	ddI + ABC + LPV/r
d4T + 3TC + NVP or EFV	ddI + ABC + LPV/r
d4T + ddI + NVP or EFV	ddI + ABC + LPV/r
ABC + 3TC + AZT	NNRTI + LPV/r + ddI

Discontinuation of ARVs. Sometimes it may be necessary to stop ARVs. This may occur in the following situations:
- When adherence is a problem despite repeated counselling.
- When there is drug toxicity.

Counselling and Psychosocial Support
This should be ongoing to address the parent and child's concerns. As the child gets older it is important to work towards disclosure. Children need to understand their condition and how to deal with problems such as stigma, especially in school.

As they approach adolescence, children need to be taught how to look after themselves and to assume responsibility for taking their own medicines. With adequate care perinatally, infected children are reaching adulthood. If they were attending a purely paediatric clinic they would graduate to an adult clinic just like any other children who have chronic diseases.

28.10.5 PREVENTION OF HIV TRANSMISSION IN HEALTH FACILITIES

HIV does not spread through casual contact, hence patients with HIV infection may be nursed in open wards. Eating utensils need not be handled in a special way. However, health workers who handle HIV-contaminated blood or certain body fluids are at risk.

Precautions against transmission of HIV in the health facility include:
- Decontaminating surfaces which have been soiled by blood or other body fluids with sodium hypochlorite 0.25% (household bleach, e.g., Jik).
- Soaking instruments in glutaraldehyde solution.
- Washing hands and other contaminated parts of the body with soap and water
- Using gloves for all direct contact with blood and other body fluids.
- Soaking in bleach for 30 minutes, all soiled bed linen and clothing before general washing.
- Wearing gloves and taking care in all situations involving direct exposure to blood and body fluids, e.g., wound dressings, surgery and other invasive procedures, collection of laboratory specimens.

Handling Accidental Exposure to Contaminated Blood or Needle Stick Injury

These include immediate measures, post-exposure care, and post-exposure prophylaxis. They consist of the following:

Immediate measures:

- If the exposure is to the skin:
  - Decontaminate skin by washing thoroughly with soap
  - Squeeze the wound and let blood flow freely
  - Apply iodine, methylated spirit, betadine, or other virucidal agents
- If exposure is to the eyes:
  - Rinse thoroughly with sterile saline, eye irrigant and clean water splash
- If exposure is to the mouth/nose:
  - Flush with clean water, rinse
  - Use oral disinfectant

Post exposure care:

- Allay anxiety.
- Discuss safer sex/third party risks.
- Carry out HIV pre- and post-test counselling.
- Conduct serological testing:
  - Baseline HIV screening at injury
  - Repeat at 6 weeks, 3 months, and 6 months
- Post-exposure prophylaxis: This is carried out as soon as possible. It consists of AZT 300mg or d4T (30mg if wt<60kg, 40mg if >60kg) + 3TC 150mg twice a day for 28 days. For high risk exposure add LPV/r.

29. Nutrition, Growth, and Development

All children from conception require adequate nutrition for their growth, development, and normal function. Both under and over nutrition are undesirable and lead to disability. Currently, 31% of Kenya's children aged below 5 years are stunted. There is little information on the nutritional status of children aged 5–18 years, but it is known that poor nutrition leads to poor school performance. Nutritional needs vary according to the rate of growth. Both the rate of growth and nutritional needs are highest in utero, followed by the first year and gradually reducing until the adolescent growth spurt.

Stunted children will become stunted adults. The damage that occurs in utero and early childhood cannot be reversed later in life.

29.1 Foetal Nutrition

Foetal nutrition depends on the nutrition of mothers, meaning that good nutrition of the mother contributes to the good nutrition of the foetus. It is preferable that a mother be well nourished before conception and that she continues to get

adequate nutrition through pregnancy and lactation. Foetal under-nutrition predisposes to adulthood diseases such as diabetes and obesity, while micronutrient deficiency predisposes to congenital defects. It is therefore important to ensure adequate maternal nutrition. All programmes of maternal and reproductive health should have a component on maternal nutrition.

29.2 Infant and Young Child Feeding

This is centred on exclusive breastfeeding for 6 months and timely and adequate complementary feeding with continued breastfeeding up to 24 months. All infants should be breastfed unless there is medical contraindication. The national guidelines need to be followed to ensure prevention of malnutrition which is the main underlying cause of death in children aged below 5 years. Community support for appropriate breastfeeding is needed. Figures for 2003 indicated that only 2.6% of women at that time practised exclusive breastfeeding for the recommended 6 months. Mother should be prepared and counselled for breastfeeding during the antenatal and postnatal periods.

Although the recommendations for feeding in this section are strictly for ages 0–2 years, they can be extended to older children up to 3 years. Compliance with the feeding recommendations for infants and young children can be achieved with the help of support groups, which could have a number of additional activities on other aspects of health in the community.

Children aged 2–5 years are often on adult diets and this may not be sufficient for their needs. Consequently, families need the knowledge on how to feed them adequately (see Table 29.1). Some of these children may have started nursery school and may thus fit into the existing early childhood development (ECD).

Every facility providing maternal and child health (MCH) services should:

- Adhere to the National Infant Feeding Policy (Figure 29.1), which should be routinely communicated to all health staff and strategically displayed.
- Train all health care staff in skills necessary to implement this policy.
- Provide information to all pregnant and lactating mothers and their partners on the benefits and management of breastfeeding.
- Assist mothers to initiate breastfeeding within the first 30 minutes of birth.
- Give newborn infants no food or drink other than breast milk unless medically indicated (see specific guidelines on infants of HIV infected mothers – Table 29.2).
- Show mothers how to breastfeed and to maintain lactation even if they should be separated from their infants.
- Practice rooming-in, allow infants to remain with the mother 24 hours a day; Encourage breastfeeding on demand.
- Encourage and actively promote exclusive breastfeeding for infants up to 6 months.
- Provide information and demonstrate to mothers how to introduce and prepare appropriate nutritious complementary foods to their infants after 6 months of age.

- Encourage mothers to breastfeed for at least 24 months (see guidelines for HIV infected mothers).
- Foster the establishment of breastfeeding support groups and other support groups and refer mothers to them on discharge from hospital or clinic.
- ***DO NOT:***
  - Accept any free samples and supplies of breast milk substitutes.
  - Allow any publicity by the manufacturers or agents of breast milk substitutes.
  - Give any feeds using bottles or teats.

29.2.1 RECOMMENDED FEEDING FOR YOUNG CHILDREN

Young children's feeding requirements generally go through 3 phases, as shown in the following:

Age	Type of feeding recommended
Birth to 6 months	Exclusive breast milk. Breastfeed as often as the child wants day and night, at least 8 times in 24 hours.There should be no other food or milk or fluid offered (including water) for healthy babies except medicines including ORS when indicated.
6 to 12 months	Breastfeed on demand. If not breastfeeding, give 500ml of milk. Introduce enriched complementary foods like *uji* mixed with milk, sugar or oil.Mashed green vegetables, and proteins (plant or animal sources).Also give fresh fruit juice or mashed fruit.Feed 3 times a day if breastfed, and 5 times a day if not breastfed.
13 to 24 months	Breastfeed on demand.Continue energy rich foods, giving at least 5 times a day.

29.2.2 NATIONAL POLICY ON INFANT AND YOUNG CHILD FEEDING PRACTICES: SUMMARY STATEMENT

Figure 29.1 presents a schematic diagram that summarizes the national infant and young child feeding policy. Then, Figure 29.2 illustrates the knowledge links between voluntary counselling and testing (VCT) for HIV and healthy child feeding practices.

29.3 Healthy Feeding through Childhood

Eating habits are established during the first 2 years. By this time the child is eating family foods. Encourage child to eat, but respect the child's appetite. Do not force a child to eat. An adequate and balanced diet needs to be followed. Up to age 5 years, nutritious snacks are an essential part of the diet.

Organized feeding through the school years may help to prevent hunger, which affects the child's learning. In the low cost school, parents may offer food or service for the children. In high cost schools food and snacks sold in school shops/canteens should be healthy. Parents and teachers are responsible for this.

Figure 29.1: Summary of national infant and child feeding policy

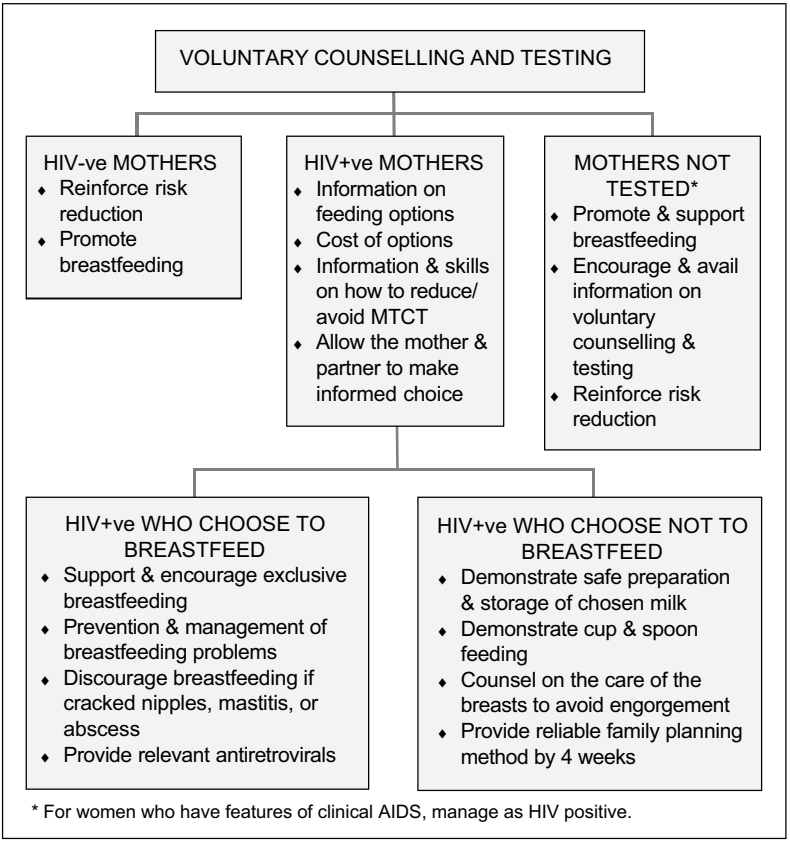
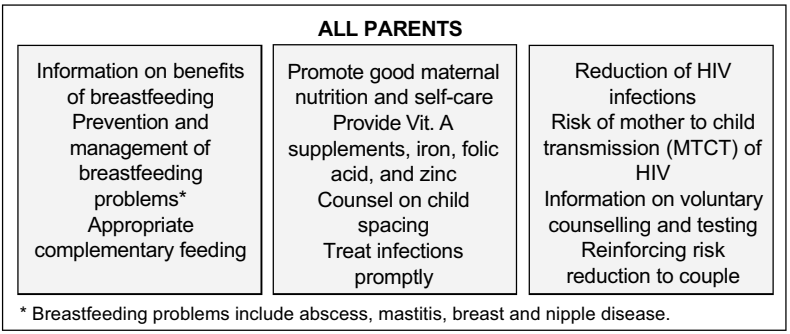


Figure 29.2: Information links between VCT and infant feeding



30. Growth Monitoring and Growth Promotion

Rate of growth is highest in the first year of life. It then gradually reduces until the child reaches puberty when there is another growth spurt that lasts 2–5 years.

Weight Gain
A term neonate aged 0–2 months gains 30g per day; an infant aged 2–6 months gains 20g per day. A child doubles birth weight at 5–6 months and triples birth weight at 12 months.

Increase in Height
Infants increase their height by about 25cm in the first year and 10cm in the second year.

Head Growth
Head growth is measured by head circumference. At birth head circumference ranges between 33cm and 37cm. Thereafter, it increases by 2cm per month for the first 0–3 months; by 1cm per month from 3 to 6 months of age; and lastly by 0.5cm per month from 6 to 12 months of age. These increments add to a total of 12cm by the end of the first year. Note that 80% of brain growth occurs in the first 2 years of life.

Head circumference below that expected for age is microcephaly, and above that expected is hydrocephaly or macrocephaly.

Growth Monitoring
Weight loss leads to wasting and is usually a sign of recent food shortage or illness. Inadequate gain in height or length leads to stunting and is a sign of chronic lack of food or illness. Use the following guide:

- Body mass index (BMI) = weight in kg x (height in metres)^2
- Children with BMI above the 85th percentile are overweight, while those above the 95th percentile are obese.

Serial weight and height measurement and recording on the growth chart should be done as part of maternal and child health (MCH) programme. Each child hasown growth curve, but if a child deviates from this curve the reason should be investigated.

Growth monitoring is important throughout childhood to detect not only failure to grow well but also features of over nutrition like obesity. Growth monitoring after 9 months is presently inadequate, however, as parents and health care providers have tended to associate clinic attendance with immunization. So after the measles vaccine at 9 months, few mothers see the need to come to clinic unless the child is unwell. Also, as the child grows bigger and maybe the mother has a new baby, the older child is no longer priority. Growth monitoring at community level has been in existence for a long time in Kenya, but probably not widespread.

It is necessary to make growth monitoring an important community activity. Community health workers (CHWs) can be trained and supported to carry out this activity. They together with the parents need to visualize the growth of children and seek help if the child is not growing appropriately (Table 30.1). All children up to age 5 years should be weighed regularly – preferably monthly.

Table 30.1: When a child does not grow well: Assess nutritional status

Classification	Signs
Normal	No low weight for age and no other signs of malnutrition
Very low weight	Very low weight for age Poor weight gain
Severe malnutrition	Visible severe wasting, "baggy pants" sign Oedema of both feet

To assess a child's growth, the CHWs need weighing scales and tools for length/ height measurement. Currently, however, readily available charts are only for children up to 5 years. Poor growth is detected by the regular use of the growth chart. Action must be taken as soon as a slowing growth is detected. The advice given to a mother depends on the age of the child (Table 30.2). The advice must be practical and the mother must be able to do what she is told.

When a child does not grow well:
- Assess the child's feeding.
- Ask what the child is fed.
- Ask how many times the child is fed in a day.
- Counsel the mother on feeding.

Table 30.2: Feeding recommendations children with poor growth or lack of growth

Age	Growth chart shows	Recommendations
0–6 Months	Poor or no weight gain for 1 month	Breastfeed as many times as possible, day and night. Check that mother is breastfeeding properly and that her diet is adequate.
	Poor or no weight gain for 2 months	As above. In addition, the mother should be encouraged to eat and drink enough. Refer child for investigation. Child may have hidden illness.
7–12 months	Poor or no weight gain	Breastfeed as often as child wants. Give adequate servings of enriched complementary feed at least 3 times a day if breastfed and 5 times if not breastfed.
13–24 months	No/poor weight gain for 1 month	Continue breastfeeding. Check diet composition and how much child takes. Advise on how to enrich the food. Feed 3 main meals. Give snacks at least 2 times between meals.
	Poor or no weight gain for 2 months	Continue feeding as above. Take history and refer.
>24 Months and over	Poor or no weight gain	Child should eat half as much food as the father. Child should be encouraged to eat with other children, but should have an adequate serving of food served separately. Take history and refer.

Follow up programme for child

- Review the progress of the child in 5 days.
- Reassess feeding.
- Counsel mother about any new or continuing feeding problems.
- If child is very low weight for age, ask the mother to return 14 days after the initial visit to monitor the child's weight.
- Encourage the mother to continue feeding until the child gains appropriate weight for age, if after 14 days the child is no longer very low weight for age.

Refer all children for further evaluation if:

- Weight has not increased in the last 2 months even though the advice on feeding practices has been followed by the mother/caregiver.
- Sick children are not gaining weight adequately. (Sick children may need to be referred immediately for other reasons.)
- Child continues to lose weight (consider TB, HIV infection among other problems).
- Child's weight is well below the bottom line on the chart.
- There is any sign of swelling of the child's feet and face (kwashiorkor) or indication of severe wasting (marasmus).

Advice to mothers should be:

- Well babies less than 6 months old need no other milk or food apart from breast milk.
- Adding oil or margarine or sugar, and milk, egg, or groundnuts makes *uji* and other energy and protein rich foods and helps young children grow well.
- Feed often like 5 times a day; small children have small stomachs.
- Feed older children at least 5 times a day – 3 family meals and 2 nutritious snacks.
- Feed sick children at least one extra meal per day and continue for 1–2 weeks after they recover.
- Continue to take interest in what the child feeds on even in the school years. Mothers should know that the children are likely to have poor school performance if not fed well.
- Avoid over feeding and limit non nutritious snacks especially if the child is over weight.

31. Development

Besides nutrition children need appropriate stimulation in order to reach their development potential. Both parents and health workers need to know the normal developmental milestones. The following list gives some of the major milestones.

Developmental milestone	**Normal limits**
Can lift head when prone	4 weeks
Social smile	4–6 weeks
Good head control	3–6 months

Turns to origin of the sound	2–3 months
Extends hand to grasp a toy	2–3 months
Sitting without support	5–9 months
Standing	7–13 months
Walking	12–18 months
Talking	9–24 months

Note: Refer for further assessment if a milestone delays beyond the normal age limit indicated above.

Children need simple, culturally appropriate toys to play with. Parents can be taught how to make simple toys with materials available in the home. Encourage parents to spend time with their young children.

32. Nutritional Disorders

32.1 Micronutrient Deficiency

32.1.1 IRON DEFICIENCY

The commonest sign of iron deficiency is anaemia, which is discussed in a later section. Iron deficiency negatively affects cognitive function. A school going child may perform poorly at school long before iron deficiency anaemia manifests. Iron deficiency also increases risk of infection.

Prevention

Diet should consist of iron rich foods like dark green leafy vegetables (whose iron is poorly absorbed), meat, liver, and other animal sources (whose iron is easily absorbed)

32.1.2 IODINE DEFICIENCY

Iodine deficiency leads to deficiency of thyroxine because iodine is involved in the production of thyroxine. The thyroid gland may be enlarged in an effort to produce more thyroxine, leading go goitre.

Prevention

Consumption of iodized salt is adequate prevention against iodine deficiency.

32.1.3 VITAMIN A DEFICIENCY

Vitamin A is a retinol ester that can be either ingested or synthesized within the body from plant carotene. It is important in maintenance of integrity of skin and membranes, immunity, and night vision. Deficiency of vitamin A results in increased rate of infection and increased mortality. In Kenya, about 75% of children aged below 5 years have vitamin A deficiency. Worldwide, vitamin A supplementation has been shown to result in a 23–34% reduction of all childhood mortality (6–59 months), 50% reduction in measles mortality, and 33% reduction in diarrhoeal disease mortality.

Vitamin A deficiency is a major cause of illness and blindness among poor communities worldwide.

Eye Manifestations of Vitamin A Deficiency
- Early signs include reversible dry cornea and night blindness
- Later signs include irreversible damage of cornea rupture and scarring, an Bitot's spots (white areas on lateral parts of the sclera). Blindness also develops as a consequence of vitamin A deficiency.

Prevention of Vitamin A Deficiency
- Encourage families to consume vitamin A rich foods, which include:
  - Animal products, for example liver, milk and kidneys.
  - Plant products, for example dark green leafy vegetables, yellow fruits and vegetables.
- Give vitamin A supplementation together with immunization.
- Give vitamin A supplementation routinely in the presence of the following conditions:
  - Malnutrition
  - Diarrhoea
  - Malaria
  - Tuberculosis
  - Pneumonia
  - Worm infestation
  - Fever
  - Measles

For children aged under 5 years it is important to ensure that they have not received Vitamin A in the last 1 month.

Treatment for Xerophthalmia
Affected children are given Vitamin A on day 1 and 2 and a third dose 1–4 weeks after the second dose. Children suffering from measles should be treated as if they have xerophthalmia.

32.1.4 VITAMIN D DEFICIENCY
Although there are no data from national surveys, vitamin D deficiency is commonly diagnosed in many parts of the country, usually during the second half of the first year. For children who were born premature, the deficiency is diagnosed much earlier.

Clinical Features
Children present with poor growth, delayed or regressed milestones, recurrent pneumonias, widening of the wrists, and prominence of costo-chondral junctions (rickety rosary).

Management
Refer all suspected vitamin D deficiency children to higher level for appropriate management.

Prevention
Children should be exposed to sunlight with minimal clothing for 30 minutes a day. For infants born preterm, supplementation with vitamin D at a dose of 4001U/day is recommended. In addition, the diet should provide adequate calcium and phosphate, which are usually inadequate from milk for the infant and young child.

32.2 Macronutrient Malnutrition

Macronutrient malnutrition presents as protein–energy malnutrition (PEM). PEM is a common disorder that covers a wide spectrum of deficiency in nutrition ranging from mild or underweight to severe forms like marasmus and kwashiorkor. The first sign of PEM is poor weight gain.

Clinical Features
The clinical features are itemized for the two severe forms or malnutrition, kwashiorkor and marasmus, in Table 32.1. Each of these features varies from mild to severe. A child may have combination of features for both kwashiorkor and marasmus, and is then diagnosed to have marasmic kwashiorkor.

Table 32.1: Indications of severe malnutrition

Kwashiorkor	Marasmus
Pedal oedema	Very low weight for age
Low weight	Gross loss of subcutaneous fat
Apathy	”Wise old man look”
Poor appetite	Good appetite (if no complications)
Muscle wasting	Severe muscle wasting
”Flaky paint” dermatosis	
Hair changes (thin, sparse)	

Classification
“Weight for height” is now used for classifying malnutrition for the sake of deciding on management options rather than “weight for age” because weight is affected by stunting. It is known that that children who are less than 60% for their “weight for age” may be so mainly because of stunting and such children do not need hospital treatment. Mid upper arm circumference (MUAC) can also add value.

Consequently, the following classifications are available for children with macronutrient malnutrition:
- ***Mild malnutrition:*** Child <5 yrs who is failing to gain weight for 2 months.
- ***Moderate malnutrition:*** Weight for height Z score between > -3SD and < -2SD, MUAC >11.0cm and < 12.5cm.
- ***Severe malnutrition:*** Weight for height Z score < -3SD, MUAC <11.0cm with or without oedema. If weight for height is not available, use “visible severe wasting”.

Children with macronutrient malnutrition may have the following additional features or complications in varying degrees and combinations:

- Anorexia
- Lower respiratory infections
- Fever
- Hypothermia
- Vomiting
- Diarrhoea with or without dehydration
- Altered consciousness
- Severe anaemia

Management

For mild malnutrition:

- Advise fortnightly attendance at the clinic for nutritional counselling and growth monitoring.
- Treat any intercurrent problem, e.g., diarrhoea, pneumonia, malaria.
- Check HIV status.

The child should be referred to higher level for appropriate management if:

- There is no change after 2 months.
- Child develops moderate to severe malnutrition.

For moderate malnutrition:

- Patients with this degree of malnutrition can be treated as an outpatient with food supplementation and nutrition counselling.

For severe malnutrition:

- Assess such children for the presence of complications such as dehydration, shock, severe anaemia, hypoglycaemia, hypothermia, malaria, pneumonia, septicaemia, and mouth ulcers.
- If the children do not have any of these complications or problems, and have good appetite and are alert, treat as outpatients with ready to eat therapeutic food.
- Review weekly until weight for height Z score is > -2, MUAC is >11.0cm, and there is no oedema.

☛ **If children have the complications mentioned and/or have poor appetite and/or are not alert, they should be referred urgently for admission after stabilization.**

Prevention

Preventive strategies for macronutrient malnutrition include the following:

- Provide appropriate nutritional advice in the MCH clinic (breastfeeding and complementary feeding). Advise mother on how to mix nutritious food from the 3 food groups.
- Show mothers how to provide sensory stimulation to their children.
- Use growth chart in the MCH clinic for all children aged below 5 years.

- Provide health education to parents attending all health facilities and in the community on appropriate child rearing and feeding.
- Advocate for hygiene in food preparation.
- Advocate for environmental sanitation.

33. Children with Special Health Needs

33.1 Failure to Thrive

A child whose physical growth is significantly below that expected for age is said to have "failure to thrive". Failure to thrive is placed in two categories: non-organic and organic failure to thrive.

Non-Organic Failure to Thrive
In this category, the child is usually less than 5 years with no underlying medical condition. The failure to thrive might be due to maternal emotional problems, child might have been unwanted, or there might be severe poverty. In some circumstances this form of failure to thrive could constitute child abuse.

Clinical features include the following: Besides the size, child is often unkempt, has delayed social motor and speech development, and there is poor parent–child interaction.

Organic Failure to Thrive
The child with this category of failure to thrive has an underlying medical condition that is usually a chronic illness, for example a chronic infection like TB or HIV kalaazar; a major congenital malformation; or an endocrine or metabolic disorder.

A complete history including nutritional, social and growth monitoring is essential. In non-organic FTT the mother's history may be inconsistent, or show no concern for the child. A thorough physical examination for all forms of failure to thrive is essential.

☛ **Refer to higher level for appropriate management.**

33.2 Child Abuse and Neglect

Child abuse is maltreatment of children or adolescents by parents, guardians or other caregivers. Early recognition is very important for prompt intervention.

Most child abusers (90%) are related caregivers who tend to be lonely, unhappy, angry and under heavy stress, many of them having experienced abuse of one form of another during their own childhood.

Abused children may have certain provocative characteristics, such as negativity, difficult temperament, or offensive behaviour, or disability. Types of child abuse are in various forms, including:

- Physical abuse (non-accidental trauma): This is the commonest form of child abuse. It manifests as physical injuries that include bruises, burns, head injuries, and bone fractures. Their severity can range from minor bruises to fatal injuries.
- Emotional abuse: This type of abuse is characterized by intentional verbal acts, criticisms, and lack of nurturing. This type is very difficult to prove.
- Nutritional neglect or deliberate underfeeding is associated with failure to thrive.
- Sexual abuse usually occurs with family members and is the most overlooked (or under reported) form of abuse. Types of sexual abuse include molestation, sexual intercourse, and rape.
- Others: These may involve intentional drugging (or poisoning) or neglect of medical care.

Clinical Presentation

These may manifest as unexplained inconsistent injuries and delay in seeking medical help for the injuries. Sexual abuse may remain concealed for fear of reprisal from the perpetrator; often the victim (in this case the abused child) does not know what to do or where and how and to whom to report. Most victims report to a health facility due to acute stress or vaginal bleeding, STIs, UTI, enuresis, encopresis (faecal incontinence in absence of organic defect), or pregnancy. Children with nutritional neglect present with failure to thrive, poor hygiene, delayed immunizations, delayed development in speech, mental status and social interaction.

☛ **Most abused children are shy, with expressionless faces, and tend to avoid eye contact.**

Investigations

For children who are suspected to be abused, the following are recommended:

- Thorough history and examination for all types of abuse, indicating who accompanies the child to the health facility. Precise documentation is important.
- In physical abuse, total skeletal survey is recommended (x-ray may find fractures at various healing stages).
- Sexual abuse: Examine for sperms, acid phosphatase, and infections, e.g., gonorrhoea. Rape cases may require examination under GA to determine the type and extent of genital injury.
- Nutritional neglect: Must rule out all other causes of failure to thrive.

Management

☛ **Refer all children considered to be victims of child abuse to higher level for appropriate management.**

Reasons why a child suspected to be abused should be admitted include the following:

- The diagnosis might be unclear, and admission may be important for the child because of consideration for immediate safety, or the state of the child may require medical or surgical intervention.
- The need to remove the child from the source of the abuse in order to protect the child until the evaluation of the family with respect to the safety of the child is completed.
- The needs of the perpetrator for psychiatric evaluation and care.
- The need to involve the police and the social worker for more effective management of such a child.

For children who experience rape or sodomy, the following need to be done:

- Refer urgently for evaluation and prophylaxis for HIV/AIDS.
- Do not remove clothes or wash the child.
- Report to police, social worker, and children's officer.

Prevention

Health workers should have a high index of suspicion on likelihood of abuse. Older children should be encouraged not to keep "secrets" and to refuse any enticement to have what could be sexual abuse. Children who are in high-risk situations should be removed from that environment and not left there.

☛ **Referral for these children is necessary for long-term psychological and psychiatric care.**

34. Gastrointestinal Conditions Other Than Diarrhoea

34.1 Infestation with Worms

This is a common condition in children. Various types of infestations and their investigation are summarized in Table 34.1; drug treatments are shown in Table 34.2.

☛ **HOOKWORM** – Anaemia develops if iron intake is slow and infection is significant. If patient fails to respond to therapy consider other cause, e.g., blood loss, poor compliance.

De-worm children above 2 years at least every 6 months – with mebendazole 500mg STAT.

Prevention

Appropriate prevention depends on the particular worm. In general, the following measures should be instituted:

- Providing safe water
- Washing hands and trimming fingernails
- Changing innerwear and bed sheets frequently
- Using latrines.
- Wearing shoes/sandals

Table 34.1: Specific worm infestations, their clinical features, and investigations required for diagnosis

Worms	Clinical features	Investigations
Ascaris lumbricoides (roundworms): Large round, cream coloured worms that live in the small intestines	▫ Infection by swallowed embryonated eggs ▫ Loef?er's syndrome ▫ Mild bouts of recurrent colic ▫ The mother has seen the worm in stool or vomitus ▫ Complications such as obstruction, vomiting may occur	Stool for ova
Hookworms	▫ "Ground itch" ▫ Features of anaemia (iron deficiency)	Stool for ova Haemogram
Trichuris trichiura (whipworms)	▫ Diarrhoea with blood ▫ Rectal prolapse ▫ Anaemia ▫ Wasting	Stool for ova Worms may be seen adhering to rectal mucosa
Strongyloides stercoralis	Most infections are asymptomatic but the following may occur: ▫ Larva currens (buttocks) ▫ Soiling of innerwear with stool ▫ Hyperinfection syndrome ▫ Diarrhoea ▫ Gram-negative septicaemia ▫ Bacterial peritonitis ▫ Encephalitis	Direct stool microscopy (motile larvae, adult worms
Enterobius vermicularis oxyuriasis (pin worm) Synonyms: Threadworm, pinworm, seatworm. The worm is 4mm long and is just visible to the human eye	Mode of spread *Auto-infection:* ▫ Direct anal to mouth transfer via the fingernails ▫ Retro- infection; eggs may hatch into larvae at the anal-rectal area. Then larvae move retrogradely to the caecum. *Cross infection:* ▫ Contamination of fingers by clothing, objects, toilet seats, etc. ▫ By inhaling and swallowing eggs in the dust *Main presentation:* Perianal and perineal itching. Migrating larvae may cause: ▫ Vaginitis, vulvitis, salpingitis, and peritonitis ▫ Irritation, insomnia may occur	Stool for ova Ova can be obtained from the perianal region by use of adhesive tape
Taenia saginata (beef tapeworm)	▫ Non-specific symptoms, irritability ▫ Segment may be passed with stools ▫ Egg in stools	Stool for ova (motile proglottides)

Table 34.2: Drugs and their dosages for common worm infestations

Worms	Adults	Children
Ascaris lumbricoides (Roundworm)	Levamisole 2.5mg/kg as a single dose *OR* Albendazole 400mg STAT	Levamisole 2.5mg/kg as a single dose *OR* Albendazole 200mg STAT for children under 2 years
Hookworm	Levamisole 2.5mg/kg as a single dose *OR* Albendazole 400mg STAT	Levamisole 2.5mg/kg as a single dose Albendazole 200mg STAT for children under 2 years + ferrous sulphate
Trichuris trichiura (whipworm)	Albendazole 400mg STAT	Albendazole 200mg STAT for children under 2 years
Strongyloides stercoralis	Albendazole 400mg BD x 3 days *OR* Thiabendazole 25mg/kg x 3 days	Albendazole 200mg BD x 3 days *OR* Thiabendazole 25mg/kg x 3 days
Enterobius vermicularis (pinworm)	Albendazole 200mg STAT for children 12 months up to 24 months and 400mg STAT for children above 2 yrs	Albendazole 200mg STAT for children 12 months up to 24 months and 400mg STAT for children above 2 years
Taenia saginata (beef tapeworm)	Niclosamide 2g; 1g before breakfast, 1g 1 hour after breakfast	>6 years 1g before & 1g after breakfast 2–6 years 500mg before and 500mg after breakfast < 2 years 250mg before and 250mg after breakfast

34.2 Amoebiasis

This is an infection usually of the colon by Entamoeba histolytica. Most of the people infected by E. histolytica are asymptomatic cyst carriers. Two diseases caused by E. histolytica are amoebic dysentery and amoebic liver abscess.

Clinical Features

- ***Amoebic dysentery:*** This presents as bloody diarrhoea and depending on the severity of infection there may be varying degrees of dehydration.
- ***Amoebic liver abscess:*** This presents as intermittent fevers, night sweats and tenderness in the right hypochondrium and with difficulty in breathing for some of the patients. The abscess may rapture into the chest causing empyema or into the abdomen, causing peritonitis.

Management

Refer patients to higher level for appropriate management

34.3 Schistosomiasis

This is infection with blood flukes of the genus Schistosoma, which may cause chronic disease of intestines, liver, and genitourinary tract. Adult flukes are white worm-like creatures that inhabit parts of the venous system of humans. All the worms need a molluscan (snail) intermediate host. Important species of schistosomiasis in Kenya are Shistosoma haematobium and Shistosoma mansoni. Adult worms live and copulate within the veins of the mesentery.

The sexually mature worms are mainly found in the intestinal veins for Shistosoma mansoni while those of Shistosoma haematobium are mainly located in the venous plexus of the genitourinary tract. Eggs that are laid penetrate the intestinal or bladder mucosa, pass into the lumina, and are passed in faeces or urine. Once passed, the eggs hatch in fresh water liberating cercariae that multiply in snails (intermediate host) and produce thousands of cercariae. These penetrate human skin within a few minutes after exposure and transform into schistosomiasis which develop into sexually active adult worms in the intestinal veins or venous plexus of genitourinary tract depending on the species. An adult worm's lifespan ranges from 3–37 years. Shistosoma haematobium is common along the coastline, especially along Tana River, Kwale, and Lamu. Shistosoma mansoni, on the other hand, is widespread, and occurs particularly in Machakos, the rice schemes, parts of Nyanza, and even Nairobi.

Clinical Features
Acute dermatitis and fever after exposure are rare presentations. Occasionally transverse myelitis and convulsions may occur. Chronic schistosomiasis is the main presentation in Shistosoma mansoni, manifesting with portal hypertension, splenomegaly, anaemia and oesophageal varices. On the other hand, Shistosoma haematobium may present with terminal haematuria, dysuria and may progress to obstructive uropathy; bladder cancer has been noted as a late complication in some these patients.

Metastatic eggs can be found in other organs such as the spinal cord and brain. It has also been noted that Salmonella infections, presenting as recurrent pyrexia, are difficult to eradicate until schistosomiasis has been treated.

Investigations
- S. mansoni: Take stool and examine for ova, using concentration or Kato technique
- S. haematobium: Examine urine for RBC and for ova of Shistosoma haematobium

Management
Shistosomiasis should be treated with praziquantel 20mg/kg BD for one day (effective against all types). Patients should be examined for living eggs and if positive to be given another course of treatment.

Refer to higher level for appropriate management if:
- There are features of obstructive uropathy.
- There are feature of portal hypertension.

Prevention
Preventive strategies against schistosomiasis should include the following:
- Avoid contact with contaminated water.
- Give mass chemoprophylaxis to school age children in endemic areas.
- Improve environmental hygiene, advocating use of toilets by communities.
- Eradicate snails, which are the intermediate hosts.

34.4 Gastrointestinal Bleeding

Clinical Features
Gastrointestinal bleeding may present as blood in vomitus or in stool. In either case, there may be frank red blood or altered blood that looks like coffee grounds or there might be black stool Bleeding may occur from the upper or lower gastrointestinal tract. The amount of bleeding varies depending on the cause of bleeding. Massive bleeding can present with features of shock.

The common causes of upper gastrointestinal bleeding include the following:
- ***The newborn:***
  - Swallowed maternal blood: In this situation the baby looks well.
  - Stress ulcers often following birth asphyxia.
  - Coagulopathy: DIC associates with asphyxia, sepsis. vitamin K deficiency.
  - Necrotizing enterocolitis (NEC): More common in sick preterm infants.
- ***Infants and children:***
  - Swallowed blood following epistaxis (history of epistaxis)
  - Gastritis
  - Oesophageal varices
  - Gastric/duodenal ulcers

At all ages the common causes of lower gastrointestinal bleeding include the following:
- Anal fissure.
- Infectious diarrhoea (including NEC in neonates, shigella, campylobacter, salmonella, amoebiasis and schistosomiasis).
- Coagulopathy due to bleeding disorders that include liver disease and DIC.
- Intussusception, which is more common in infants and young children.

Management
If there is shock, initiate treatment for shock according to the guidelines given under Emergencies. Otherwise, urgently refer to higher level for appropriate management all sick neonates and children with gastrointestinal bleeding.

34.5 Vomiting

Clinical Features
Vomiting in children may be due to a systemic infection or may accompany diarrhoea, as it often happens. Vomiting may also be due to upper gastro-intestinal tract; vomiting may be the primary presentation for this condition.

☛ It should be noted that many normal babies regurgitate milk regularly and are clinically normal with normal growth. ***These are not considered to be having a vomiting problem.***

The common causes of gastrointestinal obstruction include the following:
- Early infancy
  - Gastro-oesophageal reflux disease (GORD), which initially presents as painless and persistent vomiting.
  - Pyloric stenosis, which presents as projectile vomiting and with a mass palpable in the right upper abdominal quadrant in the affected children.
  - Congenital upper gastrointestinal obstruction.
- Later infancy/early childhood
  - Intussusception that presents with intermittent acute pains and blood in the stool. A mass may be palpable in the abdomen

Management
- Avoid antiemetics.
- Treat non obstructive causes appropriately and refer all that do not respond well after 24 hours of therapy.
- Initiate rehydration according to degree of dehydration, using normal saline in the acute phase.
- Refer urgently to higher level for appropriate management all patients with obstructive features and those with gastroesophageal reflux disease.

34.6 Peptic Ulcer Disease

This refers to ulceration of gastric or duodenal mucosa that has a tendency to being chronic and/or recurrent.

Clinical Features
Duodenal ulcer has the following features:
- Presents with epigastric pain that is typically nocturnal and also when the patient is hungry.
- May present for the first time with complications (described below).
- There is wide individual variation in presenting symptoms and in the food that gives pain or discomfort when eaten.
- 95% of duodenal ulcers are caused by Helicobacter pylori (H. pylori).

Gastric ulcer presents with epigastric pain that is worse after eating food. Other symptoms are similar to those for duodenal ulcers.

Complications
Chronic blood loss may lead to iron deficiency anaemia, and acute bleeding results in haematemesis or melaena stool.

Management
Avoid any foods that in the patient's experience, give pain. Avoid obviously acidic foods for example cola drinks. Avoid gastric irritating drugs (NSAIDs). Give magnesium based antacids or combined magnesium-aluminium compounds, liquid preferred. Adjust dose to limit pain.

☛ **Refer to higher level for appropriate management.**

34.7 Constipation and Encopresis

Clinical Features

- Constipation is failure to open bowels regularly and is often accompanied by painful passage of hard stool. It may be associated with soiling of pants
- Encopresis is intermittent leakage of soft/watery stool in a child with chronic constipation.

Constipation may be caused by obstructive lesions (these include congenital or acquired defects) or by neurological or endocrine abnormalities (hypothyroidism), or they may be functional.

☛ Note: Exclusively breastfed infants may take several days without passing a stool. But when they do the stool is soft. This should not be confused with constipation.

Management

Children with perceived constipation are often treated at home with herbs and even enemas. However, this mode of treatment may make it difficult to diagnose this condition and may lead to some complications. The inclusion of bananas or pawpaw in the diet may be beneficial, especially in increasing fibre intake. For disimpaction, use glycerine suppositories for all ages. Refer all children with suspected nonfunctional lesions and any child that fails to respond to disimpaction of stool.

35. Disorders of the Liver and Spleen

35.1 Hepatosplenomegaly

Liver enlargement is said to have occurred when the liver measures more than 3cm below the costal margin or has a liver span greater than normal for age. Enlargement of the spleen, on the other hand, is said to have occurred if the spleen is “just palpable”. Refer to Table 35.1 for a summary of the causes of these conditions.

☛ **Refer to higher level for appropriate management**

35.2 Jaundice after the Neonatal Period

Definition: Yellow discolouration of skin and mucous membranes due to excess bilirubin. It is also referred to as hyperbiliribinaemia, usually with serum bilirubin at that time of >2mg% (35.2µmol/L). Jaundice is a clinical feature and not a diagnosis. Any patient with jaundice should be appropriately evaluated to determine the cause of the jaundice so as to institute appropriate management.

Hyperbilirubinaemia is categorized according to the site of the abnormality in the metabolism and excretion of bilirubin: pre-hepatic, hepatic or post-hepatic. Thus:

Table 35.1: Causes of hepatosplenomegaly

Category of causes	The specific causes associated with hepatomegaly	The specific causes associated with splenomegaly
Infections	Malaria kala azar Schistosomiasis Infectious hepatitis Amoebic hepatitis/abscess Brucellosis	Malaria/tropical splenomegaly HIV Kala azar (leishmaniasis) Schistosomiasis Infectious hepatitis Brucellosis Other infections, like SBE, typhoid fever, infectious mononucleosis
Blood	Haemolytic anaemia Leukaemia	Haemolytic anaemia, e.g., sickle cell anaemia in child <3 years autoimmune haemolytic anaemia Leukaemia
Nutrition	Kwashiorkor	Iron deficiency
Congestion	Cardiac failure	Portal vein thrombosis
Other	Liver tumours Displaced rather than enlarged liver	Liver cirrhosis (portal hypertension) Juvenile rheumatoid arthritis, SLE

- ***Pre-hepatic:*** This is due excess intravascular release of bilirubin, often by haemolysis)
- ***Hepatic:*** This is due to hepatocyte dysfunction with faulty uptake, metabolism, or excretion of bilirubin.
- ***Post-hepatic:*** This is due to blockage of bile and its constituents so that they do not exit from the biliary system (this may result from common bile duct obstruction or intrahepatic cholestasis).

The common causes of Hyperbilirubinaemia include viral hepatitis, haemolytic anaemia (e.g., sickle cell, malaria), cirrhosis, biliary obstruction, hepatoma, and drug induced reactions.

Clinical Features

Meticulous history and physical examination are important before ordering investigations. The history should include exposure to hepatotoxic drugs, known history of haematological disorder, history suggestive of viral hepatitis (anorexia, nausea, and aversion fatty foods), and history suggestive of obstructive jaundice (of dark urine, pale stool and pruritus)

Physical examination should look for features suggestive of cirrhosis (spider naevi, gynaecomastia, loss of axillary hair, parotid gland enlargement and ascites) or features suggestive of parenchymal liver disease or haemolytic jaundice (splenomegaly).

Management

Patients with history and physical findings suggestive of viral hepatitis could be managed as outpatients requiring advice on bed rest, and should be given multi-vitamins. However, refer all patients to higher level for appropriate management. Consider hepatic encephalopathy in any patient who has jaundice and mental complaints. Early treatment of hepatic encephalopathy may reduce mortality.

35.3 Obstructive Jaundice beyond Neonatal Period

This refers to jaundice caused by obstruction of bile in the biliary tree. It can be due to intrahepatic or extrahepatic causes.

Clinical Features
These include the following features:
- Jaundice and pruritus, which can be severe, with steady increase in jaundice.
- Distended gall bladder.
- Anorexia.
- Trouble some diarrhoea with foul smelling and pale stool.
- Dark urine with a history of flatulence.

The causes of obstructive jaundice include the following:
- Those that are intraluminal include gallstones that can dislodge from the gallbladder and get impacted in the common bile duct (CBD) and helminthiasis especially ascaris and liver flukes.
- Those within the wall or mural include primary sclerosing cholangitis.
- Those acting outside the wall or extramural include enlarged lymph nodes of any cause, and neoplasms.
- Other causes include iatrogenic trauma to the ducts during surgery (especially cholecystectomy).

☛ Refer to higher level for appropriate management

36. Haematologic Conditions

36.1 Anaemia

Patients with anaemia have a reduction in total red blood cell mass, decreased concentration of red blood cells (RBC), and reduced haemoglobin (Hb) in the peripheral blood, resulting in a corresponding decrease in the oxygen carrying capacity of the blood.

