



**CHAPTER 9 SYSTEMIC AND NOSOCOMIAL INFECTIONS**

For the rare patient unable to take oral therapy:

- chloramphenicol, IV, 500 mg 6 hourly

**Note:**

This is inferior to doxycycline, which should be commenced as soon as possible.

### 9.9 TYPHOID FEVER

A01.0

\*This is a notifiable disease.

#### DESCRIPTION

Systemic infection due to *S. typhi* or related organisms (e.g. *S. paratyphi*). Initial symptoms are abdominal pain, headache and fever with diarrhoea only developing late. Bacteraemia is common initially, subsequently stool culture has the highest yield.

#### NON-DRUG TREATMENT

Transfusion is indicated for severe haemorrhage.  
Replace fluid and electrolytes.

#### DRUG TREATMENT

- ciprofloxacin, oral, 500 mg 12 hourly for 10 days

**OR**

If oral therapy not possible, start with:

ceftriaxone, IV, 2 g/day

Stool cultures must be repeated at weekly intervals after convalescence to ensure that a carrier state has not developed. Two consecutive negative stool cultures are required to exclude carrier state. This is of vital importance in food handlers, who must not be permitted to return to work until stools are negative.

Chronic carriers:

- ciprofloxacin, oral, 750 mg 12 hourly for 6 weeks

#### REFERRAL

- surgical consultation for complications such as intestinal haemorrhage, threatening bowel perforation or localisation with metastatic infection with or without abscess formation, and peritonitis

### 9.10 VARICELLA (CHICKENPOX)

B01.8

See also primary care guidelines.

#### NON-DRUG TREATMENT

Cool, wet compresses or tepid water baths.

Body hygiene to prevent secondary infection.

Advise against scratching.







## CHAPTER 10 HIV AND AIDS

### 10.1 OPPORTUNISTIC DISEASES

#### 10.1.1 CANDIDIASIS OF OESOPHAGUS/TRACHEA/BRONCHI

B20.4

##### **DESCRIPTION**

Mucosal candidiasis involving oesophagus/trachea/bronchi is AIDS-defining (WHO clinical stage 4). Oesophagitis is by far the commonest manifestation.

Clinical features: symptoms of pain or difficulty on swallowing together with oral thrush.

##### **NON-DRUG TREATMENT**

Maintain adequate hydration.

##### **DRUG TREATMENT**

- fluconazole, IV/oral, 200 mg daily for 14 days  
The usual route is oral, but give IV if patient unable to swallow.  
An early relapse should be treated with a 4-week course of fluconazole as above.  
**Note:**  
Fluconazole prophylaxis is discouraged.

In case of failed therapy:

- amphotericin B, slow IV infusion, 0.7 mg/kg/day in dextrose 5 % over 4 hours for 14 days  
The nephrotoxicity of amphotericin B is minimised by ensuring adequate hydration.  
Regular, e.g. 3 times a week, monitoring of potassium, magnesium and renal function is essential.

##### **REFERRAL**

##### **DOWN**

- to antiretroviral treatment center

#### 10.1.2 CRYPTOCOCCOSIS

B45

##### **DESCRIPTION**

Infection due to *Cryptococcus neoformans*. Extrapulmonary disease is AIDS-defining (WHO clinical stage 4). Meningitis with or without disease elsewhere is the commonest manifestation.

**NON-DRUG TREATMENT**

Therapeutic lumbar puncture is of critical importance in cryptococcal meningitis as the intracranial pressure is frequently elevated – this should be done with pressure monitoring, removing sufficient CSF (maximum 18 mL) to lower pressure to 18 cm H<sub>2</sub>O. Therapeutic lumbar puncture should be done daily until there is improvement.

**DRUG TREATMENT**

- amphotericin B, slow IV infusion, 0.7 mg/kg/day in dextrose 5 % over 4 hours for 14 days

This is not always feasible and an earlier switch to oral fluconazole may be considered if there has been a good clinical response, i.e. resolution of headache and normal consciousness.

The nephrotoxicity of amphotericin B is minimised by ensuring adequate hydration. Regular, e.g. 3 times a week, monitoring of potassium, magnesium and renal function is essential.

Follow with:

- fluconazole, oral, 400 mg daily for 8 weeks

**SECONDARY PROPHYLAXIS**

Continue for at least 6 months and until CD4 count increases to > 200 on HAART or life long if patient is not on HAART.

**Note:**

In patients on concomitant TB therapy, CSF should be culture negative before reducing the dose to 200 mg daily as rifampicin reduces the plasma levels of fluconazole.

- fluconazole, oral, 200 mg daily

**REFERRAL****SPECIALIST OR TERTIARY**

- focal neurological signs – CT scans required to exclude other pathology e.g. toxoplasmosis

**DOWN**

- to antiretroviral treatment centre

**10.1.3 CRYPTOSPORIDIOSIS DIARRHOEA**

B20.8

**DESCRIPTION**

Chronic diarrhoea due to *Cryptosporidium parvum*. Disease lasting > 4 weeks is AIDS-defining (WHO clinical stage 4).

**NON-DRUG TREATMENT**

Rehydration with oral rehydration solution (ORS).

**DRUG TREATMENT**

There is no specific antimicrobial therapy for cryptosporidiosis. As with other opportunistic diseases it responds well to HAART.

Antimotility agents are partially effective, e.g.:

- loperamide, oral, 4 mg initially, followed by 2 mg as required up to four times daily

**REFERRAL  
DOWN**

- o to antiretroviral treatment centre

**10.1.4 CYTOMEGALOVIRUS (CMV)**

B25

**DESCRIPTION**

CMV disease outside the reticulo-endothelial system is an AIDS-defining illness (WHO clinical stage 4). The commonest manifestations are:

- o retinitis
- o GIT ulceration and
- o polyradiculitis

Retinitis must be diagnosed by an ophthalmologist.

GIT and other organ involvement must be diagnosed on biopsy.

CNS disease must be diagnosed by PCR of CSF.

**DRUG TREATMENT****Ganciclovir**

Ganciclovir is the treatment of choice, but this agent is toxic and expensive and can only be used by a specialist familiar with its use.

Patients should be commenced on HAART as soon as possible after initiating ganciclovir in order to prevent recurrent disease. Initial therapy with systemic ganciclovir should be considered for all patients, but intra-ocular therapy is an option for limited retinitis. See Section 18.6: Retinitis, HIV CMV.

