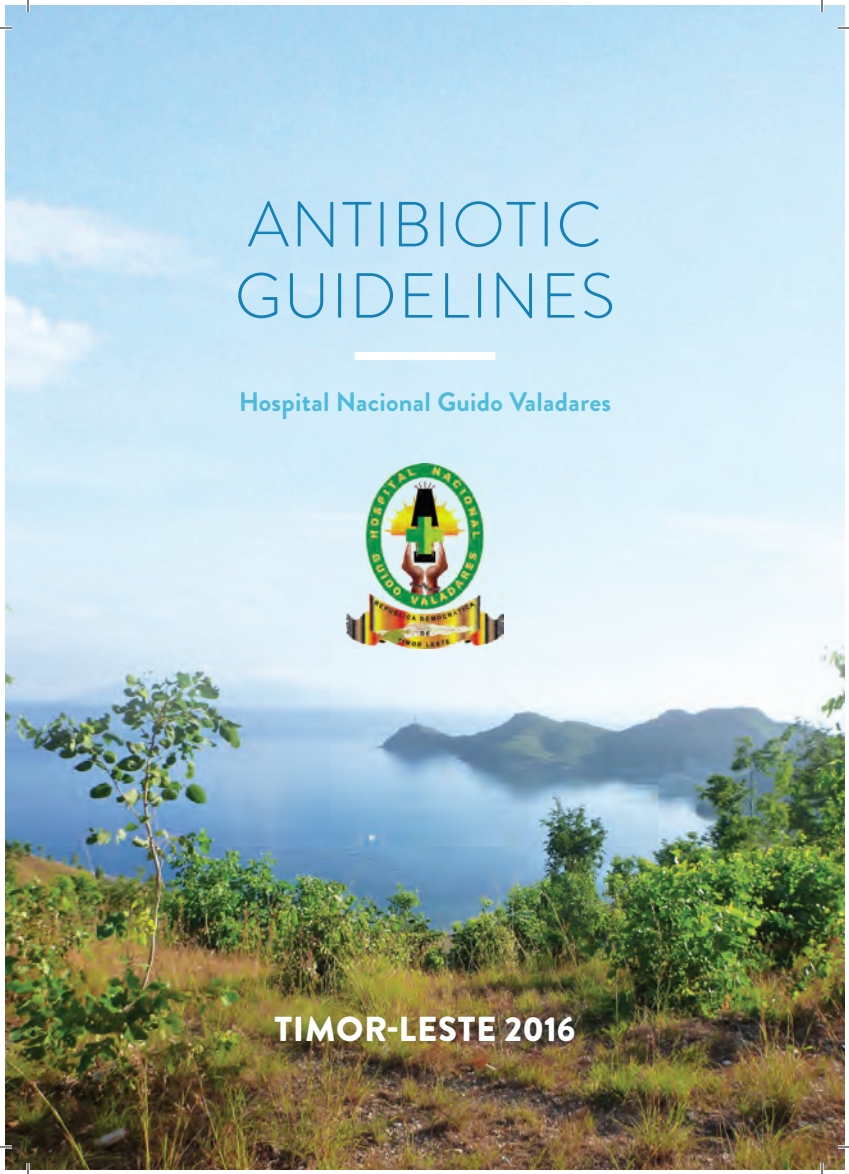
ANTIBIOTIC GUIDELINES

Hospital Nacional Guido Valadares



TIMOR-LESTE 2016

PREFACE

I am pleased to present this first edition of Empiric Antibiotic Guidelines, as a guidance to all medical practitioners at Hospital Nacional Guido Valadares (HNGV).

Antibiotics are critical in the management of infection, and can have a significant impact in reducing morbidity and mortality. Emerging antimicrobial resistance has been identified as global challenge by the World Health Organisation. Careful use of antibiotics targeted to likely pathogens is an important strategy in combating development of antimicrobial resistance. The purpose of this first edition of Empiric Antibiotic Guidelines is to guide rational antimicrobial prescribing in HNGV. The guidelines are based on similar guidelines in use in Australia (Therapeutic Guidelines Ltd), Fiji and the Solomon Islands, with consideration for published antimicrobial resistance data from the South-East Asia Region. With ongoing capacity development of microbiology services in Timor-Leste, we anticipate that future editions will incorporate more specific information about local epidemiology and antimicrobial resistance patterns.

The guidelines have been developed as a collaboration between Hospital Nacional Guido Valadares (Timor-Leste), the National Health Laboratory (Timor-Leste), Menzies School of Health Research (Australia) and the Royal Darwin Hospital (Australia), supported by the World Health Organisation (WHO) in Timor-Leste as part of the European Union-WHO Universal Health Coverage Partnership in Timor-Leste.

I am hopeful that this document will be used responsibly and be useful to serve its purpose. Lastly, I would like to thank World Health Organization and Menzies School of Health for the great support.

José António Gusmão Guterres
Executive Director and President of Counsel of Directors
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OVERVIEW OF COMMON ANTIBIOTICS

β-Lactams

Penicillins, cephalosporins, monobactams and carbapenems have a β-lactam ring in their molecular structure. These bactericidal antibiotics act primarily on the bacterial cell wall. Although some bacteria produce β-lactamases and therefore have developed resistance, these drugs on the whole remain useful in treating many different types of infections.

Penicillins

Penicillin is active against streptococci, neisserriae, spirochaetes, some anaerobes including clostridia and a few other organisms. Most *Staphylococcus aureus* isolates are intrinsically resistant to penicillin and there is increasing resistance to cloxacillin. The prevalence of penicillinase-producing *Neisseria gonorrheae* is now also on the rise. There are reports of decreased susceptibility of pneumococci and streptococci to penicillin from other parts of the world. The only serious disadvantage of penicillins is the potential for hypersensitivity reaction.

A. Penicillins

- **Benzylpenicillin** (also known as crystalline penicillin or penicillin G)
  For intravenous (IV) use and needs to be given frequently (4 – 6 hourly).
- **Procaine Penicillin**
  Intramuscular (IM) preparation with a longer duration of action. Needs to be administered less frequently i.e. daily.
- **Benzathine Penicillin**
  Intramuscular preparation, providing low levels of penicillin in the circulation for 3 – 4 weeks.
- **Phenoxymethyl Penicillin** (also known as penicillin V)
  An oral preparation, intrinsically less active than Benzylpenicillin.

Penicillin is the drug of choice for the treatment of the following infections:

- Streptococcal infections e.g. tonsillopharyngitis
- Infections due to *Streptococcus pneumoniae*
- Meningococcal infections e.g. meningitis, septicaemia
- Syphilis
- Clostridial infections
- Diphtheria
- Leptospirosis

B. Aminopenicillins

Ampicillin and amoxicillin are destroyed by staphylococcal β-lactamases but have a slightly broader spectrum than penicillins because of their activity against some Gram-negative bacilli such as *E.coli*, *Salmonella sp* and *Shigella sp*. They also have better activity against *H.influenzae* and *Enterococcus sp* compared with penicillin. Although previously sensitive, resistance to these drugs among *E.coli* is now widespread. Many strains of *H.influenzae* also produce β-lactamases, which can destroy these drugs. Amoxicillin is better absorbed than ampicillin and has a longer half-life and hence is preferred for oral therapy. These drugs are used in the empirical treatment of respiratory infections and in the treatment of susceptible urinary tract infections. They may also be used for typhoid fever.

C. Anti–Staphylococcal Penicillins

These are narrow spectrum penicillins, resistant to staphylococcal β-lactamases. Methicillin, oxacillin, and cloxacillins fall into this category. Of these, only cloxacillin, flucloxacillin and dicloxacillin are clinically useful and are to be used only for proven or suspected staphylococcal infections.

Flucloxacillin, suitable for oral administration, can cause cholestatic jaundice in some patients. Some staphylococci have developed resistance to this group, by mechanisms other than β-lactamase. These methicillin-resistant *Staphylococcus aureus* (MRSA) organisms will be resistant to all other β-lactams (i.e. all penicillin, cephalosporins, monobactams and carbapenems).

D. Anti–Pseudomonal Penicillins

These are newer penicillins with a high grade of activity against Gram-negative bacteria including pseudomonas, e.g. piperacillin, ticarcillin.

E. β-lactam and β-lactamase inhibitor combinations

Examples of β lactamase inhibitors include clavulanic acid and sulbactam. Amoxicillin can be combined with clavulanic acid, which itself has minimal antibacterial activity but inhibits β-lactamase effectively so that amoxicillin can still be used against β-lactamase-producing bacteria. Amoxicillin/clavulanic acid combination can cause cholestasis. Combinations utilising sulbactam are more expensive and so should be used only while treating infections with known β-lactamase producers.

Note: Hypersensitivity to any penicillin implies the potential for hypersensitivity to all penicillins. 5 – 10% of patients with penicillin hypersensitivity, especially those with early manifestations, will also be hypersensitive to cephalosporins.

Cephalosporins

The cephalosporins have been traditionally divided into "generations" based on their spectrum of activity. In general, cephalosporins are less prone to hypersensitivity reactions, are more stable to staphylococcal penicillinases and have a broader spectrum than penicillins. However, they are expensive and have very little action against enterococci. None of the cephalosporins available in Timor-Leste have action against MRSA. Cephalosporins also have been shown to select out MRSA, vancomycin-resistant enterococci and ceftriaxone-resistant Gram-negative bacilli. Therefore, indications for their use should be limited.

A. First generation cephalosporins include (among others) cephalexin (oral), cephalothin and cephazolin (parenteral). The spectrum of activity is similar for each, being effective against penicillinase-producing staphylococci and other Gram-positive cocci (except MRSA and enterococci) and a few Gram-negative enteric bacilli. There is no special advantage for any one first generation cephalosporins over another. They are not usually the first choice for any infection, although are the first choice for most surgical prophylaxis. They may be used in some patients with penicillin hypersensitivity, but not in those with immediate (IgE-mediated) hypersensitivity.

B. Second generation cephalosporins include (among others) cefuroxime axetil and cefaclor (oral). These are more stable to some Gram-negative β-lactamases. Their activity against Gram-positive organisms is similar to, or less than, that of the first generation

cephalosporins and they have varying degrees of activity against anaerobes. These drugs have a limited role in therapy and are more expensive than the first generation cephalosporins.

C. The major activity of the third generation cephalosporins (e.g. ceftriaxone, ceftazidime, cefotaxime) is against Gram-negative bacilli. They have some activity against Gram-positive cocci and their activity against anaerobes varies. A major advantage of these agents is their ability to reach the central nervous system. Ceftazidime has the additional benefit of specific anti-pseudomonal activity. Ceftriaxone and cefotaxime are useful in hospital-acquired and any other Gram-negative septicaemia and meningitis.

Carbapenems (e.g. Meropenem)

Carbapenems have a much broader spectrum, including Gram-positive, Gram-negative and some anaerobic bacteria. They are the agents of choice for ESBL (extended spectrum β-lactamase-producing) organisms

Aminoglycosides

This group of antibiotics (including gentamicin, tobramycin, netilmicin, amikacin, kanamycin, neomycin and streptomycin) act by inhibiting protein synthesis in bacteria. They have good activity against aerobic Gram-negative bacilli, including *Brucella sp.* When given together with penicillins, they have good activity against enterococci. Streptomycin in combination is also useful against mycobacteria. Aminoglycosides are not absorbed when given orally and should be administered parenterally for systemic effects. Aminoglycosides are ototoxic and nephrotoxic. The therapeutic index is low and blood levels need to be monitored if used for either directed or empirical therapy for longer than 3 days (see Gentamicin dosing). In spite of this disadvantage, they are used widely for their action on Gram-negative bacilli. Gentamicin is the least expensive and is the aminoglycoside of choice for empirical treatment of severe Gram-negative sepsis including nosocomial infections.

The primary indication for aminoglycosides is as short-term empirical therapy pending the outcome of investigations. Their value as empirical drugs relates to their rapid bactericidal activity and the comparatively low levels of resistance in many community and healthcare-associated Gram-negative pathogens. When used empirically, no further doses

should be given beyond 72 hours and if ongoing empirical IV therapy is required (ie an organism is not grown) therapy should be changed to an alternative, less toxic drug.

Aminoglycosides are indicated for **directed therapy in only a few circumstances**. These include, but are not restricted to:

- infections when resistance to other safer antimicrobials has been shown
- combination therapy for serious *Pseudomonas aeruginosa* infections and brucellosis
- low doses as synergistic treatment for streptococcal and enterococcal endocarditis.

Monitoring plasma concentrations of aminoglycosides is recommended in these patients and should commence on the first dose of directed therapy. In Timor-Leste this is currently not available and therefore close monitoring for deteriorating renal function and ototoxicity is absolutely essential.

Fluoroquinolones

These antibiotics (eg ciprofloxacin, norfloxacin) act by inhibiting DNA synthesis within bacteria. Their greatest activity is against aerobic Gram-negative bacilli including *Pseudomonas sp*, *Haemophilis sp*, and Gram-negative cocci such as *Moraxella* and *Neisseria sp*. Adverse effects (including gastrointestinal side effects, hepatotoxicity, CNS toxicity, prolongation of the QT interval and tendon rupture) are increasingly described and the risks may outweigh the benefits. Resistance also occurs rapidly, so use should be restricted to where there is no alternative.

ANTIBIOTIC PROPHYLAXIS

INFECTION	ANTIBIOTIC CHOICE
Prevention of recurrence of Rheumatic Fever Continuous antimicrobial prophylaxis against *Streptococcus pyogenes* in recommended for patients with Rheumatic Fever.	**Benzathine Penicillin 1.2MU (900mg)(child <20kg: 0.6MU (450mg)) IM for 1 dose every 28 days** *Alternative (poorer choice):* Penicillin V 250mg (child: 15mg/kg) PO BID
No cardiac valve involvement	Treat for a minimum of 10 years or until age 21 (whichever is longer)
Mild cardiac valve involvement	Treat until age 35
Moderate or severe cardiac valve involvement (including valve surgery)	Prophylaxis for life
Prevention of Infective Endocarditis The need for prophylaxis is based on the risk of bacteraemia and targeted endocarditis prophylaxis should be given IN ADDITION to standard prophylactic antibiotics for surgical procedure if required (see Surgical Prophylaxis).	**Low risk patients undergoing a lower risk procedure** e.g. dental treatment, oral surgery or surgical procedure of the respiratory tract For procedures under a local anaesthetic: **Amoxicillin 2g (child: 50mg/kg) PO 1 hour prior to procedure** For procedures under general anaesthetic: **Ampicillin 2g (child: 50mg/kg) IV within 1 hour prior to procedure**
High risk patients are those with: • Prosthetic valve • Previous Infective Endocarditis • Cyanotic Congenital Heart disease • History of Rheumatic Heart Disease.	**Higher risk patients undergoing ANY procedure or low risk patients undergoing a higher risk procedure** e.g. major gastrointestinal, urological or other major surgical procedures: **Ampicillin 2g (child: 50mg/kg) IV within 1 hour prior to procedure**

INFECTION	ANTIBIOTIC CHOICE
Post splenectomy prophylaxis If available, all patients should also receive immunisations against the encapsulated organisms *Streptococcus pneumoniae*, *Neisseria meningitidis* and *Haemophilus influenzae B*.	**Amoxicillin 250mg (child: 15mg/kg) PO OD for life** All patients should also have an emergency supply of antibiotics to take before medical review in the event of a sudden onset of unexplained fever: Adult: Amoxicillin 3g PO for 1 dose then 1g TID until review. Child: Amoxicillin/Clavulanic acid 25mg/kg (max 500/125mg) PO TID
Surgical Prophylaxis Surgical prophylaxis is the use of antibiotics to prevent infection as opposed to their use where infection is already established. Antibiotic choice is guided by the likely source of infective organisms. Most infections occur secondary to the patient's own organisms which may include multiple drug resistant organisms secondary to previous antibiotic use. All pre-existing infections should be treated prior to any surgery if possible. Post-operative courses of antibiotics >24 hours are only necessary in established infection. Extended prophylaxis is associated with increased rates of resistance and subsequent infection with resistant pathogens.	Give antibiotics within 1 hour before procedure (ideally 15 – 30 minutes before surgical incision). Cephazolin is the antibiotic of choice for most surgical prophylaxis and has a relatively short half-life and therefore should be re-dosed if the procedure is 4 hours or longer. For most procedures, use: **Cephazolin 2g (child: 50mg/kg) IV for 1 dose** *Alternative:* Cloxacillin 2g (child: 50mg/kg) IV for 1 dose For genitourinary or gastrointestinal procedures, use: **Cephazolin 2g (child: 50mg/kg) IV for 1 dose + Gentamicin 4mg/kg (child: 7.5mg/kg) IV for 1 dose** *Alternative to Cephazolin*: Cloxacillin 2g (child: 50mg/kg) IV for 1 dose For a new prosthetic implant continue Cephazolin or Flucloxacillin 6 hourly for 24 hours post-operatively then cease