The average normal haemoglobin levels for the various ages in childhood are shown in Table 36.1:

Table 36.1: Normal childhood haemoglobin levels

Age category in childhood	Average haemoglobin level
Newborns	14g/dl
Children aged under 5 years	10g/dl
Children aged 5–9 years	11g/dl
Children aged 9 years and above	12g/dl

Anaemia except in the newborn may therefore be classified as follows as follows:
- Severe anaemia: Haemoglobin below 5g/dl.
- Moderate anaemia: Haemoglobin of 5–8g/dl.
- Mild anaemia: Haemoglobin above 8g/dl but below normal for age category.

The common causes of anaemia in Kenya are the following:
- Haemolysis of red blood cells caused by infections like malaria or congenital abnormalities like haemoglobinopathies exemplified by sickle cell disease.
- Iron deficiency due to chronic blood loss from bleeding, following parasitic infestation like hookworm, or nutritional deficiency of iron,
- Reduced production of red blood cells by the bone marrow due to depression of its function by chronic illness, infection, infiltration or just failure to produce blood cells (aplasia)

Clinical Features
Meticulous history and examination are essential in order to identify the cause of the anaemia. Pallor of the palms is a useful indicator of anaemia and is classified into two categories: “some pallor” for mild to moderate anaemia and “severe pallor”. Other features of severe anaemia include irritability, listlessness, anorexia, easy fatigability, heart failure, and shock. Additiona; clinical features depend on the underlying cause of the anaemia.

Management
- For anaemia due to malaria, manage the malaria is according to the guidelines given under the malaria section in this chapter. In addition, give folic acid to all patients who have malaria and anaemia:
  - Below 2 years of age: 2.5mg daily for 3 months
  - Above 2 years of age: 5mg daily for 3 months
  - Continue with the doses once weekly as for malaria prophylaxis above
- For anaemia due to iron deficiency, the following needs to be done:
  - If severely anaemic, refer urgently to hospital.
  - If the anaemia is mild or moderate and the patient is not severely malnourished, give iron and folate orally.

☛ **Review the child every 2 weeks.**

- For anaemia due to worm infestation, deworm using albendazole or mebendazole: Iron therapy should be continued until normal haemoglobin is achieved, usually after 3 months of treatment (1 month’s treatment corrects the anaemia while the other 2 months treatment is needed to build up iron stores). The dose of iron is usually 6mg/kg/day of elemental iron (or 30mg of ferrous sulphate which contains 6mg of elemental iron) to a maximum of 200mg 3 times a day

☛ **Iron should not be given in the presence of sickle cell disease, so as to avoid excessive iron load in the body that might result in toxicity.**

- Refer all patients with severe anaemia or who fail to respond to treatment to higher level for appropriate treatment.
- Advise mothers to give a balanced and adequate diet to all children. Iron and folate containing foods include meat, fish, liver, eggs, dark green leafy vegetables, and yellow fruits.

36.2 Sickle Cell Anaemia (Disease)

This is a chronic haemolytic anaemia found mainly in Nyanza, Western, and Coast provinces. It is characterized by sickle-shaped red blood cells as a result of homozygous inheritance of Haemoglobin S. Because sickled red blood cells are fragile and cannot withstand the trauma of being squeezed through capillaries during circulation, haemolysis occurs in the small blood vessels. These abnormal red blood cells are also destroyed within the spleen.

Clinical Features (Presentation)
Symptoms of sickle cell disease or anaemia usually start around the age of 6 months and include the following:

- Pain and swelling of the hands and feet (hand and foot syndrome)
- Anaemia and mild jaundice
- Impaired growth and development
- Susceptibility to infections (including malaria, Haemophilus influenza, Streptococcus pneumoniae)
- Hepatosplenomegaly
- Acute splenic sequestration blood with resultant cardiovascular collapse

As the child grows pain predominates, being experienced as:

- Bone pain, involving the long bones, the back, and the head.
- Severe abdominal pain with vomiting.
- Acute chest syndromes (sudden onset of fever, chest pain leucocytosis, and pulmonary infiltrates on x-ray) that may be fatal.

Other features of sickle cell disease include:

- Aplastic crisis
- Priapism (painful erection of the penis)
- Hyperhaemolytic crisis
- Impaired renal function
- Avascular necrosis of the femoral head is common
- Occlusion of major intracranial vessels that may lead to hemiplegia, cranial nerve palsies and other neurological deficits
- Bossing of the skull that might be “tower shaped” skull.

Management
Management options for sickle cell disease include:

- Adequate diet to prevent growth failure due to malnutrition
- Adequate hydration, therefore avoiding dehydration by encouraging the child to drink as much as possible
- Allowing activity according to tolerance

- Avoiding exposure of the child to precipitating conditions, e.g., exposure to cold
- Seeking medical care early
- Giving prophylaxis for malaria
- Give supplementary folic acid but avoiding administration of iron
- Ensuring adequate immunization including that of pneumococcal vaccine if
- possible.

☛ **Refer all new patients for appropriate diagnosis and initiation of proper management.**

Management of Sickle Cell Crises

For all patients with sickle cell crisis the following should be done:

- Intravenous or oral fluids should be given and their intake monitored carefully
- Infections should be treated vigorously and promptly
- For patients with thrombotic (vaso-occlusive, painful, or infarctive) crisis the following should be done:
  - Assess severity of pain carefully and give appropriate analgesia at all times.
  - For mild pain give paracetamol, diclofenac or ibuprofen.
  - For moderate pain use give dihydrocodeine, codeine phosphate.
  - For severe pain give analgesia and refer to hospital.

☛ **Refer all patients with aplastic, sequestration, and haemolytic crises to higher level for appropriate management.**

37. Neoplasms in Childhood

Neoplasms can occur in any age group. In general most neoplasms require referral to hospital facilities and skill for treatment. All suspected malignancies or those whose diagnosis is unclear should be referred early to higher level for appropriate management. Early treatment of malignancies carries the best prognosis. See Table 37.1 for a summary of the features, investigations, and management of various tumours.

Table 37.1: Common childhood malignancies, their clinical features, useful investigations, and line of management

Tumour	Clinical features	Investigations	Management
Leukaemias	Anaemia bone pains, haemorrhagic tendencies, epistaxis and gum bleeding Repeated infections	Haemogram Bone marrow Cytochemistry Flowcytometry	Refer to haemato-logist/oncologist for specialized care for chemotherapy
Burkitt's lymphoma	Usually a jaw tumour May also present as an abdominal mass or central nervous system tumour	Biopsy of the mass; haemogram, bone marrow, x-ray, ultra-sound scan CT scan, PET scan Lumbar puncture	Refer for specialized care

Continued

Table 37.1, *Continued*

Tumour	Clinical features	Investigations	Management
Hodgkin's disease	Lymph node enlargement, usually cervical Splenomegaly abdominal masses	Haemogram Chest x-ray Lymph node biopsy for histology and immunohisto-chemistry Bone marrow	Refer for specialized care for chemotherapy with or without radiotherapy
Nephroblastoma (Wilms' tumour)	Average age 2 years: Embryonal tumour Early childhood Painless loin mass (abdominal mass) Fast growing	Full haemogram U/E in normal IVU (intravenous urography) shows displaced calices FNAC shows malignant embryonal tumour cells CXR for metastasis	Refer to specialized care Chemotherapy Surgery – nephrectomy with post surgical chemotherapy has good prognosis
Neuroblastoma	Embryonal tumour Abdominal mass in loin region Markedly elevated blood pressure Fast growing often crossing midline Child is sick looking	Full haemogram IVU shows caudally displaced normal kidney FNAC – malignant embryonal cells Ultra sound shows supra renal tumour with normal kidney CXR – look for metastasis, 24 hr urine – VMA grossly elevated	Refer to specialist centre Chemotherapy Surgery NB: Challenging anaesthesia, has poor prognosis
Dysgerminoma	Commonest midline tumour in neonatal period Commonest in ovary, testis, thymus, sacrococcygeal (most dramatic – teratoma) Presents with pressure symptoms May ulcerate especially when malignant	Plain x-ray may show calcification U/S – defines extent/site of tumour Foetoprotein tumour marker	Surgical excision; if benign, leave alone; if malignant, chemotherapy Good prognosis

38. Cardiovascular Diseases In Children

Most cardiac diseases in young children are congenital, while those in older children may be acquired or congenital. The heart may also be affected by systemic disorders like pneumonia, anaemia, electrolyte imbalances and malnutrition.

Clinical Features

The clinical features depend on the severity of the lesion or defect in the heart. Minimal lesion or defect may only be discovered on routine examination. Major ones may lead to functional disability. Easy fatigability and difficulty in breathing are prominent features of cardiac dysfunction; frequent interruptions of breastfeeding accompanied by sweating may be the manifestation in infants. Other features include poor weight gain and poor growth. The affected children have stature and nutrition that is usually below the average for the age and also have frequent respiratory infections.

A physical examination that consists of evaluation of pulses in all limbs and of blood pressure, apex beat and heart sounds, and inspection of the precordium is likely to detect the specific cardiac lesion. The presence of a murmur indicates presence of a defect but does not indicate its size. Cyanosis and digital clubbing are often noted in children with cyanotic heart diseases.

Parents can usually notice that the affected child has a problem although they may not be able to localize the problem. A young baby who gets tired quickly or who has to pause many times while breastfeeding, or looks breathless or is not growing well, or has a darkish bluish tinge on the lips and tongue should be suspected to have a heart problem and should be taken to a health facility for examination.

☛ **Innocent murmurs occur at any age but are commonest among neonates.**

38.1 Heart Failure (Congestive Cardiac Failure)

Heart failure occurs when the heart is unable to supply output that is sufficient for the metabolic needs of the tissues in the face of adequate venous return. Any severe cardiac condition, severe pneumonia, or anaemia can lead to heart failure.

Signs of Cardiac Failure

- Among infants and young children cardiac failure manifests as feeding difficulties and excessive sweating, rapid weight gain, tachycardia, gallop rhythm, respiratory distress, and tender hepatomegaly.
- Among older children cardiac failure manifests in addition with raised jugularvenous pressure, dependent oedema, orthopnoea, fatigue, exercise intolerance, and basal crepitations.

Management

Refer all children with diagnosed or suspected cardiac disease to higher level for appropriate management.

38.2 Pulmonary Oedema

Pulmonary oedema is accumulation of fluid in the alveoli due to an increase in pulmonary capillary venous pressure resulting from acute left ventricular failure.

☛ **This is an acute emergency.**

Clinical Features

Breathlessness, sweating, cyanosis, frothy blood tinged sputum, respiratory distress, rhonchi and crepitations.

Management
Give a dose of IV frusemide 0.5–2mg/kg/dose and refer urgently to higher level for appropriate management.

38.3 Congenital Heart Disease with Cyanosis

The congenital cardiac abnormalities that are associated with cyanosis are associated with shunting of blood from the right side of the heart to the left side. These include the following cardiac abnormalities:
- Tetralogy of Fallot
- Pulmonary atresia with ventricular septal defect (VSD)
- Transposition of the great vessels
- Truncus arteriosus (associated VSD is always present)
- Eisenmenger syndrome
- Hypoplastic left heart syndrome

☛ **These abnormalities manifesting in the neonatal period have a poor prognosis.**

38.3.1 TETRALOGY OF FALLOT

This is the commonest of the cyanotic group because of a slightly better prognosis in infancy, allowing more of them to survive longer. Classically, tetralogy of Fallot consists of pulmonary stenosis, ventricular septal defect, dextroposition of the aorta, and right ventricular hypertrophy.

Specific Clinical Features
Cyanosis is a major feature but it may not be present at birth, but developing later during first year. Other features include dyspnoea on exertion, to which the affected child responds by assuming a squatting position for a few minutes after such an exercise. The affected children tend also to have paroxysmal hypercyanotic attacks often referred to as “blue” spells. The pulse may be normal but a systolic thrill is felt along the left sternal border in 50% of cases. Clubbing of fingers and toes occurs after a long time.
The following complications are associated with Tetralogy of Fallot:
- Cerebral thrombosis due to polycythaemia,
- Brain abscess (usually after 2 years of age) presenting with headache, fever, nausea and vomiting with or without seizures,
- Bacterial endocarditis, and
- Congestive heart failure.

Management
- For children with “blue” spells , administer oxygen; child should be should be in knee-chest position.
- Avoid dehydration in these children at all times.
- Refer children with this condition to higher level for appropriate management.

38.4 Congenital Heart Disease without Cyanosis

The commonest in this group of conditions are ventricular septal defect, patent ductus arteriosus, and atrial septal defect.

38.4.1 VENTRICULAR SEPTAL DEFECT (VSD)

This is the most common cardiac malformation, accounting for 25% of congenital heart diseases. The magnitude of the left to right shunt is determined by the size of the defect and the degree of the pulmonary vascular resistance.

Clinical Features

Small defects with minimal left to right shunts are the most common. Patients are often asymptomatic. The patients may have a loud, harsh or blowing left parasternal pansystolic murmur, heard best over the lower left sternal border on auscultation. Large defects with excessive pulmonary blood flow and pulmonary hypertension are characterized by dyspnoea, feeding difficulties, profuse perspiration, recurrent pulmonary infections and poor growth. Physical examination reveals prominence of the left precordium, cardiomegaly, a palpable parasternal lift and a systolic thrill, besides a systolic murmur.

Prognosis and Complications

Spontaneous closure of small defects occurs in 30–50% of cases. A large number remains asymptomatic and a significant number with large defects get repeated infections and congestive cardiac failure. Infective endocarditis is a complication in VSD, while pulmonary hypertension may develop as a result of high pulmonary blood flow.

Management

Refer the affected child to higher level for appropriate management.

38.4.2 PATENT DUCTUS ARTERIOSUS (PDA)

The pulmonary arterial blood is shunted through the ductus arteriosus into the aorta during foetal life. Functional closure occurs soon after birth when pulmonary pressure falls. Gradually anatomical closure takes place over several days. This process is slower in the preterm infant. Patent ductus arteriosus is when ductus fails to close and the blood continues to shunt through it to the aorta.

Clinical Features

On auscultation one frequently hears a systolic or machinery murmur over the entire precordium, axilla and back. The patient also has bounding peripheral pulses. The affected child may also be in congestive cardiac failure with its typical clinical manifestations.

Types of Patent Ductus Arteriosus

- Anatomical defect: This type is the typical ductus that occurs in term and preterm babies; treatment is surgical management.

- PDA of prematurity: This is basically a “functional” problem; the ductus remains open when there is tissue hypoxia, e.g., in respiratory distress or anaemia and is contributed to by fluid overload. The ductus normally closes spontaneously or by use of drugs and sometimes surgery may be required.
- PDA accompanying other abnormalities: This accompanies other congenital cardiac abnormalities and may be the only communication between the right and left side of the heart. In such cases closure of the patent ductus may lead to death unless the accompanying defects are also corrected.

Management
Refer all children with patent ductus arteriosus to higher level for appropriate management.

38.5 General Management of Congenital Heart Disease

The following general principles guide the management of congenital heart disease:
- Parents should be counselled on what can and what cannot be done depending on the heart lesion.
- Evaluation and close follow up of affected children is vital for appropriate and effective management.
- The majority of patients having mild CHD require no treatment. Such patients are expected to live normal lives and should not have any exercise restriction. The parents of the child should be made aware of this.
- Good nutrition should be maintained with adequate immunization and avoiding anaemia.
- Children with severe disease will tend to limit their own exercise but if dyspnoea, headache and fatigability in cyanotic patients occur, their exercise and other activities should be limited.
- Bacterial infections should be treated vigorously.
- Prophylaxis against bacterial endocarditis should be given before dental procedures, urinary tract instrumentation, and lower GIT manipulation.
- Observe for polycythaemia in cyanotic patients and avoid dehydration.
- Venesection with volume replacement should be carried out for polycaethsemic when haematocrit goes above >65%; and maintain it between 55–65%.

38.6 Acquired Heart Disease

38.6.1 ACUTE RHEUMATIC FEVER

This is an acute, systemic connective tissue disease related to an immune reaction to untreated group A beta haemolytic streptococcus infection of the upper respiratory tract in children. The significance of this disease is the rheumatic heart disease complication that may result from it and which may result in severe heart valve damage. Rheumatic heart disease is the commonest form of heart disease in Kenyan children. The initial attack of acute rheumatic fever occurs in most cases between the ages of 3 and 15 years.

Clinical Features
For the sake of diagnosis, clinical features related to rheumatic heart disease are categorized into major and minor criteria:
- Major criteria include migrating polyarthritis, carditis (manifested by signs of cardiac failure, persistent tachycardia, pericardial rub or heart murmurs) Sydenham's chorea, erythema marginatum, and subcutaneous nodules.
- Minor criteria include past history of rheumatic fever, raised ESR, fever, and arthralgia.

Diagnosis of rheumatic fever occurs when in the presence of 2 major criteria and 1 minor criterion, or 1 major criterion and 2 minor criteria.

Complications
The main complication of rheumatic fever is rheumatic heart disease.

Management
Give aspirin and the patient to higher level for management.

Prevention
- Reduction of overcrowding among populations as much as possible.
- Early treatment of streptococcal sore throat with appropriate antibiotics (benzathine penicillin 25,000–50,000 units/kg/dose STAT; maximum 1.2 mega units dose ***OR*** phenoxymethylpenicillin 25–50mg/kg/24 hour TDS for 10 days).

Long-Term Prophylaxis
Parents should be made aware of the necessity for long-term prophylaxis:
- Children with previous acute rheumatic fever ***without*** carditis should be given benzathine penicillin 1.2 mega units monthly for 5 years or up to the age of 18 years whichever is longer. Patients allergic to penicillin should be given erythromycin 125–250mg BD for 5 years.
- Children with previous acute rheumatic fever ***with*** carditis should be given benzathine penicillin 1.2 mega units ***OR*** erythromycin 125–250mg/dose BD for those sensitive to penicillin for life.

38.7 Rheumatic Heart Disease

Rheumatic heart disease is inflammatory damage of the heart valves as a complication of acute rheumatic fever. The mitral vale is the most commonly involved valve, although any valve may be affected. The inflammatory damage involved in rheumatic heart disease results in stenosis or incompetence of the valves, either singly or in combination with ether valves. Rheumatic heart disease may be asymptomatic and the lesion is only discovered during routine examination. Some patients may present with congestive cardiac failure.

Heart murmurs are over the precordium on auscultation, but the murmurs depend on the nature of the damage (whether incompetence or stenosis) and on the specific valves involved.

Complications
The complications for rheumatic heart disease include congestive cardiac failure, pulmonary oedema and bacterial endocarditis

Management
Refer all patients with rheumatic heart disease to higher level for appropriate management.

Long-Term Prophylaxis
- Rheumatic fever: Advise that all patients with a history of rheumatic fever must be given prophylaxis for life (see Section 38.6.1)
- Endocarditis prophylaxis: In addition to rheumatic fever prophylaxis, do the following:
  - Dental procedures: Amoxicillin 50mg/kg PO 2 hrs before procedure and 25mg/kg PO 6 hours after the initial dose. If penicillin allergy - erythromycin 1g PO 2 hrs before procedure then half the dose 6 hours after the initial dose
  - Lower gastrointestinal and genitourinary procedures: Amoxicillin 50mg/kg IM 30 minutes before procedure and 6 hours after the initial dose + gentamicin 1.5mg/kg IM 30 minutes before procedure and 8 hours after the initial dose.

Patient Education
The need for follow up should be strongly emphasized.

38.8 Infective Endocarditis

The most common pathogens are bacterial but they can also be fungal. Any child with a heart condition can get endocarditis but it can occasionally affect normal valves.

Clinical Features
The clinical features include fever, splenomegaly, petechiae, and new murmurs.

Management
Refer all suspected patients with infective endocarditis to higher level for appropriate management.

38.9 Pericardial Disease

Diseases of the pericardium are difficult to detect unless one has a high index of suspicion. Clinical features may be vague or very dramatic, as the situation when one has cardiac tamponade. A review of some of the diseases affecting the pericardium is given below.

38.9.1 ACUTE PERICARDITIS

This is usually caused by bacterial infections but it can also be due to viral pathogens.

Clinical Features
Patients may present with fever, chest pain and dyspnoea and may have pericardial friction rub on auscultation.

38.9.2 PERICARDIAL EFFUSION

Pericardial effusion may be due bacterial infection resulting in collection of pus in the pericardium (exudates) or to some non-infective inflammation with collection of serous fluid in the pericardium (transudate), for example in rheumatoid arthritis.

Clinical features
This may be asymptomatic if it is due to non infective cause and it is a small effusion. Otherwise, there may be acute chest pain or a dull ache depending to the cause of effusion. On examination, the apex beat may be difficult to palpate and the heart sounds may be distant if the amount of fluid in pericardium is large.

38.9.3 CARDIAC TAMPONADE

Cardiac tamponade occurs when cardiac filling is severely limited by the presence of a large amount of pericardial fluid.

Clinical Features
The affected patient presents with severe dyspnoea, cold extremities with decreased capillary refill, raised JVP, tachycardia, pulsus paradoxus, and inaudible heart sounds.

Management
This is an extreme emergency that requires urgent decompression of the pericardium. Refer the patient urgently to higher level for appropriate management.

38.9.4 CONSTRICTIVE PERICARDITIS

This tends to be chronic and is often due to tuberculosis. The pericardium becomes thick and inelastic leading to poor filling of the heart.

Clinical Features
The patient presents with cough and dyspnoea, small volume pulse, ascites, hepatomegaly and raised jugular venous pressure (JVP).

Management
Refer the patients suspected of having constrictive pericarditis to higher level for appropriate management.

38.10 Hypertension in Children

This is defined as elevation of systemic blood pressure beyond the 95th blood pressure centile for age (or above the upper limit of normal). The blood pressure varies with age, gender, and stature; these values are found in normograms for blood pressure for children. A simplified version of a normogram that considers only age is shown in Table 38.1.

In order to record blood pressure accurately, a correct size cuff for the child is needed; such a cuff is expected to cover about two thirds of the arm.

Table 38.1: Upper limits of normal blood pressure values for both sexes at different ages (in mmHg)

Average age	12 hours	8 years	9 years	10 years	12 years	14 years
Systolic bloodpressure	80	120	125	130	135	140
Diastolic bloodpressure	50	82	84	86	88	90

The following are the common causes of hypertension at different ages:

- For neonates and infants: Renal artery thrombosis or stenosis and coarctation of the aorta.
- From 1 year to 10 years: Renal parenchyma disease and coarctation of the
- aorta.
- From 11 years to 18 years: Renal parenchyma disease, essential hypertension.

Clinical Features

Essential hypertension may initially be asymptomatic. Coarctation of aorta in neonate may present with sudden collapse or features suggesting sepsis. Others will present with clinical features of underlying diseases or target organ system – hypertensive encephalopathy, pulmonary oedema.

Management

Refer all children with hypertension to higher level for appropriate management.

Hypertensive Crisis

Defined as systolic or diastolic pressure above the 95th percentile by 50%, or when signs of hypertensive encephalopathy or pulmonary oedema occur.

- **Untreated or inadequately treated hypertensive crisis result in congestive heart failure and stroke.**
- **Refer affected patients urgently to higher level for appropriate management**

39. Urinary Tract and Renal Conditions

39.1 Features of Renal Disease

Clinical Features

The clinical features of renal disease include the following:

- Changes in urine output that include reduced urinary output (oliguria, anuria), increased urinary output (polyuria), increased frequency without increased volume.

- Oedema of the body, usually facial initially, but later involving legs and generalized.
- Haematuria that ranges from microscopic to gross. Haematuria is a serious sign of disease and should be aggressively investigated. Causes include infections (urinary tract infection, tuberculosis, schistosomiasis), acute glomerulonephritis, trauma, meatal ulcers, blood disorders (bleeding disorders, leukaemia, purpura, sickle cell disease), tumours, scurvy, congenital abnormalities.
- The blood pressure may be raised in some conditions or it may be a terminal manifestation in some conditions.
- Renal masses may be palpable, for example if the patient has nephroblastoma, polycystic kidneys, horse-shoe kidneys, neuroblastoma, or hydronephrosis.

Laboratory Findings

The following laboratory findings may be found renal disease:

- Pyuria of >10 cells/cubic mm in uncentrifuged urine specimen.
- Casts of renal tubules formed by red blood cells (RBC), white blood cells (WBC), epithelial cells. The casts may be granular or hyaline.
- Proteinuria that may vary from minimal to gross.
- High blood urea or blood urea nitrogen (Azotaemia, BUN) that accompany renal failure.
- Raised blood creatinine levels that accompany renal failure.
- Hyperkalaemia. Usually, there are no clinical consequences until the levels rise to 6mmol/L and above. Clinical features of hyperkalaemia include muscular weakness, abdominal distension, tingling of the face of the muscles on the hands and feet, and irregular pulse.

39.2 Urinary Tract Infections (UTI)

Urinary tract infection is commonly caused by the following bacterial organisms: Eschericchia coli (75%), Klebsiella and Proteus vulgaris, less commonly by Streptococcus faecalis and some Pseudomonas species, and rarely by a Staphylococcus species.

Clinical Features

In children it is not easy to differentiate upper from lower urinary tract infections, but loin (lumbar) pain and tenderness suggest upper urinary tract infection.

- In neonates and early infancy, boys are affected more often than girls because of the higher incidence of congenital urinary tract malformation in boys than girls that are noted at that age. Affected children present with fever, failure to thrive, irritability, poor feeding and vomiting.
- In older infants and children, girls are affected more often than boys because of their anatomically shorter urethra. Affected children present with anorexia, vomiting, fever, abdominal pain, frequency, enuresis in a previously dry child and dysuria. For the younger child, the mother may report that the child cries when passing urine.

- For all male children, ask about the nature of the stream of urine when they are passing it. In those with urinary tract obstruction, the urinary stream is poor. Recurrences of urinary tract infection are common.

Investigations
The following investigations are recommended for a child with urinary tract infection:
- Full blood count.
- Urinalysis where urinary tract infection is contemplated when urinary WBC are >10 WBC/cubic mm in uncentrifuged urine midstream or catheter specimen.

For the best results, the urine specimen for investigation of urinary tract infection should reach the laboratory within 2 hours of voiding or be refrigerated at 4'C for a period not exceeding 24 hours

When associated with haematuria or proteinuria, pyuria is suggestive of parenchymal renal disease such as glomerulonephritis or interstitial nephritis. Sterile pyuria is often due to infection with tuberculosis. Consequently, carry out cultures for tuberculosis.

Management
Refer all patients suspected of having urinary tract infection to higher level for appropriate management

39.3 Glomerular Disorders

39.3.1 ACUTE GLOMERULONEPHRITIS (AGN)
This is an inflammatory renal disease commonly following streptococcal infection of skin and tonsils.

Clinical Features
The patient presents with smoky or tea coloured urine as a result of haematuria, with oedema that manifests as puffiness of the eyes more noticeable in the morning. The oedema is seldom severe or generalized. The affected children also experience back pain, hypertension commonly presenting as headaches, visual disturbance, and vomiting.

Occasionally the patients may present with pulmonary oedema with dyspnoea or convulsions and coma due to hypertensive encephalopathy. There may be evidence of primary streptococcus infection, most often as an acute follicular tonsillitis with cervical adenitis and less often as skin sepsis. In the initial stages of the illness there is oliguria that is followed by diuresis (oliguric and diuretic phases).

Investigations
Urinary examination is likely to show red blood cells in urine, RBC casts, WBC casts, granular and hyaline casts.

Management
Refer all patients with acute glomerulonephritis to higher level for appropriate management.

39.4 Nephrotic Syndrome

Causes of nephritic syndrome include the following:
- Idiopathic or unknown for the majority of children with nephritic syndrome.
- Congenital nephritic syndrome, which may be to congenital syphilis.
- Secondary nephritic syndrome that is due to post acute glomerulonephritis, plasmodium malaria, other infection and infestations, allergy following bee stings, heavy metal poisoning (e.g., mercury and lead), urinary tract infection.

Clinical Features
The clinical features of nephritic syndrome include the following:
- Oedema that is marked to massive and may be accompanied by ascites and or pleural effusion may occur.
- Marked proteinuria.
- Hypoproteinaemia, mainly low serum albumin in blood.
- Hyperlipidaemia.

Children with nephritic syndrome who have haematuria with hypertension are categorized as nephritic nephrosis.

Management
Refer all patients with nephritic syndrome to higher levels for appropriate management.

39.5 Tubular Disorders

Tubular disorders can be congenital or be the result of shock or toxins. Congenital variety tends to be associated with acidosis (renal tubular acidosis -RTA) and renal rickets.

Management
Refer suspected patients with renal tubular disorders to higher level for appropriate management.

39.6 Acute Renal Failure

Acute renal failure is acute or sub-acute decline in the glomerular filtration rate and/or tubular function characterized by rapid accumulation of nitrogenous waste products, for example urea and creatinine, in the blood.

Aetiologies of Acute Renal Failure
The causes of acute renal failure into pre-renal, renal and postrenal groupings:

- Pre-renal acute renal failure: This group of diseases include the following:
  - Diarrhoea and vomiting with severe dehydration, burns, inappropriate diuretic treatment, peritonitis, pancreatitis, heart failure and livers disease with ascites.
  - Diseases of the renal arteries and veins that include direct trauma to renal vessels, dissecting aortic aneurysm
- Intrinsic renal problems:
  - Glomerulonephritis, acute interstitial nephritis, acute tubular necrosis, intratubular obstruction.
  - Post-infectious glomerulonephritis; renal damage related to drugs, for example methicillin, ibuprofen and gentamicin
  - Following volume depletion and also as a result of toxins
  - Rhabdomyolysis and uric acid nephropathy
- Obstruction of the collecting system:
  - Bladder outlet obstruction, bilateral ureteral obstruction, ureteral obstruction and a single kidney.

Management
Refer all suspected cases if renal failure to higher level for appropriate management.

39.7 Chronic Renal Failure

Chronic renal failure describes the situation when there is the existence of advanced, irreversible and usually progressive renal failure. Chronic renal failure is commonly caused by chronic glomerulopathies, hypertension, chronic interstitial nephritis, and diabetes mellitus.

The following are important manifestations of chronic renal failure:
- At biochemical level in the blood, there is acidosis, hyperkalaemia, elevated blood urea and elevated serum creatinine.
- At cardiovascular level there is pulmonary oedema, hypertension, pericarditis and cardiac tamponade and heart failure.
- At skeletal level, there is bone pain and bone fractures (rare).
- At nervous system level, there is encephalopathy (confusion, convulsions) and peripheral neuropathy.
- At haematological system level there is anaemia, excessive bleeding, e.g., from gums, skin, nose.
- At the skin level, there is scratching (pruritus) and darkening of skin.

Chronic renal failure should be suspected in the presence of the following:
- Previous history of renal disease, e.g., acute nephritis, nephrotic syndrome is present
- History of hypertension
- History of diabetes mellitus
- High blood urea and serum creatinine
- Some of the systemic manifestation listed under “manifestations of chronic renal failure”.

Management
Refer all patients with suspected chronic renal failure to higher level for appropriate management.

39.8 Hypokalaemia

Hypokalaemia is said to have occurred when serum potassium levels are persistently below 3.5mmol/L. Causes of hypokalaemia include inadequate dietary intake (rare), gastrointestinal fluid loss (vomiting, diarrhoea, fistulae), renal loss (diuretics, uncontrolled diabetes mellitus), systemic metabolic alkalosi, and dialysis.

Clinical Features
Clinical features for hypokalaemia include the following:
- Muscular weakness
- Tetany
- Fatigability
- Thirst
- Polyuria
- Paralytic ileus
- Cardiac arrhythmias
- Low serum potassium
- Elevated serum bicarbonate
- Low serum chloride
- ST segment depression and appearance of V waves on ECG.

Management
Refer all patients suspected of having chronic renal failure to higher level for appropriate management.

39.9 Genito-Urinary Anomalies

The genito-urinary anomalies include undescended testes, hypospadias, ectopia vesicae, patent urachus, urachal cyst, and recto urethral fistula in males with imperforate anus.

Management of these conditions is complex and the patients need to be referred to higher level for appropriate management.

40. Central Nervous System

40.1 Seizure Disorders

A seizure is defined as a paroxysmal involuntary disturbance of brain function that may result in loss of consciousness and abnormalities in movement, behaviour, or sensation. Seizures can result from organic lesions such as acute

or chronic infections, tumours, and developmental defect, but more commonly the cause is unknown.

Epilepsy is defined as recurrent seizures.

40.1.1 TYPES OF SEIZURES

The clinical features depend on the type of seizure. The various forms of seizures are itemized below:

- **Partial seizures, which include:**
  - Simple partial seizures; can be motor, sensory and sensory-motor (consciousness not impaired).
  - Complex partial seizures; starting with an aura (later impairment of consciousness) and often accompanied by automatic behaviour.
  - Partial seizures becoming progressive (Jacksonian seizures) or generalized.

- **Generalized seizures, which include:**
  - Absences, which are brief lapses of awareness lasting for about 30 seconds and are uncommon below 5 years of age.
  - Tonic seizures, which manifest with sustained muscle contractions.
  - Myoclonic seizures, which are repetitive symmetrical muscle contractions whose distinctive forms are:
    – Benign myoclonus of infancy disappear by age 2 years.
    – Early childhood type, whose onset starts at about 2 years and has a relatively good prognosis.
    – Complex type, whose onset is in the first year of life commonly following birth asphyxia (a common cause), with a poor prognosis.
    – The juvenile form that begins at age 12–16 years, among children that are neurologically and has a good response to treatment.
  - Clonic seizures, characterized by rhythmic jerking.
  - Tonic-clonic seizures characterized commonly by an aura with loss of sphincter control and postictal deep sleep.
  - Atonic seizures, characterized by sudden loss of muscle tone.
  - Infantile spasm, characterized by their initiation at age 4–8 months with sudden symmetrical contraction of all parts of body. Prognosis is poor if there is identifiable underlying pathology, but good if there is no identifiable underlying pathology.

Meticulous history from parents and reliable witness is critical in diagnosing a seizure disorder. It is important to find the details of the prodromal phase, aura and the type, duration, frequency and the age of onset of seizures. Details about the post ictal phase are important. It is also important to determine the underlying pathology, for example birth asphyxia, neonatal jaundice, or infection of the central nervous system.

A careful and thorough physical examination is necessary to detect associated neurological dysfunction or abnormality. Evaluation of blood pressure, head circumference in those aged less than 2 years, and fundoscopy are important in the examination of such children.

40.1.2 MANAGEMENT DURING AN EPILEPTIC ATTACK

During an epileptic attack, the following should be observed:

- The patient should be placed on the left lateral position with the head turned to the same side.
- Tight fitting clothing around the neck should be loosened or removed.
- No attempt should be made to insert any instrument into the mouth to avoid tongue biting, as this may have already happened.
- The patient should not be surrounded by too many eager observers.
- Seizure should be allowed to complete its course without physically attempting to hold down the patient. However, the patient should be removed from danger like fire.

General Management

- A child with seizure should first be treated for any underlying diagnosed condition.
- Most patients with epilepsy can be started on therapy as outpatients.
- Treatment is usually life long. Therapy may be discontinued after a seizure free period of at least two years if the patient has no risk factors. Reduce dose gradually over many months. Sudden discontinuation of drugs may precipitate status epilepticus. Complex partial seizures will require lifelong drugs.

Pharmacological Management

Start long-term therapy if patient has had two or more seizures within one year Start therapy with one drug, usually phenobarbital. Increase at regular intervals until seizures are controlled or side effects appear. Refer to Tables 40.1 and 40.2 for drugs of choice and dosages for paediatric seizure disorders.

Refer patient to higher level for appropriate management if:

- Seizures are not controlled with maximum drug dose.
- Child develops side effects.
- Raised intracranial pressure is suspected.
- Space occupying lesion is suspected.

Parent and Patient Education

The following are important for the education of the patient and the parent:

- Medication should be taken regularly and it should not be assumed that the child is healed when the seizures are controlled. Treatment in most cases is life long.
- Ensure normal activity for the age of the child including school.
- Child should avoid dangerous activities like climbing trees.
- Protect child from falling into fires.
- The patient should never swim alone and all precautions should be taken when swimming.
- The parent should not to be over protective of the child.

Table 40.1: Drugs of choice for common seizures

Main classification of convulsive disorder	Subclassification of the main convulsive grouping	Preferred drug of choice for treatment	Other drugs that can be used for treatment
Partial seizures	Simple	Phenytoin	Carbarmazepine, Valproic acid
	Complex	Carbamazepine	Phenotoin
	Secondarily generalized	Phenobarbitone	Phenotoin
Generalized seizures	Absence	Ethosuximide	Valproic acid, Clonazepam
	Tonic-clonic, clonic, tonic, atonic	Phenobarbitone	Carbamazepine, Phenytoin
	Myoclonic	Clonazepam	Nitrazepam, Valproic acid, Phenobarbitone

Table 40.2: Paediatric dosages of common drugs for convulsive disorders

Drug	Dosage	Frequency	Remarks
Phenobarbitone	3–6mg/kg	Once daily	May cause hyperactivity in some children
Phenytoin	4–7mg/kg	Once daily	Causes gum hypertrophy
Carbamazepine	20–30mg/kg/day	3 divided doses	
Sodium valproate	30–60mg/kg/day	3 divided doses	May precipitate, absence status if given with clonazepam. Also causes transient alopecia.
Ethosuximide	20–40mg/kg/day	2–3 divided doses	
Clonazepam	0.1–0.2mg/kg/day	Once daily	May precipitate absence status if given with sodium valproate

NB: Sodium valproate is the most broad spectrum anticonvulsant, but it is very costly and is better used as a second line drug. If seizures are not controlled, drugs used at maximum recommended dose should be withdrawn gradually as another one is introduced.

☛ **If seizures are not controlled, gradually withdraw drugs used at maximum recommended dose as another one is introduced.**

40.2 Status Epilepticus

Clinical Features

A succession of seizures without regaining consciousness between attacks or one prolonged convulsion lasting 30 minutes or more. Status epilepticus can occur with partial, complex partial, absence, tonic-clonic, or clonic seizures and may result in respiratory embarrassment with cyanosis and hypoglycaemia.

Management

The following is recommended in stabilizing the child with status epilepticus:

- For the airway and breathing:
  - Establish the airway
  - Give oxygen
  - Provide ventilation
- With regard to circulation and disability:
  - Establish intravenous access
  - Give 10% dextrose 5ml/kg.
  - Give diazepam intravenously or rectally.

☛ **Transfer patient with status epilepticus urgently to higher level for appropriate management.**

40.3 Febrile Convulsions

These are generalized tonic-clonic seizures seen in childhood with the following characteristics:

- Occurs in children aged between 6 months and 5 years.
- There is fever at the time of the attack (usually greater than 38°C).
- They are of brief duration (always less than 15 minutes).
- They occur in the absence of central nervous system infection, and
- There is absence of neurological abnormalities in the inter-ictal period.

Management

Emergency care:

- Give paracetamol to reduce the temperature.
- Given diazepam rectally if child is convulsing at the time of presentation.
- Reduce clothing should be to a minimum to facilitate lowering of temperature.

☛ **Refer the child to higher level for appropriate management.**

Subsequent care:

- Educate parents that recurrences are common but that they can be reduced by administration of antipyretics as soon as child becomes febrile. Diazepam may be used occasionally.
- Use anticonvulsants regularly after the second or third attack of the febrile convulsions or if the convulsion is atypical.

Seizures in the neonate are covered under neonatal care, Section 26.6.

40.4 Cerebral Palsy

Cerebral palsy (CP) is defined as a non-progressive disorder that consists of motor and other neurological problems resulting from a defect or lesion of the developing brain.

The aetiological factors associated with cerebral palsy are:
- Those occurring in the prenatal period, including rubella, syphilis, toxoplasmosis, and asphyxia.
- Birth asphyxia, the main factor in the perinatal period, being responsible for about 50% of cerebral palsy cases.
- Those occurring with bilirubin encephalopathy, meningitis, encephalitis, intracranial haemorrhage, hydrocephalus.

Clinical Features
Spastic paralysis is the commonest variety. It involves one or more limbs and also the trunk. Posture is that of hyperextension with tendency to contractures. Deep tendon reflexes are increased. The choreoathetoid type of cerebral palsy is less common and is characterized by involuntary movements and abnormal posture. Cerebral palsy may also present as ataxia with low muscle tone and lack of balance. Abnormalities associated with cerebral palsy include deafness, visual defects, speech difficulties, mental retardation, convulsions, and growth retardation. If the problem dates from birth, neonatal reflexes may persist. Malnutrition can result from neglect of the child or from difficulties associated with feeding the child.

All children should, if possible, be seen by a doctor with some experience of cerebral palsy children for correct diagnosis. The nature of the motor dysfunction, its distribution, and all related abnormalities should be noted and a decision made on what could be offered to the child.

Symptomatic Therapy
Physical therapy is the mainstay of management of these children. Such therapy should be started as early as possible. The main aim is to prevent contractures and abnormal movement patterns and to train other movements and coordination. Depending on the degree of disability the child can be trained by experienced therapist to attain some degree of independence. Home training programme for the parents is the most important part. Anal sphincter control may be assisted by administration of stool softeners and enemas where necessary.

Anticonvulsive drugs should be given if there are convulsions and any accompanying problem should be appropriately dealt with.

A multidisciplinary approach is recommended for management of children with cerebral palsy.

Support of Family
Parents are encouraged to bring their children early for care and not hide them from the public. The diagnosis should be discussed with the parents in an open and honest manner, explaining that there is no cure for the condition but that physical therapy contributes significantly to the well being of the affected child.

40.5 Mental Retardation

Children whose neuromotor and cognitive development is delayed are considered to have mental retardation. The degree of impairment can range from mild to very severe. Intellectual performance is below average, as expected, and the severely retarded is not able to adapt to daily demands and thus may not be able to lead an independent life. Mental retardation may also be part of a syndrome like Downs syndrome

Management
Refer all children with mental retardation to higher level for appropriate management.

40.6 Hydrocephalus

Hydrocephalus is excessive enlargement of the head because of accumulation of cerebral spinal fluid in the cerebral ventricles as a result of the blockage of its flow. Hydrocephalus can be congenital or acquired.

- Congenital isolated hydrocephaly occurs due to blockage of flow of CSF.
- Commonest area is the Aqueduct of Sylvius. It may also be part of neuro-tube defect.
- Acquired is usually due to complication of meningitis or it may be due to a tumour. In both situation, the flow of the cerebral spinal fluid is blocked.

Clinical Features
For those aged 0 to 2 years there is enlargement of the head, bulging fontanel, sunset eyes and large veins on the head. Depending on the cause and the severity there may be neurological signs as well.
For those over 2 years there is headache, vomiting and papilloedema. There may also be focal neurological signs.

Management
Refer all patients with hydrocephalus to higher level for appropriate management

41. Skin Diseases

41.1 Eczema

41.1.1 ATOPIC ECZEMA

Atopic eczema has a genetic predisposition with a strong personal or family history of asthma and allergic rhinitis. The usually begins in the first 2 to 3 months of life.

Clinical Features
Pruritus is the cardinal feature of eczema. There is tendency to chronicity or relapses. Acute changes include erythema, papules or vesicles, crusting, and secondary infection. Subsequently, there is scaling, hypopigmentation, or hyperpigmentation. Distribution of the lesions varies with age. In infants it tends to be on the scalp, face, and extensor surfaces, while in older children it tends to be in flexures and skin creases.

Management
The management of atopic eczema consists of the following:
- Educate parents on the disease and its natural history and advise to avoid any precipitating factors, e.g.:
  - Synthetic clothing.
  - Any food substance that seriously aggravates the eczema.
  - Letting the skin to dry excessively, e.g., by using harsh soaps like bar soaps, Sunlight, Ushindi, etc. One should use the normal toilet soaps. No need to use medicated soaps.
  - Any of the petroleum jelly products for those who react against them (Vaseline, Ballet, Valon, Ideal, etc.).
- Keep the skin moist by using emulsifying ointment.
- Use antihistamines like chlorpheniramine maleate to alleviate the itch.
- Apply topical steroids. Thesare recommended for severe cases, but generally for not more than 7 days. Note that infants can absorb steroids through the skin easily.
- Treat any intercurrent infection (bacterial or fungal).

Refer to higher level for appropriate management if the body surface area involved is large (e.g., 50% and over) or the disease is severe.

41.1.2 CONTACT DERMATITIS
Acute or chronic inflammation produced by substances contacting the skin and causing toxic (irritant) or allergic reactions.
Primary irritants include acids, alkalis, soaps, detergents, and acetone. Allergic contact dermatitis may be caused by topical drugs, plants, shoes, clothing, metal compounds, dyes, and cosmetics.