Maintenance therapy is only applicable to CNS disease and retinitis.

FBC should be monitored regularly during therapy. Other drugs associated with bone marrow suppression (particularly zidovudine) should be avoided.

**BIOPSY PROVEN GIT DISEASE AND OTHER ORGAN DISEASE**

- ganciclovir, IV, 5 mg/kg 12 hourly for 14–21 days. Specialist initiated.

**CNS****Initial treatment**

- ganciclovir, IV, 5 mg/kg 12 hourly for 14–21 days. Specialist initiated.



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### **Maintenance treatment**

Only patients with a good clinical response should be considered for maintenance, as the cost is currently very high.

- ganciclovir, IV, 5 mg/kg daily until CD 4 count rises to > 100 on HAART

### **REFERRAL**

#### **SPECIALIST OR TERTIARY CENTER**

- all

#### **DOWN**

- to antiretroviral treatment centre

### **10.1.5 ISOSPORIASIS**

A07.3

#### **DESCRIPTION**

Diarrhoea due to *Isospora belli*. Disease lasting > 4 weeks is AIDS-defining (WHO clinical stage 4).

#### **NON-DRUG TREATMENT**

Rehydration with oral rehydration solution (ORS).

#### **DRUG TREATMENT**

- trimethoprim/sulfamethoxazole 80/400, oral, 4 tablets 12 hourly for 10 days

#### **SECONDARY PROPHYLAXIS**

Continue for at least 6 months and until CD4 count increases to > 200 on HAART or life long if patient is not on HAART:

- trimethoprim/sulfamethoxazole 80/400, oral, 2 tablets daily

### **REFERRAL**

#### **DOWN**

- to antiretroviral treatment centre

### **10.1.6 MYCOBACTERIOSIS – DISSEMINATED NON-TUBERCULOUS**

B20.0

#### **DESCRIPTION**

Disseminated infection due to non-tuberculous mycobacteria, usually *Mycobacterium avium* complex. Diagnosis must be by culture from sterile sources, e.g. blood, tissue and bone marrow. AIDS-defining illness (WHO clinical stage 4).

#### **DRUG TREATMENT**

- clarithromycin, oral, 500 mg 12 hourly. Specialist initiated.

#### **PLUS**

- ethambutol, oral, 15–20 mg/kg/day



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Treatment can be stopped when treatment has been continued for at least 12 months AND the CD4 count has increased to > 100 on HAART.

### REFERRAL DOWN

- o to antiretroviral treatment centre

### 10.1.7 PNEUMOCYSTIS PNEUMONIA

B20.6

#### DESCRIPTION

Interstitial pneumonitis due to *Pneumocystis jiroveci* (formerly *carinii*). AIDS-defining illness (WHO clinical stage 4).

#### NON-DRUG TREATMENT

Oxygen by face mask or CPAP as necessary.

#### DRUG TREATMENT

- trimethoprim/sulfamethoxazole 80/400, oral, 6 hourly for 21 days
  - < 60kg three tablets
  - > 60kg four tablets

#### **Note:**

Monitor FBC and potassium when on high dose therapy.

#### **Trimethoprim/sulfamethoxazole desensitisation**

Patients with a history of trimethoprim/sulfamethoxazole hypersensitivity should be considered for desensitisation.

Desensitisation should not be considered for patients with hypersensitivity that is life threatening such as Stevens–Johnson syndrome.

This desensitisation schedule should only be done as an inpatient.

#### **Note:**

Antihistamines should **not** be given with this regimen:

Dilute 0.1 mL (0.8/4 mg) of trimethoprim/sulfamethoxazole suspension in 200 mL sodium chloride 0.9% or dextrose 5% solution.

1 mL dilute solution = 0.004/0.02 mg trimethoprim/sulfamethoxazole

Hour	dose	trimethoprim/sulfamethoxazole, administer orally
0	0.004/0.02mg	1 mL of dilute solution
1	0.04/0.2 mg	10 mL of dilute solution
2	0.4/2 mg	0.05 mL of syrup or 100 mL of dilute solution
3	4/20 mg	0.5 mL of syrup
4	40/200 mg	5 mL of syrup or ½ tablet
5	160/800 mg	2 single strength or 1 double strength tablet



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Alternatives, in case of allergy, intolerance, etc.:

- clindamycin, oral, 600 mg 8 hourly for 21 days

### PLUS

- primaquine, oral, 15 mg daily for 21 days  
Exclude G6PD deficiency before initiating therapy.

For hypoxic patients:

- prednisone, oral, 80 mg daily for 5 days, then taper over 14 days

### SECONDARY PROPHYLAXIS

Continue for at least 6 months and until CD4 count increases to > 200 on HAART or life long if patient is not on HAART.

- trimethoprim/sulfamethoxazole 80/400, oral, 1 tablet daily

Alternatives, in case of allergy, intolerance, etc.:

- dapsone, oral, 100 mg daily

### REFERRAL

#### SPECIALIST OR TERTIARY CENTRE

- intolerance to second line regimen

#### DOWN

- to antiretroviral treatment centre

## 10.1.8 CEREBRAL TOXOPLASMOSIS

B20.8

### DESCRIPTION

Intracranial space occupying lesions, with contrast enhancement on imaging, due to *Toxoplasma gondii*. AIDS-defining illness (WHO clinical stage 4).

Diagnosis is confirmed by response to therapy, which occurs in 7–14 days.

### DRUG TREATMENT

- trimethoprim/sulfamethoxazole 80/400, oral, 4 tablets 12 hourly for 28 days, followed by 2 tablets 12 hourly for 3 months

### SECONDARY PROPHYLAXIS

Continue for at least 6 months and until CD4 count increases to > 200 on HAART or life long if patient is not on HAART.

- trimethoprim/sulfamethoxazole 80/400, oral, 1 tablet daily  
See trimethoprim/sulfamethoxazole desensitisation above.

### REFERRAL

#### SECONDARY OR TERTIARY

- intolerance to trimethoprim/sulfamethoxazole

#### Note:

Attempt desensitisation first.