BONE INFECTIONS

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Acute Osteomyelitis Infection of the bone that has occurred acutely, with symptoms for <14 days.	**Cloxacillin 2g (child: 50mg/kg) IV 6 hourly for 2 – 4 weeks (child: IV duration of 5 – 7 days may be sufficient if rapid response to treatment)** **THEN** **Cloxacillin 1g (child: 25mg/kg) PO QID for a total of 6 weeks antibiotic therapy (child: 4 weeks total antibiotic therapy may be sufficient if rapid response to treatment)** If slow to respond, MRSA may be responsible. Consider a switch to: Vancomycin (see page 107) If still slow to respond, a Gram-negative organism may be responsible. Consider adding: Ceftriaxone 2g (child: 50mg/kg) IV OD	Potentially curable with antibiotic therapy alone. Where possible cultures and sensitivities should guide treatment. Consider Tuberculosis as a possible pathogen. Vancomycin requires close monitoring of creatinine clearance (refer to Cockcroft-Gault calculation).
Chronic Osteomyelitis Relapsed or long-standing bone infection that may cause a sinus tract to the skin.	**Cloxacillin 2g (child: 50mg/kg) IV 6 hourly for 2 weeks (child: IV duration of 5 – 7 days usually sufficient)** **THEN** **Cloxacillin 1g (child: 25mg/kg) PO QID to complete a total of 12 weeks antibiotic therapy** *Alternative if failing therapy and repeat investigations unhelpful*: Ciprofloxacin 500mg (child: 10mg/kg) PO BID + Amoxicillin/ Clavulanic acid 500/125mg (child: 25mg/kg) PO BID for 12 weeks *Alternative*: Trimethoprim/Sulphamethoxazole 320/1600mg PO BID for 12 weeks	Requires surgical debridement in addition to antibiotics for a cure. Tuberculosis may cause an acute or indolent osteomyelitis. Consider if failing usual therapy or if known risk factors for TB such as immunocompromise or a close TB contact. Anyone on longterm antibiotic regimens should have renal function monitored at least 2 weekly.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Septic Arthritis Usually presents as a monoarticular arthritis, spontaneously or following trauma. Can also occur in the setting of multifocal *Staphylococcus aureus* disease. Requires surgical washout to cure.	**Cloxacillin 2g (child: 50mg/kg) IV 6 hourly for 2 weeks (child: IV duration of 5 – 7 days may be sufficient if rapid response to treatment)** **THEN** **Cloxacillin 1g PO QID for a total of 4 – 6 weeks antibiotic therapy (child: total duration of 2 – 3 weeks usually sufficient)** If slow to respond despite surgical washout and antibiotics, MRSA may be responsible. Consider changing to: Vancomycin (see page 107) If *Neisseria gonorrheae* is suspected, add: Ceftriaxone 2g (child: 50mg/kg) IV OD for 10 days In neonates, Group B *Streptococcus* and *Haemophilus influenzae* are common pathogens. Consider adding: Ampicillin 50mg/kg IV 6 hourly	Surgical washout and microbiology examination of joint fluid is required. Exclude acute rheumatic fever in young persons. Gonococcal arthritis should be suspected if no response to Cloxacillin therapy is seen after 48 hrs, particularly if risk factors present. If still no further response **obtain specialist opinion.** Vancomycin requires close monitoring of creatinine clearance (refer to Cockcroft-Gault calculation).

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Open Fractures **Grade 1** <1cm skin laceration, <8hrs since injury, no signs of infection and able to be adequately debrided/ cleaned.	**Cloxacillin 2g (child: 50mg/kg) IV 6 hourly then review after 24 hours**	All open fractures require debridement, washout and fracture stabilisation. If prosthetic material placed into contaminated or infected tissue, may need prolonged antibiotics. **Seek specialist opinion.** Check Tetanus immunisation status of all patients and give DTP vaccine if required.
Grade 2 As above but 1 – 10cm skin laceration.	**Cloxacillin 2g (child: 50mg/kg) IV 6 hourly + Metronidazole 500mg (child: 10mg/kg) PO/IV BID then review after 24 hours** *Alternative*: Amoxicillin/Clavulanic acid 500/125mg (child 25mg/kg) PO BID	
Grade 3 >10cm skin laceration or extensive soft tissue loss OR >8 hrs since injury OR infection established.	**Cloxacillin 2g (child: 50mg/kg) IV 6 hourly + Metronidazole 500mg (child: 10mg/kg) PO/IV BID for 7 days** *Alternative*: Amoxicillin/Clavulanic acid 500/125mg (child: 25mg/kg) PO BID	

CARDIOVASCULAR INFECTIONS

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Bacterial Endocarditis (Native Valve) Diagnosed using Modified Dukes Criteria if relevant investigations available. **Always seek consultant advice.**	**Benzylpenicillin 1.8g (child: 50mg/kg) IV 4 hourly for 4 – 6 weeks + Cloxacillin 2g (child: 50mg/kg) IV 4 hourly for 4 – 6 weeks + Gentamicin 1mg/kg (up to 80mg) IV 8 hourly for 2 weeks only** *Note*: TID Gentamicin is ONLY used for endocarditis, not for any other indication. Renal function should be checked every 2 days. Consider changing Gentamicin to 12 hourly or a lower dose if renal function is impaired. Patient should also be regularly asked about symptoms of ototoxicity such as vertigo or hearing impairment. If this occurs, cease Gentamicin immediately and **obtain specialist advice**	Obtain a PICC line if available. 3 important principles of management: • Treatment must be given IV • Treatment is usually 4 – 6 weeks in duration • Adequate drug concentrations and duration are essential. If bacterial endocarditis is suspected it is recommended that at least 3 blood cultures be taken (from different venepuncture sites) before initiating therapy if available. If culture positive, should have antibiotics modified to reflect causative agent. **Seek specialist review.**
Hospital-Acquired or Prosthetic Valve Bacterial Endocarditis **Specialist only**	**Vancomycin (see page 107) for 4 – 6 weeks + Gentamicin 1mg/kg (up to 80mg) IV 8 hourly for 2 weeks only. Consider changing Gentamicin to 12 hourly or a lower dose if renal function is impaired** *Note*: TID Gentamicin is ONLY used for endocarditis, not for any other indication. Renal function should be checked every 2 days. Consider changing Gentamicin to 12 hourly or a lower dose if renal function is impaired. Patient should also be asked regularly about symptoms of ototoxicity such as vertigo or hearing impairment. If this occurs, cease Gentamicin immediately and **obtain specialist advice**	All patients on Vancomycin and Gentamicin should have their renal function monitored every 2 days (see Cockcroft-Gault calculation).

CENTRAL NERVOUS SYSTEM INFECTIONS

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Acute bacterial meningitis Classic symptoms of meningitis include headache, fever, and neck stiffness. Common organisms include *Streptococcus pneumoniae*, *Neisseria meningitis*, *Haemophilus influenzae*. Symptoms and clinical signs in young infants may be subtle and non-specific, including fever, lethargy, irritability, vomiting or a bulging fontanelle. Neck stiffness may not be present. Empirical therapy should be commenced without delay.	**Ceftriaxone 2g (child: 50mg/kg) IV 12 hourly for 10 days** *Alternative*: Chloramphenicol 1g (child: 25mg/kg) IV 6 hourly OR Cefotaxime 2g (child: 75mg/kg) IV 6 hourly If immunocompromised, pregnant, >50 years old or a neonate, consider Listeria infection. Add: Ampicillin 2g (child: 50mg/kg) IV 4 hourly	Exclude raised intracranial pressure with fundoscopy and CT (if available) PRIOR to lumbar puncture. Raised intracranial pressure may cause coma or focal neurological signs. CSF protein, glucose, white cell count with microscopy and subsequent culture should direct antibiotic therapy, however treatment should not be delayed if there is difficulty obtaining CSF. CNS Tuberculosis is an important differential diagnosis. If chronic meningitis symptoms with persisting headache, also consider cryptococcal meningitis.
Encephalitis Viral encephalitis is an infection of brain tissue that presents with a level of brain dysfunction and signs of infection such as fever. In the setting of meningoencephalitis it can often be difficult to differentiate between viral and bacterial causes, particularly if no typical associated features. If there is uncertainty it is important to also commence empirical antibiotics early (see Bacterial meningitis). VZV encephalitis should be suspected if associated with a typical rash (see Varicella Zoster infection).	**Aciclovir 20mg/kg IV 8 hourly for 14 days + adequate IV hydration** *Alternative (much poorer choice)*: Aciclovir 400mg PO 5 times a day	Many other disorders can mimic viral encephalitis and are also worth considering. This may include cerebral Toxoplasmosis (particularly if HIV positive), Tuberculosis or Anti-NMDAR encephalitis. Many viruses such as Japanese encephalitis and Nipah virus cannot be treated with antivirals, and should be managed with supportive care alone if diagnosis can be confirmed.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Brain abscess Often polymicrobial and require surgical consultation. Consideration of the source of spread is necessary but not always successful. Potential sources include paranasal sinusitis, dental infection, endocarditis, or penetrating trauma. Organisms may include anaerobes, *Streptococcus* and Gram-negative bacteria. In those who are immunocompromised such as with HIV, chemotherapy or other immunosuppressants, it is necessary to consider other diagnoses including Toxoplasmosis, fungal infection, Nocardiosis, or Cryptococcosis.	**Ceftriaxone 2g (child: 50mg/kg) IV 12 hourly + Metronidazole 500mg (child: 10mg/kg) IV 8 hourly for at least 6 weeks of antibiotic therapy** *Alternative*: Chloramphenicol 1g (child: 25mg/kg) IV 6 hourly If *Staphylococcus* suspected (see notes), add: Cloxacillin 2g (child: 50mg/kg) IV 6 hourly If ENT source likely, consider adding *Pseudomonas* cover. Switch all antibiotics to: Meropenem 2g IV 8 hourly **(specialist only)** If no improvement, consider adding: Vancomycin (see page 107) **(specialist only)**	Consider PICC line where available. If no improvement, consider alternative diagnoses such as: • Tuberculosis • Melioidosis • Malignancy **Seek specialist advice.** Consider staphylococcal cover if abscess secondary to trauma, or if likely to be the result of bacteraemia such as in endocarditis or multifocal abscesses. Vancomycin requires close monitoring of creatinine clearance (refer to Cockcroft-Gault calculation).
Tuberculoma / Tuberculous Meningitis (Adult)	**See National Tuberculosis Guidelines**	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Epidural abscess Epidural abscesses are most commonly caused by *Staphylococcus aureus*. Tuberculosis is an important differential diagnosis in settings like Timor-Leste with a high prevalence. Requires CT scan for diagnosis.	**Cloxacillin 2g (child: 50mg/kg) IV 4 – 6 hourly for 4 weeks** **THEN** **Cloxacillin 1g (child: 25mg/kg) PO QID for 2 weeks for a total of 6 weeks antibiotic therapy**	Consider PICC line where available. Consider Tuberculosis as a differential diagnosis.
	In adult males with prostatic symptoms: Cloxacillin 2g IV 4 – 6 hourly + Ceftriaxone 2g IV 12 hourly for 4 weeks THEN Step down to Amoxicillin/Clavulanic acid 500/125mg PO BID for 2 weeks for a total of 6 weeks antibiotic therapy	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Herpes Simplex Very common in children and adults, commonly occurring on the lips as ulceration. The primary episode usually occurs in childhood with fever and oral ulceration associated with lymphadenopathy, and may recur throughout life. Lesions are usually preceded by pain, burning, tingling or itching for several hours to days. The lesions begin as macules and rapidly become papular, with vesicles appearing within 48 hours and scabs within 3 to 4 days. It may also occur on the genitals. Eye involvement usually manifests as dendritic ulcer (see Dendritic ulcer in Eye Infections section).		Treatment is effective if initiated within 48 hours of a lesion appearing. Longterm suppressive therapy may be considered in patients with frequent disabling recurrences, Erythema Multiforme, or in immunocompromised patients.
Mild	**Symptomatic management only**	
Moderate or Severe	**Aciclovir 400mg (child: 10mg/kg) PO 5 times a day for 7 days**	
Recurrent (see Comments)	**Aciclovir 400mg (child: 10mg/kg) PO BID for up to 6 months**	
Eczema Herpeticum Widespread Herpes skin infection complicating pre-existing skin disease, most often atopic dermatitis. Presents with an acute eruption of vesicles or multiple crusted erosions in an area of dermatitis. May be associated with fever and malaise.	**Aciclovir 400mg (child: 10mg/kg) PO 5 times a day for 7 days** If secondary bacterial infection present: Cloxacillin 500mg (child: 12.5mg/kg) PO QID for 7 days	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Herpes Zoster/Shingles Caused by reactivation of Varicella Zoster virus (chicken pox virus). Usually occurs in adults, but can occur in children. The eruptions present with blisters in a dermatomal distribution on an erythematous base. In immunocompromised patients the eruption may be multi-dermatomal or diffuse and there may be systemic manifestations.	**Aciclovir 800mg (child: 20mg/kg) PO 5 times a day for 7 days + Bath the lesions 3 times a day to remove crust and cover with non-adherent dressing** Adults: Consider Amitriptyline 25 – 50mg PO at night for neuropathic pain	Antiviral treatment has been shown to significantly reduce acute pain, the duration of the rash, viral shedding and ophthalmic and liver complications if started within 72 hours of onset. Always treat if the host is immunocompromised or if there is eye involvement.
Tinea Caused by dermatophytes that can infect any part of the skin, hair or nails. The typical skin rash is annular, itchy and scaly with a definite edge and central clearing as it expands. It may be widespread on the trunk (tinea corporis) and may be associated with alopecia on the scalp (tinea capitis).	**Clotrimazole 1% cream topically BID until 2 weeks after clinical resolution achieved, usually a total of 3 – 6 weeks** *Alternative*: Miconazole 2% cream topically BID If tinea capitis: Ketoconazole 1 – 2% shampoo topically to scalp OD for 3 – 6 weeks	Keep feet dry, particularly in between toes, and dry footwear in the sun.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Cutaneous Candidiasis Presents as patches of moist confluent erythema, sometimes with vesicles or pustules. Usually occurs on mucosal surfaces or in skin folds (e.g. under breasts), where a curd-like material is seen on an erythematous base. Most commonly occurs in patients with predisposing factors such as therapy with broad-spectrum antibiotics or underlying diabetes.	**Clotrimazole 1% cream topically BID until 2 weeks after symptoms resolve** A mild steroid cream can be added to the anti-fungal cream if required to relieve itching	
Pityriasis versicolor A common condition caused by *Malassezia* yeasts, presenting as patches of hyperpigmentation or hypopigmentation. Appearance is of well-demarcated pale or tan macules with a fine scale.	**Ketoconazole 1 – 2% shampoo topically for at least 3 weeks**	Rash is usually asymptomatic and treatment is usually sought for cosmetic reasons. After treatment lesions may fail to re-pigment, but this does not necessarily represent failure of treatment.
Head lice These are crawling insects the size of a sesame seed. They live on the scalp but lay eggs on the hair, and spread by direct head-to-head contact. Diagnosis is by observing a moving louse on the scalp by wet combing with a fine toothed comb after applying generous conditioner to wet hair.	**40% cases can be cured by wet combing alone** If insecticide required: **Permethrin 1% cream topically to hair and scalp. Leave in for 20 minutes before washing out. Repeat 7 days later** *Alternative (if Permethrin not available or recurrent)*: Ivermectin 200mcg/kg PO for 1 dose. Repeat 7 days later	Wash pillowcases in hot water and put combs and brushes in hot water. Family and close physical contacts should be examined. Ivermectin should not be used in children <15kg or pregnant women.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Body Lice These crawling insects live in clothing, especially the seams, and feast on blood from patients intermittently. Main symptom is itch. Diagnosis is by inspecting clothes for Lice. Lice can also serve as a vector for Trench Fever (*Bartonella quintana*).	**Permethrin 1% cream topically to body. Leave on for 20 minutes before washing off. Repeat 7 days later** *Alternative (if Permethrin not available or recurrent)*: Ivermectin 200mcg/kg PO for 1 dose. Repeat 7 days later	Avoid contact of Permethrin with mucous membranes. Ivermectin should not be used in children <15kg or pregnant women. Clothing and bedclothes should be discarded or washed in hot water and sealed in a closed plastic bag for 30 days.
Pubic Lice *Phthirus pubis* colonises pubic, axillary, beard and body hair and may also involve eyebrows and eyelashes. The main symptom is itch. Eggs are visible on hairs.	**Permethrin 1% cream topically to hair. Leave in for 20minutes before washing out. Repeat 7 days later** If eyelashes involved: Apply white soft paraffin BID to eyelashes for 8 days to suffocate lice and then remove with forceps *Alternative (if Permethrin not available or recurrent)*: Ivermectin 200mcg/kg PO for 1 dose. Repeat 7 days later	Contact tracing is essential to identify additional cases. Examine all body surfaces including eyelashes and eyebrows. Shaving pubic hair is often helpful. Ivermectin should not be used in children <15kg or pregnant women.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Scabies (non-crusted) Scabies is caused by infestation with the mite Sarcoptes scabiei var Hominis, a human pathogen that is spread by close physical contact between infected persons. Human scabies is not acquired from animals. An allergic reaction to the mites causes inflammation and itch. Typically, an itchy, excoriated non-specific rash on the trunk is seen. This is associated with scaly burrows of the finger web spaces and wrists. The itch gets worse at night and with heat. Secondary bacterial infection can occur (see Impetigo).	**Permethrin 1% cream topically to dry skin from the neck down paying attention to hands, genitals and under the nails. Leave on for 24 hours and reapply to hands if they are washed** *Alternative*: Benzyl benzoate 25% emulsion (apply as per Permethrin) *Alternative for children < 2 months*: Sulphur 5% in white soft paraffin topically OD for 2 – 3 days *Alternative for adults or children >15kg (if Permethrin not available or recurrent)*: Ivermectin 200mcg/kg PO for 1 dose. Repeat 7 days later	If untreated it will usually spread to all members of a patient's family. Clothes, towels and bedding should be washed, and the patient's family and close contacts should be treated simultaneously. Itch may initially worsen with treatment, and may take 3 weeks to resolve after treatment completion. Treatment success is improved if therapy is applied on 2 occasions 1 – 2 weeks apart. Ivermectin should not be used in children <15kg or pregnant women.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Crusted Scabies In crusted scabies the mite population on the patient is very high due to inadequate host immune response. It occurs in immunocompromised patients, including those with HIV infections.	**Scabicidal: Permethrin 1% cream (see above for administration) OR Benzyl benzoate 25% emulsion on alternate days** **PLUS** **Keratolytic: Salicylic acid 5 – 10% in Sorbelene cream after washing on alternate days when scabicidal is not used** *Alternative*: Whitfield's solution (3% Salicylic acid and 6% Benzoic acid in lanolin base) **PLUS**	All should have HIV testing.
Mild	**Ivermectin 200mcg/kg PO Days 1 and 8**	Ivermectin is better absorbed if taken with a fatty meal. Ivermectin should not be used in children <15kg or pregnant women.
Moderate	**Ivermectin 200mcg/kg PO Day 1, 2 and 8**	
Severe	**Ivermectin 200mcg/kg PO Day 1, 2, 8, 9 and 15**	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Cutaneous Larva Migrans Caused by animal hookworm, this erythematous, intensely itchy eruption also causes worm-like burrows are visible just under the skin.	**Albendazole 200mg (child: as for adult) PO OD with fatty food for 3 days**	
Yaws Contagious skin infection caused by *Treponema pallidum* subspecies *pertenue*. Mostly causes a self-limiting primary infection with papules that enlarge into wart-like lesions with superficial erosion that heal spontaneously within six months. Weeks to months later a generalised eruption of similar skin lesions occurs and multiple relapses may occur in the first 5 years. Typically the skin lesions are painless, raised and reddish brown with a yellow crust. Secondary lesions can occur with haematogenous dissemination to skin, or rarely to bone and cartilage.	**Benzathine Penicillin 1.2MU (900mg)(child <20kg: 0.6MU (450mg)) IM for 1 dose OR Azithromycin 2g (child: 10mg/kg) PO for 1 dose**	Infection with Yaws will result in a false positive result on Syphilis testing (as the bacteria are closely related). Unlike syphilis it is transmitted by direct skin-to-skin contact. Can be complicated by periostitis or paranasal maxillary erosions.

