Contents

1 Obstetrics and Gynaecology – medication in common conditions
  1.1 Anaemia
  1.2 Premature labour
  1.3 Seizures in eclampsia
  1.4 Prevention and treatment of post-partum bleeding

2 Antibiotics in pregnancy, labour and delivery
  2.1 Urinary tract infection
    2.1.1 Lower urinary tract
    2.1.2 Pyelonephritis
  2.2 Premature rupture of the membranes
  2.3 Elective Caesarian section
  2.4 Breast abscess

3 Antibiotics in gynaecology – preventive/therapeutic
  3.1 Pelvic inflammatory disease
  3.2 Sexual assault
  3.3 Elective gynaecological surgery

4 Sexually transmitted diseases
  4.1 Gonorrhoea
    4.1.1 Disseminated gonococcal infection
    4.1.2 Gonococcal ophthalmia in older children or adults
    4.1.3 Infection in children following child abuse
  4.2 Chlamydia
  4.3 Syphilis
    4.3.1 HIV co-infection
    4.3.2 Neurosyphilis
    4.3.3 Syphilis in pregnancy
    4.3.4 Infants born to VDRL positive mothers
  4.4 Genital herpes
  4.5 Trichomoniasis
  4.6 HIV/AIDS

5 Genito-urinary diseases in males and non-pregnant females
  5.1 Lower urinary tract
  5.2 Upper urinary tract
  5.3 Bacterial prostatitis
  5.4 Epididymo-orchitis
    5.4.1 Sexual transmission
    5.4.2 Non sexual transmission
    5.4.3 Severe infection

6 Septicaemia
  6.1 Empirical treatment
  6.2 Urinary source
  6.3 Biliary or gastro-intestinal tract
  6.4 Female genital tract
  6.5 Ischaemic ulcers/decubitus ulcers
  6.6 Intra-venous cannulae

7 Paediatrics
  7.1 Respiratory infection
    7.1.1 Acute sore throat
    7.1.2 Acute bacterial otitis media
7.1.3 Croup
7.1.4 Acute epiglottis

7.2 Lower respiratory tract infection
7.2.1 Acute bronchitis
7.2.2 Pneumonia

7.3 Cardiovascular system infection
7.3.1 Bacterial endocarditis

7.4 Gastro-intestinal infection
7.4.1 Acute gastro-enteritis
7.4.2 Bloody diarrhoea
7.4.3 Cholera
7.4.4 Amoebiasis/amoebic dysentery
7.4.5 Giardiasis
7.4.6 Acute bacterial meningitis

7.5 Urinary tract infections

8 Prophylaxis in non-surgical/surgical practice
8.1 Non-surgical
8.1.1 Hepatitis B
8.1.2 HIV
8.1.3 Meningitis
8.1.4 Recurrence of rheumatic fever
8.1.5 Prevention of bacterial endocarditis

8.2 Surgical
8.2.1 Orthopaedics
8.2.2 Genito-urinary
8.2.3 Gastro-intestinal, biliary and colonic
8.2.4 Neurological/oropharyngeal
8.2.5 Lower limb amputation

9 Common dental conditions
9.1 Dental Abscess
9.1.1 Without cellulitis
9.1.2 With cellulitis and facial swelling

9.2 Pericoronitis
9.3 Oral ulcers
9.4 Oral candidiasis
9.5 Facial fractures
Introductory

Much of this booklet is concerned with antibiotics. These medications are used poorly in every country in the world and we are paying the price with increasing bacterial resistance, a rising burden of adverse effects and poor resource utilisation from the cost of unnecessary medicines.

In the introduction to the Australian Antibiotic Guidelines (version 13, for 2006), there is a set of statements called the “Antibiotic Creed”. It applies equally to Kiribati.

<table>
<thead>
<tr>
<th>“The antibiotic creed”</th>
</tr>
</thead>
<tbody>
<tr>
<td>M  microbiology guides therapy wherever possible</td>
</tr>
<tr>
<td>I  indications should be evidence-based</td>
</tr>
<tr>
<td>N  narrowest spectrum required</td>
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<tr>
<td>D  dosage appropriate to the site and type of infection</td>
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<tr>
<td>M  minimise duration of treatment</td>
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<tr>
<td>E  ensure monotherapy in most situations</td>
</tr>
</tbody>
</table>

1. Obstetrics and Gynaecology- medications in common conditions

1.1 Anaemia
This is common in Kiribati and should be dealt with in the ante-natal period and not left until it compromises care in labour and the puerperium.

Common causes of anaemia include hookworm infestation and this should be treated with:

- Mebendazole (100 mg, orally twice daily for three days) after the first trimester
- Pyrantel 10 mg/kg orally as a single dose after the first trimester

Treat the anaemia with oral ferrous sulphate/folic acid combination tablets twice daily for not less than one month before repeating the blood haemoglobin measurement.

1.2 Premature labour (and to gain time in foetal distress when an urgent Caesarean section is being arranged)

**GIVE:**

- Salbutamol – IV infusion -10 micrograms/minute, increasing the rate at ten minute intervals until contractions diminish –then increase the rate to a maximum of 45 mcg./minute until contractions have ceased –maintain this rate for an hour and then gradually reduce

  **OR**

- If infusion pumps not available, give salbutamol IV or IM injection 100-250 mcg. Repeat according to response and then oral salbutamol 4 mg 6-8- hourly for 48 hours maximum

  **OR**

- Nifedipine 10mg immediate release capsules-contents given sublingually and up to a further four doses repeated at not less than every 15 minutes to 40 mg maximum. Then, nifedipine sustained release capsules 10mg -30mg orally 6-hourly not exceeding 120 mg /24 hours

Salbutamol may cause hypokalaemia and hyperglycaemia, tachycardia

Nifedipine reduces blood pressure and may cause dizziness, dependent oedema. Monitor blood pressure and watch for postural fall in blood pressure on standing treat by lying the patient down
1.3 Prevention of recurrent seizures in eclampsia / prevention of seizures in pre-eclampsia

GIVE:

- Magnesium sulphate 4 Gm. IV over 5-15 minutes followed by

EITHER:

- IV infusion 1 Gm/hour for at least 24 hours after the last seizure

OR:

- Magnesium sulphate deep IM injection 5 Gm into each buttock, then 5 Gm. every 4 hours into alternate buttocks for at least 24 hours after the last seizure

Use no greater than 20% concentration of magnesium sulphate for IV injection.