#### DOWN

- to antiretroviral treatment centre

## 10.2 ANTIRETROVIRAL THERAPY

Highly active antiretroviral therapy (HAART) consists of three or more antiretroviral drugs that are capable of suppressing HIV replication when used together. The usual HAART regimen contains two nucleoside reverse transcriptase inhibitors together with either a non-nucleoside reverse transcriptase inhibitor or a protease inhibitor. High levels of adherence are essential for long-term success with HAART. The national guidelines for public sector use of HAART are based largely on the 2002 WHO guidelines. Treatment with HAART is a rapidly changing field. Therefore the guidelines are likely to change, particularly with the advent of new therapies.

### Medical indications for initiating HAART in adults:

- CD4 count < 200  $10^6/L$
- OR**
- WHO stage 4 disease (excluding tuberculosis – see below)

### PSYCHOSOCIAL INDICATORS OF READINESS FOR HAART

- It is essential that patients have good insight into the need for long-term therapy and high levels of adherence.
- Structures need to be in place to provide adherence support for patients.
- Patients should be encouraged to disclose their HIV status to somebody close to them and this person should act as a treatment supporter. If this is not possible then the patient should join a support group.
- Depression must be treated.
- HAART must not be commenced if there is active substance abuse.

### HAART REGIMENS AND MONITORING

With the antiretrovirals currently available in South Africa it is possible to have two robust HAART regimens. These should last at least five years and considerably longer than this in patients with high levels of adherence.

#### Regimen 1

Consists of two nucleoside reverse transcriptase inhibitors, i.e. stavudine + lamivudine **plus** a non-nucleoside reverse transcriptase inhibitor, either efavirenz or nevirapine. Efavirenz and nevirapine are equipotent, but have different toxicities. Efavirenz is teratogenic and should not be used in women of child-bearing potential. There is cross-resistance between efavirenz and nevirapine so there is no point switching them when virological failure occurs.

- stavudine, oral, 40 mg 12 hourly
- If < 60 kg: 30 mg 12 hourly.

#### AND

- lamivudine, oral, 150 mg 12 hourly

#### PLUS

- efavirenz, oral, 600 mg at night

#### OR

- nevirapine, oral 200 mg daily for the first 2 weeks increasing to 200 mg 12 hourly thereafter



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### Regimen 2

Consists of two alternative nucleoside reverse transcriptase inhibitors, i.e. zidovudine and didanosine plus the protease inhibitor combination, i.e. lopinavir/ritonavir. The small dose of ritonavir in this preparation acts as a potent enzyme inhibitor in order to boost the level of lopinavir.

- zidovudine, oral, 300 mg 12 hourly

#### AND

- didanosine, oral, 400 mg once daily on an empty stomach  
If < 60 kg: 250 mg 12 hourly

#### PLUS

- lopinavir/ritonavir 400/100, oral, 3 capsules 12 hourly

### Efficacy monitoring

Monitor CD4 count and viral load 6 monthly.

The viral load will indicate when resistance is developing and when regimens need to be changed. The viral load should become lower than the detectable limit by 6 months. If this does not happen on the first regimen then this is nearly always due to poor adherence. Consider switching to the second line regimen when the viral load rises to > 5 000 copies/mL, assuming that the initial response was good. The CD4 response is more variable, with an average increase of around 150 cells in the first year.

### Toxicity monitoring

Laboratory monitoring for toxicity varies with the individual antiretroviral drug. Refer to the national guideline.

## USING HAART IN PATIENTS WITH TUBERCULOSIS

A wide range of immune suppression occurs in HIV infected patients in areas where tuberculosis is endemic. Tuberculosis itself should not be a criterion for starting HAART, even though some forms of tuberculosis are considered AIDS illnesses. If tuberculosis develops before HAART is started, the CD4 count determines when HAART should be started:

### CD4 > 200

Defer HAART until after tuberculosis has been treated. HAART should only be started then if the CD4 drops to below 200 or another AIDS-defining illness occurs.

### CD4 50–200

Complete 2 months of antituberculous therapy, i.e. two months for an initial episode of tuberculosis, before commencing HAART.

### CD4 < 50 or severe AIDS defining illness

Commence ARV therapy after 2 weeks of TB therapy.

If the patient develops TB when on HAART then the HAART regimen must not be discontinued but modified because of drug interactions (see below).

There are significant shared side effects of HAART and TB therapy. HAART can also lead to paradoxical deterioration of TB. In addition there are significant drug



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interactions. Rifampicin acts as an enzyme inducer, leading to increased metabolism of many drugs:

- nucleoside reverse transcriptase inhibitors, e.g. zidovudine, are not affected
- non-nucleoside reverse transcriptase inhibitors, e.g. efavirenz and nevirapine, levels are modestly reduced. These can be used with rifampicin. Efavirenz is preferable as the evidence is less good with nevirapine.
- protease inhibitor levels are **dramatically reduced**. Only ritonavir, a powerful enzyme inhibitor, is capable of overcoming this at higher doses. Additional ritonavir 300 mg 12 hourly added to lopinavir/ritonavir 400/100mg will result in adequate protease inhibitor levels.

### MANAGEMENT OF SELECTED ANTIRETROVIRAL SIDE EFFECTS

#### Hyperlipidaemia

Protease inhibitors can cause dyslipidaemia, with raised LDL cholesterol and triglycerides. Criteria for initiating therapy are the same as for HIV seronegative subjects. See Section 8.9: Dyslipidaemia. Statins should not be used as protease inhibitors inhibit the metabolism of most statins resulting in extremely high levels.

Patients who fail to respond to diet should be treated with a fibric acid derivative, e.g.:

- bezafibrate, oral, 400 mg at night

#### Hyperlactataemia

Symptomatic hyperlactataemia without acidosis occurs in 1–2% of patients on long-term NRTIs per annum. Lactic acidosis is rare, i.e.  $\pm$  0.1% per annum. The risk of lactate elevation differs among the NRTIs approximately as follows:

didanosine > stavudine > zidovudine > lamivudine

Risk factors for hyperlactataemia include:

- females
- obesity
- prolonged use of NRTIs
- development of NRTI-induced peripheral neuropathy or fatty liver

The clinical symptoms of hyperlactataemia are non-specific and may include:

- nausea
- vomiting
- abdominal pain
- weight loss
- malaise
- liver dysfunction (due to steatosis)
- tachycardia

A high index of suspicion is necessary. Lactate levels need to be sent on ice and processed rapidly. Alternatively, point of care finger prick lactate monitoring can be done. Acid base status should be checked.



