



Republic of Namibia

Ministry of Health and Social Services

OPERATION THEATRE MANUAL



**First Edition
2015**



MINISTRY OF HEALTH AND SOCIAL SERVICES

OPERATION THEATRE MANUAL

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2015

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PREFACE

The operating theatre is a dynamic and complicated area, where the safety of patients' undergoing surgery requires great priority. The rapid development in technology, medicine and nursing, have led to new increased needs in the management of the operating theatre.

Pre-operative preparation is essential and should be checked and rechecked to ensure no errors occur. During surgical procedures, several things can go wrong such as the operation on the wrong site or organ or location or even the wrong person. Patient harm can occur due to the lack of standardized pre-operative, operative and post-operative processes.

It is therefore important to identify the causes of patient harm and act to eliminate or correct the practices that are known to be unsafe or wasteful. An operation theatre team that works effectively together to use its knowledge and abilities can avert a considerable proportion of life-threatening complications.

Improving patient safety is determined by how well caregivers work together as a team, how effectively they communicate with one another and with patients, and how carefully the care delivery processes and supporting systems of care are designed. With the growing recognition of safety challenges in health care and with regards to surgical procedures, the Ministry of Health and Social services through the Quality Assurance Unit has developed the Operation Theatre Guidelines.

The aim of this guideline is to provide information on the preoperative, operative and post-operative processes that should be adhered to in order to improve the safety of patients undergoing surgical procedures. All healthcare workers especially those working closely with operation theatres are mandated to utilize this very important resource to ensure safety of all surgical procedures at all times.

I wish to congratulate all those healthcare workers and stakeholders for their contribution towards the development of this guideline.



Andrew Ndishishi (Mr)
Permanent Secretary

The signature is written in black ink over a blue oval stamp. The stamp contains the text 'PERMANENT SECRETARY' at the top, 'REPUBLIC OF MALAYSIA' at the bottom, and 'MINISTRY OF HEALTH AND SOCIAL SERVICES' around the sides. A date stamp '2023-01-29' is visible in the center of the stamp.

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ABBREVIATIONS AND ACRONYMS

ACH	Air Changes per Hour
AHU	Air Handling Unit
CDC	Centres for Disease Control and Prevention
CSSD	Central Sterile Services Department
D&C	Dilatation and Curettage
GRN	Government of the Republic of Namibia
HCW	Health Care Worker
HIV	Human Immunodeficiency Virus
HBV	Hepatitis B Virus
IPC	Infection Prevention and Control
MoHSS	Ministry of Health and Social Services
MSH	Management Sciences for Health
NGO	Non-Governmental Organisation
NPO	Nil Per Os
OT	Operation Theatre
PPE	Personal Protective Equipment
QA	Quality Assurance
QC	Quality Control
USAID	United States Agency for International Development
WHO	World Health Organisation

CHAPTER 1: INTRODUCTION

Every patient has the right to be treated using the safest technology available in health facilities. This requires two main aspects, knowledgeable and well trained caring healthcare workers, and validated systems in operating theatres and sterile services that will ensure safety for the patients and to reduce harm. Therefore, all health-care professionals and institutions have obligations to provide safe and quality health care and to avoid unintentional harm to patients.

Medical errors can result in numerous preventable injuries and deaths. Adverse events have been estimated to occur in about 4% to 16% of all hospitalized patients in Namibia where more than half of these occur in surgical care and are preventable¹. In order to reduce risk to patients, a surveillance programme for surgical site infections should be in place to measure occurrence and improvement. The surgical operating team comprises the surgeons, anaesthetists, nurses, technicians and other OT personnel (porters and cleaners) involved in surgery. All members of the operating team play a role in ensuring the safety and success of an operation.

It is in this light that this manual for the Operation Theatre has been developed. The manual provides guidance to help ensure that surgical teams consistently follow critical safety steps, thereby removing the most common and avoidable risks endangering the lives and wellbeing of surgical patients.

The manual will also assist the administration of the operating theatre and anaesthetic services to ensure: the smooth operation of those services, and that personnel act swiftly and in a co-ordinated manner in an emergency. This manual should be made available and implemented by all theatre, recovery room and anaesthetic personnel and will act as a reference for all healthcare workers.

1.1 Goal

The goal is to ensure the safety of patients undergoing surgical procedures and protection of the surgical team.

1.2 Objectives

The main objectives of these guidelines are to ensure:

- a) Appropriate pre-operative assessment and patient preparation
- b) Adequate preparation for anaesthesia and surgical procedures
- c) Observation of asepsis and the principles of sterile technique are adhered to
- d) Appropriate post-operative care

¹ Van Zyl, M. Draft Document on OT Procedures (1995)

CHAPTER 2: OPERATING THEATRE DESIGN AND ADMINISTRATION

This section will briefly deal with the design, layout, work flow and administrative responsibilities of the Operating Theatre (OT) Manager. The OT team works closely together with the surgeons, nurses and OT technicians. Therefore the work and relaxation areas for staff must be put into the plans early during the planning phase and should be well demarcated yet accessible from the outside if required.

There must be a separate clean area for the entry of surgical instruments and other equipment, and there should be a demarcated area for used or soiled surgical instruments to be rinsed before sending to the Central Sterile Services Department (CSSD). The layout should accommodate the arrival of patients and the recovery area post operatively.

2.1 Layout and Design

Theatre managers, infection control team, surgeons and anaesthetists should be involved in the planning of the theatre design/layout. Ideally, the operating theatre suite should be a purposely built independent complex located away from the main flow of traffic but in an area easily accessible to the critical care, surgical and maternity wards and the supporting service departments, e.g. CSSD, laboratory and X-ray departments.

The operating theatre should ideally have an independent air handling unit with controlled ventilation such that the lay-up room and the OT table is under positive pressure and has the most Air Changes per Hour (ACH) i.e. 20-24.

The traffic within the operating suite must be controlled via a security lock system which only allows access to staff, patients and equipment from different entrances and exits. There should be no thoroughfare through the OT.

2.1.1 Walls and Ceilings

It is recommended that all surface materials should be hard, nonporous, fire resistant, waterproof, stain proof, seamless and easy to clean. In addition the corners of the walls and the floor should be coved (round) and smooth for easy cleaning. Washable epoxy resin paint for the walls is ideal, because it lasts a long time and can withstand a daily washing programme. Cheaper paint has a tendency to break off and may fall in an open surgical wound. Tiles are generally not recommended as these are difficult to clean and collect dust easily.

The walls and ceiling often are used to mount essential devices and equipment to reduce crowding of the floor area therefore the walls must be solid and robust enough to carry the weight of equipment. The ceiling may be used for mounting an operating microscope, or an electrosurgical unit in addition to the operating light and boom.

The walls must be fitted with outlets for oxygen, other medical gases and vacuum, and where possible, an anaesthetic gas scavenging system should be fitted at floor level. There is also a need to fit multiple electric outlets on the walls.

2.1.2 Floors

Floors should be smooth, without cracks and breaks, made of materials that will reduce static and should not endanger the safety of personnel. The surface of the floor shall provide a path of moderate electrical conductivity between all persons and equipment making contact with the floor to prevent the accumulation of dangerous electrostatic charges. The floor covering should be specified, such as continuous thick and tough vinyl, and the manufacturer's guidelines for cleaning and maintaining the floor must be available in the cleaning policy. The floor covering should be curved up the wall to 2.5 cm, thus ensuring that edges are coved and easier to clean than right angled floors.

The floor surface must be suitably hard, nonporous and appropriate for frequent cleaning and there should be no cracks. The floors should have a nonslip surface, to prevent staff from slipping and injuring themselves. When floors are being cleaned, a warning sign "wet floor" should be put up to warn the personnel.

2.1.3 Doors

Ideally, sliding or swing doors (self-closing) should be used in the OT. Sliding doors are recommended which must remain closed at all times, particularly during an operation because the microbial count in the air rises every time doors swing open from either direction. There must be a clear glass viewing window in the door to prevent frequent opening and closing of the door.

The doors of the OT will require baffle plates to balance the airflows.

2.1.4 Lighting

Most OT lights are white fluorescent because they cast minimal shadow. Lighting should be evenly distributed throughout the room. The anaesthetist must also have sufficient light.

The overhead operating light must:

- a) Be near daylight in colour and free of shadow
- b) Give contrast to the depth and relationship of all anatomic structures. The light may be equipped with an intensity control mechanism. The surgeon may ask for more light when needed therefore a reserve light should be available (e.g. a mobile operation light).
- c) Provide the diameter light pattern of a focus appropriate for the size of the incision. These are adjusted with controls mounted on the light fixture.
- d) Be freely adjustable to any position or angle. Most overhead operating lights are ceiling mounted on mobile fixtures. It can be positioned so that light is directed into a single incision or two concurrent operative sites.
- e) Be spark-proof where anaesthetic gases are used.
- f) Produce minimum heat to prevent injury to exposed tissues, to ensure the comfort of the sterile team, and to minimize airborne micro-organisms.
- g) Be easily cleaned. Tracks recessed within the ceiling virtually eliminate dust accumulation.

Suspension-mounted tracks (booms) or a centrally mounted fixture must have smooth surfaces easily accessible for cleaning. A source of light from a circuit separate from the usual supply must be available for use in case of power failure. In case one of the bulbs is not working, it should be replaced as soon as possible, to provide sufficient lighting at all times during an operation. **NO** oil, for example liquid paraffin, should be put on the operating light.

2.1.5 Ventilation

The ventilating system in the OT must be mechanical ventilation, supplied from an independent air handling unit (AHU) which ensures a controlled, filtered, clean air supply. Air changes and circulation provide fresh air and prevent accumulation of anaesthetic gases in the room.

2.1.5.1 *Types of Operating Theatres*

There are usually two types of OTs. The conventional OT is where 20-24 ACH are delivered via mechanical ventilation ducted into the room and removed via an exhaust system. This is the more common type of ventilation available for conventional OTs for general surgery.

The second type of OT is the ultra-clean or laminar flow OT. Here, 80% of extremely clean air is re-circulated via a canopy above the operating area, and this unidirectional airflow can be up to 300 m/s (meters per second) forming a curtain of air. This type of OT is used for ultra-clean operations like implant surgery.

Wall mounted or floor standing air conditioners are not considered appropriate for providing clean air in a sterile environment, they only cool the air and are strongly discouraged. The filters clog up easily with dust which comes in directly from the outside and need frequent changing. They do not remove stale air from the OT which increases the risk of infection.

2.1.6 Air Flows

In the OT there should always be positive pressure which enters the OT suite in the preparation or layup room, to ensure safety of the surgical instruments when the trolleys are being laid up for surgical procedures. The Layup and OTs should have the highest positive air pressure which flows outwards to the scrub areas, and sub-sterile rooms. Positive pressure forces air out of the room.

Air-conditioning units may be a source of micro-organisms that pass through the filters. These must be changed at regular intervals to prevent this and the ducts must be cleaned regularly according to the manufacturer's recommendations. If air conditioners must be used, the position of the air-conditioning units should be determined in consultation with the hospital engineers, surgeons, infection control persons and other relevant cadres.

Wall mounted air conditioners (which do not regulate the contamination of the delivered air) should be replaced by conventional airflow systems.

2.1.7 Temperature and Humidity

The temperature should be maintained at 21 +/- 3 degrees Celsius inside the OT all the time with corresponding relative humidity between 50 to 60%. Appropriate devices to monitor and display these conditions inside the OT may be installed.

Moisture provides a relatively conductive medium, allowing static to leak to earth as fast as it is generated. Sparks form more readily with low humidity and fires are a potential hazard.

2.1.8 Gas Scavenging System for Anaesthetic Explosive Gases

In most countries an anaesthetic gas scavenging system is put in place to avoid major explosions. Since most anaesthetic gases are heavy they sink to the bottom and there is a danger of fire or explosion should a spark be produced. The latter can happen if the humidity is below 45% or with diathermy machines.

2.2 Administration in the Operating Theatre

2.2.1 The Operating List

The nurse in charge of the OT has the sole responsibility of managing all the activities of the OT. The activities include among others the theatre lists and communication with the surgeons in case of changes in the operation list.

The nurse in charge of the OT should therefore be given all the necessary support to correctly execute his/her responsibilities regarding theatre activities.

It is essential to have a written operation list for all elective cases. This helps the OT staff to adequately prepare for the surgical procedures.

The following is recommended:

- The operation list should preferably be sent by 12H00 on the day before the operation.
- The operation list should be handed in physically or by fax or email and **NOT** telephonically.
- The name and contact details of the Doctor/nurse who compiled the theatre list should be clearly indicated.
- The surgeon should discuss the operation list in co-operation with the OT nurse-in-charge.
- The operation list must not exceed the permitted time allocated to it. Note: this does not refer to the time during an operation of an individual patient)
- The operation list should preferably be put on a notice board near the patient's admission/ entrance to the OT.

2.2.1.1 Facts that must be taken into consideration when operations are booked

- The age of the patient plays an important role, for example an infant or a small child should not be placed at the end of a list. The same applies to the elderly person. Children and the aged must not be starved for too long.
- Types of operations – major operations e.g. laparotomy are always booked at the beginning of the operation list.
 - A diagnosed abscess or in case of doubt/uncertainty, the operation should preferably be done at the end of the slate.
- Emergency cases such as acute abdomen and caesarean section should always be considered a priority.
- Patients with a state of disease such as Diabetes Mellitus must not be starved for long periods. The patient may become comatose.
- Abbreviations should never be used e.g. D&C (dilatation and curettage) as abbreviations may cause confusion to personnel.

2.2.1.2 Particulars that Should Appear on the Operating List

- The time, day, and date when the operation will be performed.
- Full names, surname, gender, age as well as the form of address e.g. Mr. Mrs or Miss.
- The name/number of the ward in which the patient lies, as well as the sex e.g. male or female.
- A clear description of the type of operation to be performed. When an operation is to be performed on an extremity, or inguinal hernia repair, it should be clearly indicated which side e.g. left or right, and must be checked with the patient as well. This is important to prevent an operation being performed on the wrong side or the wrong operation.
- The scheduled time for the operation should also appear on the list. If the surgeon decides to do a patient earlier or later on the scheduled list or cancel an operation, the OT nurse must inform the nurse in the particular ward of the change on the operating list immediately.
- The name of the surgeon as well as the anaesthetist must appear on the operation list.
- It must be indicated whether the patient is a state or private patient, as well as a major or minor case.

Preferably the OT nurse must inform the nurse of the specific ward when the next patient on the list should be given his/her pre-medication if indicated.

2.2.2 The Registers Used in the Operating Theatres

Different registers are used in the OT, namely:

1. Operation registers
2. Register regarding abortions and pregnancy residues
3. Register for foreign objects
4. Medicine register
5. Specimen register for biopsies
6. Death register

2.2.2.1 Operating Register

Every operation done in the OT, whether under general or local anaesthetic, must be recorded in the operation register.

The operating register is a legal document, so are the operating slips, and both must be stored in the section for enquiry as well as for statistical purposes for at least five years.

All the information and particulars of the patient which appear on the operating slip must be complete and in detail and be recorded in the operating register:

- The patient's full names and surname
- Registration number and age
- Ward in which the patient is admitted
- Full description of the operation performed
- Suturing material, type of skin sutures, draining tubes, catheters, prosthesis, etc.
- Comments made about the amount and type of swabs use during the operation and the correct certification thereof
- Initials and surname of anaesthesiologist
- Anaesthetic agent used for anaesthesia
- Signature of scrub nurse, as well as the amount of specimens sent to the laboratory
- Indicate whether the patient is male or female
- Indicate whether the patient underwent major or minor surgery
- Indicate whether the patient is a state or private patient
- Duration of the operation

It is every nurse's responsibility to record his/her operation slips of the day's operations, for which s/he acted as scrub nurse, in the operating register and to sign next to it.

The scrub nurse who counted the swabs must sign the register daily before s/he goes off duty.

It is important that monthly statistics are kept up to date and are marked in red. Every new month's operations must be started on a new page with the relevant month written on top of the page. The operation slips must, after recording them in the operation register, be crossed out as proof that they in fact were recorded in the register. These slips must be kept in the section and in a special storing or filling area.

Should a patient go into cardiac arrest in the theatre or dies on the operating table, this information must also be recorded in red in the operation register.

