

National Antibiotic Treatment Guidelines

Prepared by

Alliance for the Prudent Use of Antibiotics (APUA)-Nepal

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List of Contributors

APUA Members involved in drafting guidelines

Dr. Kumud K Kafle
Dr. Asfaq Sheak
Mr. Shyam P Lohani
Dr. Dhurba L. Singh
Dr. Iswor L. Acharya
Dr. Pramila Pradhan
Mr. Bimal M. Shrestha
Mr. Bhupendra B Thapa
Mr. Radha R Prasad
Dr. Rewati M Shretha
Dr. Bharat M Pokhrel
Mr. Gorkha B. D.C.

1. General Medicine

Dr. Madhur D. Bhattarai
Dr. Sashi Sharma
Dr. Khagendra B. Shrestha

2. Pediatrics

Dr. Fakir C. Gami
Dr. Ananta.D. Shrestha
Dr. Rameswor.M.Shretha

3. Ophthalmology

Dr. D.N. Shah
Dr. O.K. Malla
Dr. D.B. Karkee

4. Obstretics/Gynecology

Dr. Kasturi Malla
Dr. Jyoti Sharma

5. ENT

Dr. Madhav Dahal
Dr. Bimal.K. Sinha
Dr. R.K.Singh
Dr. Toran KC

6. Surgery

Dr. K.P. Singh
Dr. A.K. Sharma
Dr. Pradeep Vaidya

7. Dermatology

Dr. Anil K. Jha
Dr. Bimala Ojha
Dr. Vijay .B. Rajbhandari

8. Other participants

Dr. Chandrika Shrestha

Dr. Baikuntha Parajuli

Relative Safety of Antimicrobial Agents in Pregnancy and Breast-feeding

Antimicrobial Agents in Pregnancy

The safety of antimicrobial agents in pregnancy is a frequent cause of concern. Fortunately, most are remarkably safe. Both the Australian Drug Evaluation Committee and the Food and Drug Administration in the USA have categorized antimicrobials according to their relative safety. The categories A, B, C, D or X are defined similarly but not identically (Table I).

Agents with potentially teratogenic effects are of greatest concern when given in the first trimester, whereas those prone to cause neonatal disease, such as kernicterus, need to be avoided immediately prior to delivery. The comments given in the table II draw attention to the nature of the risk. In some cases, this applies to the pregnant woman rather than directly to the foetus. Those agents with the specific risk of causing haemolysis in the G6PD-deficient foetus are indicated by an asterisk. Adverse effects not particularly related to pregnancy are not included. (Safety in lactation is based on Therapeutic guidelines: antibiotic.

Table I. Categories of antimicrobial agent safety in pregnancy

	Australian	FDA (USA)
Category A	Drugs that have been taken by large number of women of child bearing age, without any proven increase in the frequency of malformations or other direct or indirect harmful effects on the foetus having being observed	Controlled studies in women demonstrate no foetal risk
Category B	Drugs that have been taken by only limited number of pregnant women and women of childbearing age, without an increase in the frequency of malformations or other direct or indirect harmful effects on the foetus having being observed	Animal studies demonstrate no foetal risk but there are no human trials
Group B1	Studies in animals have not shown evidence of an increased occurrence of foetal damage	or
Group B2	Studies in animals are inadequate or may be lacking; however, available data show no evidence of an increased occurrence of foetal damage.	Animal studies demonstrate a risk not corroborated in human trials.
Group B3	Studies in animals have shown evidence of an increased occurrence of foetal damage, the significance of which is considered uncertain in humans	
Category C	Drugs, that because of their pharmacological effects, have caused or may be suspected of causing harmful effects on the human foetus or neonate without causing malformations. These effects may be reversible. Product Information should be consulted for further details.	Animal studies demonstrate foetal risk, but there are no human trials or neither human nor animal studies are available.
Category D	Drugs that have caused or are suspected to have caused or may be expected to cause an increased incidence of human foetal malformations or irreversible damage. These drugs may also have adverse pharmacological effects. Product information should be consulted for further details.	Evidence exists for foetal risk in humans; benefits may outweigh risk.
Category X	Drugs that have such a high risk of causing permanent damage to the foetus that they should not be used in pregnancy or when there is possibility of pregnancy.	Evidence exists for foetal risk in humans; benefit clearly outweighed by risk.

Table II Relative safety of antimicrobial agents in pregnancy and lactation

Antibacterial agents	Category (pregnancy)		Lactation	Comment	
	Australian	USA			
Aminoglycosides					
Amikacin	D	D	safe	Congenital deafness has followed streptomycin use, therefore use any aminoglycoside during pregnancy only when essential. Single-dose spectinomycin appears safe for gonorrhoea in pregnancy.	
Gentamicin	D	D	safe		
Netilmicin	D	D	safe		
Spectinomycin	B1	-	uncertain		
Tobramycin	D	D	safe		
Cephalosporins					
Cefaclor	B1	B	safe	All cephalosporins listed here are regarded as being safe.	
Cefepime	B1	B	safe		
Cefotaxime	B1	B	safe		
Cefotetan	B1	B	safe		
Cefoxitin	B1	B	safe		
Cefpirom	B1	B	safe		
Cefpodoxime	B1	B	safe		
Ceftazidin	B1	B	safe		
Ceftriaxone	B1	B	safe		
Cefuroxime	B1	B	safe		
Cephalexin	B1	B	safe		
Cephalothin	B1	B	safe		
Cephazoline	B1	B	safe		
Penicillins					
Amoxicillin	A	B	safe	All penicillins appear to be safe in pregnancy and lactation. There is limited data for the beta-lactamase inhibitors, but no reason to expect them to be unsafe.	
Amoxicillin/clavulanate	B1	B	safe		
Benzathine penicillin	A	B	safe		
Benzyl penicillin	A	B	safe		
Flucloxacillin	B1	B	safe		
Phenoxyethyl penicillin	A	B	safe		
Piperacillin	B1	B	safe		
Piperacillin/tazobactam	B1	B	safe		
Procaine penicillin	A	B	safe		
Ticarcillin	B2	B	safe		
Ticarcillin/clavulanate	B2	B	uncertain		
Other Beta lactams					
Aztreonam	B1	B	safe		Probably safe in pregnancy but inadequately studied. Maternal intolerance in some pregnant animals-caution advised.
Imipenem/cilastatin	B3	C	safe		
Meropenem	B2	-	uncertain		
Macrolides					
Azithromycin	B1	B	safe	Probably safe but inadequate data. Clarithromycin has been associated with foetal toxicity.	
Clarithromycin in primates	B3	C	uncertain		
Erythromycin risk (except estolate)	A	B	safe	Erythromycin estolate is associated with an increased risk of cholestatic hepatitis in pregnant women. Other erythromycins are routinely used for chlamydial infection in pregnancy. All are compatible with breastfeeding.	
Roxithromycin	B1	-	safe		
Quinolones					
Ciprofloxacin	B3	C	avoid	Quinolones cause arthropathy and Fleroxacin B3-X cartilage damage in juvenile experimental animals. Experience with newer fluoroquinolones are relatively	
Nalidixic acid	A	-	uncertain		
Norfloxacin	B3	C	avoid		

Ofloxacin	B3	C	avoid	contraindicated, probably only because less experience has accrued. High levels are present in milk.
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Tetracyclines

Doxycycline	D	D	avoid	All tetracyclines are contraindicated in pregnancy and during breastfeeding because of the possibility of retardation of foetal skeletal development and enamel hypoplasia with discoloration of teeth. IV use is associated especially in those with hepatotoxicity and nephrotoxicity in pregnant women, with renal insufficiency or if overdosed.
Minocycline	D	D	avoid	
Tetracycline	D	D	avoid	