Patients with lactate levels 2–5 mmol/L who are relatively well:

Therapy can be altered by selecting NRTIs that are less associated with lactataemia or, in the case of stavudine, by reducing the dose and monitor by serial lactate measurements (initially weekly) for approximately three months.

Patients with lactate levels > 5 mmol/L:

Withdraw HAART and commence alternative antiretroviral therapy once hyperlactatemia has resolved to less than 2 mmol/L which may take up to three months. This should be commenced at ARV treatment centre. Symptoms typically resolve very slowly. If there is acidosis then admission to a high care unit is recommended.

Lactic acidosis carries a poor prognosis. Treatment is supportive. It is essential to exclude other causes of lactic acidosis, especially sepsis. Consideration can be given to high dose vitamin B, especially riboflavin and thiamine. However, it is unknown whether these may have a role in therapy.

In most cases of severe symptomatic hyperlactataemia or lactic acidosis NRTIs should be stopped and not used again. However some authorities feel that once symptoms settle NRTIs that are less associated with hyperlactataemia could be used. If this is done then it is essential to monitor lactate levels serially, i.e. monthly for 3 months.

#### **Immune reconstitution inflammatory syndrome (IRIS)**

Within 3 months of initiating HAART some patients experience an immunopathological response to opportunistic diseases, which may be previously undiagnosed or diagnosed and on effective therapy.

IRIS is associated with an abnormal inflammatory response that can cause recurrence of symptoms in patients on treatment for an opportunistic infection, paradoxical deterioration despite therapy or unusual inflammatory presentations. IRIS is particularly common in patients with tuberculosis and occurs mainly when HAART is started with low CD4 counts and when opportunistic infections are partially treated, e.g. within 2 months of starting treatment for tuberculosis or cryptococcal meningitis.

Diagnosis is often difficult as new opportunistic diseases or drug resistance need to be excluded. HAART and therapy for the opportunistic infection should continue. Symptomatic therapy, e.g. paracetamol or NSAIDs is helpful for fever or pain. Short courses of high dose corticosteroids have been used, but should **ONLY** be considered for life-threatening manifestations, e.g. compression of major structures by enlarging lymph nodes, expanding CNS tuberculomata and worsening meningitis, as there are no controlled trials.

### **10.3 POST-EXPOSURE PROPHYLAXIS, OCCUPATIONAL**

Z29.2

Antiretroviral therapy may prevent the risk of acquiring HIV following a significant occupational exposure.

It is essential to adequately document occupational exposures for possible subsequent compensation.

Other blood borne infections (hepatitis B and C) should also be tested for in the source patient and appropriate prophylaxis instituted in the case of hepatitis B.



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### ASSESSING THE RISK OF OCCUPATIONAL EXPOSURES

The risk of acquiring HIV following occupational exposure is determined by the nature of the exposure or by the infectiousness of the source patient. High-risk exposures involve exposure to a larger quantity of viruses from the source patient, either due to exposure to larger quantity of blood or because the amount of virus in the blood is high. Any one of the following associated with an increased risk of HIV transmission and are **high risk** exposures:

- deep percutaneous sharps injuries
- percutaneous exposure involving a hollow needle that was used in a vein or artery
- visible blood on the sharp instrument involved in a percutaneous injury
- the source patient has terminal AIDS or is known to have a high viral load, i.e. > 100 000 copies/mL

In instances when the risk of infection is extremely low or non-existent, post-exposure prophylaxis (PEP) is not indicated, as the risks of PEP will far outweigh the benefits. PEP is **NOT** indicated when:

- the material the healthcare worker was exposed to is not infectious for HIV in the occupational setting, e.g. vomitus, urine, faeces or saliva, unless these are visibly blood stained
- the exposure was on intact skin
- the source patient is HIV negative, unless there are clinical features to suggest seroconversion illness, in which case PEP should be commenced until further tests are done – consult with a virologist or infectious diseases specialist
- the healthcare worker is HIV positive

### PEP REGIMENS

PEP should be commenced as soon as possible, within minutes, after the injury. PEP should be considered up to 72 hours after exposure and, in exceptional circumstances involving high-risk exposures, PEP may be considered up to 7 days after exposure.

When PEP is indicated, two regimens are recommended:

#### **standard risk, basic two-drug regimen**

- zidovudine, oral, 300 mg 12 hourly for 4 weeks

#### **AND**

- lamivudine, oral, 150 mg 12 hourly for 4 weeks

#### **high-risk, expanded three-drug regimen**

#### **ADD**

- lopinavir/ritonavir 133/33, oral, 3 capsules 12 hourly

Recommendations for post exposure prophylaxis (PEP) after occupational exposure to infectious material (includes blood, CSF, semen, vaginal secretions and synovial/pleural/ pericardial/ peritoneal/amniotic fluid) from HIV seropositive patients.

Exposure	HIV status of source patient		
	Unknown	Positive Standard risk	Positive High risk*
intact skin	no PEP	no PEP	no PEP
mucosal splash/non-intact skin	consider 2 drug regimen	2 drug regimen	2 drug regimen
percutaneous (sharps)	2 drug regimen	2 drug regimen	3 drug regimen
percutaneous (needle in vessel or deep injury)	2 drug regimen	3 drug regimen	3 drug regimen

PEP is not well tolerated. Adverse events occur in about half and therapy is discontinued in about a third. The highest rates of adverse events occur with 3 drug regimens. Most of the adverse events are not life threatening. Headache, nausea and malaise are the commonest adverse events. In cases where adverse events are intolerable a clinician experienced in managing HIV should be consulted for alternative antiretroviral drugs.

#### Monitoring after occupational exposure

Laboratory monitoring is done to exclude acquisition of HIV infection and, for those given PEP, to monitor toxicity.

Healthcare workers should be tested for HIV infection at the time of the exposure and again at 6 weeks, 3 months and 6 months.

The test of choice is the HIV antibody test, which should be done in a laboratory, usually an enzyme immuno-assay or ELISA, rather than with a clinic-based rapid test in order to ensure adequate documentation. Healthcare workers should be instructed to practice safer sex until their HIV test is negative 6 months following exposure.