Use 50% magnesium sulphate for IM injection. Mix each 5 Gm. magnesium sulphate solution with 1 mL of 2% lignocaine.

When infusing magnesium sulphate, monitor patient by checking tendon reflexes and respiration. Both are depressed if the serum magnesium is too high. If the respiratory rate falls to, or is less than, 12/min reduce the rate of infusion.

1.4 Prevention of post-partum bleeding

Active management of the third stage of labour should be routine

To prevent post-partum bleeding

If available, the preferred medication is oxytocin.

GIVE:

- Oxytocin 5 units by slow intravenous injection when the anterior shoulder is delivered or immediately after birth

OR

- Oxytocin 10 units by intramuscular injection when the anterior shoulder is delivered or immediately after birth

For the treatment of post-partum haemorrhage

GIVE:

- Oxytocin 5-10 units by slow intravenous injection

OR

- Oxytocin 10 units by intramuscular injection

Followed, in severe cases only, by oxytocin 0.02-0.04 units/minute as an intravenous infusion to a maximum of 40 units

The infusion should not be started until the placenta has been delivered

To prevent post-partum haemorrhage, if oxytocin is not available

GIVE:

- Ergometrine 200 micrograms by IM injection when the anterior shoulder is delivered or immediately after birth

To treat post-partum haemorrhage

GIVE:

- Ergometrine 250-500 micrograms by slow intravenous injection

Ergometrine should not be used in patients with raised blood pressure or pre-eclampsia.

2. Antibiotics in pregnancy, labour and delivery

2.1 Urinary tract infections in pregnancy
2.1.1 Lower urinary tract: If no symptoms, do not start antibiotics until culture and sensitivity have been performed. If empirical treatment is required
  GIVE:
  - Nitrofurantoin 50 mg orally, 6-hourly
Duration: 10-14 days
This medication is safe in pregnancy

2.1.2 Pyelonephritis: Take urine/blood cultures.
  GIVE:
  - Ampicillin 1Gm. IV 6-hourly
  PLUS
  - Gentamicin 240 mg IV once daily (adjust dose or frequency if renal function impaired)
Gentamicin can have ototoxic effects on the foetus. This must be balanced against the risks of uncontrolled infection. Switch to oral therapy once patient afebrile.

2.2 Premature rupture of the membranes
Pre-term
  GIVE:
  - Ampicillin 1 Gm .IV 6-hourly
  PLUS
  - Gentamicin 240 mg. IV daily
Both for two days and followed by:
  - Erythromycin 500 mg orally 6-hourly
  PLUS
  - Metronidazole 400 mg. orally 8-hourly
Total duration of treatment will not normally exceed one week.

At term: If the rupture has been for more than 18 hours, antibiotic must be started.
  GIVE:
  - Ampicillin 1Gm IV 6-hourl
  - Gentamicin 240 mg. IV once daily
Normally labour will be induced. Antibiotic cover extends through labour, delivery and post-labour to a total of 72 hours.

2.3 Elective Caesarean section
All patients who have had vaginal examinations/those with ruptured membranes
  - Ampicillin 1-2 Gm IV immediately after the cord has been clamped
If there are signs of infection
  GIVE:
  - Ampicillin 1 Gm IV  6 hourly
  PLUS:
  - Gentamicin 240 mg IV once daily (adjust dose/frequency if renal impairment)
Both for 5 days minimum

2.4 Breast abscess
  GIVE:
  - Cloxacillin 1 Gm. IV  6-hourly. Continue with oral treatment after 48 hours
If penicillin hypersensitive, use **erythromycin 500 mg orally 6-hourly**

Surgical drainage may be required

### 3. Antibiotics in gynaecology - prophylactic and therapeutic

#### 3.1 Pelvic inflammatory disease

Usually a mixture of organisms - gonococci, Chlamydia and both aerobes and anaerobes.

For out-patients (mild disease)

GIVE:

- Doxycycline 100mg. orally 12-hourly for 10 days

PLUS:

- Metronidazole 400 mg .orally 8-hourly for 7 days

PLUS:

- Amoxicillin 500 mg orally 8-hourly for 7 days

For cases severe enough to warrant admission

GIVE:

- Ampicillin 1 Gm. IV 6-hourly

PLUS:

- Gentamicin 240 mg. IV once daily (adjust dose/frequency to renal function)

PLUS:

- Metronidazole 400 mg. orally 8-hourly

Change to oral treatment with doxycycline and metronidazole (as above) when infection is resolving.

#### 3.2 Sexual assault

To treat empirically possible gonorrhoea/syphilis

GIVE:

- Amoxycillin 3 Gm. as a single dose

PLUS:

- Probenecid 500 mg as a single dose

#### 3.3 Elective gynaecological surgery

If the vaginal vault is to be opened

GIVE:

- Metronidazole 400 mg. orally 4 hours before surgery

### 4 Sexually transmitted diseases

#### 4.1 Gonorrhoea

Do culture organism/sensitivities where possible. All patients should have serology for syphilis (and HIV wherever possible), after counselling.

**Uncomplicated urethral, endocervical, rectal or pharyngeal infection**

Treat for gonococcal and (presumed) chlamydial infection.

GIVE:

- Amoxicillin 3 Gm orally as a single dose
PLUS:

- Probenecid 1 Gm as a single dose

PLUS EITHER:

- Doxycycline 100 mg, orally 12-hourly for 7 days

OR:

- Tetracycline 500 mg orally 6-hourly for 7 days

In pregnant women, tetracyclines must not be used.
Substitute for tetracycline or doxycycline —— erythromycin 500 mg orally 6-hourly for 7 days

Sex partners should be examined, samples obtained and treatment started if indicated

4.1.1 Disseminated gonococcal infection
Difficult to exclude on physical examination alone. May need blood, joint fluid and/or CSF culture.