The lesions in contact dermatitis may be acute vesicles or may consist of weeping subacute erythema or dry scaly papules. Chronic lesions may be lichenified (thickened), excoriated, and hyper pigmented.

The distribution of the lesions may take the shape of offending item or area of its contact, for example shoes, watch, and gloves, or may be asymmetric or have other forms.

The following management is recommended for children with contact dermatitis:
- Identify and remove the causative agent.
- Drain large blisters, but do not remove their tops (roofs).

- Apply gauze or thin cloths dipped in water or normal saline.
- Apply topical 1% hydrocortisone ointment to dry lesions and cream for wet ones.

41.1.3 SEBORRHOEIC DERMATITIS

This is an inflammatory scaling disease of the scalp, face and occasionally other areas with high density of oil glands (axilla, upper chest, anogenital areas).

Clinical Features

Symptoms develop gradually as:

- Dry or greasy diffuse scaling of scalp (dandruff) with pruritus.
- Yellow-red scaling papules, in severe cases found along the hairline, external auditory canal, the eye brows, conjunctivitae, and naso-labial folds. The lesions are not accompanied by hair loss.
- Cradle cap (thick yellow crusted scalp) in newborns.
- Severe seborrhoeic dermatitis, found in neurological disorders Parkinson's disease) and HIV infection.

Management

- Refer children with seborrhoeic dermatitis to higher level for appropriate management
- Remove dandruff by applying shampoos containing selenium sulphide, sulphur, and salicylic acid, or tar daily (more recently ketaconazole shampoo is excellent).
- Apply topical steroids, using mild lotions.
- Treat superimposed bacterial, fungal, or viral infections, which are especially prevalent in patients with HIV.

41.2 Bacterial Infections

41.2.1 IMPETIGO CONTAGIOSUM

This is a contagious intradermal infection caused by streptococcal or staphylococcal organisms. This condition is commonly associated with poor hygiene, crowded living conditions and neglected minor trauma. The condition frequently complicates scabies, purpura urticaria and insect bites. Impetigo contagiosum may presents as bullous lesions that rupture and crust on the face, arms, legs, and buttocks.

The recommended management of this condition comprises the following:

- Local treatment for minor lesions consisting of cleaning the lesion with normal saline
- Systemic treatment for extensive lesions consisting of administration of systemic antibiotics (amoxicillin/cloxacillin or erythromycin)

41.2.2 BULLOUS IMPETIGO

This condition is common in neonates (pemphigus neonatorum) although any age can be affected. It is caused by a staphylococcal bacteria, involving mainly the axilla and the groin.

The skin lesions are usually large bullae containing pus and clear serum, and may rupture easily leaving raw areas. Crust do not form in this condition. Refer patient with bullous impetigo if patient is toxic or is suspected to have septicaemia or if the lesions are extensive especially in the neonate.

Patient Education
The patients and their guardians need to know the following about bullous impetigo:
- It can spreads easily, especially in schools
- Affected children should be isolated and treated
- Towels and bath facilities for those affected should be separated.

41.3 Fungal Infections

The fungal infections of the skin include dermatophyte (genus microsporum, trichophyton and epidermophyton) infections, which thrive on non-viable keratinized tissue of the skin (stratum, comeum, hair and nails). Sources of infection include other persons, animals such as puppies or kittens, and more rarely the soil. The nomenclature for the infection is “tinea” followed by the Latin name of the appropriate body part: for example, Tinea pedis for athlete’s foot, which is manifested by scaling or maceration between toes particularly the fourth interspace. This is caused by Tinea rubrum and/or Tinea interdigitalae.

Predisposing factors include hot humid weather and occlusive footwear. Tinea cruris is an erythematous and scaly rash with distinct margin extending from groin to upper thighs or scrotum. Itching may be severe and is common in males.

Tinea corporis (body ringworm) forms characteristically annular plaques with raised edges and central clearing and scaling with variable degrees of itching. Tinea capitis (scalp ringworm) is mainly a disease of children; those infected experience spontaneous recovery at puberty. It manifests commonly with scaling, itching, and loss of hair, often referred to as “Mashillingi” in Kiswahili. Scarring and alopecia may result from the infection. Tinea anguum involves the nails and presents with nail discolouration and subungual hyperkeratosis (friable debris).

The management of fungal skin infections consists of the following;
- Administer ketoconazole 3–6mg/kg/day or fluconazole 6mg/kg/day.
- Apply clotrimazole cream.
- Administer ketoconazole shampootwice weekly until lesions clear.

41.4 Parasitic Infestations

41.4.1 SCABIES
Scabies is caused by the human itch mite, Sarcoptes scabiei, and spreads through intimate personal contact, facilitated by overcrowding and poor hygiene.

Transmission via bedding or clothing is infrequent, partly because the mites do not survive for a day without host contact.

Clinical Features
The clinical features of scabies include the following.
- Intense itching. worse at night or after hot shower.
- Skin papular rashes associated with burrows that occur predominantly on the finger webs, the wrists flexor surfaces, elbows and axillary folds, and around the areola of the breasts in females, the genitals especially male, along the belt line, and on the buttocks. In young children rash may be generalized and may affect the face.
- Secondary infection causes rashes that manifest themselves as urticarial papules, crusts and pustules.

☛ The burrow is a fine, wavy scaly line, 0.5–1cm long, with a small papule/ vesicle at the end.

Diagnosis
Diagnosis is made by demonstration of typical burrows on the skin; these may be difficult demonstrate.

Management
The following are recommended for the management of scabies:
- Application to the entire skin (from the neck down) of 25% benzyl benzoate emulsion (use 12.5% in children) on days 1 and 2 without bathing. On day 3 bathe and apply again.
- Application of 5–10% sulphur ointment.

The nonspecific measures against scabies include the following:
- Maintaining good personal hygiene.
- Use of antihistamines for pruritus.
- Treatment of the whole family and personal contacts.
- Putting the clothing used by the affected individually, including beddings, mattresses, in the sun.
- Treatment of secondary bacterial infections using cloxacillin in severe cases.
- Treatment of the whole family for scabies at the same time.

41.4.2 JIGGERS/TUNGA PENETRANS

Diagnosis of jiggers is not a problem but education to the community on treatment is mandatory. The following is recommended:
- Wash affected area with soap and dry thoroughly.
- Extract the jiggers with clean pin.
- Suffocate the jiggers by soaking the affected feet in Lysol or kerosene if not extensive.
- Give tetanus toxoid.

The following preventive measures are recommended:

- Smoothening the walls and floors with mud or cow dung
- Dusting of the earthen floors with insecticide powders. (Ensure that any compound used is not harmful to humans.)
- Personal hygiene should be maintained for affected populations.

41.5 Pellagra (Niacin Deficiency)

Pellagra is a dietary deficiency that may occur in starvation, isoniazid therapy, diarrhoeas, and liver cirrhosis.

Clinical Features
This condition presents with characteristic dermatitis, diarrhoea and dementia and may result in death if appropriate treatment is not given.

Weight loss, anorexia, fatigue, malaise, pruritus with burning sensation, dysphagia, nausea, diarrhoea, vomiting, impaired memory, confusion and paranoid psychosis may occur. Skin lesions are limited to areas exposed to the sun, namely the face, neck, hands and feet. Mucous membranes may be involved, manifesting as scarlet stomatitis and scarlet red tongue.

Management
Refer to level 4.

41.6 Dermatological Emergencies

41.6.1 STAPHYLOCOCCAL SCALDED SKIN SYNDROME (SSSS) OR RITTER'S DISEASE

This is a toxin-mediated epidermolytic condition leading to detachment of the superficial epidermal layers to resemble scalding. Affected childre may look like they have been immersed in a basin of hot water and sustained burns.

This condition mainly occurs in children under 2 years of age, varying in severity and distribution from a localized form (bullous impetigo) to a generalized form of epidermolysis. The condition is also found in immuno-compromised patients and in those with renal failure.

Clinical Features
The clinical features in this condition comprise the following.
- Flaccid vesicles that shear off, leaving raw areas, when gentle lateral pressure is applied to them.
- Focus of infection may be found in the nose, umbilical stump, purulent conjunctivitis, otitis media or nasopharyngeal infection

Management
Refer patients with this condition to higher level for appropriate management.

41.6.2 ERYTHEMA MULTI FORME SYNDROME

This condition is now a common problem as a result of the increased prevalence of HIV/AIDS. It is characterized by an infiltration by mono-nuclear cells into the dermo-epidemial junction, leading to the formation of vesicles generally found on the extremities, palms, and soles in the mild form of disease. In severe forms of the disease, widespread mucosal involvement occurs with typical features of Steven's-Johnson syndrome and may last 1–2 months, being accompanied by a a high mortality.

The following is known about its aetiology:

- About 50% are idiopathic, with no known cause.
- Administration of drugs like sulphanamides, phenytoin, barbiturates, penicillins, and thiacetazone have been known to lead to its occurrence.
- Viral infections like Herpes simplex and bacterial infections like streptococcal and infections with mycoplasma have been associated with the development of the condition.
- Underlying malignancies have been known to be associated with this condition.

Clinical Features

The clinical features of this condition include the following: In severe form the mucous membranes are always involved, with extensive bullae formation and systemic symptoms of fever and prostration. There may be cheilitis and stomatitis that interfere with feeding, with vulvitis in females and balanitis in males, leading to difficulties in micturition. There may be conjunctivitis that leads to keratitis, and there may be epidermal necrolysis, that may be life threatening.

Management

The following emergency care should be provided:

- Stop the offending factor immediately.
- Apply 1% tetracycline eye ointment to the eyes that are affected.
- Keep the patient warm.
- Provide IV fluids if the patient is dehydrated or in shock.

41.6.3 EXFOLIATIVE DERMATITIS

Also known as exfoliative erythroma syndrome or erythroderma, this is a serious, life threatening skin disease characterized by generalized and confluent redness with scaling of the skin, associated with systemic toxicity, generalized lymphadenopathy, and fever. The disease manifests as an acute illness and may also manifests as a chronic illness. More than 50% of patients with this condition have a history of pre-existing dermatosis, commonly eczematous dermatitis (atopic, contact). It is also associated with psoriasis, drug reaction, leukaemia and lymphoma. In 10–20% of cases no possible cause can be identified.

Constitutional symptoms of this condition include fatigue, weakness, anorexia, weight loss, malaise and feeling cold (shivering) Skin appears red and is thickened and scaly, and commonly without any recognizable borders for the

lesions. Oedema of lower legs and ankles may occur. The palms and soles may be involved with resultant thickening and fissuring. There may be alopecia (although this is not a constant finding), with shedding of the nails.

Erythroderma may be purely secondary to HIV infection.

Prognosis
This is a very serious disease with many complication in a number of body systems. The highest level of skill and facility are necessary for its management. The prognosis is however guarded.

Management
Refer to higher level for appropriate management

42. Endocrine System Conditions

42.1 Diabetes Mellitus

Diabetes mellitus is recognized by persistent elevation of concentration of glucose in the blood (hyperglycaemia).

42.1.1 GENERAL INFORMATION

Clinical Features
The clinical features for diabetes mellitus include polyuria, polydipsia and polyphagia. The affected child also has weight loss and experiences recurrent infections. In severe uncontrolled diabetes with keto-acidosis, there may be altered consciousness and coma.

Classification
Diabetes mellitus is classified as type 1 or type 2:
- Type 1, insulin dependent diabetes mellitus: Usually occurs in children and young adults and in the absence of appropriate therapy is associated with ketoacidosis. These patients require insulin to sustain life.
- Type 2, non-insulin dependent diabetes mellitus: Usually afflicts adults, although it is increasingly being seen in obese children.

Investigations
The following investigations are recommended:
- Evaluation of plasma glucose: fasting venous plasma glucose of more than 7.8 mmol/L on more than one occasion or random plasma glucose of more than 11.1 mmol/L in symptomatic patients is indicative of diabetes mellitus.
- Urinalysis for protein, sugar, and ketones is useful for making a diagnosis.

Management
Management of this condition includes the following:

- Aim at abolition of symptoms of diabetes
- Aim at correction of hyperglycaemia, and glycosuria
- Aim at prevention and management of complications.

For children with diabetes mellitus, the following is also important:
- Maintaining normal weight, growth and development.
- Improving quality of life.
- Keeping the urine free of ketones.

General Management
Dietary modification is important in both types 1 and 2 diabetes mellitus. The hospital nutritionist should be consulted so as to appropriately carry out dietary modification that is preferably individualized.

The following food composition is recommended.
- Carbohydrate: 50–60% in complex form; should be based on the staple for the family and refined products should be avoided.
- Protein: 10–20%; should include vegetable protein sources like soya beans, lentils, and beans. Animal products should be included if possible.
- Fat: 25–30% of energy intake; should be preferably polyunsaturated types.
- There should be adequate fibre in the diet, because fibre can prolong absorption of sugar. Fibre containing foods include most unrefined staple foods, beans, legumes, bran, fruits, and vegetables.

☛ **Strict adherence to meal schedules should be maintained.**

42.1.2 TYPE 1 DIABETES MELLITUS

This form of diabetes usually presents with diabetic keto-acidosis (DKA). Patients with type 2 DM can also present with DKA especially in situations of stress such as infection or neglect of therapy.

Clinical features
The clinical features include intense polydipsia, polyuria, and polyphagia. In young children it may present with enuresis in a previously dry child. The child may also present with abdominal pain, vomiting, dehydration, acidotic breathing, and altered consciousness or coma. The child loses weight in spite of having a good appetite.

Management
Management of diabetic ketoacidosis is a medical emergency.. Some patients with DKA present without coma.

Rehydration of the child if dehydrated using normal saline in line with management guidelines is recommended. After the initial resuscitative rehydration, the child should be transferred to higher level for appropriate management.

Fluid Replacement in a Child with Diabetic Ketoacidosis
Working assumption is that the child has lost 10% of weight due to dehydration. Intravenous infusion of normal saline is initiated. Total fluid to be given should be 100ml/kg/24 hours, with additional fluid for maintenance. The child should receive 20ml/kg of fluid in the first hour and the rest of the rehydration over 24 hours.

Cerebral oedema may occur during the rehydration phase.

Maintenance Fluid Volume per 24 Hours for Age
- <24 months: 100ml/kg
- 2–4 years: 85ml/kg
- 5–10 years: 70ml/kg
- >10 years: 20–30ml/kg

Parent/Patient Education
The parent of, or a child with, diabetes mellitus should receive the following information to enhance management of the condition:
- The parent or child (if old enough) should taught how to give insulin at home and how to look after the insulin.
- Child with any infection should always be taken to the health facility for immediate treatment.
- Such a child should seek medical advice for any injury, however minor.
- Patients with diabetes should take their meals regularly, even at school.
- Teachers should be made aware of child's diabetic status.
- Patients should carry sweets or glucose and chew them if they experience any symptoms of hypoglycaemia.
- Patients should always carry a "Diabetic Alert" card with them and inform all health workers when they present to clinic with any problem.
- Patients and patients should join support groups for diabetes mellitus.

42.1.3 TYPE 2 DIABETES MELLITUS

This form of diabetes occurs in obese children usually over age of 10 years and can also present ketoacidosis. Children whose BMI is >85% for age should be screened for this condition, especially if there is a family history of diabetes.

Management
The primary management of Type 2 diabetes mellitus is based on manipulation of the diet and use of exercise. The following is recommended:
- Manage as outpatient preferably in the hospital's diabetic or specialist paediatric clinic if there is such a clinic.
- Consult hospital nutritionist for dietary modification.

Pharmacological Management
Oral hypoglycaemic drugs should be used only if diet and exercise fails and should be strictly under guidance of specialist.

Refer all children with complications after stabilization to higher level for appropriate management.

Complications

- Hypoglycaemia: This occurs when blood glucose falls lower than 4mmol/L.
  - Non-pharmacological management: Give sugar-containing soft drinks, snacks or sweets. These can be given at home if patient or caregiver notices signs of hypoglycaemia.
  - Monitor blood sugar every 15 minutes until blood glucose is 6–8mmol/L.
  - Pharmacological management: Give IV 10% dextrose bolus 5ml/kg (do not use 50% dextrose in children). Give 5 or 10% dextrose fluid as a continuous infusion until normal blood glucose is achieved then change to oral feeding.
- Infections, including:
  - Nephropathy: This is rare in children, but all children over 12 years should be screened for microalbuminuria.
  - Neuropathy: This is very rare in children.

42.2 Thyroid Diseases

42.2.1 GOITRE

This is the enlargement of thyroid gland usually caused by lack of iodine or defects in synthesis of thyroxine hormone. Children may demonstrate features of hyperthyroidism or hypothyrodism .

42.2.2 HYPERTHYROIDISM

This condition is due to excessive levels of the thyroid hormone.

Causes

In the neonatal period it is a manifestation of the effect of Graves disease in the mother. In older children it may be a manifestation of Graves disease in the child or subacute thyroiditis.

Clinical Features

The clinical features for this condition include tachycardia, cardiac failure, arrhythmias, tremors/jitteriness, lid lag, exophthalmos, sweating, and failure to thrive. If the child has a goitre there may be pressure symptoms on the trachea like stridor and difficulty in swallowing

Management

Refer to higher level for appropriate management.

42.2.3 HYPOTHYROIDISM

This condition is due to deficiency of the thyroid hormone.

Classification

Hypothyroidism can be classified into the following 5 categories:

- Congenital failure of thyroid development (complete or partial).
- Endemic cretinism due to iodine deficiency.
- Iatrogenic (after thyroidectomy, radio-iodine therapy, pituitary ablation, drug induced).
- Auto-immune thyroiditis.
- Pituitary gland damage, e.g., cranial pharyngeoma.

Clinical Features
The deficiency ranges from mild with minimal or unrecognized clinical manifestation to severe mental retardation (cretinism).

In congenital hypothyroidism most neonates appear normal at birth. Prolonged neonatal jaundice, feeding difficulty, lethargy and somnolence, apnoeic attacks, constipation, large abdomen, umbilical hernia, macroglossia, failure to thrive, delayed physical and mental development, slow pulse rate, dry skin, sparse dry hair, and hoarse voice are some of the clinical features of such children. Ideally diagnosis should be based on neonatal screening tests and not abnormal physical signs. Since such tests are not routinely carried out in the health services, however, the clinical features listed and a high index of suspicion continue to play an important role in picking up such children, who can then undergo appropriate laboratory investigations to confirm the diagnosis.

Management
Refer all children with suspected thyroid disease to higher level for appropriate management.

Prevention of endemic hypothyroidism
Iodinization of salt has helped reduce incidence of endemic goitre in our country.

42.3 Adrenal Disorders

42.3.1 ADRENAL INSUFFICIENCY

Causes
The following situations have been associated with adrenal insufficiency:
- Congenital adrenal hyperplasia
- Long-term use of steroids
- Addison's disease
- Pituitary hypofunction

Clinical Features
Congenital deficiency may be associated with ambiguous genitalia and precocious puberty. Other manifestations of deficiency include hypoglycaemia, hyponatraemia, hyperkalaemia, and hypotension.

Management
Refer to higher level for appropriate management.

43. Musculoskeletal Conditions

43.1 Arthralgia (Non-Specific)

This is joint pain without features of inflammation.

Clinical Features
The clinical features include general malaise, joint pains without affecting joint mobility, and without features of inflammation (redness, warm, tenderness) although the joint might be slightly tender. The arthralgia is usually a feature of another illness and careful systemic examination is likely to reveal the responsible disease.

Investigations
There is not specific investigation besides that to identify the responsible disease

Management
Paracetamol should be administered at 40mg/kg/day given four times a day.

43.2 Juvenile Rheumatoid Arthritis

This condition is an arthritis beginning at or before the age of 16 years and tends to affect large and small joints and may interfere with growth and development. Stiffness worse in the morning and the child may be reluctant to use affected limb.

Classification
Juvenile rheumatoid arthritis (JRA) is classified into three grouping, namely, systemic (Still's disease), pauciarticular types I and II and polyarticular varieties. Presentation is shown in Table 42.1.

Table 42.1: Presentation of juvenile rheumatoid arthritis, by type

Type	Systemic disease	Pauciarticular (JRA)	Polyarticular (JRA)
Frequency of occurrence as a percentage	20%	40%	40%
Rheumatoid factor test	-ve	-ve	+/-+ve/-ve
Antinuclear factor test	-ve	75% +ve	
HLA B27 antigen test		+/-+ve/-ve	-ve
Presentation	High fever, rash, splenomegaly, generalized lymphadenopathy, serositis, striking leucocytosis and thrombocytosis	Type I: mainly male Type II: mainly female	As for adult rheumatoid arthritis

Prognosis
Overall prognosis for juvenile rheumatoid arthritis is better than that for adult rheumatoid arthritis. Complete remission occurs in 50–75% of patients. Those with polyarticular form of the disease and are RhF positive have a less favourable prognosis.

Management
Refer to higher level for appropriate management.

44. Mental Disorders

Childhood mental dysfunction is not uncommon but is often overlooked, especially in busy clinics with a lot of children very sick with somatic illnesses. Mental illnesses depend on recognition by the parents and, to some degree, teachers for the children who go to school. Assessment of such children requires a friendly, non-threatening environment. Depending on the age of the child, it is important to observe how the child plays and relates to the parent and the environment as well as to the clinician. The older child with mental illness is able to relate and talk to the clinician.

Early recognition of children with mental illness and their referral to a mental specialist is important.

44.1 Vegetative Disorders

These include eating (pica, bulimia and anorexia nervosa) and elimination (enuresis and encopresis) disorders . Encopresis has already been dealt with.

44.1.1 ENURESIS (BED WETTING)

Most children will be dry at night by age of 5 years. Enuresis is more common in boys. It may be a feature of diseases like renal diseases, cardiac diseases, diabetes mellitus and seizure disorders. Enuresis is categorized as primary when a child has never been dry, or secondary when a child has been dry for at least 1 year before starting bed- wetting again. Secondary enuresis is usually due to some stressful events in a child's life. However, it is important to rule out other diseases that have been mentioned earlier.

The general management of enuresis involves the following:
- Getting the cooperation of the child and parent.
- Avoiding punishment and humiliation of the child.
- Limiting evening and night fluid intake.

Refer those that do not respond to the general management to higher level for appropriate management.

44.2 Anxiety Disorders

These are the commonest psychiatric disorders in children and adolescents. It may be difficult to distinguish between an anxiety disorder and normal anxiety, although it is very important to make such a distinction.

The three types of anxiety disorders are:

- Separation anxiety in which the affected child shows excessive distress when separated from home and may refuse to go to school or sleep away from home
- Phobia whereby there is persistent fear of social situations, school and animals
- Post traumatic stress disorder that is related to a traumatic or a life threatening event. Child may re-enact the event or have nightmares.

Refer affected child to higher level for appropriate management.

44.3 Mood Disorders: Depression

Clinical Features

The clinical features depend on the age of the child, as illustrated below

- In infants, there is panic behaviour and irritability initially looking for a parent/ care giver. This is followed by the child losing interest in every body. Child becomes inactive, apathetic with sad facies.
- Affected child has a sad face, is withdrawn, has poor feeding and poor sleeping, with poor school performance.
- In adolescence, there is fatigue for no apparent reason, lack of interest in normal activities, poor school performance, and suicidal tendencies.

Management

Refer to higher level for appropriate management.

44.4 Conversion Syndromes (Hysteria)

These are mental disorders in which there is a psychogenic disturbance of either motor or sensory function in some parts of the body.

Clinical Features

Patients with this condition could present as paralysis of a part of the body, tremors, blindness, deafness, seizures, or aphonia. The severity of disability fluctuates, and the patient fails to exhibit the seriousness the disability accords.

Management

Refer to higher level for appropriate management.

44.5 Disruptive Behaviour Disorders

44.5.1 ATTENTION DEFICIT/HYPERACTIVITY DISORDER

Clinical Features

The onset of this condition is usually before age of 7 years and the child is permanently on the move during the waking period leading to poor sustained attention and as a result the child finds it difficult to complete tasks and is

inattentive. Very often the child is labelled as being stubborn by the parents and has poor school performance

Management
Refer to higher level for appropriate management.

44.5.2 CONDUCT DISORDERS

These are defined as repetitive and persistent behaviours that violate societal norms. Children present with truancy, drug abuse, defiance of authority, stealing, excessive lying, running away from home, aggressiveness and involvement in criminal activities. Such children often have a background of family disharmony.

Refer to higher level for appropriate management.

44.5.3 PERVASIVE DEVELOPMENT DISORDERS – AUTISM

The conditions appear early in life and affects the child's social, cognitive and language development. Besides autistic disorder, these disorders include Asperger's disorder and Rett's disorder

In autistic disorder (autism), the child has marked impairment of social and emotional interaction with people. The onset is in the first year of life. There is lack of language development, the child is inflexible and may have ritualistic behaviour. It is important to exclude medical conditions like cerebral palsy and hearing impairment.

Refer to higher level for appropriate management.

44.5.4 CHILDHOOD PSYCHOSES

Childhood schizophrenia, bipolar mood illness, and depression may present with psychotic features in the same way as they do in adults. The age of onset is usually after 12 years, rarely before. Those with very early onset may be difficult to diagnose and are often mistaken for having some conduct disorder and have poor school performance.

Refer to higher level for appropriate management.

44.5.5 SUBSTANCE ABUSE RELATED DISORDERS

These are syndromes arising out of repeated maladaptive use of substances (substance is defined as any chemical with brain altering properties). They are characterized by significant impairment of psychological, social, and occupational functioning as observed over a 12-month period. Commonly abused substances in Kenya include tobacco, Cannabis sativa, khat (miraa), opioids (heroin), cocaine, and solvents (glue, petrol, wood varnish). Substance related syndromes include intoxication, dependence, withdrawal, psychosis, mood disorders, anxiety, sleep disorders and sexual disorders.

Those at high risk include children aged 12–20 years and patients with primary mental disorders.

Substance abusing adolescents usually present with self-neglect, slovenliness, deteriorating school performance, excessive sleeping, rough appearance, increasing and unexplained demand for money from caregivers, involvement in petty crime (pilfering), and running away from home, in addition to aforementioned substance-related disorders.

Refer such patients to higher level for appropriate management.

44.5.6 SUICIDE ATTEMPTS

This is an unsuccessful attempt by one to end their own life. This is more common in adolescents following severe social problems or stress. Suicide attempt is used as a desperate attempt on conflict resolution. But it may also be due to depression, schizophrenia or influence of alcohol/drugs

Refer to higher level for appropriate management, which would include admission.

The following are general principles to observe for such patients:
- Avoid accusing the patient.
- Treat the patient with understanding and respect.
- Every suicide attempt should be regarded as serious. Do not regard an attempt as just attention seeking. A successful attempt may follow.

45. Child Health

It is the responsibility of all health care providers to ensure that the children in their catchment area are kept as healthy as possible. Many child health programmes are covered in the care of children in the community. Individual sections also include advice on prevention. Those that are not are discussed in detail in this section.

Programmes that help to keep children healthy include:
- Adequate nutrition for all children and their parents
- Growth monitoring
- Ensuring proper child care and stimulation to enhance adequate development
- Immunization of all children
- Screening for disabilities and adequate referral in all cases
- Continued support for all children with chronic illnesses
- School health programmes
- Environmental sanitation and food hygiene

45.1 Immunization

The basic principle of immunization is to administer to a healthy person a vaccine that will prevent that person from getting a certain disease.

Ideally, all children should complete their primary immunization by the age of one year. This may involve community activities to ensure each child has a card and that immunization is up to date. If by any chance a child's immunization is incomplete, the parent is requested to take the child to an immunization centre at the earliest opportunity.

Vaccines may be made with live attenuated vaccines (e.g., rubella, OPV, measles, BCG), inactivated or killed vaccines (e.g., Hib, IPV), or micro-organisms and detoxified toxins (e.g., tetanus).

Generally, several vaccines can be given at the same time. This is important since it reduces the number of injections as well as visits to a health facility. BCG, OPV, DPT-HepB-Hib, and measles vaccines can be given simultaneously if the child is of the appropriate age and has not received the immunizations. A critically ill child needing hospital admission must be given the appropriate vaccines upon recovery.

45.1.1 IMMUNIZATION GUIDELINES

All parents are encouraged to take their children for immunization starting soon after birth. Presentation of the child health card at every visit to a health facility helps to detect those who missed previous vaccinations. In the community, health workers can also check on these cards.

It is necessary that informed consent be obtained, from either the parent or the patient, before any vaccination is given.

45.1.2 VACCINE ADMINISTRATION

The following is important for vaccine administration:

- The vaccine dose should always be checked from instruction on the vaccine, but nearly all paediatric doses are 0.5ml.
- Site for intramuscular vaccine administration for children under 2 years of age is the antero-lateral aspect of the thigh, while those aged more than 2 years should be given in the deltoid if big enough. If they are not big enough, use the site as for a child under 2 years of age. All intramuscular vaccine administration must be deep into muscle.
- Simultaneous administration of uncombined live vaccines must be given at different sites.
- Minimum interval between vaccine doses should be 4 weeks.

45.1.3 AGE AT VACCINATION

Vaccines are given at specific ages, in accordance with the national immunization schedule, shown below. The list includes vaccines not currently on the national vaccination schedule, but indicates when such vaccines could be given.

- Vaccines given at birth are BCG, OPV, Hepatitis B.
- Vaccines given at 6 weeks, 10 weeks, and 14 weeks include OPV, diphtheria, pertussis, tetanus, Hepatitis B, and Haemophilus influenza b.
- Vaccines given at 9 months include measles and yellow fever.

- Other vaccines not on the national vaccination schedule that can be given between 6 weeks and 12 months include conjugate pneumococcal vaccine and meningococcal vaccine.
- Vaccination of the preterm follows the chronological age rather than weight, although HepB should be given when the baby weighs at least 2kg.
- Vaccines given between the ages of 12 and 24 months include measles, mumps, rubella, varicella, and any of the above if missed, or booster doses for DPT and Hib.
- Vaccines given between 2 and 5 years include DPT-HepB-Hib if never given, varicella, HepA, pneumococcal vaccine, meningococcal, and influenza vaccines.
- Vaccines given above 6 years include adults and comprise tetanus (including boosters every 10 years), pneumococcal, HepB, HepA, influenza (very useful for elderly), and meningococcal vaccines.

45.1.4 SPECIFIC INSTRUCTIONS

The following are general instructions with respect to immunization,

- A slight fever and/or other minor illness should not prevent you from immunizing a child.
- Children should be vaccinated during recovery from a serious illness if they had missed the vaccine.
- Mothers/child-caregivers should be informed about possible side effects of each of the given vaccines.
- All vaccinations should be recorded on tally sheets and on the Child Health Immunization cards and mothers should be instructed to always bring the cards along with them when taking children to a health facility.
- Mothers should be instructed to return the child for the next immunization on the date as indicated on the card.
- The disposal of used sharp syringes should be handled appropriately to prevent injury and spread of diseases like HIV.
- Appropriate cold storage of the vaccines should be ensues, with the recommended cold-chain instructions for each of the vaccines followed carefully. All the vaccines and diluents must be kept cold. DPT, HB, and TT vaccines are damaged if kept below $0^{o}C$ and therefore should never be frozen. Always check the Vaccine Vial Monitor (VVM). The cold chain should be maintained because vaccines are easily destroyed by heat and rendered ineffective.
- Hands should be washed before and after handling vaccines.

45.1.5 CONTRAINDICATIONS

A definite severe reaction to a preceding vaccine dose is a contraindication to further doses of the same vaccine.

45.1.6 IMMUNIZATION IN SPECIAL SITUATIONS

Immunization in Immunocompromised Host

- HIV/AIDS infection: HIV exposed and asymptomatic children infected with HIV should receive all standard Kenya Expanded Programme on Immunization (KEPI) vaccines. BCG vaccination should not be repeated if there is no

reaction and live vaccines are avoided for children in clinical stage 3 or 4 of the disease and immunological stage 3.
- Oncology patients: Live vaccines are best given during remission.
- Corticosteroid therapy (high dose): Live vaccines can be given after cessation of therapy. If can not discontinue, then do not give.
- Pregnancy: Generally live vaccines are contraindicated during pregnancy unless the risk of disease outweighs risk of vaccine, e.g., yellow fever epidemic.

Side Effects and Adverse Reactions to Vaccinations

The side effects range from mild to severe for various vaccines.
- BCG vaccine: These include injection abscess, regional or widespread lymphadenitis, osteomyelitis, and disseminated BCG infection. These should be treated with anti-tuberculosis drugs.
- Oral polio vaccine: Adverse reactions rarely occur.
- Measles vaccine: Adverse reactions include fever, mild rash, and – rarely – convulsions and encephalitis.
- DPT (diphtheria, pertussis, tetanus): Most adverse reactions are attributed to the pertussis component. Minor reactions include pain at the injection site and fever. Major reactions are persistent crying, high pitched cry, excessive somnolence, convulsions, encephalopathy, and coma.
- Recombinant DNA Hepatitis B vaccine: Side effects include pain, fever, and swelling at the site of the injection.

45.1.7 CHILDHOOD IMMUNIZATION SCHEDULE IN KENYA (KEPI)

Under the Kenya Expanded Programme of Immunization, Kenya maintains the vaccine schedule shown in Table 45.1. Dosages and route of administration are summarized in Table 45.2.

Table 45.1: Childhood immunization schedule in Kenya (KEPI)

Vaccine	Age	Remarks
BCG Polio (OPV 0)	At birth Birth dose	Or at first contact with child.
DPT_1-$HepB_1$ -Hib_1, oral polio (OPV 1)	6 weeks (1½ months)	Or at first contact with child after that age.
DPT_2-$HepB_2$ -Hib_2, Oral polio (OPV 2)	10 weeks (2½ months)	4 weeks after DPT 1 and OPV 1 can also be given anytime after this period, when in contact with the child.
DPT_3-$HepB_3$-Hib_3, oral polio (OPV 3)	14 weeks (3½ months)	4 weeks after DPT 2 and OPV 2; can also be given any time after this period, when in contact with the child.
Measles	9 months	May be given between 6 and 9 months if child is admitted to hospital for any other illness. Repeat at 9 months as per KEPI schedule.

Table 45.2: Vaccine dosage and route of administration

Vaccine dose	Route of administration
BCG* Child under 1 year, 0.05ml Child over 1 year, full dose, 0.1ml	Intra-dermally into upper outer part of left forearm, at the junction of the upper and middle thirds. If given correctly a small weal appears at the site of the injection. Inform the mother that a small sore will appear in 2–6 weeks. Let this heal by itself. It will leave a small scar. If no reaction develops, the vaccination should be repeated after 3 months except in HIV infected children.
Polio (OPV)* 2 drops by mouth. Follow manufacturers' instructions on dosage	Read the instructions on the bottle. Give vaccine by mouth. Use dropper provided. If child spits or vomits repeat the dose.
Pentavalent vaccine consisting of DPT- HepB-Hib 0.5ml	Intramuscularly in the upper outer part of the thigh.
HepB 0.5ml – child 1.0ml – adult	Intramuscularly in the upper outer part of the thigh for child and deltoid (left) for adult
Measles* 0.5ml	Subcutaneously or intramuscularly in upper outer part of the arm (deltoid muscle)
Tetanus toxoid (TT) 0.5ml	Intramuscularly in the outer part of the upper-arm (deltoid muscle)

* Live vaccines.

45.1.8 VACCINES AVAILABLE BUT NOT YET IN KEPI PROGRAMME

- Pneumococcal vaccine: There are 2 types of pneumococcal vaccine
  - Conjugate vaccine (PCV) which can be given at 6, 10, and 14 weeks together with DPT-HepB-Hib. When this is available it should be given to all children.
  - Polysaccharide vaccine, which can be given to any person aged 2 years and above. This vaccine is recommended to be used for high risk people with following conditions:
    - Sickle cell disease and any person who has had splenectomy
    - Immune deficiency states such as HIV, malignancy, congenital immune deficiency, transplant patients, or any person on high dose corticosteroid therapy
    - Chronic cardiac or pulmonary diseases
    - Diabetes mellitus
- MMR (measles, mumps, rubella): Given at 12–15 months.
- Influenza vaccine: check type available some are suitable for persons over 12 years and others can be used from 6 months.
- Meningococcal vaccine: polysaccharide type for age >2 years often used to control epidemics. A conjugate type is currently available in developed countries.
- Hepatitis A: Not yet routinely given. But can be given to special high risk groups including patients with clotting factor disorders, at risk of occupational exposure, or during an outbreak.

- Hepatitis B (not combined): Can be used at birth or outside the age when the combined vaccine is not recommended.
- Rabies vaccine (see Section 45.1.12, below).
- Varicella vaccine (live attenuated): Can be given simultaneously with MMR. Can be given either routinely to all children, or post exposure to high risk groups – immunocompromised patients without history of having had varicella infection. For cancer patients it is best given during remission.
- Rotavirus vaccine: Recommended for children from 6 months.
- Acellular pertusis vaccine in combination with tetanus, diphtheria. Etc.

45.1.9 TETANUS TOXOID (TT2+) IMMUNIZATION SCHEDULE FOR PREGNANT MOTHERS

Tetanus toxoid is routinely given to women during their first (or a subsequent) pregnancy. The other doses are given as shown in Table 45.3.

Table 45.3: Tetanus toxoid schedule for pregnant mothers

Dose	Timing
1st dose	During 1st pregnancy (ideally)
2nd dose	4 weeks after 1st dose
3rd dose	6 months after 2nd dose
4th dose	at least 1 year after the 3rd dose
5th dose	at least 1 year after the 4th dose

A total of 5 doses is recommended during the reproductive age of women. The 3rd, 4th, and 5th doses can be given in subsequent pregnancies if not given as suggested above.

☛ **Immunizing a pregnant mother ensures protection of her newborn baby against tetanus.**

45.1.10 VITAMIN A SUPPLEMENT

Vitamin A is not strictly a vaccine, but an important immune booster. It is currently recommended to be given to all under 5 children. The schedule is shown in Table 45.4.

Table 45.4: Vitamin A supplementation schedule

Dosage (in IU)	When to give
<6 months – 50,000 6–12 months – 100,000 >12 months – 200,000	A dose can be given to a non-breastfeeding baby in the first 6 months. Otherwise first dose is at 6 months then every 6 months (twice per year) up to the age of 60 months. All mothers are given 200,000IU immediately after birth or within first month of delivery.

45.1.11 IMMUNE GLOBULINS (PASSIVE IMMUNIZATION)

- These may be non specific or specific and are given either IM or IV.
- Non specific immunoglobulins: Can be used as replacement in individuals with antibody deficiency disorders
- Specific immunoglobulins: Prepared from donors known to have high antibody to specific antigens or specific sources. Very useful in post exposure prophylaxis Examples include rabies, varicella, RhO (D) immune globulin (anti D)

45.1.12 RABIES

Any mammalian animal may carry rabies. Saliva from a rabid animal contains large numbers of the rabies virus, which is inoculated through a bite, any laceration, or a break in the skin. Rabies is fatal if not managed properly.

Management

Emergency care for a suspected rabid bite includes the following:

- Thorough irrigation of bite with copious amounts of saline solution
- Cleansing the bite with a soap solution
- Debridement of the bite area
- Administration of antibiotic
- Administration of tetanus toxoid
- Delayed suture or skin grafting
- Infiltration of the wound with rabies immunoglobulin

Indications for rabies vaccine are the following:

- Bites from wild animals
- Bites from UNPROVOKED domestic animal
- Bites from a sick looking domestic animal, whether immunized or not
- Laboratory findings of Negri bodies in the brain of the involved animal
- Persons at high risk of exposure

☛ **Always refer as soon as possible to a centre that can vaccinate.**

PART III
Surgery and Related Disciplines

IN THIS SECTION:

46. Acute Trauma and Selected Emergencies

46.1 Abdominal Trauma

Abdominal injuries (to spleen, liver, bladder, gut) are not an uncommon cause of preventable death and their proper clinical assessment is vital. The spleen, liver, retroperitoneum, small bowel, kidneys, bladder, colorectum, diaphragm, and pancreas tend to be the most commonly injured organs.

Signs and symptoms of blunt injuries can be masked by injuries elsewhere, e.g., fractured limbs, fractured ribs or spinal cord, and head injuries and may also develop slowly. If a patient has multiple injuries assume the abdomen is involved until this is ruled out. Organomegaly makes the involved organs more vulnerable to abdominal trauma so be cautious with children with pretrauma splenomegaly.

☛ **Unexplained shock in a trauma patient should point towards an intra-abdominal bleed.**

Clinical Features
Of important value are the vital signs (pulse rate, blood pressure, respiratory rate, temperature). There may be obvious bruises or abdominal wall wounds. Pain, localized tenderness, or rigidity of the abdominal wall indicates the most likely site of injury. Abdominal distension can be due either to gas leaking from a ruptured viscous or to blood from injured solid organ(s) or torn blood vessels. This is a serious sign!

Haematurea occurs in bladder injuries and haematochezia in rectal injuries. The absence of bowel sounds or sustained shock despite resuscitation mandates urgent surgical intervention.

Investigations
Determining packed cell volume (PCV) is useful for serial assessments.
Management at Level 2–3
- Maintain airway and breathing.
- Is your patient in shock? (Has low BP, high pulse rate, cold clammy extremities, etc.). Start large bore intravenous line in cases of shock.
- Take blood sample for later group and cross match and transfer sample with patient.
- Clean, stitch and dress small superficial wounds, but do not let this adversely delay referral. Management at level 2 and 3 is limited mainly to patient resuscitation in order to stabilize patient.
- Give tetanus toxoid 0.5ml STAT.
- Start antibiotics crystapen 1g QID + metronidaxole 400mg TDS IV as appropriate.
- Keep patient warm.
- Closely monitor BP, pulse rate, respiratory rate, temperature, and urine output. Measurement of abdominal girth may prove useful in follow up of patient's progress.

- Repeat clinical examinations regularly while awaiting transportation and document your findings. Adequate documentation at this early stage is critical.
- Urgent referral to centre with adequate surgical coverage if suspect surgical interventions will be required. If patient is stable and no evidence of significant injury is present, with normal vital signs and no significant tenderness, then observe at least 24 hours. If after this time you are still not sure, consult on telephone with higher level or refer.
- Transfer with appropriate transportation and escorts(s). Make sure resuscitation measures are in place and continued during referral.
- Ensure accurate documentation is sent with the patient.

46.2 Animal and Snake Bites

These include bites by humans, dogs, and other domestic animals, as well as wild animals.

Management
Will depend on the extent of tissue loss and site of injury. Most bites consist of cuts and simple lacerations.

Immediate Care
- Stop all bleeders by pressure and ligature while preparing for thorough toileting. If in shock, manage accordingly with fluid resuscitation.
- Administer a pain reliever, e.g., diclofenac 75mg for an adult, and antibiotics as indicated.

Local Care
Clean cuts and lacerations thoroughly with cetriamide + chlorhexidine or hydrogen peroxide. Hydrogen peroxide is indicated for septic wounds only. One may use detergent only and dress. A delayed suture is advised 4–7 days after a bite if the patient presents late. Update tetanus toxoid immunization. In the meantime the following should be done:
- Give amoxicillin 500mg TDS (25–50mg/kg) + metronidazole 400mg TDS for 5 days.
- Give rabies vaccine where indicated (see section on rabies management in Section 1.4.2).
- Give anti venom for snake bites in appropriate cases.
- Consider urgent referral if rabies vaccine or anti snake venom is not available in facility or surgical toilet is needed. For referral, ensure adequate documentation and availability of resuscitation equipment during the actual referral phase.

46.3 Burns

The majority of burns are caused by heat, which may be open flame, contact heat, or hot liquids (scalds). Others are chemical, electric, friction, sunburns, and irradiation. Extreme cold can cause tissue injuries (i.e., frost bite).

Management
First aid measures:
- Airway: Ensure patient has a clear air way, for example by suction of oral airway.
- Breathing: Ensure patient is breathing and receiving oxygen by mask if need be.
- Circulation: Ensure adequate intravenous access, availability of intravenous crystalloids and group and cross match blood.
- Give tetanus toxoid and analgesics.