The laboratory assessment of toxicity is limited to screening and monitoring for the haematological toxicity of zidovudine. Perform FBC at baseline, after 2 and 4 weeks on antiretroviral therapy.

#### 10.4 POST-EXPOSURE PROPHYLAXIS FOR PENETRATIVE ANAL OR VAGINAL SEXUAL ASSAULT

PEP should be offered to rape survivors who present within 72 hours.

Rape survivors who test HIV seropositive must not be given PEP.

Offer the basic two-drug PEP regimen:

- zidovudine, oral, 300 mg 12 hourly for 4 weeks

#### AND

- lamivudine, oral, 150 mg 12 hourly for 4 weeks

High-risk, expanded three-drug regimen:

#### ADD

- lopinavir/ritonavir, oral, 400/100 mg 12 hourly

Laboratory monitoring should be the same as for occupational PEP.

Other important aspects of care for the rape survivor should not be forgotten, i.e. contraception, treatment for sexually transmitted infections, counseling and forensic specimens.

## CHAPTER 11 SURGICAL ANTIBIOTIC PROPHYLAXIS

### GENERAL PRINCIPLES

- the need for prophylactic antibiotic therapy is based on the risk of wound contamination
- antibiotic prophylaxis is not required for clean operations/procedures in immunocompetent patients, who have minimal risk of contamination. In all other situations, prophylaxis should be considered.
- the drug chosen should be active against the pathogens most likely to be associated with wound infections
- prophylaxis must be given within 60 minutes of the first incision, usually at induction

**The prophylactic dose is a single dose equal to the standard therapeutic dose.**

A second dose is **ONLY** given if surgery is prolonged, i.e. > 4 hours for cefazolin **OR** > 8 hours for metronidazole

TYPE OF SURGERY	ANTIBIOTIC USED
<b>Cardiovascular surgery</b>	• cefazolin, IV, 1 g
<b>Lower limb amputation</b>	• cefazolin, IV, 1 g <b>PLUS</b> • metronidazole, IV, 500 mg
<b>Orthopaedic surgery</b>	• cefazolin, IV, 1 g
<b>Head and neck surgery</b>	• cefazolin, IV, 1 g For procedures involving the oropharyngeal mucosa: <b>ADD</b> • metronidazole, IV, 500 mg
<b>Abdominal surgery Upper GIT</b>	• cefazolin, IV, 1 g

TYPE OF SURGERY	ANTIBIOTIC USED
<b>Colorectal and appendix</b>	<ul style="list-style-type: none"> <li>• cefazolin, IV, 1 g</li> </ul> <b>PLUS</b> <ul style="list-style-type: none"> <li>• metronidazole, IV, 500 mg</li> </ul> If perforation has occurred, treat patient for infection with a course of appropriate antibiotics.
<b>Biliary</b>	Only for high risk patients: bile obstruction, jaundice, biliary stones or cholecystitis, or re-operation: <ul style="list-style-type: none"> <li>• cefazolin, IV, 1 g</li> </ul> <b>PLUS</b> <ul style="list-style-type: none"> <li>• metronidazole, IV, 500 mg</li> </ul>
<b>Pelvic surgery</b>	<ul style="list-style-type: none"> <li>• cefazolin, IV, 1 g</li> </ul> <b>PLUS</b> <ul style="list-style-type: none"> <li>• metronidazole, IV, 500 mg</li> </ul>
<b>ENT surgery</b>	<ul style="list-style-type: none"> <li>• cefazolin, IV, 1 g</li> </ul> For procedures involving the oropharyngeal mucosa: <b>ADD</b> <ul style="list-style-type: none"> <li>• metronidazole, IV, 500 mg</li> </ul>
<b>Nephro-urological surgery</b>	<ul style="list-style-type: none"> <li>• cefazolin, IV, 1 g</li> </ul> Treat patients with preoperative bacteriuria according to MCS.
<b>Ophthalmic surgery</b>	<ul style="list-style-type: none"> <li>• chloramphenicol 0.5% ophthalmic drops, instil 1 drop 2–4 hourly for 24 hours prior to surgery</li> </ul>
<b>Neurosurgery</b>	<ul style="list-style-type: none"> <li>• cefazolin, IV, 1 g</li> </ul>

**SEVERE  $\beta$ -LACTAM ALLERGY**

Use in place of cefazolin and cefazolin plus metronidazole.

Clindamycin has good anaerobic cover.

- clindamycin, IV, 300 mg

**COLORECTAL, BILIARY OR PELVIC SURGERY**

- clindamycin, IV, 300 mg

**PLUS**

- gentamicin, IV, 3 mg/kg



## CHAPTER 12 PAIN

### 12.1 PAIN, CHRONIC

R52

#### **DESCRIPTION**

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage.

Pain is always a subjective experience.

The perception of pain is modulated by the patient's mood, morale and the meaning the pain has for the patient.

#### **ASSESSMENT OF PAIN**

Pain needs to be recognised and assessed before it can be managed appropriately. All patients with chronic pain require a thorough physical assessment as well as psychiatric/psychological assessment to rule out depression and/or a somatoform pain disorder.

Consider using a visual analogue scale.

Self-report of pain is the key to pain assessment.

Patient evaluation includes complaints of pain, functional status, medication use and possible overuse, and comorbid illness.

Pain control should be reviewed regularly in each patient.

#### **NON-DRUG TREATMENT**

Treatment of chronic pain needs to address the physical pathology that initiated the chronic pain, as well as the important social and psychologic sequelae of chronic symptoms.

The goal of pain management should include reconditioning, reducing pain and improving function, sleep and mood.

Discuss the management with the family.

Address all factors that may contribute to pain and associated symptoms, e.g. family stress, anxiety and sleep deprivation. Address family anxiety.

Use therapies, e.g. massage, splints, physiotherapy etc, where appropriate.

#### **DRUG TREATMENT**

Although pain is rarely eliminated, treatment should reduce daily pain level, as well as the frequency, severity and duration of the pain flares.

Neuropathic pain is best treated with analgesics in addition to tricyclic antidepressants or antiepileptics.

Concerns regarding addiction should not compromise adequate pain control with opioids.

Utilise the least invasive route of medication administration, preferably orally.

**ANALGESICS**

For chronic pain, analgesics must be administered regularly and not as “when required” (prn). Additional short acting analgesia may be required 30 minutes prior to pain inducing activity such as physiotherapy.