If organism expected/shown to be penicillin sensitive
GIVE:

- Penicillin G 50,000 units/kg/dose IV 12-hourly for 7 days. Increase to 14 days if meningeal involvement

If resistant to penicillin
GIVE:

- Ceftriaxone 50 mg./kg/day IV or intramuscularly as a single daily dose for 7 days

In the case of a child, treat mother and her sexual partner.

4.1.2 Gonococcal ophthalmia in older children or adults
GIVE:

- Ceftriaxone 1 Gm intramuscularly as a single dose

Topical antibiotics alone are inadequate.

4.1.3 Infection in children following child abuse
GIVE:

- Ceftriaxone 125 mg intramuscularly as a single dose(250 mg. in child > 45 kg)

PLUS

- Doxycycline 100 mg orally 12-hourly for 7 days

OR, if child under 9 years old

- Erythromycin 500 mg orally 6-hourly for 7 days

4.2 Chlamydial infections

Difficult to substantiate as a “stand-alone” infection but very prevalent in Kiribati.
If gonococci are not found and strong clinical evidence for Chlamydia,
GIVE:

- Doxycycline 100mg orally 12 hourly for 7 days

OR (infants, children, pregnancy)

- Erythromycin 500 mg orally 6-hourly for 7 days

4.3 Syphilis

This disease, once thought to be disappearing is now making an unwelcome return and must be considered when anyone presents with an STI. Anyone suspected of having a STI should have a serological test for syphilis (VDRL). The VDRL is often negative in primary syphilis. Treat genital ulcers as though due to syphilis even with a negative VDRL.
All patients with syphilis should be counselled about risks of HIV and encouraged to have a screening test.
Early syphilis
Primary, secondary or early latent disease of less than a year’s duration
GIVE:
- Benzathine penicillin 2.4 megaunits intramuscularly as a single dose

If penicillin hypersensitive
GIVE:
- Doxycycline 100 mg. orally 12 hourly for 2 weeks
OR:
- Erythromycin 500mg. orally 6-hourly for two weeks

Re-examine at 3 and 6 months with repeat serology.
If titres have not decreased four-fold by 3 months or signs of infection persist, perform CSF examination and re-treat.

4.3.1 HIV co-infection
Initial treatment as above. Monitor VDRL at 1,2,3,6, and 12 months. A four-fold increase in titre at any point should lead to CSF examination and re-treatment.

Late latent infection (more than one year’s duration, gummas, cardiovascular syphilis)
GIVE:
- Benzathine penicillin 2.4 megaunits as a single dose/week for 3 consecutive weeks
OR:
- Doxycycline 100mg. orally 12-hourly for 4 weeks, if penicillin hypersensitive

Repeat VDRL at 6 and 12 months.

4.3.2 Neurosyphilis
GIVE:
- Penicillin G 2.4 Gm. IV every 4 hours for 10-14 days, followed by benzathine penicillin 2.4 megaunits intramuscularly weekly for 3 weeks

4.3.3 Syphilis in pregnancy
Pregnant women should be screened in early pregnancy with a repeat VDRL in third trimester. Treat according to the stage of the syphilis as above except for early syphilis which should be treated more aggressively as below.
GIVE:
- Benzathine penicillin 2.4 megaunits IM as one dose per week for 3 weeks
OR:
- Procaine penicillin 1.2 megaunits/day IM for 10-14 days—especially after 20 weeks

Monthly VDRL should be performed throughout the pregnancy and the patient re-treated if the titre does not fall within 6 weeks of initial treatment.

4.3.4 Infants born to VDRL positive mothers
Treat as infected if:
- Syphilis untreated/inadequately treated in mother
- Syphilis treated with a non-penicillin regimen
- Syphilis treated but VDRL did not fall
- Syphilis treated less than one month before delivery
- Uncertain As to what treatment was given
- Insufficient serological follow-up to ascertain response to treatment and current infection status
In the infant, any clinical sign of infection, or VDRL titre higher than those of the mother, should lead to treatment.

**GIVE:**
- **Procaine penicillin 50,000 units/kg IM daily for 10-14 days**
- **Benzathine penicillin 50,000 unite/kg IM once a week for 3 weeks**

The more detailed description given above would not normally feature in a set of guidelines for common diseases and in many countries patients with, or suspected of having, syphilis would be seen in specialised STI clinics. These clinics rarely exist in developing countries and general doctors see and treat all STIs. For further information beyond the notes above contact a specialised STI service.

**4.4 Primary genital herpes**

Considerable debate persists about the value of treating this condition because of the high relapse rate and the risk of producing viral resistance with treatment.

If treating, give:
- **Acyclovir 200 mg orally 5 times/day, for 10 days**

  This is not available on the Kiribati EDL.

**4.5 Trichomoniasis**

**GIVE:**
- **Metronidazole 2 Gm. orally as a single dose**

During pregnancy metronidazole is contraindicated. Use topical econazole pessaries 150 mg. at night for three nights.

**4.6 HIV/AIDS**

In Kiribati there are currently (August 2007) five patients who are HIV positive and are receiving anti-retroviral treatment from the HIV Care Team. There are probably more patients (possibly up to 50) who have been screened and are HIV positive. In the absence of more widespread screening it is impossible to estimate the true rate of HIV positivity. If experience elsewhere is a guide, Kiribati should be very vigilant and the current emphasis on prevention should continue and be reinforced. Drugs for HIV/AIDS are a highly specialised field and will not be discussed in these guidelines. For fuller information refer to the HIV Care Team.

**5. Genito-urinary infection in the male or non-pregnant female**

**5.1 Uncomplicated lower urinary tract infections**

Culture and sensitivity tests are recommended although treatment does not need to be delayed. Common organism is *E.coli*. In Australia over 60% and in Fiji over 80% are resistant to amoxycillin. While we do not have a quantitative estimate, the laboratory at Tungaru Hospital finds many *E.coli* isolated from urine resistant to amoxycillin.