Quick Assessment of the Extent of Burns
- Burnt surface area estimation
- Degree of burn
  - First degree – Epidermis only
  - Second degree – Epidermis and portions of dermis
  - Third degree – All skin to subcutaneous
- Special sites of injury (note facial, perineal, hands, and feet)
- Look out for circumferential burns on extremities
- Other injuries (e.g., fractures, head injuries, chest injuries, abdomen, etc.)
- The Wallace Rule of Nines (see Figure 46.1) is used to estimate the extent of burns

☛ **Refer to a level 4 facility and above if patient meets the admission criteria below.**

Criteria for Admission (For Referral to Facility 4 and Above)
- Extent of burns: >10% body surface area.
- Burns to the following burn areas:
  - Hands and feet
  - Face and neck
  - Perineum
  - Joints and other associated injuries
- Inhalational burns.
- Chemical and electric burns.
- Other known pre-existing diseases, e.g., diabetes mellitus.

☛ **Initiate fluid management schedule.**

Fluid Therapy
Fluid administration is the mainstay of treatment and is life saving. Quick vascular access is mandatory. See details below for fluid management schedule. If fluids are started at level 2 or 3, it is important that the fluid chart be accurately documented including time of fluid commencement.

During referral ensure resuscitation continues and also ensure appropriate transportation of the patient, accompanied by an escort who is familiar with the case.

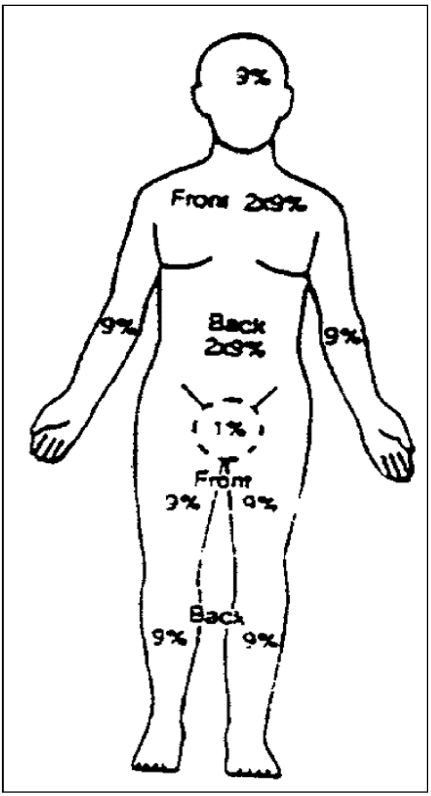
During referral observe the following precautions:
- Cover patient with dry sheet.
- Avoid hypothermia.
- Provide appropriate analgesia.
- Ensure fluid management continues.

46.3.1 EVALUATION OF THE EXTENT OF BURNS USING THE WALLACE RULES OF NINE FOR ADULTS

The "Rule of nines" for estimating the extent of a burn surface area in adults is so called because the various areas of the body are calculated at multiples of 9% of total body area (Figure 46. 1). By adding the affected areas together, the percentage of the total body surface burnt can be calculated quickly.

Note that the body surface area distribution in children is different from that of the adult and is continuously changing with growth. Figure 46.2 should be seen in conjunction with Table 46.1. The table will assist in body surface area estimation for the different age groups in children.

Figure 46.1: Evaluating the extent of burns using the Wallace Rules of Nine



The total body area is critical to the fluid management of the burn patient.It is safer to overestimate body surface area than under-estimate it. A useful rough guide is to estimate the palm of the hand excluding the fingers as being approximately 1%.

46.3.2 AMOUNT OF FLUIDS TO BE ADMINISTERED

Parklands Formula

4 x Total body surface area burnt x Weight in kg = (ml) administered within the first 24 hours from the time of the burns.

The total fluids calculated should be administered as indicated below:
- First 8 hours from the time of burns = 1/2 total calculated fluid
- Next 8 hours = 1/4 total calculated fluid

- Next 8 hours = 1/4 total calculated fluid

As an example, for a 80kg man with 20% burns, total fluid (80kg x 20% x 4) ml = 6,400ml. Administer as follows:
- 3,200ml within the first 8 hours
- 1,600ml next 8 hours
- 1,600ml over the next 8 hours

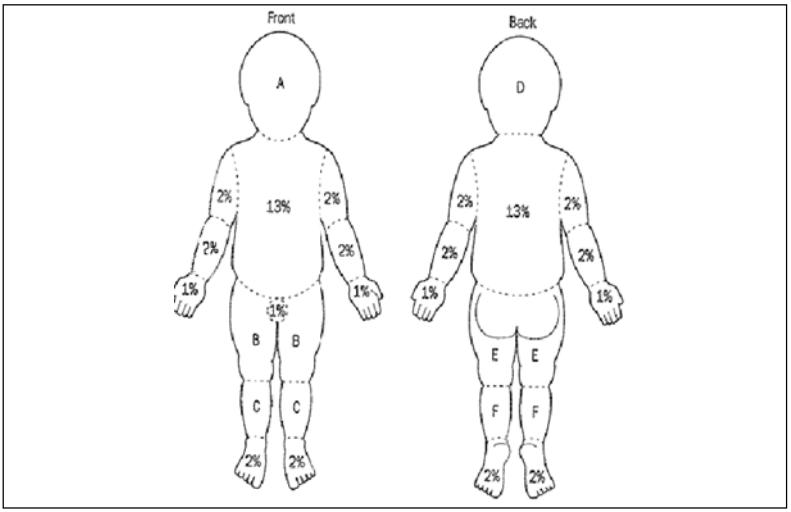
For management of a person with burns, the following is necessary:
- Fluids used should be either normal saline or Hartman's solution.
- Monitoring should be carried out for vital signs, urine output (maintain at least 1–2ml/kg/hr) and packed cell volume.
- Care of the burn surface while awaiting transfer includes the following:
  - Cleaning with clean water, antiseptics, or normal saline.
  - Applying antiseptic cream like silver sulphadiazine, nursing wounds exposed, and using a cradle.
  - Using a moist plastic bag for burns of the hands and feet after antiseptic cream application.

☛ **Refer the patient without delay to higher level for appropriate management.**

Table 46.1: Change in body surface area with growth

Body area	< 1 yr (%)	1 yr (%)	5 yr (%)	10 yr (%)	15 yr (%)
Head (A/D)	10	7	7	6	5
Thigh (B/E)	3	3	4	5	5
Leg (C/F)	2	3	3	3	3

Figure 46.2: Body surface area estimation in children



46.4 The Multiply Injured Patient

A patient injured in more than two body systems is defined as a multiply injured patient. This situation commonly occurs in road traffic accidents, falls from a height, blast injuries, etc.

The approach to a patient with multiple injuries must be systematic in order to identify all the injuries and prioritize the sequence of attention.

Resuscitation Required and Its Order

1) ***Airway:*** Position the head and with finger or suction, clear blood, mucus and foreign bodies. Take care to avoid causing cervical injury and apply cervical collar or use the jaw lift manoeuvre. Use log rolling procedure if it is necessary to reposition the patient in any way.
2) ***Breathing:*** Respiratory rate and air entry into the chest should be checked. If need be, perform mouth to mouth respiration using a gauze or plastic sheet with hole inserted.
3) ***Circulation:*** Stop active bleeding. Monitor pulse rate and blood pressure and fix a large intravenous cannula preferably in the antecubital area. Perform a cut down if need be.
4) ***Dysfunction of CNS:*** Assess neurological status, consciousness level, spinal cord, etc.
5) ***Drugs, including fluids:*** These should be used to correct acid–base and volume imbalance.
6) ***Exposure for examination:*** Disrobe the patient entirely and carry out a complete physical examination.
7) ***Chest injuries:*** For example, haemopneumothorax from whatever cause takes priority.
8) ***Head injuries:*** Require setting of baseline observations.
9) ***A patient in shock from non-obvious causes:*** This points towards the abdomen, suggesting visceral injury. It can be very unapparent and may be fatal.
10) ***Peripheral bone fracture:*** This may need stabilization initially and proper attention later.
11) ***After resuscitation and stabilization:*** The patient will require frequent and more thorough examinations.

☛ **An unstable patient requires immediate referral.**

46.4.1 CHEST INJURY

PENETRATING INJURY

Common objects causing such injury are knives, arrows, spears, and bullets. The objective of management is to restore normal anatomy or physiology resulting from the stab injury.

Management at Level 2–3
Refer the following to a higher level for appropriate management:
Penetrating chest injuries: Do not remove any impaled objects. Make sure resuscitation measures continue during transportation. If the implement used during stabbing is still in situ, do not remove it. It is advisable for this to be removed only in a controlled setting like in theatre. For referral stabilize this by surrounding with heavy dressing or other cloth like material. Inform receiving centre of transfer and talk to recipient doctor.

SIMPLE RIB FRACTURES

This is a break in the continuity of a rib(s). Could be traumatic or pathological. Types of fractures can be crack fracture(s), single or multiple fractures with fragment displacement, and segmental fracture(s).

Clinical Features
There is history of trauma. Pain on breathing or movement. Evidence of chest trauma. Crepitus at the fracture site or tenderness. May have signs of associated haemo-pneumothorax, subcutaneous emphysema.

☛ **Caution: The chest injury may be associated with splenic or liver injury – especially associated with higher and lower rib fractures.**

Investigations
Physical examination is adequate at this level.

Management
- Give Supplemental oxygen if there are signs of respiratory distress.
- Administer analgesia; this includes ibuprofen 200mg TDS and/or 2% lidocaine hydrochloride 2–5ml directly into fracture site STAT.
- Refer all to higher level for appropriate management.

☛ **Suspect possibility of severe injury if there are fractures of the first rib and of the 8th rib and below.**

FLAIL CHEST

This occurs when multiple fractures are sustained with more than one site per rib. The main danger is that the patient may lapse into respiratory failure.

Clinical Features
- Chest pain
- Paradoxical chest movement
- Dyspnoea may be present
- Evidence of fracture ribs
- Haemothorax or pneumothorax

Management at Level 2–3
- Resuscitate if needed – airway, fluids, and oxygen as appropriate.
- Administer analgesia, ibuprofen 200mg TDS, if sure no neurological injury is present.
- Refer to higher level for appropriate management.
- Provide appropriate transportation with resuscitation equipment and nurse

PNEUMOTHORAX

This occurs when air enters the plural space, causing lung collapse on the affected side. Causes include spontaneous development following staphylococcal pneumonia following chronic obstructive pulmonary disease. Pneumothorax may also be caused by blunt trauma with rib fractures and or lung contusion, penetrating injuries, stab wounds and missiles.

Clinical Features

There is shortness of breath, tightness of the affected chest, tachypnoea and tachycardia. Sweating and cyanosis may be present. Reduced chest excursion also occurs with reduced air entry on auscultation, and hyper-resonant chest is noted on percussion.

Management
- Patients suspected to have pneumothorax should be referred immediately to higher level for appropriate management.
- If tension pneumothorax is suspected, and it should be, air should be drained immediately with wide bore needle.
- On referral, provide transport with oxygen and a competent escort.

☛ Tension pneumothorax is a clinical diagnosis and not a radiological diagnosis. ***Ordering a chest radiograph may result in patient death before active treatment can be implemented.***

HAEMOTHORAX

This occurs when blood collects in the pleural space. Haemothorax may vary in amount from small to massive. Causes include trauma, post surgical bleeding, and tumours of the chest cavity and chest wall.

Clinical Features

Depending on the magnitude of the blood collection, there could be hypovolaemic for massive bleeding, symptoms similar to those associated with pneumothorax except for the percussion note, which is dull for haemothorax. However, haemopneumothorax is the more common presentation following chest trauma.

Management at Level 2–3

Initiate resuscitation measures as described above. If a patient is suspected to have haemothorax on clinical grounds, refer them urgently to higher level for appropriate management and provide transport with oxygen and a competent escort.

46.1.2 MAXILLOFACIAL INJURY

This injury can present with an apparently frightening clinical picture. DO NOT PANIC!

The bones of the mid face tend to stick out and are thus prone to being injured. The nose, zygoma, and mandible are the most prone to injury, with maxillary bone injuries being relatively less common and more complicated. This latter constitute the La Fort injuries.

The management principles of maxillofacial injuries are:

- Restore the airway and breathing.
- Control bleeding.
- Restore the teeth and other bones to normal alignment.

Airway

- If palate is collapsed on the roof of the mouth, scoop with finger and try to elevate.
- If tongue is pushed back in the direction of the pharynx, pull forward with forceps. Apply suture to hold in place if need be. Lie patient on their side.
- With severe nose injury, suck to clear blood and insert nasopharyngeal tube if need be. Take precautions as above for possible neck injuries.

Bleeding

- Apply local area or nasal packs soaked in adrenaline.
- Direct suture of spurting bleeders.

Circulation

- Administer fluids.
- Monitor fluid management as above.
- Give tetanus toxoid 0.5ml STAT.
- Arrange transport with adequate resuscitation equipment. Ensure communication with receiving facility has been made.

☛ **Patients with maxillofacial injury require immediate referral to higher levels or appropriate management.**

46.1.3 HEAD INJURY

With the high number of road traffic accidents and assaults, this is a fairly common injury. Early and proper management is critical in order to avoid death and long-term morbidity.

Management

- Apply cervical collar and use log rolling techniques.
- Initiate resuscitation measures.
- Document accurately the neurological status with the Glasgow scale (Table 46.2) or other reliable scale.
- Ensure adequate oxygenation and monitor fluid balance. Avoid over hydration.

- Review regularly every 15 to 30 minutes while awaiting transportation.
- Arrange immediate referral to higher level for appropriate management and provide appropriate transportation and personnel to accompany the patient during transportation.

Regular neurological assessments performed less often than hourly are of no use for interpretation.

Table 46.2: Glasgow coma scale

Serial No.	Category	Specific function	Score
I	**Eye opening (E)**	Spontaneous	4
	To voice	3	
	To pain	2	
	Nil	1	
2	**Best verbal response (V)**	Oriented, converses	5
	Converses but confused	4	
	Inappropriate words	3	
	Incomprehensible words	2	
	Nil	1	
3	**Best motor response (M)**	Obeys	5
	Localizes pain	4	
	Flexion withdrawal	3	
	Flexion abnormal	3	
	Extension	2	
	Nil	1	

Glasgow Coma Score
Score = E + M + V (the higher the score the better the prognosis).
Note: Trend is more important than present level of consciousness.

46.1.4 SPINAL INJURY

Spinal injury may involve soft tissues (muscles and ligaments), bones (vertebrae and discs), and neural tissue (spinal cord and nerves). It is important for the primary assessment to establish the presence of an injury and initiate immediate treatment to avoid worsening the primary injury or secondary ones.

Causes of spinal injuries include:
- Road traffic accidents
- Assault
- Blunt injury
- Penetrating injuries: Sharp objects like knives, spears, firearms
- Sports injury
- Falling from a height

Bone injury can be stable or unstable and may be associated with neurological manifestations like paraplegia or quadriplegia depending on the level of injury. The injury could be a compression fracture with retropulsion of bone fragments into the spinal canal, causing spinal cord compression or the complete transaction of the cord.

Clinical Features
Spinal injury may present as part of the multiply injured patient and caution is needed not to overlook this condition. Neurogenic shock may be present. Neurogenic shock refers to the haemodynamic triad of hypotension, bradycardia, and peripheral vasodilatation resulting from autonomic dysfunction and the interruption of sympathetic nervous system control in acute spinal cord injury.

Spinal shock is defined as the complete loss of all neurological function, including reflexes and rectal tone, below a specific level that is associated with autonomic dysfunction.

Management
Care of the spinal column should be observed with application of a cervical collar or a hard board. Practise log rolling procedure at all times. Spinal stabilizing should be provided during transportation. Resuscitation should continue during transportation.

Refer to higher level for appropriate management, which includes acute treatment and thereafter referral to the spinal injury unit for rehabilitation. Transfer should be made even if the clinical manifestations of spinal injury are minor.

47. General Surgery

47.1 Abdominal Conditions

47.1.1 ACUTE ABDOMEN
"Acute abdomen" is a clinical term used to describe a syndrome that usually incorporates symptoms and signs in the abdomen. Central in the syndrome is a severe, acute abdominal pain. The term is a symptomatic diagnosis and not a definitive one. It is critical in these patients that a variety of diagnoses be suspected and diagnosed or clearly excluded before definitive treatment is initiated.

The common causes of abdominal pain are medications (NSAIDs), gastroenteritis, peptic ulcer disease, acute erosive gastritis, appendicitis, acute cholecystitis, acute pancreatitis, acute intestinal obstruction, renal colic, diverticulitis, ectopic pregnancy, ruptured or twisted ovarian cyst, mittelschmerz, urinary tract infection, and pelvic inflammatory disease (PID).

Clinical Features
Meticulous history and physical examination are very important in establishing the diagnosis. The clinical features include abdominal pain, abdominal distension, abdominal guarding and rigidity, altered bowel sounds, and alteration of bowel habits.

A search should be made for signs and symptoms of GIT, genitourinary, hepatobiliary, and respiratory diseases, as well as metabolic disorders (diabetes

mellitus, porphyrias), CNS diseases (neuropathies), haematologic diseases (for example, thrombotic crisis in sickle cell disease), and cardiovascular disease.

☛ **As a result of organ displacement associated with pregnancy, clinical examination of the abdomen for abdominal pain in a pregnant female can be confusing.**

Investigations
- Haemoglobin, white blood cell count, packed cell volume
- Urea and electrolytes
- Urinalysis

Management
Details of the patient's history and condition, as well as an accurate documentation of events are important.
- Start resuscitation of patient with nil orally, nasogastric suction, and a wide bore intravenous line or other form of secure intravenous access.
- Collect blood sample for grouping and cross matching, which should be sent with patient to the higher level for appropriate management.
- Catheterize and initiate an input output chart as indicated.
- Arrange transfer to a surgical facility as soon as possible.
- Provide suitable transportation and escort
- During transfer, maintain resuscitation, nasogastric suction, fluids, and input output chart.

47.1.2 INTESTINAL OBSTRUCTION

Clinical Features
In infants, suspect bowel obstruction if:
- No meconium is evacuated within the first 24 hours of birth.
- There is green or bilious vomiting.
- There is abdominal distension

In adults, suspect bowel obstruction if:
- There is constipation.,
- There is abdominal distension.
- There is fever (if advanced obstruction is present).
- There are features of dehydration.
- There are altered bowel sounds.
- There are abdominal pain and vomiting.

☛ **If there is gross abdominal distension with no pain, suspect sigmoid volvulus.**

Investigations
- Haemoglobin, white blood count, packed cell volume
- Urinalysis
- Urea and electrolytes

Management
- Initiate resuscitation with nasogastric suction, intravenous fluids, and nil orally.

- Monitor vital signs.
- Then manage as for acute abdomen above.
- Refer to higher level for appropriate management.

47.1.3 PERITONITIS

This is inflammation of the peritoneum. Appreciate that peritonitis could be due to tuberculosis and could also be aseptic. The aseptic type is usually due to chemical irritants like pancreatic juices, etc. Peritonitis usually ends up producing adhesions that may cause future bowel obstructions of varying degrees.

Clinical Features

Presentation is with an acute tender abdomen, abdominal distension, altered bowel sounds, guarding, rigidity, rebound tenderness, and fever.

Complications of peritonitis include the following:

- Abscess formation
- Multiple organ failure
- Site infection following surgery
- Wound dehiscence
- Enterocutaneous fistulae

Investigations

- Haemoglobin, PCV
- Urea and electrolytes

Management

- Correct fluid and electrolyte imbalance. These are usually disturbed by the movement of fluid and electrolytes into the third space. The disturbance could arise or be made worse by vomiting and/or diarrhoea.
- Apply nasogastric suction, as this is usually necessary because of organ hypotonia and dilatation.
- Administer antibiotics to cover a broad spectrum of bacteria. Combinations advised in order to get the appropriate cover are crystalline penicillin 2 mega units QDS, gentamicin 80mg TDS + metronidazole 500mg TDS.
- Alleviated pain only once a diagnosis has been made. Analgesic recommended in such a situation is diclofenac 75mg TDS.

Refer to higher level for appropriate management. Continue resuscitation as indicated above during transfer.

47.1.4 APPENDICITIS

Clinical Features

Starts classically with diffuse abdominal pain felt most prominently in the periumbilical area. There is anorexia and nausea. Vomiting may follow. Pain then settles in the right lower quadrant and is localized at McBurney's point. The pain may be relieved briefly after perforation, but is accentuated by the ensuing diffuse peritonitis. There is localized tenderness in the right lower quadrant.

There is rebound tenderness, muscle guarding, cutaneous hyperaesthesia, and pelvic tenderness in the right iliac fossa on rectal examination. Rovsing's sign may be positive and the temperature may be elevated.

Investigations
Laboratory examinations are not critical for diagnosis. There is leucocytosis with neutrophilia. ***Normal values do not rule out appendicitis.***

Management
- Resuscitate as for acute abdomen above.
- Urgently refer to higher level for appropriate management.

47.1.5 TRACHEOESOPHAGEAL FISTULA

This is found in young infants. It is a communication between the trachea and the oesophagus. The condition tends to have life threatening complications and needs urgent treatment soon after birth. This is dealt with under the Paediatric section.

Surgical correction should be carried out as soon as patient can be stabilized for surgery. Usually surgery is recommended within a few days of birth. Repair may be performed as a primary procedure or a staged procedure at higher level of health care.

At this level, initiate resuscitation measures as for acute abdomen above (suction, antibiotics, fluids) and refer urgently to level 5 to 6 for appropriate care.

47.1.6 INTESTINAL ATRESIA

During development, the gastrointestinal tract first develops into a tube, which later canalizes. Failure of this process during any stage may result in intestinal atresia. This can affect any section of the bowel and can have varying degrees of severity.

Clinical Presentation
For an upper GIT lesion, bilious vomiting will be the main form of presentation with abdominal distension secondary to gaseous distension. Failure to pass meconium may occur for lower level lesions.

Management
- Initiate resuscitation measures with intravenous lines, nasogastric suction, and fluid charts.
- Correct any fluid and electrolyte imbalance that may be present.
- Refer immediately to higher level for appropriate management.

47.1.7 CHILDHOOD HERNIAS

INGUINAL HERNIA

Inguinal hernia is an extension of the processus vaginalis, which fails to close during foetal development. Through this opening abdominal content can herniate to varying extents into the inguinal canal and scrotal sac. The communicating type is the most common form and extends down into the scrotum, while the non-communicating one is less common.

Clinical Features

A bulge presents at either the internal or the external rings, or the scrotum for males and inguinolabial region for females, and increases in magnitude with straining. There may be associated pain and discomfort, or it may present as an acute abdomen. Examination findings reveal a reducible mass, but cases of irreducible incarceration may occur. Trans-illumination test may be positive.

Management

Patient resuscitation as for intestinal obstruction where appropriate.
Refer to higher level for appropriate surgical management. In case there is obstruction, make an emergency referral.

ABDOMINAL HERNIA

This is a protrusion through the abdominal wall due to one of the following:

- Omphalocoel: Due to the failure of development of the anterior abdominal wall at the area of insertion of the umbilicus, with the abdominal contents herniated out with only a peritoneal covering. There may be other associated anomalies. This is the most severe of these types of hernia.
- Gastrochesis: A herniation of small bowel contents with no covering at all, and often paraumbilical. Unlike omphalocoes, this condition does not have many associated anomalies.
- Umbilical hernia: A mild condition as a result of a defect in the linea alba. The herniated bowel has a covering of subcutaneous tissue and skin.

Clinical Features

There is protrusion of bowel contents through abdominal wall to varying extents with or without other organs. Covering of the hernia varies and strangulation is a possibility.

Investigations

Usually a clinical diagnosis is sufficient for these conditions.

Management

Refer all cases to a higher level for appropriate management.

INTUSSUSCEPTION

This occurs when a piece of, usually small, bowel invaginates into itself. This invagination may cause strangulation that leads to gangrene formation in the affected portion of bowel.

Clinical Presentation
There is onset of acute abdominal pain sometimes associated with “red current jelly” stools. Clinical examination reveals a mass of the interssuceptus in the right hypochondrium.

Investigation
Plain abdominal radiograph may show evidence of obstruction but misses still in identifying intussusceptions in early disease. Ultrasound gives better detection rates.

Management
Carry out urgent resuscitation. Refer to level higher level for appropriate management.

47.1.8 IMPERFORATE ANUS

This is failure of the anal opening to canalize and is the commonest cause of intestinal obstruction in the newborn. Anatomical presentations vary widely.

Clinical Presentation
There is failure to pass meconium, or may pass meconium per urethra or vagina.

Investigation
Check for other anomalies.

Management
Refer affected children to higher level for appropriate management.

47.1.9 INGUINAL HERNIA (ADULT)

This is usually an acquired condition and is often linked with activity associated with increase of abdominal pressure.

Complications
Complications of this condition include obstruction (when a hollow viscus goes through a ring of variable size and cannot be reduced), incarceration (when a non-hollow organ, for example the omentum, goes through a ring of variable size and cannot be reduced). Strangulation is a process whereby blood flow into the obstructed viscus is compromised and if not corrected culminates in ischaemia of the viscus supplied by the involved blood vessels. Pain and tenderness over the hernial area are ominous signs. Sudden change from reducible to irreducible status is an ominous sign, especially if discolouration of tissues over the area is present.

Clinical Features
Protrusion in the groin region, initially on straining and later may be spontaneous. There may also be a nagging or painful sensation in the groin or a strangulated, painful groin mass.

Examination
Observation of the bulge with the patient coughing while standing and again when lying down, and with a finger invaginated into the external ring, repeat the same examinations. This examination is able to differentiate femoral from inguinal hernia. There is no great advantage of differentiating indirect from direct inguinal hernia pre-operatively.

Management
If strangulation or incarceration are suspected, initiate resuscitation with intravenous fluids, nil orally, and nasogastric suction and follow with emergency referral. If not sure, do not attempt reduction of a strangulated hernia. Give injectable analgesia as available, ibuprofen 500mg or diclofenac 75mg IM. Refer all such cases to higher level for appropriate management.

47.1.10 LOWER GASTROINTESTINAL BLEED

This may be frank bleeding depending on the cause. Common causes include:
- Haemorrhoids
- Anal fistulae and fissures
- Tumours: benign (leiomyoma, fibromas, polyps) or malignant
- Trauma
- Angiodysplasia
- Bleeding disorders

Investigations
- Estimation of PCV
- Stool for microscopy, culture and sensitivity

Management
Refer suspected cases to higher level for appropriate management.

47.2 Anorectal Conditions

There is pain usually on defecation that prevents proper sitting and causes immobility (commonly due to abscess, thrombosed haemorrhoids or acute fissure-in-ano). Painless bleeding is commonly due to haemorrhoids but may be due to colorectal carcinoma.

A patient with a perianal mass complains of feeling a mass (usually prolapsed haemorrhoids or anal tags) or has anal discharge that is associated with itching, and is commonly associated with tumours, proctitis, and helminthic infestations. Perineal discharge, on the other hand, is commonly due to fistulae and is common in obese people.

47.2.1 ANAL INCONTINENCE

Causes
A thorough examination of the patient with digital rectal examination are critical for identifying the cause of anal incontinence. The following have been associated with anal incontinence:

- Congenital abnormalities.
- Trauma to the sphincters and anorectal ring, injuring them (obstetric, operative, abuse, accident).
- Neurological abnormalities (due to spinal cord disease).
- Anorectal disease (rectal prolapse, third degree haemorrhoids, anorectal cancer).

Management
Initiate resuscitation where indicated. Suture wounds where applicable. For deep wounds, refer urgently. Otherwise referral to higher level for appropriate management.

47.2.2 RECTAL PROLAPSE

Rectal prolapse may be partial (mucosal) or complete (whole thickness of rectal wall). It is a common occurrence in children and the elderly (especially females, who form 85% of the affected adult population), but may occur at any age

Clinical Features
Clinically there are 3 types, categorized as follows:
- Primary prolapse with spontaneous reduction.
- Secondary prolapse with manual reduction.
- Tertiary prolapse that is irreducible.

Most patients present with reducible prolapse, which often occurs during defecation and is associated with discomfort, bleeding, and mucus discharge. Prolapse may also be caused by mild exertion (e.g., through coughing or walking) and may also be associated with incontinence of flatus and faeces. When uterine prolapse compounds rectal prolapse, urinary incontinence may also be a feature. Also note that:
- Rectal prolapse is also associated with benign prostatic hypertrophy, constipation, malnutrition, old age, and homosexuality (specifically men having sex with men).
- Anorectal carcinomas should always be suspected if there are also ulcers, indurations, or masses in this area.
- During clinical examination it is important to check for patulous anus and for poor sphincter tone (on digital examination).

Management
Refer all suspected patients for appropriate management.

47.2.3 PRURITIS ANI

This is a common condition especially in males. Causal factors include skin conditions (psoriasis, lichen planus, contact eczema), infective conditions (candidiasis, threadworms), anal-rectal conditions (piles, fissures, fistula, proctitis, polyps), neoplastic disease, anal warts, GIT conditions (irritable bowel syndrome, ulcerative colitis, etc.), drugs (quinidine, colchicine), and obesity.

Management
- Treat as for the cause.
- Advise on improved personal hygiene for those affected.
- Refer obstinate cases to higher level for appropriate management.

47.2.4 FISSURE IN ANO

This is an elongated longitudinal ulcer of the lower anal canal. The commonest site is the midline posteriorly, followed by midline anteriorly.

Clinical Features
This condition is occurs in children, but is more common in females in their midlife and uncommon in the elderly. The affected individual experiences pain during defecation that is often intense, may last for an hour or more but subsides only to come again during the next defecation. The patient is reluctant to open bowels because of the pain and tend to be constipated. The stool is frequently streaked with fresh blood and a slight discharge occurs in chronic cases. A sentinel tag is usually demonstrated, with a tightly closed puckered anus. Digital rectal examination and proctoscopy are painful, and can be performed after application of K-Y gel. It is important to consider carcinoma of the anus, anal chancre, tuberculosis ulcer (whose edges are undermined) and proctalgia fugax as important differential diagnoses that must be ruled out.

Management
Conservative management can be effective and consists of improvement of personal hygiene, use of stool softeners, proper diet, and use of saline sitz baths. These measures may bring about spontaneous healing. If these measures fail, refer to higher level for appropriate management.

47.2.5 HAEMORRHOIDS

These are varicosities of the haemorrhoidal plexus often complicated by inflammation, thrombosis and bleeding. Haemorrhoids are not commonly associated with pregnancy.

Clinical Features
There is painless rectal bleeding and prolapse or sensation of a mass in anal area (especially during defecation), with mucous anal discharge. Appropriate assessment is digital examination and proctoscopy (use good light). Haemorrhoids may be complicated with thrombosis, infection and profuse bleeding, all of which require surgical intervention for appropriate management.

Management
Advise a high fibre diet to prevent constipation. Refer complicated haemorrhoids to higher level for appropriate management.

47.2.6 ANORECTAL ABSCESS

There are four types of abscesses: submucosal, subcutaneous (perianal), ischiorectal, and high intermuscular locations. Usually there is no apparent

cause, but certain underlying diseases such as Crohn's disease, ulcerative colitis, rectal cancer, HIV disease, diabetes mellitus, and active tuberculosis may be present.

Clinical Features
Presents as acute painful swelling with fluctuation not always obvious and there is pain on defecation and bloodstained purulent anal discharge. Complications for anorectal abscess include fistula formation, recurrence of the abscess, and sinus formation.

Management
- Give analgesia, in the form of ibuprofen 400mg orally.
- Urgently refer those suspected to have the condition to higher level for appropriate management.

47.2.7 RECTAL TRAUMA

Rectal trauma may be caused by assault, road accidents, birth trauma, and sexual assault.

Clinical Features
Patients present with pain, bleeding, and purulent rectal discharge. Clinical findings include anal laceration, features of peritonitis and fever, with or without foreign bodies in the rectum.

Management
Refer to higher level for appropriate management.

47.2.8 FISTULA IN ANO

This condition may complicate anorectal abscesses, Crohn's disease, ulcerative colitis, tuberculosis, colloid carcinoma of the rectum, LGV and HIV infections. The types of Fistula in Ano are subcutaneous (anus to skin), submucous, low anal (open below the anorectal ring), high anal and pelvirectal.

Clinical Features
There is persistent seropurulent discharge, periodic pain and pouting openings in the neighbourhood of anal verge. Appropriate examination involves palpating the anal internal opening for a nodule on digital examination and confirmation is made at proctoscopy.

Management
This condition requires specialized treatment; refer to a surgeon.

47.2.9 DISTAL COLON AND RECTAL CARCINOMA

Distal colon and rectal carcinoma are especially found in elderly patients, presenting with rectal bleeding and change in bowel habits. They may additionally present with abdominal or pelvic pain or even intestinal obstruction. It

is important to rule out familial conditions in the family history. Clinical examination for patients suspected to have distal colon and rectal carcinoma should include rectal examination.

Investigations
Proctoscopy, colonoscopy, and biopsy.

Management
Refer urgently to higher level for appropriate management.

47.3 Abscesses

An abscess formation is the culmination of an uncontrolled localized infection. There is tissue necrosis with liquefaction (pus formation).

Indications that an abscess needs incision and drainage include incomplete pus discharge, throbbing pain, a localized swelling that is tender, hot, and usually with a shiny skin and with fluctuation. Fluctuation may be absent in deep abscess.

Management
Can be carried out at all levels with referral to higher level for more complicated abscesses or those requiring general anaesthesia. Exercise caution for special abscesses like mastoid abscess, as simple incision and drainage of these will result in severe injury or in chronic sinuses. Refer such sinuses to higher level for appropriate management.

Treatment
- Incision and drainage
- Use of local anaesthesia, lignocaine 2%.
- To incise and drain the abscess:
  - Prepare the area by cleaning and draping.
  - Spray the area with anaesthetic spray (ethyl chloride)
  - Test using a needle to aspirate pus if not already done.
  - Make an incision into the soft part of abscess. Insert finger into the cavity and break all the loculi (pockets) of pus to leave a common cavity for drainage. Leave a wick of gauze (Vaseline) to facilitate drainage.
- Breast abscess may require counter incisions leaving in a corrugated drain for about 24 hours.
- See ENT section for management of mastoid abscesses.
- Leave the wound(s) to heal by granulation.
- Hand and foot abscesses will require multiple incisions with counter incisions in some areas and elevation of the limbs.
- Perianal and ischio-rectal abscesses require general anaesthesia; refer. If referred back after treatment, patients require days to weeks of sitz baths before they heal. Ask the patients to add 3–4 tablespoons of salt to the basin of water.

- Antibiotics are indicated in hand abscesses. Other abscesses may or may not need antibiotics depending on the presence or absence of local cellulites.
- Face abscesses require antibiotic cover.

47.4 Breast Conditions

Breast disease presents in a variety of forms as lumps, breast pain, nipple discharge, breast ulcers, or eczema.

47.4.1 BREAST ABSCESS

This condition is common during lactation, especially second week of puerperium, and during pregnancy, and rarely occurs at other times.

Clinical Features

There is severe breast pain and fever and there may be an area of induration. Aspirate with a big bore needle to confirm presence of pus.

Management

The following needs to be emphasized for breast abscess:

- Do not delay incision and dependent drainage. Refer urgently for this treatment at higher level.
- Do not wait for fluctuation or abscess to point.
- Do not stop breastfeeding (unless the nipple is cracked or discharging, and in this case continue to express milk for the baby).
- Give antibiotics early. Most infections are due to Staphylococcus aureus and amoxcicillin 500mg QDS for 1 week is appropriate.
- Refer urgently to higher level for appropriate management.

47.4.2 BREAST LUMPS

Breast lumps can be a result of a wide number of conditions, including the following:

- Cystic lesions that may be due to breast abscess, fibrocystic disease, cystsarcoma phylloides (serocystic disease), galactocele, or hydatid cysts.
- Solid lesions that may due to developing breast abscess, antibioma, fibroadenoma, giant fibroadenoma, intraductal papilloma, tuberculosis lymphoma, neurofibroma, or carcinoma of breast

Investigations

Haemoglobin, erythrocyte sedimentation rate.

Management

Refer urgently to higher level for appropriate management.

47.5 Central Nervous System

Conditions affecting the central nervous system (CNS) that may require intervention may be classified as follows:

- Congenital disorders (hydrocephalus, microcephaly, encephaloceles, etc.)

- Degenerative disorders
- Vascular disorders
- Infections (e.g., brain abscesses)
- Neoplasms
- Trauma

Clinical features may be generalized or localized. A detailed history and careful examination are necessary to an accurate diagnosis. Generalized features include headache, vomiting and alterations in level of consciousness. Localized features include paralysis and/or sensory defect of a part of the body, diplopia and blurred vision or loss of vision. (Refer to neurosurgical textbooks for greater detail.)

A PCV should be taken and the patient referred to higher level for appropriate management.

47.5.1 HYDROCEPHALUS

See paediatric section for additional information.

Refer to higher level for appropriate management.

47.5.2 INCREASED INTRACRANIAL PRESSURE AND SPACE OCCUPYING LESIONS

This is usually caused by increases in mass content (e.g., tumour, haemorrhage, oedema or CSF).

Clinical Features

Principal symptoms are headache, vomiting, and visual disturbance. Papilloedema may be detected. Weight loss and anorexia may be present especially with tumours. Bradycardia, mild hypertension, and intellectual deterioration are common in later stages. Diagnosis is made on basis of clinical history, neurological examination (papilloedema) and radiograph examination (plain skull radiographs and CT scan).

Management

Refer urgently to higher level for appropriate management.

47.5.3 INTRACRANIAL INFECTIONS

These include osteomyelitis of the skull commonly complicating penetrating injuries, post craniotomy infections, intracranial infections complicating otitis media, mastoiditis, paranasal sinusitis and scalp infections. Conditions that may arise from infections are skull osteomyelitis, extradural and subdural empyema, cerebral abscess, and meningitis.

Clinical Features

Clinical features will vary depending on the site and spread of infection, but will include local tenderness, focal neurological signs, etc., disordered consciousness, epilepsy, or signs of meningitis.

Diagnosis is made on the basis of clinical history plus physical and neurological examination. Plain radiographs of skull may show opaque air sinuses or air bubbles in brain. Angiography or CT scan is used to confirm the diagnosis.

Management
Refer to higher level for appropriate management. The patient suspected to have this condition should receive an adequate dose of appropriate antibiotics while awaiting referral.

47.6 Chest Conditions

47.6.1 CONGENITAL HEART DISEASE

For detailed description of the different congenital heart diseases please see section in paediatrics or refer to a suitable textbook. Surgical intervention is often needed for some congenital defects and for these refer patients suspected to have the condition to higher level for appropriate management. The objective of surgical intervention is to:

- Restore anatomy to as near normal as possible.
- Maintain unidirectional blood flow.
- Restore deranged physiology to as near normal as possible.
- Correct electrical anomalies to as near normal as possible.

These can be achieved through various shunts, patches, electrophysiological procedures, and other corrections.

Management
Refer to higher level for appropriate management.

47.6.2 EMPYEMA THORACIS

In empyema thoracis there is pus in the pleural space. The condition may be classified as acute, sub-acute, or chronic, depending on the duration of presence. Immunosuppression is commonly associated with chest diseases (investigate in suspicious cases). Complications include chronicity with lung destruction, fistula formation and chronic sinuses through the chest wall.

Clinical Features
Symptoms of underlying condition may be present. Patient may also have shortness of breath, fever, sweating, diasphoresis, tachypnoea, tachycardia, dullness to percussion with reduced air entry on the affected side, and weight loss.

Investigations
These should include a haemoglobin estimation and thoracocentesis.

Management
If the primary pathology is a pneumonia, commence appropriate antibiotic regime. Make sure that good documentation provided.

Refer suspected cases to higher level for appropriate management.

47.6.3 ACHALASIA CARDIA

Main symptom here is dysphagia owing to failure of relaxation of the lower oesophageal sphincter. This results in dysphagia with differing degrees of food stasis and regurgitation of feeds.

Clinical Manifestations

There is long standing dysphagia, more for solids than liquids, and more common in young patients. Vomiting of feeds also occurs, sometimes of foods taken some days back. Weight loss if present is usually only slight.

Management

Refer to higher level for appropriate management

47.6.4 MALIGNANT DYSPHAGIA

This is difficulty in swallowing because of carcinoma of the oesophagus.

Clinical presentation

There is progressive dysphagia with weight loss. The presence of regurgitation suggests a cardiac lesion. Patients tend to be wasted in the late stages with associated dehydration. Up to 60% of these patients in Kenya will present with underweight (BMI less than 18kg/M^2). Most patients present with late disease.

Management Plan

Refer to higher level for appropriate management, which may include curative surgery for early disease or palliative measures (including palliative surgery) for later disease. Majority of patients will present with late disease.

It is important that counselling be carried out for the patient and the patient's relatives. It is important that they understand the prognosis of the disease.

47.6.5 LUNG NEOPLASM

More cases are being seen in Kenya and the association with smoking is high.[1] Different histological subtypes occur, of which squamous cell carcinoma is the most common.

Clinical Features

The clinical features for this condition include the following:

- Chronic cough
- Haemoptysis
- Wheezing or stridor
- Lung infection or other sequels of bronchial obstruction
- Features of spread – nodes, malignant effusions, fistulae, etc.
- Systemic symptoms like appetite loss

[1]According to a 2006 WHO report, 12% of adolescents and up to 29.3% of Kenyan adults smoke.

Management
Resuscitate as appropriate and refer to higher level for appropriate management.

47.7 Genitourinary System

Infections of the urogenital system are characterized by the following symptoms: dysurea, urgency in micturition, colic pain in either flanks or loins, pain on the lower abdomen due to inflammation of the urinary bladder (cystitis), poor urinary stream, dribbling and hesitancy, nocturia, urinary incontinence, urinary retention, haematuria, and renal failure.

These symptoms overlap over many specific conditions, so that a thorough examination is required to facilitate an accurate diagnosis. The following needs to be done in this regard:

- Ask about and check for urethral discharge.
- Palpate the urethra for areas of induration (stricture).
- Palpate the lower abdomen for tenderness, masses in the urinary bladder.
- Bimanually palpate the kidney for masses or tenderness.
- Perform a rectal or vaginal examination:
- Manually palpate the urinary bladder for masses.
- Feel for the prostate in a man (size, consistency, nodularity, tenderness, fixation of rectal mucosa to it, etc.)

47.7.1 POSTERIOR URETHAL VALVES

As a developmental anomaly a membrane develops in the posterior urethra of male foetuses and results in bladder neck obstruction. The resulting increase in pressure is associated with developmental alterations from the normal.

Clinical presentation
Symptoms range from mild symptoms of repeated urinary tract infection to obstructive uropathy. Symptoms may also include distended bladder or dilated ureters and ultimately renal failure.

It is not unusual for normal newborns not to pass urine for the first 24 hours. Consequently, failure to pass urine within this timeframe does not necessarily suggest posterior urethral valves problem.

Management at Level 2–3
Refer urgently to higher level for appropriate management.

47.7.2 CHILDHOOD HYDROCELE

This is fluid within the processus vaginalis within the scrotum.

Clinical Features
Swelling in the scrotal sac, which may spread down from the inguinal canal, in the communicating type, or be localized to the scrotum in the non-communicating type. Communicating types are associated with straining and

may develop strangulation if bowel contents enter. In non communicating type, one can palpate and grasp the sac towards the scrotum and get above it.

Investigations
Transillumination test is positive and the communicating type can be demonstrated on straining.

Management
Refer to higher level for appropriate management.

47.7.3 TESTICULAR TORSION

☛ **This is a surgical emergency and a high level of suspicion is needed to avoid unnecessary morbidity.**

Clinical Presentation
There is sudden onset of scrotal pain in a young male. The diagnosis is mostly clinical. Testicular torsion must be differentiated from epididymochitis.

Management
Give analgesics and refer urgently to higher level for appropriate management, communicating with receiving surgeon.

47.7.4 CIRCUMCISION

This is excision of the prepuce (foreskin of penis). Indications include ritual (religious, traditional, personal), phimosis, paraphimosis, recurrent Herpes genitalis restricted to the prepuce, recurrent balanitis (inflammation of prepuce), balanoposthitis (inflammation of prepuce and glans penis), tight frenulum, long and adherent prepuce.

Method
To perform a circumcision:
- Clean and drape the perineum.
- Local anaesthesia is used. Lignocaine 2%.
- Dilate the prepucial meatus with artery forceps.
- Retract foreskin and clean with warm saline.
- Make circular incision on inner skin approximately 3cm from the corona, taking care not to injure the urethra and the glans penis
- Pull foreskin over glans penis and make incision with surgical knife over the coronal sulcus. Leave adequate penile skin.
- Complete circumcision with scissors.
- Control all bleeders with clamps and ligatures.
- Suture incision with 2/0 plain catgut.
- Use of plastibel in circumcision of neonates is not recommended due to frequent injuries and is best left for experienced surgeons.
- Do not use adrenaline.