Monitor pain control and seek advice if pain is not promptly and adequately controlled. It is useful to combine different classes of medicines, the combination of which will be determined by the severity, type and control of pain.

**1. Non-opioid drugs**

- paracetamol, oral, 1 g 6 hourly

**2. Non-steroidal anti-inflammatory drugs (NSAIDs)**

Can be used in combination with paracetamol or opioids.

E.g.:

- ibuprofen, oral, 400–800 mg three times a day with meals  
An additional nighttime dose of a NSAID may be required.

**3. Opioid drugs**

Increase doses of opioids according to the individual need to overcome pain. Take into account the development of tolerance.

The correct dose is that which relieves patient’s symptoms and, except for **tramadol**, may exceed the recommended dose used in other pain relief settings. Assess patient frequently.

- morphine, short acting, oral  
Starting dose: 10–20 mg 4–6 hourly.  
Increase dose by 50% every 24 hours if pain control is sub-optimal.  
Reduce the dosing interval if there is regular breakthrough pain.  
Manage nausea.  
**OR**  
morphine, long acting, oral, 30–60 mg 12 hourly  
Titrate to desired effect.  
**OR**  
tramadol, oral, 50 mg, 4–6 hourly as a starting dose.  
May be increased to a maximum of 400 mg daily.

As opioids cause constipation, laxatives should be used prophylactically, e.g.:

- lactulose, oral, 20 mL daily as required

**ADJUVANT THERAPY**

Adjuvant agents can enhance pain control by targeting specific pain mechanisms.

- nerve injury pain
- burning paresthesia
- neuropathic pain
- nerve root compression
- HIV neuropathy
- chemotherapeutic nerve injuries

In addition to analgesia as above:

- amitriptyline, oral, 10–25 mg at night  
Titrated up to 75 mg at night.

**AND/OR**

- carbamazepine, oral, 100 mg every 12 hours for two weeks then 200 mg every 12 hours  
Titrated slowly up to 600 mg every 12 hours, depending on the response.

For nausea and vomiting:

- metoclopramide, oral, 10–20 mg 8–12 hourly  
**OR**  
metoclopramide, IV, 10 mg every 8 hours

For pruritus or nausea:

- promethazine, oral/IV, 10 mg 6 hourly

For anxiety:

- diazepam, oral, 2–5 mg every 12 hours

For colic:

- hyoscine butylbromide, IV/oral, 10 mg 6–8 hourly

**REFERRAL**

- pain resistant to medical management

There is no place for invasive/life supporting measures in terminal patients. Discuss end of life events with patients to relieve their anxiety and avoid unnecessary referrals.



## CHAPTER 13 MUSCULOSKELETAL SYSTEM

### 13.1 ARTHRITIS, RHEUMATOID

M06.9

#### **NON-DRUG TREATMENT**

Manage by co-ordinated multidisciplinary care.

The primary outcome is to improve and maintain functional status.

The early use of the non-drug methods of management especially nursing, physiotherapy and occupational therapy, is essential.

Acute flare-ups: rest affected joints and consider the use of day and/or night splints.

#### **DRUG TREATMENT**

Evaluate all patients with suspected RA for Disease-Modifying Anti-Rheumatic Medication (DMARD). All patients with suspected RA should be seen at an early stage by an appropriate specialist.

#### **Disease-modifying anti-rheumatic medication (DMARD), e.g.:**

- methotrexate,
- chloroquine sulphate
- sulfasalazine

Use DMARDs only with regular monitoring for toxicity. This applies particularly to the retinal toxicity caused by chloroquine and to the adverse effects of methotrexate i.e. bone marrow, liver toxicity, etc.

- |                |  |
|----------------|--|
| chloroquine:   | ○ Beware of G6PD deficiency.   |
|                | ○ Do ophthalmic examination every six months.                                  |
| sulfasalazine: | ○ Liver function and FBCs 2–4 weekly for first 3 months then every 3–6 months. |
| methotrexate:  | ○ Liver function and FBCs prior to and every 12 weeks during treatment.        |
|                | ○ Use with caution in alcoholics and patients with renal disease.              |

Titrate dose of sulfasalazine and methotrexate gradually to maintenance dose.

- methotrexate, oral, 7.5 mg/week. Specialist consultation.  
Increase dose gradually to 20 mg per week.

#### **PLUS**

folic acid, oral, 5 mg/week with methotrexate

#### **AND/OR**

- chloroquine sulphate, oral, 150 mg (as base) for 5 days of each week

#### **AND/OR**

- sulfasalazine, oral, 500 mg twice daily, initial dose  
Increase dose to 1 g twice daily.

**Oral corticosteroids**

Indicated for:

- severe synovitis not controlled by other means
- the elderly threatened by functional dependence
- intolerable morning stiffness
- marked systemic component
- as bridging therapy while waiting for DMARDs to take effect

May be used at high doses, for an acute flare, for short periods i.e. 2 weeks.

- prednisone, oral, 40–60 mg daily for 2 weeks  
Thereafter gradually reduce the dose to 5–10 mg daily.  
The continued need for systemic steroids always needs periodic review.

Patients requiring corticosteroids for longer than 3 months should be educated to take in enough calcium in their diet or if necessary, give:

- calcium elemental, oral, 1 g daily

If necessary:

**ADD**

- vitamin D, oral, 800 units daily or 50 000 units twice a month

Monitor serum calcium twice a month.

**Pain alleviation**

- paracetamol, oral, 1 g 6 hourly as needed

**NSAIDs**

Use for active inflammation with pain.

NSAIDs are used for symptomatic control only as they have no long-term disease modifying effects.

Once the diagnosis has been established, do not use as monotherapy.

The anti-inflammatory action of the NSAIDs may take 2–4 weeks to become evident.

Reduced NSAID dosages must be used in the elderly.

NSAIDs are relatively contra-indicated in patients with significantly impaired renal function, i.e. GFR < 60.

Concomitant use of more than one oral NSAID has no additional clinical benefit  
and only increases toxicity.  
The addition of paracetamol is of benefit.

- ibuprofen, oral, 800 mg 3 times daily  
If not tolerated: 400 mg three times daily.

**OR**

diclofenac, oral, 50 mg 3 times daily

If not tolerated: 25 mg three times daily.