**GIVE:**
- **Trimethoprim 300mg orally daily for 5 days**
- **Nitrofurantoin 50-100mg. orally 6-hourly for 5 days**

Nitrofurantoin is an older drug but has high efficacy and can be given safely in pregnancy. It can cause nausea and vomiting and should be introduced at the lower dose of 50mg.
Trimethoprim is easy to take, has very few adverse effects and is only beginning to induce resistance in *E.coli*. It is not yet on the Kiribati EDL but may be considered for inclusion it is not used in pregnancy because of its folate antagonism action.

### 5.2 Upper urinary tract infection

Treat for 14 days with antibiotics based on culture/sensitivities if possible. If no culture information

**GIVE:**
- Ampicillin 2 Gm. IV 6-hourly
- Gentamicin 240 mg IV once daily (adjust dose/frequency according to renal function)

If use of gentamicin is undesirable—for example in the elderly or in renal failure

**USE:**
- Ceftriaxone 1 Gm. IV Daily

If Pseudomonas is isolated use
- Ciprofloxacin 600mg. orally 12-hourly

Recurrent infection – prophylaxis

**USE:**
- Nitrofurantoin 50-100 mg orally at night
  OR
- Nalidixic acid 1 Gm. Orally at night
  OR
- Trimethoprim 150 mg orally at night

All urinary infection in males—especially young males should be fully investigated as it may be a pointer to a structural abnormality in the GU tract. This is not commonly the case in adult females.

### 5.3 Chronic bacterial prostatitis

Be guided by culture and sensitivity, if available

**GIVE:**
- Cotrimoxazole 2 tablets 12 hourly
  OR
- Trimethoprim 300 mg orally daily for 12 weeks

If culture negative consider the possibility of Chlamydial infection

**GIVE:**
- Doxycycline 100 mg. orally 12-hourly for 3 weeks, followed by 100 mg daily for a further 3 weeks
  OR
- Erythromycin 500mg. 6 hourly for 6 weeks

### 5.4 Acute epididymo-orchitis

#### 5.4.1 Sexual transmission

**GIVE:**
- Doxycycline 100mg. orally 12 hourly for 14 days

#### 5.4.2 Non-sexual transmission

**GIVE:**
- Cotrimoxazole 2 tablets 12-hourly for 14 days

#### 5.4.3 Severe infections

**GIVE:**
- Ampicillin 2Gm. IV 6-hourly
  PLUS:
  - Gentamicin 240 mg IV once daily (dose/frequency adjusted to renal function)

May require 7-10 days treatment

6 Septicaemia

This is a medical emergency and needs urgent treatment. Before starting antibiotics take three blood samples for culture and sensitivities. The results will allow adjustment of treatment once the initial empirical management has brought the situation under control. Septic shock may complicate the condition and worsens the prognosis. This is dealt with under the Emergency Drug Guidelines and is not repeated here. If a source for the septicaemia can be found it enables more rational choice of antibiotics.

6.1 Empirical treatment

Cover major possibilities including Staphylococcal septicaemia which is not uncommon in Kiribati.

GIVE:
- Cloxacillin 2 gm. IV 4-hourly
  PLUS:
  - Gentamicin 240 mg IV stat and thereafter once daily (check dose/frequency in the light of renal function)

6.2 Urinary source - usually due to *E.coli*.

GIVE:
- Ampicillin 2 Gm. IV 6-hourly
  PLUS:
  - Gentamicin 240 mg IV once daily (adjust dose to renal function)

In penicillin hypersensitive patients, gentamicin can be used alone or change to single-agent treatment with *ceftriaxone 2 Gm. IV daily*.

6.3 Biliary or gastro-intestinal tract

Likely pathogens include enterobacteriaceae, anaerobes, enterococci.

GIVE:
- Ampicillin 2 Gm IV 6-hourly
  PLUS
  - Gentamicin 240 mg IV once daily (adjust dose for renal function)
  PLUS
  - Metronidazole 500 mg. IV 12-hourly—infuse over not less than 20 minutes

If gentamicin cannot be used, substitute with
- Ceftriaxone 1-2 Gm. IV daily

6.4 Female genital tract

Common organisms; anaerobic bacteria, enterococcus, streptococcus, occasionally staphylococcus.

GIVE:
- Ampicillin 2 Gm. IV 6-hourly
  PLUS
  - Gentamicin 240 mg. IV once daily (adjust for renal function)
  PLUS
  - Metronidazole 500 mg IV 12-hourly –infused over not less than 20 minutes
Skin streptococci and staphylococci are the likely bacterial pathogens

GIVE:
- Cloxacillin 2 Gm. IV 4-hourly
PLUS
- Gentamicin 240 mg. IV once daily (adjust to renal function)

If hypersensitive to penicillin use
- Chloramphenicol 1 Gm. IV 6-hourly

6.5 Ischaemic ulcers/decubitus ulcers

These will have normal skin pathogens as above, plus anaerobes

GIVE:
- Cloxacillin 2 Gm IV 4-hourly
PLUS
- Gentamicin 240 mg IV once daily (adjust for renal function)
PLUS
- Metronidazole 500 mg IV 12-hourly (infuse over not less than 20 minutes)

6.6 Intra-venous cannulae

Usually staphylococcal infection

GIVE:
- Cloxacillin 2 Gm IV 4-hourly
PLUS
- Gentamicin 240 mg IV once daily (adjust to renal function)

6.7 Lung

Possible organisms; streptococcus pneumoniae, haemophilus influenzae, gram-negative bacteria.

GIVE:
- Cloxacillin 2 Gm. IV 4-hourly
PLUS
- Gentamicin 240 mg. IV once daily (adjusted for renal function)

If response inadequate ADD penicillin G 3 megaunits IV 6-hourly.