47.7.5 ADOLESCENT HAEMATURIA

This clinical condition can be macroscopic or microscopic blood within the urine. In children possible causes include glomerulonephritis, anaphylactoid purpura (Henoch-Schonlein purpura), fever, strenuous exercise, mechanical trauma (masturbation), foreign bodies,[2] urinary tract infection (bacterial or parasitic), hypercalciuria/urolithiasis, sickle cell disease/trait, coagulopathy, tumours, drugs/toxins (NSAIDs, anticoagulants, cyclophosphamide, ritonavir, indinavir), anatomic abnormalities (hydronephrosis), polycystic kidney disease, vascular malformations, and hyperuricosuria.

Investigations

- Microscopy
- Urinalysis

Management

- Direct treatment against the primary cause, managing associated complications.
- Refer to higher level for appropriate management.

47.7.6 HAEMATURIA IN THE ADULT

This is a common condition that has mostly benign causes. The commonest of these causes is urinary tract infection, while the most feared causes are malignancies of the urinary tract. Other causes include bleeding diathesis, urinary tract calculi, urinary tract trauma, and hypertension. Macroscopic haematuria is more likely than microscopic haematuria to be due to urinary tract pathology. Ageing is associated with a higher incidence of significant urinary tract pathology.

Investigation

This should include urine for microscopy and cytology.

Management

- Treat as for the underlying cause. Treatment for bladder cancer needs special emphasis as delay in diagnosis has morbidity and mortality implications.
- Refer to higher level for appropriate management.

47.7.7 URINARY RETENTION

Inability to pass urine while the urinary bladder is full. There is an urge to micturate and if not relieved, there is severe pain with straining. The causes vary with age and gender.

Common Causes

- For children, meatal stenosis, phimosis or paraphimosis, posterior urethra valves, ruptured urethra after trauma, and constipation.
- For adults aged 20–50 years, urethral stricture, calculi (bladder and urethral stones), bladder tumours, ruptured urethra (trauma), and postoperative (any perineal operation) clot retention.

[2] Younger age group.

- For male adults older than 50 years, prostatism (benign prostatic enlargement, carcinoma of the prostate, prostatitis, prostatic fibrosis), calculi, urethral strictures, bladder tumours, ruptured urethra (trauma), and postoperative clot retention.
- For females, bladder tumours, calculi, pelvic tumours (cancer of the cervix), urethral stenosis, and postoperative clot retention (severe haematuria).

It should be noted that cord compression with paraplegia/quadriplegia results in urinary retention.

Management
Relieve acute retention by catheterization:
- Pass a size 16FG Foley's catheter in adults or 8FG in children. If this passes and the bladder is emptied retain it. After urine is drained, the anteverted bladder returns to normal position.
- All catheters must be well lubricated with gel (Xylocaine, K-Y gel, etc.). Refer to higher level for appropriate management urgently.

47.7.8 URETHRAL STRICTURE

Causes of urethral stricture include congenital, traumatic (usually follows fracture of pelvis), inflammatory (follows gonorrhoea infection usually earlier in life), and instrumentation that results from indwelling catheter following endoscopy or postoperatively following prostatectomy or after amputation of penis.

Clinical Features
Usually occurs in younger patient (below 50 years) and the early symptoms include passage of flakes in urine with early morning urethral discharge while the later symptoms include difficulties in micturition (narrow prolonged stream, dribbling, straining). There is urine retention with a distended urinary bladder. History of urethral discharge in the past, history of pelvic injury, and history of instrumentation are significant. The urethra should be palpated for induration, with a rectal examination performed in all patients.

Investigations
Urinalysis and culture and sensitivity. Investigate for urethral discharge.

Management
Suprapubic cystostotomy if there is retention of urine
Refer to higher level for appropriate management.

47.7.9 URETHRAL INJURIES

This may result from urethral trauma (for example, a fall astride a projecting object, cycling accident), fracture of pelvis in road traffic accident, penetrating wounds (bullet wounds, etc.), and iatrogenic injuries.

Clinical Features
Patient presents with difficulty or inability in passing urine. There may be blood at the external meatus.

Management
- Do not catheterize the patient per urethra.
- Give analgesia, for example ibuprofen 400mg TDS.
- If bladder is full, empty through a suprapubic cystostotomy, but if the patient has passed urine “leave him alone”.
- Start antibiotics, for example cyprofloxacin 500mg TDS.

Refer to higher level for appropriate management.

47.7.10 RUPTURED BLADDER

This usually follows a blow, a kick or fall on a distended bladder, gunshot or stab wounds, passage of instruments, endoscopic resection of prostate or bladder tumour, diathermy coagulation of bladder tumour, and operative procedures in the pelvis (for example tubal ligation and hysterectomy).

Clinical Features
The bladder may be injured intraperitoneally or extraperitoneally. Intrapentoneal rupture results in sudden agonizing pain in the hypogastrium, and severe shock, with a rigid abdomen that distends slowly. The patient passes no urine. Rectal examination reveals a bulge in the pouch of Douglas. Extraperitoneal rupture displays similar symptoms as in rupture of posterior urethra described above.

The patient experiences pain, has blood stained urine, and may show other features of the primary pathology. Severe peritonitis is an ominous complication that may develop if the patient is not attended to within 12 hours; in such situations of not being attended to, it may have a mortality rate of 100%.

Management
- Initiate resuscitation measures.
- If there is no fracture of the pelvis, pass a 14F Foley’s catheter and a little blood stained urine may drain out.
- If not sure of diagnosis, make immediate referral to higher level for appropriate management.

47.7.11 BENIGN PROSTATE ENLARGEMENT (BPE)

Benign prostate enlargement causes lower urinary tract symptoms. A big prostate is not always symptomatic or problematic, but it can cause damage to the kidneys, ureter, or bladder with minimal symptoms. Benign prostate enlargement is age related but not in a linear fashion. Benign prostate enlargement symptoms increase with size but not in a linear fashion and the condition does not always require surgery. Symptom evaluation of BPE must include the international prostate symptom score as in Table 47.1.

Management
This includes:
- Watchful waiting medical treatment (alpha blockers and alpha reductase inhibitors) for those with mild symptoms without damage to kidneys or ureters.

Table 47.2: International prostate symptom score (IPSS)

Name: _____ Date: _____

	Not at all	Less than 1 time in 5	Less than half the time	About half the time	More than half the time	Almost always	**Your score**
Incomplete emptying Over the past month, how often have you had a sensation of not emptying your bladder completely after you finish urinating?	0	1	2	3	4	5	
Frequency Over the past month, how often have you had to urinate again less than two hours after you finished urinating?	0	1	2	3	4	5	
Intermittency Over the past month, how often have you found you stopped and started again several times when you urinated?	0	1	2	3	4	5	
Urgency Over the last month, how difficult have you found it to postpone urination?	0	1	2	3	4	5	
Weak stream Over the past month, how often have you had a weak urinary stream?	0	1	2	3	4	5	
Straining Over the past month, how often have you had to push or strain to begin urination?	0	1	2	3	4	5	

	None	1 time	2 times	3 times	4 times	5 times or more	**Your score**
Nocturia Over the past month, how many times did you most typically get up to urinate from the time you went to bed until the time you got up in the morning?	0	1	2	3	4	5	

Total IPSS score	

Quality of life due to urinary symptoms	Delighted	Pleased	Mostly satisfied	Mixed – about equally satisfied and dissatisfied	Mostly dissatisfied	Unhappy	Terrible
If you were to spend the rest of your life with your urinary condition the way it is now, how would you feel about that?	0	1	2	3	4	5	6

Total score: 0–7 Mildly symptomatic; 8–19 moderately symptomatic; 20–35 severely symptomatic.

- Surgical treatment for those with complications like retention that fails trial without a catheter. Note that retention without such a trial does not qualify as an absolute indication for surgery.

Other absolute indications for surgery include:
- Bladder stone
- Bladder diverticulum
- Intractable bleeding
- Raised creatinine
- Dilated ureters and kidney

Cystotomy should be carried out for retention of urine and all cases referred to higher level for appropriate management.

47.7.12 PROSTATE CARCINOMA

Clinical Features
There is poor urinary stream, haematuria, back or leg pain, as well as urinary urgency. Other features of secondary spread may also be present. Digital rectal examination typically reveals an irregular, firm prostate or nodule.

Management
Refer urgently to higher level for appropriate management. May provide follow up treatment as directed by the referral team (e.g., urology team)

47.8 Ulcers and Tumours of the Skin

The causes of these include the following:
- Infections:
  - Bacterial: Mainly tuberculosis, leprosy, syphilis, and anthrax
  - Fungal: For example histoplasmosis
  - Parasitic: For example leishmaniasis
- Tumours
  - Squamous cell carcinoma
  - Basal cell carcinoma
  - Melanoma
  - Kaposi's sarcoma
- Vascular
  - Ischaemic (arterial)
  - Venous insufficiency
  - Sickle cell disease
  - Diabetes
  - Thromboangitis
- Trauma
- Tropical ulcers

Clinical Features
Ulcers are mainly found in the lower limbs but may occur on any part of the body. Examination should be thorough and systematic. The following are, with brief examples, the characteristics to note:

- ***Site:*** E.g., 95% of rodent ulcers (basal cell carcinoma) occur on upper part of the face; carcinoma typically on the lower lip, and syphilitic on the upper lip.
- ***Size:*** Carcinoma spreads more rapidly than inflammatory ulcer.
- ***Shape:*** Rodent ulcers are usually circular while straight edges are found in dermatitis.
- ***Edge:*** Undermined occurs in tuberculosis, rolled edges in basal cell carcinoma, (rodent), everted edges in squamous cell carcinoma, vertically punched out edges in syphilis, and sloping edges in venous and traumatic ulcers.
- ***Base:*** Is palpably indurated in squamous cell carcinoma.
- ***Floor:*** When examined appears granulomatous in tuberculosis.
- ***Discharge:*** Purulent discharge indicates active infection, while greenish discharge is seen in pseudomonas infection.
- ***Lymph nodes:*** Are enlarged mainly in malignant tumours.
- ***Pain:*** Generally occurs in malignant, tuberculous and anal ulcers, while trophic ulcers are painless.

Investigations
These depend on the causative factor and may include:

- Haemoglobin
- Blood sugar
- VDRL
- Mantoux test
- HIV screen

Management
The following are important:

- Given antibiotics for infected wounds – ciprofloxacin 500mg QID.
- Clean and dress with antiseptic on a regular basis.
- Use local antiseptics, and if needed, administer tetanus toxoid.
- Identify primary cause and if able to manage at this level, then manage.
- Refer to higher level for appropriate management if there is suspected malignance (wounds failing to heal within a reasonable time frame or other serious complication).

48. Dental and Oral Conditions

Oral health is an integral part of general health. It entails the health of the mouth (the oral cavity), the jaws, teeth and all the contiguous structures. Therefore, diseases, disorders and conditions that may be diagnosed in this area of the body can be particularly diverse. Since the mouth constitutes the main gateway

into the entire body, disease processes and disorders elsewhere throughout entire body may also be reflected and diagnosed here. This chapter outlines the most common diseases, conditions, and disorders that health clinicians may encounter in their daily practice.

48.1 Bacterial Infections

The mouth is a favourite habitat of a myriad range of disease causing and commensal micro organisms. These include nearly the entire range of aerobes, anaerobes, and Gram-positive and Gram-negative microbes. Commonly, sites and sources of bacterial infection in the orofacial area include:

- Carious (decayed) teeth
- Root remnants in the jaw
- Periodontal infection
- Pericoronal infection
- Pre-existing pathology such as bone cysts, bone dysplasia and neoplasms
- Trauma to tissues

Remarkably, bacterial infections in the oral cavity may take diverse clinical courses and presentations as now outlined in the subsequent sections below.

48.1.2 DENTAL CARIES AND PULPITIS

The most common cause of pulpal disease is dental caries, which leads to bacterial invasion of dentine and eventually the pulp. Dental caries is a progressive damage of the enamel, dentine, and cementum initiated by microbial activity on any tooth surface in the oral cavity. The spillage of microbial toxins into the tooth pulp through the caries lesion precipitates pulpitis.

Clinical Features

This is a very painful condition that can cause extreme agony. The affected tooth will often elicit extreme tenderness to touch.

Management

- Initiate analgesics treatment.
- Consider extraction of carious teeth.
- Urgently refer to facility 4 and above.

48.1.3 CELLULITIS AND ABSCESS FORMATION

Orofacial cellulitis may emanate from any of the sources and sites earlier given. The principal micro-organisms that precipitate cellulitis produce diverse toxins, enzymes and cytokines that destroy tissue to facilitate infection that spreads through the contiguous fascial planes. In this way there is always the danger of the spillage of the infection into the bloodstream (septicaemia) and any adjacent vital organs and structures.

☛ When an acute infection emanates from the mandibular structures or floor of the mouth and rapidly spreads to involve the bilateral fascial planes, it often

culminates in a deadly condition referred to as Ludwig's Angina. ***All clinicians must endeavour to recognize these conditions most promptly since death can occur in a matter of hours.***

Clinical Features
There is bilateral upper neck massive swelling with board-like feel on palpation. Tongue is raised towards the roof of the mouth and the floor is heavily indurated, the tissues having a cauterized-like surface. The patient is severely distressed because of respiratory embarrassment, and onset of stridor is ominous because it implies impending death.

Management
The following is important for management:
- Start potential antimicrobial administration immediately: Amoxicillin 500mg TDS + metronidazole 500mg TDS + gentamicin 80mg TDS where Gram-negative infections are suspected; also give ibuprofen 400mg TDS to control pain.
- Ensure secure airway during referral and provide competent escort.

Refer urgently to higher level for appropriate management and inform recipient hospital of the referral.

48.1.4 CERVICOFACIAL NECROTIZING FASCIITIS

This is a bacterial infection that often requires special attention since it is associated with extreme morbidity. It is a mixed bacterial infection whose pathogenesis principally involves extensive and rapid destruction of fascia, almost exclusively around the neck and craniofacial area. The exact pathophysiology of the exclusive fascial damage remains unknown, however. Paradoxically, no specific microorganisms have been implicated in the pathology of this condition. Once fascia is destroyed, the covering skin remains without nutrients and support, thereby breaking down to expose the underlying structures. Since this condition may not be as uncommon as medical literature may imply, clinicians are prompted to recognize it. The hallmark of the condition is that it may present with little suppuration and yet there will be extensive fascial necrosis with consequent skin breakdown.

Management
- Start amoxicillin 500mg TDS + metronidazole 500mg TDS and ibuprofen 400mg.
- Immediately refer to higher level for appropriate management.

48.1.5 PERIODONTAL (GUM) INFECTIONS

The periodontium is a functional unit whose main roles include the support of the teeth within the jawbones and the provision of sensory information relating to the function of chewing. The components of the periodontium, therefore, include the alveolar bone, cementum, the periodontal ligament and the gingiva (gum). Acute and chronic periodontal disease is one of the most common ailments affecting humankind. Some evidence of deterioration of the periodontal tissues can be demonstrated in almost all dentate adults. The periodontal tissues, like other

tissues, are subject to inflammatory, degenerative, dysplastic, and neoplastic pathological changes.

48.1.6 ACUTE ULCERATIVE GINGIVITIS

This disease has been reported to be highly prevalent in parts of our African region, where it affects children and groups of persons with congenital disorders such as Down's syndrome. Significantly, nutritional deficiencies arising from the prevalent poor socio-economic status of many of our populations may predispose to the occurrence of most of the cases that may present with acute ulcerative gingival conditions. Poor oral hygiene may be prevalent where economic empowerment is low.

Management includes:

- Oral hygiene with antibiotics and mouth wash.
- Give amoxicillin 500mg TDS + metronidazole 500mg TDS + gentamicin 80mg TDS.
- Try to address the primary cause.

If no improvement refer to higher level for appropriate management.

48.1.7 GANGRENOUS STOMATITIS (CANCRUM ORIS, NOMA)

This is an infective condition of the orofacial tissues that may cause extensive tissue destruction with severe morbidity. The condition may initially manifest as an acute ulcerative necrotizing gingival infection, which rapidly involves a block of the contiguous tissues culminating in their breakdown. Unfortunately, the clinical picture and changes associated with this condition may often be so rapid that even the keenest clinician may not notice the progression of the pathological events.

Refer to higher level for appropriate management.

48.1.8 BONE INFECTIONS

Infection in the jawbones may be localized or generalized. Generally, the localized forms of infection are the most common with the focal osteitis/alveolitis ("dry socket") occurring 1 to 7 days following a dental extraction. This probably is the most common bone infection after dental extraction. Patients will complain of pain that is much more severe than a toothache. The pain is usually throbbing and deep-seated. Analgesics often offer little help.

Clinical Features

Examination reveals a denuded open tooth-socket with a scanty necrotic clot, while the bone often appears literally dry, hence the term dry socket.

On the other hand, infection may involve a large part of the jawbone, most often the mandible. The source of infection may be anywhere within the oral cavity. Such infection would then be rightly designated as osteomyelitis. In its acute form, severe pain and fever are significant presentations. It may eventually develop suppurative osteomyelitis that may lead to sequestration. In other

situations the acute phase may progress into the chronic sclerosing type of osteomyelitis that is not associated with sequestration. Fortunately, osteomyelitis of the jawbones has remained relatively uncommon with the improvement of oral health facilities and the availability of antimicrobial therapy in general.

Management of Focal Osteitis/Alveolitis
- Urgently refer to level 4 and above.
- Provide analgesia.

Management of Jaw Osteomyelitis
- Initiate ibuprofen 400mg TDS.
- Refer immediately.

48.2 Trauma of the Orofacial Tissues

Injury to the teeth and the supporting alveolar bone occurs quite frequently, especially among children. Other more severe injuries to the soft and skeletal tissues of the orofacial area commonly arise through road traffic accidents, sporting activities, and interpersonal violence. Such violence where guns and other missiles are employed may lead to extensive tissue destruction with high morbidity. Injuries of the tissues in the maxillofacial area can at first appear daunting, but it is important to follow the basic principles of resuscitation as a priority: secure the airway, maintain breathing, and ensure circulation.

Manage all orofacial injuries by:
- Stabilizing as appropriate and maintaining airway.
- Administering tetanus toxoid 0.5ml STAT.
- Giving ibuprofen + amoxcicillin 500mg QID.

Refer to higher level for appropriate management.

48.2.1 OROFACIAL CONGENITAL AND DYSPLASTIC CONDITIONS

Clefts of the lip and palate constitute the most commonly encountered congenital malformations. When they are particularly severe, they may pose feeding problems for the affected babies from birth. Special methods of feeding the affected children have to be instituted to facilitate normal growth and weight gain while awaiting surgical intervention. Fortunately, the severe forms of this condition that necessitate such drastic and innovative feeding methods are rare.

Dysplastic lesions may include those that lead to aberrant tissue growths such as congenital epulides, natal and neonatal teeth. Dysplastic lesions of bone may manifest much later in life and should be easy to recognize. Although rare, some bone dysplasias may manifest with endocrine disorders that could have generalized effects.

Management
Refer to higher level for appropriate management.

48.2.3 CYSTS AND BENIGN TUMOURS OF THE OROFACIAL REGION

Cysts may occur in the soft tissues or the facial bones. They are generally slow growing and painless. Eventually they cause swelling and disfigurement. In the bony cysts pain may manifest due to tissue tension and/or supervening infection.

Similarly, benign tumours of the orofacial region may originate from either the soft tissues or bone. Those originating from bone are much more common and often manifest late when function and disfigurement prevail. Among these neoplasms, ameloblastoma is the most important since it is the most common and particularly locally infiltrative. Early identification of this condition is extremely important because of the capacity of this tumour to infiltrate the surrounding tissues. The ossifying/cementifying fibroma is the next most important benign tumour that should be diagnosed early since it can also cause severe disfigurement.

Management

The odontogenic keratocyst has now been classified as a benign infiltrative tumour of the jawbones. A diagnostic incisional biopsy must, therefore, be performed to ascertain its existence before surgical extirpation is executed.

Refer for to higher level for appropriate management.

48.2.4 MALIGNANT NEOPLASMS OF THE OROFACIAL REGION

Because of its prevalence, oral squamous cell carcinoma (OSCC) constitutes the most important malignant neoplasm of epithelial origin. The aetiological factors associated with this neoplasm include tobacco use and sustained alcohol consumption. Immunosuppressive conditions may precipitate the prevalence of OSCC. Malignant neoplasms whose cells of origin are mesenchymal in nature are broadly classified as sarcomas. As a group almost all these lesions have hardly any identified definite aetiological associations. Sadly, effective management of almost all the lesions remains most disheartening. Cells of the mononuclear-macrophage system (the reticulo-endothelial systems) may also give rise to malignant neoplasms manifesting in the orofacial region. Among these, lymphomas are common, with Burkitt's lymphoma being the most common type.

Management

Refer urgently to higher level for appropriate management

48.3 Neuropathies of the Orofacial Region

48.3.1 PAROXYSMAL TRIGEMINAL NEURALGIA

This condition carries very high morbidity because of the severe pain associated with it – which can be intractable. This disease is common among middle-aged and elderly persons. Patients may report sequential symmetrical tooth extraction

with no relief of pain. There is no known aetiological factor. The pain will be reported as severe and lancinating, lasting only a few seconds at particular sites (trigger zones) known to the patient. Often, sleep may not be disturbed at night. During the day there are usually multiple attacks of pain.

Management
Initiate analgesia – ibuprofen 500mg TDS and refer urgently to higher level cases of intractable pain.

48.3.2 FACIAL PALSY

Facial palsy may manifest as a result of a variety of factors, including trauma, deep-seated craniofacial neoplastic lesions and non-specific viral infections. More commonly, the idiopathic type of facial palsy (Bell's palsy) is seen. The history of the condition is often short and there may be no clear-cut associated aetiological events.

Management
A good history may delineate the type of facial palsy. Refer to higher level for appropriate management

48.3.3 HERPETIC INFECTIONS

The herpes group of viruses and especially Herpes zoster constitutes one of the most common causes of vesiculo-bullous lesions in the orofacial region. The lesions are usually of acute onset, manifesting with irritating pain. Where there is underlying immunosuppression due to HIV infection, fulminating Herpes zoster infection may cause extensive damage of the periodontium leading to spontaneous tooth exfoliation from the affected jaw segments.

Investigations
Investigate for HIV and carry out Mantoux and examine the sputum.

Management
- Diagnosis of the acute lesions is often made clinically as the crops of vesicles are typical.
- Do not touch these lesions without gloved hands.
- Clean if blisters are already punctured.
- Apply calamine lotion if vesicles are not punctured.
- Give analgesia – ibuprofen 300mg TDS.
- Refer to higher level for appropriate management.

48.4 Temperomandibular Joint (TMJ) Disorders

Temporomandibular joint pain and dysfunction remains enigmatic in terms of aetiology and pathogenesis. The condition may be intertwined with stressful life events that are often difficult to elucidate clinically. The condition has become particularly common in persons in their 2nd decade of life and above. Generally, TMJ pain can be most variable in quality, may be nonspecific and without any

clear-cut associated local events. However, it is often possible to correlate the manifestation of TMJ pain with painful conditions in other areas such as the spine, recurrent headaches and even abdominal cramps. No radiographic or other imaging modality may demonstrate a tangible biologic basis for the dysfunction and pain. Currently, consensus of professional opinion worldwide indicates that this group of conditions should be referred to as temporomandibular joint disorders (TMDS).

Management of TMDS
Refer to higher level for appropriate management

49. Ophthalmology

In Kenya eye diseases are ranked eighth among the top ten causes of morbidity. Blindness prevalence is estimated at 0.7%. At the current population this translates to about 224,000 people being blind, with close to 672,000 suffering from low vision. Eighty percent of the causes of blindness are either curable or preventable through primary eye care (MOH document, 2004)

49.1 Ophthalmia Neonatorum (Conjunctivitis of the Newborn)

Clinical Features
There is bilateral copious pus discharge in the first month of life.

Management
- Apply prophylactic silver nitrate or povidine iodine.
- If signs develop of ophthalmia neonatorum refer to higher level to attend eye clinic immediately.
- Apply tetracycline eye ointment 8 hourly.
- Apply gentamycin eye drops both eyes 2 hourly ***OR***
- Give IM gentamycin 5mg/kg single dose.
- Give tetracycline eye ointment to all newborns at birth.
- Refer to higher level if complications like corneal ulcer are observed.

49.2 Congenital Cataract

Opacification of the lens that may be progressive and not detectable at birth.

Clinical Features
There is loss or irregular red reflex. Check CNS and ears for other possible associated anomalies.

Management
Refer to specialized centres for childhood eye diseases.

49.3 Senile Cataract

It is estimated that 43% of blindness in Kenya is due to cataract. The senile form is a slow lens thickening secondary to degeneration, and the condition is highly amenable to correction.

Clinical Features
There is slowly progressive painless visual loss or blurring affecting one or both eyes with increasing glare, showing a white pupil.

Management
Refer to higher level for appropriate management

49.4 Childhood Blindness

Approximately 10,000 cases of blindness occur during childhood, with causes including congenital cataract, corneal diseases, measles disease, congenital glaucoma, and retinoblastoma.

Clinical Features
The features depend on underlying condition but may include:
- Poor vision (older child)
- Squint (lazy eye)
- White pupil
- Growth in the eye
- Protruding eyeball

Management
Refer to higher level for appropriate management.

49.5 Retinoblastoma

This condition usually occurs among under-5's and is diagnosed on average at about 24 months of age. It may present as a unilateral or bilateral lesion. Retinoblastoma is associated with increased risk of developing pineal tumour. Up to 40% of this condition is hereditary.

Clinical Features
- Leukocoria – white pupillary reflex
- Crossed eye or strabismus
- Red painful eye
- Poor vision

Management
Refer to higher level for appropriate management.

49.6 Common Blinding Conditions

When evaluating these conditions follow the guidelines below.
- Always check the vision for all patients using the Snellen's chart.
- Take good eye history.
- Do eye examination using a torch.
- ***Caution:***
  - Never use steroid containing medicines on the eye without a prescription from an eye specialist.
  - Never put any medicines on any eye that may have been perforated.
  - Never use atropine drops or ointment without a prescription from an eye specialist.
  - Never use traditional eye medicines in the eye.

49.7 Trachoma

Trachoma is the leading cause of preventable blindness in Kenya, accounting for 19% of blindness.

Clinical Features
There is mucopurulant discharge associated with conjunctiva, corneal scarring, and inward turning of eyelids and lashes, causing pain, ulceration, and corneal scarring. There is loss of vision.

Management
- Tetracycline eye ointment 3 times daily for 6 weeks ***OR***
- Tabs azithromycin 1g annually for 3 years as mass treatment. Promote regular face washing.
- Improve environmental sanitation and disseminate health education.
- Refer for surgical correction of entropion/trichiasis to higher level for appropriate management unless the capacity to provide management is at the facility. (Some health centres may have clinical officers trained in eye care who will be able to manage this condition.)

49.8 Glaucoma

Glaucoma is associated with approximately 25,000 blind cases in Kenya annually.

Clinical Features
There is unexplained gradual decrease in central or peripheral vision.

Management
Refer to higher level for appropriate management

49.9 Refractive Errors

Clinical Features
These include the following:
- Decreased vision
- Frontal headaches
- Squinting
- Inappropriate viewing distance
- Eye strain

Management
Refer to higher level for appropriate management.

49.10 Vitamin A Deficiency

Clinical Features
These include the following;
- Dry eye
- Foreign body sensation
- Eye pain
- Night blindness
- Severe loss of vision
- In most cases features are of gradual onset
- Complications include:
  - Corneal ulcers
  - Night blindness

Management
Administer vitamin A treatment and supplementation. In case of complications, refer to higher level for appropriate management.

49.11 Herpes Zoster Ophthalmicus (HZO)

Clinical Features
The following features occur:
- Acute vesicular skin rash which follows the 5th cranial nerve dermatome
- Blurred vision
- Eye pain
- Red eye
- Fever
- Malaise

Management
Give ibuprofen 400mg TDS and then refer to higher level for appropriate management.

49.12 Chalazion

This is inflammation of the meibomian glands of the eyelid that typically forms a granulomatous inflammatory mass.

Clinical Features
The affected patient complains of eye discomfort. Typically there is a hard and painless eye lid swelling away from the lid margin.

Management
Refer to higher level for appropriate management

49.13 Painful Red Eye

A condition that should not be underestimated, this often signifies some underlying inflammatory process. A good history and physical examination may aid in identifying the primary cause. It is important to rule out emergency ophthalmic conditions, which if found should be referred immediately.

Management
Give ibuprofen 400mg TDS and refer to higher level for appropriate management, especially if there is visual loss or significant trauma.

49.14 Unexplained Vision Loss

This frightening condition can have many causes, some of which are associated with poor prognosis. Obvious causes like space occupying lesions, metabolic disorders, blood disorders, and HIV/AIDS should be looked for.

Management
Refer to higher level for appropriate management, especially through the eye clinic.

49.15 Allergic Conjunctivitis

This is an immune mediated conjunctivitis that may present seasonally or without a specific pattern.

Clinical Features
- Itching, which may be bilateral
- Watery discharge
- Redness
- Photophobia

Management
Management of this condition includes the following:

- Application of cold compress
- Application of zinc sulphate eye drops
- Application of prednisolone eye drops
- Refer to higher level for appropriate management

49.16 Viral and Purulent Conjunctivitis

Clinical Features
- Watery eye or pus in the eye
- Redness of the eye.

Management
Management of this condition includes the following.
- Application of tetracycline eye ointment 1% 8 hourly for 7 days ***OR***
- Application of gentamycin eye drops 6 hourly for 7 days.
- Prevention of this condition is by good eye hygiene.
- If no improvement, refer to higher level for appropriate management.

49.17 Asthenopia (Eye Strain)

Clinical Features
There is normal vision, but pain when reading or doing other close work like sewing.

Management
- Reassure patient.
- Refer to higher level for appropriate management if pain persists.

49.18 Corneal Ulcers

These are relatively common. They involve the loss of epithelium and usually heal spontaneously. Some form of trauma is associated with these ulcers in most cases.

Clinical Features
- Red eye
- Photophobia (inability to tolerate bright light)
- Sensation of foreign body in eye
- Tearing
- Pain

Management
- Give tetracycline eye ointment 1% three times daily, then refer to eye clinic immediately.
- ***OR*** give gentamicin eye drops 2 hourly as alternative.
- Refer to higher level for appropriate management if complications develop.

49.19 Stye

This is an infection of the follicles or tarsal glands[3] that is localized to the eyelids.

Clinical Features
There is an acute painful swelling localized on the lid margin that may cause swelling of the entire eyelid. On examination, ensure the underside of the eyelid is examined.

Management
- Warm water compresses.
- Tetracycline eye ointment 1% 8 hourly for 1 week.
- If no improvement within a week refer to eye clinic, level 4 and above.
- At specialized centres – surgical drainage.

49.20 Eye Trauma

The eye is a delicate external organ and it is easy for it to be injured. Eye injuries are generally classified as penetrating and non penetrating and include corneal and conjunctiva foreign bodies and abrasions, burns (dry heat and chemical burns), blunt trauma (contusion), penetrating injuries to the eye ball (perforations), injuries to eye lids, orbital injuries, and cranial nerve injuries.

A good evaluation of the eye injury includes the following:
- Check vision of all such patients.
- Ensure good lighting and use a magnifying lens, as these make eye examination easier.
- Ensure that the eye examination to be carried out is thorough; note that a small entry wound does not always equate to minimal injury.

Management
Management depends on the type of injury.
- ***Corneal and conjunctival abrasions:*** Pad the eye with tetracycline eye ointment 1% for 24 hours. If not sure refer immediately to higher level for appropriate management.
- ***Foreign bodies:*** Refer to higher level for appropriate management.
- ***Blunt trauma:*** Do the following:
  - Give ibuprofen 400mg TDS.
  - Rest the eye.
  - Note that there may be a ruptured eyeball.
  - Refer to higher level for appropriate management.
- ***Chemical burn:*** Irrigate the eye with plenty of water or normal saline urgently for 30 minutes. *Washing the face is not enough*. Pad with tetracycline eye ointment. Refer immediately to higher level for appropriate management.
- ***Penetrating eye injuries:*** Give systemic antibiotics and analgesics, give an injection of tetanus toxoid (IM) STAT, do not apply any topical medications to

[3] See chalazion above.

the eye, protect the eye with a clean pad or shield. Refer without delay to a level 5 and above with a resident eye specialist. Communicate directly with specialist prior to transfer.
- ***Lid injuries:*** Dress wound and give tetanus toxoid. Refer immediately to facility preferably with an eye specialist. Inform specialist of arrival of the patient. NOTE. Refer all patients with injuries involving the lid margin.
- ***Orbital injuries:*** Refer to higher level for appropriate management.
- ***Cranial nerve injuries:*** These commonly occur with head injuries and need specialized treatment. Refer to higher level for appropriate management.

50. Orthopaedics

50.1 Fractures

Definition – Discontinuity of bone.

Classification
- Open (compound)
- Closed

Most fractures are secondary to trauma, although pathological fractures that are secondary to tumours, infections, osteoporosis, and congenital deformities also occur. Fractured bone segments may communicate with wound while the skin over it is intact (closed fractures) or with the skin broken and therefore exposed to the outside (open or compound). Compound fractures are always contaminated.

50.1.1 OPEN/COMPOUND FRACTURE

The treatment is as for closed fractures except that these are contaminated and the following should be done first:
- Thorough surgical toilet and debridement (in theatre)
- Give tetanus toxoid and antibiotics
- External fixation is preferred for these fractures

Note that delayed healing may occur as a result of:
- Poor immobilization
- Poor reduction
- Poor blood supply
- Infections
- Soft tissue interposition
- Systemic diseases

Complications of compound fractures include fat embolism, neurovascular injuries, infections, joint stiffness, non union, mal-union, and delayed union.

Management
- Rehabilitation
- Physiotherapy, orthotic fitting
- Occupational therapy

50.1.2 CLOSED FRACTURES
The bone fragments do not communicate through the skin.

Clinical Features
- Pain
- Swelling
- Loss of function
- Abnormal movements/deformity/crepitus
- Signs of blood loss and neurovascular complications, e.g., pulselessness, cold extremity and bleeding. Always look for compartment syndromes.

Investigations
- Haemoglobin, packed cell volume
- Group and cross match blood for fractures of major bones

Management
- Give ibuprofen 400mg TDS.
- Splint fracture; this prevents soft tissue damage and also reduces pain.
- Familiarize yourself with the Thomas splint and how to apply it appropriately.
- Period of immobilization in plaster:
  - Upper limbs: Adults, 6–8 weeks; Children, 3–4 weeks.
  - Lower limbs: Femur – Adults, 12 weeks; Children, 6 weeks; Tibia – Adults, 8–10 weeks; Children, 4–5 weeks.
- Check radiograph before removing the splint.
- For all fractures, it is essential to check for neurovascular complications in early stages. If present, immediately split the plaster or decompress the affected compartment.

50.2 Joint and Tendon Injuries

These injuries are usually due to sports injuries, road accidents, assault and occupational hazards. They may be classified as:
- Dislocations
- Fracture dislocations
- Haemarthrosis, which may occur as a complication of any of the above injuries or may occur spontaneously as in haemophilia.
- Ligamentous injuries may occur following twisting, traction or bending forces
- The knee: Commonly affected are the medial and lateral, collateral, and cruciate ligaments, occasionally the menisci.
- The ankle joint: This is a major weight bearing joint and its stability depends on the surrounding ligaments. Proper diagnosis and accurate reduction is important if congruency of the joint is to be maintained.

- The elbow: Dislocations here occur in the posterior direction resulting from a fall on an outstretched hand. Spasm of the triceps muscle then locks the elbow in the dislocated position.

Clinical Features
In general joint injuries present with the following:
- Pain
- Swelling
- Loss of function
- Deformity
- Crepitus (if there is an associated fracture)
- Neurovascular complications

Management
Treatment of dislocation should be urgent because of possible damage to neurovascular structures
- Relieve pain and inflammation: Ibuprofen 400mg TDS
- Splint the dislocation/fracture
- Immobilize: Period of immobilization is the same as for fractures of the adjacent bones.

50.3 Club Foot

Typical talipes equinovarus presents with:
- Deformity
- Heel inverted
- Forefoot and mid foot inverted and adducted (Varus)
- Ankle in equinius (the foot is planterflexed with toes at a lower level than heel)

Refer to a higher level for appropriate management.

50.4 Acute Osteomyelitis

This is caused by haematogenous spread of bacteria from a primary source, which may or may not be obvious. The commonest causative agent is Staphylococcus aureus. Other organisms that may be responsible include Streptococcus pyogenes, Pneumococus pneumoniae, Staphylococci albus, and sometimes Salmonella typhi in sickle cell disease.

Clinical Features
Pain is the major presenting symptom. The severity increases with time. There is accompanying fever, and the patient becomes toxic. The main physical signs are localized tenderness, loss of function of the limb, and swelling. Commonly involved bones are proximal tibia, distal femur, and distal humerus.

Investigations
Haemogram

Management
- Give ibuprofen 400mg TDS to relieve pain and inflammation.
- Elevate and rest the limb.
- Give antibiotics STAT, and refer for administration of appropriate parenteral antibiotic therapy for three weeks, like amoxicillin 500mg QDS.

50.5 Chronic Osteomyelitis

This follows inadequate management of acute osteomyelitis, infected compound fractures, spread from infected tissue including prosthesis and bone surgery.

Clinical Features
Infection may remain quiescent, with acute or subacute exacerbations that manifest as discharging sinuses.

Management
Refer to higher level for appropriate management.

50.6 Septic Arthritis

This is an acute infection of the joint space.

Aetiology
- Haematogenous spread from a primary focus elsewhere in the body.
- Direct penetrating injuries into the joint.
- Extension of infection from a compound fracture of the neighbouring bone.

The commonest causative organisms are Staphylococcus aureus, Streptococcus pyogenes, Haemophilias influenza, and to a lesser extent Salmonella typhimurium or typhi. Large joints such as shoulder, knee, ankle, and hip are more often affected. Septic arthritis is most common in children under 3 years of age

Clinical Features
- Fever, chills and irritability.
- Swollen, warm, very tender joint(s).
- Pseudoparalysis of the joint.
- Multiple joints may be affected.

Investigations
Haemogram - anaemia and leucocytosis present

Management
- Start on intravenous antibiotics: Amoxicillin 500mg orally QDS + gentamicin 5–7.5mg/kg TDS. Then refer for culture and sensitivity.
- Splint the joint.
- Give ibuprofen 400mg TDS.

Refer to higher level for appropriate management.

50.7 Osteosarcoma

This is a highly malignant bone tumour of late childhood and early adulthood. Commonly involves long bones, i.e., distal femur and proximal humerus. Tumour presents with pain, noticeable swelling, tenderness, or pathological fractures.

Refer to higher level for appropriate management.

50.8 Lower Back Pain

Aetiological Factors
- Trauma
- Inflammatory: Rheumatoid arthritis, ankylosing spondylitis, etc.
- Degenerative: Spondylosis (degenerative disease), prolapsed interverebral disc, spondylolisthesis
- Neoplastic: Usually secondary tumours
- Infection: Pyogenic, non-pyogenic (tuberculosis – Pott's disease)
- Spinal stenosis: Congenital, degenerative
- Others: Kyphoscoliosis

Clinical Features
- Pain: Sharp and localized, chronic and diffuse
- Referred pain (sciatica): Pain radiates into the lower limb. Pain aggravated by coughing, straining, etc.
- Stiffness
- Deformity, e.g., TB spine
- Numbness or parasthesia in the lower limb
- Urinary retention or incontinence can be due to pressure on the cauda equina
- There may be history of trauma, heavy lifting, neoplasm, connective tissue disorder like rheumatoid arthritis.

The following is important on physical examination:
- Skin: Scars, pigmentation, abnormal hair.
- Shape and posture
- Palpation
- Feel for tenderness
- Motion: May be impaired
- Sensation: May be diminished if nerves are involved
- Reflexes: May be diminished if nerves are involved
- Straight leg raising test: Discloses lumbosacral root tension
- Examine other systems

Investigations
- Erythrocyte sedimentation rates in suspected tumour

Management
- Give ibuprofen 400mg TDS

Refer to higher level urgently for appropriate management.

51. Ear, Nose, and Throat Conditions

51.1 Epistaxis

Bleeding through the nose, resulting from nose picking, trauma (fall in games, assault, etc.,), nasal and paranasal neoplasms, nasal infection, systemic derangements, e.g., acute fevers, hypertension, renal disease with uraemia, abnormalities of blood clotting, and foreign bodies in the nose.

Management

- Immediate: Sit the patient up (to avoid aspiration).
- Pinch the nose for 10–20 minutes. This is usually sufficient to stop bleeding.
- Apply ice or cold packs on the bridge of the nose.
  - To pack the nose, remove clots with a suction catheter. Apply xylocaine nasal spray, then pack (preferably using Tiley's forceps) with ribbon gauze or narrow strip of gauze impregnated with liquid paraffin. Start packing from the floor of the nose towards the roof. The pack should fit lightly to be effective. Do not use adrenaline.
  - A paraffin pack should be removed within 24–48 hours. Bismuth iodoform paraffin paste (BIPP) or zinc iodoform paraffin paste (ZIPP) packs can be left in situ for up to 48 hours.
  - A patient with a nasal pack should be put on:
    - Broad spectrum antimicrobial e.g. cotrimoxazole or amoxicillin for seven days
    - Analgesic, e.g., paracetamol 500mg 8 hourly for 5 days (children 40mg/kg/day QDS)
- Attend to primary cause.
- Consider referral if the following are observed:
  - Bleeding is uncontrolled with packs.
  - Bleeding is from the postnasal space or posterior nose.

51.2 Foreign Bodies in the Ears

The types of foreign bodies include metallic pieces (hair clips, smooth pellets, needle, etc.), wooden items (e.g., match sticks, vegetable matter like seeds and insects.

Clinical Features

Obvious history of foreign body insertion into the ear, conductive deafness, pain or discomfort in ear. Discharging ear, disturbing noise (insects), and bleeding (traumatic insertion especially by a child).

☛ **Danger signs: Foreign bodies in the ear with bleeding from the ear and external evidence of trauma suggest foreign body entry into the middle ear.**

Management
Most foreign bodies can be removed fairly easily with crocodile forceps, a hook, an ear probe or by suction and gentle syringing with warm, clean water. Rounded objects may if pushed further into the ear rupture the eardrum. Also refer complications such as perforation of eardrum or a suspected foreign body in the middle ear.

- **If you lack the instruments for extraction of foreign bodies, please refer.**

51.3 Foreign Bodies in the Nose

Covered in Paediatrics, Section 27.6.2.

51.4 Foreign Bodies in the Oesophagus

The commonest objects are fish bones or meat in adults. All other forms of foreign bodies can be found in psychiatric patients. The commonest objects encountered in children are coins.

Clinical Features
There is pain in retrosternal area and/or in the back, dysphagia, pooling of saliva in the mouth or regurgitation of food. The affected patient may present with dyspnoea and hoarseness if there is laryngeal oedema from compression by the foreign body and localized tenderness in the lower part of the neck. As a number of children are not able to communicate their problem, child may present later with complaints relating to the presence of a foreign body.

Management
Refer to higher level for appropriate management.

51.5 Wax in the Ears

If soft, remove by syringing with clean, warm water. If hard but not blocking the eardrum, remove with a hook or by gentle syringing with clean water. If hard and blocking the ear canal, soften over few days with water and liquid paraffin and then syringe.
Advise patients to leave wax to migrate out of the ear on its own instead of attempting to remove it with ear buds, as this encourages impaction.
Referral to higher facilities usually not needed unless keratosis is suspected.

51.6 Hearing Impairment

In the paediatric age group, pay special attention to young children. A high index of suspicion and proper history are important, especially among children born prematurely, those born with low birth-weight, those born after difficult delivery,

those who develop yellowness of eye (neonatal jaundice) or whose mothers had febrile illness during pregnancy, and those treated for meningitis. Do not ignore parents' complaint of a child not hearing or a child who is slow to develop speech. Use changing voice intensity to assess grossly the state of hearing. If suspect hearing loss, refer at whatever age to higher level for appropriate management. A child who does not hear can be helped at any age but the earlier the better.

Refer to an institution specializing in dealing with hearing impairment with facilities for audiometry, tympanometry, and rehabilitation.

51.7 Mastoiditis

This is infection of the mastoid air cells and mastoid bone occurring as a complication of acute otitis media or chronic suppurative otitis media.