Other antibacterial agents

Chloramphenicol	A	-	avoid	Possibility of Grey-baby syndrome when given near term, Also idiosyncratic aplastic anaemia.
Clindamycin	A	-	avoid	Appears safe.
Cotrimoxazole	C	C	safe	Very large doses of trimethoprim are teratogenic in animals if used consider folate supplementation. Sulphonamides may cause kernicterus when given at term. Avoid during breastfeeding if infant is G6PD deficient.
Fusidic acid	C	-	safe	Risk of kernicterus when given perinatally, otherwise safe
Haxamine (Methanamine)	A	C	safe	Appears safe
Lincomycin	A	-	safe	Appears safe
Metronidazole	B2	B	avoid high	Mutagenic in bacteria and carcinogenic in mice after long Single dose
Nimorazole	-	-	uncertain	term use, therefore usually avoided in first trimester. A Recent meta-analysis suggests it is safe.
Nitrofurantoin	A	B	uncertain	Related to metronidazole. Probably safe. Appears safe except at term (neonatal haemolysis may Occur due to immature enzyme systems and G6PD deficiency).
Ornidazole	-	-	uncertain	Related to metronidazole. Probably safe.
Rifampicin	C	C	safe	Cause of skeletal malformation in animals and of haemorrhage in humans. If given in late pregnancy mother and neonate vitamin K.
Sulphonamides	C	C	safe	Safe for full-term, healthy infants.
Teicoplanin	B3	-	uncertain	
Tinidazole	B3	-	uncertain	Related to metronidazole. Probably safe.
Trimethoprim	B3	C	safe	Avoid in first trimester- see cotrimoxazole.
Vancomycin	B2	B	safe	No studies: use with caution (oral vancomycin for <i>Clostridium difficile</i> disease safe as not absorbed)

Antimicrobial agents in breast feeding

Antimicrobials given in therapeutic doses to lactating women are detectable in the milk. Some attain levels in milk that are a significant proportion of the maternal serum concentration, but most reach only a few percent. Even for the former, breast-feeding is not a means of achieving anything approaching therapeutic levels in the infant, and the possibility of overdosing via breast-feeding does not arise. The theoretical possibility of causing subsequent allergic reactions in the newborn has not been convincingly demonstrated. However, in the case of a very few antimicrobial agents, the small amounts ingested via milk can have adverse effects.

Metronidazole and related drugs can give a bitter taste; concerns about their mutagenic potential have not been shown to be justified. Chloramphenicol is presumed capable of causing idiosyncratic bone marrow suppression in very small amounts. Nalidixic acid, nitrofurantoin and sulphonamides in breast milk have been shown to cause haemolysis in infants with G6PD deficiency, and this is presumably a possibility with other oxidant agents. It is postulated that sulphonamides may reach sufficient levels to precipitate kernicterus in the predisposed neonate, but no adverse effects in infants have been reported with cotrimoxazole given to lactating women. Tetracyclines attain significant levels in milk and even though absorption may be slight as the result of chelation with calcium, it seems prudent to avoid these agents as one would in pregnancy or childhood. Aminoglycosides are relatively contraindicated in pregnancy, but achieve low levels in milk and are not absorbed by mouth. Vancomycin is not absorbed by mouth.

Antimicrobial agents regarded as compatible with breast feeding by American Academy of Pediatrics Committee on Drugs include: penicillins, cephalosporins, macrolides, clindamycin, cotrimoxazole, isoniazid, ethambutol, rifampicin, quinine, quinine and acyclovir. Nalidixic acid and nitrofurantoin are safe in the absence of G6PD deficiency.

Antibiotic Prophylaxis in Surgery

The purpose of prophylaxis is to prevent postoperative infection. With appropriate agents, a significant reduction in the incidence of wound infection is achievable and, in addition, there may be corresponding reductions in postoperative respiratory and urinary infection rates.

A major determinant of postoperative infection (and, therefore, of the requirement for prophylaxis) is the 'category' of the surgical procedure, which classifies incisional wounds according to the extent of microbial contamination:

Clean Procedures: Primarily closed, elective procedures involving no inflammation or antecedent trauma, no break in technique, and no entry into the gastrointestinal, oropharyngeal, genitourinary, biliary, or tracheobronchial tracts.

Clean-Contaminated Procedures: Surgery during which a colonised viscus (e.g. gastrointestinal, tracheobronchial or genitourinary tract) is entered. Inflammation is absent and there is no significant spillage/contamination. Included in this category are: clean procedures in which there are minor breaches in technique; re-operation of clean surgery within 7 days; and procedures following blunt trauma.

Contaminated Procedures: Surgery in the presence of nonpurulent inflammation, or where there is major spillage from a colonised viscus, or there is major breach in aseptic technique. Traumatic wounds less than 4 hours old are included in this category.

'Dirty' Procedures: Surgery in the presence of established infection, e.g. perforated viscus, devitalised tissue, and traumatic wounds more than 4 hours old.

Guidelines for Prophylaxis

The following guidelines for prophylaxis apply to **clean, clean-contaminated** and **selected contaminated** procedures. The use of antimicrobials in dirty and some contaminated procedures is not classified as prophylaxis but as treatment for presumed infection. The duration of such treatment is commonly 3 to 5 days.

- In situations where postoperative infection rates are low (e.g. following clean surgery), prophylaxis should be given only when: (a) infection would have catastrophic results (e.g. heart valve or joint replacements); or (b) a risk index or some other information indicates an increased probability of postoperative wound infection.
- Antibiotic should be present in the target tissues at the time of incision and when contamination occurs.
- The optimum timing for prophylaxis by parenteral administration is at the time of induction of anaesthesia. The infection rate increases if antibiotics are given more than 2 hours preoperatively or are delayed until after the start of the operation.
- For the majority of procedures lasting for 2 hours or less, a single dose of prophylactic antibiotic is sufficient.
- Excessively long courses of 'prophylactic' antibiotic, whether before or after surgery, select for resistant organisms and may increase the risk of infection. The practice of continuing antibiotics until such time as surgical drains have been removed is unproven and not recommended.
- For procedures lasting more than 2 hours, or when there is massive blood loss producing antibiotic 'wash-out', 1 or 2 further doses may be required.
- The antibiotic chosen for prophylaxis should have spectra of activity that include those organisms most likely to cause infection following the procedure. It is not necessary for the chosen agent to 'cover' all the likely contaminants.
- The benefits of prophylaxis should outweigh the risks, e.g. the antibiotic should be safe and should not contribute to the emergence of antibiotic-resistant bacteria.
- Since antibiotic prophylaxis accounts for at least one-third of all antibiotics used in hospital practice, the issues of antibiotic costs and cost-effective prophylaxis are becoming increasingly important.
- Prophylactic antibiotics are only one factor that determines the risk of infection. Other factors of equal or even greater importance are surgical technique, the duration of surgery, the duration of preoperative stay, shaving the operation site (if this must be done, shave immediately preoperatively), repeat surgical procedure, obesity, immune compromise and a variety of other host factors.

Topical Antibiotics

Topical antibiotics have an established place in the treatment of conjunctivitis, otitis externa, acne and discrete of impetigo. The use of topical antibiotics in most other situations is controversial. Antiseptics, for example povidone iodine, are preferred for minor wounds. It seems reasonable to avoid use of valuable systemic agents for two reasons: the patient may become allergic and the organisms may become resistant. Emergence of resistance is a problem both in hospital and in the community.

Antimicrobial Combinations

Antimicrobial combinations should be avoided unless indicated:

- To extend the spectrum to cover, e.g. empirical therapy of suspected mixed infections such as pelvic inflammatory disease.
- To achieve a bactericidal effect (synergy), e.g. in enterococcal endocarditis.
- To prevent the emergence of resistant organisms, e.g. in the therapy of tuberculosis.

Synergistic combinations of antibiotics are those that show greater activity than would be expected from their individual activities.

Antagonistic combinations have less activity than any one of the components and are fortunately uncommon.

Pediatrics

Acute Respiratory Infection

Pneumonia

Symptoms and signs: cough, fever and difficulty in breathing, increased respiratory rate 50 or more than 50 for a child aged 2 months up to 1 year, and 40 or more than 40 for a child aged 1 year up to 5 year

Treatment:

Age or weight	Cotrimoxazole Pediatric Tablet	Amoxicillin		Chloramphenicol	
		Tablet 250mg	Liquid 125mg/5ml	Capsule 250mg	Liquid
125mg/5ml 2 to 12 months (4 to <10 Kg)	2	½	5 ml	-	5 ml
12 months to 5 year (10-19 Kg)	3	1	10ml	1	10ml

In severe case of pneumonia or very severe disease e.g. if a child is having chest in-drawing, referral is necessary after giving 1st dose of any one of above antibiotic.

Severe pneumonia

The condition is being treated at District or Zonal or Regional hospital because there is need of giving oxygen and injectable antibiotics.

PHC/District/Zonal and above:

- Oxygen inhalation
- Benzyl penicillin (Crystalline penicillin)
- Maintenance of fluid and electrolyte imbalance.
- Treatment of complications.

Note: In general the dose of Amoxicillin is 15 mg/Kg/dose q8h for 5 days or Crystalline penicillin 1 lac unit/Kg q6h for 5 days.

Acute Ear Infection

Symptoms and signs: pain in the ear, fever or ear discharge.