7. Paediatrics

The Department of Paediatrics at Tungaru Hospital receives patients through both the emergency and the out-patients departments. The initial diagnostic and treatment algorithms used are those of the WHO “Integrated Management of Childhood Illness” manual. These same guidelines are the basis for the diagnosis and management of conditions presenting to the Health Centres in the Outer Islands with clear indications of when a doctor needs to be consulted or a patient referred urgently for management. The guidelines are not reproduced here but can be consulted and are available for any medical officer working in the emergency and out-patients departments.

Antibiotic management of selected common conditions in childhood

Principles

- Usually children over 40 kg should receive the adult dose
- In all cases the maximum dose should not exceed the adult dose
- Take special care in neonates—in the first few weeks of life renal excretion and hepatic drug metabolism are poorly developed. Dosage intervals may need to be extended. Maturation occurs rapidly in the first few weeks.
- All intravenous antibiotics must be given by slow infusion to reduce risk of thrombophlebitis.
In ideal circumstances gentamicin levels should be measured and doses adjusted accordingly. This is currently not possible in Kiribati-extra care should be taken when giving gentamicin to patients with impaired renal function.

7.1 Respiratory infections

7.1.1 Acute sore throat
Most are viral. Simple analgesia plus adequate hydration will be adequate treatment.

Features suggesting bacterial infection include:
- Fever >38 degrees Celsius
- Tender cervical nodes
- Tonsillar swelling or exudates
- No cough

If likely bacterial
GIVE:
- Penicillin V 7.5-15mg/kg/dose(max 500mg/dose) orally 12-hourly for 10 days
- Benzathine penicillin 25,000-50,000 units/kg/dose (max.1.2 megaunits) as a single IM dose

Amoxicillin is not a preferred antibiotic as it has too wide a spectrum but can be used if, for any reason, the alternatives are not available.

If hypersensitive to penicillin
GIVE:
- Erythromycin 10-12.5mg/kg/dose (max.500mg/dose)500 mg orally 6-hourly for 10 days

It is important to complete the course to prevent rheumatic fever which is still common in Kiribati.

7.1.2 Acute bacterial otitis media.
This is either bacterial or viral and normally resolves in a few days with some pain relief.

If symptoms persist or there is pus draining from the ear
GIVE:
- Amoxicillin 10-20 mg/kg/dose(max 500mg) orally 8-hourly for 7 days
- Co-trimoxazole syrup (40 mg trimethoprim/200 mg suphamethoxazole/5 mL)

Dosage calculated as 2.5 mg/kg/dose orally 12-hourly for 7-10 day.

**Amoxicillin dose according to age**
- <2 months (5 kg) 62.5 mg 8-hourly
- 2 months to up to 12 months (6-9kg) 125 mg 8-hourly
- 12 months to 5 years (10-19 kg) 250 mg 8-hourly

**Co-trimoxazole syrup dosage according to age**
- 1-2 months (<5 kg) 2.5 mL 12 hourly
- 2 months to 12 months (6-9 kg) 5.0 mL 12 hourly
- 12 months to 5 years (10-19 kg) 7.5 mL 12 hourly

7.1.3 Croup
A viral infection of the upper airway which affects children from the ages of 6 months to 3 years. It is characterised by fever, a harsh cough, a hoarse voice and stridor.

Children who have stridor while at rest or who have signs of respiratory distress (i.e. suprasternal retraction, tachypnea, restlessness) should be admitted.

Pulse oximetry is useful – an oxygen saturation of 93% or less while breathing air is an indication
for admission.  
Most cases of croup are mild and self-limited.

Mild croup  
These patients will have stridor only with exertion or crying and no signs of respiratory distress.  Avoid exposure to cold air.  Give paracetamol for fever.  
- Give paracetamol 20 mg/kg every 4 hours

Moderate croup  
These patients will have stridor at rest and some signs of respiratory distress but oxygen saturation should be greater than 90% on air.  
- Give oxygen to maintain an oxygen saturation greater than 93%  
PLUS  
- Give dexamethasone 0.6 mg/kg intramuscularly as a single dose

Severe croup  
These patients will have signs of marked respiratory distress plus hypoxia or cyanosis. Admission to an intensive care unit is desirable and intubation may be necessary.  
- Give oxygen to maintain an oxygen saturation greater than 93%  
PLUS  
- Give dexamethasone 0.6 mg/kg intramuscularly as a single dose  
PLUS  
- Give nebulised adrenaline, 0.5 ml/kg of 1:1000 solution or 0.05 ml/kg of a 1% solution diluted with saline to a volume of 2.5 ml

NOTE:  Patients who fail to respond to nebulized adrenaline may require endotracheal intubation. Nebulized adrenaline provides only temporary relief of airway obstruction lasting 1 to 2 hours. Patients should be closely observed after this period for recurrence of obstruction

7.1.4 Acute Epiglottitis  
Epiglottitis is a medical emergency and failure to provide prompt treatment may be fatal.  
- Due to infection of the epiglottis with Haemophilus influenzae bacteria  
- Mainly affects children between the ages of 3 and 8 years but is occasionally seen in adults. Characterised by fever, inspiratory and expiratory upper airway noises, a severe sore throat, dysphagia and drooling  
- Patient looks very unwell  
- Very high risk of acute airway obstruction

All patients should be referred immediately to an anaesthetist and admitted to an intensive care unit. Attempting to view the throat or otherwise upsetting the child may cause airway obstruction and should be avoided. Keep the patient sitting up.  
GIVE:  
- Ceftriaxone 100 mg/kg stat then 50mg/kg intravenously daily  
OR  
- Chloramphenicol 40 mg/kg stat then 25mg/kg intravenously daily

Early transfer to oral therapy is desirable

7.2 Lower Respiratory Tract Infections  

7.2.1 Acute bronchitis  
In an immunocompetent child, acute bronchitis is most often viral and does not require antibiotic therapy. Randomized controlled trials show that antibiotic therapy provides no overall benefit and may cause harm.
If sputum is voluminous and purulent, with fever, secondary bacterial infection is assumed
GIVE:
- Amoxicillin 10-20 mg/kg/dose (max. 500 mg.) orally 8 hours for 5-7 days

7.2.2 Pneumonia
Community acquired
Infants under 2 months of age are considered to have severe pneumonia

(a) Mild Disease
Infant age 2 months to 1 year (6-9 kg)
Clinically—cough and respiratory rate 50 breaths per minute or more. No chest in-drawing.
GIVE:
- Procaine penicillin 400,000 units/dose IM daily for 5 days
OR
- Amoxicillin syrup (125 mg in 5 mL) 10-20 mg/kg/dose (max 125 mg/dose) orally 8 hours for 5-7
OR
- Co-trimoxazole syrup – trimethoprim 2.5 mg/kg/dose orally 12 hourly for 5 days
Review child after two days or sooner if not improving.