EYE INFECTIONS

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Blepharitis Inflammation of the lid margins divided anatomically into anterior and posterior. Anterior refers to inflammation mainly centered around eyelashes and follicles, while posterior blepharitis involves the meibomian glands.		Exact aetiology is unclear but can be seen as a complication of seborrhoeic dermatitis, or acne rosacea with secondary *Staphylococcus* or *Streptococcus* involvement.
Anterior	**Lid hygiene with daily warm compresses and gentle scrubbing**	
Posterior	**Lid hygiene (as above) initially** If no improvement, use: Doxycycline 100 mg (child ≥8 years: 2mg/kg) PO OD for 3 – 8 weeks	
External Hordeolum (Stye) Abscess of small sebaceous gland associated with the eyelash. When infected it is generally staphylococcal infection.	**No antibiotic is necessary unless there are signs of infection. Consider warm compresses BID**	Removal of the eyelash often aids resolution.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
External Hordeolum (Stye) *continued* **Chronic infection only:**		
Children	**Tetracycline 1% ointment OR Erythromycin 0.5% ointment applied to the affected eye 3 – 4 times a day for 1 – 2 weeks**	
Adults	**Tetracycline 1% ointment OR Erythromycin 0.5% ointment applied to the affected eye at night + Chloramphenicol 1% ointment or 0.5% eyedrop solution 1 drop to the affected eye QID**	
Internal Hordeolum (Meibomian abscess) Usually a staphylococcal abscess of the meibomian gland and is often tender.	**Consider warm compresses BID** If signs of cellulitis: Cloxacillin 500mg (child: 12.5mg/kg) PO QID for 5 – 7 days	Topical antibiotics are not indicated. Incision and drainage is sometimes necessary for persistent or recurrent meibomian abscess.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Endophthalmitis An inflammatory condition of the intraocular cavity usually caused by infection. Presentation is usually acute with impaired vision, eyelid oedema, a congested eye, redness and pain. May also occur as a serious complication of cataract surgery, following a penetrating eye injury, or as a result of metastatic bacterial infection. **Ophthalmology review required.**	**Intra-ocular antibiotics as available (ophthalmology only)** If delay in ophthalmology review: Ciprofloxacin 750mg (child: 20mg/kg) PO + Vancomycin IV (see page 107) for 1 dose Duration depends on response as determined by an ophthalmologist	Delayed treatment may result in loss of vision. Do not use topical antibiotics if an open globe injury is suspected as preservatives are toxic to the intraocular contents. Vancomycin requires close monitoring of creatinine clearance (refer to Cockcroft-Gault calculation).
Bacterial Conjunctivitis Presents as irritated red eyes with purulent discharge stuck to the eyelid. Symptoms usually begin unilaterally. Many cases will spontaneously resolve within 5 days. Conjunctivitis in the neonatal period requires urgent treatment – see Neonatal infections.	**Antibiotics are often not required** If severe or not resolving, use: Chloramphenicol 1% ointment or 0.5% eyedrops 1 drop to the affected eye 1 – 2 hourly for the first 24 hours. Thereafter QID for a total of 7 days antibiotic therapy *Alternative*: Tetracycline 1% ointment to the affected eye TID	Chloramphenicol can cause contact hypersensitivity reactions that can be severe. If failing to respond to antibiotic therapy, significant pain, loss of vision or photophobia, refer to ophthalmologist.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Trachoma A clinical diagnosis in the setting of chronic conjunctivitis. Caused by *Chlamydia trachomatis*, Trachoma is the leading cause of preventable infectious blindness in the world.	**Azithromycin 1g (child >6 months: 20mg/kg) PO for 1 dose** *Alternative or if <6 months old*: Tetracycline 1% ointment BID to both eyes for at least 6 weeks. Repeat after interval of 6 months for another 6 weeks if necessary	In areas where Trachoma is prevalent, regular face washing and treatment of all household contacts is recommended.
Pre-septal Cellulitis Soft tissue infection of the eyelids anterior to the orbital septum. Vision and ocular range of motion is normal.		
Mild	**Cloxacillin 500mg (child: 12.5mg/kg) PO QID for 7 days**	
Moderate or Severe	**Cloxacillin 2g (child: 50mg/kg) IV 6 hourly** Step down to Cloxacillin 500mg (child: 12.5mg/kg) PO QID when improving to complete 7 days of antibiotic therapy	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Post-septal (orbital) Cellulitis Usually arises from infection of the paranasal sinuses or after orbital trauma. Clinical symptoms include reduced vision, limited or painful extraocular movement or proptosis.	**Cloxacillin 2g (child: 50mg/kg) IV 6 hourly + Ceftriaxone 2g (child: 50mg/kg) IV OD** Step down to Amoxicillin/Clavulanic acid 500/125mg (child: 25mg/kg) PO BID when improving for a total of 14 days antibiotic therapy	**Urgent ophthalmology referral necessary.** Consider CT scan. Pathogens include *Staphylococcus aureus*, *Haemophilus spp* (in unvaccinated patients), *Streptococcus spp* and anaerobic bacteria. Can be caused by fungi in immunocompromised patients or those with diabetes. If this is suspected clinically, additional antifungal cover will be required.
Corneal ulcer Symptoms include pain and worsening photophobia. A small white spot is often evident on the cornea. **Give antibiotics then always refer to Ophthalmologist.** If dendritic appearance, see Dendritic corneal ulceration below.	**Chloramphenicol 1% ointment or 0.5% solution 1 drop to the affected eye 1 hourly initially** *Alternative*: Ciprofloxacin 0.3% solution Frequency should be decreased according to clinical response under supervision of an ophthalmologist	Strict hourly dosing (including overnight) for the first 48 hours improves outcomes. Treatment may need to be supplemented with subconjunctival injection by an ophthalmologist if there is pus present in the anterior chamber.
Dendritic corneal ulceration Caused by Herpes Simplex virus.	**Aciclovir 3% ointment to the affected eye 5 times a day for 14 days or until at least 3 days after complete resolution**	Fluorescein staining of the cornea facilitates a presumptive clinical diagnosis of dendritic ulcer. As this is a viral infection, antibiotics have no place in treatment of this condition.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Eye Injuries **Non-perforating eye injuries**		
	If not infected: Symptomatic treatment only, rinsing eyes with clean salted water **If infected (sticky discharge):** Chloramphenicol 1% ointment or 0.5% solution 1 drop into the affected eye 1 – 2 hourly for the first 24 hours. Thereafter QID for a total of 7 days	
Corneal abrasion without infection	Chloramphenicol 1% ointment or 0.5% solution 1 drop into the affected eye 6 hourly for 3 days	
Corneal injury with infection Suggested by corneal opacification around injury, redness and discharge.	Treat as for Corneal ulcer	