Clinical Features
This is a painful swelling above the ear in children under 2 years of age. There is tenderness, oedema and possible flatulence behind the ear in other children often with preceding otitis media and mastoid tenderness. There is fever and sagging of the posterosuperior meatal wall.

Management
Give antibiotics as for otitis media.

Refer if:
- The swelling points and/or bursts to discharge pus. If an abscess develops refer to level 4 and above. Do not carry out an incision and drainage at level 2 and 3 as this condition requires a formal mastoidetomy to adequately clear all the pus and infected material. Inadequate incision and drainage will result in a chronic sinus.
- The child develops a squint in the eye or facial palsy on the same side as the mastoiditis. The child develops signs of meningitis or brain abscess.

51.8 Laryngeal Trauma

These can be blunt or penetrating injuries. The priority is to secure and maintain an airway, then refer urgently to an ENT specialist for endoscopy and repair.

51.9 Allergic Rhinitis

Immunoglobulin IgE-mediated rhinitis is characterized by seasonal or perennial sneezing, nasal congestion, pruritus, and often conjunctivitis and pharyngitis. Symptoms vary in severity from day today or hour to hour.

Management
- Avoid the allergen (precipitating factor).

- Give antihistamines: chlorphenamine 4mg 6 hourly adults and 0.35mg/kg in children in 4 divided doses.
- Give sodium cromoglycate nasal spray 4 hourly as a prophylaxis.
- Topical steroids are safe and effective.

Refer to higher level for appropriate management.

51.10 Parotid Mass

These may be true parotid swellings (e.g., parotitis, parotid abscess, cysts, dialecticism, tumours, etc.), or pseudoparotomegaly due to swellings in nearby structure, (e.g., hypertrophy of the masseter, jaw swellings, parapharyngeal masses, lymph enlargement, facial nerve tumours, etc.). Parotid swellings may also occur in other systemic conditions (e.g., malnutrition, diabetes mellitus, HIV/AIDS, Sjogren's syndrome). Infective masses may be associated with other features of infection like fever and pain and there is local inflammation or discharge from the opening of the parotid duct. Most parotid swellings are painless unless infected or malignant. Presence of facial nerve palsy is highly suggestive of a malignant process.

Management
Refer to higher level for appropriate management

51.11 Acute Otitis Media

This is covered in Paediatrics, Section 27.1.

51.12 Chronic Suppurative Otitis Media (CSOM)

There are 2 types of CSOM: Tubo-tympanic and Attico-antral.

51.12.1 TUBO-TYMPANIC TYPE

There is discharge of pus from one ear or both ears for more than 2 weeks following untreated or unresolved acute otitis media with a central perforation. There is recurrent ear discharge usually after URTI. Secondary infection may be present with Gram-negative organisms, yeast, and fungi.

Clinical Features
A purulent discharge from the ear for more than 2 weeks, usually not foul smelling. There is impaired hearing with a central perforation in the ear drum.

Treatment
- Do not syringe such ears.
- Refer to higher level for appropriate management.

51.12.2 ATTICO ANTRAL

Clinical Features

There is foul smelling discharge and hearing impairment with attic or marginal perforation with cholesteatoma.

Treatment

Do not syringe such ears.

51.13 Ear Nose and Throat Manifestations of HIV/AIDS

In general, 40% of AIDS patients present with otolaryngological symptoms. These include:

- Infections: These can be viral, bacterial, or fungal, e.g., rhinitis, sinusitis, pharyngitis, glossitis, tonsillitis, laryngitis, parotitis, deep neck space cellulitis and abscesses, otitis externa, otitis media, and labyrinthitis.
- Tumours: There is an increase in head and neck cancers associated with HIV/AIDS, especially Kaposi's sarcoma, lymphomas, squamous cell carcinoma, and salivary gland tumours.
- Other features: Adenoid hypertrophy, oropharyngeal and oral ulcers, atrophic rhinitis, lymphadenopathy, parotid cysts, otitis media with effusion, vertigo, deafness, tinnitus, and cranial nerve palsies.

Management

Is directed at the presenting lesion.

51.14 Nasopharangeal Carcinoma

Clinical Features

Commonly presents first as neck mass. As a general rule, any mass in the angle of the mandible can be assumed to be nasopharangeal carcinoma until proved otherwise. Other non specific symptoms may include congestion, rhinorrhea, epistaxis, or ear pain, to mention a few.

Management

Refer to higher level for appropriate management.

51.15 Carcinoma of the Larynx

Clinical Features

- Unremitting hoarseness for more than four weeks
- Dyspnoea
- Cough
- Haemoptysis
- Stridor
- Neck mass

Management

Refer to higher level for appropriate management.

PART IV
Obstetrics and Gynaecology and Related Disciplines

IN THIS SECTION:

52. Gynaecology

This section involves mainly the cohorts of pregnant women and the newborn, adult women of reproductive age (WRA), postmenopausal women, and sometimes infants and children in relation to sexual assault. Issues covered include abortion/miscarriage, pelvic masses, menstrual disorders, carcinomas, and sexual assault.

52.1 Abortion (Miscarriage)

The old working clinical definition of abortion denotes termination of pregnancy before the 28th week of gestation. With advancement in modern neonatology, the technical definition denotes termination of pregnancy when the foetus weighs less than 500g. There are many types of abortion; these are summarized in Table 52.1 and described in more detail below.

52.1.1 THERAPEUTIC ABORTION

Where the health of the mother and/or foetus is at risk, therapeutic abortion may be performed if recommended by two senior and experienced doctors as per the Penal Code section 240 and the Medical Practitioners and Dentists Board Code of Ethics and Professional Conduct 2003.

☛ When termination of pregnancy is done outside of the provisions stated above, the punishment under the law is provided by sections 158, 159, and 160 of the penal code. (See Box 52.1 on page 303.)

52.1.2 UNSAFE ABORTION

WHO defines unsafe abortion as a procedure for terminating an unwanted pregnancy either by persons lacking the necessary skills or in an environment lacking the minimal medical standards or both. Illegally induced unsafe abortion by mainly unqualified people is associated with incompleteness, sepsis, genital and visceral injuries, and death. Investigations and management is as for septic abortion. Repair of genital and visceral injuries is mandatory. Refer to Table 52.2 for management and staffing recommendations.

52.1.3 THREATENED ABORTION

Clinical Features

These are summarized in Table 52.1.

Investigations

- Haemogram
- Blood slide for malaria parasites in endemic malarial areas
- Urinalysis and microscopy
- Refer for ultra sound examination to exclude “Blighted Ovum” or hydatidiform mole and reassure if normal intrauterine pregnancy is seen

Table 52.1: Diagnosis and management of various types and stages of abortion

Types of abortion	Diagnosis	Management
Threatened abortion	Mild abdominal pain and mild PV bleeding Cervix closed	Bed rest Mild sedation Follow up Treat any underlying cause
Inevitable abortion	Abdominal pains PV Bleeding Cervix open All POCs still in uterus	- Expedite expulsion by oxytocin 20IU in 500ml normal saline drip to be run over 4 hours or Misoprostal 600mcg per vaginam if greater than 14 weeks (include on EML) - Evacuate if less or some POCs retained after expulsion.
Incomplete abortion	Abdominal pains PV bleeding Cervix open Some POCs retained	- Evacuate uterus by MVA under paracervical block (2.5ml of 1% Lignocaine Hcl Inj at 2, 4, 8, and 10 o'clock positions).Ensure it is not intravascular. *OR* misoprostrol 600mcg orally Antibiotics: Doxycycline 100mg BD and metronidazole 400mg TDS for 7 days. Analgesia: Ibuprofen 400mg TDS for 5 days.
Complete abortion	Little or no bleeding or pain Uterus contracted Cervix closed	Observe Reassure Discharge
Missed abortion	History of amenorrhoea Symptoms of pregnancy regress, uterine size smaller than dates Mild PV bleeding	Induce if more than 12 weeks Evacuate if less than 12 weeks (Ultra sound scan if available) *OR* Misoprostrol 800mcg orally for less than 12 weeks
Molar abortion	Presents as threatened or incomplete, uterine size larger, grapelike vesicles Ultrasound if available	Evacuate or induce as in missed abortion. X-match and drip for evacuation as excess bleeding is a risk. Strict follow up for possible choriocarcinoma. Manage as per details in Section 54.1.12.
Septic abortion	Any of the above with symptoms and signs of infection	Parenteral broad spectrum antibiotics Evacuate with MVA in severe cases without delay Or in mild cases misoprostrol 600mcg orally. Manage as per details in Section 54.1.7.
Habitual abortion	Three or more consecutive spontaneous abortions	Treat emergency. Management depends on underlying cause, refer to Section 54.1.9.
Therapeutic abortion	Life threatening conditions in woman/foetus, compliance with law and MPDB guideline	Manage as per details in Section 54.1.10.

Table 52.2: Recommended emergency abortion care activities by level of health care facility and staff

Level	Staff may include	Abortion care provided
First referral (Level 4: District, sub-district, mission hospital, nursing home)	Nurses, trained midwives, general practitioners, specialists with training in obstetrics and gynaecology	All activities as in Table 54.1 plus: Emergency uterine evacuation through the second trimester treatment of most abortion complications, blood cross match and transfusion; local and general anaesthesia; counselling; laparotomy and indicated surgery are available
Diagnosis & referral for severe complications, e.g., septicaemia, peritonitis, renal failure		
Secondary & tertiary referral (Levels 5 & 6)	Nurses, trained midwives, general practitioners, obstetrics and gynaecology specialists.	All activities above plus: Uterine evacuation as indicated for all emergency abortion treatment of severe complications (including bowel injury, tetanus, renal failure, gas gangrene, severe sepsis); treatment of coagulopathy and counselling

Source: Adapted from *Clinical Management of Abortion Complications: A Practical Guide* (WHO, 1994).

Box 52.1: Abortion and the Law

Penal Code Section 240
"A person is not criminally responsible for performing in good faith and with reasonable care and skill a surgical operation upon any person for his benefit, or upon an unborn child for the preservation of the mother's life, if the performance of the operation is reasonable, having regard to the patient's state at the time and to all the circumstances of the case".

Medical Practitioners and Dentists Board Code of Ethics and Professional Conduct 2003
"The Laws of Kenya do not allow for termination of pregnancy 'on demand' and severe penalties are meted out to those found guilty of procuring or attempting to procure an abortion or miscarriage. There is room, however, for carrying out termination when in the opinion of the attending doctors it is necessary in the interest of the health of the mother or baby. In these circumstances, it is strongly advised that the practitioner consults with at least two senior and experienced colleagues, obtains their opinion in writing, and performs the operation openly in hospital if he considers himself competent to do so in the absence of a gynaecologist. In all cases of illegal termination of pregnancies, the sentences shall be suspension or erasure".

Penal Code Section 158. Attempt to Procure Abortion
Any person who, with intent to procure miscarriage of a woman, whether she is or is not with child, unlawfully administers to her or causes her to take any poison or other noxious thing, or uses any force of any kind, or uses any other means whatever, is guilty of a felony and is liable to imprisonment for fourteen years.

Penal Code Section 159. Attempt to Procure Abortion by the Pregnant Woman
Any woman who, being with child, with intent to procure her own miscarriage, unlawfully administers to herself any poison or other noxious thing, or uses any force of any kind, or uses any other means whatever, or permits any such thing or means to be administered or used to her, is guilty of a felony and is liable to imprisonment for seven years.

Penal Code Section 160. Supply Drugs or Instruments to Procure Abortion
Any person who unlawfully supplies to or procures for any person any thing whatever, knowing that it is intended to be unlawfully used to procure the miscarriage of a woman whether she is or is not with child, is guilty of a felony and is liable to imprisonment for three years.

Management
- Order bed rest at home or in facility.
- For pain, offer PO hyoscine butylbromide 20mg 8 hourly and/or PO paracetamol 1g 8 hourly for 5 days.
- Sedate with PO phenobarbitone 30mg hourly for 5 days ***OR*** PO diazepam 5mg 8 hourly for 5 days to help allay anxiety and enforce bed rest.
- If more bleeding and signs of progression to incomplete abortion occur, do MVA under a para-cervical block (2.5ml of 1% lignocaine HCL injection at 2, 4, 8, 10 o'clock position) as above or stabilize and refer to higher level for appropriate management.

Patient Education
- If on bed rest at home, return to health facility if features of progression to incomplete abortion intensify, e.g., more bleeding.
- Abstain from sexual intercourse for at least 2 weeks to prevent progression to incomplete abortion and risk of infection.

52.1.4 COMPLETE ABORTION

Clinical Features
As shown in Table 52.1.

Investigations
Haemogram, malaria parasites, urinalysis

Management
- Stabilize as necessary, for example with intravenous fluids, e.g., IV fluids.
- Administer antibiotics: Amoxicillin – clavulanate 625g BD ***OR*** doxcycycline 500mg QDS for 7 days and metronidazole 400mg TDS for 7 days.
- Give ferrous sulphate and folic acid in standard dosage for appropriate period to restore normal haemoglobin. Ferrous sulphate should be given after completing the course of tetracycline.

☛ **Transfusion is necessary.**

Refer to higher level for appropriate management

Patient Education
- If further pregnancy is desired, refer to higher level for further investigation.
- If further pregnancy is not desired, discuss and offer appropriate contraception.

52.1.5 INCOMPLETE ABORTION

Clinical Features
As shown in Table 52.1 for threatened abortion.

Management
- Resuscitate with fluids (normal saline and dextrose). If the patient is in shock, transfer to higher level for appropriate management.
- Give oxytocin 10 IU IM or ergometrine 0.5mg IM STAT.

- Remove POC from cervical os digitally or with ovum forceps.
- Manage pain: IM diclofenac 75mg STAT or paracervical block during MVA (use a total of 10ml lignocaine hydrochloride 1% 2.5ml at 2, 4, 8, and 10 o'clock positions of the cervix); provide verbal support
- Give antibiotics: PO doxycycline 100mg 12 hourly + PO metronidazole 400mg 8 hourly for 7 days.

Patient Education
As for complete abortion.

52.1.6 SEPTIC ABORTION

Clinical Features
As shown in Table 52.1.

Investigations
- As for threatened abortion
- Blood cultures for patients in endotoxic shock

Management
- Refer all cases having evidence of septic abortion to higher level for appropriate management that involves inpatient care.
- Resuscitate as in incomplete abortion.
- Give IV crystalline penicillin 2 mega units QDS and IV gentamicin 80mg TDS + IV metronidazole 500mg TDS ***OR*** chloramphenical IV 1g 6 hourly and metronidazole 500mg IV 8 hourly for 3 to 7 days depending on the severity of the infection then change to orals on discharge for 5 days.
- Evacuate the uterus soon after initial antibiotic doses.

☛ **Patients with severe septic abortion or with features of endotoxic shock should be referred urgently to higher level for appropriate management.**

Patient Education
As in complete abortion.

52.1.7 MISSED ABORTION

Clinical Features
As shown in Table 52.1.

Investigations
- As for threatened abortion.
- Refer for ultrasound to confirm absence of intrauterine life.
- Bleeding and clotting time in case disseminated intravascular coagulopathy (DIC) has developed.

Management
- Give antibiotics: Doxycycline 500mg QID for 7 days + metronidazole 500mg TDS 7 days
- Evacuate the uterus as in incomplete abortion.

- Refer to higher level for appropriate management all cases of intrauterine foetal death (IUFD).

Patient Education
As for complete abortion.

52.1.8 HABITUAL ABORTION

Clinical Features
As shown in Table 52.1.

Management
Refer all cases of habitual abortion to higher level for appropriate management.

52.1.9 POST-ABORTION CARE (PAC) AT LEVEL 2–3

All women should have access to comprehensive quality services for the management of post-abortion complications. PAC services include resuscitation, evacuation of the uterus by MVA, post-abortion counselling, education and family planning services to help reduce repeat unwanted and unsafe abortions, and linkages to other reproductive health and support services. It also includes community participation. Some mid-level providers (nurses and clinical officers) are trained to provide PAC. The MOH has supplied MVA kits to some health centres and dispensaries.

52.1.10 MOLAR ABORTION (HYDATIDIFORM MOLE)

Clinical Features
A hydatidiform mole usually presents as a threatened or incomplete abortion. In the threatened stage, before the cervix opens, the diagnosis of hydatidiform mole is suspected if bleeding does not settle within a week of bed rest. The uterine size is larger than gestational age and foetal parts are not palpable. Foetal movements are not felt at gestation 18–20 weeks and beyond. Features of hyperemesis gravidarum, nausea, vomiting, and ptyalism are still present and severe after 3 months. When the cervix opens, passage of the typical grape-like vesicles confirms the diagnosis. Bleeding may be very heavy when a mole aborts spontaneously.

Management
Resuscitate and refer to higher level for appropriate management

52.2 Ectopic Pregnancy

Ectopic pregnancy is a pregnancy outside the uterine cavity, which of most are in the fallopian tube. Ectopic pregnancy is usually due to partial tubal blockage and therefore the patient is often subfertile. There are two types: acute ectopic pregnancy and chronic (slow leak) ectopic pregnancy. Differential diagnosis for this condition include pelvic inflammatory disease (PID), appendicitis, abortion, and ruptured ovarian cyst.

Clinical Features
For acute ruptured ectopic pregnancy:
- Amenorrhoea 6–9 weeks.
- Abdominal pain of sudden onset.
- Shock and anaemia.
- Abdominal distension and tenderness.
- Shoulder tip pain due to haemoperitoneal diaphragmatic irritation.
- Cervical excitation tenderness present.

For chronic (slow-leak) ectopic pregnancy:
- Abdominal pain
- Irregular PV bleeding, usually dark blood (amenorrhoea may be present).
- Anaemia, fainting attacks.
- Low abdominal and pelvic tenderness and possibly a mass.
- Cervical excitation present.

Management
If ectopic pregnancy is suspected from clinical features, refer for emergency laparotomy.
- Fix IV drip, give analgesia (IM diclofenac 75mg STAT).
- Obtain specimens for haemogram and cross-match to accompany patient.
- Refer and organize travel of patient to higher level for appropriate management. Organize for competent escort to accompany patient to referral facility.
- Take blood donors if possible.

52.3 Infertility

Infertility is usually defined as the failure to conceive after 1 year of sexual intercourse without contraception. It is divided into 2 types:
- Primary: The woman has never conceived in spite of having unprotected sexual intercourse for at least 12 months.
- Secondary: The woman has previously conceived but is subsequently unable to conceive for 12 months despite unprotected sexual intercourse.

Causes of Infertility
These include the following:
- Tubal factor: There is bilateral occlusion of fallopian tubes as a result of PID.
- Male factor: The sperm ducts are damaged as a result of previous STIs leading to abnormalities of sperm function.
- Endocrine disorders affecting the woman.
- Tropical diseases in both the man and the woman including leprosy, filariasis, schistosomiasis, or tuberculosis
- Cervical mucus abnormalities.
- Congenital disorders.

Management
Simple screening by history and physical examination of any cases of infertility should be done.
- Refer all cases to higher level for appropriate management.
- Since infertility results from either (or both) female problems or male problems, both partners should undergo evaluation.
- Diagnosis.
- History from couple and individually.
- Physical examination of both partners.

52.4 Pelvic Masses

Do simple screening by history and physical examination for any lower abdominal swellings but refer to higher level for appropriate management any that may include further investigations

The differential diagnosis for pelvic masses includes normal pregnancy, distended urinary bladder, uterine fibroids, pelvic abscess, tubal-overian mass, and ovarian cyst.

52.4.1 NORMAL PREGNANCY
Is easy to diagnose from history of amenorrhoea and enlarged cystic midline pelvic mass. Foetal movements and heart sounds may be noted after 18 weeks.

Refer to higher level for appropriate management if in doubt.

52.4.2 DISTENDED URINARY BLADDER
Acute retention of urine is the commonest. It is commonly associated with acute urinary tract infection in young girls and may be associated with other pelvic tumours in older women. Catheterization and administration of nitrofurantoin 100mg TDS for 10 days. Antibiotic and urine examination will suffice in urinary tract infection (UTI).

52.4.3 UTERINE FIBROIDS
Clinical Features
Uterine fibroids are benign growths of the uterine wall muscle. They occur commonly in age groups 30 years and above. They are associated with nulliparity, low parity, subfertility and infertility. Uterine fibroids present with features of a swelling in the lower abdomen or dysmenorrhoea or heavy periods. Vaginal examination reveals a mass that is firm, nodular, non-tender and moves with the cervix. Diagnosis is essentially clinical.

Management
Refer to higher level for appropriate management.

52.4.4 PELVIC ABSCESS AND TUBO-OVARIAN MASS

Clinical Features

Essential features for diagnosis of this condition include the following;

- History of STI or pelvic infection
- Lower abdominal and pelvic pain
- Nausea and vomiting
- Tender adnexal mass
- Fever and tachycardia
- Rebound tenderness

Management

- Start on drip of normal saline ***OR*** dextrose 5% 500ml.
- Give IV benzyl penicillin 5mu STAT and gentamycin 80mg STAT.
- For pain relief, give diclofenac IM 75mg then refer.

52.4.5 OVARIAN CYSTS

Clinical Features

These are usually benign and may occur in women of any age group. Menses are usually normal in simple cysts. Abnormal menses including amenorrhoea occur in functional cysts. Ovarian cysts may undergo torsion to cause acute pain. A cystic mass in one or other side of pelvis is essential for diagnosis

Management

Refer to higher level for appropriate management

52.4.6 NEOPLASMS (MALIGNANT GROWTHS)

These may present as pelvic masses.
Refer to higher level for appropriate management.

52.5 Menstrual Disturbances

Most women suffer some form of menstrual disturbance in their lifetime. Common types are mentioned here. Health service providers should sensitize community members that menstrual disturbances may be a symptom of serious illness and advise their patients to seek help from health facilities when they have menstrual disturbances.

52.5.1 AMENORRHOEA

Amenorrhoea means the absence of menstruation for 2 cycles or more. It is a symptom and not a disease. Primary amenorrhoea refers to a patient who at any age has never menstruated. Secondary amenorrhoea refers to cessation of the periods after menstruation has been established. There are 2 varieties of amenorrhoea: cryptomenorrhoea (hidden periods) and true amenorrhoea (primary and secondary).

CRYPTOMENORRHOEA

Clinical Features. The menstrual fluid is retained in the genital tract. The commonest variety seen is imperforate hymen occurring after menarche (12–14 years) with cyclic abdominal pains. Vulval inspection will reveal a bluish bulging hymen. There may be or may not be lower abdominal mass.

Management
Refer to higher level for appropriate management.

TRUE AMENORRHOEA

True amenorrhoea can be physiological as the period before puberty, during pregnancy, during lactation, and after the menopause. However, it may also be pathological.

Clinical Features
The clinical features depend on age of presentation in physiological type and on the level of disturbance in the pathological type of amenorrhoea.

Investigations
In physiological type of amenorrhoea, a good menstrual history and physical examination is usually sufficient to confirm physiological amenorrhea. A pregnancy test and/or ultrasound usually confirms early pregnancy.

In the pathological type the causes may be uterine lesions, ovarian lesions, pituitary disorders, other endocrine disorders, psychiatric illness or emotional stress and severe general illness.

Management
Refer to higher level for appropriate management.

52.5.2 DYSFUNCTIONAL UTERINE BLEEDING (DUB)

A normal menstrual period lasts 2–7 days with an average of 3–5 days. The normal menstrual cycle lasts between 21–35 days. The term “menorrhagia” refers to excessive bleeding during the menstrual periods.

“Dysfunctional uterine bleeding” refers to those cases in which the bleeding is not due to some obvious local disorder, such as pelvic infection or new growth, or some complication of pregnancy, but rather some form of hormonal imbalance.

Clinical Features
Irregular periods associated with lack of ovulation that are commonest at puberty and during perimenopausal period and at times, during the reproductive years, (14–44 years). As a consequence, there may be anaemia and poor health. At puberty it may be associated with changes in climate and environment, school examinations, stress, and intercurrent illness and pregnancy. It is important to

exclude abortion, ectopic pregnancy, and fibroids during the reproductive years, while pregnancy and uterine and cervical cancers should be excluded during perimenopausal years.

Management
Refer to higher level for appropriate management.

52.5.3 DYSMENORRHOEA

Dysmenorrhoea is pain before or during period, sufficient to interfere with the woman's normal occupation. It may be associated with nausea, vomiting and disturbance of bowel function. There arc 2 types of dysmenorrhoea, namely Primary Dysmenorrhoea and Secondary Dysmenorrhoea.

PRIMARY DYSMENORRHOEA

Clinical Features
This is the commonest type of dysmenorrhoea, occurring in girls or young women less than 20 years of age. The pain is spasmodic or colicky in nature. It starts on the first day of the period and may last a few hours or throughout the period. It may be associated with nausea, vomiting and/or diarrhoea, or constipation. It may be incapacitating and interfere with normal daily activity.

Good history and examination are necessary to rule out coexisting disease.

Management
- Reassure the patient.
- Counsel on stress and treat as appropriate.
- Administer analgesics: PO paracetamol 1g 8 hourly or PO ibuprofen 400mg 8 hourly or aspirin 600mg 8hourly with hyoscine butyl bromide 20mg 8 hourly for 3 days.
- Suppress ovulation by use of contraceptive pill for three cycles, for example Ethinylestradiol 30mg + levonogestrel 150mcg. Note that this is not recommended as a remedy in young girls. In a majority of cases, pain may cease after first delivery.
- Follow up is as appropriate.

SECONDARY DYSMENORRHOEA

Clinical Features
This is secondary to organic disease, for example PID, fibroids, and associated infertility. Features of underlying cause may be evident. Often the pain precedes the onset of a period by a week to 10 days.

Management
- Administer aspirin 600mg TDS, paracetamol 1g TDS, ***OR*** ibuprofen 200mg TDS as in primary dysmenorrhoea.
- Refer to higher level for appropriate management.

52.5.4 PREMENSTRUAL TENSION SYNDROME

Clinical Features

This manifests as premenstrual discomfort in lower abdomen and back 7–10 days preceding menses. It gives a sensation of distension or pelvic engorgement. There is relief after flow begins. It is accompanied by nervous irritability, depression, headache, listlessness, and discomfort in breasts. Occasionally there is fluid retention. A good history and physical examination are important for accurate diagnosis.

Management

- Reassure. Administer drugs with mild tranquillizer effect like phenobarbitone 30 nocte or diazepam 5mg nocte.
- If severe or persistent, refer to higher level for appropriate management

52.6 Neoplasms (Potentially Malignant Conditions)

Health service providers should sensitize community members on symptoms of gynaecological cancer and advise them to seek help from health facilities. They should also be encouraged to have routine annual gynaecological check ups by qualified health personnel. Health service providers should use simple cancer screening technologies such as visual inspection with acetic acid (VIA) and visual inspection with Lugol's Iodine (VILI) and breast examination. They should refer suspicious cases to higher levels for appropriate management.

52.6.1 OVARIAN CANCER

Clinical Features

The following features are noted:

- May occur at any age but commoner in women aged 40 years and above.
- May have a mass in lower abdomen.
- There is wasting.
- There is ascitis.
- There is irregular vaginal bleeding.

Management

Refer urgently to higher levels for appropriate management.

Prevention

Annual pelvic examination and pelvic ultrasound are recommended as preventive measures for early detection and management.

52.6.2 CANCER OF THE CERVIX

This is the most common gynaecological cancer. The risk factors for this condition are early age of first coitus, multiple sexual partners, having a spouse with multiple sexual partners, high parity, infection with human papilloma virus, and infection with Herpes simplex type II.

Clinical Features
- Commonest in age group 30 and above.
- There is post-coital bleeding.
- There is post-menopausal bleeding.
- There is foul smelling vaginal discharge.
- There is intermenstrual PV bleeding.
- Pain, anaemia, and cachexia are late presenting features.
- Speculum examination reveals an easily bleeding growth on the cervix.

Management
Refer to higher level for confirmation of diagnosis by biopsy and histology, staging, and definitive treatment.

Prevention
- Avoid risk factors listed above
- Pap smear every 3 years for early detection.
- Visual inspection (of cervix) with acetic acid (VIA) or with Lugol's iodine (VILI) are simple screening methods that can be applied for all women from sexual debut.
- HPV vaccine before sexual debut and for those who are HPV negative.

☛ **High index of suspicion is essential as early detection is important, but many patients present late with advanced disease.**

52.6.3 CARCINOMA OF THE ENDOMETRIUM

This is probably the third commonest cancer in women in Kenya after cervical cancer and breast cancer. Commonest age at onset is peri and post menopausal period. It is associated with low parity, obesity, diabetes, and hypertension and may be preceded by endometrial hyperplasia due to unopposed oestrogen stimulation of endometrium.

Clinical Features
The condition presents with abnormal uterine bleeding at peri or post menopausal age. Clinical findings may sometimes be unremarkable in early disease, although enlarged uterus and evidence of metastasis may be evident in late cases.

Management
Refer suspected cases to higher level for appropriate management.

52.6.4 CARCINOMA OF THE VULVA

Clinical Features
- Majority of patients present after the menopause.
- May be preceded by pruritic conditions of the vulva.
- Presents as an ulcer on the vulva.
- May have inguinal lymphadenopathy.
- Diagnosis is by clinical features and confirmed by biopsy and histology. Differential diagnoses include granuloma inguinale, lymphogranuloma venereum, syphilitic chancre or gummata, and chancroid.

Management
Refer all suspected cases to higher levels for appropriate management.

52.6.5 CARCINOMA OF THE VAGINA

This is a rare cancer, with peak incidence from age 45 to 65.

Clinical Features
There is post coital bleeding, dyspareunia, watery discharge, urinary frequency or urgency, and painful defecation. Cancers are commonly found in the upper part of the vagina on posterior wall. Speculum and digital examination reveals growth in the vaginal wall.

Management
Give supportive management (nutrition, vitamins, haematinics) Refer urgently to higher levels for appropriate management

52.7 Pelvic Inflammatory Disease (PID)

Pelvic inflammatory disease is the inflammation of pelvic structures above the cervical os, including the uterus, the fallopian tubes, the ovaries, and all the related structures. It is essentially a consequence of STI (gonorrhoea and Chlamydia trachomatis), but can follow puerperal sepsis, abortion, or TB.

Clinical Features
Diagnosis of this condition is mainly clinical. The clinical features include:
- Lower abdominal pain
- Fever
- Signs of pelvic peritonitis
- Toxic appearance with vomiting
- Dyspareunia, infertility, mucopurulent cervical discharge, and bilateral adnexal tenderness
- Adnexal induration and/or masses (tubo-ovarian).

Management
☛ **Refer urgently to higher levels for appropriate management**

Management may include amoxicillin/clavunate 625mg BD for 7 days or PO docycycline 100mg 12 hourly for 10 days + PO metronidazole 400mg 8 hourly for 10 days. Advise patient to avoid alcohol.

Patient Education
In case of multiple partners, condoms should be used.

52.8 Abscesses and Fistulae

52.8.1 BARTHOLIN'S ABSCESS

Bartholin's glands are located bilaterally in the vulva, adjacent to the vaginal orifice. Cysts arise when the glands' ducts become occluded. Bartholin's

abscesses occur when the gland becomes secondarily infected with one of many common bacterial pathogens.

Clinical Features
Patient may complain of any combination of symptoms that include local pain, low-grade fever, perineal discomfort, labial swelling, dyspareunia, purulent PV discharge and difficulty in sitting. Physical examination may reveal tender, fluctuant abscess lateral to and near the posterior fourchette, local swelling, erythema, labial oedema and painful inguinal adenopathy. Most abscesses develop over 2–3 days and spontaneous rupture often occurs within 72 hours.

Management
- Treatment of acute phase includes bed rest, analgesics, e.g. administer PO ibuprofen 400mg 8 hourly for 5 days, hot wet compresses.
- PO doxycycline 100mg 12 hourly for 10 days.
- Refer to higher level for appropriate management.

52.8.2 GENITAL FISTULA

This is communication between the genital tract and the urinary or alimentary tracts and may occur singly or in combination. It is due to:
- Obstetrical injury: Obstructed labour usually leads to pressure necrosis of the bladder and vaginal wall and the rectum. Necrotic tissue sloughs off, leading to vesico-vaginal fistula (VVF) and recto-vesical fistula (RVF).
- Instrumental delivery: May cause perforation of the vagina and rectum.
- Operative injury: A fistula may be caused during total abdominal hysterectomy and caesarean section;
- Extension of disease: Malignancy of the bowel or any pelvic abscess may perforate into the rectum and posterior vaginal wall.
- Radiotherapy: Heavy radiation of the pelvis causes ischaemic necrosis of the bladder wall and bowel, causing urinary or faecal fistula.

Clinical Features
The patient complains of urinary or faecal incontinence or both. Secondary amenorrhoea is common.

Management
- Reassure the patient that the condition is usually correctable with surgery.
- Refer to higher level for appropriate management.

52.9 Sexual Assault

Sexual assault (rape) is a violent crime directed predominantly against women. Under Kenyan laws rape is defined as carnal knowledge of a woman without her consent or by use of force, duress or pretence. A girl below 18 years of age is not legally deemed to be able to give consent (Children Act). Neither are mentally retarded or psychiatric women.[4]

[4] See also *National Guidelines for Medical Management of Rape and Sexual Assault*, DRH/MOH.

Clinical Features
These will range from none or mild to very severe injuries that may be life threatening. The medical personnel must approach the rape victim with great understanding, respect and concern for her well being. The patient may appear deceptively calm, and is usually withdrawn and detached. A careful history and medical record are important because this information will be required in court. If the patient has eaten, drunk, bathed, or douched, this may affect the outcome of laboratory tests. History must be taken to evaluate the risk of acquisition of sexually transmitted disease and pregnancy.

During physical examination, it is important to document location, nature and extent of external trauma to face, neck, breast, trunk, limbs, the genitalia, and vagina; in addition, cervical trauma must be documented. Clothes and attire are retained as exhibits. Psychological trauma is evaluated and managed.

Investigations
These will depend on clinical findings, but key investigations include:
- Pregnancy test
- HIV test
- Urine test for analysis of STI, semen
- High vaginal swab (HVS)
- Refer to *National Guidelines for Medical Management of Rape and Sexual Assault*

Management
- Patients and relatives should be encouraged to report all cases to the police.
- Discourage private deals by perpetrators to evade the law.
- Treat physical injuries, noting that some tears or cuts may require surgical repair.
- Administer tetanus toxoid deep IM 0.5ml for soiled lacerations.
- If female, do pregnancy test; if negative, give emergency contraception within 72 hours of intercourse: Levonorgestrel 750mcg STAT, then repeat the same dose 12 hours later, ***OR*** ethynyl estradiol 30mcg + levonorgestel 150mcg , 2 tablets STAT, repeat after 12 hours.
- Give HIV post-exposure prophylaxis for HIV infection PO Zidovudine 300mg 12 hourly + PO lamivudine 150mg 12 hourly within 72 hours, and determine the HIV status of the victim. If positive, stop and refer the victim to a comprehensive care centre (CCC); if negative, continue ARV treatment for 28 days.
- Give PEP for STIs PO doxycycline 100mg 12 hourly for 7 days and ciprofloxacin 500mg STAT.
- Give tranquillizers, e.g., PO diazepam 5mg 8 hourly ***OR*** sedatives PO phenobarbitone 30mg 8 hourly
- Refer to higher level for appropriate management.

Psychological and psychiatric review is necessary and long-term psychological and psychiatric care may be required. Major or reconstructive surgery may be required for medical/legal reasons.

53. Obstetrics

53.1 Antenatal Care and Complications

Uncomplicated antenatal care could be carried out at all levels of health care, while complicated antenatal care should be carried out only at 4 to 6 levels of health care.

53.1.1 ANTENATAL CARE

The goal of antenatal care is to ensure a healthy mother and a healthy baby. Antenatal care is organized to achieve this goal through several main objectives:

- Prevention and treatment of pregnancy complications.
- Provision of nutritional, social, emotional or physical support.
- Detection and treatment of disorders or diseases.
- Provision of patient education.
- Planning for labour and delivery.

Conduct of Antenatal Care

Antenatal care should start as early as possible in the pregnancy. Per WHO guidelines (refer to Figure 53.1), the initial visit should include:

- General history: Past medical and surgical history is recorded as is any family history of diabetes, hypertension, TB, hereditary diseases, and multiple pregnancy.
- History of the current pregnancy: Last menstrual period (LMP), estimated date of delivery (EDD), maturity at present, any problems encountered so far, e.g., bleeding. LMP is the first day of the LMP and gestation is calculated in weeks from LMP Thus the EDD) is calculated by adding 7 to the days of the LMP and 9 to the month of the LMP; for example, for an LMP of 1/1/93, the EDD is 8/10/93.

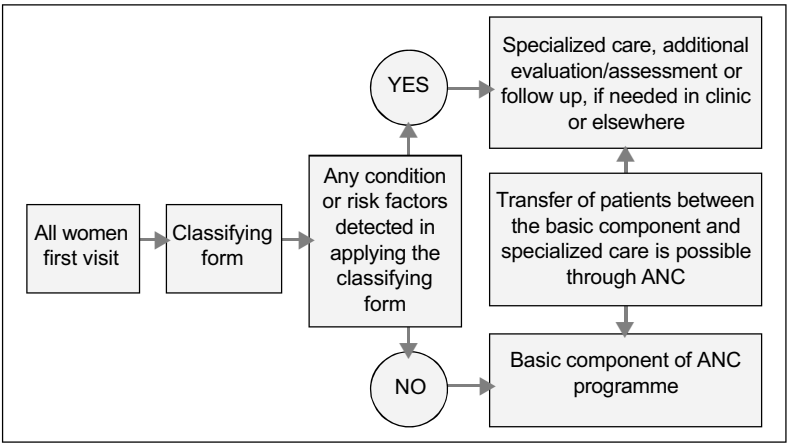
A physical exam is then done, to include:

- BP, weight, urinalysis.
- General physical exam.
- Abdominal exam: Fundal height, lie, presentation, foetal heart sounds, presence of multiple gestation, sizes of liver and spleen and presence of other masses.
- Vaginal exam: This is indicated as follows:
  - At early pregnancy to confirm and date pregnancy.
  - In late pregnancy at 36 weeks to assess pelvic adequacy.
  - In labour to confirm diagnosis and monitor progress.
  - Other times to evaluate symptoms and complaints from patient.
- Other tests as appropriate for individual patient.

The New WHO Antenatal Care Model

Criteria for classifying women in the basic component of the new antenatal care model (refer to Figure 53.2). The 4 visits are 1st by 16 weeks, 2nd by 24–28 weeks, 3rd at 32 weeks, and 4th at 36 weeks.

Figure 53.1: The new WHO antenatal care model



At each return visit antenatal care should include:

- Interval history of symptomatology and/or problems. Date of first foetal movements.
- Weight: Amount and pattern of weight change.
- Blood pressure, check for oedema.
- Urinalysis for glucose, proteins, ketones.
- Obstetric examination, vaginal examination/speculum as indicated.
- Repeat laboratory tests, if necessary, e.g.:
  - PCV at 28–36 weeks.
  - Serology for syphilis and HIV at 36 weeks.
  - Special laboratory tests as indicated for individual patients to assess maternal/foetal wellbeing:
- Examination of amniotic fluid.
- Foetal heart movements monitoring and evaluation.
- Decision on place and expected mode of delivery should be discussed and agreed with the patient not later than 36 weeks of gestation.
- Counselling should be provided for FP in general and for postpartum voluntary surgical contraception (VSC). Duly signed informed consent forms should be available at admission
- Patients should be advised to report to the health facility promptly if they have PV bleeding, draining of liquor, blurred vision, or labour pains.

Those who check NO for all questions follow the 4 visits model, while those with problems may require extra visits.

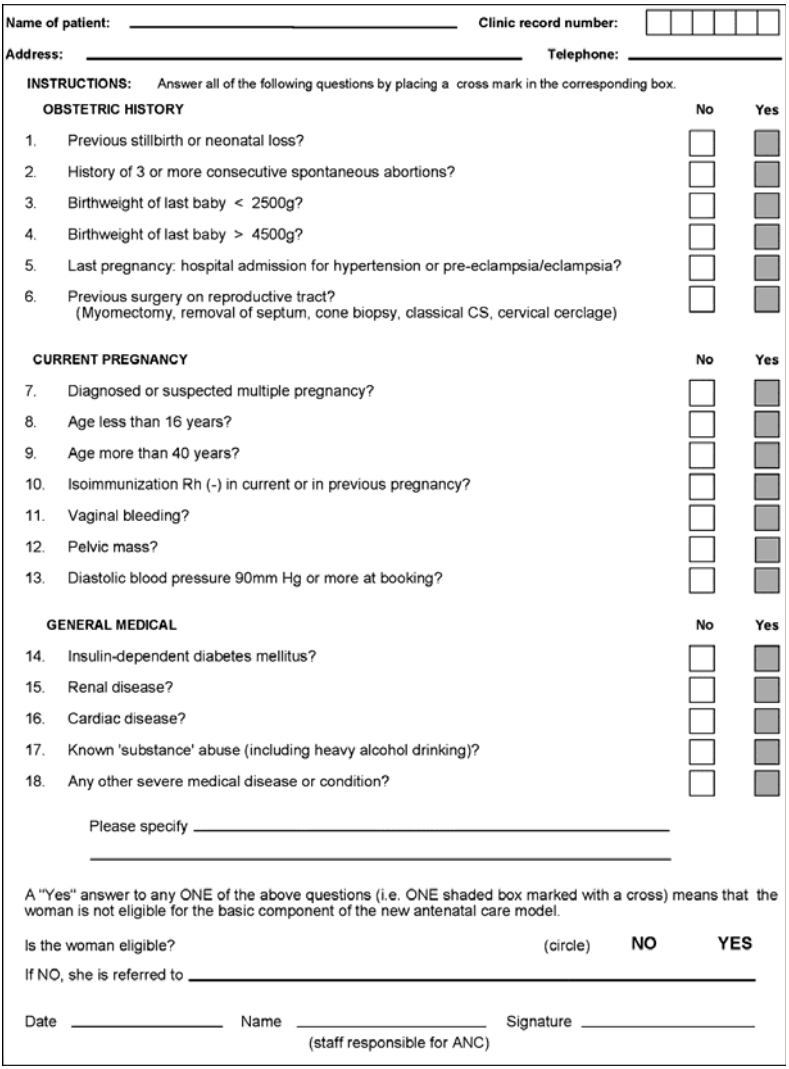
Management

Principles of management include:

- Prenatal investigations and counselling in appropriate cases.
- Early start of antenatal care.

- Close medical supervision during pregnancy.
- Special tests and examinations to evaluate foetal development and well being as well as maternal wellbeing.
- Timely intervention for therapy and delivery.

Figure 53.2: Criteria for classifying women in the basic component of the new antenatal care model



Name of patient: _____ Clinic record number: ☐☐☐☐☐☐

Address: _____ Telephone: _____

INSTRUCTIONS: Answer all of the following questions by placing a cross mark in the corresponding box.

	OBSTETRIC HISTORY	**No**	**Yes**
1.	Previous stillbirth or neonatal loss?	☐	■
2.	History of 3 or more consecutive spontaneous abortions?	☐	■
3.	Birthweight of last baby < 2500g?	☐	■
4.	Birthweight of last baby > 4500g?	☐	■
5.	Last pregnancy: hospital admission for hypertension or pre-eclampsia/eclampsia?	☐	■
6.	Previous surgery on reproductive tract? (Myomectomy, removal of septum, cone biopsy, classical CS, cervical cerclage)	☐	■

	CURRENT PREGNANCY	**No**	**Yes**
7.	Diagnosed or suspected multiple pregnancy?	☐	■
8.	Age less than 16 years?	☐	■
9.	Age more than 40 years?	☐	■
10.	Isoimmunization Rh (-) in current or in previous pregnancy?	☐	■
11.	Vaginal bleeding?	☐	■
12.	Pelvic mass?	☐	■
13.	Diastolic blood pressure 90mm Hg or more at booking?	☐	■

	GENERAL MEDICAL	**No**	**Yes**
14.	Insulin-dependent diabetes mellitus?	☐	■
15.	Renal disease?	☐	■
16.	Cardiac disease?	☐	■
17.	Known 'substance' abuse (including heavy alcohol drinking)?	☐	■
18.	Any other severe medical disease or condition?	☐	■

Please specify _____

_____

A "Yes" answer to any ONE of the above questions (i.e. ONE shaded box marked with a cross) means that the woman is not eligible for the basic component of the new antenatal care model.