Children aged 1-5 years
Cough, no chest in-drawing, 40 or more breaths/minute.
GIVE:
- Procaine penicillin 25,000-50,000 units/kg/dose (max. 1 mega unit) IM daily for 5 days
OR
- Amoxicillin syrup (125 mg/5 mL) 10-20 mg/kg/dose (max. 250 mg/dose) orally 8-hourly for 5 days
OR
- Cotrimoxazole syrup (40 mg trimethoprim and 200 mg sulphamethoxazole in 5 mL) – calculated as trimethoprim 2.5 mg/kg/dose orally 12-hourly for 5 days
Review after two days.

Children over 5 years of age
GIVE:
- Procaine penicillin 25,000-50,000 units/kg (max. 2 mega unit) IM daily for 5 days
OR
- Amoxicillin syrup 10-20 mg/kg/dose (max 500 mg/dose) 8-hourly orally for 5 days
Review in two days.

(b) Moderate to severe disease
Clinical findings of cough, fever, chest in-drawing.
Before starting antibiotics take blood or other samples for culture.

Infants less than 2 months
All pneumonia in children less than 2 months must be regarded as severe.

Admit for treatment.
Malnourished children should be treated with antibiotics to cover both Gram positive and Gram negative organisms until cultures provide a better clue to aetiology.
- Penicillin G 50,000 units/kg/dose IV for 7 days
  6-hourly in infants over three weeks old
  8-hourly in infants 1-3 weeks old
  12-hourly in infants <7 days old
(These differences in regimen allow for the altered kinetics of drugs in the neonatal period)
PLUS
• Gentamicin 2-2.5 mg/kg/dose IV 12-hourly in infants <2 months old

Alternatively, GIVE:
• Ampicillin 25 mg/kg/dose IV 6-hourly

PLUS
• Gentamicin 2-2.5 mg/kg/dose IV 12-hourly

If there is any suspicion of Staphylococcal infection
• Give: Cloxacillin 25 mg/kg/dose IV 6-hourly

PLUS
• Gentamicin 2-2.5 mg/kg/dose IV 12-hourly

The total duration of treatment should be 7-10 days depending on the response.

Children aged 2 months and over
GIVE:
• Penicillin G 50,000 units/kg/dose (max. 1 mega unit/dose) IV 6-hourly for 3 days followed by procaine penicillin 50,000 units/kg/dose (max. 2 megaunits) IM daily to complete at least 7 days

OR
• Ampicillin 25 mg/kg/dose (max. 1 Gm/dose) IV 6-hourly for 3 days followed by amoxicillin 20 mg/kg/dose (max. 500 mg/dose) orally 8-hourly to complete at least 7 days

OR
• Chloramphenicol 12.5-25 mg/kg/dose (max 1 Gm/dose) IV 6-hourly for 3 days followed by chloramphenicol 12.5-25 mg/kg/dose (max 500 mg/dose) orally 6-hourly to complete at least 7 days

If Staphylococcal infection is suspected give:
• Cloxacillin 25-50 mg/kg/dose (max. 500 mg/dose) IV 6-hourly for 7 days

Atypical pneumonia
This may occur in children and failure to respond to the penicillin-based regimens given above may be the first clue to Mycoplasma infection, as will a slower onset of the disease (clinical history is important).
If suspected give:
• Erythromycin 10-12.5 mg/kg/dose (max. 500 mg/dose) IV 6-8-hourly-by slow infusion in normal saline OR orally, if feasible, for 7-10 days

7.3 Cardiovascular system infections
7.3.1 Bacterial endocarditis:
Principles of management
• Treatment should be given intravenously for at least the first two weeks
• Treatment is prolonged
• Doses must be high enough throughout the course of treatment

Take blood for culture before starting treatment. Staphylococcal septicaemia occurs not uncommonly in Kiribati and it may be the causative organism in endocarditis - be prepared to treat this empirically until cultures show a different aetiology.

Empirical treatment
• Penicillin G 100,000 units/kg/dose (max 3 megaunits/dose) 4-6 hourly for 6 weeks

PLUS
• Cloxacillin 50 mg/kg/dose (max 2 Gm/dose) 4-6 hourly for 6 weeks

PLUS
• Gentamicin 2-2.5 mg/kg/dose (max 80 mg/dose) 8-hourly IV for 2 weeks (need to monitor renal function and ideally plasma gentamicin during this 2 week period)
Drug therapy may need to be altered in the light of culture and sensitivity results when available.

7.4 Gastro-intestinal infections

7.4.1 Acute gastro-enteritis
It cannot be stressed enough that death in childhood from acute gastroenteritis is almost invariably due to dehydration. The “Integrated Management of Childhood Illness” protocols give clear and simple guidance to mothers of affected children and to first-line health workers. When the child arrives at hospital it is important not to give unnecessary and potentially harmful medication for what is in the majority of cases a self-limiting disease. Oral Rehydration Solution remains the most important therapy. Medicines to reduce gastro-intestinal motility are not recommended in childhood.

Indications for the use of antibiotics are bloody diarrhoea and cholera (a very rare event in Kiribati though sporadic cases have been recorded in travellers from endemic areas.)