GENITAL INFECTIONS

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Vulvovaginal candidiasis Presents with vaginal or vulval irritation burning or itch. The mucosa may have a white discharge with plaques on an erythematous base. *Candida albicans* is the most frequent cause but other *Candida* species can also be involved.	**Clotrimazole pessary 500mg PV at night for 3 days + Clotrimazole 1% cream PV at night for 7 days** OR Nystatin pessary 100,000U PV at night for 3 days + Clotrimazole 1% cream PV at night for 7 days	Treatment of sexual partners is not necessary unless balanitis is present. Vulvovaginal candidiasis is unusual in children 2 – 12 years old.
Bacterial Vaginosis A process of bacterial flora imbalance that reflects a change in typical vaginal flora including the normally dominant lactobacilli. Lactobacilli produce hydrogen to keep an acidic pH, which limits anaerobe growth. The specific trigger for the imbalance is not clear. Women may present with an off-white, fishy smelling discharge, but it does not cause dysuria, itch or burning.	**Metronidazole 2g PO for 1 dose OR Metronidazole 500mg (child: 10mg/kg) PO BID for 7 days** *Alternative (in pregnancy)*: Clindamycin 300mg PO BID for 7 days **(specialist only)**	Bacterial vaginosis resolves spontaneously in 1/3 of women, and 50 – 75% of women are asymptomatic.
Trichomoniasis *Trichomonas vaginalis* is a protozoan is spread predominately via sexual transmission with many being asymptomatic. Women are infected more than men and present with a thin purulent of frothy malodorous discharge. Men present with urethritis including a mucopurulent urethral discharge with or without dysuria.	**Metronidazole 2g PO for 1 dose** If recurrent re-treat with: Metronidazole 500mg PO BID for 5 days and treat the sexual partner	Co-existence of Trichomoniasis and Bacterial Vaginosis are high (approximately 60 – 80%). Perform full STI screening including Syphilis and HIV.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Pelvic Inflammatory Disease (PID) PID refers to infection of the upper genital tract structures in women including the uterus, oviducts, and ovaries, which has the possibility of involving neighbouring pelvic organs. PID includes chorioamnionitis, salpingitis, tubo-ovarian abscess, and endometritis and can be caused by a range of sexually and non-sexually transmitted organisms.		Consider full STI screening including Syphilis, Chlamydia, Gonorrhoea, Hepatitis B and HIV in all.
Mild	**Amoxicillin 500mg PO TID + Metronidazole 500mg PO BID for 14 days + STI pack (Cefixime 400mg PO + Azithromycin 1g PO for 1 dose)**	STI pack in Timor-Leste includes 1 dose of Cefixime and Azithromycin to provide empirical cover for the most common sexually-transmitted organisms including *N.gonorrheae* and *C.trachomatis* that can cause PID. When treating a patient for an STI, also provide an STI pack for the patient's partner.
Moderate or Severe	**Ceftriaxone 2g IV OD + Metronidazole 500mg IV BID + Azithromycin 1g PO (Azithromycin is for 1 dose only)** Step down to Amoxicillin 500mg PO TID + Metronidazole 500mg PO BID when improving for a total of 14 days antibiotic therapy	An STI pack is NOT required on top of this empiric antibiotic therapy, although an STI pack should be provided for the patient's partner.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Bartholin's abscess The Bartholin glands are deep to the posterior aspect of the labia majora, and usually produce mucous for vaginal and vulval lubrication. Blockage of these ducts causes cysts which can sometimes become secondarily infected resulting in abscess, often due to *Staphylococcus aureus*.	**Unless there is significant erythema post-drainage, antibiotics are not required.** If infection persists and antibiotic therapy is necessary, use: Cloxacillin 500mg (child: 12.5mg/kg) PO QID + Metronidazole 500mg (child: 10mg/kg) PO BID for 7 days	Mainstay of treatment is surgical drainage.
Gonorrhoea *Neisseria gonorrheae* is sexually transmitted. It occurs predominantly as urethritis in men and cervicitis in women. It can also involve the throat (pharyngitis), rectum (proctitis) or eyes (conjunctivitis). Some men and many women are carriers with no symptoms. Symptoms in men include urethral discharge (usually white or yellow), dysuria and urinary frequency. Symptoms in women include dysuria, urinary frequency and vaginal discharge, which are often mistaken for a urinary tract infection. Complications include abscess around the urethra and labia, inflammation of the epididymis and testis, acute salpingitis, pelvic peritonitis, pelvic abscess, ectopic pregnancy, infertility, severe conjunctivitis and iritis. Systemic spread (Disseminated Gonorrhoea) presents as bacteraemia, pustular skin rash and/or acute infective arthritis.	**Ceftriaxone 500mg IM + Azithromycin 1g PO (to cover Chlamydia) for 1 dose** For systemic/disseminated disease that involves joints, skin or bloodstream: Ceftriaxone 1g IV/IM OD for 7 – 10 days Infants born to mothers with Gonorrhoea are at high risk of infection and require prophylaxis – see Neonatal Gonorrhoea Prophylaxis See Gonococcal Ophthalmia Neonatorum for treatment of gonococcal conjunctivitis in neonates	Treat all sexual partners. Note that ~30% of patients will have concurrent Chlamydia. Therefore treatment of all suspected cases with Azithromycin is essential. Consider full STI screening including Syphilis and HIV in all.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Chlamydia *Chlamydia trachomatis* is an intracellular bacterium causing two sexually transmitted diseases in adults depending on the serotype.		Screening and treatment of sexual partners is essential. Gonococcal and chlamydial infections frequently occur together. Treatment for the two infections should be given concomitantly. Children born to women with untreated *Chlamydia trachomatis* infection may develop severe conjunctivitis and blindness or pneumonia. See treatment of Ophthalmia Neonatorum. Consider full STI screening including Syphilis and HIV in all.
Infection of urethra, endocervix or rectum *Note*: Males present with urethritis, or with complications including epididymitis or, in homosexual men, proctitis. Female infection is often subclinical or non-specific. Complications include cervicitis, salpingitis and endometriosis. A major cause of infertility in women worldwide.	**STI pack: Azithromycin 1g PO + Cefixime 400mg PO (to cover Gonorrhoea) for 1 dose**	
Lymphogranuloma venereum (LGV) A transient painless ulcer on genitalia followed by enlarged inflamed lymph nodes that ulcerate.	**Doxycycline 100mg PO BID for 21 days + Ceftriaxone 500mg IM (to cover Gonorrhoea) for 1 dose**	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Chancroid A sexually transmitted disease caused by *Haemophilus ducreyi*. It is a frequent cause of genital ulceration and a risk factor in the transmission of HIV. At 3 – 7 days post exposure, painful vesicular papules form, rapidly developing into soft ulcers with undermined, ragged edges. Ulcers are haemorrhagic and sticky, and often secondarily infected. Commonly 7 – 14 days later, inguinal nodes become involved and a painful, matted, tethering 'bubo' occurs. A discharging sinus may develop and in time become a spreading ulcer. Lesions heal slowly and commonly relapse.	**STI pack: Cefixime 400mg PO + Azithromycin 1g PO for 1 dose** OR Ceftriaxone 500mg IM + Azithromycin 1g PO for 1 dose	Consider full STI screening including Syphilis and HIV in all.
Syphilis **Early Syphilis (Present <2yrs)** **Primary**: Presence of a painless syphilitic chancre **Secondary**: Fever and papulosquamous rash often of the palms and soles of the feet. Disease can spread to the CNS, eyes, and other organs and is referred to as the 'great imitator' with many possible signs. **Early Latent**: Asymptomatic (silent) infection with no clear signs or symptoms	**Benzathine Penicillin 2.4MU (1.8g) IM for 1 dose** If CNS or eye involvement present, consider lumbar puncture and treat as per Neurosyphilis (see below) Re-examine and repeat VDRL at 6 weeks, 3 and 6 months to determine adequate treatment. A repeated course of antibiotics is needed if VDRL titre is not falling within 6 weeks	VDRL testing may be negative in early primary Syphilis, therefore always treat if there is a consistent clinical presentation. If VDRL is positive, confirm with TPPA testing. All patients with Syphilis should have complete STI screening including HIV.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Syphilis *continued*		All patients with Syphilis should have complete STI screening including HIV.
Late Syphilis (Present >2yrs) Progression from untreated early Syphilis. **Late Latent**: Asymptomatic **Tertiary:** • Cardiovascular Syphilis • Gummatous disease (granulomas of the skin, bones, or viscera)	**Benzathine Penicillin 2.4MU (1.8g) IM weekly for 3 consecutive weeks** Re-examine and repeat VDRL at 6 weeks, 3 and 6 months to determine adequate treatment. A repeated course of antibiotics is needed if VDRL titre is not falling within 6 weeks If CNS or eye involvement consider lumbar puncture and treat as per Neurosyphilis (see below)	
Neurosyphilis Various levels of CNS involvement possible, and can occur at any stage of infection. In all Syphilis, assess clinically for cognitive dysfunction, motor or sensory loss, eye or auditory disturbances, cranial nerve palsies or symptoms or signs of meningitis. If present, treat as for Neurosyphilis.	**Benzylpenicillin 2.4g IV 4 hourly for 14 days** Repeat lumbar puncture at 6 months with repeat treatment if CSF leukocytosis	The success of Neurosyphilis treatment is determined by stabilisation of clinical signs and normalisation of CSF abnormalities.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Syphilis in Pregnancy		All pregnant women should be screened early, at first antenatal clinic visit. Screening should be repeated in the 3rd trimester and preferably again at delivery. All pregnant women with a history of sexual contact with a person with documented Syphilis should be treated presumptively. All newborn infants to mothers with Syphilis should be carefully examined for evidence of congenital Syphilis. Hypersensitivity to penicillin: Penicillin therapy after desensitisation is preferred to alternative treatment.
Early Syphilis (Present <1yr) For different types see above	**Benzathine Penicillin 2.4MU (1.8 g) IM weekly for 3 consecutive weeks** OR Procaine Penicillin 1.2MU (1.2g) IM OD for 14 days (especially if >20 weeks gestation)	
Late Syphilis (Present >1yr) For different types see above	**Treat as per Late Syphilis (Non-Pregnant)** Following treatment, monthly VDRL testing should be done for duration of pregnancy. A repeat course is indicated if the sexual partner was not treated simultaneously, if VDRL titre is not falling within 6 weeks, or if titre not available	
Herpes Simplex Virus (Genital) Herpes simplex virus 1 and 2 can cause genital infection presenting with shallow painful ulcers with possible fever, dysuria, itch or tender lymph nodes. The primary infection may spontaneously remit and then recur many months to years later. Recurrences are generally less severe and shorter in duration.	**Primary infection: Aciclovir 400mg PO TID for 7 days** Recurrences: Aciclovir 800mg PO TID for 5 days	Evaluate and treat sexual partner(s) with genital lesions. Patient and partner(s) should be counselled about the natural history of the disease with emphasis on potential for recurrence. Advise abstinence from sexual activity while lesions are present.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Genital Warts Genital warts are caused by certain types of Human Papillomavirus (HPV). The goal of treatment is removal of exophytic warts and symptom improvement and not eradication of the virus itself.	**If external or peri-anal: Podophyline 0.5% solution topically to each wart BID for 3 days, cease for 4 days, then repeat this cycle weekly for 4 – 6 applications until warts disappear** *Alternative*: Trichloroacetic Acid (TCA) 80–90% solution topically to each wart weekly for 2 – 4 weeks (requires administration by a physician)	Podophyline is contraindicated in pregnancy and breastfeeding mothers. TCA is toxic and can cause severe pain on adjacent normal skin. This can be neutralised with soap or sodium bicarbonate.

GENITOURINARY INFECTIONS

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Cystitis Symptoms may include dysuria, urinary frequency or haematuria. Fever or renal angle tenderness represents upper urinary tract infection (see Pyelonephritis).	**Trimethoprim/Sulphamethoxazole 160/800mg (child: 4mg/kg) PO BID for 3 days (non-pregnant women) (children <12 months: 5 days)** OR Amoxicillin/Clavulanic acid 500/125mg (child: 25mg/kg) PO BID for 3 days (children <12 months: 5 days)	Change antibiotic therapy based on results of cultures and susceptibility testing. High fluid intake and complete bladder emptying may aid resolution of cystitis. For symptomatic infants <12 months old, have a low threshold for treating as for Pyelonephritis. Men should be examined for evidence of prostatitis.
Pyelonephritis OR Complicated Urinary Tract Infection Pyelonephritis usually presents with fever, dysuria and unilateral renal angle tenderness. In young children the symptoms and signs may be more non-specific, with fever, vomiting and poor feeding common in infants <12 months.		Complicated urinary tract infection is urinary tract infection in the presence of: • obstruction • immunosuppression • stone disease • anatomical urinary tract abnormality Must attempt to define or exclude underlying anatomical or functional abnormality.
Mild (low grade fever without nausea or vomiting)	**Trimethoprim/Sulphamethoxazole 160/800mg (child: 4mg/kg) PO BID for 10 – 14 days** OR Amoxicillin/Clavulanic acid 500/125mg (child: 25mg/kg) PO BID for 10 – 14 days	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Pyelonephritis OR Complicated Urinary Tract Infection *continued*		
Moderate or Severe	**Ampicillin 2g (child: 50mg/kg) IV 6 hourly + Gentamicin 4 – 5mg/kg (child <10 years: 7.5mg/kg) IV OD** If still requiring IV therapy after 48 hours, change Gentamicin to Ceftriaxone 2g IV OD Switch to PO therapy (as for Mild) when improving for a total of 14 days antibiotic therapy If *Pseudomonas* is isolated (Moderate to Severe) use: Ciprofloxacin 500mg PO BID for 14 days	Change to directed therapy based on culture and sensitivity if available. Use Gentamicin for no longer than 72 hours (refer to Gentamicin dosing schedule). Requires close monitoring of creatinine clearance (refer to Cockcroft-Gault calculation). For children <12 months old with pyelonephritis, there should be a low threshold for treating initially with intravenous antibiotics, due to an increased risk of secondary bacteraemia.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Epididymo-orchitis Infection of the epididymis and/or testes. Presents with pyuria, scrotal pain and oedema, and swelling. Treatment divided into whether sexually acquired or non-sexually acquired.		Those >35 years OR participating in insertive anal intercourse are more likely to have Gram-negative pathogens. Age cut-offs are suggestions only help to guide most likely organisms. Use Gentamicin for no longer than 72 hours (refer to Gentamicin dosing schedule). Requires close monitoring of creatinine clearance (refer to Cockcroft-Gault calculation).
Non-Sexually-acquired (typically >35yrs) **Mild or Moderate**	**Trimethoprim/Sulphamethoxazole 160/800mg PO BID for 14 days OR Ciprofloxacin 500mg PO BID for 14 days**	
Severe	**Ampicillin 2g IV 6 hourly + Gentamicin 4 – 5mg/kg IV OD** If still requiring IV therapy after 48 hours, change Gentamicin to Ceftriaxone 2g IV OD Step down to Trimethoprim/ Sulphamethoxazole 800/160mg PO BID OR Ciprofloxacin 500mg PO BID when improving for a total of 14 days antibiotic therapy	
Sexually-acquired (typically <35yrs)	**STI Pack** (see Pelvic Inflammatory Disease)	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Chronic Bacterial Prostatitis Persistent infection of the prostate, usually with Gram-negative organisms. Presentation may include low-grade fever, urgency or perineal discomfort. Most cases of what is thought to be 'chronic' prostatitis, characterised by chronic pelvic pain (90 – 95%), are not due to infection and repeated courses of antibiotic treatment should be avoided. Chronic bacterial prostatitis is rare.	**Ciprofloxacin 500mg PO BID for 4 weeks (specialist only)**	Therapy should be guided by culture and sensitivity tests where available.

GASTROINTESTINAL INFECTIONS

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Oral thrush (Candidiasis) A fungal infection of the buccal mucosa caused by *Candida* species. White plaques are seen on the tongue, cheeks or roof of the mouth. Risk factors include immunosuppression such as HIV infection or diabetes, the use of inhaled steroids, concurrent antibiotics, or poor oral hygiene.	**Nystatin oral suspension 100,000U (1mL) PO QID after food for 7 – 14 days or until several days after symptoms resolve**	Place under the tongue or in the buccal cavity then swallow.
Candida Oesophagitis Most commonly seen in the setting of immunosuppression such as HIV.	**Nystatin tablet 500,000U PO QID for 14 – 21 days** *Alternative*: Fluconazole 200 – 400mg (child: 6mg/kg) PO OD for 14 – 21 days	Ensure HIV testing is completed.
Diarrhoeal diseases An increased frequency of liquid or semi liquid stools. Antibiotic therapy is ONLY indicated when bacterial infection is suspected, such as with high fever, tachycardia, leucocytosis, abdominal tenderness, several abdominal pain, or blood in the stool. If this occurs, see Severe Dysentery below.	**Most diarrhoeal disease does not require antibiotic therapy**	The major concern with diarrhoea is a rapid loss of fluid and risk of dehydration. Oral and/or intravenous rehydration is usually all that is required.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Severe dysentery Severe diarrhoea associated with blood and mucous. Commonly caused by *Salmonella* or *Shigella* species. Treatment is especially required in infants <12 months old because of the risk of bacteraemia and other systemic manifestations.	**Ceftriaxone 2g (child: 50mg/kg) IV OD + Metronidazole 500mg (child: 10mg/kg) PO/IV TID** Step down to Trimethoprim/Sulphamethoxazole 160/800mg (child: 4mg/kg) PO BID + Metronidazole 500mg (child: 10mg/kg) PO TID when improving for a total of 7 – 10 days antibiotic therapy *Alternative to Trimethoprim/Sulphamethoxazole*: Ciprofloxacin 500mg (child: 10mg/kg) PO BID for 3 days	Rehydration and electrolyte replacement is the most important component of treatment.
Intestinal Amoebiasis Invasion of the intestinal lining by *Entamoeba histolytica* trophozoites causes amoebic bloody diarrhoea or colitis. Severe colitis may be complicated by perforation.	**Metronidazole 500mg (child: 10mg/kg) PO TID for 7 – 10 days** *Alternative*: Tinidazole 2g (child: 50mg/kg) PO OD for 3 days	Currently luminal amoebicides to eliminate cysts in the colon are not available on the Timor-Leste essential drugs list (e.g. Paromomycin, Diloxanide). The risk of relapse is increased without their use.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Liver Abscess A collection of pus inside the liver. Symptoms and signs include fever, lethargy, right upper quadrant discomfort, anorexia, a large and tender liver and pleural effusion.		Ultrasound required for diagnosis. If not responding or if >5cm seek surgical opinion regarding drainage. Currently luminal amoebicides to eliminate cysts in the colon is not available on the Timor Leste essential drugs list (i.e. Paromomycin, Diloxanide). The risk of relapse is increased without their use.
Likely amoebic	**Metronidazole 500mg (child: 10mg/kg) PO/IV TID for 7 – 10 days**	
Likely bacterial	**Metronidazole 500mg (child: 10mg/kg) PO/ IV TID + Ceftriaxone 2g (child: 50mg/kg) IV OD for 14 days** **THEN** **Step down to Amoxicillin/Clavulanic acid 500/125mg (child: 25mg/kg) PO BID for a total of 6 weeks antibiotic therapy**	
Giardiasis Often characterised by yellow diarrhoea, excess gas, stomach or abdominal cramps, and/or nausea.	**Metronidazole 500mg (child: 10mg/kg) PO TID for 5 – 7 days** *Alternative*: Tinidazole 2g (child: 50mg/kg) PO for 1 dose	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Strongyloidiasis Uncomplicated disease is frequently asymptomatic, or may involve gastrointestinal symptoms including abdominal pain or diarrhoea. Pulmonary symptoms can occur during the pulmonary migration phase. Dermatological manifestations include urticarial rash and Larva Currens. Disseminated Strongyloidiasis occurs when patients with chronic *Strongyloides* infection become immunosuppressed. This can be rapidly fatal.	**Albendazole 400mg PO TID for 3 days. Repeat after 7 days** *Alternative (adult or child >15kg)*: Ivermectin 200mcg/kg PO with fatty food for 1 dose. Repeat 7 days later	Diagnosis of Strongyloidiasis depends on microscopic identification of larvae in the stool. May be supported by the presence of eosinophilia in the blood. Ivermectin should not be given to children <15kg and should not be used in pregnancy.
Antibiotic-associated diarrhoea Most antibiotic-associated diarrhoea is a side effect of the medication, while only a small proportion of antibiotic-associated diarrhoea is caused by *Clostridium difficile*.	**Cease other antibiotics if possible** **Metronidazole 500mg (child: 10mg/kg) PO BID for 10 days**	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Typhoid (enteric fever) – proven or suspected Caused by ingestion of contaminated water or transmitted by poor hygiene practices during food handling. Typhoid may be suspected in the presence of fever >38 degrees for >3 days, and can be associated with a dry cough, bowel changes (constipation in adults, diarrhoea in children), headache, malaise, cough or rash.	**Ceftriaxone 2g (child: 50mg/kg) IV OD** *Alternative*: Azithromycin 1g (child: 20mg/kg) PO OD for 5 days OR Chloramphenicol 500mg (child: 25mg/kg) PO QID for 5 days If Ceftriaxone chosen, step down to Chloramphenicol PO OR Azithromycin PO when improving for a total of 7 days antibiotic therapy	
Helminths (Hookworm, Roundworm, Whipworm)	**Albendazole 400mg PO OD for 3 days. Repeat after 7 days if heavy infection** *Alternative*: Mebendazole 200mg PO OD for 3 days *Alternative (Pregnancy)*: Pyrantel 250mg PO OD for 3 days	
Helicobacter pylori Patients infected with *H.pylori* have a 10 – 20% lifetime risk of developing peptic ulcers and a 1 – 2% risk of developing stomach cancer.	**Optimum therapy if available: Omeprazole 20mg PO BID + Amoxicillin 500mg PO TID + Clarithromycin 500mg PO BID for 7 days** *Alternative*: Omeprazole 20mg PO BID + Amoxicillin 500mg PO TID + Metronidazole 500mg PO BID for 10 – 14 days	All patients with a duodenal ulcer, proven *H.Pylori* peptic ulcers or with MALT should be treated.