Is the woman eligible? (circle) **NO** **YES**

If NO, she is referred to _____

Date _____ Name _____ Signature _____

(staff responsible for ANC)

Consult Table 53.1 for a selection of common complaints in pregnancy, how to manage them, and what to tell women so as to avoid them.

- **Refer complicated cases to high risk clinic of the hospital (levels 4–6) for management.**

53.1.2 ANAEMIA IN PREGNANCY

Anaemia in pregnancy is a major obstetric problem in Kenya. Locally, anaemia is generally accepted as Hb <10g%. Mild anaemia Hb 8–10g, moderate Hb 6–7g, severe Hb 4–5g, and very severe below Hb 4g.

In severe anaemia the pregnancy is in danger of abortion, premature labour or IUFD, while in very severe anaemia the mother's life is also in danger. Most cases are due to iron deficiency as a result of dietary deficiency or blood loss from hookworm infestations. Anaemia is also due to haemolysis caused by malaria, sickle cell disease, and folate deficiency due to inadequate intake especially in urban areas. Iron deficiency and folic acid deficiency often occur together, causing "Dimorphic Anaemia".

Table 53.1: Common complaints in pregnancy

Complaint	What to do	What to avoid
Abdominal pain, backache	Exclude UTI and local lesion; if none reassure. Physiotherapy	Avoid unnecessary medication
Morning sickness (nausea & vomiting)	Reassure up to 3 months. If severe with dehydration admit for hydration. Exclude UTI, malaria, and typhoid	Avoid anti-emetics
Indigestion (flatulence, heartburn & constipation)	High roughage diet. If severe give mild laxative and antacid, e.g., Bisacodyl 5mg in the morning 2 at bedtime x 5 days. Magnesium trisilicate 10ml TDS x 5 days	Avoid strong laxatives or enema
Ptyalism (Excessive salivation)	Reassurance	Avoid anti-cholinergic drugs
Food fads; pica (Craving for unusual foods and substances)	Advise on balanced diet. Eat according to desire. Give haematinic supplements as for prophylaxis	Discourage harmful and contaminated materials, e.g., soil
Generalized pruritus	Reassurance: Mild anti-pruritic (chlopheniramine 4mg TDS) 5 days; Exclude skin and systemic diseases	Avoid steroids
Pruritus vulvae	See under vaginal discharge	Avoid douching
Muscle cramps	Calcium lactate 300mg daily Physiotherapy	Avoid NSAIDs
Fatigue	Reassurance; bed rest 3–7 days Advise on balanced diet	Avoid drugs
Breast tenderness	Reassure; advise on breast support	Avoid NSAIDs and breast massaging
Bleeding gums	Oral hygiene, massage gums, vitamins ABC Refer to dentist if necessary	Do not excise hypertrophied gums (epulis)

Clinical Features
There is general weakness, dizziness, pallor, oedema. In addition, in haemolytic anaemia there may be jaundice and hepatosplenomegaly.

Investigations
- PCV, stool for ova of hookworm and schistosomiasis where applicable
- Blood slide for malaria parasites

Refer to higher level for appropriate management.

Prevention
- Balanced diet: Prophylaxis iron (PO ferrous sulphate 200mg 8 hourly + folate 5mg OD) until the Hb is above 10, throughout pregnancy.
- Prophylaxis antimalarial using PO sulfadoxine 500mg / pyrimethamine 25mg STAT, then repeat every 4 weeks.
- De-worm with PO albendazole 400mg STAT.
- Early detection is important. Routine antenatal Hb screening at first visit and near term.

Management
As detailed in Table 53.2, principles of management include:
- Raise Hb (oral ferrous sulphate 200mg TDS + folic acid 5mg OD – refer if needed).
- Remove cause – dietary deficiency, treat malaria, treat hookworms, give haematinics if dietary deficiency exists.
- Prevent recurrence.

Table 53.2: Management of anaemia in pregnancy

Severity	Hb (g%)	Management
Mild	8–10	Treat cause oral haematinics with ferrous sulphate 200mg TDS and folic acid 5mg OD, as for prophylaxis
Moderate	6–7	Refer
Severe	4–5	Refer
Very severe	Below 4	Resuscitation and treatment as for severe cases

Complications of Anaemia in Pregnancy
The complications of anaemia in pregnancy include the following:
- Cardiac failure: may lead to death.
- May worsen effects of minor PPH leading to death.
- May worsen effects of minor hypoxia during anaesthesia causing death.
- Reduces resistance to infection.
- Causes late abortions, premature labours.
- Perinatal mortality and morbidity is increased even in term babies.
- Babies become anaemic (iron deficiency) after 2–3 months of life. Administer prophylactic haematinics. Refer to a paediatrician.

☛ **Whereas mild anaemia can be taken care at all levels of health care, moderate to severe anaemia needs to be taken care of at 4 to 6 levels of health care.**

53.1.3 ANTEPARTUM HAEMORRHAGE (APH)

Antepartum haemorrhage (APH) is defined as vaginal bleeding after the twentieth week of pregnancy. APH is associated with increased foetal and maternal morbidity and mortality. The foetal and maternal status will depend on amount, duration, and cause of bleeding.

The causes of APH are:

- Local causes including cervical lesions (e.g., trauma, cancer of cervix, cervical polyps), vaginal lesions (tears/lacerations) and infections.
- Placental causes: Placental abruption (abruptio placentae)
- Placenta praevia: Occurs when any part of the placenta implants in lower part/ segment of the uterus.
- Vasa praevia: A rare cause of APH in which the umbilical cord is inserted into placental membranes with blood vessels traversing and presenting over the internal cervical os.

Refer all cases of APH to higher level 4 for appropriate management

53.1.3 CARDIAC DISEASE IN PREGNANCY

In Kenya, this is often of rheumatic heart disease origin.

Clinical Features

There may be history of rheumatic fever in childhood, or known rheumatic heart disease, dyspnoea, palpitations, body oedema, cough, easy fatigability, evidence of heart enlargement, murmurs, thrills, left parasternal heave, prominent neck veins and tachycardia. There may also be hepatomegaly, ascites and basal crepitations.

Investigations

Routine antenatal profile (Hb, VDRL, blood group, urinalysis)

Management

This depends on the functional classification of the New York Heart Association: Class I – Asymptomatic; Class II – Symptomatic with heavy work; Class III – Symptomatic with light work or exercise; and Class IV – Symptomatic at rest.

Refer all patients with suspected heart disease during pregnancy to higher level for appropriate management.

Patient Education

Advise on family planning. Cardiac patients should have small families of 1 or 2 children or none. Suitable methods include mini laparotomy, tubal ligation under local anaesthesia, vasectomy, barrier methods, progesterone only agents, e.g., microlut pill, depo, noristerat injection and norplant. Oestrogen containing methods are contraindicated in such patients.

Refer to higher level for advice on suitable method.

53.1.4 DIABETES IN PREGNANCY

Diabetes mellitus is a metabolic disorder characterized by elevated glucose levels in blood. Covered in the section in Internal Medicine.

Clinical Features

This include history of diabetes in family, history of having big babies weighing over 4kg at birth, history of stillbirths and neonatal deaths. Overt diabetes may manifest with polydipsia, polyuria, weight loss, blurred vision, lethargy. Routine ANC urinalysis shows glucosuria.

Refer for fasting blood sugar or oral glucose tolerance test (OGTT).

Complications of diabetes include hypertension, nephropathy, pregnancy-induced hypertension, foetal macrosomia, intrauterine growth retardation, polyhydramnios, foetal distress, and hypoglycaemia in the baby after birth..

Management

Refer suspected cases to higher level for appropriate management

Patient Education

This should involve the following:

- Pre-pregnancy counselling to facilitate achieving optimum glucose control before pregnancy to minimize foetal complications in diabetic pregnancy
- Family planning: Advise on a small family.
- Recommended FP methods include VSC, barrier methods, norplant/jadelle, IUCD, and progesterone-only pill.
- Oestrogen containing methods are contraindicated.

53.1.5 DRUGS IN PREGNANCY

Drugs taken by the mother during pregnancy can be harmful to the developing foetus in a variety of ways. Drugs taken just before delivery can also affect the baby. Table 53.3 provides guidelines on drugs that are considered safe or relatively safe in pregnancy. These drugs should be used with caution and only when necessary, and drugs that are contraindicated should be avoided.

53.1.6 MALARIA IN PREGNANCY

Malaria in pregnancy may present as acute febrile illness with various clinical manifestations including severe haemolytic anaemia, hypoglycaemia, coma/ convulsions, and pulmonary oedema. Complications of malaria in pregnancy include abortion, intrauterine death, premature labour, and intrauterine growth retardation. Among semi-immune women (those from endemic area), malaria may be asymptomatic, despite placental infection. Malaria causes severe anaemia and low birth weight and is more common in primigravidae than multigravidae.

Investigations

- PCV
- Blood slide for peripheral blood film for identification of parasites. This may be negative in women from endemic areas, however, despite placental parasitization.

Management

This is consists of supportive and pharmacologic portions of management.
Supportive management includes:

- Correction of dehydration.
- Evacuation if incomplete/inevitable abortion.
- Delivery if foetal death or established labour.

Table 53.3: Drug use in pregnancy

Types of medication	Degree of safety for use in pregnancy		
	Safe or relatively safe	**Some risk – Use with caution**	**Contraindicated in pregnancy**
Analgesics	Codeine, morphine, pacacetamol, pethidine	Indomethacin, salicylates	
Anti-convulsants	Ethosuximide, phenobarbitone, primidone	Clonazepam, phenytoin	
Anti-microbials	Ampicillin, amoxycillin, cephalosporins, clidamycin, dicloxacilin, erythromycin, gentamicin, isonizid, miconazole, oxacillin, penicillin	Chloramphenicol, metronidazole, nitrofuratoin, streptomycin, sulfonamides, trimethoprim, rifampicin, kanamycin	Tetracycline
Anticoagulants	Dipyridamole, heparin	Dicumarol, warfarin	
Antiemetics	Hydroxyzine, meclizine, prochlorperazine	Phenothiazines	
Antihypertensive	Hydralazine, methyldopa, propranolol	Diazoxide	Nitroprusside
Bronchodilators	Aminophylline, beclomethasone	Cromolyn sodium	
Cardiac drugs	Atropine, digoxin, lidocaine, procainamide, quinidine	Dispyramide, nifedipine	
Decongestants	Pseudoephedrine		
Diuretics	Frusemide, Hydrochlorothiazide		Acetazolamide
Gastrointestinal drugs	Antacids, cimetidine, ranitidine		
Hypoglycemics	Insulin		Chlorpropamide, tolbutamide
Sedative & psychiatrics	Barbiturates, flurazepam	Diazepam, chlordiazepoxide, haloperidol, lithium, phenothiazines, tricyclic antidepressants	
Thyroid preparations	L-thyroxine, propylthiouracil		Iodide
Vaccines	Polio, tetanus, rabies		Rubella, measles, smallpox
Other drugs	Ferrous sulphate, probenecid		Antineoplastic drugs, oestrogens, DES

Pharmacologic management includes:
- For clinical disease it is essential to use the most effective antimalaria drug available.
- Immediate treatment is essential.
- For uncomplicated disease the following is recommended:
  - Quinine hydrochloride orally 600mg TDS for 7 days
  - Artemether-lumefantrine 4 tabs STAT, then after 8 hours then BD for 2 more days. This treatment can be used in the second and third trimesters and even in the first trimester if quinine is not available

For severe or complicated disease the following is recommended:

☛ **This is a medical emergency that puts both the life of the mother and foetus at high risk. Aggressive management is essential.**

- Start quinine IM quinine 15–20mg/kg of body weight max 900–1,200mg
- Give oral glucose and refer.
- Start analgesia/antipyretic: IM diclofenac 75mg STAT
- Other drugs that can be used for treatment in pregnancy are artemisinin derivatives in absence of quinine
- Refer severely ill patients to higher level for appropriate management.

Prevention

In endemic areas all women should receive 4 doses of Sulphadoxine-pyrimethamine with one dose being given in the second trimester (between 16 and 27 weeks) and the second dose being given in the third trimester (between 28 and 36 weeks).

Preventive doses should be given at least 4 weeks apart. Non-immune pregnant women should be advised not to visit a malarious area. If travel is not avoidable they should take special precautions in order to prevent being bitten such as using mosquito repellents and an insecticide treated bed net. In addition, they should take chemoprophylaxis of either daily proguanil (e.g., paludrine) 200mg or if in the second or third trimesters, mefloquine 250mg weekly.

☛ **Drugs that are contraindicated in pregnancy are doxycycline and primaquine. Health care providers should refer to the latest edition of National Guidelines for Treatment and Control of Malaria as protocols may change from time to time.**

53.1.7 MULTIPLE PREGNANCY

In multiple pregnancy there is more than one foetus in utero. In most situations it is a twin pregnancy, but those involving more foetuses like triplets may be encountered. Multiple pregnancies may be associated with use of fertility drugs and are generally associated with higher risk for adverse outcomes (antenatal, intrapartum, and postpartum) than for a singleton.

Clinical Features

The uterus is larger than gestation dates would indicate. There are multiple foetal parts or more than 2 foetal poles. There may be a family history of twins and on

examination foetal heart rates can be identified at two different areas with a difference of 15 beats per minute. There is increased risk for having PET, polyhydramnios, anaemia, APH, PPH, malpresentation, congenital foetal anomalies and premature labour.

Investigations
Refer for ultrasonography.

Management
For antenatal care, refer such patients to higher level for appropriate management.

53.1.8 PRE-ECLAMPSIA AND ECLAMPSIA

Pre-eclampsia (PET) and eclampsia are a continuum of the same syndrome. PET is defined as the onset of hypertension with either proteinuria, oedema or both at a gestation of 20 weeks or more. Hypertension is here defined as a blood pressure of 140/90 mmHg or higher on more than 2 occasions of about 6 hours apart. Eclampsia is the presence of convulsive seizures in a patient with PET. Eclampsia carries a high foetal mortality and high maternal morbidity and in cases of poor management a high maternal mortality as well. The aetiology of pre-eclampsia and eclampsia is unknown, remaining as “a disease of theories”

The risk factors associated with pre-eclampsia and eclampsia are listed below:

- Parity, mostly affecting primigravidae
- Positive family history of PET
- Associated with the following medical diseases:
  - Diabetes mellitus
  - Chronic hypertension
  - Renal disease; chronic pyelonephritis, acute glomerulonephritis, polycystic kidneys
- Age extremes
- Obstetric conditions
  - Multiple pregnancy
  - Hydatidiform mole
  - Hydrops fetalis

Clinical Features
For management purposes the clinical features may be graded by the criteria shown in Table 53.4.

Table 53.4: PET grading

Category	Diastolic BP	Proteinuria (dipstix)	Oedema (Variable)
Mild	Up to 100mmHg	-	+
Severe	> 100mmHg	++	++

Management

- **All cases of hypertensive disease in pregnancy should be referred to higher level for appropriate management.**

- **For eclampsia, admit in the resuscitation room.**

Management – General

- Observe the ABC's – airway, breathing, circulation
- Clear the airway:
  - Suction of excess secretions
  - Nurse on the lateral position
  - Introduce a mouth gag, plastic airway, or spatula
  - Administer oxygen through a nasal catheter
- Introduce an indwelling Foley's catheter to monitor urine output and check for proteinuria
- Assess condition of mother and foetus.

Management – Pharmacological

- Control the convulsions:
  - Magnesium sulphate 20% 4g IV over 5min and then 50% 5g in each buttock deep IM.
  - If MgSO4 not available:
    - Diazepam 20mg IV immediately.
    - Then put an IV line of 500ml 5% dextrose with 40mg diazepam to keep patient deeply sedated but arousable.
- After stabilization, refer to hospital with skilled escort and a referral letter.

53.1.9 RHESUS (Rh) INCOMPATIBILITY

Rhesus isoimmunization occurs in pregnancy where a Rhesus negative mother is pregnant with a Rhesus positive foetus. Other ways of isoimmunization include transfusion with Rhesus incompatible blood, ectopic pregnancy, hydatidiform mole, and abortion.

Clinical Features

Usually none but severe isoimmunization can lead to spontaneous abortion, intrauterine foetal death (hydrops foetalis) and neonatal death. Severely affected neonates who require exchange transfusion need to be referred to higher level for appropriate management, to avoid hyperbilirubinaemia.
Refer to higher level for appropriate management.

Prevention

- A Rh-negative woman who delivers a Rh-positive baby must have anti D 500mcg within 72 hours of delivery if she is not already isoimmunized (i.e., Rh antibody negative) (confirm if 250mcg will suffice).
- The same applies for un-isoimmunized Rh-positive mothers who have an abortion, ectopic pregnancy, or hydatidiform mole.

53.1.10 URINARY TRACT INFECTION (UTI) IN PREGNANCY

This is infection of the urethra, bladder, ureter and the kidney. It is more common in pregnancy because of the physiological changes that cause dilatation of the urinary system and relative stasis of urine. Glycosuria and amminoaciduria in pregnancy also encourage bacterial growth. UTI can lead to abortion, premature labour, low birth weight, and intrauterine growth retardation.

ASYMPTOMATIC BACTERIURIA

Clinical Features

This condition occurs when there are 100,000 or more bacteria per millilitre of urine without any symptoms. It occurs in 2–10% of all pregnant women. If left untreated pyelonephritis will develop in 25–30%.

Investigations

- Urinalysis

Management

Oral antibiotic therapy, oral amoxicillin 500mg TDS or nalidixic acid 500mg QDS or erythromycin 500mg 6 hourly. All for 10 to 14 days.

Can be managed at all levels of health care provided culture and sensitivity results are provided.

URETHRITIS AND CYSTITIS

Clinical Features

There is dysuria, frequency, urgency, hesitancy, suprapubic pain, and false labour.

Management

- Advise on adequate hydration
- Give Oral antibiotic therapy as above
- Relieve pain using hyoscine butylbromide 20mg TDS or paracetamol 1g TDS for five days.

PYELONEPHRITIS

Clinical Features

There is fever, vomiting, renal angle tenderness, particularly on the right, and rarely premature labour.

Management

Refer to higher level for appropriate management.

53.2 Intrapartum Care and Complications

53.2.1 NORMAL LABOUR

Normal labour and delivery can be managed at all levels of health care, but they require a skilled provider linked to emergency obstetric care (EmOC) facilities through an effective referral system.

Normal labour is characterized by the onset of regular uterine contractions at term accompanied by progressive cervical dilatation and expulsion of the foetus.

Labour is divided into 3 stages:
- ***First stage:*** From onset to full dilatation of the cervix.
- ***Second stage:*** From full dilatation to expulsion of the foetus.
- ***Third stage:*** From delivery of the baby to delivery of the placenta.

Management
Proper management of labour reduces maternal and perinatal mortality and morbidity. It includes:
- Provision of rapid counselling and testing for HIV for those who missed during prenatal period.
- Making correct diagnosis of labour, with cervical effacement and dilatation 3–4cm and regular uterine contractions.
- Regular assessment consisting of maternal BPTPR 1 hourly, foetal heart rate half hourly, and VE 4 hourly.
- Use of partogram, which is a simple but essential tool in labour management that provides a graphic display of the labour record to show the progress of labour in terms of cervical dilatation, descent of the head, foetal condition, and maternal condition. An “alert line” and an “action line” should be noted. Parameters are charted against time. The partogram is especially useful where there is a shortage of staff, and where the majority of labours and deliveries are managed by midwives, clinical officers, or medical officers, or patients have to be transferred to other facilities for operative deliveries (e.g., caesarean section)
- The expected rate of cervical dilatation is at least 1cm/hour.
- Avoid artificial rupture of membranes unless there is a clear indication.
- Vaginal examination is done at least 4 hourly to assess cervical dilatation, moulding, caput, position. Descent assessed by abdominal palpation, noting the number of fifths of the head felt above the pelvic brim.
- Foetal condition is monitored by the foetal heart sounds and the colour of liquor.
- Maternal condition is monitored by BP, temperature, pulse, and urinalysis. Most normal labours are completed by 12 hours. The few (approximately 20 %) that go beyond 12 hours should be critically evaluated to rule out cephalopelvic disproportion (CPD), inadequate uterine contraction, malpresentation, or malposition.
- Proper management of the first stage ensures the woman reaches second stage strong enough for safe delivery. Patients in labour require:
  - Psychological support.
  - Appropriate analgesia if desired by patient, e.g., pethidine 100mg IM STAT at 4–6cm cervical dilation.
  - Hydration and nourishment.
- Refer all complicated cases to higher level for appropriate management..

53.2.2 NORMAL DELIVERY

Clinical Features

Second stage (full dilatation) is achieved when contractions become strong and frequent, patient grunts and bears down and develops the urge to push, the head descends further, the perineum bulges and the overlying skin becomes tense and glistening, and the anus may “gape”.

Management

- Full dilatation should be confirmed by digital vaginal examination (VE).
- Mother should be encouraged to bear down with contractions and relax in between.
- At crowning, perineum should be supported with the fingers to prevent perineal tear.
- If necessary episiotomy should be done under lignocaine hydrochloride 1% 5 to l0ml STAT.
- When the head is born, it is allowed to rest, the cord round the neck is checked and loosened if present.
- Anterior shoulder is delivered followed by the posterior.
- Oxytocin 10IU IM is given after delivery of shoulders; ***OR*** if oxytocin is not available ergometrine 0.5mg unless contraindicated (hypertension, cardiac disease, delivery of first twin).
- Cord is clamped and cut leaving adequate length for administration of drugs if needed.
- Application of tetracycline 1% eye ointment is recommended as prophylaxis against ophthalmia neonatorum.
- APGAR (A= appearance, P = pulse, G= grimace, A= activity, R = respiration) scoring is done.
- Identification tag is applied, and the is baby wrapped in warm towels and given to the mother to initiate breastfeeding.
- Baby is given a full physical examination when stable.
- Following delivery of the baby, the mother employs the two other AMSTEL manoeuvres, which include gentle massaging of the uterus, then delivery of the placenta.
  - Deliver the placenta by controlled cord traction.
  - Gently massage the uterus.
  - Examine the placenta and membranes for completeness, infarcts, retroplacental clot, and any other abnormalities.
  - Weigh the placenta.
- The perineum, vagina, and cervix are then examined for tears. The episiotomy and any tears discovered are repaired immediately. Patients are then observed closely for l–2 hours before being transferred to the postnatal ward. This period of observation after delivery of the placenta is called Fourth Stage of Labour and involves monitoring of blood pressure (BP), temperature (T) and pulse rate hourly, together with uterine palpation, vulva inspection, and estimation of degree of blood loss.

53.2.3 COMPLICATED LABOUR AND DELIVERY

Patients in labour should be referred before labour becomes obstructed. Complications of labour may affect the mother, the baby, or both. Most complications are associated with obstructed labour. Cephalopelvic disproportion (CPD) is the major cause of obstructed labour and ruptured uterus.

Maternal complications of labour include:

- Genital tract infection
- Fistula formation
- Laceration of the genital tract
- Peripheral nerve palsies
- Foot drop

Foetal/infant complications of labour include:

- Foetal distress
- Meconium aspiration
- Hypoxia/Asphyxia
- Injuries
- Foetal death

53.2.4 CEPHALOPELVIC DISPROPORTION (CPD)

This occurs when the baby is too big for pelvis or the pelvis is too small for the baby. CPD may be due to faults in the pelvis or faults in the foetus, or a combination of both.

The faults in pelvis may be:

- Contracted pelvis
- Deformed pelvis

The faults in the foetus may be:

- Too large baby
- Hydrocephalus
- Foetal monsters
- Locked twins (rare)

CPD is the most important cause of obstructed labour. Other causes of obstructed labour are malpresentations or malpositions of the foetus, and soft tissue abnormalities of the genital tract. Obstructed labour is the commonest cause of ruptured uterus and a major cause of maternal mortality. Obstructed labour and ruptured uterus can be prevented by appropriately timed caesarean section.

53.2.5 OBSTRUCTED LABOUR

The requirements for a diagnosis of obstructed labour are:

- The cervix fails to dilate despite good uterine contractions.
- There is oedema of the cervix and vulva.

- The head fails to descend.
- The degree of moulding increases.
- Bandl's ring occurs.
- There is urinary retention, blood stained urine on catheterization.
- There is foetal distress.
- There is maternal distress, manifested by:
  - Dehydration
  - Fever
  - Tachycardia

Management
Give supportive management.

☛ **Refer urgently to higher level for appropriate management.**

53.2.6 RUPTURED UTERUS

Ruptured uterus is an obstetric catastrophe and should be prevented. Major causes are:
- Obstructed labour
- Previous operations on uterus (C/S, myomectomy)
- Ecbolic herbs and improper use of oxytocin
- Grand multiparity
- Perforations during evacuation of uterus or D&C are a type of ruptured uterus

Clinical Features
Clinical features may be insidious ("quiet") or obvious ("classical"). In classical cases the patient who was in labour complains of severe abdominal pains, has PV bleeding, and goes into shock. Examination shows hypovolaemic shock with signs of intraperitoneal haemorrhage.

Impending rupture of the uterus can be diagnosed by:
- Observing rise in maternal pulse (more than 100 beats per minute)
- Localized abdominal pains
- Foetal distress (irregular foetal heart, meconium stain)
- PV bleeding

Management
Once recognized, refer urgently to higher level for appropriate management.

53.2.7 INDUCTION OF LABOUR

Patients who require induction of labour should be referred to higher level for appropriate management. Such patients include those with:
- Intrauterine foetal death from any cause
- Prolonged gestation (postdates, from the 42nd week and above)
- Diabetes mellitus
- Pre-eclampsia and eclampsia
- Rhesus isoimmunization

53.2.8 OPERATIVE VAGINAL DELIVERY

Level 3 with specially trained, competent and experienced provider may perform vacuum delivery (ventouse). Indications and case selection must be appropriate to avoid maternal and/or foetal injuries. These include:

- Poor maternal effort.
- Delayed second stage (within 30 minutes from full dilatation) in the absence of CPD.
- Cord prolapse in second stage.

Requirements for vacuum delivery are:

- Cephalic presentation
- Full cervical dilation
- Low head (good descent)
- Empty bladder
- Episiotomy

Contraindications for vacuum delivery are:

- CPD
- Previous caesarean or myomectomy scar
- Malpresentation (breech, transverse lie, oblique, etc.)
- Malpositions (brow and face malpositions)

53.3 Postpartum Care and Complications

53.3.1 POSTNATAL CARE

Postnatal care can be given at all levels by a skilled provider appropriately supported. Postnatal care is the care of the woman in the immediate postpartum period and within 6 weeks of delivery. This is the time the woman is returning to her normal pre-pregnant status. Targeted postnatal care has a minimum of 3 check ups. The emphasis is on starting early in the postpartum period, with the first review being 24 to 48 hours after delivery, the second review within two weeks after delivery, and the third between 4 and 6 weeks after delivery. The aim of postnatal care is to protect and promote maternal and infant health, support breastfeeding, and provide family planning counselling and services.

Immediate Postpartum Care

This includes the following:

- Repairing the episiotomy as soon as possible.
- Closely observing and monitoring maternal BP, pulse, and temperature for 1–2 hours.
- Ensuring that the uterus is well contracted, lochia loss is normal and urine has been passed.
- Encouraging the mother to establish bonding and initiate breastfeeding.
- Giving paracetamol 2 tabs TDS for after pains and episiotomy pain and providing rapid counselling and testing for HIV for those whose status is unknown and also giving the prophylactic ARVs to the baby (within 72 hours) if mother is positive.

- Transferring the mother to postnatal ward.
- Continuing the above observations at least twice daily.
- Encouraging rooming-in (or "bedding-in") of mother and baby.
- Continuing to give paracetamol 2 tabs TDS.
- Advising on nutritious diet and generous fluid intake for successful lactation.
- Giving the baby first immunizations (BCG and first polio).
- Documenting and notifying the birth to the civil registrar.
- If no problem, discharging after 24–48 hrs to avoid ward congestion. Women who deliver at home should come for check up with their babies within 24–48 hours.

Second Follow up Visit and Review between 1 and 2 Weeks

- See at 1–2 weeks to check and treat for secondary PPH, sub-involution of uterus, puerperal infection, and whether baby is well and breastfeeding

Third Follow up Visit and Review between 4 and 6 Weeks

- For those not breastfeeding, the visit and review should be at one month for family planning
- Otherwise third visit is at 4–6 weeks to check for any problems in mother or baby, see whether periods and/or intercourse have resumed, and provide counselling on family planning, baby care, breastfeeding, and immunizations.
- At 6 weeks, family planning service should be provided if required. Suitable methods for lactating mothers include:
  - Progesterone-only pill given daily for 6 months with no break in between. Then change to combined pill.
  - Intrauterine device ("coil") – provide if trained or refer.
  - Depo medroxyprogestrone acetate 300mg ***OR*** norethisterone 200mg every 2 months ("injection")
  - Etonogestrel 68mg put subdermally 21–28 days after delivery and replaced after 3 years.

Refer to higher level for voluntary surgical contraception (VSC) or "tubal ligation".

53.3.2 COMPLICATIONS OF PUERPERIUM

The puerperium is defined as the time period of 6 weeks following delivery. Some of the maternal complications include postpartum haemorrhage, puerperal sepsis, deep vein thrombosis, psychosis, breast engorgement, mastitis, and breast abscess.

POSTPARTUM HAEMORRHAGE (PPH)

Levels 2–3 managing labour and delivery should recognize postpartum haemorrhage and initiate treatment, then refer appropriately with blood donors. The skilled provider should be supported by an effective referral system. PPH is defined as bleeding from the genital tract after delivery. Further definition categorizes it into primary and secondary PPH.

Primary Postpartum Haemorrhage
There is bleeding of more than 500ml within the first 24 hours postpartum. Clinical experience and empirical estimates of blood loss are important for diagnosis of PPH.

Secondary Postpartum Haemorrhage
There is abnormal bleeding occurring after 24 hours and up to 6 weeks postpartum. PPH is a condition that can sometimes be preventable by proper management of all stages of labour. An understanding of the factors that predispose to PPH will lead to the practice of precautionary measures that minimize its occurrence.

Patients at high risk of developing postpartum haemorrhage include the following:
- Those with prolonged or obstructed labour.
- Those with grand multiparity.
- Those with past history of PPH.
- Those with past history of retained placenta.
- Those with multiple pregnancy.
- Those with polyhydramnios.
- Those with antepartum haemorrhage, either placental abruptio or placenta praevia.

The commonest causes of PPH are:
- Uterine atony.
- Failure of adequate contraction and retraction of uterus after delivery associated with:
  - Prolonged labour
  - Precipitate labour
  - Over-distension of the uterus by, e.g., multiple pregnancy and/or polyhydramnios
  - Grand multiparity
  - Fibroids
- Halothane use in general anaesthesia.
- Concealed haemorrhage in placenta abruptios leading to intramyometrial haemorrhage and manifested as Couvelaire uterus.
- Uterine sub-involution.
- Retained placental fragments or membranes: This is a common complication in which there is delay in completion of the third stage of labour due to adherent placenta. Adherent placenta manifests usually as actual placental invasion of the myometrial wall in the following forms:
  - Placenta accreta, which is superficial myometrial invasion
  - Placenta increta, which is deep myometrial invasion
  - Placenta percreta, which is uterine perforation by placenta.
- Lacerations or tears of the birth canal: THIS can be cervical, vaginal, or vulvoperineal.

- Other causes include disseminated intravascular coagulation (DIC), which is usually secondary to other causes like intrauterine foetal death, amniotic fluid embolism, abruptio placentae, and pre-eclampsia/eclampsia.
- Rupture of the uterus where there is previous scar, oxytocin hyper-stimulation, obstructed labour in multigravidae, and use of ecbolic herbs.
- Uterine inversion and when there is excessive cord traction, adherent placenta, manual removal of placenta, and poor technique of placental delivery.

Investigations
- Hb or PCV, most important
- Bleeding time
- Clotting time

Management
General measures include
- Put up an IV line.
- If can't manage, refer. Specific measures depend on the cause.

UTERINE ATONY
Do a bimanual uterine massage and express any clots This may also provoke uterine contractions. Put up an oxytocin drip 20 units in 500ml dextrose or normal saline to run at 20 drops per minutes for about 2 hours. If this is not sufficient, refer.

RETAINED AND ADHERENT PLACENTA
Retained Placenta also causes uterine atony. The following is recommended:
- ***Apply general measures as above.***
- Manual removal of the placenta in lithotomy position on the delivery couch, and administer:
  - 10–20mg diazepam IV, then
  - Try manual removal of placenta using the ulnar surface of the right hand with the left hand supporting the uterus. If this is not possible then see below.

ADHERENT PLACENTA
Refer to higher level for appropriate management.

LACERATIONS/TEARS OF GENITAL TRACT
Cervical Tear
The following are important for cervical tear:
- Review in lithotomy position and in good light.
- Secure a good exposure of cervix by 2 Sims's specula.
- Carry out a careful evaluation of the extent of the tear.
- Repair cervix with No. 1 catgut and achieve haemostasis.

Refer the patient with cervical tear to higher level for appropriate management if skills and facilities for repair not available or general anaesthesia be required because of a big tear or laparotomy considered necessary.

Vaginal Tear
The following are important for vaginal tear:
- Examine in lithotomy position.
- Carry out ligation of bleeders and repair of tears and laceration with No. 1 catgut.
- Carry out evacuation of haematomata.

Vulvoperineal Tear
Proper management of episiotomy involves:
- Define upper end.
- Stitch vaginal epithelium with continuous catgut No. 1 suture.
- Stitch muscle layer with the same interrupted stitch.
- Stitch skin with interrupted catgut.
- Repair all other tears.
- Refer to higher level for appropriate management if suspected to have disseminated intravascular coagulopathy (DIC) (refer with blood donors) or because of bleeding with failure to clot.

Ruptured Uterus
Resuscitate and refer to higher level for appropriate management.

Uterine Inversion
Perform manual replacement or refer:
- Initiate oxytocin drip 20 units in 500ml 5% dextrose 20 drops per minute.
- The inserting fist to remain until uterine cavity is well contracted.

53.3.3 PUERPERAL INFECTIONS

These are any postpartum infection of the genital tract complicating labour or delivery, an important contributor being wound sepsis after caesarean section. Extragenital causes of puerperal fever must be considered and looked for. These include upper and lower urinary tract infections, deep vein thrombosis, respiratory tract infections, and mastitis with associated breast engorgement.

Clinical Features
There is fever of greater than 38°C during the first 6 weeks after delivery. Other features include lethargy, general malaise, toxicity, dehydration, lower abdominal tenderness, foul-smelling lochia, parametrial pain, and thickening and retained membranes.

Management
Carry out first aid, give first dose of broad spectrum parenteral antibiotics then urgently refer to higher level for appropriate management.

PUERPERAL SEPSIS

This is usually a polymicrobic infection presenting as a combination of endometritis, endomyometritis, and endoparametritis. Associated risk factors are: prolonged labour, prolonged rupture of membranes, low socioeconomic status,

caesarean section, and underlying chronic debilitating disease. Anaerobic organisms are encountered in most infections associated with puerperal sepsis.

Investigations
- Haemoglobin and PCV
- Urinalysis

Management – General
General measures/non-pharmacological therapy on admission are as follows:
- For rehydration: Start an IV line of 500ml 5% dextrose.
- Keep patient warm.
- Arrange for infant care in nursery or by relatives.
- Evacuate uterus for any remaining placental tissue or membranes.

Management – Pharmacological
- ***Oral therapy for mild sepsis:***
  - Amoxicillin/Clavulanic 625mg BD for 5 days + metronidazole tablets 400mg TDS for 5 days + paracetamol tablets 2 TDS for 5 days.
- ***Parenteral therapy for severe sepsis:***
  - Crystapen penicillin injection 3 mega IV or IM QDS for 5 days + gentamicin 80mg IV or IM TDS + metronidazole 500mg IV TDS for 5 days.

Management – Surgical
Refer patients with the following:
- Patient toxic
- Patient febrile >39^{o}C
- Patient dehydrated
- Patient not able to take oral drugs
- Pelvic abscess or peritonitis suspected
- Also refer cases of severe infections or those who may require surgery to higher level for appropriate management

53.3.4 SEPTIC PELVIC THROMBOPHLEBITIS

This condition occurs with development of ovarian vein thrombophlebitis in a patient with preceding pelvic soft tissue infection. It presents as a definite mass extending caudally and is a rare condition that is diagnosed mainly by exclusion. Response to therapy is poor.

Refer to higher level for appropriate therapy. Heparin 10,000 units 4 hourly until symptoms abate is part of good management.

53.3.5 EXTRA-GENITAL DIFFERENTIAL DIAGNOSES

These include urinary tract infection, deep vein thrombosis and respiratory tract infections. Respiratory complications are an infrequent cause of puerperal morbidity, with lobar pneumonia being the most serious infection and may be complicated by atelectasis. Patients who have delivered through caesarean section are the most susceptible to developing this condition.

53.3.6 BREAST CONDITIONS

These involve the following conditions:

- Breast engorgement: This is accompanied by inflammation of breast and fever. Adequate breastfeeding and paracetamol 1g TDS for 5 days are usually adequate.
- Mastitis: This is infection of the parenchyma of mammary glands. It may occur any time postpartum but usually 2–3 weeks after. Predisposing factors include: breastfeeding per se, fissures in nipple, and recent weaning.

Presentation and Diagnosis

Diagnosis of mastitis is usually made on the basis of the pain on the same side, localized cellulitis, and axillary lymph nodes that may be palpable and tender. The most common causative organism is Staphylococcus aureus.

Management

- Express milk on affected side.
- Apply ice packs.
- Support affected breast.
- Antibiotics: Amoxicillin/clavulanate 625mg 12 hourly ***OR*** flucloxacillin 500mg 6 hourly for 5 days; plus paracetamol 1g 8 hourly for 5 days.

Breast abscess may be a sequelae of mastitis. In addition to the above measures incision and drainage will be necessary as well as stoppage of breastfeeding when there is a purulent discharge. If abscess does not respond to this, refer to higher level for appropriate management.

53.3.7 DEEP VEIN THROMBOSIS (DVT)

The risk of symptomatic thromboembolic disease during pregnancy is about 6 times greater than in the non-pregnant state and the incidence is even higher in the postpartum interval. Risk factors include advanced maternal age, grand multiparity, history of DVT, operative delivery, and venous stasis (e.g., prolonged bed rest).

Management - Pharmacological

The mainstays of DVT treatment are anticoagulation therapy, stockinet, and ibuprufen 400mg TDS.

Patient Education

- Avoid contraceptives containing oestrogen. Use non hormonal or progesterone only injectable contraceptives or oral progesterone contraceptive as appropriate.
- Avoid prolonged bed rest, where appropriate. Exercise legs even during bed rest.

53.3.8 PUERPERAL PSYCHOSIS

The following are risk factors of puerperal psychosis:

- Family history of major psychological illness of close relative, e.g., mother.
- Major emotional complications during and after a previous pregnancy.

- "Reaction" of current pregnancy.
- "Fear" of labour from a previous experience.
- Traumatic childhood.
- Deprivation of emotional support during adult life, e.g., single mother.
- Severe prolonged or multiple somatic symptoms with no apparent organic cause during current/or succeeding pregnancy.
- Major sustained mood changes or repeated rapid mood swings or abnormal sleep patterns.
- Refer to Mental Illness chapter for clinical features and management.

54. Family Planning (FP)

Family planning means that "everyone should plan their family so that all children are born when wanted, expected, and welcome". The health benefits of family planning play a major role in protecting the lives of infants, children, women and the family as a whole. See also Family Planning Guidelines for Service Providers MOH/DRH 2005.

Many categories of people can be involved in the provision of FP advice, information, and services, provided they have received the necessary training and instruction. Similarly, FP can be provided in varied settings (including levels 2–3) and within facilities operated by various providers (public, mission, private) provided they conform to the basic requirement for the provision of the particular FP method.

Family planning methods are grouped roughly as hormonal and non-hormonal. Table 54.1 indicates whether a method is or is not recommended for a particular group of women, and Table 54.2 shows the effectiveness of various methods. Subsequent sections discuss the range of family planning choices.

Table 54.1: Family planning methods and their suitability for various types of users

Method recommended for the group	Not recommended for the group
Combined pill	
Women under 40 years, of any parity Women who want highly effective contraception Breastfeeding mothers after 6 months postpartum Younger women/adolescents who are sexually active and have been adequately counselled	With suspected pregnancy Who are over 35 years and smoke With history of blood clotting disorders or heart disease With lump in either breast, liver disease With unexplained abnormal vaginal bleeding With BP over 140/90mm/Hg confirmed on revisit
Progestin-only pill	
Women of reproductive age, of any parity Breastfeeding mothers after 4–6 weeks postpartum	With suspected pregnancy With history of blood clotting disorders or heart disease With lump in either breast, liver disease With unexplained abnormal vaginal bleeding

Continued

Table 54.1, *Continued*

Method recommended for the group	Not recommended for the group
Injectable methods	
Women of proven fertility Breastfeeding mothers after 6 weeks postpartum Women who want long-term contraception Women who want at least 2 years between pregnancies	With suspected pregnancy With history of blood clotting disorders or heart disease With lump in either breast, liver disease With unexplained abnormal vaginal bleeding
Implants	
Women needing long-term protection Breastfeeding mothers after 6 weeks postpartum (Long term highly effective contraception) Women who have their desired family size but do not want permanent surgical contraception	With suspected pregnancy With history of blood clotting disorders or heart disease With lump in either breast, liver disease With unexplained abnormal vaginal bleeding
Intrauterine devices	
Women who have delivered 1 or more times Breastfeeding mothers Women who want long-term contraception Women in a stable monogamous sexual relationship Women after 6 weeks postpartum; before 6 weeks if provider has specialized IUD insertion training	With suspected pregnancy, history of PID or ectopic pregnancy With anaemia or heavy menstrual bleeding Having no menses after 6 weeks postpartum With history of heart disease With abnormalities or cancer of pelvic organs Having unexplained vaginal bleeding or severe menstrual pains At risk of exposure to STDs
Male and female condom	
Men who desire to take contraceptive initiative Couples needing an immediately effective method Couples waiting to rule out a suspected pregnancy Couples at risk of exposure to HIV, STDs	Who desire or require highly effective protection against pregnancy Who are allergic to latex

Table 54.2: Guide to family planning methods

Method	Pregnancy rate?	Used at inter-course?	Effect on STD risk?	Compatible with breast-feeding?	Return to fertility after stopping?
Male sterilization	0.15 (0.1)	No	None	Yes	Permanent method
Female sterilization	0.4 (0.2)	No	None	Yes	Permanent method
Implants	0.2 (0.04)	No	Probably none	Yes, but not preferred method. Wait 6 weeks postpartum	Immediate on removal
Combined oral contra-ceptives	1–8 (0.1–3)	No	May protect against some forms of PID, but increase risk of infection with some STDs	After 6 months postpartum, but not preferred method if breastfeeding	Immediate to short delay (average 2–3 months)

Continued

Table 59.2, *continued*

Method	Pregnancy rate?	Used at inter-course?	Effect on STD risk?	Compatible with breast-feeding?	Return to fertility after stopping?
Progestin-only minipill	3–10 (0.5–3)	No	None	Yes, but not preferred method. Wait 6 weeks postpartum	Immediate to short delay
Injectables	0.3–0.4	No	Unknown	Yes, but not preferred method. Wait 6 weeks postpartum	Delayed 4–12 months
Intrauterine devices (IUCD)	3 (0.3–2)	No	Increase risk of PID in women at risk of STDs	Yes	Immediate after removal by trained provider
Condoms	12 (2)	Yes	Protective (70% against AIDS)	Yes	Immediate
Natural family planning	20 (1–9)	No	None	No, method not reliable	Immediate

54.1 Hormonal Contraceptives

In this category of contraceptives are “the pill”, which has been modified over the years to reduce side effects and improve effectiveness, as well as injectables and implants. They all work to affect the body’s hormone functions. Some combine both progestogen and oestrogen and others have only one or the other. They are described in turn.

54.1.1 COMBINED ORAL CONTRACEPTIVE PILL

This pill contains a combination of progestogen and oestrogen in proportion and quantity that vary across the various preparations. The pill acts by inhibiting ovulation and thickening the cervical mucus, thus providing a physical barrier to spermatozoa and making the endometrium too thin for implantation.