Treatment:

SHP/HP/PHC/District Hospitals:

Age or weight	Cotrimoxazole Tablet	Amoxicillin	
		Tablet 250mg	Liquid 125mg/5ml
2 to 12 months (4 to <10 Kg)	2	½	5 ml
12 months to 5 year (10-19 Kg)	3	1	10ml

Note: If the child is suffering from Mastoiditis, the child should be referred to PHC/District/Zonal or higher center for treatment after giving first dose of an antibiotic and first dose of paracetamol for pain.

Chronic Ear Infection

Symptoms: Pus is seen draining from the ear and discharge for more than 14 days. There is no history of ear pain and fever.

Treatment:

SHP/HP/PHC/District/Zonal and above:

- Dry the ear by wicking.
- Follow up in 5 days.

Bacillary Dysentery

Etiology: Usually caused by Shigellae Species

Symptoms and signs: fever, blood and mucus in stool, abdominal pain and tenesmus

O/E: toxic look, distended abdomen and tender, increased bowel sound may or may not be associated with neurologic manifestations.

Treatment:

SHP/HP/PHC/District/Zonal and above:

- Cotrimoxazole 2-3 tablets (for dose see under pneumonia) OR Nalidixic acid: 55 mg/Kg q6h for 5 to 7 days.
- Maintenance of fluid and electrolytes
- Paracetamol if fever.

Cholera

Etiology: *Vibrio Cholerae*

Symptoms and signs: Watery diarrhoea (rice water) with or without fever. Sometimes there may be signs of severe dehydration.

Treatment:

SHP/HP/PHC/District and above:

- Cotrimoxazole 2-3 tablets (for dose see under pneumonia) for 3 days OR Tetracycline (12 months to 5 years): 250 mg q6h for 3 days or erythromycin (250 mg) 2-4 months or 4 to less than 6 Kg: ¼th tablet q6h for 3 days;
4-12 months (6 to less than 10 Kg): ½ tablet q6h for 3 days; 12 months to 5 years (10-19 Kg): 1 tablet 6 hourly for 3 days
- Maintenance of fluid and electrolytes.

Tetanus neonatorum

Tetanus (lockjaw) is an acute, spastic paralytic illness caused by *Clostridium tetani*. Tetanospasmin is a neurotoxin produced by *Clostridium tetani*. Neonatal tetanus (tetanus neonatorum) is a generalized tetanus typically manifest within 3-12 days of birth.

Agent: *Clostridium tetani*, an anaerobic, spore forming bacilli.

Symptoms: progressive difficulty in feeding (suckling and swallowing), with hunger and crying.

Signs: paralysis or diminished movement, stiffness to the touch, spasm with or without opisthotonos.

Treatment:

SHP/HP/ PHC/District/Zonal and Above:

- Tetanus immunoglobulin: 500-3000 units IM.
- Crystalline Penicillin: 1 lac unit/kg/24 hours in 4 divided doses for 10 to 14 days
- Treat convulsion.
- Isolate baby in quite and dark place.

Acute Osteomyelitis and Septic Arthritis

Septic arthritis or pyogenic arthritis is an inflammation of the joint caused by pyogenic microorganisms.

Symptoms and signs: The main features of septic arthritis is acute inflammation localized to the region of joint. This may produce pain, tenderness, swelling, erythema, and decreased range of motion. Septic arthritis in neonate often presents with fever and a toxic appearance. Pseudoparalysis of involved extremity and pain when diaper is changed are common early manifestations involving hip.

In older patients, pain may be localized to the involved joint but may also be referred to a site other than the joint itself.

Treatment:

SHP/HP: refer to PHC/District hospital

PHC/District/Zonal and above:

If Gram positive cocci: Cloxacillin 50-100 mg/Kg/24 hourly IV Or IM in 4 divided doses PLUS Gentamycin 6 mg/Kg/24 hourly IV Or IM in 3 divided doses or single dose for 3-4 weeks.

If Gram negative organism: Ampicillin 10-25 mg/Kg q6h PLUS Gentamicin 6 mg/Kg/24 hours in 3 divided doses or single dose for 3-4 weeks.

Note: Antibiotics in oral route is not efficacious in neonates. If the facility for culture/sensitivity is not available treat with cloxacillin and gentamicin.

Acute post- streptococcal glomerulonephritis

It is defined as sudden onset of gross haematuria, oedema, hypertension, and renal failure.

Agent: Group A beta-haemolytic streptococci.

Symptoms and signs: It is most common in children but rare before the age of 3 years. The child develops an acute nephritis 1-2 weeks after an antecedent streptococcal infection. The severity of renal involvement may vary. Patient may have asymptomatic microscopic haematuria with normal renal function to acute renal failure. The child may develop varying degrees of oedema, hypertension, and oliguria. An encephalopathy or congestive heart failure or both may also develop. Non-specific symptoms such as malaise, lethargy, abdominal or flank pain, and fever are common. The acute phase generally resolves within 1 month following onset but urinary abnormalities may persist for more than 1 year.

Treatment:

SHP/HP: refer to PHC or District hospital.

PHC/District/zonal and above:

Crystalline penicillin: 50,000 to 1 lac unit/Kg q6h for 10 days OR Benzathine penicillin: 6 lac for children less than 27 Kg in a single dose and 12 lac for children more than 27 Kg after sensitivity test. If the patient is not sensitive to penicillin, use erythromycin 30-50 mg/Kg q6h for 10 days.

Acute Rheumatic Fever

Etiology: Group A, B- haemolytic streptococcus

Diagnosis:

Jones major criteria: Carditis, polyarthritis, erythema marginatum, chorea and subcutaneous nodule

Jones minor Criteria: Fever, arthritis, previous history of rheumatic fever, elevated acute phase reactants (ESR and CRP) and prolonged P-R interval on an electrocardiogram PLUS evidence of a preceding group A streptococcal infection (culture, rapid antigen).

One major and two minor criteria plus evidence of a preceding streptococcal infection indicate a high probability of rheumatic fever.

Treatment:

SHP/HP: refer to PHC/ District hospitals.

PHC/District/Zonal and above: Benzathine penicillin G (IM): For child less than 27 Kg: 6 lac IM Once after sensitivity test; For child more than 27 Kg: 12 lac deep IM once OR

Penicillin V (Oral): 250 mg q6h for 10 days OR Erythromycin 40mg/Kg/24 hours in 4 divided dose for 10 days.

Acute Bacterial Meningitis

Bacterial meningitis is one of the most potentially serious infections in infants and older children.

Etiology: First 2 months of life:

- a. Group B streptococci,
- b. Gram -ve enteric bacilli,
- c. L-monoctogens,
- d. H. influenzae type b;

2 month-12 years of age:

- a. H-influenzae type b,
- b. Streptococcus pneumoniae,
- c. N. meningitidis;

Over 12 years of age:

- a. N. meningitidis,
- b. S. pneumoniae.

Symptoms and signs are fever, vomiting, convulsion, loss of consciousness, purpuric rashes or features of shock and neck rigidity. Sudden onset with rapidly progressive manifestations of shock, purpura, disseminated intravascular coagulation and reduced levels of consciousness are the most dramatic and fatal manifestations of meningococcal sepsis with meningitis. Meningitis due to H. influenzae type b or pneumococcus is preceded by several days of upper respiratory tract or gastrointestinal symptoms.

Treatment:

SHP/HP: refer to PHC/District hospital.

PHC/District/Zonal and above:

Crystalline penicillin: 3 lac unit/Kg/24 hours in 4 to 6 divided doses for 10-14 days.

Note: meningitis, encephalitis and child with very severe febrile disease (unable to feed, vomits everything he or she eats, convulsion, lethargic or unconscious) should be referred.

Ophthalmology

Pain in the eye

Pain in the eye ranges from mild to severe. Mild pain or discomfort and foreign body sensation. Severe pain may be associated with vomiting and photophobia. It also occurs in corneal ulcer, iritis, glaucoma etc.

Diagnostic Features:

- Mild pain or discomfort and foreign body sensation.
- Severe pain with redness, lacrimation and hazy cornea indicates corneal ulcer.
- Severe pain with vomiting, headache and dimness of vision occurs in acute glaucoma.
- Severe pain, usually at night, associated with blurring of vision, photophobia with marked redness of eye, indicates iritis.

Treatment:

Foreign Body:

Foreign body in the conjunctiva may be dust particles, husks and insects etc. The foreign body usually remains in the lower conjunctival sac. It can be removed easily by swab stick after pulling lower lid down.