It is advisable to record the time and date of the operations on the cover. This makes the searching process easier in case of a query.

2.2.2.2. Register regarding Abortions and Pregnancy Residues

According to the Health Legislation (Act No. 2 of 1975) any person in-charge of an institution in which an operation is performed, which has a bearing on an abortion or the removal of pregnancy residues, must record the particulars of such an operation.

It is thus necessary to keep a special register for the purpose of abortions and the removal of pregnancy residues.

Refer to the Act on abortion and sterilization Act (1975), as amended through Act 48 of 1982. The register and other relevant documents must be kept for at least five years. It is important for the register to contain the following information:

- Name and surname of patient
- Registration number
- Age/ marital status/ nationality
- Name and surname of the doctor who referred the patient
- Name of the assistant surgeon if applicable
- Description of the operation being performed
- Name and surname of the anaesthetist
- Type of anaesthetic agent being used
- Reason for the legal abortion/ operation
- Remarks in case of any visible signs of injury
- Specimens for laboratory

Monthly statistics must be kept up to date. The special form for the notification of the operation pertaining to an abortion and the removal of pregnancy residues (Act No. 02 of 1975) must be completed in duplicate. The original forms must, on a monthly basis, be sent to the medical superintendent's office for cognizance. The duplicate remains in the theatre and must be filed.

2.2.2.3 Register for Foreign Objects

Every institution must keep a register for the recording of foreign objects.

- Foreign objects, for example bullets, knives, etc., must be stored in a cupboard marked "Foreign objects" and the key must be kept by the nurse in-charge
- The said objects may be used as evidence, should a court case evolve and the police are in need of the object
- Foreign objects may not be handed over to any person except to a law enforcement officer who must identify him/herself as such
- The person receiving a foreign object must sign the register in the appropriate place and fill in his/her Registration number

The following information must be recorded in the register:

- Name and age of patient
- Registration number and ward
- Date of procedure
- Signature of the scrubbing nurse
- Description of object removed
- Signature of the surgeon
- Signature and registration number of the person receiving the object

2.2.2.4 Medicine Register

A variety of medicines are used in the theatre, especially for the administering of an anaesthetic.

It is therefore important that there is strict control of all the different medicines, as well as proper recording into registers. Schedule 3 and 4 and Schedule 4 medicines may not be stored in the same poison cupboard, but in separate cupboards, which are clearly marked "Poison Schedule 5".

- The poison cupboards must be in a proper place and must be wall-mounted
- The poison cupboards must have a double lock and the keys must be kept by the nurse in charge
- The keys may not be given to any unauthorized person or left in drawers

The medicine register must be checked once a week by the nurse in-charge of that section. The medicine register must be kept for at least five years.

Internal rules in connection with the administering of scheduled medicines and the keeping of registers

1. Scheduled agents must be checked by two people, of which one must be a registered nurse. If another nurse is not available, for whatever reason, any person who can read and write may be asked to check the medicines with the registered nurse
2. Both persons must go to the patient and make sure the prescribed amount of the prescribed medicine is administered to the person whom it was prescribed for. Check the identification label on the patient
3. Syringe and needle must be taken to the patients' bed in sterile receiver. The medication may only be drawn up in the syringe at the patients' bed
4. Immediately after the medicine has been administered it must be recorded in the register and signed by both persons. It must then also be recorded on the patients' treatment chart and cardex
5. If the registered nurse, who checked the medicine, cannot, for whatever urgent reason, accompany the nurse to the patient, a second nurse may check the ampoule and accompany the nurse to ensure it is administered to the correct patient. In this case the third person's signature must also appear in the register
6. Complete full name and registration number of the patient, doctor, administrator of medicines and control person's name and signature must be recorded
7. The rank of the administrator and controller must clearly be recorded behind the signature
8. The signature of the administrator must correspond with the signature on the patient's treatment chart and card

9. The strength of the medicine administered and not the amount of the medicine must be recorded
10. A balance of the supply ampoules and tablets may not be filled in beforehand
11. Two people must check the scheduled medicines together
 - a) The person receiving scheduled medicines from the pharmacy must, on return to the section, check these again with a second person
 - b) If an ampoule or tablet breaks by accident, the broken ampoule or tablet must be checked by a second person in the section and reported to the pharmacist. An incident report must be sent at the same time. A faulty recording made in the register must be cancelled by a straight line and initialled by the person who made the entry and reference to the correct page must be given. A second person must sign as well
 - c) Nobody may delete anything from the register

The person, who checks the registers regularly, must make the entries in red ink. Two people must always check the medicines and sign the register. The two people who check the medicines must pay special attention to the expiry date, batch number, and that the letters on the ampoule are clearly legible and whether the ampoule is intact. Also check whether there are no holes in the ampoule through which the content may leak. Entries must be carried over to a new register by the pharmacist when the medicine register's pages are full.

2.2.2.5 Specimen register for biopsies

For efficient control over specimens, it is necessary to keep a book/ register in which all specimens are recorded, with the same information as on the label. A space should be made available for the signature of the person who recorded the specimen into the book/ register, as well as the signature of the person who received the specimen at the laboratory.

- The specimen must be clearly marked with the following information on the label:
 - The name and surname of the patient
 - The registration number
 - The ward in which the patient is placed
 - The type of specimen
 - The name of the operation
 - The date and time when the specimen was taken
 - The required laboratory test
 - The name of the surgeon
- At the end of the day's operating schedule the nurse should check all specimens with the entries in the book/ register

- A reliable person, for example the porter, then takes the specimens and the book/ register to the laboratory and the person who receives them at the laboratory signs the specimen book in the space provided for this purpose
- In the space provided on the operating slip it must be recorded that the specimen was sent to the laboratory. This information must also be recorded in the operation register
- It is very important that every specimen carries the correct information to prevent a mix-up of specimen which may lead to a faulty diagnosis and treatment

2.2.2.6 Death Register

Any death that occurs in the OT, whether under general or local anaesthetic, must be recorded in the death register. The death register can be a modification of the operating register with added columns for documenting time of death, name and signature of the Doctor who certified the death and comments section e.g. for post-mortem findings.

The death register is a legal document and must be stored in the section for enquiry as well as for statistical purposes for at least five years.

All the information and particulars of the patient which appear in the operating register must be complete and in detail and be recorded in the death register by the scrub nurse:

- The patient's full names and surname
- Registration number and age
- Ward in which the patient was admitted
- Full description of the operation performed
- Suturing material, type of skin sutures, draining tubes, catheters, prosthesis, etc.
- Comments made about the amount and type of swabs use during the operation and the correct certification thereof
- Initials and surname of anaesthesiologist
- Anaesthetic agent used for anaesthesia
- Signature of scrub nurse, as well as the amount of specimens sent to the laboratory
- Indicate whether the patient is male or female
- Indicate whether the patient underwent major or minor surgery
- Indicate whether the patient is a state or private patient
- Duration of the operation
- The name of the Doctor who certified the death

The surgeon should request for a post-mortem. Nothing should be removed from the patient (e.g. endotracheal tubes, intravenous lines, drainage tubes, urinary catheter).

The scrub nurse should inform the Theatre in Charge immediately.

Note: In case a separate death register does not exist the above information must be recorded in red in the operation register.

2.3 Visitors to the Operating Theatre

2.3.1 Introduction

The main objective of medical staff of OTs remains the creation of a safe environment, conducive to healing, and the protection of patient privacy and integrity. Allowing unauthorized people into this environment will violate this responsibility. The anaesthetized patient depends on the care giver to protect him/her against such intrusion of privacy, not authorized by him/her.

2.3.2 Definition

Visitors to the OT include all people not forming part of the medical and nursing team allocated to the specific procedure at the allocated time.

2.3.2.1 Objectives

- To protect the patients privacy;
- To restrain the entering of unauthorized people into the OT;
- To ensure that the patient has given informed consent for the presence of the visitor;
- To establish a guideline for visitors to the OT.

2.3.2.2 Recommendations regarding Visitors to the Operating Theatre

Medical representatives are only allowed into the OT if they are there to demonstrate operating equipment, medical devices or loan instruments. It is best to obtain permission from the Medical Superintendent before starting the demonstration.

- a) All medical representatives (for example sales representatives of medical equipment/devices and pharmaceutical products) should report to the theatre manager for permission to enter the OT.
- b) Informed consent should be obtained from the patient prior to the induction of anaesthesia
- c) Surgeons requiring the presence of medical representatives are to discuss this with the patient. Surgeon should obtain patient's permission and document these consent in the notes
- d) Medical representatives may enter the sterile field only if they have gowned and gloved correctly under the supervision of scrub nurse
- e) The medical representatives may enter the OT on the scrub nurse instructions after the patient has been cleaned and draped
- f) The medical representatives must be informed of areas where they may enter and attend to the procedure

- g) Medical representatives may guide and advise the scrub nurse and surgeon on use, assembling and sequence of use of instruments and implants but not work directly with the patient
- h) Family members are not allowed to watch or be present at any surgical procedure EXCEPT for caesarean section as indicated below
- i) A mentor must accompany medical students and the level of study should be determined prior to entering the OT
- j) Having unauthorized people in the OT will grossly violate the patients' right to privacy and confidentiality (as stated in the Namibian constitution)

2.3.2.3. During a Caesarean Section

If the father requests to be present during the procedure:

- The surgeon, anaesthetist and paediatrician must give permission
- The midwife is to accompany the father and advise him on the correct attire
- The midwife must show the father the OT change room and waiting area
- It is advisable to inform the father on the process of the procedure
- The father is only allowed into the OT after induction, cleaning and draping of the patient and with permission from the surgical team
- If the family wishes to take photos or videos at the birth, permission must be given before the procedure by the entire team, as per the health facility policy/standard operating procedures
- The father must be advised and informed on the entering of the sterile field, the role of each team member, and his role inside the OT
- The father must be advised to indicate if he is not able to cope with any of the activities and to leave the theatre rather than inhibit the work of the team
- When the midwife takes the baby to the nursery, the father goes with her. He does not stay until the end of the operation

2.3.2.4 Parents

- Parents may accompany young children to the OT waiting area
- Parents who enter the OT are dressed appropriately (according to the hospital policy) to relieve anxiety in the child. Surgeon, anaesthetist and scrub nurse must give permission
- The parent may stay with the child until the first phase of anaesthesia is completed
- Parents must be guided not to interfere with the work of any of the team members
- Parents must leave the theatre on the instruction of the scrub nurse, surgeon and anaesthetist

2.4 Medical - Legal Risks (Precautions)

2.4.1 Introduction

Every patient's care falls within the **Regulations R.2598 of November 1984, relating to the scope of practice of persons enrolled or registered under the Nursing Act**, where s/he, as a nurse, carries the responsibility for his/her action and omission, as well as the one of her colleagues of whom s/he is the superior.

Any accidents or injuries must immediately be reported to the nurse in charge. Law suits may arise from a multitude of aspects in the theatre.

2.4.2. Three Types of Law

2.4.2.1 Common Law

Consisting of unwritten rules, applicable to all citizens, like:

- Good habits and traditions which are binding through long use
- Religious principles
- Duty of Care - each healthcare worker is bound by Duty of Care to do his or her best in executing duty to the best of his or her ability

2.4.2.2. The Statutory Law

This law clearly stipulates what is applied by the state or other authorized bodies. In the case of the latter it only applies to a certain group for example the Law on Nursing.

2.4.2.3 The Patient Charter

All aspects of healthcare must be of the highest standard. Organization and supervision must be of such a quality that the members of staff are at all times familiar with the methods used in an OT.

2.4.3 Risks in the Operating Theatre which can Lead to Possible Law Suits

2.4.3.1 Identification

Insufficient identification as a result of:

- Not checking the patients name verbally and comparing it with that on the hand band. Be careful with the usage of first names
- Incomplete full name and surname
- Absence and incomplete of wrist band, name, registration number and procedure
- Not indicating the correct side which needs to be operated on – left or right
- Allergies
- Baby born through caesarean – Absence of wrist band in theatre on arm and leg

2.4.3.2 Permission

Nurses must realize that no operation or procedure in the theatre may be performed without a valid informed consent. Should this happen, the case may be reported as assault. According to the policy of the Ministry of Health and Social Services, written permission must be obtained.

- An informed consent must be signed for both the operation and the anaesthetic
- Permission must be given voluntarily and with full insight
- The doctor must give the patient a full and comprehensive account of what will be done, the consequences thereof and the risks involved
- Ignorance makes consent invalid
- The patient must be fully conscious and may not be under the influence of any medicines. The patient must sign before the administering of any pre-medication
- The consent form clearly states:
 - The name of the patient
 - The type of operative procedure or surgical performance
 - The date
 - Type of anaesthetic

2.4.4. Surgical Asepsis

Sterility and maintenance of a high standard of aseptic techniques are of primary importance. Hygiene of the surroundings must be maintained at all times.

Personnel

A high standard of personal hygiene is expected and each staff member must maintain a high standard of sterile technique. The nurse in-charge must see to it that his/her staff do not always work under pressure and stress. The organization of the operating section must be such, that precautionary measures are possible for all patients, even if an extremely heavy burden is placed on the staff. Suturing material, syringes and instruments must be sterile. The autoclave must be in working condition and serviced regularly (refer to the CSSD Guidelines). The cleaning of the theatre after a septic case and the day's operating schedule is essential.

2.4.5. Checking of Instruments, Swabs and Needles

Strict control over instruments, swabs and needles is necessary. The scrub nurse should ensure that the tally of all instruments, swabs and needles is correct. If the tally is not correct, s/he should inform the surgeon. If the surgeon is told that the tally is short or missing the medical devices issued, and continues to close the wound, he or she will be held responsible. A written report must be done should a swab, instrument or needle be missing.

2.4.6 Assistance during Operation

In case of emergencies, a nurse may assist if a second surgeon is not available. BUT s/he must change her role to an assistant and not hand the instruments to the surgeon and count the swabs. Should a nurse assist in an operation, s/he should write an incident report to the accounting officer of the hospital. Nurses may not assist during an illegal operation, for example an illegal abortion, or s/he will be regarded as an accomplice.

2.4.7 Keeping of Reports

Full reports of every operation must be kept, for example:

- Full name and surname of patient
- Date of operation
- Initials and surname of surgeon and assistant
- Anaesthetist – initials and surname and type of anaesthetic administered
- Operation done, amount of swabs used, drainage tubes, suturing material and catheters used
- Nurse who assisted during operations – initials and surname
- Circulating (runner) nurse – initials and surname
- Time – beginning to end of anaesthetic

This report may be needed for medico-legal cases. It is therefore essential that it is at all times complete.

2.4.8 Injuries

Members of OT staff, and or patients might sustain injuries during an operating session. These are to be considered as injury on duty for the staff and as medical negligence for the patient following proper investigations. All records must be kept of the incident. Some examples are shown below.

2.4.8.1 Burns

- Theatre lights without heat shields
- Warm instruments, for example wound hook
- Rinsing water used in the peritoneal cavity
- Faulty diathermy machine and plate
- Neglect to use the foam rubber mattress
- Incorrect use of electric blanket or warm water bottle
- Strong chemical solution for the preparation of the skin or cleaning purposes
- Shoulder supports incorrect or in a faulty position
- Injury of the healthy part of the body next to or near to the wounded part, for example the tongue during a tonsillectomy operation, or injury to the face or nerves during a mastoidectomy

2.5.8.2 Fall

An unconscious patient can easily fall off an operating table or trolley if there is no sufficient supervision and safety belts are not tied properly.

2.4.8.3 Position

Injuries can occur because of faulty positioning:

- Nerve, vein and joint injuries because the feet are crossed
- Incorrect way of picking up the legs which are placed in a lithotomy position.

2.4.8.4 Tourniquet

Incorrect use could injure veins and nerves if:

- A tourniquet is kept on too long
- Neglect or forgetting to remove a tourniquet

The time span in which a tourniquet is used must be recorded in the patients operating notes as well as in the operating register.

2.4.8.5 Electric shock

Faulty electric apparatus, for example diathermy machine and suction apparatus can cause electric shocks. Therefore electric apparatus must be checked daily for loose wires or faulty conditions. All electric apparatus and supply must be checked and maintained frequently by the electrical/ technical workshop.