Client Education

This should contain the following information with regard to the pill:

- It is highly protective against pregnancy.
- Pregnancy rate increases if the pill is not taken regularly.
- It may be associated with minor complaints, such as nausea, headache, weight gain, and gastrointestinal upsets.
- It is unsuitable for breastfeeding mothers because of its suppressive effect on milk output.
- If you forget to take one pill, take it as soon as you remember. The next pill should be taken at the regular time even if this means that you have to take 2 pills on the same day.

- Return to the clinic if you experience the following:
  - Suspected pregnancy.
  - Swelling or pain in legs.
  - Yellowing of skin or eyes.
  - Pain in the chest, or arms or shortness of breath.
  - Severe headaches, depression, vision difficulties.
- Side effects: Although many side effects of oral contraceptives use have been eliminated with low dose pills, some women still experience irregular menstrual bleeding, nausea, weight gain, headaches, skin colour changes, and other side effects. These may go away after several months or continue for as long as oral contraceptives are taken
- Complications: Increased risk of cardiovascular disease in women over 35 years of age who smoke, and increased risk of hypertension. Users exposed to STIs may be at risk of serious diseases, including PID and possibly cervical cancer.
- Non-contraceptive benefits:
  - Reduces menstrual flow (lighter, shorter periods).
  - Decreases dysmenorrhoea.
  - Protects against ovarian and endometrial cancer.
  - Decreases benign breast disease.
  - Gives some protection against ectopic pregnancy.

54.1.2 PROGESTOGEN-ONLY PILL (MINI PILL)

This is a pill that is taken daily. It contains only a progestogen and acts by altering the cervical mucus, making it thicker/denser, thus preventing sperm transport. It also suppresses ovulation and inhibits implantation of fertilized ovum.

Client Education

This should include the following:

- Used in breastfeeding mothers because it does not interfere with lactation.
- Has a high level of pregnancy protection.
- There is need for compliance on a daily regimen.
- Unrelated to sexual intercourse.
- May cause menstrual irregularities.
- If one forgets to take one pill, one should take it as soon as they remembers (see combined pills).
- One should return to the clinic immediately for a pregnancy check if 45 days have passed since one's last menstrual period.
- Side effects: Users may experience irregular bleeding patterns.
- Complications: Studies to date have shown no long-term complications.
- Non-contraceptive benefits:
  - Does not affect lactation.
  - Lighter shorter periods.
  - Decreased breast tenderness.
  - Does not increase blood clotting.
  - Decreases dysmenorrhoea.
  - Protects against endometrial cancer.

54.1.3 EMERGENCY CONTRACEPTIVES

Emergency contraceptives reduce the occurrence of pregnancy from unprotected intercourse by 8% to 2% (75% protection).

Unprotected intercourse
- Rape
- Condom leakage
- Condom breakage/slippage

Types of Emergency Contraceptives
- Ethynil estradiol 50mcg + noresthisterone 1mg take 2 tablets then repeat after 12 hours). Requires a total of 4 tablets. ***OR***
- Four tablets of a ethinil estradiol 30mcg + levonorgestrel 150mcg (e.g., microgynon or nordette) to be taken within 72 hours of unprotected intercourse. Repeat same dose 12 hours later.
- One tablet of 75mcg levonorgestrel 2, and repeat same dose 12 hours later all within 72 hours of exposure.

54.1.4 INJECTABLE CONTRACEPTIVES

These are either progesterone only or combined progesterone plus oestrogen. They consist of long acting progestogen usually administered as deep intramuscular injections. They act by suppressing ovulation, inducing a thin atrophic endometrium, and producing a thick cervical mucus that is difficult for sperm to penetrate.

Types of Injectables

They are available in two forms:
- Medroxyprogesterone acetate (Dmpa), e.g., Depo-Provera: 150mg per vial and given as a deep (depot) intramuscular injection every 3 months.
- Norethisterone enanthate (Net En), e.g., Noristerat: As 200mg vials and given at 2-month intervals

A third group of injectables consists of combined (oestrogen+progesterone) and given monthly:
- Cyclofem (DMPA 25mg + oestradiol cypionate 5mg).
- Mesiyna/Norigynon (Net En 50mg + oestradiol valerate 5mg).

Client Education
- May be associated with heavy menses, amenorrhoea or spotting.
- Regular administration is required.
- Return to the clinic as scheduled to continue using this method.
- Return to the clinic if one suspects pregnancy, has dizziness, or experiences heavy bleeding.
- Side effects: Users may experience menstrual irregularity (amenorrhoea, spotting, and rarely, heavy bleeding).
- Complications: Studies to date have shown no long-term complications.
- Advantages: They contain natural oestrogens and hence have a protective effect on CVS and CNS and give a better cycle control.

54.1.5 SUB-DERMAL IMPLANTS

These are Implanon and Jadelle (etonorgestrel 68mg). Jadelle contains 2 rods of progestogen, inserted under the skin of the arm, that slowly release progestogen for up to 5 years. The method acts by thickening cervical mucus, suppressing ovulation, and causing atrophic changes in the endometrium that make it unsuitable for zygote implantation. Implanon is a single rod combined progesterone oestrogen implant that gives protection for 3 years.

Client Education

The following is important:

- May be associated with prolonged menses, spotting, or amenorrhoea.
- Requires a minor surgical procedure for insertion and removal.
- If possible return to the same clinic if you desire implant or removal.
- Return for removal any time you desire, but it can be kept in place for 5 years.
- Return to the clinic if you:
  - Suspect pregnancy.
  - Experience pain, swelling or pus at the implant site
  - Experience dizziness or headache.
  - Experience heavy bleeding.
- Benefits include the following:
  - Highly effective.
  - Immediate return to fertility.
  - Offers continuous, long-term protection.
  - Reduces menstrual flow.
  - Protects against endometrial cancer and ectopic pregnancy.
  - Does not affect lactation.
- ***Side effects:*** Users may experience infection at insertion site, irregular menstrual bleeding (longer bleeding episodes, amenorrhoea, or spotting).
- ***Complications:*** Studies to date have shown no serious long-term complications.

54.2 Intrauterine Contraceptive Device (IUCD)

This forms a highly effective long-term widely used family planning method worldwide (refer to Table 54.3 for the various types). The modern IUCD is a plastic device usually bound with copper wire and is placed in the uterus through the cervix. Lippes's loop has no copper. The IUCDs act by preventing the implantation of fertilized ovum, inhibiting sperm mobility, and inhibiting fertilization.

Client Education

The following is important:

- Check regularly to ensure IUCD is in place.
- Return for removal any time, but most can be worn for 3–10 years and the Lippes Loop R for an indefinite period of time.
- May cause dysmenorrhoea and menorrhagia.
- Return to the clinic in case of:

Table 54.3: Types of IUCDs

Device	Duration of effectiveness
Copper T 380A	Up to 12 yrs
Nova T	5 yrs
Multiload-MLCu-375	5 yrs
Multiload-MLCu-250	3 yrs
Copper T 220	3 yrs
Gynefix	8 yrs
Hormone releasing IUCDs: e.g., Mirena (LNG-IUCD), Progestasert (Progesterone IUCD)	5 yrs

- Signs of pregnancy, heavy bleeding or spotting.
- Abnormal sexual pain or vaginal discharge.
- Chills or fever.

Benefits include the following:

- Highly and immediately effective.
- Long-term protection with immediate return to fertility upon removal.
- Does not interfere with intercourse.
- Can be used in women who are breastfeeding.
- ***Side effects:*** Users may experience pain on insertion and increased menstrual bleeding and abdominal cramps for the first 1or 2 periods.
- ***Complications:*** Increased risk of anaemia if heavy bleeding occurs, perforation (rare), and increased risk of PID and associated infertility, especially within 4 months of insertion and in women at risk of STDs.
- Displacement: When threads are not visible at the cervix and pregnancy is ruled out then:
- Refer to higher level if difficult to remove for appropriate management.
- If one conceives with the IUCD in place, remove it if possible; otherwise leave alone until delivery (ultrasound if possible) and counsel client accordingly.

54.3 Barrier Methods

In this category are the condoms, diaphragm, spermacides, and cervical cap.

54.3.1 THE MALE CONDOM

Offer physical barrier to sperm deposition in the vagina. Condoms also offer some protection against STIs including HIV/AIDS, HBV, and carcinoma of the cervix.

Client Education

The following is important:

- Before every intercourse, place condom on erect penis, leaving tip empty to collect semen.

- Withdraw the penis from the vagina after each ejaculation while the penis is still erect.
- Remove condom after use.
- Do not re-use condoms.
- Discard used condom immediately in toilet or pit latrine.
- Using spermicides with condoms increases the effectiveness.
- Complications may include local irritation if allergic to latex/lubricants.
- May interfere with sexual pleasure for some people.
- ***Side effects:*** Some users experience sensitivity to rubber or lubricants.

Benefits
- Fairly effective if used properly.
- Immediately effective.
- Highly effective protection against STIs/HIV/AIDS.
- May prevent premature ejaculation.

54.3.2 THE FEMALE CONDOM
The female condom is a thin (0.05 mm) polyurethane sheath, 7.8cm in diameter and 17cm long. It is soft, loose fitting, and has two flexible rings. One ring is inserted into the vagina and acts as an internal anchor. The other ring forms the open edge of the device and remains outside the vagina after insertion. The female condom provides protection for one act of intercourse. It can be inserted up to 8 hours before intercourse but must be removed immediately after. There are no complications associated with it, and unlike the male condom it can be cleaned and reused.

54.3.3 SPERMICIDES
Spermicidal creams, jellies and/or foaming tablets are inserted into vagina before sexual intercourse and act by inactivating the spermatozoa and physically preventing entry into uterus. Best used with condoms.

Client Education
The following is important:
- Interferes with natural spontaneity of sexual act.
- May cause local irritation.
- May be difficult to insert by client.
- Low effectiveness as a contraceptive.
- ***Side effects:*** Some users experience sensitivity to spermicide.
- ***Complications:*** None.

54.3.4 DIAPHRAGM AND CERVICAL CAP
A flexible rubber cover or cap to cover the cervix, inserted before sexual intercourse forming a physical barrier for sperm entry. Should be used with a spermicide. It is not a commonly used contraceptive owing to difficulty of self-insertion and its associated high failure rate. However, it is protective against cancer of the cervix risks in the long term.

Client Education

- Diaphragm and cervical cap:
  - Must be fitted by a provider and refitted after marked weight change (5kg gained or lost, or after childbirth).
  - Must be kept clean and stored properly.
  - Must be used with spermicide.
  - Diaphragm, or cervical or contraceptive sponge.
  - Can be inserted up to 6 hours before intercourse.
  - Can remain in place for 6 hours (not longer than 24 hours).
  - Contraceptive sponge must be moistened with water to activate its spermicide. contraceptive sponge must never be re-used and must not be used during menstruation.
- ***Side effects:*** Some users experience sensitivity to rubber or lubricants/ spermicides; some diaphragm users experience increased frequency of urinary tract infection.
- ***Complications:*** None.

54.4 Surgical Contraception

Many factors have contributed to improved safety of voluntary surgical contraceptive in the last 20 years, These include improved anaesthetic methods, better surgical techniques, asepsis, improved training of personnel, and better selection and monitoring of clients.

54.4.1 TUBAL LIGATION

A voluntary irreversible procedure for fallopian tubal occlusion that can be done under general or local anaesthesia by minilaparotomy or laparoscopy.

☛ **Refer to level 4 for provision.**

Client Education

- More or less irreversible (permanent).
- Failure very rare when done by trained professional.
- Counselling absolutely necessary.
- No loss of libido or vigour or health.
- Return to the clinic if one experiences:
  - Postoperative fever, pus, or pain at the surgical site.
  - Weakness or rapid pulse.
  - Vomiting or persistent abdominal pain.
- Benefits:
  - Permanent, highly and immediately effective
  - No change in sexual function
  - Good for client if pregnancy would be a serious health risk
  - Does not affect lactation
- ***Side effects:*** Some users experience minor pain and bleeding and wound infection following procedure.

- ***Complications:*** Injury to other organs (e.g., gut, bladder) and rarely death; risk of complications increased if general anaesthesia is used. Haemorrhage.

54.4.2 VASECTOMY

A voluntary surgical procedure to cut and ligate the vas deferens so that spermatozoa cannot be ejaculated. Done under local anaesthesia. Now gradually becoming accepted in Kenya.

Client Education

- Counselling necessary: permanent and irreversible.
- Use condom for at least 15 ejaculations.
- Return to the clinic if one experiences:
  - Postoperative fever.
  - Excessive swelling, pus, or pain at the surgical site.
- ***Side effects:*** Some users experience minor swelling, pain, infection, and bruising following procedure.
- ***Complications:*** Risk of serious complications or death extremely low.

54.5 Periodic Abstinence (Natural Family Planning)

Avoidance of sexual intercourse during ovulation and for a safety margin before and after ovulation. Various methods may be used to determine the fertile period: cervical mucus, basal body temperature, rhythm.

Benefits

- No physical side effects and it is cheap.

No need for prescriptions by medical personnel.
Improved knowledge of reproductive system and possible closer relationship between couples.

Client Education

Requires high motivation and highly cooperative partners.
Has a high failure rate.
Assumes a regular, perfect menstrual cycle.
Requires proper record-keeping.
Has no health risks, except for pregnancy.
Side effects: None.
Complications: None.

PART V
Guidelines on Appropriate Use of Blood and Blood Products

IN THIS SECTION:

55. Introduction

This section of the guidelines has been derived from Guidelines for Appropriate Use of Blood and Blood Products prepared by the Ministry of Health to assist physicians and other health care providers in the correct selection of patients for transfusion, and the safe administration of blood and blood products.

Severe anaemia is a major health problem in Kenya and is frequently treated with blood transfusion. Transfusions of blood products can save lives, but are not without risks or costs. Some of the possible complications include the transmission of infectious diseases such as HIV, hepatitis B, hepatitis C, syphilis, and malaria, as well as haemolytic and non-haemolytic transfusion reactions, immunosuppression, and alloimmunization. Safe blood is a scarce and valuable resource that is expensive to collect, process, and administer. Limiting transfusion to patients whose chance of survival or quality of life is improved with blood will help to lower the high demand for blood products and will reduce unnecessary exposure of patients to the risks of transfusion.

The following guidelines are recommended for appropriate transfusion practice:

- Blood should be transfused only when required to save a life. The decision to transfuse should be based on an estimate of the patient's risk for developing complications of inadequate tissue-oxygen delivery and should be based on both the haematologic and the clinical status of the patient.
- Red cell transfusion is recommended for patients whose haemoglobin is less than 5g/dl. Stable patients at even this level of haemoglobin may not need blood transfusion.
- Efforts should be made to stabilize patients through use of intravenous therapy with crystalloids and colloid solutions and oxygen therapy before blood is available.
- Before transfusion the patient should be appropriately evaluated to confirm that blood transfusion is still necessary.
- Effective transfusion requires a minimum of 2 units of blood for an adult or 20ml whole blood (10–15ml packed cells) per kilogram body weight for a child.
- The post-transfusion haemoglobin level should be compared with the pre-transfusion value to assess the efficacy of the transfusion.
- The underlying cause of the need for the blood transfusion needs to be identified and appropriately managed.

56. General Guidelines for the Use of Red Blood Cell Products

The following general information is required when using red cell blood products:

- A red blood cell (RBC) transfusion is intended to increase the delivery of oxygen to the tissues. Red blood cells can be transfused as either whole blood

or packed red blood cells (PRBCs). A unit of whole blood measures approximately 400–500ml and has a haematocrit of 45–55%. A unit of PRBCs consists of the red blood cells concentrated from a unit of whole blood. Each unit of PRBCs contains approximately 180–200ml of RBCs and 50–70ml of plasma. The haematocrit of PRBCs is 60 to 70%. Each unit of blood contains approximately 60g of haemoglobin and 250mg of iron, predominantly in the form of haemoglobin. Both whole blood and PRBCs contain a small amount of citrate anticoagulant and additional preservative solutions. Blood units that are collected in CPDA-1 anticoagulant can be stored for up to 35 days.

- PRBCs should not be used to treat long-standing anaemia that can be corrected with non-transfusion therapy such as iron or to increase blood volume, oncotic pressure, coagulation factors, or platelets.

- Red blood cells must be compatible with the ABO antibodies present in the recipient patient's serum, and must be cross-matched in order to confirm compatibility. Unless the patient is bleeding or haemolysing, the post-transfusion haemoglobin can usually be accurately predicted. One unit of blood (or the equivalent volume in a child) usually increases the patient's haemoglobin by 1g/dl. In acute haemorrhage, blood transfusion should be initiated as soon as possible to offset the deficit; however, too rapid infusion of large volumes of cold blood with excess extracellular potassium, reduced pH, and excess citrate can sometimes have undesired effects on cardiac rhythm.

- The risk of mortality increases significantly in otherwise stable patients when the haemoglobin level falls to approximately 3.5–4g/dl. In ischaemic heart disease, the risk of mortality significantly increases when the haemoglobin falls between 6 and 7.5g/dl. Perioperative RBC transfusion experience suggests that patients usually require transfusion when their haemoglobin level is less than 6g/dl, and only rarely when their haemoglobin is above 10g/dl. For levels between 6 and 7g/dl, the transfusion needs depend on the amount of blood loss, underlying coronary/cardiac disease, and overall patient status.

56.1 Acute Blood Loss, Including Preoperative Transfusion and Chronic Anaemia

56.1.1 ACUTE BLOOD LOSS

In a patient with acute blood loss, an early haemoglobin level will not accurately reflect the severity of blood loss until there has been adequate plasma volume replacement. Serial haemoglobin levels are required to determine the need for red cell transfusion as well as evaluation of the clinical status of the patient.

The following is anticipated with varying degrees of blood loss:

- As a general rule, a loss of blood volume of less than 15% results in minimal symptoms; 15–30% results in tachycardia; 30–40% in signs of shock; and greater than 40% in signs of severe shock.

- Some patients with underlying diseases may require transfusion at 30–40% blood loss. Almost all patients with losses greater than this require transfusion.

- The first treatment for hypotension, shock, and acute blood loss is volume expansion with normal saline (without dextrose), infused in a volume at least three times the volume lost. Normal saline up to 50ml/kg is recommended for initial volume replacement. This should be followed by colloid solution, e.g. 6% dextran or 6% hydroxy-ethyl starch, given in equal volume to the blood volume lost. The 6% dextran should not exceed 50ml/kg body weight, and the 6% hydroxy-ethyl starch 20ml/kg body weight in 24 hours. The decision to transfuse should be made on the basis of parameters such as heart rate, blood pressure, haemoglobin, and the presence of active bleeding.

Blood may be required to restore blood volume and oxygen-carrying capacity in patients with massive haemorrhage (blood loss greater than 40%). In massive transfusion (more than four units within 1 hour in an adult, or the replacement of the equivalent of the patient's blood volume within 24 hours), platelets or fresh frozen plasma should be given according to the results of the patient's platelet count and coagulation profile, if possible. Consider giving ABO compatible fresh frozen plasma (FFP) in a dose of 15ml/kg if the prothrombin time (PT) is prolonged, and platelet concentrates (4–6 donor units for an adult) when the platelet count falls below 20,000/mm^3. If the platelet count or coagulation profile is not available, consider giving 2 units of FFP and 6 donor units of platelet concentrate for every 6 units of blood transfused within a period of 24 hours.

56.1.2 PERIOPERATIVE TRANSFUSION

It is important to know the following with regard to perioperative transfusion:

- In the perioperative patient, transfusion decisions should be based not only on a haemoglobin level but also on clinical signs and symptoms and prior medical history. In anaesthetized patients, vital signs alone do not reflect the patient's real situation. During the intraoperative period, the patient's cardiopulmonary reserve, the amount of anticipated blood loss, oxygen consumption and the presence of atherosclerotic heart disease affect the decision for transfusion.

- Prior to elective surgery, all efforts should be made to correct anaemia without the use of blood. Patients with a Hb level less than 5g/dl may need transfusion prior to surgery if anaemia cannot be corrected by other means.

- Blood should be cross-matched and made available for immediate use during surgery for patients with a high likelihood of needing a transfusion. Transfusion may be necessary during surgery for patients with a Hb level less than 8g/dl or who lose more than 1 litre of blood during surgery.

- In the case of postoperative or postpartum haemorrhage, the source of bleeding must be identified and stopped. Transfusion is not indicated as treatment of anaemia in postoperative or postpartum patients if no active bleeding exists.

56.1.3 CHRONIC ANAEMIA

With respect to chronic anaemia, the following is recommended: Blood should be used only to relieve clinical signs of cardiac and respiratory distress in severely anaemic patients, in order to achieve haemodynamic stability. Blood should not be used to correct anaemia. Most patients with chronic anaemia have nutritional and/or mild blood loss anaemia that responds rapidly and effectively to specific therapies. In case of transfusion, it should be done preferably be done using PRBCs and should be done slowly with careful monitoring of the patient. This is because these patients have normal blood volumes and the transfusion of whole blood may cause circulatory overload, with harmful effects.

56.1.4 RED BLOOD CELL TRANSFUSION GUIDELINES

The following guidelines are recommended for red blood cell transfusion for acute and preoperative blood loss and also for chronic anaemia

Acute and Perioperative Blood Loss

- Evaluate patient for risk of ischaemia.
- Estimate blood loss:
  - If >30-40% of rapid blood loss: Transfuse RBCs and use volume expanders
  - If <30-40% of rapid blood loss: RBCs not usually needed in otherwise healthy person
- Monitor vital signs:
  - Tachycardia and hypotension not corrected with volume expanders: RBCs needed
- Measure haemoglobin:
  - If Hb > 10g/dl: RBCs rarely needed
  - If Hb < 5g/dl: RBCs usually needed
  - If Hb 5–10g/dl: RBCs may be needed, determined by additional clinical conditions

Chronic Anaemia

- Transfuse only to decrease symptoms and to minimize risk (generally at Hb of less than 5g/dl). Do not transfuse above 5g/dl Hb unless patient is symptomatic.
- Treat nutritional and mild blood loss anaemia with specific therapeutic agents as indicated (iron, folic acid, B12).
- Use specific strategies for sickle cell disease and thalassaemia (See section below).

56.2 Blood Transfusion in Pregnancy

The following information is important with regard to anaemia blood transfusion in pregnancy:

- In pregnancy, maternal plasma volume increases by 40%, and red cell mass by 25%. Blood loss is usually well tolerated during pregnancy. The mean blood loss during vaginal delivery is 500ml, while 1,000ml is lost during caesarean

section. Indications for transfusion in the pregnant and postpartum patient are similar to those for the non-pregnant patient.

- In addition to the clinical assessment of pallor, all women should have their haemoglobin measured at the first antenatal visit, and subsequently once during every trimester. Clinical evaluation of mucous membranes (conjunctivae and tongue) or palmar pallor may not detect mild or moderate anaemia that may lead to adverse effects later in pregnancy or at the time of delivery.

- All women should have ABO blood grouping and Rhesus (Rh) factor typing performed at the first antenatal visit. Where facilities exist, a screen for unexpected antibodies should be done. All Rh-negative women, with no evidence of immunization, delivering an Rh-positive foetus (or who have an abortion) should be given Rh immune globulin (RhoGAM) in a dose of 300mg IM within 72 hours of delivery or abortion.

- Nutritional education must be an integral part of routine antenatal care, including recommendations for protein and dark green leafy vegetables in the diet.

- Women with Hb of less than 10g/dl should receive ferrous sulphate 200mg (60mg elemental iron) 3 times a day throughout pregnancy. Clinically stable pregnant women with severe anaemia (< 7g/dl) should be evaluated for the cause of their anaemia and treated appropriately. These women should be monitored every 2 to 4 weeks, including measurement of the Hb level. It may be necessary to admit or refer women with a Hb level persistently lower than 7g/dl for closer clinical monitoring and treatment.

- Blood transfusion should be considered for pregnant women with Hb level less than 5g/dl who become symptomatic with dyspnoea, shock, or orthostatic hypotension.

- Blood should be ordered and made available in the delivery room for immediate transfusion in case of haemorrhage at the time of delivery for pregnant women with a Hb level less than 7g/dl. Pregnant women with a Hb less than 7g/dl should be referred for delivery at facilities where blood transfusion is available.

- Blood transfusion is not indicated in anaemic women who are clinically stable after delivery.

- In the case of postpartum haemorrhage, the source of bleeding must be identified and corrected. The first therapy of acute blood loss is volume replacement.

56.3 Paediatric and Neonatal Transfusions

The following information is important for paediatric and neonatal blood transfusions:

- Transfusion should be considered in a child with a Hb level of less than 4g/dl.
- Transfusion should be considered in a child with a Hb level of less than 5g/dl ***and*** clinical signs of cardiac or respiratory distress (intercostal or subcostal retractions, or other signs of cardiac failure). Increases in heart rate or respiratory rate alone may be normal compensatory mechanisms and are not necessarily indications for transfusion.
- Blood is not generally recommended for clinically stable children with a Hb level between 4 and 5g/dl. Many of these children have chronic anaemia. They should be admitted for evaluation and treatment of the cause of their anaemia and should be monitored closely for changes in Hb level and signs of decompensation.
- Respiratory distress is unlikely to be due to chronic anaemia if the Hb level is 5g/dl or greater. Children with a Hb level of 5g/dl or more should not be transfused indiscriminately, but the cause of their anaemia should be investigated.
- Children should be transfused with 10–15ml/kg of PRBCs or 20ml/kg of whole blood. Transfusions must be given slowly (over a 4-hour period) in chronically anaemic patients and monitored closely to avoid volume overload. Diuretics should be used if the patient is in congestive cardiac failure.

56.3.1 GUIDELINES FOR PAEDIATRIC TRANSFUSION

- If Hb is < 4g/dl, transfuse.
- If Hb is > 4g/dl and < 5g/dl, transfuse when signs of respiratory distress or cardiac failure are present. If patient is clinically stable, monitor closely and treat the cause of the anaemia.
- If Hb is >5g/dl, transfusion is usually not necessary. Consider transfusion in cases of shock or severe burns. Otherwise, treat the cause of the underlying anaemia.
- Transfuse with 10–15ml/kg of PRBCs or 20ml/kg of whole blood. In the presence of profound anaemia or very high malaria parasitaemia, a higher amount may be needed.

56.3.2 CONGENITAL ANAEMIAS

Children with congenital anaemias such as sickle cell diseases Hb S/S, Hb S/C, Hb S/-thalassaemia, like all other children, should only be transfused when they develop cardio-respiratory symptoms from severe anaemia, or the indications listed below.

Indications for Red Blood Cell Transfusion in Sickle Cell Disease

- Symptomatic anaemia due to:
  - Aplastic crisis
  - Splenic sequestration
  - Accelerated haemolysis (due to haemolytic anaemia or sickle cell crisis)
  - Preoperative preparation for most types of surgery

- Chronic transfusion:
  - Prevention of recurrent occlusive stroke (< 30% HbS)
  - Selected sickle cell pregnancy complications such as recurrent foetal loss

56.3.3 UNIQUE ISSUES IN THE NEONATE

The total blood volume of neonates is small, although the volume is higher per kg of body weight than that of older children or adults (85ml/kg for full-term and 100–105ml/kg for pre-term). Transfusions are generally given in very small increments, increasing the risk of infectious disease transmission through multiple donor exposures.

Blood transfusion in pre-term infants is often given for the anaemia of prematurity, associated with delayed renal production of erythropoietin due to decreased sensitivity to lower haematocrit levels. This commonly develops in neonates after 2 weeks of life. Neonates, especially pre-term, may require multiple transfusions.

In neonates, a dose of 15ml/kg of packed red blood cells will increase the haemoglobin by approximately 3g/dl.

☛ **Avoid using blood donated by blood relatives to transfuse neonates.**

Neonatal Red Blood Cell Transfusion Guidelines

Transfuse with 10–15ml/kg PRBCs for:

- Acute blood loss of > 10% of blood volume.
- Haemoglobin < 7g/dl.
- Haemoglobin < 8g/dl in a newborn with apnoea, bradycardia, tachycardia, tachypnoea, or decreased vigour.
- Haemoglobin of < 12g/dl with moderate to severe respiratory distress or severe congenital heart disease and absence of weight gain for 7 days with no other explanation.

56.4 Guidelines for Plasma Transfusions

The following is recommended for plasma transfusions:

- Fresh frozen plasma (FFP) is the acellular portion of blood that is frozen within hours of donation. FFP must be ABO-compatible with the recipient's red blood cells.

- Fresh frozen plasma is indicated for correction of coagulation abnormalities and for correction of microvascular bleeding when prothrombin time and partial thromboplastin time are greater than 1.5 times the midrange normal reference value. FFP is indicated for treatment of bleeding due to multiple coagulation-factor deficiencies, massive transfusion with coagulation abnormalities, and bleeding due to warfarin therapy. FFP should not be used when a coagulopathy can be corrected with vitamin K.

56.5 Guidelines for Platelet Transfusions

The following is important to know with regard to platelet transfusions:

- Platelet concentrates are separated from whole blood. Each unit contains greater than 5.5 x 10^{10} platelets in approximately 50ml of plasma. Four to eight units of concentrated platelets are the usual adult dose for profound thrombocytopaenia. Each unit of platelet concentrate increases the platelet count of an average adult by 7–10,000/mm^3. Response to platelet transfusion may be adversely affected by fever, sepsis, severe bleeding, splenomegaly, consumptive coagulopathy and certain drugs.

- As a general rule, patients undergoing major invasive procedures require platelet counts of 50,000/mm^3 or greater. Surgical and obstetrical patients with microvascular bleeding often require platelet transfusions when the platelet count is less than 50,000/mm^3 and seldom require transfusions if the platelet count is greater than 100,000/mm^3. Platelet transfusion is generally not indicated for patients with extrinsic platelet dysfunction (e.g., uraemia) since the transfused platelets will also function inadequately. Prophylactic platelet transfusion is not effective for thrombocytopaenia due to increased platelet destruction. The cause of the destruction should first be investigated and treated.

- Neonates undergoing minor surgery or invasive procedures may be transfused with platelets at counts of less than 50,000/mm^3.

- ABO-compatibility should be ensured. Rh-negative patients, particularly women of childbearing age, should receive platelets from Rh-negative donors whenever possible.

56.6 Autologous Transfusions

The following is important for autologous transfusions:

- For elective surgery in patients with Hb level of 10g/dl or greater, 2–4 units of blood may be collected from the patient prior to surgery for the patient's own use during surgery (autologous transfusion). Collections should be at least 7 days apart, and the last donation should be at least 4 days before surgery. There is no indication for a single-unit autologous transfusion in an adult.

☛ **Unused autologous units can be released into the general donor pool, provided the patient meets all criteria for blood donation and the units are fully screened and tested.**

- Preoperative isovolaemic haemodilution may be performed prior to surgery. This can be accomplished by removal of 2 or more units of blood and replacement with an equal volume of crystalloid. This technique improves tissue perfusion during surgery and makes the units of blood available for autologous transfusion during and after surgery.

57. Transfusion Reactions

The following is important to know about transfusion reactions:

- Although transfusion can be a lifesaving therapy, it can result in many adverse effects. Approximately 1% of all transfusions lead to some type of adverse reaction. Many measures have been taken to reduce transfusion related risks, including donor risk screening and laboratory testing of blood products, but it is not possible to provide a blood supply with zero risk. Therefore, physicians must carefully weigh the benefits of transfusion against the risks.

- Transfusion reactions can be caused by immunological or non-immunological mechanisms, and may be immediate or delayed for some time after the transfusion. The majority of immediate serious reactions are immunological and are caused by clerical errors, including incorrect recording of blood type, cross-match results, or patient name resulting in transfusion of the wrong unit or the wrong patient. The importance of proper patient identification and specimen labelling cannot be overemphasized. Other common serious complications of blood transfusion are related to infectious disease transmission. The most serious of the transmitted agents are HIV and Hepatitis B and C.

- All transfusions should be given under the supervision of a clinician. The patient should be monitored closely for the first 15 minutes of the transfusion since it is during this period that serious haemolytic transfusion reactions can first be detected. The transfusion should be regulated to infuse for a maximum of 4 hours, with monitoring of the vital signs by the nursing staff every 30 minutes. Any change in vital signs (temperature, pulse, respiratory rate, blood pressure) or level of consciousness may be an indication of a transfusion reaction. The symptoms and signs of a transfusion reaction include pruritus, palpitations, lumbar pain, pain along the entry vein, fever, hypotension, tachypnoea, tachycardia, and altered level of consciousness.

- Blood should be set up for transfusion within 30 minutes of leaving the laboratory. Unused blood from the theatre or wards should be returned immediately (within 30 minutes) to the laboratory.

57.1 Types of Transfusion Reactions

- Immunological reactions:
  - Red cells: Haemolysis (immediate or delayed)
  - White cells: Febrile reactions, pulmonary infiltrates
  - Platelets: Post transfusion purpura
  - Plasma proteins: Anaphylactic shock, urticaria
  - Other: Graft versus host disease
- Non-immunological reactions:
  - Disease transmission (HIV, Hepatitis B and C, syphilis, malaria, etc.)
  - Septicaemia

- Air embolism
- Fluid overload
- Iron overload

The majority of transfusion reactions are febrile reactions, characterized by a mild temperature elevation without other clinical signs or symptoms. These can be managed with antipyretics, without having to stop the transfusion. The most common cause of serious haemolytic transfusion reaction is the administration of ABO incompatible blood. If serious transfusion reaction is suspected, the transfusion should be stopped immediately. The patient should have an IV line kept open with saline and vital signs should be monitored. The laboratory should be notified of the suspected transfusion reaction, and a transfusion reaction work-up immediately initiated. The laboratory should report all suspected transfusion reactions to the Hospital Transfusion Committee.

57.2 Transfusion Reaction Work-up

- Stop the transfusion but keep the IV line open with normal saline.
- Monitor the vital signs of the patient.
- Inform the laboratory about a possible transfusion reaction.
- Check the clerical information to ensure that the patient is receiving the correct blood.
- Take the following blood samples from the patient (from the opposite arm):
  - 10ml of blood into a plain tube. Check the colour of the plasma for haemolysis.
  - 2ml of blood into an EDTA tube.
- Collect a sample of the first voided urine.

Send to the laboratory:
- All samples correctly labelled.
- The blood that reacted, together with the attached transfusion set.
- All empty blood bags of already transfused units.
- Laboratory request form filled in.
- Report all investigations to the Hospital Transfusion Committee.

58. Implementation of Guidelines

Effective implementation of blood transfusion guidelines requires:
- That each hospital establish a Hospital Transfusion Committee. This committee will serve to ensure that the quality of blood transfusion services and practices is maintained at a high level.

- That the Transfusion Committee oversee all policies and procedures relating to blood utilization for the hospital. These include the selection of patients for transfusion; ordering, distribution, handling, and administration of appropriate

blood and blood components; and the monitoring of the effects of blood on patients, including the investigation of blood transfusion reactions.
- That the Transfusion Committee develop transfusion practice guidelines, with approval of the medical staff. These guidelines then serve as the basis for all transfusion practice review.

The Transfusion Committee will also:
- Monitor the hospital's blood transfusion practices and blood bank services through regular audits of hospital charts and laboratory records.
- Ensure staff education and training on proper blood transfusion practices.

The Transfusion Committee should be composed of representatives of the departments that do the majority of blood ordering and transfusing. These include paediatrics, medicine, surgery, obstetrics, and anaesthesia. In addition, a pathologist, a blood bank technologist, a nursing service representative, a management representative, and a physician or technologist from the blood collection centre should be on the committee if possible.

PART VI
Referral Systems

IN THIS SECTION:

59. The Referral Framework

The Government of Kenya is actively promoting the concept of comprehensive care for all people at the community level. The elements of comprehensive care include clinical, nursing, psychological, and social support. Maintaining the continuum of care is essential, and requires a strong linkage between the community and the health system. This occurs through an effective and efficient referral system

A referral system is a network of service providers and facilities that link together to provide a continuum of care for acute and chronic illnesses. It includes individuals and organizations working to provide care and support to those who need it. There are typically 4 levels to a referral network in the health system: the community, primary, secondary, and tertiary levels.

As defined by the Kenya Essential Package for Health (KEPH), these 4 levels of the referral network incorporate the community level (level 1), with its households, community health workers (CHWs), traditional birth attendants (TBAs), traditional herbalists, and community health extension workers (CHEWs). At the primary care level, dispensaries and health centres (KEPH levels 2 and 3) are the first point of linkage between the community and the formal health system. They are strengthened by the CHEWs and health management committees. The district hospitals (level 4), the provincial hospitals (level 5), and the national referral hospital (level 6) provide levels of increasing specialization of care to support the community level. Providers at all of these levels should be able to recognize complications, gauge their severity, provide prompt treatment based on their capacity as defined by the norms and standards for each level of care, and refer any clients they are unable to treat to a facility where they know adequate treatment is available.

The objective of a referral system is to improve clients' access to services, reduce the time it takes for them to receive required care, and avoid unnecessary delays. Meeting the needs of clients entails a collective effort of many providers, both formal and informal. In order to strengthen access to existing services and enhance linkages between and among the providers, formal referral arrangements, proper communication, and standard tools must be in place.

The service provider initiating referral at any level of the referral system has the responsibility to document the referral activity and follow up with clients to ensure they received the necessary care. An effective system ensures continuity and high quality of care to patients, enhancing the utilization of available resources and encouraging clients to participate actively in making decisions that directly affect their lives.

Coordinated service delivery and strong communication among health care providers is necessary to ensure that access to required services is as quick as possible, referrals can be easily traced and followed up, referral outcomes can be

documented, feedback from clients on the services they received can be noted, gaps in the system can be identified, and steps taken to improve service provision. For this, effective communication and transport arrangements are crucial.

The following elements are essential:

- ***Availability, accessibility, and affordability:*** Services must be based on prevailing local health problems, and provided in a way that local needs can be addressed.
- ***Coordination, coordination, coordination:*** Referral activities within and between different service providers with different resources and different mandates demand focused attention. This is best facilitated by having a team or specific individuals designated to coordinate these referral activities.
- ***Relationships:*** Higher level health facility providers should take the lead in establishing and maintaining referrals by supporting lower level providers, with both the clients and the providers working as partners.
- ***Effective communication and transport arrangements:*** Identification of the most cost-effective means of transport should be done. One way is to choose a member of the community with a vehicle to assist other community members with transport during referrals in such a manner that the costs incurred can be covered and taken care of within such an arrangement.
- ***Feedback:*** Mechanisms should be established to help with the tracking of referrals from the point of initiation to the point of delivery. This will provide evidence that the client completed the referral process.
- ***Monitoring and quality control:*** Monitoring and evaluation mechanisms for the continuous assessment and improvement of the referral process and outcomes are crucial and need to be initiated and maintained.

60. General Guidelines

An efficient and effective pyramidal referral system is essential for effective management of surgical patients and is especially important in the emergency situation so as to provide rapid and effective treatment to the patients. A referral system can function either upwards or downwards with respect to the levels of health care. Upward referral seeks specific medical care from specialists and subspecialist found at the higher levels of health care or even outside the country. Downward referral engages the local facility nearest a patient's home environment because they no longer need the more specialized health care at the higher level. Instead, they require ongoing medical care that is best able to cope with the patient's needs and this often happens to be at locations nearest to the patient's home.

An efficient referral system ensures an appropriate mix of patients with different types of needs, admitted in different health facilities countrywide. This means

that all referrals must be directed at the correct facility while maintaining the normal pyramidal referral system of flow within the health system as much as possible.

Besides referrals between facilities, there are also referrals within institutions. Such referrals are necessary and important for patient's wellbeing. Hospitals should only manage cases they are able to handle, and in situations where they cannot adequately take care of them they must refer them to the next appropriate facility. All referrals must be carefully evaluated and the risks and benefits assessed critically before the decision to refer is made. The basic guidelines for upward referral are shown below and will vary a little depending on the level in question.

60.1 Procedure for Upward Referral

The upward referral consists of the following components:

1. Critical evaluation and decision to refer is made by:
   a) Individual doctor or health care provider.
   b) Management Team taking care of the patient.
   c) Ministry or other administrative body in charge of the welfare of the patient.

2. Documentation is prepared that includes the following:
   a) Admission details.
   b) Diagnostic details and investigations carried out.
   c) Medications and treatments given to the patient.
   d) The reason for the transfer of the patient.

☛ **This documentation MUST accompany the patient being referred.**

3. Appropriate communication with respect to the referral is made:
   a) With the receiving unit or health facility.
   b) With the relatives

4. Preparation of appropriate transportation is made:
   a) Efficient and reliable means of transport to effect the referral is secured.
   b) The means of transport secured is exclusively allocated for transportation of the referred patient.

5. An appropriately qualified escort is appointed.

6. A systematic check to ensure that the resuscitation equipment to accompany the patient is available and functioning well.

60.2 Procedure for Downward Referral

On completion of treatment at the higher centre there will be a need to refer the patient back to the initial facility for purposes of feedback to the facility and for ongoing rehabilitation or palliative care of the patient.

The downward referral is a mirror of the upward referral, except that in this situation the patient has already received specialized care and is now being sent to the lower health facilities for continuing care or for feedback or for rehabilitation or palliative care.

The downward referral consequently consists of the following components:
1. Decision to refer the patient downwards.

2. Documentation detailing the following aspects with respect to the patient being referred:
   a) Admission/identification details.
   b) The final diagnosis for the patient.
   c) Procedures carried out during hospitalization in the referring facility or unit.
   d) Medications provided while the patient was hospitalized in the referring health facility.
   e) Follow-up details and any rehabilitation requirements.
   f) In case of terminal disease the hospice needs to be involved in the referral process and the follow up of the patient.

☛ **There must be 3 legible copies of the referral note or letter: one for the patient, another for the unit receiving the patient, and a third for the file.**

3. Communication is made with receiving unit or facility as appropriate and feedback obtained as appropriate. Such communication enhances the efficiency of the referral system.

4. Communication is made with the relatives with regard to the planned downward referral and the need for the a referral for this patient.

5. Preparation is made for the appropriate transportation for the intended referral.

6. An appropriately qualified escort is appointed, although in many situations the relatives would be sufficient to provide such an escort.

7. Booking is made for the patient to be reviewed in the Surgical Outpatient Clinic (SOPC) in the referring facility, unless arrangements are made for the patient to be reviewed in the receiving unit or health facility.

60.3 Guidelines for an Institutional Referral System

Just as important to patient care is the institutional referral systems that need to be clear and functional. Each facility needs to have a system for both the upward and downward flow of patients to mirror that at the national level.

A simple institutional referral system should have the following features:
1. Casualty department review:
   a) Make a correct diagnosis.
   b) Call appropriate unit.

c) Ensure patient is reviewed.
d) Ensure patient is handed over to the unit on-call doctor.
e) Ensure documentation is accurate.

2. Making unit referrals and admission decisions:
   a) Decision on whether treatment should be provided to the patient on an outpatient basis or after admission as an inpatient.
   b) If patient is admitted, ensure the patient is handed over to the admitting ward doctor.
   c) If the decision is made to provide care to the patient on an outpatient basis, then correct referral should be made.
   d) In the event of incorrect clinic referral, the doctor rather than the patient should be responsible for correcting this error .

3. If the patient referred is not admitted, they should be referred to specialized clinics at the facility. Referrals should be made to the National Referral Centre.

61. Dangers and Barriers to a Coordinated Referral System

All team members at all levels need to be conscious of the dangers that face a coordinated referral system. Efforts need to be made to avoid these dangers to the referral system. These dangers and barriers involve the following:

- Lack of confidence in the facility by the community and the tendency by the community to bypass the facility to go to the next nearest facility they consider more suitable for them. Such a situation could be due to:
  - Poor community relationships.
  - Poor manpower utilization.

- An infrastructure that is nonfunctional:
  - Broken down, understaffed and under supplied middle level facilities.
  - Inadequate or inappropriate communication infrastructure at the various levels of care. This is exacerbated by poor management practices at the health facilities and failure to involve the community in the process.
  - Treating patients with specified conditions at inappropriate levels.
  - Inadequate funding and supplies for higher levels of health care, so that they are unable to provide expected services.

- Lack of or poor utilization of human resources, due to the following:
  - Brain drain because of perceived low wages, inadequate infrastructure, and non conducive working environments in the public health services, to NGOs or private health facilities with better remuneration, or even out of the country.
  - Poor distribution of staff.
  - Frustration in the workplace.
  - Poor working relationships.

- Lack of drugs and other equipment, which is to an extent related to issues of poor planning and inadequate financing.
- Inaccurate diagnosis and treatment plans for facilities because of inadequate training for personnel at the facilities.
- Lack of working quality control and M&E measures.

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