SHP/HP/PHC/District: Chloramphenicol 1 drop q4h OR Chloramphenicol eye ointment at bedtime

Referral:

- If foreign body can not be removed easily from conjunctiva.
- If foreign body is found impacted on cornea. Treat with an eye drop (as mentioned above) and refer the patient to the **zonal or higher hospital/ eye hospital/eye center**.
- If there is suspected penetrating or perforating injury, cover the eyes with a sterile pad and refer patient immediately to the nearest zonal hospital or eye hospital or eye center. Do not put any drop or ointment in the eye.

Corneal ulcer

In suspected cases of corneal ulcer apply

SHP/HP/PHC/District: Chloramphenicol 1% eye drops q1h PLUS chloramphenicol eye ointment at bedtime PLUS Homatropine eye drops 1 drop q8h daily.

Paracetamol can be used when there is pain that troubles the patient..

Referral: All the cases of corneal ulcers must be referred to eye hospitals/centers.

Conjunctivitis

An inflammation of the conjunctiva is called conjunctivitis.

Diagnostic features:

- Discomfort in one or both eyes
- Discharge from the eye. It may be watery in viral and allergic conjunctivitis but purulent in bacterial conjunctivitis.
- Marked redness of conjunctiva.

Treatment:

- Wash the eye frequently with lukewarm water

SHP/HP/PHC/District/Zonal and above: Chloramphenicol OR Gentamycin eye drops q4h PLUS Chloramphenicol/ Gentamicin eye ointment at bedtime. The treatment can be continued until conjunctivitis resolves completely

Prevention:

Prevention of healthy eye being infected can be achieved by:

- Not touching the eyes with finger
- Not rubbing the eye
- Lying on affected side
- Not using the same handkerchief for both eyes

Prevention to be taken by other family members.

- Handkerchief and towel used by patient must be kept separate.

Referral:

If patient does not respond within 7 days of treatment or redness of the eye increases, refer patient to hospital.

Trachoma

Trachoma is a communicable kerato-conjunctivitis caused by *Chlamydia trachomatis*.

Diagnostic features:

- Involvement of both eyes.
- Lacrimation
- Foreign body sensation
- Mucopurulent discharge from both eyes
- Redness of the conjunctiva
- Appearance of papillae and follicle in the conjunctiva
- Vascularised infiltration in the upper part of cornea: pannus
- Signs of complication e.g. trichiasis, corneal opacities etc.

Treatment

SHP/HP: Refer to Eye hospital/Centers/ Trachoma Control Offices.

PHC/District: Start following treatment: Sulphacetamide 20% eye drops q6h PLUS Tetracycline eye ointment q6h and refer to Eye Hospital/Center/Trachoma Control Office.

Chemical Burn of the Eye

Accidental injury to eye by acid/alkali

Symptoms: burning sensation, pain, diminution of vision, associated skin lesion of eye lids and face due to chemical.

Treatment:

SHP/HP/HPC/District:

- Promptly wash the eye with plain water at least for 30 minutes.
- Atropine eye drops: 1 drop q8h PLUS
- Acetazolamide –250mg orally q6h PLUS
- Vitamin C 1 g q12h. PLUS
- Gentamycin eye drop: 1 drop q4h.
- Paracetamol 1 tab SOS

Referral: The patient should be referred to Eye Hospital/Center as soon as possible.

Acute Congestive Glaucoma (Angle Closure glaucoma)

Symptoms: pain in the eye, congestion of the eye, diminution of vision. There may be history of colored haloes and nausea and vomiting. On examination cornea is hazy, anterior chamber is shallow, pupil is mid dilated, intraocular pressure is high. Digitally eye appears hard.

Treatment:

SHP/HP/PHC/District:

- Acetazolamide stat 500 mg and 250 mg q6h
- Pilocarpine 2 % eye drops q6h
- Timolol maleate 0.5% eye drops q12h (except contraindicated). DO NOT use in patients with Bronchial asthma and cardiac problem.

Referral: Painful, red eye with diminished vision should be referred immediately to an Eye Hospital/Center.

Obstetrics and Gynaecology

Pelvic Inflammatory Disease (PID)

Pelvic inflammatory disease is a major health problem in both developed and developing countries in spite of availability of many powerful antimicrobial drugs. Often the infection rate are highest in areas where medical resources are most severely limited. Treatment of this condition and its sequelae in particular infertility, consumes a significant portion of the medical resources of numerous countries.

A variety of organisms cause pelvic infection and secondary infection readily occurs when primary infecting agent is often identified. In most cases the infection ascends from the vagina and cervix to the uterus and parametrial tissue, fallopian tube, ovaries and pelvic peritoneum. Salpingitis can occur following appendicitis or diverticulitis or from blood spread up tuberculosis. Infection can also occur following abortion, delivery, gynaecological surgical procedure or an insertion of intrauterine contraceptive devices.

The most common causative organisms found in PID are *N. Gonorrhoeae* in 30-80%, 25-35% have anaerobes and 20-30% case have *C. trachomatis* and 10% have mycoplasma.

Diagnostic features: The classical description of PID are lower abdominal pain and tenderness. Purulent cervical discharge, adenexal tenderness, fever, elevated erythrocyte sedimentation, leucocytosis. Other symptoms include urinary tract symptom and irregular intermenstrual bleeding.

- Febrile illness more common in gonorrhea associated salpingitis and severe anaerobic pelvic infection.
- A palpable adenexal mass
- A cervical discharge wet film smear will differentiate from lower genital tract infection.

Treatment:

SHP and HP: Oral therapy

Ciprofloxacin 500 mg stat PLUS
Doxycycline 100 mg q12h for 14 days OR Tetracycline 500 mg q6h for 14 days PLUS
Metronidazole 400 mg q8h for 14 days.

PHC: Oral therapy as in HP

Parenteral therapy: Acute PID, admission necessary.

Inj Ciprofloxacin 200 mg IV q12h for 2 days OR Ampicillin 500 mg IV q6h for 2 days Or Inj Cefotaxime 1 gm IV q6h for 2 days PLUS
Inj Metronidazole 500 mg IV q8h for 2 days

THEN change over to oral medicine orally for 12 days more as follows:

Ciprofloxacin 500 mg q12h for 12 days OR Cephalexin 500 mg q6h for 12 days OR Amoxicillin 500 mg q6h for 12 days PLUS
Metronidazole 400 mg q8h for 12 days.

District: Same treatment protocol as PHC (oral as well as parenteral).

Zonal and above:

Oral Therapy: as in PHC

Parenteral Therapy:

Inj Ceftriaxone 1 g IM daily for 2 days OR Inj Ciprofloxacin 200 mg IV q12h for 2 days OR Ampicillin 500 mg IV q6h for 2 days PLUS
Inj. Metronidazole 500 mg IV q8h for 2 days

THEN change over above medicines orally for 12 days more.

Cefotaxim axetil 200 mg q12h for 12 days OR Ciprofloxacin 500 mg q12h for 12 days OR Ampicillin 500 mg q6h for 12 days PLUS
Metronidazole 400 mg q8h for 12 days

In pregnancy: Doxycycline, Tetracycline and Ciprofloxacin should not be used.

Vaginal Discharge Syndrome (Cervicitis and Vaginitis)

Vaginal discharge may be due to a wide variety of physiological and pathological causes. It may also be the presenting complaint in woman suffering from STDs. It is important to distinguish which women presenting with vaginal discharge have cervicitis and vaginitis as opposed to vaginitis alone. Vaginitis is more likely to produce symptoms but unlikely to be associated with complications. In contrast, cervicitis is a common cause of complications and sequelae and therefore of very considerable public health importance. In the absence of laboratory capacity for identifying specific pathogens in the cervix, risk assessment is recommended for identifying which women have cervicitis. For risk assessment the health workers have to ask the questions what is the probability of this woman having a cervical infection (multiple partners, driver husband, commercial sex workers, carpet industries workers, single woman etc).

Treatment:

In Sub-Health Post, Health Post, Primary Health Centre and District Hospitals, the treatment is given as vaginal discharge syndrome as follows:

Oral therapy:

Ciprofloxacin 500 mg as a single stat dose PLUS

Doxycycline 100 mg q12h for 7 days OR Tetracycline 500 mg q6h for 7 days OR Erythromycin 500 mg q6h for 7 days PLUS

Metronidazole 2 gms as single stat dose for both partners.

In pregnancy, Ciprofloxacin, Doxycycline or Tetracycline are not prescribed.

Local therapy:

1. Clotrimazole vaginal tablets: 1 tablets vaginally at bedtime for 6 days
2. Clotrimazole cream for local use q12h for 2 weeks.