INFANTS AND CHILDREN (1 MONTH – 12 YEARS)

Antibiotic dosing principles

- Children > 12 years old may receive the adult dose.
- Special care in neonates (see Neonatal section) – dosage and intervals may differ from older children.
- Where a combination medication is used (e.g. Trimethoprim/Sulphamethoxazole), the child's dose refers to the dose of the first medication in the combination tablet.
- The dose must not exceed the maximum adult dose unless specified.
- All intravenous infusions should be given carefully according to Injectable Guidelines to avoid thrombophlebitis.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Malnutrition In severe acute malnutrition, the usual signs of bacterial infection such as fever are often absent. Multiple infections are common. If specific infections are identified treat for these, otherwise, in all children with severe acute malnutrition, give the following antibiotics empirically.		Consider treating as for Sepsis if child is lethargic, hypothermic or hypoglycaemic.
Severe acute malnutrition in children not looking unwell and with no obvious signs of infection	**Trimethoprim/Sulphamethoxazole 4/20 mg/kg PO BID for 5 days OR Amoxicillin 25mg/kg PO BID for 5 days**	
Severe acute malnutrition with oedema or looking unwell	**Ampicillin 50mg/kg IM/IV 6 hourly + Gentamicin 7.5mg/kg IM/IV OD for 7 days** Step down to PO antibiotics once improving (see above)	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Pertussis Consider pertussis if the child has a whooping-type cough, persistent cough, post-cough vomiting, or apnoeic or cyanotic episodes. Fever is uncommon.	**Azithromycin 10 mg/kg PO OD for 5 days** *Alternative*: Trimethoprim/ Sulphamethoxazole 4/20 mg/kg (max 160/800mg) PO BID for 7 days	There is no conclusive evidence that antibiotics alter the course of disease but treatment of Pertussis minimises the transmission to susceptible contacts. Patients should avoid contact with others, especially young children and infants, until at least 5 days of antibiotic therapy have been taken.
Epiglottitis Typically caused by *Haemophilus influenzae*, Epiglottitis is a potentially fatal condition that can have rapid progression. Suggested by a gradual onset, history of sore throat, swelling and redness visible in the lower pharynx, drooling and stridor. Minimise child distress, unnecessary examinations and invasive procedures. Urgent anaesthetic referral for airway management required.	**Ceftriaxone 50mg/kg (max 1g) IV BID for 5 days** The addition of corticosteroids may be considered. Use: Dexamethasone 10mg (child: 0.15mg/kg) IV for 1 dose. Repeat at 24 hours if required	All patients require intensive monitoring – **seek specialist ENT advice**

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Paediatric TB Suspect TB if any 2 of the following: • History of recent TB contact • cough >2 weeks • fever >2 weeks • failure to thrive • fatigue/reduced playfulness >2 weeks • enlarged lymph nodes (greater than 1x1cm) >2 weeks • profuse night sweats >2 weeks	**As per paediatric TB guideline**	Also examine for signs of extra-pulmonary TB: • pleural effusion • enlarged non-tender lymph nodes or lymph node abscess, mainly in neck • signs of meningitis • abdominal swelling with or without palpable lumps • progressive swelling or deformity in the bone or a joint, including the spine

LINE INFECTIONS

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Haemodialysis Line infection Patients who present with clinical sepsis in the presence of a haemodialysis line.	**Vancomycin 1g IV for 1 dose, then further doses given after haemodialysis (usually 3 times a week)** *Alternative (if Vancomycin not available):* Cloxacillin 2g IV 6 hourly In the setting of suspected Staphylococcus aureus bacteraemia, the recommendation is for a minimum of 14 days of IV therapy **(specialist only)** If fevers are persisting after 72 hours, reconsider removal of line and consider adding: Ceftriaxone 1g IV OD	Blood cultures should be taken where possible and line removed.

NEONATAL INFECTION AND PROPHYLAXIS

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Well baby with obstetric risk factors for infection Early infections present in the first 3 days after birth, and are often associated with obstetric risk factors for infection. Symptoms of neonatal sepsis may be non-specific and may come on gradually. Antibiotics are given empirically to babies born to mothers with obstetric risk factors for infection to ensure early treatment and prevent complications of early onset neonatal sepsis.	**Ampicillin 50mg/kg/dose IM/IV 12 hourly + Gentamicin 4 – 5mg/kg/ dose IV/IM (<2kg: 48 hourly; >2kg: 24 hourly) for 2 – 5 days**	Obstetric risk factors for early onset neonatal sepsis include: • Home birth • Rupture of membranes > 18 hours • Offensive liquor • Preterm delivery • Maternal fever or sepsis • Maternal history of a previous neonatal death from sepsis
Early and late onset neonatal sepsis This may present with fever with no focus, or more obvious signs of septicaemia. The antibiotics suggested are appropriate for these presentations as well as for pneumonia or urinary tract infection in the neonatal period. Most common infecting organisms include Group B *Streptococcus*, *Listeria monocytogenes*, *Haemophilus influenzae*, *Escherichia coli* and *Klebsiella pneumoniae*.	**Ampicillin 50mg/kg/dose IV/IM (12 hourly during first week of life; 8 hourly after first week of life) + Gentamicin 4 – 5mg/kg/dose IV/IM (<2kg: 48 hourly; >2kg: 24 hourly) for 7 – 10 days**	Further guidance on appropriate investigations and management in cases of neonatal infection can be found in the Neonatal Sepsis Standard Operating Procedure guideline.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Neonatal sepsis with possible *Staphylococcus aureus* infection Suspect in the setting of: • Fever + skin pustules • Skin abscess • Omphalitis • Pneumonia + Pneumatocoele or empyema • Hospital-acquired late onset infection	**Cloxacillin 50mg/kg/dose IV/IM (12 hourly during first week of life 8 hourly after first week of life) + Gentamicin 4 – 5mg/kg/dose IV/IM (<2kg: 48 hourly; >2kg: 24 hourly) for 7 – 10 days** If no improvement, especially in the setting of hospital-acquired infection, consider switching to: Meropenem 40mg/kg/dose IV 8 hourly + Vancomycin 15mg/kg/dose IV (8 hourly for term neonates or 12 hourly for preterm neonates) **(specialist only)**	Abscesses may require incision and drainage. Consider Gram stain +/- culture of swabs or other clinical samples if available. Umbilical cord should be cleaned with antiseptic solution and allowed to dry. With omphalitis, consider neonatal Tetanus.
Meningitis Meningitis in the neonatal period is most commonly caused by Group B *Streptococcus*, *Listeria monocytogenes*, and Gram-negative organisms.	**Ampicillin 50mg/kg/dose IV/IM (12 hourly during first week of life; 8 hourly after first week of life) + Gentamicin 4 – 5mg/kg/dose IV/IM (<2kg: 48 hourly; >2kg: 24 hourly) for 10 days** *Alternative*: Ceftriaxone 100mg/kg/dose IV OD for 10 days	

(also see Neonatal Sepsis SOP)

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Necrotising Enterocolitis This infection is common in extremely premature babies, and presents with distended abdomen, feed intolerance, fever, abnormal white cell count and thrombocytopaenia. It is associated with high rates of mortality. Antibiotics target enteric organisms including Gram-positive, Gram-negative and anaerobic pathogens.	**Ampicillin 50mg/kg/dose IV/IM (12 hourly during first week of life; 8 hourly after first week of life) + Gentamicin 4 – 5mg/kg/dose IV/IM (<2kg: 48 hourly; >2kg: 24 hourly) + Metronidazole 7.5mg/kg (<2kg: 12 hourly; >2kg: 8 hourly) IV for 7 – 10 days** If no improvement, consider switching to: Meropenem 40mg/kg/dose IV 8 hourly + Vancomycin 15mg/kg/dose IV (8 hourly for term neonates; 12 hourly for preterm neonates) **(specialist only)**	
Skin pustules (no systemic symptoms) Skin infections in neonates are usually caused by *Staphylococcus aureus*. If fever or other systemic symptoms are present, the infant should be treated with high-dose parenteral antibiotics to cover for the possibility of sepsis.	**Cloxacillin 25mg/kg/dose IV/PO (12 hourly during first week of life; 8 hourly after first week of life) for 5 – 7 days**	Wash skin with soap and water, dry and clean with antiseptic solution. Rupture and drainage of pustules is usually not required.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Neonatal Malaria (confirmed) Refer to Timor-Leste National Malaria Guidelines	**Artesunate 3mg/kg IV/IM (12 hourly for 3 doses then 24 hourly for 2 more doses) for a total of 3 days therapy** *Alternative*: Quinine 20mg/kg in 10ml/kg of IV fluid infused over 4hrs. Then 8 hours after initial dose give Quinine 10mg/kg in IV fluid over 2hrs and repeat 8 hourly for a total of 7 days therapy	
Neonatal Gonorrhoea Prophylaxis If the mother is successfully treated prior to delivery, no prophylaxis is required for the neonate. If the mother has not been treated, the risk of vertical transmission is 30 – 40%. A single dose of Ceftriaxone provides effective prophylaxis for the neonate.	**Ceftriaxone 50mg/kg (max 125mg) IM/IV for 1 dose** Monitor for disseminated disease and if this occurs treat as per Neonatal Gonorrhoea	For all cases also treat mother and sexual partner – see Gonorrhoea
Neonatal Chlamydia Prophylaxis If a mother has active Chlamydia infection that has not been treated, the risk of the neonate developing Chlamydia conjunctivitis is 20 – 50% and the risk of Chlamydia pneumonia is 5 – 30%.	**Prophylactic antibiotics are not effective at preventing Chlamydia conjunctivitis or pneumonia in neonates**	Families should be advised to monitor for signs of conjunctivitis or pneumonia, and present early for treatment.

(also see Neonatal Sepsis SOP)

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Neonatal Conjunctivitis OR Gonococcal Ophthalmia Neonatorum Conjunctivitis may be associated with a blocked tear duct, or bacterial colonisation with oropharyngeal flora. Congenitally-acquired infections including Gonorrhoea and Chlamydia can also cause severe, sight-threatening conjunctivitis. Gonococcal conjunctivitis usually presents in the first two weeks of life with sudden severe grossly purulent conjunctivitis. It can rapidly lead to perforation of the globe and blindness. Topical antibiotics alone are insufficient. Urgent consultation with an ophthalmologist is required.	**Irrigate the eye with saline several times a day until purulence subsides** **Ceftriaxone 50mg/kg (max 125mg) IV/IM for 1 dose + Azithromycin 20mg/kg PO OD for 3 days** If any evidence of disseminated disease treat as for Disseminated Gonococcus for 10 days (see Genital Infections section)	Exclude disseminated gonococcal infection by careful physical examination. The infant's mother and her partner should be evaluated and treated for Gonorrhoea if gonococcal infection suspected. This is preventable with prophylactic antibiotics for babies born to mothers with known gonococcal infection (see Neonatal Gonorrhoea Prophylaxis above) Between 5–30% of mothers with Chlamydia spread it to the newborn during delivery. Approximately 50% of neonates with Chlamydia conjunctivitis develop Chlamydia pneumonia. Topical therapy for chlamydial conjunctivitis is not effective. The infant's mother and her partner should be evaluated and treated for Chlamydia.
Oral Thrush (Candidiasis)	**Nystatin 100,000IU/mL PO 1 drop QID for 7 – 10 days** Treat mothers' breast with: Miconazole cream 2% OR Gentian violet	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Neonatal Syphilis Prophylaxis/ Treatment Babies born to mothers with Syphilis should be assessed for clinical evidence of congenital Syphilis. The risk of transmission from mothers with late Syphilis is approximately 10%.		
Asymptomatic babies born to mothers with Syphilis (even if treated during pregnancy)	**Benzathine Penicillin 37.5mg/kg/dose (50,000U/kg) IM for 1 dose**	
Symptomatic baby with congenital Syphilis (including CNS disease)	**Benzylpenicillin 60mg/kg/dose IV/IM 12 hourly for 14 days**	For all cases also treat the mother and partner and notify the case to the MoH. Symptoms or signs may include growth restriction, respiratory distress, rash (palms/ soles), mucosal lesions, anaemia, jaundice, hepatosplenomegaly, nasal discharge, bony tenderness or periostitis on X-ray.