2.4.8.6 Apparatus

Maintenance of all apparatus and equipment, for example the anaesthetic machine, operating table, monitors and defibrillator must be done thoroughly and must be ready before the operation commences.

2.4.8.7 Other causes of injuries

- Oxygen cylinders not fixed
- Sharp, dangerous objects within reach of patient
- Faulty instruments
- Swinging doors
- Slippery, wet floors
- Splints
- Faulty respirators

2.4.8.8 Explosions

Flammable and volatile anaesthetic agents, such as ether, if used without due care and inadequate ventilation may explode or combust, causing serious injury. Diathermy should not be used where open anaesthetic gases are being administered.

2.4.8.8.1 Precautionary Measures

- Anaesthetist must give permission for the use of diathermy and other electrical equipment
- Oxygen cylinders must be in stands to prevent them from falling over
- No open flames are allowed in the theatre
- Prevent the build-up of static electricity. Make sure the air conditioner works efficiently
- No one should smoke in the OT. Put a “No Smoking” sign where everyone can clearly see it
- Prescribed clothes must be worn at all times

2.4.8.9 Mental (psychological) Injuries

- Irresponsible remarks in front of patients, especially during induction of anaesthetic.
- Giving incorrect information.
- Information to the press. Special permission must be given by the patient as well as the medical superintendent for the issuing of medical and related information.

2.4.8.10 Violation of Privacy and Name

- Disclosure of a patient’s personal particulars
- Neglect of professional confidentiality
- Giving out information about a patient to a person whom it does not concern
- Indecent exposure or display of a patient

2.4.8.11 Care of Unconscious Patients

An authorized person must guard the patient to avoid complications and must administer intensive care to a patient during the recovery period. Death during the recovery period can take place due to improper care.

2.4.8.12 Blood

Proper, precise identification of blood must be done by means of checking the patient’s name and file. Faulty blood transfusion can result in death. Unfavourable (adverse) reactions must be reported immediately. Refer to policy of blood and blood products transfusion.

2.4.8.13 Resuscitation

Equipment must at all times be available and in a proper working condition, for example monitors, respirators, defibrillators, etc.

2.4.8.14 Medication

- Strict control
- Registers must be correct and up dated
- Check any allergies on the patient’s chart

- “Medical Alert” tokens may not be removed
- Cautious checking and control of strength of medication

2.4.8.15 Tissue specimen

Missing or incorrectly marked specimen can have serious consequences both for the patient management and also medio-legal implications.

Foreign objects removed, for example a bullet, must be stored, for a possible police investigation.

2.4.8.16 Accidents

Accidents and injuries in the theatre must be filled in the prescribed form and signed by the person who knows about the incident.

2.5 Central Sterile Services Department

2.5.1 Introduction

This section provides a summary of CSSD services and should serve as a reminder. There is a separate CSSD Guideline which should be referred to for detailed information.

The sterilizing and disinfecting unit should be designed to allow for effective uni-directional work flow for sterilizing and disinfecting equipment. Ideally all cleaning, disinfection and sterilization should be carried out in the CSSD. (Refer to the CSSD Guidelines for further information).

Even in a small one-room unit (called a Theatre Sterile Services Unit or TSSU), the separation of activity sites and the flow of work can be achieved by careful planning and renovation and physically separating areas using racks and ventilation.

There should be a dedicated area for cleaning equipment and instruments, preferably physically separated and under negative pressure ventilation.

Sterilization in the OT is not recommended but should it happen, the personnel need to ensure that the equipment used is effective. There must, therefore, be validation processes in place which will ensure that sterility is obtained. For other matters such as the number of sterilizers and packaging material refer to the **CSSD Guidelines**.

2.5.2 Recommendations Regarding Sterile Services

- The design of the sterilizing and disinfecting unit, and the layout of equipment, ensures flow of work from the soiled (dirty area) to the clean side of the unit
- There is a washing and decontamination area, with stainless steel sinks and running water, and a sanitary sewage system
- There is a pre-packing area with storage facilities for clean materials

- There is a storage area for sterile packs with racks that allow for an adequate circulation of air
- Adequate light and ventilation is available
- There is an adequate number of sterilizers that are capable of sterilizing porous loads (gowns, drapes and dressings), as well as wrapped and unwrapped instruments
- Where ethylene oxide is used as a sterilizing agent, the installation complies with relevant safety standards and legislation
- Autoclave sterility is tested daily and the test results are recorded
- The sterility of each pack is shown on indicator tapes that are suited to the processes used

CHAPTER 3: THE PATIENT

This section deals with the patient assessment, consent form for operation, and post-operative care.

3.1 Consent to an Operation

The purpose of the consent is to:

- 1) Protect the patient from unnecessary invasive procedures
- 2) Protect the surgeon and health facility from claims of an unauthorized operation or invasive procedure
- 3) Ensure that the patient makes an informed decision

3.1.1 General Recommendations

The attending doctor must adequately explain to the patient in a clear and simple language the following:

- The proposed operation
- The purpose of the operation
- The nature of the operation
- The extent of the surgical procedure
- Potential risks and complications
- Expected outcome of the procedure proposed
- Other available treatment options and
- Pre-operative advice to the patient regarding diet, bathing, smoking and other factors that might affect the outcome of the operation.

Note: Adequate translation must be provided for patients with a language barrier.

The anaesthetist also has a responsibility to inform the patient of the following:

- Any unfavourable reactions to medication or anaesthetic agent that may be given during the operation; and
- The risks of anaesthesia must be explained but without causing the patient undue stress.

NOTE:

- Written informed consent is necessary for any procedure that may possibly be injurious to the patient.
 - The patient has a right to withdraw his/her written consent prior to the operation if his/her determination to do so is a rational one. The surgeon is then notified and the patient is not taken to the OT.

3.1.2 Information that should appear on the Consent Form

- The document must contain the patient's full name and surname, date of birth, age, sex and registration number
- The correct procedure to be performed as well as the type of anaesthesia to be administered e.g. general, local, spinal or epidural
- The patient or legal guardian's signature as well as in what capacity the legal guardian is signing, e.g. patient, mother, father, etc
- Signatures of the two witnesses of which one preferably must be a registered nurse
- Date and time when consent was obtained
- An illiterate person can give consent by means of a thumb print whereby the witness must indicate if it is the right or left print. ***In case the patient uses the thumb print, the name should be added in print.***
- The patient must sign before pre-medication is given and prior to going to the OT. It must be an informed consent freely given without coercion
- The patient giving consent must be of legal age (eighteen years and older), mentally sound and competent
- A consent form must be completed by one person only

NOTE: No surgical procedure is to be performed on a patient without a legal consent except in a life-threatening emergency situation. In a dire emergency consent is desired but not essential. In such a case the Medical Superintendent of the hospital must be consulted and may give consent to an operation. **Surgical procedures done without patients consent may give rise to legal suits in the courts of law.**

3.1.3 Persons not capable of signing their own consent

- A minor that is younger than 18 years
- A person who is mentally incompetent
- An unconscious or intoxicated/drunk person or after pre-medication was given

3.1.4 Persons capable of signing their own consent

- Persons who have reached the legal age of eighteen years and older, mentally sound and competent
- A married woman younger than eighteen years may sign her own consent Marriage makes her a major
- A minor illegitimate mother can give consent for her child, but not for herself.
- If sterilization is to be performed on a married woman, she can sign her own consent, but it will be advisable to obtain the husband's signature and vice versa. There must be a police declaration signed by the couple

- In the case of an unconscious patient the doctor will decide if an operation is necessary to save the patient's life. If the patient's life depends on an emergency operation, the medical superintendent of the hospital must be consulted and can give approval for the necessary operation to be done

3.2 Pre-Operative Assessment

3.2.1 A Pre-anaesthetic Assessment

The pre-anaesthetic assessment provides information needed to:

- Select the type of anaesthesia to be administered and plan anaesthetic care
- Identify any medicine sensitivities
- Safely administer the appropriate anaesthetic and
- Enquire about any relevant medical history

The duties of the anaesthetist are listed below:

- An anaesthesiologist or other qualified individual should conduct the pre-anaesthetic assessment
- Anaesthetic care is carefully planned and documented in the anaesthetic record
- The plan considers information from other patient assessments and identifies the anaesthetic to be used, the method of administration, other medications and fluids, monitoring procedures, and the anticipated post-anaesthetic care
- The anaesthetic planning process includes educating the patient and his or her family or decision-maker regarding the risks, potential complications, and options related to the planned anaesthesia and post-operative analgesia. This discussion occurs as part of the process of obtaining consent for anaesthesia. The anaesthesiologist or the qualified individual who will administer the anaesthetic provides this education
- Since anaesthesia carries a high level of risk, its administration should be carefully planned. A pre-anaesthetic assessment should be conducted and recorded

3.2.2 When to carry out an Anaesthetic Assessment

- An anaesthetic assessment of a patient for elective surgery should be performed a day before the anaesthesia is administered
- An anaesthetic assessment of a patient for emergency surgery should always be done before the patient is taken to theatre
- The medical assessment of surgical patients is documented before the start of the anaesthesia
- Interpret and act on any abnormal findings (e.g. blood pressure, haemoglobin, blood glucose, etc.) of the patient

3.2.3 Other Requirements

The pre-operative assessment will require a clinical check up by the surgeon prior to the operation. The surgical team should ensure that the patient fully understands the procedure and that the consent form is signed (see above).

3.3 Reception of the Patient in the OT

The patient is taken to the OT on a patient trolley with side rails in position. The patient should be accompanied by a nurse and a porter. At the reception area in the OT, the OT nurse receives the patient in a polite and friendly way.

The nurse escorting the patient should give his/her report to the receiving nurse and the information regarding the patient's identification and type of operation is checked. After handing over the patient, the escorting nurse must sign on the **progress report**. The following is recommended:

- The person who receives the patient should introduce themselves to the patient and ask the patient for his/her name and what kind of operation they have come for
- Patients with chronic illnesses should be asked if they took their medications e.g. high blood pressure and diabetes treatment and how many hours prior to operation
- Determine the condition of the infusion line
- Determine whether or not pre-operative dietary and fluid restrictions have been maintained. If not inform the anaesthetist. Aspiration for gastric contents during induction of anaesthesia is a danger
- If applicable, check whether the anatomical site of the operation is clearly spelt out
- Check whether the patients vital signs were taken prior to coming to theatre
- Ensure that the surgical safety check list is attached to the patients file

3.3.1 Pre-operative Check of Patient Particulars

3.3.1.1 Identification of the patient

- The OT nurse must check the patient's identification wristband and records.
- Check with the patient, by asking what his/her name is
- Check at the same time on the arm band on the patient arm, the charts and the operation list, to ensure that it is the correct patient for the correct operation
- Check if the side rails or restraining straps are firmly in position

3.3.1.2 Consent to an operation

The OT nurse who receives the patient from the ward must ensure the following:

- The patient has signed the operation consent

- The patient understands what the operation entails. Ask the patient what operation is to be performed and whether the doctor has explained the whole procedure
- The correct operative site is marked, especially where the operation is to be performed on an extremity or repair of inguinal hernia

The operation consent must be completed correctly, and signed by the patient, parent or legal guardian as well as the surgeon and the two witnesses.

3.3.1.3 Cortisone treatment and other prescribed medications

Check on the prescription as well as on the treatment chart if cortisone has been prescribed and any other medications that the anaesthetist should be aware of. If medications have been prescribed, the anaesthetist must be informed accordingly.

3.3.1.4 Pre-medication

Observe the patient's anxiety level. Check the patient's prescription and treatment charts to ensure that the prescribed pre-medication was administered, as well as the correct dosage at the correct time. Observe the patient for possible reaction to pre-medication. If the patient shows a reaction, it must immediately be brought to the attention of the anaesthetist.

3.3.1.5 Allergies

Check the medical history, physical examination, laboratory tests and x-ray reports. Pay particular attention to allergies and previous unfavourable reactions to anaesthesia, antimicrobial agents or blood transfusion.

3.3.1.6 Urine test

If indicated, make sure that the urine was tested and if any abnormalities were detected and charted. Check whether an indwelling catheter is inserted. Check for proper drainage. Abnormalities in the urine must be reported to the anaesthetist/surgeon.

3.3.1.7 Empty Bladder

To prevent over distension of the bladder or incontinence during unconsciousness, check whether the patient has voided. The patient should void to empty the urinary bladder just before transfer to the OT. Time when patient last voided must be recorded. Most abdominal surgery will require a urinary catheter in place to ensure fluid balance checks.

3.3.1.8 Dentures

Dentures and removable bridges are removed for general and local anaesthesia unless otherwise ordered by the anaesthetist. This is to prevent obstruction of respiration under anaesthesia. Prosthesis such as an eye, false teeth extremity, contact lenses and glasses are removed for safekeeping.

- All jewellery (*including wedding rings, body piercings, traditional body and head gear*) should be removed for safekeeping
- If it is impossible to remove the wedding ring, it must be securely taped or tied to the finger to prevent loss
- Nail polish is removed from the patient's finger and toes to permit observation of nail bed colour, an indication of oxygenation and circulation

3.3.2 Pre-operative Preparation

3.3.2.1 Skin preparation of the patient

The purpose of skin preparation is to render the operative site as free as possible from transient and resident micro-organisms, dirt, and skin oil so that the incision can be made through the skin with minimal danger of infection from this source.

Mechanical cleansing: (Refer to the MoHSS IPC Guidelines 2nd Edition 2014 Chapter 8)

Skin preparation: Ordinary bathing with soap and water prior to the operation will remove excessive dirt and grim and make the patient feel better and more presentable for the operation.

In some situations, the surgeons will ask that the patient be bathed in 2% chlorhexidine, especially for implant surgery. This should be provided by the healthcare facility and used the night before the operation.

Patients whose operations will be performed on the face, eye, ear, or neck are advised to shampoo their hair prior to hospital admission as this may not be permitted for a few weeks post-operatively.

All patients should shower or be bathed after hospital admission as close to the time of departure to the OT as possible. The operative site and surrounding area should be thoroughly cleansed with a rapid-acting antiseptic agent such as povidone iodine, if requested by the surgeon. Usually skin preparation takes place in the Operating Theatre.

NOTE: History of allergies must be obtained before applying any chemical agent to a patient's skin.

3.3.2.2 *Hair removal*

Hair removal from the skin surrounding the operative site may be necessary. Usually the surgeon is responsible for designating in the patient's pre-operative order the limits of the skin area and how it is to be prepared. The procedure is carried out by nursing personnel, as per hospital policy and should be done in the anaesthetic room or the OT but NOT in the ward prior to moving the patient to the operating theatre.

NOTE: Skin preparation may be an embarrassing procedure for the patient. Drape the patient to expose the area to be prepared, but avoid unnecessary exposure.

Hair may be removed by shaving with clippers or application of a depilatory cream after a skin test has been done to determine allergy. **RAZORS AND SHAVING IS NOT RECOMMENDED.**

3.3.2.3 Nil per mouth

Oral intake is discontinued as ordered, usually nothing by mouth/Nil per Os (NPO) for 8 hours preceding the operation, to prevent regurgitation or emesis and aspiration of gastric contents. This instruction is also given to ambulatory surgery patients to follow at home.

The nurse must review the orders and nursing care plan. Ask the patient if he or she has taken anything by mouth, if NPO order was written to prevent aspiration.

NOTE: If the patient is a smoker, s/he is not allowed to smoke prior to the operation. If the patient had something to eat or to drink just before transportation to the operating theatre, the anaesthetist must be informed immediately.

- Depending on the patient's condition, the surgeon may postpone the operation to a later date, as anaesthesia would be hazardous
- In cases of emergency where the patient was not kept nil per mouth, a nasogastric tube is passed on orders of the surgeon, otherwise anaesthesia may be hazardous
- The form is then signed by the ward nurse as well as the OT nurse
- The patient is now taken to the waiting area and never left alone. The patient is made comfortable and continuously observed by the nurse allocated to the waiting room
- The patient is not to be disturbed by unnecessary conversation etc. A quiet, restful atmosphere enables the patient to gain full advantage of pre-medication

3.4 Monitoring and Recording the Physiological Status

3.4.1 During Anaesthesia and Surgery

- Each patient's physiological status should be monitored and recorded during anaesthesia and surgery
- The anaesthetist monitors and records the physiological status of the patient during anaesthesia, and enters the anaesthetic, medication and intravenous fluids used in the patient's anaesthetic record
- The anaesthetist should have access to the patient care notes and know the findings of the medical examination. It is important that each health professional has access to the records of other care providers, in accordance with the MoHSS healthcare facility policies and guidelines

3.4.2 Monitoring and Recording of the Patient's Post-anaesthetic Status

Each patient's post-anaesthetic status should be monitored, and the patient is discharged from the recovery area in accordance with accepted guidelines. Physiological monitoring provides reliable information about the patient's status during the administration of anaesthesia and the recovery period.