7.4.2 Bloody diarrhoea
Collect stool sample for culture and sensitivity testing before starting antibiotics.
- Cotrimoxazole (trimethoprim 40mg/sulphamethoxazole 200mg/5mL) calculated as trimethoprim 2.5mg/kg/dose, 12-hourly for 5 days
  OR
- Chloramphenicol 12.5mg/kg/dose (max. 500mg/dose) orally 6-hourly for 5 days

7.4.3 Cholera
- Co-trimoxazole, calculated as trimethoprim) 2.5mg/kg/dose, 12-hourly for 3-4 days

Other causes of (usually chronic) diarrhoea include:

7.4.4 Amoebiasis /amoebic dysentery
GIVE:
- Metronidazole 10mg/kg/dose (max 400mg/dose) orally 8-hourly for 7-10 days

7.4.5 Giardiasis
GIVE:
- Metronidazole 6mg/kg/dose (max 400mg/dose) orally 8-hourly for 7-10 days

7.4.6 Acute bacterial meningitis
Infants 2 months and above
Take blood and CSF for culture,-unless there is a raised intracranial pressure.
Treat empirically with:
- Penicillin G 100,000 units/kg/dose (max 4 megaunits/dose) IV 6-hourly
  PLUS
- Chloramphenicol 25mg/kg/dose (max. 1 Gm./dose) IV 6-hourly

Duration: 10-14 days.
ADD
- Dexamethasone 0.15mg/kg/dose IV 6-hourly for the first 4 days
Dexamethasone treatment is associated with an improved prognosis in children.

If clinical response is not evident, or the bacteria are resistant to penicillin and chloramphenicol
GIVE:
- Ceftriaxone 100mg/kg(max 4 Gm/dose) IV as a single dose daily for 10-14 days

7.5 Urinary tract infections (UTI)
All children with UTIs need to be investigated for underlying structural abnormality of the GU tract (eg vesico-ureteric reflux).
Culture urine and request sensitivities. Until results return

**GIVE:**
- **Trimethoprim suspension (50mg/5 mL) 2.5mg/kg/dose, 12-hourly for 7 days**
- **Amoxycillin 10-20mg/kg/dose (max 500mg/dose) orally 8-hourly for 7 days**

In many countries resistance of *E.coli* to amoxycillin exceeds 50% (Fiji >80%). It may not be a useful first line medicine in the near future.

### 7.5.1 Upper GU infection
Pyelonephritis requires urgent antibiotic treatment.

- **Ampicillin 25-50mg/kg/dose (max 1Gm/dose) IV 6-hourly**
  **PLUS**
- **Gentamicin 2-2.5 mg/kg/dose (max 80mg/dose) IV 12 hourly**
- **Ceftriaxone 50mg/kg/dose (max 1 Gm/day) IV daily as a single agent**

Children with vesico-ureteric reflux will need prophylactic antibiotics at nights.

### 7.6 Skin and soft tissue sepsis
Most superficial infections may not require antibiotics.

Common organisms Streptococci/Staphylococci.

If antibiotic is needed because of spreading infection, systemic symptoms eg cellulitis

**GIVE:**
- **Cloxacillin 25-50mg/kg/dose (max 1Gm/dose) IV 6-hourly**
  **until there is a clinical response**
- **Then change to oral flucloxacillin or cloxacillin according to availability for 5 days, or longer if clinical features suggest it is necessary**

### 7.6.1 Erysipelas
Caused by *Streptococcus pyogenes*-normally very sensitive to penicillin.

**GIVE:**
- **Penicillin G 50,000-100,000 units/kg/dose (max 4megaunits/dose)IM 6-hourly**
  **until there is a clinical response — then change to**
- **Procaine penicillin 50,000 units/kg IM daily to complete 7days**

### 8 Prophylaxis in surgical and non-surgical practice

#### 8.1 Non-surgical prophylaxis

Vaccines/immunization in childhood are handled by UNICEF-WHO according to agreed international protocols and guidelines. These are not reproduced here.

#### 8.1.1 Hepatitis B
**Primary protection**
A full course of Hepatitis B vaccine should be given to all newborns, all at risk of contracting infection (health workers) and sexual partners of HBsAg positive individuals.
A full course of vaccine should be given at 0, 1, and 6 months.

**Post-exposure e.g. needle-stick injury**
Test the exposed person and the donor of contaminating blood for HbsAg and Anti-HbsAg.

<table>
<thead>
<tr>
<th>Exposed person</th>
<th>Status</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full course of HepB vaccine with seroconversion within 5 years</td>
<td>Protected</td>
<td>No prophylaxis needed</td>
</tr>
<tr>
<td>HBsAg positive</td>
<td>Already infected</td>
<td>No prophylaxis needed</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Anti-HBsAg positive</td>
<td>Protected</td>
<td>No prophylaxis needed</td>
</tr>
<tr>
<td>HBsAg and anti-HBsAg negative</td>
<td>Susceptible</td>
<td>Vaccine and add immunoglobulin if patient is HBsAg positive or status unknown</td>
</tr>
</tbody>
</table>

8.1.2 HIV – needle-stick injury
If the source of the inoculated blood/body fluid is HIV antibody positive post-exposure prophylaxis should be started as soon as possible and the recipient followed up for at least 6 months.

- Antiretroviral therapy should be commenced ideally within hours of the injury

Following a needle-stick injury with or without an apparent risk of Hepatitis B or HIV infection, contact the Infection Control, Principal Nursing Officer, and Tungaru Hospital.

8.1.3 Meningococcal and *H*. *influenzae* meningitis
Prophylaxis does not guarantee freedom from risk of disease. Treat, close contacts of the index case, classroom and other institutional contacts (epidemics), contacts who are young children, index cases before leaving hospital to eradicate nasopharyngeal carriage.