(also see Neonatal Sepsis SOP)

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Neonatal HIV Prophylaxis If measures are not put in place to prevent mother-to-child transmission of HIV, the risk of transmission from an infected mother to the baby is approximately 40%. It is possible to reduce this risk to <1%. The most important way of reducing risk is by using highly active antiretroviral therapy (ART) during the antenatal period to control viral replication in the mother. All pregnant women who have HIV should be commenced on ART immediately, and all exposed infants should also be treated with ART as soon as possible, ideally within 6 hours after birth. Most babies born to mothers who have been established on ART during pregnancy can be managed as low risk for developing HIV. Babies in the following categories should be considered at high risk of transmission: • Infants born to mothers with HIV infection who received less than 4 weeks of ART prior to delivery • Infants born to mothers with HIV infection with viral load >1000 copies/mL in the 4 weeks before delivery, if viral load measurement is available	**Low risk babies** **Nevirapine suspension PO OD for 6 weeks:** • <2kg: 2mg/kg • 2 – 2.5kg: 10mg • >2.5kg: 15mg **High risk babies** **Nevirapine suspension PO OD for 12 weeks:** • <2kg: 2mg/kg • 2 – 2.5kg: 10mg • >2.5kg: 15mg • Age >6 weeks: 20mg **+ Zidovudine suspension PO BID for 12 weeks:** • <2kg: 4mg/kg • 2 – 2.5kg: 10mg • >2.5kg: 15mg • Age >6 weeks: 30mg **PLUS (for all babies)** **Trimethoprim/Sulphamethoxazole 5mg/kg PO OD starting at 6 weeks of age and continuing until the baby is confirmed to be HIV negative**	All babies at risk of mother-to-child transmission of HIV should be tested using HIV RNA PCR testing at 6 weeks of age. Exclusive breastfeeding until the baby is 6 months should be encouraged. Mixed breast and formula feeding increases the risk of transmission of HIV considerably. Refer to the National ART Guidelines if HIV confirmed.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Neonatal Tuberculosis Prophylaxis Risk of transmission is reduced once a pregnant woman has been on treatment for >2 weeks. Congenital and perinatal TB transmission occur rarely, but the associated mortality when transmission does occur is high (~50%). Neonates born to mothers with confirmed TB whose treatment was started <2 weeks prior should be examined carefully to exclude TB disease. Asymptomatic babies should not receive the BCG vaccination until they have completed a 6 month course of Isoniazid preventative therapy (IPT).	**Isoniazid 10mg/kg (range: 7 – 15mg/kg; max 300mg) PO OD for 6 months** **THEN** **BCG vaccination**	If Tuberculosis is confirmed, refer to the Timor-Leste Guidelines for the Management of Tuberculosis in Children
Neonatal Herpes Simplex Virus Prophylaxis/Treatment Asymptomatic babies born to mothers with a first episode of genital herpes around the time of delivery have a high risk (approximately 30%) of neonatal Herpes disease. Those that are infected have a high risk (approximately 30%) of severe, disseminated or CNS disease. Prophylaxis is indicated for these babies.	**Aciclovir 20mg/kg/dose IV 8 hourly for 10 days** *Alternative (poorer choice)*: Aciclovir 20mg/kg/dose PO 5 times a day **At first onset of symptoms in the neonate: Aciclovir 20mg/kg IV 8 hourly for 10 – 21 days**	

(also see Neonatal Sepsis SOP)

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Neonatal Varicella Zoster Virus Prophylaxis/Treatment The highest risk of neonatal chickenpox occurs when babies are born to mothers who have their first episode of chickenpox from 7 days before, to 28 days after delivery. Horizontal transmission can also occur from other household members to a baby born to a mother with no prior history of chickenpox. Neonatal chickenpox is life-threatening, with estimated case fatality rate up to 30%. Features may include fever, vesicular rash, pneumonia, meningoencephalitis or hepatitis.	**Asymptomatic babies born to mothers with recent chickenpox (7 days before to 28 days after delivery): Varicella Zoster Immunoglobulin (if available)** **At first onset of symptoms in the neonate: Aciclovir 20mg/kg/dose IV 8 hourly for 10 days** *Alternative (poorer choice):* Aciclovir 20mg/kg/dose PO 5 times a day	Isolate from other babies and use contact precautions.
Hepatitis B Hepatitis B transmission from mother to child is common in untreated mothers with e-antigen positive chronic Hepatitis B, in the absence of vaccination (up to 90%). Birth dose Hepatitis B vaccination prevents approximately 75% of transmission, whilst the addition of Hepatitis B immunoglobulin may improve protection against transmission by approximately 90%. Mothers with Hepatitis B should be encouraged to breastfeed.	**Hepatitis B vaccine IM preferably within 12 hours of delivery (definitely within 24 hours of delivery)** **THEN** **Refer to the Childhood Immunisation Schedule to perform a full Hepatitis B vaccination regimen** Babies with low birth weight (<2kg) do not respond as well to the vaccine. Consider a booster Hepatitis B vaccine at 12 months on top of the usual regimen If available, Hepatitis B Immunoglobulin (HBIG) 100IU IM can also be given to babies born to mothers with active Hepatitis B infection	If access to the Hepatitis B vaccine is limited in Timor-Leste, babies born to mothers with Hepatitis B should be prioritised for administration of birth dose Hepatitis B vaccine.

(also see Neonatal Sepsis SOP)

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Community acquired pneumonia (Child) Pneumonia is an acute inflammation of the lung parenchyma. Children typically present with cough, difficulty breathing, and fever. Clinical signs include bronchial breath sounds and focal crackles.		In infants <12 months, bronchiolitis is a more common cause of fast breathing and chest indrawing than pneumonia. Staphylococcal infection should be suspected if there are associated skin lesions, pleural effusion/ empyema, or multiple lung abscesses. If no improvement despite broad-spectrum antibiotics, repeat CXR to investigate for complications such as pleural effusion/empyema or abscess.
Mild or Moderate	**Amoxicillin 40mg/kg (max 1g) PO BID for 3 – 5 days**	If cough has been present for more than 3 weeks, or there is associated weight loss or a known TB contact, consider TB in the differential diagnosis.
Severe	**Ampicillin 50mg/kg (max 2g) IV 8 hourly** Step down to Amoxicillin 40mg/kg (max 1g) PO BID when improving for a total of 5 – 7 days antibiotic therapy If no improvement after 3 days, switch to: Ceftriaxone 50mg/kg (max 2g) IV OD If *Staphylococcus aureus* considered likely, add: Cloxacilllin 50mg/kg (max 2g) IV 6 hourly	Severe pneumonia in children is associated with grunting, chest indrawing, oxygen saturations <90% or danger signs including inability to feed, lethargy or convulsions.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Community acquired pneumonia (Adult)		For adults with pneumonia use CORB parameters to assess severity. If 2 or more criteria are present pneumonia is classed as severe. **C** = acute confusion **O** = oxygen saturation ≤90% **R** = respiratory rate ≥30 breaths/minute **B** =blood pressure <90mmHg systolic or <60mmHg diastolic The presence of multi-lobar involvement on CXR also suggests severe pneumonia (see next page). Community acquired pneumonia is commonly caused by *Streptococcus pneumoniae*. If cough present for longer than 3 weeks, investigate for TB.
Mild	**Amoxicillin 1g PO TID for 5 – 7 days.** *Alternative:* Procaine Penicillin 1MU (1g) IM OD for 5 days. If an atypical microorganism is suspected (e.g. *Mycoplasma* in young adults) add: Erythromycin 500mg PO QID for 5 – 7 days OR Doxycycline 100mg PO BID for 5 – 7 days	
Moderate	**Ampicillin 1g IV 8 hourly + Doxycycline 100mg PO BID** *Alternative to Doxycycline*: Erythromycin 500mg PO QID Step down to Amoxicillin 1g PO TID + Doxycycline 100mg PO BID when improving for a total of 7 days antibiotic therapy If no improvement after 3 days, treat as Severe (see next page)	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Community acquired pneumonia (Adult) *continued* **Severe**	**Ceftriaxone 1g IV OD + Azithromycin 500mg PO/IV OD** If *Staphylococcus aureus* considered likely, add: Cloxacilllin 2g IV 6 hourly If no improvement after 48 hours or ICU admission with pneumonia, switch to: Meropenem 1g IV 8 hourly **(specialist or ICU only)** Step down to Amoxicillin 1g PO TID + Doxycycline 100mg PO BID when improving for a total of 7 – 10 days antibiotic therapy Prolonged treatment may be indicated in severe pneumonia, extensive disease or if lung abscess forms (see Lung abscess)	**All severe community pneumonia requires consultant advice.** Staphylococcal infection should be suspected if there are associated skin lesions, pleural effusion/ empyema, or multiple lung abscesses. If no improvement despite broad-spectrum antibiotics, repeat CXR to investigate for complications such as pleural effusion/empyema or abscess.
Hospital acquired pneumonia Pneumonia that develops more than 48 hours after admission to hospital.	**Ceftriaxone 1g (child: 50mg/kg) IV 12 hourly** Step down to Amoxicillin/Clavulanic acid 500/125mg (child: 25mg/kg) PO BID when improving for a total of 7 – 10 days antibiotic therapy If no improvement after 48 hours, switch to: Meropenem 1g (child: 25mg/kg) IV 8 hourly **(specialist or ICU only)**	Most hospital-acquired pneumonia is caused by micro-aspiration of bacteria that colonise the oropharynx. If no improvement despite broad-spectrum antibiotics, consider repeat CXR to look for a complication such as pleural effusion/empyema or abscess.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Ventilator associated pneumonia A pneumonia that develops while the patient is on invasive ventilation. Intubation greatly increases the risk of hospital-acquired pneumonia.	**Meropenem 1g (child: 25mg/kg) IV 8 hourly (ICU only)** If no improvement after 3 days, consider adding: Vancomycin (see page 107) **(ICU only)** Step down to Amoxicillin/Clavulanic acid 500/125mg (child: 25mg/kg) PO BID when improving for a total of 7 – 10 days antibiotic therapy	Vancomycin requires close monitoring of creatinine clearance (refer to Cockroft-Gault calculation). If no improvement despite broad-spectrum antibiotics, consider repeat CXR to investigate for complication such as pleural effusion/empyema or abscess.
Aspiration pneumonia Minor aspirations do not require treatment.	**Ampicillin 1g (child: 50mg/kg) IV 8 hourly** If anaerobic organisms suspected, add: Metronidazole 500mg (child: 10mg/kg) IV/PO 12 hourly If *Staphylococcus* considered likely, add: Cloxacilllin 2g (child: 50mg/kg) IV 6 hourly Step down to Amoxicillin 1g PO TID (child: 40mg/kg PO BID) OR (if covering anaerobes and/or *Staphylococcus*) Amoxicillin/Clavulanic acid 500mg/125mg PO (child: 25mg/kg) BID when improving for a total of 7 days antibiotic therapy	Causative organisms may be oral Streptococci, anaerobes and occasionally Gram-negative bacilli and Staphylococci. Anaerobic cover should only be considered in the setting of severe periodontal disease, putrid sputum or hazardous alcohol consumption. Staphylococcal infection should be suspected if there are associated skin lesions, pleural effusion/empyema, or multiple lung abscesses.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Lung abscess and empyema (Child) Adequate drainage of empyema is essential.	**Cloxacillin 50mg/kg (max 2g) IV 6 hourly for 7 – 14 days + Gentamicin 7.5mg/kg IV OD for 3 days** If no improvement after 3 days, consider changing to: Ceftriaxone 50mg/kg (max 2g) IV 12 hourly + Vancomycin (see page 107) **(specialist only)** **THEN** **Step down to Cloxicillin 25mg/kg (max 1g) PO QID OR Amoxicillin/Clavulanic acid 25mg/kg (max 500/125mg) PO BID when improving to complete 3 – 6 weeks total antibiotic therapy**	Seek surgical opinion and consider drainage of pleural space with a large intercostal tube and underwater seal. If no improvement despite second line therapy, consider alternative diagnoses such as: • Tuberculosis • Nocardiosis • Melioidosis **(seek specialist advice).** Vancomycin requires close monitoring of creatinine clearance (refer to Cockroft-Gault calculation).
Lung abscess and empyema (Adult) Adequate drainage of empyema is essential.	**Ampicillin 1g IV 8 hourly + Cloxacillin 2g IV 6 hourly + Metronidazole 500mg PO/IV 12 hourly for 4 weeks** If no improvement after 3 days, consider adding: Vancomycin (see page 107) **(specialist only)** **THEN** **Step down to Amoxicillin/Clavulanic acid 500/125mg PO BID for 2 weeks, to complete a minimum of 6 weeks total antibiotic therapy** *Alternative step down*: Cloxacillin 500mg PO QID + Metronidazole 500mg PO BID	Consider PICC line if available. Seek surgical opinion and consider drainage of pleural space with a large intercostal tube and underwater seal. If no improvement, consider alternative diagnoses such as: • Tuberculosis • Nocardiosis • Melioidosis **(seek specialist advice).** Vancomycin requires close monitoring of creatinine clearance (refer to Cockroft-Gault calculation).

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Bronchiectasis – acute exacerbation		Antibiotics are only indicated if increased work of breathing or increased sputum production. Patients with bronchiectasis often have chronically purulent sputum with organisms isolated on cultures that may or may not contribute to an exacerbation. *Pseudomonas* is likely to develop resistance to fluoroquinolones (e.g. Ciprofloxacin) if used repeatedly.
Mild or moderate	**Amoxicillin 1g (child: 25mg/kg) PO TID for 14 days** *Alternative*: Chloramphenicol 500mg (child: 10mg/kg) QID PO	
Severe	**Ampicillin 2g (child: 50mg/kg) IV 6 hourly + (adults only) Ciprofloxacin 500mg PO BID** If no improvement after 48 hours switch to: Ceftriaxone 1g (child: 50mg/kg) IV 12 hourly OR Meropenem 1g (child: 25mg/kg) IV 8 hourly **(specialist only)** Step down to Amoxicillin 1g PO TID + Ciprofloxacin 500mg PO BID (for adults) OR Amoxicillin/Clavulanic acid 500/125mg (child: 25mg/kg) PO BID (for children) when improving for a total of 14 days antibiotic therapy	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Acute bacterial otitis media Viral upper respiratory tract infections are often accompanied by mild inflammation of the middle ear. Acute otitis media is very likely if there is an acute onset of symptoms with an erythematous, bulging, immobile tympanic membrane or pus draining from the ear for <2 weeks. Pain alone is not sufficient for a diagnosis of otitis media. Most do not require antibiotics and recover with supportive therapy alone within 48 hours.		
Without perforation	**Avoid routine antibiotic use** If antibiotics are indicated (see notes), use: Amoxicillin 500mg (child: 15mg/kg) PO TID for 5 days If no improvement after 3 days, switch to: Amoxicillin/ Clavulanic acid 500/125mg (child: 25mg/kg) PO BID	Antibiotic therapy is indicated where systemic features such as high fever, vomiting or lethargy are present.
With perforation	**Amoxicillin 1g (child: 15mg/kg) PO TID + Ear toileting (see comments) + Ciprofloxacin 0.3% solution 5 drops into the affected ear(s) BID for 14 days** *Note*: Gentamicin eardrops are contraindicated in the setting of a perforated tympanic membrane due to risk of ototoxicity	Ear toileting involves dry mopping the ear with rolled tissue spears or similar performed QID until the ear is dry. Perform prior to instilling eardrops.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Acute mastoiditis (Child) Infection of the mastoid air cells of the temporal bone.	**Ceftriaxone 50mg/kg (max 2g) IV OD** Step down to Amoxicillin/Clavulanic acid 25mg/kg (max 500/125mg) PO BID when improving for a total of 3 – 4 weeks antibiotic therapy	May complicate acute otitis media or chronic middle ear inflammatory disease. Symptoms include conductive hearing loss and tenderness, swelling, and pain behind the ear. May require a CT to detect if bone is involved if clinically uncertain.
Acute mastoiditis (Adult) Infection of the mastoid air cells of the temporal bone.	**Ceftriaxone 2g IV OD + Cloxacillin 2g IV 6 hourly for 4 weeks** If not improving, consider changing to: Meropenem 1g PO TID **(specialist only)** **THEN** **Step down to Amoxicillin/Clavulanic acid 500/125mg PO BID for 2 weeks for a total of 6 weeks antibiotic therapy**	May complicate acute otitis media or chronic middle ear inflammatory disease. Symptoms include conductive hearing loss and tenderness, swelling, and pain behind the ear. May require a CT to detect if bone is involved if clinically uncertain.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Acute diffuse Otitis Externa Often caused by skin breakdown in the external auditory canal following excessive water exposure. *Pseudomonas aeruginosa* and *Staphylococcus aureus* are common organisms.	**Betamethasone 0.1%/Polymyxin 5000U/ Bacitracin 400U solution 3 drops to affected ear(s) TID + Ear toileting (see comments)** *Alternative*: Betamethasone 0.1%/ Ciprofloxacin 0.3% solution 3 drops to affected ear|(s) TID + Ear toileting (see comments) In severe cases an ear wick that has been soaked in the above eardrop preparation may be inserted	The ear canal must be kept as dry as possible during treatment and for 2 weeks afterwards. Ear toileting involves dry mopping the ear with rolled tissue spears or similar performed QID until the ear is dry. Perform prior to instilling eardrops.
Bronchiolitis Acute bronchiolitis is a lower respiratory viral infection in children <24 months, which typically occurs in annual epidemics and is characterised by airways obstruction and chest wheeze. Respiratory Syncytial Virus (RSV) is the most common cause, and secondary bacterial infection is uncommon (<2%).	**Avoid routine antibiotic use** If antibiotics are indicated (see notes), give: Ampicillin 50mg/kg IM/IV 6 hourly for 3 days	Antibiotics are not indicated routinely, but should be reserved for severe disease, infants < 2 months, or when secondary bacterial infection is suspected based on CXR changes. If evidence of sepsis, aspiration, or acute consolidation on CXR, treat as for Community-Acquired Pneumonia (child).