**OR**

naproxen, oral, 500 mg twice daily

An extra **nighttime** dose of a NSAID may be added to some patients with severe nocturnal pain/morning stiffness.

**Note:**

When an added nighttime dose is added to the patient's regimen, the risk of NSAID induced toxicity increases. A reduction in the daytime dose of NSAIDs is recommended as the nighttime dose will often exceed the recommended total daily NSAID dose. If a reduction in daytime dose cannot occur then the use of the nighttime dose must be for the shortest period possible.

In high-risk patients: i.e. patients > 65 years and those with a history of peptic ulcer disease:

- omeprazole, oral, 20 mg daily whilst on NSAIDs. Specialist consultation.

Adjunct for pain control:

- amitriptyline, oral, 25 mg at night  
Titrated dose according to response.  
Maximum dose: 75 mg at night.  
Use with caution in patients with angle closure glaucoma, prostatic hypertrophy and the elderly.  
Initial dose in the elderly: 10 mg at night.

**Intra-articular corticosteroids**

Consider if needed selected cases.

To be prescribed and administered by a specialist only.

Not more than 2–3 injections per year per joint is recommended.

- methylprednisolone acetate, 20–80 mg  
**OR**  
betamethasone depot, 0.75–6 mg, depending on joint size

**URGENT REFERRAL**

- tendon rupture
- protrusion acetabuli

**REFERRAL**

- for joint replacement and/synovectomy

**13.2 ARTHRITIS, SEPTIC AND OSTEOMYELITIS, ACUTE**

M00.9/M86.1

**NON-DRUG TREATMENT**

Rest and immobilisation.

Surgical drainage: always consider early drainage by orthopaedic surgeon.

**DRUG TREATMENT****Empiric antibiotic therapy**

Therapy is directed against *S.aureus* unless there evidence of urethritis or PID in which case gonococcal infection should be covered.

It is crucial to obtain cultures of blood, joint or other fluids before administering antibiotics.

- cloxacillin, IV, 2 g 6 hourly for 4 weeks

Penicillin allergy:

- vancomycin, IV, 1 g 12 hourly

For gonococcus:

- ceftriaxone, IV, 1 g daily

Penicillin allergy:

- ciprofloxacin, oral, 500 mg 12 hourly until resolved, i.e.  $\pm$  4 weeks

**Analgesia**

- paracetamol, oral, 1 g 6 hourly as needed

**OR**

NSAID until pain subsides e.g.:

- ibuprofen, oral, 400 mg 8 hourly

**OR**

diclofenac, oral, 25 mg 8–12 hourly

Monitor activity of disease clinically and by serial weekly CRP measurements.

**REFERRAL**

- for early drainage by orthopaedic surgeon
- if pyrexia persists in spite of adequate antibiotic therapy, a subperiosteal abscess must be looked for and drained by an orthopaedic surgeon
- growth plate involvement
- chronic osteomyelitis and its complications
- pathological fractures

**13.3 OSTEO-ARTHROSIS AND OSTEO-ARTHRITIS**

M19.9

**NON-DRUG TREATMENT**

Weight reduction.

Exercise, postural and non-weight bearing.

Rest during acute painful episodes.

Support and alleviate weight bearing of affected joints i.e. walking stick.

Consider physiotherapy and/or occupational therapy.

**DRUG TREATMENT**

When only pain relief is required:

- paracetamol, oral, 1 g 6 hourly as needed

If ineffective:

**ADD**

NSAIDs e.g:

- ibuprofen, oral, 400–800 mg three times daily

As these patients have concomitant medical conditions, NSAIDs must be used with caution in, e.g. the elderly and those with cardiovascular, gastrointestinal disease or renal function impairment.

**REFERRAL**

- for consideration of joint replacement
- intractable pain
- neurogenic compression

**13.4 GOUT**

M10.9

**NON-DRUG TREATMENT****ACUTE ATTACK**

Rest and immobilisation.

**CHRONIC GOUT**

Lifestyle modification, including continued high fluid intake. Dietary purine restriction is of limited value.

Avoid excessive alcohol intake.

Avoid diuretics if possible, or use the lowest dose possible.

**DRUG TREATMENT****ACUTE GOUT**

Short course, high dose NSAIDs, e.g.:

- naproxen, oral, 750 mg immediately then 500 mg 12 hourly for 24–48 hours

**OR**

diclofenac, oral, 75 mg immediately, then 50 mg 8 hourly for 24–48 hours

Thereafter halve the dose for the duration of the attack.

**OR**

ibuprofen, oral, 800 mg 8 hourly, for 24–48 hours

Thereafter halve the dose for the duration of the attack.

In patients with renal impairment, or dehydration, NSAIDs should be avoided and corticosteroids used instead.

Where NSAIDs cannot be used:

- prednisone, oral, 40 mg daily for 3–5 days

**CHRONIC GOUT**

Avoid known precipitants and drugs that increase uric acid, if possible, e.g.:

- low dose aspirin
- ethambutol
- pyrizinamide

- diuretics, especially hydrochlorothiazide 25 mg or greater
- Remove secondary causes where possible.  
Assess renal function and blood urate level.

**Uric acid lowering therapy**

Urate lowering therapy is required in the following:

- > 2 acute attacks per year
- chronic tophaceous gout
- urate renal stones
- urate nephropathy
- serum urate > 0.52 mmol/L

When the acute attack has settled completely, i.e. after 3 weeks:

- allopurinol, oral, 100 mg daily  
Increase monthly by 100 mg according to urate blood levels.  
Titrate dose to reduce serum urate to < 0.4 mmol/L.  
Average dose: 300 mg/day.  
Maximum dose: 400 mg daily.  
The elderly and patients with renal impairment require lower doses.

**ADD**

For the first 1–3 months:

If not contra-indicated, an NSAID, e.g.:

- ibuprofen, oral, 400 mg 8 hourly  
**OR**  
diclofenac, oral, 25 mg 8–12 hourly  
**OR**

If an NSAID is contra-indicated or not tolerated:

- colchicine, oral, 0.5 mg twice daily for up to 3 months

**Do not stop uric acid lowering drugs during an acute attack.**

**REFERRAL**

- no response to treatment
- non-resolving tophaceous gout

**13.5 SERONEGATIVE SPONDYLARTHRTIS**

M45–49

**DESCRIPTION**

A group of diseases in which there is a predominant asymmetrical lower-limb seronegative arthritis and sacro-iliitis. Many are associated with skin, mucous membrane, cardiac or bowel disease. There are HLA associations.