Monitoring methods depend on the patient's pre-anaesthetic status, anaesthetic choice, and the complexity of the surgical or other procedure performed during anaesthesia. In all cases, however, the monitoring process is continuous, and the results are entered into the patient's record. Monitoring during anaesthesia provides the basis for monitoring during the post-anaesthetic recovery period. The ongoing, systematic collection and analysis of data on the patient's status in recovery may support decisions about moving the patient to other settings and less intensive services.

Only a suitably qualified and experienced registered nurse or designated member of the medical staff may carry out monitoring in the recovery area. Recording of monitoring data provides the documentation to support discharge decisions. The anaesthetist decides whether the patient can be discharged from the recovery area to another level of care or from the organisation (as in the case of ambulatory anaesthesia).

Standardised criteria developed by medical personnel are used to make discharge decisions.

The following is recommended:

- During the post-anaesthetic recovery period, patients must receive monitoring appropriate to their condition
- Monitoring findings are entered in the patient's record
- Established criteria are used to make decisions regarding the patient's discharge from the recovery room
- The decision to discharge the patient is recorded
- Recovery area arrival and discharge times are recorded
- The signatures of those handing over and those receiving the patient are recorded

CHAPTER 4: STAFF CONDUCT AND PRACTICE

4.1 Orientation of New Personnel and In-Service Training

4.1.1 Purpose

To ensure that the new personnel are well oriented and health care workers (HCWs) keep up with all the latest developments in their occupation so as to provide quality health care services.

4.1.2 Orientation of New Staff Members

It is important that all new staff members are introduced to the operating theatre on the first day or as soon as possible to familiarize themselves in the new and unknown surrounding. Every member of the health facility should be oriented including staff members from Health Centres and Clinics.

This gives the new staff members' confidence as they familiarize themselves with the operating theatre.

During orientation, the head nurse must inform the new staff members about the policy of the institution in order for them to know what is expected from them.

Work schedules must be drafted and new staff members must be informed accordingly.

4.1.3 In-service Training

- The operation theatre must have a regular in-service training programme.
- In-service training in the form of discussions, demonstrations with regard to procedures and methods can be done by the more senior staff members. It is important that everyone participate in the in-service training activities.
- The medical – legal risks in the operating theatre and recovery room must be emphasised time and again.
- Organize an in – service training programme for domestic personnel as well. It is equally important that they must know how to clean and the importance thereof.
- The necessary training material is provided.

4.2 OT Attire

4.2.1 Purpose

The primary purpose of operating theatre attire is to instil a sense of discipline in those working in the operating theatre, and to identify the operating theatre as a separate clean area. It is also to ensure that clean clothes are worn when operating on the patient to prevent harmful bacteria.

Definition and Categories

Upon arrival in the operating theatre suite, ALL personnel working in the OT will change out of their street clothes and into theatre attire and closed toed shoes (clogs or boots). Those that work in the OT but are not part of the scrub team do not need to wear anything more than head cover. Those working in the OT and are part of the scrub team including working in the layup area will wear:

- Head cover
- Plastic apron
- Surgical mask

Additionally, those involved directly in the operation procedure will also wear eye protection to avoid splashing. Sterile gown and gloves are added for scrubbed team members.

The protective gear prevents exposure to blood and body fluids for the scrub team and support teams, but it also helps to reduce bacterial contamination via shedding of skin scales.

4.3 General Considerations

1. Each OT should have a specific complete written policy or standard operating procedures on proper attire that is known to all persons
2. Only approved, clean OT attire is worn within the restricted area of the OT suite. Street clothes should never be worn within the restricted area. **This regulation applies to anyone entering the restricted area**
3. Ideally, OT attire should not be worn outside the OT suite. However, if they are, then an over-gown and CHANGE OF FOOTWEAR is recommended. Overshoes are not recommended.
4. Dressing rooms located adjacent to the OT suite are reached through the outer corridor.
5. Comfortable supportive shoes should be worn to relieve fatigue
6. Proper personal hygiene must be re-emphasized
7. No person with an acute infection, such as a cold or sore throat, or skin lesion, such as a furuncle or any contagious condition, should be permitted within the OT
8. Persons with cuts, burns, or skin abrasions should not scrub or handle sterile equipment as this may increase the risk of infection to the patient

4.4 Components of Attire

Each item of OT attire is a specific means of protecting the patient from the sources of contamination and risk of infection.

4.4.1 Body Cover

A variety of scrub suits and dresses are available and most of them are usually made of cotton which is absorbent, breathes easily and can be washed at high temperatures. Disadvantages of cotton is that there is no barrier against wet splashes or contact, is absorbent and therefore will require a water resistant apron underneath the sterile cotton gown if operating.

- Dresses should be a wraparound style to facilitate easy removal
- Scrub shirts and waistline should be tucked inside the pants to avoid it from touching sterile areas
- Avoid putting any other clothes for example vests, under the scrub shirts

4.4.2 Surgical Mask

A surgical mask is recommended for the scrub team working inside the OT suite. It is worn to contain and filter out droplets containing micro-organisms expelled from the oral and nasopharynx. During talking, sneezing, and coughing organism laden droplet nuclei are dispersed, but this breaks the barrier because of the moisture in the breath and it is reported that a surgical mask is effective for a short period of time. Therefore the surgical mask must be changed between each patient. The mask is designed for close fit but improper application can negate their efficiency.

Always tie the strings tightly, to prevent the string coming loose during an operation and contaminating the sterile gown. The upper strings are tied at the back of the head, and the lower strings behind the neck.

The surgical masks have an exterior pliable strip or noseband that can be bent to contour the mask over the bridge of the nose (refer to the IPC Guideline Chapter 4).

4.4.3 Head Cover

All facial and head hair must be covered in the restricted area. Practically all head covers are disposable and made of lint-free nonporous, soft, cloth-like fabric. If hair is long, a helmet or hood must be worn to cover the neck area. Headgear should fit well to prevent any escape of hair and to confine micro-organisms. A cap or hood is put on before a scrub suit or dress to protect the garment from contamination by hair.

4.4.4 Eye Protection: Goggles and Face Shields

Eye protection must be worn as part of personal protective equipment to act as a barrier to infectious material entering the eye during all invasive surgical procedures, including endoscopic procedures, or in any situation where splash injury to the eyes could occur.

Eye protection must be as comfortable as possible, allow for sufficient peripheral vision, and be adjustable to ensure a secure fit. For none disposable eyewear, it is recommended that each individual be provided his/her own eyewear that is only

worn by that person in order to ensure the appropriate fit is maintained and minimize the potential of exposure to the wearer.

Eye protection should be removed in an aseptic manner to minimize splashes of blood and body fluids to the mucous membrane, in particular the conjunctiva of the eye. Eye protection should be removed and not carried outside of the surgery department. After the use of the goggles and face shields cleaning should be done according to the manufactures recommendations.

4.4.5 Appropriate Operation Room Shoes and Shoe Covers

Appropriate operation room shoes that cover the feet, preferably **gum boots**, must be worn at all times in the restricted area. **Overshoes are not recommended.**

4.4.6 Gown

Sterile cotton gowns are worn over scrub attire to permit the wearer to create and to come within the sterile field, in order to carry out a sterile technique during an operative procedure. Since these are made of cotton, a plastic apron should be worn underneath it. Although the entire gown is sterilized, the back is not considered sterile nor is any area below waist level, once the gown is donned. Wrap around gowns that provide sterile coverage to the back by generous overlap are recommended. The cuffs of gowns are rib-knit to tightly fit the wrist.

4.4.7 Gloves (see IPC Manual Chapter 4)

Sterile gloves complete the attire for scrubbed team members. They are worn to permit the wearer to handle sterile supplies or tissues of the operative wound.

Glove packages are generally the peel-apart type. Prior to opening the package, the circulating nurse should inspect for the following:

- Expiry date of the gloves, never use expired gloves.
- Damages or wetness which would indicate contamination.

When the inner paper is unfolded, the wearer puts the right glove to the right, the left glove to the left, palm side up. If a sterile glove is punctured or torn it must be changed immediately to prevent escape of micro-organisms from the skin beneath.

4.5 Principles of Aseptic Technique

It is important to observe sterile techniques in order to prevent the risk of infection.

The following is recommended:

1. Only sterile items are used within a sterile field. If you are in doubt about the sterility of anything, consider it not sterile.

2. Gowns are considered sterile only from the waist to shoulder level in front, and the sleeves.

The following practices must be observed:

- Scrub team should keep hands in sight and at or above waist level.
 - Hands are kept away from the face and elbows close to one's sides. Arms are never folded because there may be perspiration in the axillary region.
 - Items dropped below waist level are considered unsterile, and must be discarded.
3. Mayo tables and trolleys are sterile only at table level. Only the top of the sterile draped table is considered sterile. The edges and sides of the drape extending below table level are considered unsterile.
 - Anything falling over or extending over the table edge, such as a piece of suture, is unsterile.
 - In unfolding a sterile drape, care is taken that the part that drops below the table surface is not brought back up to table level.
 4. Persons who are sterile should touch only sterile items or areas; persons who are not sterile touch only unsterile items or areas, for example:
 - The sterile team members maintain contact with the sterile field by means of sterile gowns and gloves.
 - The circulating nurse does not directly contact the sterile field.

Supplies for sterile team members reach them by means of the circulating nurse opening the items on the sterile field.

4.6 The Need for Sterile Technique

Strict aseptic and sterile techniques are needed at all times in the OT, because freshly incised or traumatized tissue can easily become infected. Therefore, anything unsterile in contact with the patient is potentially dangerous and can transfer microbes into the open wound. All operative procedures are performed under sterile conditions.

Conversely, terminal decontamination and sterilization of all material and equipment used during an operation is performed with the assumption that every patient is a potential source of infection for other persons.

It is essential that all members of the operating team know the common sources of contamination by micro-organisms in the OT, and the means by which they reach the sterile field and operative wound. Maintaining the sterile technique is the responsibility of everyone caring for the patient in the OT.

4.7 Surgical Scrub

Definition

The surgical scrub is the process of removing as many micro-organisms as possible from the hands and arms by **mechanical washing and chemical antiseptics** before participating in an operative procedure (refer to the IPC Guideline).

Mechanical and Chemical Antiseptics Washing

Purpose

The purpose of the surgical scrub is to remove soil, debris, natural skin oils, hand lotions, and micro-organisms from the hands and forearms of sterile team members. The surgical scrub is done just prior to gowning and gloving for each operation.

Hand washing facilities

Adequate scrubbing and hand washing facilities should be provided for all operating team members. Preferably, taps should be elbow or foot operated.

The sink should be designed deep and wide enough to prevent splashing. A sterile gown cannot be put on over damp scrub attire without resulting in contamination of the gown by moisture oozing through. Scrub sinks should be used only for scrubbing or hand washing. They should not be used to clean or rinse contaminated instruments or equipment.

For safety and convenience, the scrub room must be adjacent to the OT.

4.7.1 Preparation for Surgical Scrub

General preparation

- Fingernails should not reach beyond the fingertip to avoid glove puncture.
- Skin and nails should be kept clean and in good condition. If hand lotion is used to protect skin, a non-oil base product is recommended.

No nail polish and artificial nails are allowed. The nail polish may chip and peel thereby providing a harbour for micro-organisms in cracks.

Preparations prior to scrub

1. Inspect hands for cuts and abrasions.
2. All jewellery on the fingers, wrists and arms should be removed. Jewellery harbours micro-organisms. It can also be a potential foreign body in the operative wound.
3. Be sure all hair is covered by headgear.
4. Adjust disposable mask snugly and comfortably over nose and mouth.

5. Adjust eyeglasses and protective glasses comfortably in relation to mask.
6. Adjust water to a comfortable temperature.
7. Ensure there is a wall clock available.

4.7.2 Surgical Scrub Procedure

- The surgical scrub takes three minutes. Use the clock in the OT or in the scrub room to check/ control the scrub.
- To prevent contamination from the elbows and arms to the hands, the hands must always be kept above elbow level.
- The scrub procedure takes place under running tap water.
- Wet hands and arms properly.
- Apply antiseptic hand scrub or soap such as chlorhexidine or povidone iodine to the hands and rub the hands together for one minute. Rinse in between. Also wash in between fingers
- Wash arms to above elbows for one minute
- Rinse hands and take fresh soap/scrub solution
- Rinse from fingertips to elbows. Always keep hands above elbow level.

Drying of hands and arms

After scrubbing, hands and arms must be thoroughly dried before the sterile gown is donned to prevent contamination of the gown by strike through of organisms from skin and scrub attire. Two huckaback or disposable paper towels are placed on top of the gown during packaging for drying of hands.

- The circulating floor nurse opens the outer layer of the gown pack. Stand way from the trolley. Water must not drip on the trolley
- The scrub-nurse takes one huckaback or disposable paper towel in the (R) hand and start drying the fingers, hand and arm up to the elbow of the (L) side. Keep away from the body. Do not go back touching or drying the fingers
- Surgeon/s follows same procedures as the scrubbing nurse/s
- Now take the second huckaback or disposable paper towel in the (L) hand and dry the (R) side in the same manner as the left side

NOTE: During and after scrubbing, keep the hands higher than the elbows to allow water to flow from the cleanest area, the hands, to the marginal area of the upper arms.

4.8 Gowning Technique

The sterile gown is put on immediately after the surgical scrub. The sterile gloves are put on immediately after gowning.

Purpose

Sterile gown and gloves are worn to exclude skin as a possible contaminant and to create a barrier between sterile and unsterile areas. Make sure there is adequate space to put on the gown without touching non sterile surfaces.

The following is recommended during the process of gowning:

- Reach down to the sterile package and lift the folded gown directly upward.
- Step back away from the table, into an unobstructed area, to provide a wide margin of safety while gowning
- Holding the folded gown, carefully locate the neckband.
- Holding the inside front of the gown just below the neckband with both hands, let the gown unfold, or fall open away from the trolley keeping the inside of the gown toward the body. Do not touch the outside of the gown with bare hands.
- Examine the gown for holes and tears. If the gown is torn, do not use it, get a new one
- Holding the hands at shoulder level, slip both arms into the armholes simultaneously

The circulating floor nurse brings the gown over the shoulders by reaching inside to the shoulder and arm seams. She securely ties or fastens the back of the gown at the neck.

4.9 Gloving Technique

The following is recommended:

1. With the left hand, grasp the cuff of the right glove on the fold. Pick up the glove and step back from the table. Look behind you before moving
2. Insert the right hand into the glove and pull it on, leaving the cuff turned well down over the hand
3. Slip the fingers of the gloved right hand under the everted cuff of the left glove. Pick up the glove and step back
4. Insert the hand into the left glove and pull it on, leaving the cuff turned down over the hand
5. With the fingers of the right hand, pull the cuff of the left glove over the cuff of the left sleeve. If the stockinet is not tight, fold a pleat, holding it with the right thumb while pulling the glove over the cuff. Avoid touching the bare wrist.
6. Repeat step 5 for the right cuff, using the left hand, and thereby completely gloving the right hand

4.10 Removing Gown and Gloves

- The gloves sit on top of the cuffs of the gown and therefore have to be removed in order for the gown to be taken off
- Gloves are rolled off the hand by turning them inside out as they are removed and discarded into a container for disposable items. Never snap gloves
- The gown is untied from the back and pulled downward from the shoulders, turning the sleeve inside out as it is pulled off the arms
- Put the used gowns in a linen container

CHAPTER 5: SURGICAL EQUIPMENT

This section is a summary of what should be done at the OT level, but is discussed in detail in the Central Sterile Services Guideline.