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Bronchitis Characterised by inflammation and bronchospasm of the airways with coughing, wheeze and shortness of breath.	**Avoid routine antibiotic use**	Most patients have a viral infection or history of exposure to cigarette smoke or other toxic inhaled substances. If consolidation on CXR, purulent sputum and/or increased work of breathing, treat as for community-acquired pneumonia.
Acute sinusitis Often follows viral upper respiratory tract infections. Common causes of bacterial rhinosinusitis are *Streptococcus pneumoniae* and *Haemophilus influenzae*. Most do not require antibiotics and recover with supportive care alone within 10 days.	**Avoid routine antibiotic use** If antibiotics are indicated (see notes), use: Amoxicillin 500mg (child: 15mg/kg) PO TID for 7 days If severe or worsening symptoms after initial improvement, switch to: Ceftriaxone 2g (child: 50mg/kg) IV OD (12 hourly if intracranial spread suspected) and **seek specialist opinion**	Consider antibiotics if high fever for more than 3 days or severe symptoms for more than 5 days including purulent nasal discharge, sinus tenderness or maxillary toothache. Patients with severe features or worsening symptoms after initial improvement may require ENT review and consideration of nasal endoscopy or surgical intervention.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Tonsillitis / Pharyngitis Although often caused by a viral infection, there should be a low threshold for treating as possible bacterial infection in Timor-Leste due to the high incidence of complications of streptococcal infection such as Rheumatic Heart Disease. *Streptococcus pyogenes* may be particularly suspected in the presence of fever >38 degrees, tender cervical lymphadenopathy, tonsillar swelling or exudates, and absence of cough.	**If *Streptococcus pyogenes* suspected: Benzathine Penicillin 1.2MU (900mg)(child <20kg: 0.6MU (450mg)) IM for 1 dose** *Alternative*: Phenoxymethylpenicillin (Penicillin V) 500mg (child: 15mg/kg) PO BID for 10 days *Alternative (poorer choice)*: Amoxicillin 500mg (child: 15mg/kg) TID PO for 10 days	It is important to complete the antibiotic course even after recovery to prevent Rheumatic Fever.
Dental abscess A collection of pus around the affected tooth that may spread to the surrounding tissue, causing pain, fever and/or swelling.	**Phenoxymethylpenicillin (Penicillin V) 500mg (child: 15mg/kg) PO QID + Metronidazole 500mg (child: 10mg/kg) PO BID for 5 days** *Alternative*: Amoxicillin/Clavulanic acid 500/125mg (child: 25mg/kg) PO BID	Refer to a dental surgeon as soon as possible as this is the mainstay of management.
Peritonsillar abscess (Quinsy) Presents with trismus, severe unilateral throat pain, high fever, change in voice.	**Adequate drainage is essential, usually requiring aspiration in hospital** **After drainage, use: Ampicillin 2g (child: 50mg/kg) IV 6 hourly for 24 hours** Step down to Amoxicillin 1g (child: 25mg/kg) PO TID for a total of 3 days antibiotic therapy	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Diphtheria Caused by toxin-producing *Corynebacterium diphtheriae* which can present as a respiratory or cutaneous disease with possible cardiac, neurological or renal complications. The respiratory presentation can be rapidly fatal due the risk of obstruction by a pseudomembrane in the upper airway. In the absence of microbiological evidence, there should be a strong clinical suspicion of Diphtheria warranting treatment when a bluish-white or grey membrane forms in the throat or on the tonsils on the background of sore throat, low-grade fever and cervical lymphadenopathy. The membrane typically bleeds on scraping.	**Benzylpenicillin 1.2g (child: 30mg/kg) IV 6 hourly** Duration depends on clinical progress – **seek specialist advice**	Diphtheria antitoxin is not currently available in Timor-Leste. An ECG can be useful to monitor toxin-induced myocarditis and its complications such as severe arrhythmias.

Development of sepsis begins with infection (tissue invasion), which can then progress to bacteraemia (blood stream involvement) and lead on to severe sepsis (infection with single organ dysfunction). Patients with severe sepsis may develop septic shock (with hypotension not responsive to fluids), and/or multi-organ dysfunction syndrome (MODS) with dysfunction of 2 or more organs. Symptoms and signs of sepsis may or may not include signs specific to a source such as cough or dysuria.

Sepsis should be considered in a child with fever who is severely ill and is likely to have infection. It is usually associated with tachycardia, tachypnoea, raised white cell count and organ dysfunction. Hypotension is a late sign of septic shock in children. Warning signs in adults include arterial hypotension (<90mmHg systolic), fever >38°C, tachycardia, tachypnoea and altered mental status. Importantly many of these signs indicate decreased organ perfusion and can be improved with careful and early fluid resuscitation, appropriate antibiotic treatment, and repeated re-assessment (at least half-hourly). Rapid treatment of sepsis saves lives.

Common causative organisms include: *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Streptococcus pyogenes*, *Haemophilus influenzae*, and *Neisseria meningitidis*. Enteric Gram-negative organisms such as *Escherichia coli*, *Klebsiella pneumoniae* and *Salmonella spp* are more common in children with underlying malnutrition.

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Severe sepsis without focus		Continue repeated assessment and investigation for site of infection. Refer to relevant section once a focus is found and direct antibiotics accordingly. *S.aureus* infection should be suspected if skin or soft tissue involvement, or if any abscesses or empyema present. If using Gentamicin and Vancomycin for severe sepsis, daily monitoring of creatinine clearance is particularly necessary (refer to Cockcroft-Gault calculation). Typhoid (enteric fever) may present as fever with few focal features. If Typhoid is suspected, see Typhoid section for stepdown antibiotic therapy.
Immunocompetent	**Ceftriaxone 2g (child: 50mg/kg) IV OD + Gentamicin 6mg/kg (child: 7.5mg/kg) IV OD** If *Staphylococcus aureus* infection suspected, add: Cloxacillin 2g (child: 50mg/kg) IV 6 hourly If not improving after 48 hours, switch to: Meropenem 1g IV 8 hourly + Vancomycin (see page 107) **(specialist or ICU only)**	
Immunosuppressed (such as splenectomy, high dose steroids, neutropaenia or chemotherapy.	**Often requires more aggressive management**	More likely to present without a clear focus.

SKIN AND SOFT TISSUE INFECTIONS

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Impetigo Superficial bacterial skin infection most often caused by *Streptococcus pyogenes* or *Staphylococcus aureus*. Lesions may sometimes be bullous or have a "honey crust".	**All Impetigo should be treated with soap and water and antiseptic solution topically TID to soften crusts**	
Moderate or Severe	**Cloxacillin 500mg (child: 15mg/kg) PO QID for 5 days** *Alternative*: Trimethoprim/ Sulphamethoxazole 160/800mg (child: 4mg/kg) PO BID for 3 days *Alternative*: Benzathine Penicillin 1.2MU (900mg) (child <20kg: 0.6MU (450mg)) IM for 1 dose	
Folliculitis, Boils and Carbuncles Folliculitis is the infection of a hair follicle with purulent inflammatory exudate. A boil is a simple subcutaneous abscess. Carbuncles are deeper and wider lesions with interconnecting tracts from neighbouring hair follicles.	**For boils and carbuncles, incision and drainage is an important part of management** *Note*: In young infants this may not be required. After adequate incision and drainage, if persistent cellulitis, give: Cloxacillin 500mg (child: 15mg/kg) PO QID for 5 – 7 days	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Cellulitis Presents as diffuse, spreading areas of skin erythema associated with warmth, pain and swelling. Fever and systemic toxicity may be present.		If signs of systemic infection present, blood cultures should be taken before starting antibiotics. Skin infections arise from damage to the cutaneous tissue. Predisposing factors such as tinea infection of the feet, lymphoedema and fissured dermatitis if present should be treated to prevent recurrence. Rest and elevation of the affected area improves clinical response. Water exposure increases the risk of certain organisms such as *Aeromonas* (fresh/brackish water) or *Vibrio* (salt water).
Mild	**Cloxacillin 500mg (child: 15mg/kg) PO QID for 5 – 7 days**	
Moderate or Severe	**Cloxacillin 2g (child: 50mg/kg) IV 6 hourly** Step down to Cloxacillin 500mg (child: 15mg/kg) PO QID when systemic features improve for a total of 7 – 10 days antibiotic therapy If fresh/brackish water exposure, add: Ciprofloxacin 500mg (child: 10mg/kg) PO BID If salt water exposure, add: Doxycycline 100mg (child: 2mg/kg) PO BID	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Bites/Traumatic wounds	**Thorough debridement and cleaning is essential. If mild infection present or high risk of infection after initial injury, oral antibiotic therapy MAY be useful**	High risk features include: • Delayed presentation >8hrs • Wounds unable to be debrided adequately • Involvement of underlying structures [e.g. tendons] • Wounds on the hand feet or face. Ensure Tetanus vaccine updated if the patient has not been immunised in the past 5 years.
Mild	**Amoxicillin/Clavulanic acid 500/125mg (child: 25mg/kg) PO BID for 5 days**	
Moderate or Severe	**Cloxacillin 2g (child: 50mg/kg) IV 6 hourly + Ceftriaxone 1g (child: 25mg/kg) IV OD + Metronidazole 500mg (child: 10mg/kg) PO/IV 12 hourly** Step down to oral antibiotics (see Mild) when improving to complete a total of 14 days antibiotic therapy	
Surgical wound infections	**Cloxacillin 2g (child: 50mg/kg) IV 6 hourly for 5 – 7 days** If Gram-negative organisms are suspected (e.g. post GI surgery or genital surgery), add: Gentamicin 4 – 5mg/kg (child: 7.5mg/kg) IV OD If still requiring IV antibiotics after 48 hours, switch Gentamicin to Ceftriaxone 1g (child: 25mg/kg) IV OD	Gentamicin requires close monitoring of creatinine clearance (refer to Cockcroft-Gault calculation).

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Diabetic Foot infection Diabetic foot infections may involve the skin and soft tissue or go deeper to underlying muscle and bone. These infections are often mixed involving aerobes and anaerobes, Gram-positive and Gram-negative organisms.	**Always obtain surgical opinion for the possibility of debridement**	Proper wound care and dressings are as important as antibiotics. Renal impairment is common in diabetic patients. Dosage must always be adjusted according to renal function.
Mild	**Amoxicillin/Clavulanic acid 500/125mg PO BID for 5 – 7 days** *Alternative*: Cloxacillin 500mg PO QID + Metronidazole 500mg PO BID	
Moderate or severe	**Surgical opinion regarding debridement should be sought** **Cloxacillin 2g IV 6 hourly + Metronidazole 500mg PO/IV 12 hourly + Ciprofloxacin 500mg PO BID** Consider Meropenem 1g IV 8 hourly if severely septic or unwell **(specialist only)** Step down to oral antibiotics (see Mild) when improving unless underlying bone involved (See Osteomyelitis for duration) If complete debridement of infected tissue occurs, continue antibiotics for a further 2 – 5 days then cease	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Necrotising Fasciitis Clinical features that suggest a necrotising infection of the skin and deeper tissues include: severe constant pain, bullae, skin necrosis or discolouration, wooden hard subcutaneous tissue, rapid spread and systemic toxicity plus fever, delirium, renal failure and a high white cell count.	**Surgical debridement is the mainstay of treatment** **Cloxacillin 2g (child: 50mg/kg) IV 6 hourly + Gentamicin 4 – 5mg/kg (child: 7.5mg/kg) IV OD + Clindamycin 600mg (child: 15mg/kg) PO TID for a minimum of 5 days antibiotic therapy but guided by response and ongoing need for surgery (Clindamycin is specialist only)**	Gentamicin requires close monitoring of creatinine clearance (refer to Cockcroft-Gault calculation).
Burns		Antibiotic prophylaxis is not indicated for patients with burns that do not require immediate debridement surgery.
Minor	**Sterilised gauze dressing impregnated with white soft paraffin**	
Moderate or Severe with signs of infection	**Silver Sulfadiazine 1% cream (this cream does not penetrate eschar) + Systemic antibiotics if signs of surrounding cellulitis (see Cellulitis)**	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Mastitis Acute mastitis is usually associated with lactation and is frequently due to *Staphylococcus aureus*.		Milk stasis is to be avoided – manual drainage of breast milk is essential. If symptoms aren't improving consider the presence of abscess requiring drainage.
Mild or Moderate	**Cloxacillin 500mg (child: 15mg/kg) PO QID for 5 days**	
Severe (with systemic symptoms)	**Cloxacillin 2g (child: 50mg/kg) IV 6 hourly** Step down to Cloxacillin 500mg (child: 15mg/kg) PO QID when improving for a total of at least 5 days antibiotic therapy	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Scrub typhus and other rickettsial infections Suspect in patients with headache, fevers, elevated transaminases, thrombocytopaenia and leukocytosis. Examine for eschar, painful lymphadenopathy and rash.	**Doxycycline 100mg PO BID for 7 days** *Alternative*: Chloramphenicol 500mg PO QID	
Malaria Caused by *Plasmodium* parasites and spread by the female Anopheles mosquito. Usually presents as a febrile illness, and can range from a mild illness to severe disease with cerebral involvement or multiorgan failure.		Refer to the Timor-Leste Malaria guidelines for further advice.
Mild or Moderate	**Artemether/Lumifantrine (Coartem) 20/120mg PO** 5 – 14kg: 1 tablet per dose 15 – 24kg: 2 tablets per dose 25 – 34kg: 3 tablets per dose >34kg: 4 tablets per dose Give at 0, 8, 24, 36, 48 and 60 hours for a total of 6 doses	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Malaria *continued*		Refer to the Timor-Leste Malaria guidelines for further advice.
Severe Treat as severe malaria if any of the following features: • Altered consciousness • Vomiting • Renal failure or oliguria • Respiratory distress • Severe anaemia • Hypoglycaemia – High parasite count >2% red blood cells • Acidosis	**Artesunate 2.4mg/kg IV/IM 12 hourly for 3 doses then 24 hourly for 2 more doses** *Alternative*: Quinine 20mg/kg in 10ml/kg of IV fluid infused over 4hrs. Then 8 hours after initial dose give Quinine 10mg/kg in IV fluid over 2hrs and repeat 8 hourly for a total of 7 days antibiotic therapy	

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Tetanus *Clostridium tetani* inoculation of a dirty wound causes disease by toxin production. After infection of a wound the incubation period of Tetanus is usually around 1 week, but ranges from 1 day to 2 months. Many patients may not remember the wound, so this should not put clinicians off the diagnosis. Generalised tetanospasm is the most common presentation, but usually begins with trismus and progresses to involve the rest of the muscles of the body. Disease may take weeks to resolve.	**Clean and debride all contaminated wounds early and thoroughly** **Nurse patients in a calm, dim, quiet environment (movement, wind, bright lights or emotional distress can all trigger spasms)** **To halt further production of toxin, use:** Antibiotics to kill *C. tetani* such as Metronidazole or (less effectively) Penicillin **To neutralise toxin already in circulation:** Human antitoxin 500 – 3000U IM if available **To reduce muscle spasm and distress:** Diazepam 5 – 20 mg PO/IV TID (doses up to 20mg 2 hourly may be required) (neonates: 2 mg IV TID). At high doses (80 mg/24h) monitor for respiratory suppression **To reduce autonomic dysfunction and muscle spasm:** Magnesium sulphate 5g (child: 75mg/kg) IV for 1 loading dose, then 2 – 3g/hr IV infusion until spasm controlled. Monitor patellar reflexes and if areflexia occurs decrease dose	ALL patients will need vaccination against Tetanus (adsorbed inactivated toxoid). Tetanus infection does NOT confer immunity. Most antibiotics will kill *C.tetani* to some degree. The anxiolytic activity of Diazepam is useful in this very distressing disease, but its antispasmodic activity is even more important. Only use Magnesium sulphate IV and Diazepam IV in a controlled hospital environment with access to respiratory support if required.
Varicella infection (chickenpox) Caused by primary infection with the Varicella Zoster virus. Most commonly contracted in childhood, but can occur in adulthood when it is more likely to cause severe disease. Usually presents with a pruritic, vesicular rash which later crusts.	*Pregnant women:* Aciclovir is recommended if commenced within 72 hours of the onset of rash *Severe or complicated disease (e.g. pneumonitis, encephalitis or hepatitis) or if immunocompromised:* Aciclovir for ≥10 days irrespective of the duration of the rash **Aciclovir 800 mg (child: 20 mg/kg) PO 5 times a day for 7 – 14 days**	Patient should stay away from anyone immunocompromised or pregnant women while infectious.