## CHAPTER 13

## MUSCULOSKELETAL SYSTEM

Diseases included are Reactive Arthritis, Ankylosing Spondylitis, Reiter's Syndrome, Psoriatic Arthropathy, the arthritis associated with Ulcerative Colitis and Crohn's disease, Behcet's syndrome, Whipples disease.

Initiate treatment with NSAIDs.

### **REFERRAL**

All with:

- severe arthritis
- deformity at diagnosis
- failure of therapy

### **13.5.1 ARTHRITIS, REACTIVE**

M13.9

### **DESCRIPTION**

An acute nonpurulent arthritis complicating an infection elsewhere in the body. A spondyloarthritis following enteric or urogenital infections and occurring predominantly in individuals with HLA-B27 antigen, usually 1–4 weeks prior to the arthritis. It is a clinical diagnosis with no laboratory test or radiographic findings. It is usually self-limiting, however joint symptoms may persist in 30–60% of patients.

### **DRUG TREATMENT**

Start with a high dose and titrate downwards if not needed or if not tolerated.

- ibuprofen, oral, 800 mg 3 times daily  
If not tolerated: 400 mg three times daily.  
**OR**  
diclofenac, oral, 50 mg 3 times daily  
If not tolerated: 25 mg three times daily.  
**OR**  
naproxen, oral, 500 mg 12 hourly

Prompt appropriate treatment of acute chlamydial urethritis may prevent subsequent attacks; i.e.:

- doxycycline, oral, 100 mg 12 hourly for 10 days

### **REFERRAL**

- if steroids are required

**13.6 SYSTEMIC LUPUS ERYTHEMATOSUS (SLE)**

L93

**These patients need to be managed by a specialist.**

**NON-DRUG TREATMENT**

Education regarding the disease and complications.

Avoid cigarette smoking as it is a trigger for lupus.

Avoidance of sunlight exposure.

Avoid medications implicated in triggering or causing deterioration of SLE.

Sun protective barrier creams are often indicated.

Regularly monitor urine for blood and protein.

Advice regarding family planning as pregnancy may cause a lupus flare.

**DRUG TREATMENT****MILD DISEASE****Pain alleviation**

- paracetamol, oral, 1 g 6 hourly as needed

**AND/OR**

- ibuprofen, oral, 800 mg 3 times daily  
If not tolerated: 400 mg three times daily.

**OR**

- diclofenac, oral, 50 mg 3 times daily  
If not tolerated: 25 mg three times daily.

**OR**

- naproxen, oral, 250–500 mg twice daily

**Corticosteroids**

Initiate therapy in patients with life threatening manifestations and organ involvement.

- prednisone, oral, 1–2 mg/kg daily, initial dose  
Taper to the lowest maintenance dose after a response has been obtained.  
Usual maintenance dose: 10 mg daily.

Patients requiring corticosteroids for longer than 3 months should be educated to take in enough calcium in their diet or if necessary, give:

- calcium, elemental, oral, 1 g daily

If necessary:

**ADD**

- vitamin D, oral, 800 units daily or 50 000 units twice a month

Monitor serum calcium twice a month.

**Additional immunosuppressive therapy**

Is often required for life threatening disease particularly kidney and CNS involvement.

These patients should be managed by a specialist.

- azathioprine, oral, 1–2 mg/kg daily

**OR**

- cyclophosphamide, oral, 100–200 mg daily or 1–3 mg/kg daily

**DISEASE LIMITED TO THE SKIN AND JOINT**

- chloroquine sulphate, oral, 150–300 mg (base) daily for 5 days a week  
Regular ophthalmic examination, i.e. every 6 months.

**SEVERE RAYNAUD'S PHENOMENON**

Long acting dihydropyridine calcium channel blocker, e.g.:

- amlodipine, oral, 5 mg daily

**ANTIPHOSPHOLIPID ANTIBODY SYNDROME**

- aspirin, soluble, oral, 150 mg daily

Patients with previous thrombo-embolic episodes should be adequately anticoagulated with lifelong warfarin.

**Hormonal therapy**

The use of the oral contraceptive is controversial.

Until there is clarity it is advisable to:

- avoid oestrogens in patients with lupus
- use only progesterone.

**REFERRAL**

- all patients for initial assessment
- lupus flare
- severe nephritis
- persistent haematological derangements ie thrombocytopenia



## CHAPTER 14 NEUROLOGICAL DISORDERS

### 14.1 CEREBROVASCULAR DISEASE

#### 14.1.1 STROKE

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##### **NON-DRUG TREATMENT**

Optimal hydration and nutrition – nasogastric tube if patient cannot swallow.  
Precautions should be taken to ensure an open airway if patient is unconscious.  
Physiotherapy and good nursing care.  
Consider rehabilitation for suitable patients – refer if necessary.

ECG in the acute setting to rule out accompanying acute coronary ischaemic event.  
Syphilis serology.

##### **DRUG TREATMENT**

The disease requires good initial evaluation, ongoing support for patients and continuous evaluation to ensure compliance in taking medication and diet.

All cases not on anticoagulation:

- aspirin, soluble, oral, 150 mg daily

Long-term anticoagulation with warfarin may be considered for thrombotic/embolic stroke, e.g. if there is a cardiac source of emboli, provided close follow-up can be anticipated.

It is unclear when this should be initiated as there is a risk of haemorrhagic transformation in the immediate post stroke period. Low dose subcutaneous heparin may be warranted for DVT prophylaxis.

See Section 3.7: Venous Thrombo-Embolism

##### **HYPERTENSION**

In the first 72 hours following stroke, it is usual for blood pressure to be elevated. It is important to remember that excessive lowering of blood pressure may worsen neurological damage.

Do not lower BP in acute stroke or use antihypertensive medication unless the SBP > 220 mmHg or the DBP > 120 mmHg, as a rapid fall may aggravate cerebral ischaemia and worsen the stroke.

If the BP is above these levels then treatment should aim not to lower the BP by more than 15–20% in the first 24 hours.

Aggressive control of hypertension following stroke limits the risk of recurrent events. Treat according to guidelines. See Section 3.5: Hypertension.