5.1 Surgical Instruments and Packs (Refer to the MoHSS CSSD Guidelines 2014 (Chapter 2))

- Surgical instruments come in different variations in structure and design to meet a particular purpose and have specific requirements.
- Surgical instruments are valuable tools and need to be respected and handled with care.
- Surgical instruments should be purchased from reputable manufactures that have high standards concerning pattern, material and workmanship.

5.1.1 Management of Surgical Instruments

For an effective surgical instrument management and control programme, the nursing staff must know the following:

- The instrument inventory of the MoHSS
- The routine instruments needed for each type of operation
- The correct use and handling of instruments
- The method of instrument processing or preparation e.g. sterilisation
- The aftercare of the instruments and
- The individual surgeon's preferences

5.1.2 Recommendations in Relation to the Handling and Caring of Instruments

1. Inspect each instrument before and after use to detect imperfections. An instrument or appliance should function perfectly to prevent needless endangering of a patient's life and increasing the operative time because of failure of an instrument.
2. Set aside damaged instruments and send them for repair or replacement promptly.
3. Use instruments only for the purpose for which they are designed. Proper use prolongs their life. Fine clamps and dissecting scissors can be forced out of alignment, cracked, or broken if they are used on heavy tissue, gauze dressings or drainage tubing.
4. Handle instruments gently at all times and avoid bunching, dropping and weighing them down under heavy pieces of equipment.
5. Provide protection for cutting instruments, lensed instruments, and fine, delicate holding instruments that are unusually susceptible to damage by using specially designed racks and cases.

6. Clean instruments meticulously. Make sure instruments, are perfectly clean and dry before storage.
7. Keep oil away from instruments. Oil forms a bacterial protecting film that is difficult and time consuming to remove and it also interferes with steam penetration during the sterilization process, except for silicone instrument spray that can be used for stiff or rusty instruments. The silicone must be removed before sterilization.
8. Give instruments regular maintenance e.g. such as sharpening of scissors.
9. Take inventory at periodic intervals during the year e.g. every 3 or 6 months. Shelved instruments must be limited.
10. All newly received instruments must be marked with a special instrument marker before being put into use.
11. Check for expiry date regularly but at least monthly.
12. Rotate sterile instruments in order to use item according to expiring date (First in, first out - FIFO).
13. Sterile packs may be stored up to the expiry date after which it has to be returned to the CSSD for repackaging and sterilization

5.1.3 Handling of Instruments during Surgery

1. The scrub nurse, who takes care of an operative procedure, is responsible for the instruments. All instruments must be checked and counted by the scrub nurse together with the circulating nurse before commencement of surgery. Artery forceps and clamps are packed in standard figures of 5 or 10 and must be counted, as well as detachable parts such as screws and blades of retractors
 - It is important that all instruments must be counted particularly when surgery is to be performed in a cavity such as the abdominal, thoracic and pelvic cavities, extra peritoneal space, vagina, and hip or shoulder joints and along the spine
 - Each item must be considered a foreign object that can cause unnecessary harm should it be left inside the patient. Therefore, to ensure adequate patient protection, these items are counted before and after use. A counting procedure is a method of accounting for items put on the sterile table for use during an operation
 - The specific instrument list must be added to each instrument set. The circulating nurse receives the instrument list from the scrub nurse and reads the names of the instruments from the beginning to the end aloud and ticks off each instrument on the list

- All instruments must again be counted before closure of peritoneum. The scrub nurse must inform the surgeon accordingly. The scrub nurse and the circulating nurse sign their names on the instrument list as well as the date when used. After cleaning and checking of instruments a new instrument list must be put on the instrument set before sterilization which corresponds to the total contents of the set
2. Instruments must be arranged in an orderly basic manner on the mayo table to facilitate checking and counting. Do not overload the mayo table initially. Additional instruments and supplies can be added as the operation progresses
 3. Never leave instruments on the patient, especially a scalpel handle with blade. It may injure the patient. Always work from the mayo table or instrument trolley
 4. Keep the diathermy point away from the patient to avoid causing a diathermy burn
 5. Handle instruments gently and with respect. It is the responsibility of the scrub nurse to see that the instruments are being used correctly by the surgeon and the assistant
 6. Ensure that all instruments handed to the surgeon are in perfect working condition
 7. All instruments falling from the operative field must be hung on the swab rack. In case an instrument is needed for surgery, it must first be cleaned and then sterilized with the approval of the scrub nurse
 8. Under no circumstances should any instrument be removed from the OT during surgery
 9. Never touch the tip of an instrument during surgery
 10. The scrub nurse must inform the surgeon aloud regarding the instrument as well as the swab count after checking
 11. After counting, all instruments must be fastened with instrument pins
 12. All blades used during surgery must be removed from the handles, counted and thrown directly in a safety box or sharps container

5.2 Sterile Instruments

The following is recommended:

- a) The sterile storeroom must be spacious with as many shelves as possible and should be free-standing from the walls, which permit supplies to be put into one side and removed from the other, thus older dated sets and packages are always used first.
- b) The shelves and open racks must be damp dusted at least once a week and the floors to be mopped daily. It is advisable to perform these cleaning duties over a week-end when surgery is minimized to emergency cases only.

Shelves must be marked clearly. Instrument sets and the various other packs must be placed sorted of a kind on the shelves. It facilitates the duties of the personnel and they will exactly know where a certain item is placed, as well as to facilitate orientation of new personnel.

- c) Torn wrapping of instrument sets and packs are unsterile and must be re-wrapped and re-sterilized.
- d) Check expired dates on all sets and packs routinely e.g. once a week.
- e) Packs must be rotated daily; that means older dated packs must be used first (FIFO).
- f) Instrument sets, linen and basin packs have a shelf life of six months if the wrapping is still intact, otherwise it must be re-sterilized.
- g) Single or loose packed instruments or items wrapped in mediplast pouches have a shelf life of six months if wrapping is still intact.
- h) Some items deteriorate with repeated sterilization
 - o Many items are seldom used yet several must be kept sterile at all times.
 - o Older supplies are always used first so that they do not become outdated.
 - o Commercially sterilized packages usually have manufacture's expiry dates on the package. Check and return to the pharmacy/clinical supply at least two to three months prior to the expiry date

5.3 Special Instruments

5.3.1 Lensed Instruments

Just to summarise, lensed instruments must be protected from breakage and distortion. Each instrument must be kept straight at all times when not in use. Flexible endoscopes such as the gastroscope should never be bent except during introduction into a passage within the patient. The junction of the flexible and rigid portions of the scope is the most vulnerable point. When a telescopic scope is sent for repair, it must be wrapped gently and placed within a padded carton to protect the lens during transportation.

General precaution for the care of lensed equipment such as endoscopy and urological instruments are as follows:

1. Do not boil or autoclave instruments containing lamps or lenses
2. Do not place lensed instruments in solvent solutions such as alcohol
3. Never handle lensed instruments with forceps. A scratch on the instrument could cause injury to tissue or the mucous membrane lining of an orifice. Also the danger of dropping the instrument is greatly increased. The forceps could crush a telescope and ruin the optical system if held too tightly. Always handle sterile instruments wearing sterile gloves.
4. Never pile these delicate instruments one on top of another or mix them with other instruments

5. Avoid rough handling, jarring, or bending of parts. Lay them on a towel to absorb the impact and to prevent wear on the sheath
6. Check the light source for working order before use and after cleansing

Thorough cleaning in clear tap water and mild soap solution is the first step toward decontamination. Special attention must be given to surface joints and revises that may retain mucus. The lumen of every hollow instrument requires special attention. Thorough rinsing immediately after use is the best precaution to prevent clotting and crushing of blood and body fluids in the instruments.

The endoscope is soaked in 2% Glutaraldehyde for 15 minutes after it has been thoroughly cleaned. Then it is removed and rinsed several times in clean or sterile water before being introduced in to a patient. The protocol for endoscopic decontamination must be followed.

5.3.2 Sharp or Semi-sharp Instruments

- Protect the edges of sharp instruments such as scissors, knives, osteotomes, chisels, etc. during cleaning, sterilization and storage
- Sharp instruments must be kept separate from blunt ones and they demand respectful handling

5.3.3 Micro-surgical and Ophthalmic Instruments

- Each delicate instrument must be separated from adjacent ones to prevent interlocking or crushing. Never pile them on top of each other. They are easily deformed
- Exact alignment of the teeth is an absolute necessity in fine – toothed forceps. The microscopic teeth are very easily bent
- Place instruments on a firm, flat surface for sorting and cleaning
- Sharp blades and tips should touch absolutely nothing, not even a towel. They must never touch another instrument or any part of a receptacle in which they are placed for storage or sterilization
-

5.3.4 Air-powered Instruments

- Be certain air exhausts are directed away from the sterile field
- Follow instructions for use, care and sterilization recommended by the manufacturer
- Test instruments for working condition before surgeon is ready to use

5.3.5 Electrical Instruments

- Electrical powered instruments, such as saws, drills, dermatomes etc., are potential explosion hazards in the OT. Most motors are designed to be explosion proof. All must have spark proof connections. However, power switches should be off when plugging electrical cords into outlets
- Alert the anaesthetist if electrical equipment will be used. He may change the anaesthesia to eliminate explosive gases
- Do not immerse motor in liquid
- Follow the manufacturer's recommended methods of cleaning, lubricating, sterilizing and using each piece of electrically powered equipment
- Check power cords and plugs for cracks or breaks and test for working condition before surgeon is ready to use instrument and the device is applied to the patient

5.4 Linen and the Disposable Draping Material

The use of linen in the OTs has significantly reduced since the introduction of disposable patient paper drapes in most of the hospitals. Woven linen has been found to cause "sterile" or non-microbial wound infections due to the lint and the fibres which settle in the wound and cause infection. Linen is however still being used in respect to OT attire, patient gowns, sheets, blankets and is responsible for an increased number of surgical site infections.

5.4.1 General Considerations in the Usage of Linen

- All linen must be washed and cleansed
- Linen must be free from holes and tears
- All old and torn linen must be sent back to the laundry to be repaired as well as a requisition for replacement
- Keep record of linen. It must only be used for what it is designed for.
- Linen must at least be checked once a month and recorded in the inventory register
- Loss of linen must be reported to the person in charge immediately
- Make sure that there is always sufficient linen in stock

NOTE: A control mechanism (standard operating procedures) should be in place in theatre regarding the management of linen.

5.4.2 Care and Handling of Clean Linen

- All linen must be kept in a linen room when not in use
- Shelves must always be neat and tidy
- Clean and dirty linen must not be kept in the same place

- The linen room must be kept under lock and key when not used and the key kept by the person in charge

5.5 Disposable Patient Paper Drapes

The precautions for draping with the paper drapes are the same as for linen and must be strictly adhered to.

Advantages of non-woven fabrics/ paper drapes

- a) Moisture repellence retards blood and aqueous fluid moisture strike-through to prevent contamination
- b) Lightweight, yet strong enough to resist tears
- c) Lint-free
- d) Contaminants are disposed along with drapes
- e) Antistatic
- f) Pre-packed by the manufacturer. This eliminates the washing, mending and folding processes. Some drapes contain a layer impermeable to ooze or filter – through. Less drapes are being used, thus no over draping of the patients - and are cost saving

NOTE:

- Keep in mind that the paper drape does not feel the same as the linen drape that you are used to
- In the beginning difficulty with the manageability of the drapes may be experienced
- Be careful not to place sharp instruments for example a scalpel on the patient drape. The blade can easily cut through the drape and injure the patient

5.6 Draping

Draping is the procedure of covering the patient and surrounding areas with a sterile barrier to create and maintain an adequate sterile field during the operation. An effective barrier eliminates the passage of micro-organisms between non-sterile and sterile areas.

Techniques to remember in draping

Since draping is a very important step in preparation of the patient for operation, drapes must be packed correctly and in sequence on the instrument trolley beforehand.

The scrub nurse as well as the entire team should be familiar with the draping procedure.

1. Place the drapes on a dry area. The area around or under the patient may become damp from the solutions used for skin preparation. The circulating nurse must remove damp items or cover the area to provide a dry field on which to lay the sterile drapes
2. Allow sufficient time to permit careful application
3. Allow sufficient space to observe sterile technique
4. Handle the drapes also as little as possible
5. Never reach across the operating table to the drape or go around the table to drape the opposite side. There should be an assistant to help
6. Take the drapes and trowel clips to the side of the table on the instrument trolley
7. Carry the folded drapes to the operating table. Watch the front of the sterile gown; it may bulge and touch the unsterile table or blanket on the patient. Stand well back from the unsterile table
8. Hold the drapes high enough to avoid touching the overhead operating light.
9. Hold the drape high until it is directly over the proper area, and then lay it down where it is to remain. Once the drape is placed, do not adjust it. Be careful not to slide the drape out of place when opening the folds. If a drape is incorrectly placed, discard it. The circulating nurse peels it from the table without contaminating other drapes or the operative site
10. Protect the gloved hands by cuffing the end of the sheet over them - do not let your gloved hand touch the skin of the patient
11. In unfolding a drape from the operative site towards the foot or the head of the table, protect the gloved hand by enclosing it in the turned-back cuff of the drape provided for this purpose. Keep the hands at the table level
12. If a drape becomes contaminated, do not handle it further. Discard it without contaminating gloves or other items
13. If the end of a drape fall is below waist level do not handle it further. Drop it and use another one
14. Drapes should never touch the floor
15. If in doubt as to its sterility, consider a drape contaminated
16. A towel clip that has been fastened through a drape has its points contaminated. Remove it only if absolutely necessary, and then discard it from the sterile set-up without touching the points. Cover the area from which it was removed with another piece of sterile draping material
17. If a hole is found in a drape after it is laid down, it must be covered with another piece of draping material or the entire drape discard
18. A hair found on a drape must be removed and the area covered immediately

NOTE:

Ask the anaesthetist permission first before you start to drape the patient. The anaesthetic screen should always be positioned after administration of a general as well as a local anaesthesia before draping, to elevate the drapes from the patients

face. The patient must also be placed in the correct position for the operative procedure to be performed, before sterile drapes are laid down.

5.6.1 Type of Drapes

A4	-	Patient drape
C4	-	Tonsil sheet
E	-	Abdominal sheet
F	-	Steri-paper towel (reinforced)
G	-	Mayo cover
H	-	Leggings
I	-	Lithotomy sheets

Standard contents of packs used in the OT

a) Tonsil set:

C4

Nasal set

b) Dilatation and curettage:

1 x 1	-	Lithotomy sheet
2 x H	-	Leggings (pack separately)
1 x F	-	Reinforced steri-paper towel

c) Basic tray:

2 x H	-	Leggings
1 x A4	-	Patient drape
1 x F	-	Steri-paper towel

d) Laparoscopy:

2 x A4	-	Patient drape
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e) Minor drape:

3 x A4	-	Patient drape
1 x F	-	Steri-paper towel
1 x A4		
1 x F		
1 x G		
1 x fan folded paper (for suturing material)		
5 x aseptic no. 4		
5 x large taped swabs (wrap paper 900 x 1200)		

f) Major drape:

- 1 x E
- 1 x G
- 1 x fan folded paper
- 1 x aseptic no.4
- 1 x 5 large taped swabs (wrap paper 1000x 1000)

g) Vaginal drape

- 2 x A4
- 1 x F
- 2 x H
- 1 x F
- 1 x F
- 1 x G
- 1 x fan folded paper
- 1 x aseptic no.4
- 2 x 5 large taped swabs
- 1 x vaginal plug
- 1 x sanitary towel (wrap paper 1000 x 1000)

Types of operations being performed at most rural hospitals and the different drapes to be used:

1) Major drape

- Laparotomy for ectopic pregnancy
- Abdominal sterilization
- Caesarean section
- Appendectomy etc.

2) Minor drapes

Orthopaedic surgery on upper and lower extremities e.g. insertion plates and screws
breast biopsy, excision of a ganglion, etc.

3) Tonsil sheet

Tonsillectomy and other surgery on the mouth.

4) Dilatation and curettage

- Dilatation and curettage/ evacuation of the uterus
- Vaginal examination for e.g. diagnostic purposes

5) Stitch sets

No dressing towels – just two paper towels for drying of hands. If sterile towels are needed, it must be added. Single towels are packed and sterilized separately when needed.