In Zonal and above, treatment is given disease wise. The causative organisms for vaginal infection are candida albican, trichomonas vaginalis and bacterial vaginosis and for cervical infection neisseria gonorrhoea and chlamydia trachomatis are responsible.

Candida albican

- Vulvovaginal candidiasis occurs worldwide
- Common in pregnancy and following antibiotic therapy
- Carriers are asymptomatic
- Seen commonly in women attending STD clinics
- Intense vulval itch/ burning sensation
- Dysuria and dyspareuria
- Thick and cottage cheese like discharge
- May be thin and mucopurulent
- Profound vulvovaginitis, vulval odema
- Vaginitis with mycotic plaques in vaginal wall and ectocervix

Diagnosis:

1. Clinical symptoms as above
2. Microscopic examination of vaginal fluid. One slide in saline preparation and other slide with few drops of potassium hydroxide. The presence of inflammatory white blood cells in saline preparation and branching pseudo hyphae are seen on the potassium hydroxide slide.

Treatment:

Local therapy:

1. Clotrimazole vaginal tablets: 1 tablets vaginally at bedtime for 6 days
2. Clotrimazole cream for local use q12h for 2 weeks.

Oral therapy:

Ketoconazole 200-400 mg or Fluconazole 150 mg stat

Troublesome recurrence cases:

- Ketoconazole 400 mg daily for 2 weeks OR
- Prophylactic Ketoconazole 400 mg daily for 5 days beginning with the onset of menses for 6 menstrual cycle

Trichomonas Vaginalis

- Both males and females may harbor the organism asymptotically.
- Infection cause vaginitis, urethritis, cervicitis and/or cystitis.
- Foul smelling, mucopurulent vaginal discharge- frothy and often green
- Dysuria and vulval soreness
- Severe vulvovaginitis
- Petechial haemorrhages on the vaginal wall and ectocervix.
- Infection is transmitted sexually.

Diagnosis:

Wet film microscopic study will show

- Inflammatory white blood cells
- Motile pear shaped flagellated organisms

Treatment:

- Metronidazole 2 gms stat dose followed by 400 mg q8h for 7 days for both the partners.
- Alcohol should be refrained during metronidazole therapy

Parenteral therapy: In severe cases (rare)

- Metronidazole 500 mg IV q8h for 5 days

Bacterial Vaginosis (BV)

- Profuse fishy smell, thin gray or whitish watery discharge.
- Little or no inflammatory reaction.
- May be frothy.
- May be asymptomatic
- Notable organism is bacteroids species, various anaerobic cocci, mobiluncus species and perhaps some mycoplasma species.
- Condition is not inherently sexually transmitted.
- Strong association with pelvic inflammatory disease.
- Associated between BV and premature rupture of membranes or other adverse pregnancy events in gravidas.

Diagnosis:

- Smell of vaginal fluid- putrid odor of BV
- A few drops of Potassium hydroxide added to vaginal fluid yields a positive " sniff test"
- pH value on higher range
- Microscopy of wet film shows " clue cells"

Treatment:

Oral therapy:

1. Metronidazole 2 gms single dose followed by 400 mg q8h for 7 days
2. **In pregnancy**, Amoxicillin/ Clavulanate 500 mg q8h for 7 days.

Chlamydia Trachomatis

- Responsible for at least half of all non-specific genital infection.
- Half of PID cases can be attributable to chlamydia.
- Infertility and ectopic pregnancy
- Spontaneous abortion/prematurity/intrauterine growth restriction/ low birth weight

- Neonatal diseases: Conjunctival infection 4-14 days of delivery, afebrile pneumonitis, otitis media
- Often silent infection
- May cause dysuria and frequency of urine
- Excessive vaginal discharge
- Post coital bleeding
- Congested oedematous cervical ectopy with small follicle
- Contact bleeding from ectocervix
- Skenitis and Bartholinitis may occur

Diagnosis:

- A single ligase chain reaction assay on urine, endocervical and urethral discharge samples
- Enzyme immunoassays

Gonococcal infection:

- Common cause of morbidity in women and neonates worldwide
- Antibiotic resistance increasing in developing world
- Excessive vaginal discharge
- Dysuria
- Mucopurulent cervical discharge
- Rectal and pharyngeal infection are asymptomatic and more difficult to eradicate.

Treatment:

Treatment of gonococcal and chlamydial trachomatis is same.

Oral therapy:

- Azithromycin 2 g single dose OR
- Doxycycline 100 mg q12h for 7 days OR
- Tetracycline 500 mg q6h for 7 days OR
- Erythromycin 500 mg q6h for 7 days

Parenteral therapy:

- Inj Ceftriaxone 250 mg IM single dose OR
- Inj. Spectinomycin 2 gms IM single dose

In pregnancy, ciprofloxacin, doxycycline, and tetracycline should not be given.

Syphilis

- STD caused by *Treponoma pallidum*
- Painless ulcer, the site of infection is usually genital
- Ulcer appears 4-5 weeks of sexual contact

Classification:

- Primary syphilis
- Secondary syphilis
- Tertiary syphilis

Diagnostic features

Primary syphilis

- History of sexual contact
- Small macule or papule or ulcer in the genital
- Enlarged regional lymphnodes

Secondary syphilis

- Rashes appear as macule changed to papule and are mostly distributed over the trunk, limbs, pelvis
- Condyloma apperas as papule on soft tissue in and around the anus, regional lymphnodes are enlarged, non-healing ulcer in mucous membranes of genitalia, oral cavity and throat.

Tertiary syphilis

- Granulomatous lesion in the connective tissue, heart, brain, testes, bone and liver

Treatment

Primary, Secondary, tertiary less than 2 years duration

SHP/HP: Procaine penicillin 12 Lacs IU by IM daily for 10 days after skin test

Penicillin allergy: Oral Doxycycline 100 mg q12h for 15 days OR Tetracycline 500 mg q6h for 15 days OR Erythromycin 500 mg q6h for 15 days

Latent syphilis more than 2 years duration

Procaine penicillin 12 lacs IU by IM for 20 days

Penicillin allergy: Doxycycline 100 mg q12h for 30 days OR Tetracycline 500 mg q6h for 30 days OR Erythromycin 500 mg q6h for 30 days

PHC: Same as SHP/HP

District and higher: Same as PHC

Cardiovascular syphilis

Inj Procaine penicillin 12 lacs IU by IM daily for 20 days

Penicillin allergy: Same as SHP/HP

Neuromuscular syphilis

Inj Crystalline penicillin 20 lacs IU by IM q4h for 14 days OR Inj Procaine penicillin 12 lacs IU by IM for 10-14 days PLUS Probenecid 500 mg q6h for 10-14 days OR

Penicillin allergy: Doxycycline 100 mg q12h for 30 days OR Tetracycline 500 mg q6h for 30 days OR Erythromycin 500 mg q6h for 30 days (in pregnancy).

Congenital syphilis

Early syphilis less than 2 years of age

District and above:

Abnormal CSF: Inj Procaine penicillin 50,000 IU/Kg IM daily for 10 days

Normal CSF: Inj. Benzathine penicillin 50,000 IU/Kg once stat dose

Congenital syphilis more than 2 years of age

Inj. Aqueous crystalline penicillin 200,000 IU/Kg daily IM for 10 days OR oral Erythromycin 10 mg/Kg q6h for 30 days.

Urinary Tract Infection

Urinary tract infection (UTI) involves all levels of the tract from kidney to urethral meatus. It is one of the common infections in pregnancy. Inadequate treatment during pregnancy can lead to acute pyelonephritis, abortion, premature delivery. If neglected can lead to chronic pyelonephritis and renal failure.

Clinical features:

- Pain: acute agonizing pain over the loin often radiating to the groin and suprapubic region
- Frequency of micturation: frequent passage of small amount of scalding usually cloudy urine sometime associated with strangury.
- Dysuria: pain suprapubic or urethral region while passing urine
- Fever: usually high grade fever with chills and rigor
- Anorexia and vomiting

General condition:

An ill looking patient with flushed face and dry tongue. Temperature may be of varying degree and fluctuating usually associated with chills and rigor. There would be proportional rise of pulse rate. Blood pressure may be normal or high. The renal angles and lumbar region may be tender and muscle guarding will be present.

Laboratory test if available:

- TC, DC
- Urine routine culture and sensitivity
- Blood urea and creatinine

Treatment

Sub Health Post and Health Post:

Oral therapy:

- Amoxycillin 500 mg q8h for 14 days OR
- Nitrofurantoin 100 mg q8h for 14 days

Primary Health Centre/ District hospital:

Oral therapy as in Health Post.