VENUS

SURGICAL GASTROINTESTINAL INFECTIONS

INFECTION	ANTIBIOTIC CHOICE	COMMENTS
Cholecystitis **Cholangitis** **Diverticulitis** **Ruptured appendicitis** **Peritonitis and Intraperitoneal abscess**	**Ampicillin 1g (child: 50mg/kg) IV 6 hourly + Metronidazole 500mg (child: 10mg/kg) IV 12 hourly + Gentamicin 4 – 5mg/kg (child: 7.5mg/kg) IV OD** *Alternative*: Chloramphenicol 1g (child: 25mg/kg) IV 6 hourly If no improvement after 48 hours, change Gentamicin to Ceftriaxone 2g (child: 50mg/kg) IV OD **Step down to Amoxicillin/Clavulanic acid 500/125mg (child: 25mg/kg) PO BID when improving for a total of 7 – 14 days antibiotic therapy**	If not clinically improving, seek specialist advice. Obtain surgical opinion if drainage of intraperitoneal abscess or other surgery such as cholecystectomy is required. Use Gentamicin for no longer than 72 hours (see Gentamicin dosing). Requires close monitoring of creatinine clearance (see Cockcroft-Gault calculation).

CHILDHOOD IMMUNISATION SCHEDULE

VACCINE	AGE OF ADMINISTRATION	COMMENT
BCG, HepB, OPV0	At birth or as soon as possible after birth	OPV 0 should be given only within 2 weeks of birth
OPV1, DTP-HepB-Hib 1	6 weeks	BCG may be given until 12 months
OPV2, DTP-HepB-Hib 2	10 weeks (or 4 weeks after OPV1, DPT1-HepB-Hib 1)	
OPV3, DTP-HepB-Hib 3, IPV3	14 weeks (or 4 weeks after OPV2, DPT2-HepB-Hib 2)	
MR	9 months	
OPV4, DTP-HepB-Hib 4, MR	18 months	
DT	6 years or school entry	

Antibiotic use during breastfeeding

There are 2 important issues to consider when prescribing drugs such as antibiotics during breastfeeding; firstly the likely exposure of the drug to the infant (who is an innocent bystander) and secondly the likely effect the drug may have on milk supply. A risk benefit analysis is warranted. Simple advice can be given such as to feed the infant just before the next dose or alternatively to take the medication just after breastfeeding thus avoiding likely peak milk concentrations.

Antibiotic use during pregnancy

The nature of adverse effects of drug use during pregnancy depends upon the time of exposure. Teratogenicity is a major risk with drug exposure during the 1st trimester, while in the 2nd and 3rd trimesters foetal growth and functional development may be affected.

Category A
Drugs which have been taken by a large number of pregnant women and women of childbearing age without any proven increase in the frequency of malformations or other direct or indirect harmful effects on the foetus having being observed.

Category B1
Drugs which have been only taken by a limited number of pregnant women and women of child bearing age, without an increase in the frequency of malformation or other direct or indirect harmful effects on human foetus having been observed. Studies in animals have not shown evidence of an increased occurrence of foetal damage.

Category B2
Drugs which have been taken by only a limited number of pregnant women and women of childbearing age, without an increase in the frequency of malformation or other direct or indirect harmful effects on the human foetus having been observed. Studies in animals are inadequate or may be lacking, but available data show no evidence of an increased occurrence of foetal damage.

Category B3
Drugs which have been taken by only a limited number of pregnant women and women of childbearing age, without an increase in the frequency of malformation or other direct or indirect harmful effects on the human foetus having been observed. 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 which, owing to their pharmacological effects, have caused or may be suspected of causing harmful effects on the human foetus or neonate without causing malformations. These effects maybe reversible. Accompanying texts should be consulted for further details.

Category D
Drugs which have caused, 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. Accompanying texts should be consulted for further details.

Category X
Drugs which have such a high risk of causing permanent damage to the foetus that they should not be used in pregnancy or when there is a possibility of pregnancy.

DRUG	BREASTFEEDING	PREGNANCY
Aciclovir	Safe to use	B3
Amoxicillin	Safe to use, may cause loose bowel action in infant	A
Amoxicillin/Clavulanic acid	Safe to use, may cause loose bowel action in infant	B1
Amphotericin	Safe to use	B3
Ampicillin	Safe to use, may cause loose bowel action in infant	A
Benzathine Penicillin	Safe to use, may cause loose bowel action in infant	A
Benzylpenicillin	Safe to use, may cause loose bowel action in infant	A
Cefaclor	Safe to use, may cause loose bowel action in infant	B1
Ceftriaxone	Safe to use, may cause loose bowel action in infant	B1
Cephalothin	Safe to use, may cause loose bowel action in infant	A
Chloramphenicol	Safe to use, may cause loose bowel action in infant	A, ensure not circulating at time of delivery
Chloroquine (prophylaxis)	Safe to use	A
Chloroquine (treatment)	Contact specialist, risk benefit ratio in favour of use	D

DRUG	BREASTFEEDING	PREGNANCY
Dapsone	Neonates with G6PD deficiency are susceptible to dapsone haemolysis. Contact specialist	B2
Doxycycline	Theoretical risk, no case reported. Short courses of 7 – 10 days	D, safe to use during the 1st 18 weeks of pregnancy
Erythromycin	Safe to use, may cause loose bowel action in infant	A
Ethambutol	Safe to use	A
Fluconazole	Compatible	D
Flucloxacillin	Safe to use, may cause loose bowel action in infant	B1
Gentamicin	Safe to use	D, reserve for severe or life-threatening infections; foetal nephrotoxicity and ototoxicity have been reported
Isoniazid	Safe to use	A
Ketoconazole	May be used, very small amounts excreted in breast milk	B3
Lamivudine	Discourage breastfeeding, risk of postnatal transmission	B3

DRUG	BREASTFEEDING	PREGNANCY
Mebendazole	May be used, poorly absorbed by mother	B3
Metronidazole	Safe to use, may cause bitterness in milk. Dose preferably twice daily after breastfeeding	B2
Nitrofurantoin	Use with caution, may cause haemolysis in G6PD deficiency	A
Nystatin	Safe to use	A
Phenoxymethylpenicillin	Safe to use, may cause loose bowel action in infant	A
Piperacillin	Safe to use, may cause loose bowel action in infant	B1
Primaquine	Compatible	D, avoid use in 3rd trimester; may cause neonatal haemolysis and methaemoglobinaemia
Procaine penicillin	Safe to use, may cause loose bowel action in infant	A
Pyrantel	Safe to use	B2, avoid use in 1st trimester
Pyrazinamide	Caution, insufficient data	B2
Quinine	Compatible	D, but has previously been used in treatment of malaria

DRUG	BREASTFEEDING	PREGNANCY
Rifampicin	May be used, monitor infant for jaundice	C
Tetracycline	Theoretical risk, no case reported. Short courses of 7 – 10 days	D, safe to use during the 1st 18 weeks of pregnancy
Trimethoprim	Safe to use	B3
Trimethoprim/ Sulphamethoxazole	Compatible in infants >1 month, may cause diarrhoea. Avoid use in ill, stressed, preterm infants or infants with hyperbilirubinaemia or G6PD deficiency	C, Avoid use late in pregnancy
Vancomycin	Safe to use, may cause diarrhoea in the infant	B2
Zidovudine	Caution – insufficient data	B3

GENTAMICIN DOSING

These Guidelines recommend once daily dosing for all indications except endocarditis and some neonatal infections. The required dose depends on the volume of distribution and renal clearance, which are related to lean bodyweight. The first dose is given **irrespective** of renal function.

For initial dosing, refer to the relevant section in these guidelines. The same dose should then be given at intervals determined by the patient's renal function (see Cockcroft-Gault calculation below). Note that all regimens below will provide Gram-negative cover for 72 hours. If empirical Gram-negative cover is required beyond 72 hours switch to an alternative, less toxic antibiotic.

It is essential to obtain creatinine results **within 24 hours of starting Gentamicin**. If this is not possible, treat patients as for normal renal function and give **2 further doses at 24 hours and 48 hours**. If the patient has a history of chronic renal impairment or a strong suspicion of chronic renal impairment (such as type 2 diabetes mellitus with complications of diabetes), treat as for moderate renal impairment and give **1 further dose at 48 hours only**.

Gentamicin dosing intervals in renal impairment

ESTIMATED CREATININE CLEARANCE	DOSING INTERVAL	MAXIMUM NUMBER OF DOSES
> 60 mL/minute	24 hourly	3 (at 0, 24 and 48 hours)
40 – 60 mL/minute	36 hourly	2 (at 0 and 36 hours)
30 – 40 mL/minute	48 hourly	2 (at 0 and 36 hours)
< 30 mL/minute	No further doses	1 (at 0 hours)

VANCOMYCIN DOSING

12 hourly Vancomycin dosing is recommended for all patients with normal renal function. Ideally trough concentrations should be monitored (target trough concentration 12 to 18mg/L) but this is not currently available in Timor-Leste. Monitor creatinine clearance if possible, and consider ceasing Vancomycin if worsening. If renal impairment known or suspected, consider alternative agent or seek specialist advice.

To reduce the risk of 'red-man' syndrome, doses should be infused at a rate not exceeding 10mg/minute and the total infusion time should not be less than 60 minutes. If red-man syndrome occurs, the infusion time should be extended.

Cockcroft-Gault calculation of creatinine clearance

Adult males:

$$\frac{(140 - \text{age}) \times \text{Ideal weight (kg)}}{0.814 \times \text{serum creatinine (micromol/L)}}$$

Adult females:

Multiply the above equation by 0.85

Vancomycin dosing for adults and children ≥12 years if serum creatinine not available

WEIGHT	DOSE
> 60kg	1.5g 12 hourly
< 60kg	1g 12 hourly

Vancomycin dosing for adults and children ≥12 years if serum creatinine available

CREATININE CLEARANCE	DOSE
> 90 mL/minute	1.5g 12 hourly
60 – 90 mL/minute	1g 12 hourly
20 – 59 mL/minute	1g 24 hourly
< 20 mL/minute	1g 48 hourly

Vancomycin dosing for children <12 years

AGE	INITIAL DOSE
Neonates < 36 weeks post conception	15mg/kg 12 hourly
Term neonates week 1 of life	15mg/kg 12 hourly
Term neonates weeks 2 – 4 of life	15mg/kg 8 hourly
Infants >1 month and children <12 years	15mg/kg (max: 750mg) 6 hourly
For children <12 years with impaired renal function, seek specialist advice	

β-LACTAM ANTIBIOTIC ALLERGY

Clinical history is the single most important aspect of determining penicillin and other β-lactam allergy and should be elicited with each patient prior to use of this class of drug.

HISTORY	RISK OF REACTION	RECOMMENDATION	COMMENTS
Penicillin allergy	**To another penicillin: 10 – 15%**	Avoid	
	To a cephalosporin: 1 – 2%	If mild (e.g. rash, vomiting) then it is safe to give a cephalosporin If IgE-mediated (urticaria, angioedema, hypotension, bronchospasm, anaphylaxis, associated with eosinophilia), or severe (Stevens-Johnson syndrome (SJS) or Toxic Epidermal Necrolysis (TEN) then do not give a cephalosporin	Do not give Cefaclor or Cephalexin to patients with any kind of Ampicillin reaction. If the penicillin allergy is IgE-mediated and it is thought to be essential to use a cephalosporin, give by graded challenge.
	To a carbapenem: <1%	As above for cephalosporin	As above for cephalosporin

HISTORY	RISK OF REACTION	RECOMMENDATION	COMMENTS
Cephalosporin allergy	**To another cephalosporin: 40 – 90%**	Avoid	
	To a penicillin: 20 – 25%	Avoid	
	To a carbapenem: 1%	As above for penicillin allergy	

RENAL ADJUSTMENT OF COMMON ANTIMICROBIALS IN ADULT

ANTIBIOTIC	EGFR > 90 (Normal)	50 – 90	10 – 50	<10	HAEMODIALYSIS
Amoxicillin	500mg – 1g PO TID	TID	BID-TID		As for eGFR <10
Amoxicillin/ Clavulanic acid	500/125mg PO BID	BID	BID		As for eGFR <10
Ampicillin	1 – 2g IV 6 hourly	6 hourly	6 – 12 hourly		As for eGFR <10
Azithromycin	500mg PO OD	No dose adjustment required in renal impairment			
Cefazolin	1 – 2g IV 8 hourly	8 hourly	12 hourly		1–2g dosed after dialysis
Ceftriaxone	1 – 2g IV daily (or IM with 1% lignocaine)	No dose adjustment required in renal impairment			
Chloramphenicol	500mg – 1g IV/PO 6 hourly	No dose adjustment required in renal impairment			
Ciprofloxacin	500 – 750mg PO BID	100% dose BID	50 – 100% dose BID	50% dose BID	As for eGFR < 10

ANTIBIOTIC	EGFR > 90 (Normal)	50 – 90	10 – 50	<10	HAEMODIALYSIS
Clindamycin	300mg – 450mg PO TID	No dose adjustment required in renal impairment			
Doxycycline	100mg PO BID	No dose adjustment required in renal impairment			
Erythromycin	250 – 500mg PO QID	100% dose QID	100% dose QID	50 – 75% dose QID	As for eGFR < 10
Flucloxacillin	500mg – 1g PO QID; 1g – 2g IV 4 – 6 hourly	6 hourly	6 hourly	8 – 12 hourly (max 4g/day)	As for eGFR < 10
Gentamicin	Refer to Gentamicin dosing section				
Meropenem	1g IV 8 hourly	8 hourly	eGFR 10 – 25: 500mg; eGFR 25 – 50: 1g 8 – 12 hourly	500mg 24 hourly	As for eGFR < 10

ANTIBIOTIC	EGFR > 90 (Normal)	50 – 90	10 – 50	<10	HAEMODIALYSIS
Metronidazole	500mg IV 8 hourly or 500mg PO BID-TID	No dose adjustment required in renal impairment			
Penicillin G (Benzylpenicillin)	600mg – 1.8g IV 4 – 6 hourly	100% dose	75% dose	25 – 50% dose	As for eGFR < 10
Trimethoprim/ Sulphamethoxazole	160/800mg PO	100% dose	eGFR 25 – 50: 100% dose; eGFR <25: 100% dose for 3 days then 50% dose	Avoid use	Avoid use
Vancomycin	Refer to Vancomycin dosing section				

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USE ANTIBIOTICS RATIONALLY
Use antibiotics prescribed by
a certified health professional only.
Always take the complete dose,
even if you feel better.
UZA
ANTIBIÓTIKA
HO DIDIAK
Ministério da Saúde
EUROPEAN UNION
World Health Organization
COUNTRY OFFICE FOR Timor-Leste