6) Delivery packs

3 x linen towels

4 x A4 patient drapes

NOTE:

- The drapes are on code and available from Medical Stores
- The drapes are issued un-sterile from the manufacturer and must be packed and autoclaved at each hospital
- Do not put too many sterile packs on the shelves that will not be used within weeks
- Work out a maximum and minimum amount that will be sufficient for daily usage as well as for emergencies
- On completion of surgery, all used disposable drapes should be discarded in a red plastic bag for incineration

5.7 Suture Materials

Definition

A suture is an all-inclusive term for any strand of materials used for tying up ends or approximating tissue and holding them until healing has taken place. Suturing usually takes place with a needle and strand which could be nylon, silk or other.

It is best if the needles used in suturing are solid so as to avoid the use of hollow needles and increasing the risk of HIV should a needle stick injury happen.

5.8 Classification of Suture Materials

Suture materials are divided into **two** categories namely:

- Absorbable sutures
- Non-absorbable sutures

5.8.1 Absorbable Sutures

a) Surgical gut Suture:

Surgical gut suture is composed of purified connective tissue (mostly collagen) derived from either the serosal layer of beef (bovine) or the sub mucosal fibrous layer of sheep (ovine) intestines. Surgical gut suture are available in plain or chromic. Chromic gut is processed to provide greater resistance to absorption.

Surgical gut suture is indicated for use in general soft tissue approximation and/or ligation, including use in ophthalmic procedures, but not for use in cardiovascular and neurological tissues. Surgical gut is digested by body enzymes and absorbed by tissue; thus no permanent foreign body remains.

➤ **Plain surgical gut:**

Plain surgical gut is used to ligate small vessels and to suture sub-cutaneous fat. It is not used to suture any layers of tissue likely to be subjected to tension during healing. Surgical gut is digested relatively quickly, usually in 5 to 10 days.

➤ **Chromic surgical gut:**

Chromic surgical gut is used for ligation of larger vessels and for suture of tissues in which non-absorbable materials are not usually recommended, as in the urinary and biliary tracts as well as in anastomosing of bowel. If the absorption rate is normal, chromic surgical gut will support the wound for about 14 days and absorb completely within 120 days.

b) Vicryl

This is a synthetic absorbable suture material. These synthetic sutures are absorbed by a slow hydrolysis process in the presence of tissue fluids. It maintains tensile strength longer than surgical gut and then absorbs rapidly within \pm 90 days.

5.8.2 Non-Absorbable Sutures

These are strands of material that effectively resist enzymatic digestion or absorption in living tissue. During the healing process the suture mass becomes encapsulated and may remain for years in tissues without producing any ill effects.

a) **Surgical silk**

Surgical silk is an animal product made from the fibre spun by the silkworm larvae in making their cocoons. Silk is not a true non-absorbable material. It loses much of its tensile strength after about one year and usually disappears after two or more years. It gives good support to wounds during early ambulation and generally promotes healing a little more rapidly than surgical gut, but is not as inert as most of the other non-absorbable materials.

It is frequently used in serosa of the gastrointestinal tract and to close fascia in the absence of infection. Silk sutures are dry. They lose tensile strength if wet. Therefore, do not moisten before use.

b) **Virgin silk**

Virgin silk suture consist of several natural silk filaments drawn together and twisted to form 8 – 0 and 9 – 0 strands for tissue approximation of delicate structures, primarily in ophthalmic surgery.

c) **Dermal silk**

Dermal suture is a strand of twisted silk fibres encased in a non-absorbing coating of tanned gelatine or other protein substance. This coating prevents the in-growth of tissue cells and facilitates removal after use as a skin suture.

It is used for suturing the skin particularly in areas of tension because of its unusual strength.

d) **Linen**

Surgical linen is spun from long-staple flax fibres, then twisted into tight strands and treated for smooth passage through tissue. Tensile strength is inferior to all other non-absorbable materials. Linen suture is used almost exclusively in gastrointestinal surgery.

e) **Ethanol/ Nylon**

Nylon is a smooth single strand of non-capillary material. The smaller the diameter becomes, the stronger the strand becomes proportionately. Nylon is used frequently in ophthalmic surgery because it has a desirable degree of elasticity. It is also used for microsurgery. Larger sizes are used for skin closure. It produces minimal tissue reaction.

f) **Polypropylene**

Polypropylene is an acceptable substitute for stainless steel in situations where strength and non-reactivity are required and the suture must be left in place for prolonged healing. It can be used in the presence of infection. It has become the material of choice for many plastic surgery and cardiovascular procedures because of its smooth passage through tissue as well as its strength and inertness.

g) **Skin clips**

Clips made of non-corroding metal may be used to approximate skin edges. They tend to leave more scars than other methods of skin closure, but they may be applied quickly when time is a critical factor and cosmetic result is unimportant. They can be used in the presence of infection or drainage. A specially designed instrument is necessary to apply clips.

h) **Marlex mesh**

Available as non-sterile in sheets of 15 by 30 cm. Use wire scissors, not dissecting scissors, to cut it. Steel is opaque to x-ray, which may be a disadvantage for the patient in later life.

Advantages of synthetic mesh:

- It is easily cut to the desired size for the tissue defect
- It is easily sutured underneath the edges of tissue to create a smooth surface
- Fibrous tissue easily grows through the openings to incorporate the mesh into the tissue to maximize tensile strength

- Polyester fibre and stainless steel mesh can be steam-sterilized immediately prior to use

i) **Umbilical tape**

Aside from its use in tying the umbilical cord on the new-born, this tape has other uses in surgery. In certain cardiovascular operations, it is used as a heavy tie, or as attraction suture. It may be put around a great vessel to retract it.

5.9 Common Suture Techniques

The primary suture line refers to those sutures that hold wound edges in approximation during healing by first intention. This line may have one continuous strand of suture material or a series of suture strands. A variety of techniques are used to place suture in tissues. The following are the most commonly used techniques.

- **Interrupted suture:**

Each stitch is taken and tied separately.

- **Continuous sutures:**

A series of stitches are taken with one strand of material and tied only at the ends of the suture line.

- **Retention sutures:**

Interrupted non absorbable sutures are placed through tissue on each side of the primary suture line and a short distance from it to relieve tension on it.

- **Purse-string suture:**

A continuous suture is placed around a lumen and tightened, drawstring fashion, to close the lumen. This is used when inverting the stump of the appendix, for example.

- **Traction suture:**

A traction suture may be used to retract a structure to the side of the operative field, out of the way, e.g. the tongue in an operation in the mouth. Usually a non-absorbable suture is placed through the part.

- **Subcutaneous suture:**

A continuous suture is placed beneath the epithelial layer of the skin in short lateral stitches. The suture comes through the upper layer of the skin at each end of the incision only.

5.10 Handling of Sutures during Surgery

1. In the preparation and use of sutures in surgery, every precaution must be taken to keep the sutures sterile and to prevent prolonged exposure and unnecessary handling
2. The scrub nursing team member should prepare only one or two sutures during the preliminary preparation
3. Kinks should never be removed by running the fingers over the strand. The tensile strength of a gut suture should not be tested before it is handed to the surgeon. Sudden pulls or jerks used to test the tensile strength of a suture may damage it so that it will break when in use
4. A suture or free ligature should not be too long or too short. A long suture is difficult to handle and increases the possibility of contamination because it may be dragged across the sterile field or fall below it. A short suture usually slips from the eye of the needle as it is being inserted and makes tying most difficult
5. Surgical gut sutures are sealed in packets that contain fluid to keep the material pliable. This fluid is mainly alcohol and water, but may be irritating to ophthalmic tissues. Hold packet over a basin and open carefully to avoid spilling fluid on the sterile field or splashing it into your own eyes. Rinsing is necessary only for surgical gut to be implanted into the eye
6. Surgical gut should be used immediately after removal from their packets. When the material is removed and not used at once, the alcohol evaporates and the strand loses pliability
7. Do not soak surgical gut. Excessive exposure to water will reduce the tensile strength. Before unwinding the strand, it can be dipped momentarily in water or saline at room temperature, not hot as heat will coagulate the protein
8. Silk sutures are dry. They lose tensile strength if wet. Therefore, do not moisten before use.

5.11 Packing and Storage Methods of Suture Materials

- Almost all suture materials are now supplied directly by manufactures in some form of sterile package ready for immediate use
- The current dry packaging method seals the suture material in a primary inner packet, which may or may not contain fluid, inside a dry outer overwrap strip packet. This unit is sterilized. This method permits self-dispensing onto the sterile field
- Packages may be stored in any moisture-proof and dustproof container
- Each primary suture packet is self-contained, and its sterility for each patient is assured as long as the integrity of the packet is maintained
- Absorbable surgical sutures are supplied by the manufacturer in sterile single – or multiple-strand packets, with or without a needle attached to the strand

5.12 Economical Use of Supplies and Equipment

As the cost of supplies increases, OT personnel should be conscious of ways to eliminate wasteful practices, for example, throw away disposable items only. Avoid throwing away re-usable ones. Continuous emphasis on cost reduction can reduce waste and result in economics of benefits to the hospital and ultimately to the patients. The OT suite is one of the most expensive departments of a hospital. Adequate linen, instruments, suturing materials, and other supplies are necessary for patient care.

Principles to Remember:

- a) Keep the varieties and numbers of instruments and supplies needed for each operation to a minimum. If the procedure book and surgeon preference cards are kept up-to-date, articles no longer used are eliminated
- b) Pour just enough solution for a skin preparation as recommended; it takes only a small amount
- c) Follow procedures for draping to provide an adequate sterile field without wasting disposable draping material
- d) Do not open another packet of sutures for that last stitch. Usually a few leftover pieces are long enough to complete the closure
- e) Syringes, hypodermic needles, drains, catheters, extra linen etc., are kept sterile. These supplies should be opened only as needed, not routinely "just in case" they might be needed
- f) Do not soak too much plaster when helping with cast applications. Keep just ahead of the surgeon. Watch him to see when he appears to be almost finished. Ask him if he wants more before soaking an extra one or two rolls of plaster
- g) Turn of lights when they are not needed

5.13 Swabs, Needle and Instrument Counts

The purpose of the count is to ensure adequate patient protection because swabs, needles and instruments are foreign objects that can cause unnecessary harm if left inside the patient.

The type and number of swabs, needles and instruments needed for different operations will vary. Each item must be considered a foreign object that can cause unnecessary harm should it be left inside the patient. Therefore, to ensure adequate patient protection, these items are counted before, during and on completion of a surgical procedure. A counting procedure is a method of accounting for items put on the sterile table for use during an operation.

Swabs, needles and instrument counts are taken on every procedure performed in the OT, especially when a major body cavity is entered or the depth and location of the wound is of such that an instrument could accidentally be left in the patient. These would include operations within the chest, abdominal and pelvic cavities, extra-peritoneal spaces, vagina, hip, shoulder or knee joint, and along the spine, mouth and throat.

5.14 The Counting Procedure

Swabs, needles and instruments are counted at different intervals i.e. before, during and after the surgical procedure.

1. As the scrub nurse counts each item, s/he and the circulating nurse count each one audibly until all items are counted
2. The circulating nurse immediately records the count for each type of swab or needles on the swab board
3. The scrub nurse hands the instrument list that is placed in the instrument set to the circulating nurse and s/he ticks off each instrument while counting each instrument with the scrub nurse
4. Each type and size of swab should be kept separate from the other types. Count additional packages away from the counted items already on the sterile trolley, in case it is necessary to repeat the count
5. Counting should not be interrupted. IF uncertain about the count because of interruption, fumbling, or for any other reason, repeat it

5.14.1 Swabs

1. Only radio-opaque swabs with an x-ray detectable material should be used on the sterile field and table, because they can be detected by x-ray examination within a wound if an incorrect count occurs. The types of swabs and the number should be kept to a minimum.
2. The scrub nurse removes the string that keeps the swabs secured in a pack and opens swabs one by one while counting with the circulating nurse. Immediately after counting each pack, it is recorded on the swab-board by the circulating nurse. Each type of swab is placed in separate sterile bowls or dishes.

NOTE:

If a pack contains an incorrect number of swabs, the scrub nurse should hand the pack to the circulating nurse to take it out of the OT immediately. The danger of error is great if attempts are made to correct errors or compensate for discrepancies.

A faulty amount of swabs must immediately be reported to the professional nurse in-charge of the OT.

The following are recommended for during Swabs Counts:

a) Before commencement of a surgical procedure

- Swabs are always counted by two persons of whom one must be a registered nurse. These two persons are responsible for checking and counting of swabs continuously throughout the surgical procedure
- The procedure for counting of swabs must take place in an OT
- The circulating nurse must have sound knowledge of the procedure as well as the medico-legal aspects concerned
- The circulating nurse must be able to identify the various types of swabs
- Each pack/ bundle of swabs must be recorded on the swab-board before the next bundle is opened
- It is the responsibility of the scrub nurse to check if recordings on the swab-board are correct
- Check if radio-opaque material is well attached
- All swabs on the sterile field must be counted
- A pack with an incorrect number of swabs must be handed to the circulating nurse and immediately removed from the OT. The nurse in-charge must be notified accordingly
- Always use two stainless steel buckets for used swabs. The one bucket without a lid is for the scrub nurse's used swabs and the bucket with lid is for the counted swabs taken off the swab-rack. The bucket with the lid must be kept closed. Buckets must be lined with the prescribed plastic bags
- Check beforehand that there are no swabs lying around in the OT or in buckets

b) During surgical procedure

- The scrub nurse assisting during the surgical procedure discards the used swabs into the bucket without a lid without contaminating the sterile gloves
- The circulating nurse takes the swabs from the bucket with a forceps and places it in a kidney dish and proceeds to hang the swabs one by one on the swab-rack

NOTE:

The circulating nurse never handles used swabs with her hands. A pair of disposable gloves must be worn for protection.

- When five (5) swabs of a kind are hung on the swab-rack, the circulating nurse draws the attention of the anaesthetist to check the blood loss to determine whether the patient needs an intravenous blood transfusion or not

- The swabs are now counted audibly one by one by the scrub and circulating nurse. The circulating nurse touches the swabs one by one with the forceps while counting. After completion of a swab count a correct sign is made on top of the figure (i.e. 5)
- The swabs are now counted for a third time and at the same time one by one removed from the swab-rack and placed in the kidney dish. The counted swabs are now discarded in the bucket with the lid. Make sure that the bucket is kept closed. The counted swabs are now crossed through on the swab-board (5). These swabs are now out of circulation. Continuous checking of swabs is essential
- If more swabs are needed during the operative procedure, the same steps must be followed as described above. Do not open unnecessary packages of swabs
- Under no circumstances should any swab be removed from the OT before completion of the surgical procedure

c) On completion of surgical procedure, just before closure of the incision

- A minimum amount of swabs should be in circulation at this stage
- All swabs in circulation must be counted before the surgeon starts to close e.g. the peritoneum
- The surgeon must be informed audibly that the swab count is correct. The surgeon must acknowledge the count
- The final count is done just before closure of the skin
- The needle and instrument counts are done at the same time and the surgeon must be informed accordingly
- On completion of closure of the skin all remaining swabs on the swab-rack may now be removed with the approval of the scrub nurse

NOTE:

Omitted counts due to extreme patient emergency must be documented on the operative record and a patient incident report completed by the scrub nurse and also signed by the circulating nurse. On completion of the operation, the scrub nurse should sign the operative records.

5.15 Incorrect Count

1. The surgeon is informed of the incorrect count and should not continue with closure of the wound.
2. The entire count is repeated immediately.
3. The circulating nurse looks in the trash receptacles, furniture, on the floor, in the linen container, and throughout the room.
4. The scrub nurse looks over the drapes and under articles on the table.
5. The surgeon re-checks the field and the wound.

6. The circulating nurse should then call the supervisor of the OT to check the count.
7. If the swab is not found, the surgeon may wish an x-ray taken at once, with a portable x-ray machine to determine whether it has been left in the wound.

Due to the condition of the patient or a reasonable assurance, based on wound exploration, that the item is not in the patient, the surgeon may wish to complete the closure first. However, it should be compulsory to take an x-ray before the patient leaves the OT whenever a swab, needle or instrument count is incorrect. If the count is wrong and the lost swab cannot be found, the scrub nurse must complete an incident form. She does this even if the item is located by x-ray. This record has legal significance to verify that an appropriate attempt was made to find the missing item.