Parenteral Therapy: If patients very sick or in shock

Inj. Ampicillin 2 g IV q6h 48-72 hours OR Inj Cefotaxime 1 g IV q6h 48-72 hours OR
Gentamicin 5 mg/Kg IV every 24 hours for 72 hours (If pathogens are sensitive to Gentamicin)

THEN switch over to above medicines orally as follows

- Amoxycillin 500 mg q8h for 12 days OR
- Cephalexin 500 mg q6h for 12 days OR
- Nitrofurantoin 100 mg q8h for 12 days

Zonal and above: Same as PHC/District

Puerperial Sepsis

Puerperal infection arises as a result of an invasion, incubation and multiplication of an organism and usually appears after 24-48 hours of delivery, sooner in cases of prolonged labor. Organisms that are normally present in the genitalia of pregnant women e.g. E. coli, gonococci, Gardnerella, vaginalis and streptococci invade the endometrium and surrounding structures including the lymphatics and blood stream thus causing puerperal sepsis.

Clinical features:

- Fever with chills (temperature higher than 38 degree C)
- Lower abdominal pain
- Profuse foul smelling discharge per vaginum
- Subinvolution of uterus (enlarged uterus)
- Peritonitis and pelvic abscess may occur
- UTI may occur
- Breast- warm, tender, red and hot
- Breast abscess may form
- Rising pulse rate significant

Treatment

Sub-Health Post/ Health post:

Oral therapy:

Amoxycillin 1 g q8h for 7 days OR Erythromycin 500 mg q6h for 7 days PLUS
Metronidazole 400 mg q8h for 7 days PLUS
Paracetamol 500 mg q8h for 2 days.

Primary Health Centre /District hospital

Oral therapy: Same as in SHP/HP

Parenteral therapy:

Inj. Benzyl penicillin 2-4 million unit deep IM q6h after skin test for 48 hours OR
Procaine penicillin 1.2 million unit IM daily for 7 days OR inj. Ampicillin 2 g q6h IV for 48-72 hours OR
Cefotaxime 1 g q6h IV for 48-72 hours PLUS

Inj. Metronidazole 500 mg IV q8h for 48-72 hours

Once fever subsides for 48 hours, then switch over to above medicines orally as follows

Amoxycillin 500 mg q8h for 7 days OR Cephalexin 500 mg q6h for 7 days PLUS
Metronidazole 500 mg q8h for 7 days

Zonal and above:

Oral therapy: same as in PHC/District Hospital

Parenteral therapy: As in PHC /District OR

Inj Ceftriaxone 250 mg daily IM for 48-72 hours

Once fever subsides then switch over to oral medicines as in PHC/District.

Post Abortion Infection

Infection is a common complication of incomplete abortion. Retained product of conception provides an opportunity for bacterial growth. Localized pelvic infection can quickly lead to more generalized infection and septic shock which can be fatal. Therefore prompt action to stabilize patient and to treat the source of infection is needed to save the woman's life.

Clinical features

- History of previous unsafe abortion
- Lower abdominal pain and tenderness
- Prolong vaginal bleeding
- Generalized discomfort- flu like syndrome
- Fever (more than 38 degree C) with sweat
- Foul smelling vaginal discharge
- Mucous discharge from the cervix
- Cervical motion tenderness on bimanual examination
- Evidence of shock (fall in BP/ rising pulse)

Treatment

Broad spectrum antiotics IV or IM that are effective against gram negative, gram positive, anaerobic organism and chlamydia my be helpful.

Sub-Health Post/Health Post:

Oral therapy:

Doxycycline 100 mg q12h for 7 days OR Amoxycillin 500 mg q8h for 7 days OR Tetracycline 500 mg q6h for 7 days PLUS

Metronidazole 400 mg q8h for 7 days

Primary Health Centre/District hospitals:

Oral therapy: same as in HP.

Parenteral therapy:

Inj Benzyl penicillin 4-6 million unit IV q6h after skin test for 48 hours OR inj Procaine penicillin 1.2 million unit IM daily for 7 days OR Inj Ampicillin 1 g IV q6h for 2 days OR Inj. Ciprofloxacin 200 mg IV q12h for 2 days PLUS

Inj Gentamycin 5 mg/Kg IV q8h for 3 days PLUS

Inj. Metronidazole 500 mg IV q8h for 2 days

Then switch on to oral medicines as follows:

Amoxycillin 500 mg q8h for 5 days OR Ciprofloxacin 500 mg q12h for 5 days PLUS

Metronidazole 400 mg q8h for 5 days

Zonal and above:

Oral therapy: Same as PHC/District

Parenteral therapy: Same as PHC/District OR

- Inj Cefotaxime 1 g q8h for 2 days OR
- Inj. Ceftriaxone 250 mg IM daily for 2 days OR

Then switch over to above medicines orally for 5 days.

General Medicine

Enteric Fever

Symptoms and signs

Fever, bodyache, headache, drowsiness, constipation followed by diarrhoea, relative bradycardia, abdominal distension and spleen palpable from the second week.

Treatment:

SHP/HP: Ciprofloxacin 500 mg (10mg/Kg) q12h for 14 days OR Chloramphenicol 500 mg q6h for 14 days OR Cotrimoxazole (160/800 mg) q12h for 14 days

PHC/District: Same as SHP/HP OR Ofloxacin 400 mg (10-15 mg/Kg) q12h for 7 to 10 days

Zonal and Above: Same as PHC/District OR Ceftriaxone 2 g (80 mg/Kg/day in children) q24h for 10 days

Gastritis and Peptic Ulceration (*Helicobacter pylori*)

H. pylori is associated with virtually all non-NSAID attributable duodenal ulcers and about two thirds of gastric ulcers.

Treatment:

SHP/HP/PHC/District: Suspected case of *H.Pylori* should be referred to Zonal Hospital.

Zonal and Above:

Proton pump inhibitor plus 2 antibiotics given for 10 days

	Omeprazole	20mg q12h
OR	Lansoprazole	30mg q12h
OR	Pantoprazole	40mg q12h

PLUS

Clarithromycin 500mg q12h and Amoxicillin 1000mg q12h

OR

Amoxicillin 1000mg q12h and Metronidazole 400mg q8h

Note: Proton Pump Inhibitor should be continued for about 6 weeks for ulcer healing.

Bismuth plus 2 antibiotics for at least 14 days (up to 4 weeks in relapse cases)

Bismuth subcitrate	120mg q6h	plus	Metronidazole	400mg q8h
		and	Tetracycline	500mg q6h

Bronchitis

Symptoms and signs:

Fever, dry cough (unproductive initially becomes productive at the later stage) can be mucoid or purulent when it becomes productive, chest pain, wheezing, breathlessness.

Treatment:

SHP/HP: Cotrimoxazole 160/800mg q12h for 7 days Or Tetracycline 250 mg q6h for 7 days OR Amoxicillin 500mg q8h for 7 days.

PHC/District: Same as SHP/HP OR Erythromycin 500 mg q6h for 7 days OR Doxycycline 100mg q12h for 7 days

Zonal and Above: Same as PHC /District OR Cefaclor 500mg q8h for 7 days OR Cefuroxime axetil 500mg q12h for 7 days OR Clarithromycin 500 mg q12h for 7 days OR Amoxicillin and Clavulanic acid

Pneumonia

No single regimen is appropriate in all circumstances and attempts to rationalize empirical treatment depended on the age and clinical status, its severity and the circumstances in which it develops (e.g. community acquired or nosocomial).

Severe pneumonia is defined by any of the following:

Respiratory rate > 30/min
Diastolic BP < 60mm Hg
Systolic < 90mm Hg
Multiple lobe involvement
Rapidly progressing consolidation
WBC <4 or >30 X 10⁹/L
PaO₂ <60mm Hg or saturation <90% breathing room air
PaCO₂ >50mm Hg
Confusion, shock or deteriorating renal function

In general patients with severe pneumonia should be admitted to hospital.

SHP/HP: Cotrimoxazole 160/800mg q12h OR Amoxicillin 500mg q8h OR Tetracycline 500mg q6h OR Erythromycin 500mg q6h for 7 days.

PHC/District: Same as SHP/HP OR Azithromycin 250mg q12h OR Cefuroxime axetil 500mg q12h

Zonal and Above: Same as PHC/District OR Amoxicillin/ clavulanate 500/125 q8h OR Cloxacillin 500mg q6h.