**H. influenzae contacts**
Adult:
- **Rifampicin 600 mg orally daily for 4 days**

Children over 4 weeks old:
- **Rifampicin 10 mg/kg/dose (max 600mg/dose) orally daily for 4 days**

**Meningococcal contacts**
Adult:
- **Rifampicin 600 mg orally daily for 2 days**
  OR
  **Ceftriaxone 250 mg IM as a single dose**
  OR
  **Ciprofloxacin 500 mg orally as a single dose**

Children over 4 weeks old:
- **Rifampicin 10mg/kg/dose(maximum 600 mg/dose) orally 12 hourly for 2 days**
  OR
  **Ceftriaxone 125 mg IM as a single dose**

8.1.4 Prevention of a recurrence of rheumatic fever
Continuous antimicrobial prophylaxis is recommended for patients with a well documented history of rheumatic fever. Intramuscular injection is the preferred route as it is more effective and leads to better adherence.

No cardiac involvement in the attack
GIVE:
- **Benzathine penicillin 1.2 megaunits IM every 4 weeks for 5 years or up to the age of 18 years**
  OR
- **Penicillin V 250 mg orally 12-hourly for the same duration**

In patients hypersensitive to penicillin give:
- **Erythromycin 250 mg orally 12 hourly**

**With cardiac involvement**
Drug prophylaxis as above but until at least 40 years and preferably for life in cases of severe cardiac involvement or moderate to severe residual valvular disease.
8.1.5 Prevention of bacterial endocarditis

I Low-risk – with structural heart disease but no prosthetic valve/previous endocarditis

Procedure under local anaesthetic:
- Amoxycillin 3 Gm. orally one hour before surgery, repeat 1.5 Gm 6 hours after procedure

Procedure under general anaesthetic:
- Amoxicillin 2 Gm. IV at induction followed by 500 mg orally 6 hours after the procedure

II High risk- prosthetic valve(s) or previous endocarditis, any type of procedure
- Amoxicillin 2 Gm. at induction followed by amoxicillin 500 mg IV or amoxicillin 500 mg orally 6 hours after the procedure
  WITH
  - Gentamicin 1.5 mg/kg IV at induction of (general) anaesthesia or commencement of the procedure

5.7.7 Surgical prophylaxis for specific procedures
The general principle is that antibiotics should be circulating at the time of maximum risk /exposure and that they should not be given too early to discourage the emergence of resistant strains, nor too long to allow suppression of normal flora and superinfection.
Normally the duration of antibiotic prophylaxis in surgery should not exceed 24 hours.

8.2 Surgical

8.2.1 Orthopaedics
Clean procedures
Insertion of prosthetic material or transplants, internal fixation of large bones
GIVE:
- Cloxacillin 2 Gm. IV at the time of induction
OR
- Cephalothin 2 Gm. at the time of induction

Allow 5 minutes to elapse between giving the antibiotic and applying the tourniquet

Compound fractures – classified as “dirty” and a course of antibiotics is needed as treatment.
GIVE:
- Gentamicin 240 mg IV daily (adjust dose/frequency to renal function)
PLUS
- Amoxicillin 500 mg IV 6-hourly
  If there is no sign of infection after 24 hours, stop the antibiotics.
- Add metronidazole if there is perineal involvement

Tetanus toxoid should be given if the patient was immunised more than 5 years ago.

8.2.2 Genito-urinary surgery
If the urine is sterile there is no need for prophylaxis.

If clinical evidence of infection but there are no culture or sensitivity results
GIVE:
- Amoxicillin 1G. IV
PLUS
- Gentamicin 2-3 mg/kg IV at the time of induction

Caesarean section
See above, under Obstetrics and Gynaecology
8.2.3 Elective gastro-intestinal or biliary surgery (including colorectal)

GIVE:
- Ampicillin 1 G. IV
PLUS
- Gentamicin 2-3mg/kg IV
PLUS
- Metronidazole suppository 1 G. rectally 2-hours before surgery
OR
- Metronidazole 500 mg IV over 20 minutes to finish at the time of induction

In major colon surgery a further dose of metronidazole should be given 4 hours induction. An infected appendix, perforation or intra-abdominal abscess requires a full therapeutic course of ampicillin, gentamicin and metronidazole for 7 days.

8.2.4 Neurological, oropharyngeal surgery

Neurosurgery requiring prophylaxis includes prolonged procedures, re-exploration and microsurgery.

For these and any oropharyngeal surgery

GIVE:
- Cephalothin 2G IV at the time of induction

8.2.5 Lower limb amputation

GIVE:
- Penicillin G 1.2 Gm. IV 6-hourly to start at induction and continue for 48 hours
PLUS
- Metronidazole 1 Gm. rectally 2 hours before surgery followed by 400 mg orally 8-hourly for 48 hours

In diabetic amputation it is advisable to add gentamicin 2-3 mg/kg IV at induction followed by 240 mg IV daily for two days.

9 Common dental conditions

Dental sepsis is a common presenting condition.

9.1 Dental abscess

9.1.1 Without cellulitis

GIVE:
- Penicillin V 500mg orally 6-hourly for 5 days
OR
- Amoxycillin 500mg orally 8-hourly for 5 days

9.1.2 With cellulitis and facial swelling

Admit

GIVE:
- Penicillin G 1 mega unit IV 6-hourly OR ampicillin 1Gm. IV 4-6 hourly
PLUS
- Metronidazole 400 mg 8-hourly for 7 days

Change to oral antibiotics when patient can swallow.

9.2 Pericoronitis (infection of gums around teeth)

GIVE:
- Penicillin V 250 mg orally 8-hourly for 5 days
OR
- Amoxycillin 500 mg orally 8-hourly for 5 days
Either of these together with **Metronidazole 200mg orally 8-hourly for 5 days**

### 9.3 Oral ulcers

Most will resolve spontaneously. Give antiseptic oral rinse with **chlorhexidine 0.2% solution used three times a day as a mouthwash**.

### 9.4 Oral candidiasis

- Nystatin suspension 100,000 units/mL 4 times a day (hold in mouth and allow to distribute over affected area—then swallow). Use for 7-10 days as needed

### 9.5 Facial fractures

Antibiotic cover needed

- Initially give IV penicillin 1 mega unit 6-hourly while patient unable to swallow
- Change to oral penicillin V 250-500 mg orally 8-hourly thereafter for a course of up to 10 days

Prophylaxis for dental procedures in patients at risk for bacterial endocarditis (see above)