Classification of the various swabs in use:

1. Abdominal swabs (large) and contains radio-opaque material
 - A pack contains x 5 swabs
 - Disposable – not to be used again
2. Large dissecting swabs made of gauze with radio-opaque material
3. Small dissecting swabs with radio-opaque material
4. Tonsil swabs with radio-opaque material
5. Surgical patties to be used in neuro-surgery and certain orthopaedic operations e.g. laminectomy, and must be counted
6. Special swabs for usage in eye surgery
7. Prep swabs (blue) for skin preps
8. Anaesthetic swabs (green) unsterile and to be used on anaesthetic machine for anaesthetic purposes only

Legal Aspects

The scrub nurse is legally responsible for the counting of swabs, needles and instruments during the performance of a surgical procedure. In case of a swab, needle or instrument that may be left inside a patient, she/he can legally be held liable for the action. A formal swab, needle and instrument count must be performed by two people of whom one must be a registered nurse.

CHAPTER 6: SURGICAL PRACTICE

6.1 Ways to Stop Surgical Bleeding

There are different ways to stop bleeding:

a) **Artery clamp**

A surgeon has a big variety of methods at his disposal to stop the bleeding, of which the artery clamp is the most common. They change in size, for example Rochester Pean or the Criles artery clamp. The point can be straight or bent, but the purpose is the same, to clamp the blood vessel.

b) **Tie off**

A strand of suture material can be used to tie off the blood vessel which is, for the time being, clamped with an artery clamp. The thickness of the suture material depends on the size of the blood vessel and the choice of the surgeon.

c) **Heat**

Warm moist swabs can be used to stop capillary bleeding during extensive surgery, for example a radical mastectomy.

d) **Oxycel/ Surgcel**

This is an absorbent, hemostatical agent. It can be placed into or on the bleeding point. It does not stick to the sides of the wound, but absorbs the blood and swells, becomes tough jelly. It causes haemostasis.

e) **Bone Wax**

It is used to stop a bleeding on the bone and is made of bees wax.

f) **Surgical diathermy**

A high frequency, electrical current, provided by an electro – surgical unit, is frequently used in the theatre to cut tissue and coagulate blood.

6.2 Use of Diathermy

It must always be remembered that the use of diathermy during surgical operations carries a medical – legal risk. It is important that the necessary precautions are taken and regular maintenance is kept.

Advantages of using diathermy

- The use of diathermy saves time.
- Blood loss is lessened.
- Also lessens the amount of suture material used.

- Is used where it is difficult to tie off bleeding points.
- Prevents trauma through unnecessary swabbing and pressure on the bleeding points.

This method, to obtain homeostasis, is called electro surgical. It has a cutting and coagulating effect because of controlled high frequency electrical currents sent through the tissue.

Electro – cauterization is the transfer of heat from a heated instrument to the tissue.

Electro – surgery is the conducting of an electric current through the tissue, also known as surgical diathermy.

The points most often used are the knife, ballpoint and barrel. The active electrode is used by the surgeon. It has a handle and a point connected to it.

Functions of the diathermy electrode

The connections commonly used are:

- The knife used to cut the tissue, during, for example a thorax operation.
- The ballpoint connection, which is used to cauterize bleeders.
- The barrel which is used in a tissue biopsy.

Mode of operation of the diathermy

The high current result in an immediate high temperature soon after it is switched on.

The negative electrode: also called the patient plate or distribution plate. It receives a radiated current and distributes it evenly to the operation area. The cycle is completed when the current is conducted back to the diathermy machine with a negative cable. This electrode must be as close as possible to the operating area and completely covered through contact with the patient's skin for an even and faster current distribution.

Risk of use of diathermy

Burns: originate when there is a break in the normal cycle, for example if the patient's arm touches the metal part of the table. The active electrode can touch a wound hook and the surgeon can, by accident, step on the pedal and activate the electrode which causes a burn. The machine can be connected incorrectly. Burns can also be caused if the surgical team's gloves are perforated.

Preparing the patient

1. The patient may not wear any jewellery, for example a ring, earrings, chains or watch when s/he comes into the operating theatre, because this can cause diathermical burns
2. Determine whether the patient has a metal prosthesis and report this to the surgeon and anaesthetist
3. Make sure no piece of clothing comes between the patient's skin and the diathermy plate. This hinders the direct contact and may lead to burns
4. Never place the diathermical plate onto a hairy area. Shave the contact area if the patient is very hairy or has big lesions
5. Do not put the plate on to a bony area, for example the elbow or knee joint, which are pressure points
6. The plate must be as close as possible to the operating area to lessen the electric current sent through the body
7. If electro-cardiogram electrodes are used on the patient together with diathermy, it must be placed as far away as possible from the operating area
8. Make sure the plate under the patient is dry and clean, after the operating area is cleaned

6.2.1 Precautionary Measures

- Before the day's operating schedule starts, the diathermy machine and plate must be tested. Check whether it is functional, whether there are any loose wires or broken isolation material. The apparatus must be maintained regularly by a technician
- Make sure that all personnel are familiar with the use and handling of the machine
- Most of the apparatus are equipped with an alarm, to warn the users that there is a break in the negative cable, or if it is incorrectly connected
- Connections, cables and electrodes must be checked for damage
- Check the alarm by switching the machine on before the negative electrode is connected
- The current control knobs must be clean, clearly marked and easy to handle
- The plate must be dry and clean
- The cables of the two electrodes may not be too long
- The apparatus must stand close to the surgeon and as far as possible from the anaesthetist
- The air conditioner must be efficient and the humidity about 60%
- Use only moist swabs when using diathermy, unless the surgeon prefers otherwise
- Start on the lowest current and turn the relevant dial slowly higher on command of the surgeon
- Clean the point of the diathermy, (positive electrode), in between use, from the coagulated blood and tissue

- When the diathermy is not in use, but still connected, the point must be put into a container, (especially for this purpose), to prevent burning the patient or one of the surgical team, if someone accidentally steps onto the pedal
- For the safety of the patient and the personnel, the instructions for the use, handling and maintenance of the machine must be followed accurately

6.2.2 Post Operational Check

- After completion of surgery the diathermy machine must be switched off and the active and negative electrodes slowly disconnected
- The scrub nurse must, immediately after surgery and after the covering of the wound, remove the plate from underneath the patient, do not pull on the cord, but on the plate, and check together with the surgeon, whether there are any burns
- The head nurse (and surgeon) must be informed if there are any burns and a detailed report has to be submitted to the Nurse Manager

The scrub nurse must write a detailed report about his/her observations concerning the use of the diathermy machine before, during and after the operation.

6.3 Handling Septic Cases

A fully functioning OT with satisfactory ventilation should be able to handle consecutive cases irrespective of their infectious status. However, if it is known that a septic case or an abscess is present, these cases should preferably be scheduled at the end of the operating schedule.

It is therefore of outmost importance that special attention is given to the operating schedule of the theatre so as to limit the degree of theatre contamination that can result from septic cases.

All operations must however be considered contaminated and the theatre should be cleaned accordingly.

6.3.1 Before the Day's Operating Schedule

- Before the day's operations commence, all the apparatus should be wiped with a moist, clean cloth and the prescribed disinfectant
- Apparatus, for example the operating table, lights and anaesthetic machine must receive special attention, as well as the mobile apparatus and apparatus mounted on the wall
- Do not wipe the electrical apparatus with a wet cloth, if they are still connected. Switch all connected apparatus off first, and then remove the plug from the socket

6.3.2 During an Operation

- During the beginning of an operation, contamination around the sterile area must be limited to a minimum
- Only the necessary amount of personnel is allowed in the theatre and the movement in and out of the theatre should be limited to a minimum
- Used swabs are disposed off into a bucket lined with a red plastic bag with lid. Soiled swabs may at no time be handled with bare hands, but with forceps, gloves and a kidney dish available for this purpose
- The floor and walls must be cleaned with a wet cloth as soon as possible after the operation, to avoid blood splashes from drying
- There should be a warning/alert mark to show that there is a septic procedure ongoing
- All equipment that is not necessary for septic operation should be removed from the OT

6.3.3 Between Operations

- All activities at the end of an operation must be executed purposefully. All cases are treated as contaminated and the theatre is cleaned accordingly
- All used linen is put into a green plastic bag and the bag is closed. A new plastic bag must be used for every operation
- Used syringes, needles and blades are placed into the safety box immediately for incineration. It is important that this waste material is handled correctly, to avoid injury to the theatre and hospital personnel
- All used items on the anaesthetic machine, like the intra tracheal tube, airways and masks, etc., are also placed into a plastic bag (**identify as septic**) and sent to the relevant section for cleaning and sterilization
- The blades of the laryngoscope should be removed from the handle, after every anaesthetic administered and must be rinsed under running tap water, dried off, wiped with alcohol swab and be ready for the next anaesthetic administered
- After completion of the operation all instruments, basins and bowls, which were used, must be rinsed, cleaned and sterilized
- Suction bottles are washed in the sluice room and packed together with the suction tubes, then sent to the relevant section for cleaning and sterilization
- Soiled apparatus, for example the anaesthetic machine, operating table swab rack, must be wiped with a clean cloth soaked in the recommended antiseptic solution. The floor must be wiped down with water and detergent after each operation if there is visible spillage and needs to be cleaned
- Disinfectants are only used to wipe down the cleaned surfaces of an operating theatre at the end of a session or list. This allows time for the disinfectant to remain in contact with the surface for a long enough period to be active. Disinfectants should NOT be used to wash down floors or surfaces

6.3.4 After Completion of the Day's Operating Schedule

- All theatres which were in use during the day must now be washed thoroughly
- Remove all used items, as mentioned before, for cleaning, re-sterilization and/or incineration
- All the equipment is cleaned with water and detergent and dried. It is then wiped over with 70% alcohol and allowed to dry. The use of hypochlorite (Biocide) is not recommended because it corrodes metal and destroys most of the equipment
- Air conditioners should be left on for a further 30 minutes or an hour
- **There is no indication to use ultraviolet light in the OT and is not recommended**
- All apparatus to be pushed back into theatre only after the floor has been washed and has dried.
- All mobile and detached apparatus in the theatre must be washed with water and detergent and moved outside. There is no need to use hypochlorite. However, if a disinfectant is indicated, 70% alcohol is sufficient
- All apparatus mounted on the wall must also be washed only where contamination has taken place i.e. behind swab rack on a daily basis
- Remove all refuse and make sure that all trolley wheels are working well. Domestic oil can be used if they are dry. Push the trolley over a cloth dipped in the biocide solution to clean their wheels as well
- All apparatus are moved back into the OT to be ready for any emergency and/or the following day's operating schedule. Make sure everything is in working condition
- The other areas, like the scrubbing room, patient waiting room, reception area, recovery room, all store rooms and offices must be dusted daily and the floors must be washed
- After the cleaning process the mops and buckets must be washed, dried and ready for use
- The dust cloths must be washed and hung up to dry. The water used for cleaning must be thrown out and the bucket must be dried
- The walls of the OT complex can be washed completely every six months or once a year, as required
- Special attention should be given to the sluice rooms. They must be cleaned thoroughly
- Instrument must be washed, packed and labelled before being sent to CSSD
- Personnel should leave theatre through the dirty corridor except the anaesthetist and anaesthetist nurse

6.4 The Recovery Room

The recovery room must be situated near the OT. It is then easily accessible to a doctor should a patient develop an emergency situation.

The Scrub nurse should **ALWAYS** accompany patient to the recovery room. Upon arrival, scrub nurse should first connect the patient to oxygen saturation and BP monitor apparatus. Once patient is stable, handing-over report is given to recovery room staff.

The nurses on duty in the recovery room are responsible for the post – operative care of the patient until the patient is ready to be transferred to another ward. At least one registered nurse must be on duty in the recovery room and she must know the resuscitation methods.

6.4.1 Receiving the Patient in the Recovery Room

Thorough identification of the patient via the ID band on the wrist, bed chart and records are important. The scrubbing nurse must give the nurse in the recovery room a complete report on the patient. The condition of the patient, type and length of anaesthetic, type of operation and results, drainage tubes, intravenous transfusions, complications, post-operative medication prescribed and other special orders are to be reported.

6.4.1.1 Observations and Care

While receiving the patient from the theatre nurse, the recovery room nurse can already make important observations, for example the colour of the skin, respiration, level of consciousness, excessive bleeding from the wound site and the position on the trolley.

Respiration, pulse rate, blood pressure, reaction of pupils and the level of consciousness must be thoroughly monitored every 15 minutes. This does not exclude the observations which must be conducted in between.

Respiration

The dorsal position with the neck extended and the jaws lifted at the corners to ensure an open airway is best suited for pulmonary expansion. The lateral, position is best suited for nose and throat operations so that airways and respiration are satisfactory.

The patient usually arrives in the recovery room with an artificial airway. Noisy breathing always indicates an obstruction of the airway. Complete obstruction is silent. Excessive use of the respiratory muscles of the abdomen, thorax and neck normally indicate an obstruction which can be caused by the falling back of the tongue, saliva, blood or foreign objects like a forgotten swab in the mouth or throat.

The falling back of the tongue can be prevented by the extension of the neck and the pushing of the corners of the jaws to the front. The muscles of the tongue are

anteriorly connected to the jaw. The tongue will therefore move forward and away to prevent blockage of the airway when the jaw is moved forward. To keep the airway clear they should be aspirated as soon as possible after arrival of the patient in the recovery room and after that whenever necessary.

Method of suction

Every time the trachea is aspirated a sterile catheter must be used. Allow the catheter to follow the natural curve of the trachea. Do not aspirate longer than 10 seconds at a time. Remove the catheter in one movement. To aspirate the right bronchi turn the patient's head to the left, for the left bronchi to the right.

Turn the recovery trolley quickly into the Trendelenburg position (the body is laid flat on the back (supine position) with the feet higher than the head by 15-30 degrees) where available – an ordinary trolley will have to be manually lifted should the patient suddenly turn blue because of an obstruction of the airway. The air way must then be aspirated, an airway inserted and oxygen administered. Make sure the neck is extended, the jaw is lifted and the mask fits well.

Call for assistance if obstruction is not released. An endo-tracheal tube must immediately be inserted. Apply artificial respiration with a resuscitation bag if the patient hypo ventilates or develops apnoea. Send for help as soon as possible, especially if the condition does not improve.

Swallow and cough reflexes

When these reflexes return the patient might feel nauseous from the irritation of the throat and the airway must be removed. The airway must first be cleared if the patient still has an endo-tracheal tube in situ, before the catheter is removed together with the tube.

Skin

The condition and colour of the skin, whether warm or cold, moist or dry, are important. Cyanosis is a sign of hypoxia; a pale, cold and moist skin is sign of shock.

The pulse rate

A fast, rising, a weak or irregular pulse rate are all signs of danger. An abnormal pulse rate must be reported to the anaesthetist.

The pupils

Pre-medication and anaesthesia influence the size of the pupils. An important observation is the reaction of the pupil to light and the difference in size. Very large dilated pupils without reflexes to light are serious and indicate a suppression of the central nervous system.

The blood pressure

A sudden fall or rise in the average blood pressure of more than 10 Hg (Mercury) must be reported.

Peripheral circulation

Peripheral circulation / pulses should be present and must not be obstructed. Look for POP casts that are too tight, tight bandages or forgotten tourniquets. Pressure on the bony prominence that can cause pressure sores and injury nerves must be avoided.

Consciousness

- Reacts to pain stimuli
- Follows simple instructions
- Speaks normally
- Completely awake
- Unconscious, no reaction (signs of danger)

NOTE: To tap the patient's face, rub his ears or shout at him to wake him up is **useless** and can be physically and psychologically traumatic and is a sign of ignorance.

If a patient starts reacting talk quietly to him and calm him down. Tell him where s/he is and that the operation is over. Deep breathing and coughing is encouraged. Infusions must be kept as ordered and must be in good operation.

Watch out for infusions which go into the tissue and reactions to blood transfusion. Observe the bandages for bleeding. If necessary they should be changed or repacked and the wound checked.

6.5 Discharge of the Patient from the Recovery Room

- Before the patient is transferred to a ward s/he must be completely awake and orientated
- Muscle relaxing medication must have worn off completely
- The respiration must be satisfactory
- The pulse rate must be normal
- All reflexes must have returned
- The patient must be handed over to the ward nurse with all the relevant information
 - A complete report must be given to the ward nurse, with the relevant information on the type of operation performed
 - Post-operative orders and prescribed medication which the patient must receive
- A nurse and a porter should accompany the patient to a ward

It is important to obtain the permission from the anaesthetist before the patient is transferred to a ward.