In case of severe pneumonia- parenteral therapy is to be instituted. Coverage of both typical and atypical bacterias should be done by combination of antibiotics

Nosocomial Pneumonia

Broad spectrum parenteral combination therapy s indicated for severe nosocomial pneumonia, e.g. Combination treatment with Amoxicillin/Clavulanate or a 2nd or 3rd generation Cephalosporin and either an Aminoglycoside or Ciprofloxacin.

Consider adding Vancomycin if enterococcal or MRSA infection is likely.

These regimen do not take account of Legionella and other atypical pneumonias, none of which are commonly hospital- acquired, or of fungal, viral or protozoal pneumonias.

Acute Bacterial Meningitis

The diagnosis of bacterial meningitis is confirmed by lumbar puncture.

Symptoms and Signs:

Fever, headache, vomiting, sudden onset neck rigidity.

Causative organism or susceptibility not known (Empirical)

SHP/HP: Benzylpenicillin 50,000 Units/Kg q4h PLUS Chloramphenical 1gm q6h for 14 days

PHC/District: Same as SHP/HP.

Zonal and Above: Same as PHC/District OR Ceftriaxone 2 gm IV q12h for 14 days (to add Benzyl penicillin or Ampicillin 2 gm q4 – 6h in adults >50 years of age to cover Listeria infection)

Urinary Tract Infection:**Symptoms and signs:**

- Pain: acute agonizing pain over the loin often radiating to the groin and suprapubic region
- Frequency of micturation: frequent passage of small amount of scalding usually cloudy urine sometime associated with strangury.
- Dysuria: pain suprapubic or urethral region while passing urine
- Fever: usually high grade fever with chills and rigor
- Anorexia and vomiting

Treatment:

SHP/HP: Cotrimoxazole 160/800 q12h for 7 days.

PHC/District: Same as SHP/HP OR Ciprofloxacin 500 mg q12h OR Cephalexin 500 mg q6h OR Nitrofurantoin 100 mg q6h for 7 days.

Zonal and Above: Same as PHC/District OR Cefuroxime axetil 500 mg q12h for 7 days OR Gentamicin 2-5 mg/Kg q12h for 1 day.

ENT

Wax

Wax is normally present in the ear canal. It gives problems when impacted.

Symptoms and signs: pain or itching in the ear, decreased hearing, dark or brown mass seen on otoscopy.

Treatment:

SHP/HP/PHC/District/Zonal and above

- No treatment needed when asymptomatic.
- Soft wax should be removed by syringing with water.
- Hard wax should be softened with GSB (glycerin 10% in sodium bicarbonate) drops. It should be instilled 3 to 4 times a day for 7 to 10 days. Then syringing is done.
- Aspirin 300 mg Or paracetamol 500 mg 3 times a day is given.
- Erythromycin 500 mg q6h (30-50 mg/Kg q6h for children) OR amoxicillin (500 mg q8h (20-40 mg/Kg q8h for children) when complicated with otitis externa.

Advice to the patient: Instillation of ear drop may increase pain and hearing impairment. Use of oil and other kinds of drops is discouraged.

Note: When wax is complicated with furunculosis, patients should be referred to Zonal or higher center.

Furunculosis

This is a bacterial infection of hair follicle usually caused by ear picking.

Symptoms and signs: acute pain in the ear, tenderness when tragus is pressed, tender red spot in the hair bearing area of the canal.

Treatment:

SHP/HP/PHC/District

- Aspirin 300 mg Or paracetamol 500 mg 1 tab 3 times a day.
- I.G. packing (10% ichthamol in glycerin) and changed every 2 days
- Add Erythromycin 500 mg q6h (30-50 mg/Kg q6h for children) OR amoxicillin (500 mg q8h (20-40 mg/Kg q8h for children) if not controlled by I. G. packing & analgesics or if the patient is diabetic. If not relieved, refer to Zonal or higher center.

Zonal and above: Excision of granulation tissue and ear packing under GA/LA..

Otomycosis

This is a fungal infection of the ear. The causative organisms are *Candida albicans* and *Aspergillus niger*.

Symptoms and signs: itching, pain, discharge. Moist dark or wet grayish white debris is usually seen.

Treatment:

SHP/HP/PHC/District/Zonal and above

- Suction clearance or syringing with luke warm water.
- Gentian Violet OR Clotrimazole ear drops q8h for 10 days.

Advice to the patient: Keep the ear dry.

Acute Otitis Media

Symptoms and signs: Acute otitis media (AOM) is also known as acute, suppurative otitis media (ASOM). Throbbing earache, decreased hearing, congestion of tympanic membrane are common. Ear discharge is not common. It is usually preceded by common cold. Fever may be present in small children.

Treatment:

SHP/HP/PHC/District: Amoxicillin 50-80 mg/Kg/day in 3 divided doses OR Cotrimoxazole 8/40 mg/Kg/day in 2 divided doses

Zonal and above: Same as PHC/District OR Cefaclor 250-500 mg q8h (20-40 mg/Kg/day in 3 divided doses).

Note: Decongestant, antihistamine and paracetamol can be added for symptomatic relief.

Otitis Media with effusion (OME)

Symptoms and signs:

It is more common in the pediatric age group. A child with OME will have recurrent earache usually at night and decreased hearing. The Tympanic membrane is dull and opaque. There will be no pus in the ear canal. An elderly person with carcinoma of the nasopharynx may present with features of persistent unilateral OME.

Treatment:

SHP/HP/PHC/District: Refer to zonal or higher center

Zonal and above: Conservative OR Grommet.

Chronic Suppurative Otitis Media (CSOM)

It is a disease of middle ear in which a patient will present with a history of frequent ear discharge and impaired hearing. It is of two types

- Tubo-tympanic (safe type)
- Attico-antral (unsafe type)

Tubo-tympanic type of CSOM

Clinical features:

Intermittent profuse mucoid/mucopurulent non-foul smelling ear discharge. Tympanic membrane will be found to be perforated.

Treatment:

Patient should avoid entry of water/oil into the diseased ear to prevent infection.

At the time of ear discharge patient should be given antibiotics (cotrimoxazole/amoxicillin/ciprofloxacin) orally and topically ear drops e.g. chloramphenicol/ciprofloxacin for 5-7 days)

Patient with Tubo-tympanic type of CSOM will finally require ear surgery (repair of the drum). This surgery is usually done after 14 years of age.

Attico-antral type of CSOM

In this type, patient presents with continuous scanty and foul smelling discharge with hearing loss.

Such patient can develop life threatening complications hence requires surgical intervention as early as possible.

If a patient with CSOM presents with pain with or without swelling behind the pinna then diagnosis of acute mastoiditis should be suspected.

High dose of preferably broad-spectrum antibiotics (ampicillin/amoxicillin/chloramphenicol) should be started and referred to the higher center immediately. If the patient presents with post aural abscess, it should be drained.

Acute Sinusitis

Symptoms and signs: It is usually secondary to viral rhinitis. The usual symptoms in adults are black, purulent nasal discharge and facial pain, often associated with malodorous breath. Tenderness may be presented over the affected sinuses.

The duration of the antibiotics are ordinarily for 10 days. Oral and nasal decongestants along with antihistamines may give symptomatic relief. Steam inhalation seems to be beneficial during acute episodes.

Treatment:**Treatment:**

SHP/HP: Amoxicillin 500 mg orally q8h OR Cotrimoxazole 160/800 mg orally q12h for 7-10 days.

PHC/District: Same as SHP/HP OR Doxycycline 100-200 mg orally q12h.

Zonal and above: same as PHC/District OR Amoxicillin/Clavulanic acid 500 mg orally q8h OR Cefaclor 500 mg q8h

Furunculosis of nasal vestibule

This is a bacterial infection of the skin of the nasal opening.

Symptoms and signs: pain, swelling, redness, headache, furuncle in the nasal vestibule, discharge per nostril.

A triangular area containing nasal tip nasal vestibule and upper lip is considered as a danger area and furunculosis in this area can easily lead on to complications which may present as cellulitis of the upper lip and face, cavernous sinus thrombophlebitis.

Treatment:

SHP/HP: Amoxicillin 500 mg q8h OR Erythromycin 500 mg q6h OR Cotrimoxazole 160/800 mg orally q12h

PHC/District: Same as SHP/HP OR Cloxacillin 500 mg q6h

Zonal and above: Same as PHC/District OR Amoxicillin/Clavulanic acid 500 mg q8h.

Acute Epiglottitis

This is an acute life threatening condition giving rise to difficulty in breathing (especially in children), sore throat, muffled voice and painful swallowing. In more serious condition there may be drooling of saliva, cyanosis, and stridor.

Treatment:

SHP/HP/PHC/District: Refer to Zonal or higher center.