6.6 Specimens for Pathology

- Consult with the surgeon accordingly regarding the tissues removed from the patient during surgery that must be sent to the laboratory for examination
- As soon as a specimen is removed, check first with the surgeon and scrubbing nurse before the tissue is placed into any solution
- Specimen for cultures, for example a throat swab, and smears, for example pap smears, are not placed into a formalin solution, but must be taken to the laboratory as soon as possible
- Specimen that needs to be placed in a special solution of 10% formalin in saline should be put immediately after removal from the patient. This solution prevents the tissue from decomposing
- Should more than one tissue specimen be taken from one patient, every specimen must be placed into a separate container and be marked accordingly
- Specimens of one patient that has to go to different laboratory sections, e.g. cytology, histology, etc, should be sent in separate bags and forms to that specific department
- In case of a tumour or growth, of the breast for example, the surgeon may perform a dissection biopsy to determine a diagnosis. These specimens must, under no circumstances be placed into a fixing agent. They are placed dry into a container with the complete particulars of the patient on the label and taken to the pathologist immediately. The surgeon waits for the results of the dissection. The pathologist informs the surgeon as soon as the result is known. If the result is not malignant, the tissue is removed locally, but if it is malignant, the tissue will have to be removed extensively (frozen section performed).
- The specimen must be clearly marked with the following information on the label:
 - The name and surname of the patient
 - The registration number
 - The ward in which the patient is placed
 - The type of specimen
 - The name of the operation
 - The date and time when the specimen was taken
 - The required laboratory test
 - The name of the surgeon
- It is very important that every specimen carries the correct information to prevent a mix-up of specimen which may lead to a faulty diagnosis and treatment

- Strict control must therefore be practiced over every specimen. The scrubbing nurse can be held responsible for a missing specimen

The implications of a missing specimen:

- It prolongs the patient's stay in hospital, which has financial implications
- The doctor cannot make the correct diagnosis and the patient cannot receive the necessary treatment and medication. This causes the patient unnecessary discomfort
- The patient may undergo surgery again for another tissue specimen
- For efficient control over specimens, it is necessary to keep a book/ register in which all specimens are recorded, with the same information as on the label. A space should be made available for the signature of the person who recorded the specimen into the book/ register, as well as the signature of the person who received the specimen at the laboratory
- A special container or basket for the reception of specimens at a central point is important. At the end of the day's operating schedule the nurse can check all specimens with the entries in the book/ register
- A reliable person, for example the porter, then takes the specimens and the book/ register to the laboratory and the person who receives them at the laboratory signs the specimen book in the space provided for this purpose
- Important is that the container for the specimen is big enough to carry the specimens and that it is covered completely with a formalin solution. Make sure the lid fits well and tight
- In the space provided on the operating slip it must be recorded that the specimen was sent to the laboratory. This information must also be recorded in the operation register

6.7 Emergency Equipment/ Emergency Situations

Patients can, at any time, before, during surgery or during the post-operative period, develop an emergency situation, for example cardiac arrest, obstruction of the air way, respiratory arrest, etc. It is therefore important that all the emergency equipment/ apparatus be at hand, ready and in working condition.

Emergency equipment must be checked regularly to determine whether they are in perfect condition. The patient may lose his life due to negligence if the personnel do not care for the emergency equipment and apparatus.

An emergency trolley with different emergency items, like resuscitation medication, syringes, needles, intravenous infusions with different intravenous sets, must be available. A monitor with a defibrillator must be available in the recovery room at all times for emergencies. Make sure the electrodes and E.C.G. jelly is with the machine at all times. Defibrillator, anaesthetic machine/ventilator and monitors must be in the recovery room.

Make sure sufficient oxygen supply, masks, airways and intra-tracheal tubes as well as a laryngoscope are available. Check that the suction apparatus is connected and in working condition.

6.8 Cardiac Arrest

Intra-operatively, the anaesthetist normally takes charge should a cardiac arrest occur. The nurse in-charge should be notified. The circulating- or anaesthetic nurse must be available immediately and must assist the anaesthetist during the resuscitation of the patient. The orders given by the anaesthetist must be carried out carefully and precisely. It is important that the nurse records the time when the cardiac arrest has been diagnosed.

Procedures that may be carried out in case of cardiac arrest:

- a. The defibrillator should be kept ready in case of cardiac arrest for the administering of cardiac treatment. The two electrodes are lubricated with a cardiac jelly and then placed on the patient's thorax, one over the apex of the heart and the other over the upper third of the sternum. The defibrillator may only be used by the anaesthetist or other doctors in the OT.
- b. The surgeon may decide to perform an open cardiac massage. After opening the thorax s/he takes the heart in his hands and pumps it regularly at 80 – 100 times per minute.

The anaesthetist ensures an open airway and administers 100% oxygen to the patient. The surgeon might stop surgery until the patient's condition stabilises. The surgeon and scrubbing nurse must remain sterile. The surgeon could continue surgery if the patient's condition improves.

The surgeon will decide whether or not to continue surgery if the patient's condition does not improve. The scrubbing nurse covers the wound and assists with the resuscitation should the surgeon decide not to continue. External cardiac massage may in the meantime be applied by the surgeon or assistant surgeon. The patient is kept in the theatre or recovery room until his condition allows surgery to continue, or transferred back to the ward.

ALL health personnel involved in the patient care i.e. scrub nurse, doctor, anaesthetist must write an incident report about the event in accordance with the policy of the institution. The scrub nurse records the event in red ink in the operation register next to the patient's name. The observations that were done and emergency medicines given are noted in the records.

6.9 Tracheostomy

A tracheotomy is an opening made in the trachea through which a tracheotomy tube is inserted and through which the patient can breathe. The tracheotomy instrument

set must at all times be kept ready and available in the OT, for when it is needed. Make sure the set is complete, especially whether the knife with a blade and the tracheal dilator are on the set.

A complete set of tracheotomy tubes of different sizes must be available. A tracheotomy can be done under local anaesthetic, however where the patient's condition cannot allow it can be done without anaesthetic in order to save the patient's life.

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Appendixes

Appendix A:

i. Anaesthetic Machine and Other Anaesthetic Apparatus

It is important that the anaesthetic machine is checked before the administering of any anaesthetic, to ensure that all the necessary items are available.

- Ensure that the following items are on the anaesthetic machine:
 - Laryngoscope with different size blades. Make sure the laryngoscope is clean and in working condition.
 - A big and a small McGill's (Adult and Paediatrics) forceps for the insertion of the intra-tracheal tube.
 - A straight artery forceps to clamp the tube. This clamp must be marked for the use of the anaesthetic machine only to prevent a mix up with the surgical instruments.
 - A pair of scissors for the cutting of plaster.
 - A set of McGill's connections.
 - A catheter introducer to insert the intra-tracheal tube.
- Also ensure that the following items are in the drawer of the anaesthetic machine:
 - Enough airways of different sizes
 - Hypodermic syringes of varied sizes
 - An ambubag
 - Different size intra-tracheal tubes
 - Different size masks
 - Sufficient cut zinc oxide plaster for the sticking of the tubes, etc.
 - A tube of local lubricant gel, for example lignocaine
 - Stethoscope
 - Nasal Gastric (NG) – tube with different sizes
 - Chloramphenicol eye ointment
 - Harnass
 - Sand bags
 - Suction nozzle (yankauer)
 - Kidney dish with water
- Make sure the anaesthetic tubes are correctly connected to the machine. Also check that the different gas cylinders have gas and a cylinder key is present.
- An empty cylinder must be replaced with a full one. The empty cylinder is marked "empty" with white chalk and is removed from the operation theatre.
- Check that the suction apparatus is in good working condition and connected to a suction tube and a suction catheter is connected.
- After every administered anaesthesia, the used airways, intra-tracheal tubes and masks must be placed in a plastic bag. A new/ clean airway, intra-tracheal tube and mask are used for every new patient.

- All used anaesthetic items are removed from the operating theatre after the last operation.
- A new, sterile suction catheter must be used for every patient. Special anaesthetic items must be kept ready, in case the anaesthetist needs them.
- Ensure the defibrillating machine is available and checked daily.

It is the responsibility of the anaesthetist to check the anaesthetic machine and all other apparatus before s/he administers the anaesthesia. The anaesthetic machine must be cleaned if it is soiled during the administration of anaesthesia.

ii. Maintenance of Equipment

- Use all apparatus economically and only for the purpose it has been designed for.
- Make sure that all apparatus is in working condition at all times. Should a HCW be unsure about how to use an apparatus, consult a skilled person, because the faulty use of an apparatus can result in the unnecessary damage of expensive apparatus and the cost of repairs can be extremely costly.
- The use of any new apparatus received in the theatre must be demonstrated to all the nursing staff.
- The head nurse must make sure that all his/her staff is acquainted with the apparatus and its operation and function.
- Apparatus such as the anaesthetic machine, operating table, etc. must be maintained and repaired on a regular basis by a technician. A special maintenance contract exists.
- All faulty and broken apparatus must be accompanied by a relevant requisition form and taken to the workshop for repair.
- Keep any loose screws and bolts and send them with the apparatus for reparation.
- Only a technician with the necessary skills to repair instruments and apparatus should be allowed to do so. Delicate and expensive apparatus, the microscope for example, must be handled with care.
- After use all apparatus must be cleaned and stored in the proper way, in a container and in a store room for example.
- If there are any apparatus or instruments in the unit which has never been used, report this to the officer in-charge of the stock-control section. It is possible that other sections or hospitals are in need of these instruments or apparatus and could be utilized.

The following is recommended:

- Induction and orientation to new personnel (end users & maintenance team).
- A service plan for all apparatus should be available in theatre.
- All received new apparatus should have a manual in place in official language.
- All theatre apparatus should be handled with care and not only delicate and expensive apparatus.

- After use, all apparatus must be cleaned and stored in a proper way according to manual.
- Standardised list for theatre to be in place as per set level.
- All levels should have well equipped maintenance team in place.
- Donated equipment should be according to the MoHSS standards/specifications and spares should be available in market.
- Good record keeping of all the equipment.

iii. Repair of Instruments and Equipment

Broken and faulty apparatus should be attended to immediately and they should not stay in departments for further use or until they are repaired.

Example: A faulty diathermy machine may not be used at all but must be removed from the operating theatre and sent to the medical workshop for repair with the necessary requisition form. The patient be may be shocked or burnt, which could lead to litigation. The doctor as well as the nurse in-charge of the operating theatre will be held liable for such a mishap.

If the repair requisition form is sent, (the general requisition form as well as the issue/receipt voucher) it is important that it is accompanied by a short description of what you think the fault may be. Record the date when the equipment was sent to and received back from the workshop, as well as the name of the instrument or apparatus into the work order.

In charges should conduct a follow up with the maintenance teams on the status of their apparatus that were sent for repair. When instruments are repaired, the technicians whenever possible should demonstrate to the in charge that they are working. The in charge should also check whether it indeed is in a working condition.

iv. Orders

The technician of the Medical/ Technical Workshop condemns an article which is beyond repair. A new apparatus must be ordered to replace the one which was condemned. Any other new apparatus needed must be budgeted for the following book year. Apparatus must be listed accordingly to priority.

Complete the correct requisition form and write a short motivation note why the apparatus is needed. The condemning note must be attached to the requisition and motivation for replacement. Make a note into the order book of the date and the name of the item ordered.

Procedures to replace outdated equipment should be in place

Annex B: Emergency and Disaster Preparedness Plan for the Operating Theatre

Purpose

To provide an emergency plan for internal emergencies that will ensure the safety of all staff, patients and visitors. All OT staff should be committed to a policy of emergency preparedness for the benefit of all patients, healthcare workers and visitors.

Disaster Committee

All internal and external disasters will be coordinated by the Disaster Committee.

The committee will consist of the following people:

- Senior Medical Superintendent (SMS) / Senior Medical Officer (SMO)
- Senior Control Registered Nurse in charge
- Control Administrative Officer
- Community Health Representative
- Environmental Health Officer
- Transport Clerk
- Representative from the local Fire Brigade Department

a) In order to cope with a disaster all staff should:

- i) Be aware of what is required of them
- ii) Know who is in control
- iii) Know the location of all emergency equipment
- iv) Know the emergency exits and evacuation routes
- v) Be constantly aware of hazards
- vi) Do not panic
- vii) Not make statements to the press

b) Internal disaster

i) Important safety rules:

- Keep all areas neat, especially storerooms.
- Control visitors
- Ensure that contractors conform to safety regulations
- Maintain equipment on a regular planned basis
- Train staff to be aware of dangers

ii) Control of fire

- It is important that every employee understands the dangers in the hospital as well as the procedures to be followed should a fire break out.
- All personnel, patients and visitors have a responsibility to ensure the safety of others.

❖ **Fire hazards within a hospital**

- High technology equipment (explosions) – autoclaves, computers
- Electrical equipment (electric fires) – polishers, medical equipment
- Linen – foam rubber mattresses
- Building in general – ceilings, oxygen ports and lines, cylinders
- Dangerous substances – theatre gases, cleaning fluid, alcohol

❖ **Techniques for extinguishing fires**

○ **Smothering**

A fire is smothered by reducing or cutting off the oxygen through the use of blankets, sand, foam and dry powder fire extinguishers.

○ **Starvation**

A fire can be starved by either removing the source (material burning) or by moving the fire to a safe area.

○ **Cooling**

Burning material can be cooled to below its combustion point. Water is a suitable coolant.

❖ **Types of fire**

○ **Class A**

General fire of wood, paper, etc. and can be extinguished with either water or foam.

○ **Class B**

Burning, flammable liquid that can be extinguished with dry powder or foam.

○ **Class C**

Fires where electricity is involved must be extinguished with dry powder or foam.

NB: DO NOT USE WATER ON AN ELECTRICAL FIRE

○ **Class D**

Gas fires that include products that release gasses when burning must be extinguished with dry powder or foam.

❖ **Using a fire extinguisher**

All staff must be aware of the position of the nearest fire-fighting equipment.

- Remove from the fixture.
- Break the seal.
- Remove the safety pin.
- Press the trigger to test.
- Aim at the base of the fire and press the trigger.
- Move from left to right.

Recommended distance from fire is 3 to 4 meters.

❖ **Important aspects to remember when confronted by a fire**

- Do not panic.
- Do not run.
- Do not turn your back on the fire.
- Move as low as possible.
- Contact the switchboard.
- Close all windows and doors.
- Attempt to control the fire.
- Activate the fire alarm if available.

iii) Evacuation procedure

• **General guidelines**

- ❖ An evacuation will follow as a result of a fire, flood, bomb or other disaster that requires patients to be moved to a safer environment.
- ❖ An evacuation will only take place on the instruction from the Disaster Committee.
- ❖ It must be done in an orderly fashion.
- ❖ Be familiar with all the possible routes and exits.
- ❖ All staff has to move to central points in their units.
- ❖ The area manager will then allocate tasks.
- ❖ All staff not allocated specific tasks must report to the assembly area to await further instructions.
- ❖ Patients are our responsibility and must be evacuated as a matter of priority.
- ❖ Do not panic.

• **Responsibilities of the Area Manager**

- ❖ Ensure calm evacuation of the area.
 - ❖ Ensure safety of all patients.
 - ❖ Ensure compliance with procedures.
 - ❖ Ensure that all persons have left the building.
 - ❖ Ensure that the second in command is aware of his/her function in the absence of the area manager.
- **Specific Departmental Tasks**
 - ❖ Pharmacy must remove important stock to the assembly area
 - ❖ Emergency unit must set up a first aid post at the assembly area.
 - ❖ Laundry staff must take all available bedding to the assembly area.
 - ❖ Maintenance department must shut off power and gas supplies and supply portable oxygen.
 - ❖ Financial officer must remove important financial documents.
 - ❖ Human resources officer must take the current staff list of all on duty.
 - ❖ Administrative staff must assist with the moving of patients.
 - ❖ Kitchen staff must assist with the moving of patients.
 - ❖ OPD staff and theatre staff must assist with patients arriving from the wards at the assembly point.