Zonal and above: Ampicillin OR Chloramphenicol preferably IV. If respiratory distress is anticipated then Hydrocortisone may be added.

Acute Tonsillitis

It is more common in pediatric age group. The patient presents with acute sore throat, fever and painful swallowing. Inflamed tonsils often with pus points on it along with enlarged and tender upper neck nodes are common clinical features.

Treatment:

SHP/HP: Amoxicillin 500 mg q8h OR Erythromycin 500 mg q6h.

PHC/District: Same as SHP/HP OR Ciprofloxacin 500 mg q12h.

Zonal and above: Same as PHC/District OR Amoxicillin/Clavulanic acid 500 mg q8h.

Ludwig's angina

It is an acute inflammatory condition involving sublingual and submental space. The main etiology is carious teeth or poor oro-dental hygiene. Patient presents with pain and swelling of submandibular space with raised floor of mouth.

Treatment:

SHP/HP/PHS/District: Refer to higher center

Zonal and above: Amoxicillin 500 mg q8h OR Cotrimoxazole 160/800 mg orally q12h OR Ciprofloxacin 500 mg q12h PLUS Metronidazole.

Surgery

Cellulitis

A spreading skin infection that also involves areas of tissue just below the skin surface.

Symptoms and signs:

Redness, tenderness and swelling on the skin.

Treatment:

If the limb is involved, then keep it raised.

SHP/HP/PHC: Amoxicillin 500 mg q8h for 5-7 days OR Cotrimoxazole 160/800 mg orally q12h for 5-7 days OR Ciprofloxacin 500 mg q12h for 5-7 days.

Lymphadenitis

An infection of the lymph nodes (glands).

Symptoms and signs:

Lymph nodes may be swollen, tender, and hard and the skin over a node may be reddened and hot.

Treatment:

SHP/HP/PHC: Amoxicillin 500 mg q8h for 5-7 days OR Cotrimoxazole 160/800 mg q12h for 5-7 days OR Ciprofloxacin 500 mg q12h for 5-7 days.

Abscess

An abscess is a localized collection of pus in any part of the body, caused by an infection.

Symptoms and signs:

Open sore or closed nodule which may be reddened and may drain pus. In some case localized swelling and induration may occur and the affected area is tender and warm to touch. In some cases, fever or chills may occur.

Treatment:

First aspirate with needle and syringe to confirm incision and drainage.

SHP/HP/PHC: Amoxicillin 500 mg q8h OR Cotrimoxazole 160/800 mg q12h for 5-7 days OR Ciprofloxacin 500 mg q12h for 5-7 days.

Clean and dress daily with ointment neomycin.

Wound Infection

Any infection in the wound

Symptoms and signs:

Pain, swelling, pus discharge from the wound.

Treatment:

SHP/HP/PHC: Amoxicillin 500 mg q8h OR Cotrimoxazole 160/800 mg q12h for 5-7 days OR Ciprofloxacin 500 mg q12h for 5-7 days.

Burn

Can be by steam, hot water or fire.

Symptoms and signs:

Pain redness, charring of the skin.

Treatment:

- Dressing with silver sulphadiazine ointment
- Antibiotic only if there is fever.
- Refer to higher center.

Trauma

Due to any cause

Treatment:

- Tetanus Toxoid IM stat
- Dressing of any wounds
- Immobilization of any fractures
- Refer to higher center

Pancreatitis

Inflammation of the Pancreas.

Symptoms and signs:

Severe pain in the epigastric region, decreased by sitting up

Treatment:

- **SHP/HP/PHC:** Refer to district or higher center
- Antibiotic if there is fever.
- **District Hospital :** Inj. Ciprofloxacin 200 mg q12h for 5-7 days PLUS Inj. Metronidazole 500 mg q8h for 5-7 days.
- Refer to higher center.

Acute Cholecystitis

Inflammation of Gall bladder with stone in them.

Symptoms and signs:

Pain right subcostal region especially if asked to take a deep breath, fever.

Treatment:

- **SHP/HP/PHC:** Refer to district or higher center.
- NPO
- **District:** Inj. Ciprofloxacin 200 mg q12h for 5-7 days PLUS Inj. Metronidazole 500 mg q8h for 5-7 days.
- Refer to higher center.

All Surgeries:

SHP/HP/PHC: Refer to district or higher center

District: Inj. Ciprofloxacin 200 mg q12h for 5-7 days PLUS Metronidazole 500 mg q8h for 5-7 days.

Regional/Zonal: Same as above OR Inj. Ciprofloxacin 200 mg q12h for 5-7 days PLUS Metronidazole 500 mg q8h for 5-7 days PLUS Inj. Gentamycin (if gram negative organism is suspected) OR Inj. Ceftriaxone 500 mg q8h for 5-7 days PLUS Inj. Metronidazole 500 mg q8h for 5-7 days PLUS Gentamycin (if gram Negative organism is suspected).

Leprosy

Symptoms and signs:

Treatment:

PB Therapy:

- Dapsone (daily)- self administration
- Rifampicin once a month- under supervision

Drug	Adults Over 15 years	Children 10-14 years	Children Under 10 years
Dapsone (daily)	100 mg	50 mg	50 mg alternate days
Rifampicin (monthly)	600 mg	450 mg	300 mg

Note:

- Removal of few drugs from blister calendar packs is necessary in multi drug therapy in children.
- The duration of PB therapy is 6 months (maximum of 9 months)

MB Therapy

- Dapsone (daily)- self administration
- 50 mg Clofazimine; Daily for adults and alternate days for children- self administration
- Rifampicin (monthly)- under supervision
- 300 mg clofazimine for adults, 150 mg clofazimine for children (10-14 years) and 100 mg cofazimine for children (under 10 years) once a month- under supervision

Drug	Adults Over 15 years		Children 10-14 years	Children Under 10 years
Dapsone (daily)	100 mg	50 mg	50 mg alternate day	
Clofazimine (daily)	50 mg		50 mg alternate day	50 mg alternate day
Clofazimine (monthly)	300 mg	150 mg	100 mg	
Rifampicin (monthly)	600 mg	450 mg	300 mg	

Note:

- Removal of few drugs from blister calendar packs is necessary in multi drug therapy in children.
- The duration of MB therapy is 12 months (maximum of 18 months). Be aware, if skin smear test result is +4 or more, then duration will be 24 months (maximum of 36 months) and treatment shall be stopped.

Tuberculosis

Symptoms and signs

Treatment

Treatment is divided into 3 categories

Category I

- New sputum positive patients
- Severe pulmonary negative and extra pulmonary patients

Category II

- Relapse patients
- Treatment failure patients
- Return after defaulter patients

Category III

- All pulmonary negative patients
- All extra pulmonary patients

Category I combined drugs

Weight Prior treatment	First 2 months (Intensive phase)			Then 6 months Continuation phase	
	HR	Z	E	HE	
	75+150 mg	400 mg	400 mg	150+400 mg	
25-39 Kg	2 tab	2 tab	2 tab	2 tab	
40-55 Kg	3 tab	3 tab	2 tab	2 tab	
55 Kg and above	4 tab	3 tab		3 tab	

Category II combined drugs

Weight Prior treatment	Intensive phase			Continuous phase	
	First 2 months	First 1,2, and 3 months	Then 6 months		
	S	HR	Z	E	HE
mg		75+150 mg	400 mg	400 mg	150+400
25-39 Kg tab	0.5 g	2 tab	2 tab	2 tab	2
40-55 Kg tab	0.75 g	3 tab	3 tab	2 tab	2
55 Kg and above	1 g	4 tab	4 tab	3 tab	3 tab

Category III combined drugs

Weight Prior treatment	First 2 months Intensive phase		Then 6 months Continuation phase
	HR	Z	HE
	75+150 mg	400 mg	150+400 mg
25-39 Kg	2 tab	2 tab	2 tab
40-55 Kg	3 tab	3 tab	2 tab
55 Kg and above	4 tab		3 tab

**Short Course Regimen for Children
(0-5 years old)**

Weight	Prior treatment phase	First 2 months		Then 4 months	
		Intensive phase		Continuation	
		S* Only for TBM	HR 75+150 mg	Z 400 mg	HR 75+150 mg
5-10 Kg	0.25 g		½ tab	½ tab	½ tab
11-24 Kg	0.33 g		1 tab	1 tab	1 tab

- Only children with TBM (TB Meningitis, TB Miliary) should receive Inj. Sterptomycin for 60 days.
- Dosage must be prescribed by physician for pre-treatment weight to less than 5 years.