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17.1 Conditions with predominant wheeze

17.1.1 Bronchospasm, acute associated with asthma and chronic obstructive bronchitis

J45.9

Description

This is an emergency situation recognised by various combinations of:

- » wheeze
- » breathlessness
- » tightness of the chest
- » respiratory distress
- » chest indrawing in children
- » cough

In adults bronchospasm is usually associated with asthma (where the bronchospasm is usually completely reversible) or chronic obstructive pulmonary disease (COPD) (where the bronchospasm is partially reversible).

The clinical picture of pulmonary oedema due to left ventricular heart failure may be similar to that of asthma. In patients over 50 years presenting with asthma for the first time, the diagnosis of pulmonary oedema due to left ventricular heart failure should be considered.

Bronchospasm in children is usually associated with asthma or with infections such as bronchiolitis or bronchopneumonia. Foreign bodies or obstruction of airways due to tuberculous nodes or congenital malformation should also be considered, especially if the wheeze is unilateral.

All PHC facilities should have peak expiratory flow (PEFR) meters, as asthma cannot be correctly managed without measuring PEFR.

Recognition and assessment of severity of attacks in children

	Moderate	Severe
Respiratory rate	more than 40 per minute	more than 40 per minute
Chest indrawing/recession	present	present
PEF (if > 5 years old)	50–70% of predicted	below 50% of predicted
Speech	normal or difficult	unable to speak
Feeding	difficulty with feeding	unable to feed
Wheeze	present	absent
Consciousness	normal	impaired

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Recognition and assessment of severity of attacks in adults

	Moderate	Severe
Talks in	phrases	words
Alertness	usually agitated	agitated, drowsy or confused
Respiratory rate	20–30 per/minute	often more than 30 per minute
Wheeze	loud	loud or absent
Pulse rate	100–120 per minute	above 120 per minute
PEF after initial nebulisation	approx. 50–75%	below 50%; may be too short of breath to blow in PEF meter

Note:

PEF is expressed as a percentage of the predicted normal value for the individual, or of the patient's personal best value obtained previously when on optimal treatment.

Drug treatment

- Oxygen, 40% or higher, using highest concentration face mask
Note:
In chronic obstructive pulmonary disease:
Oxygen, should be given with care (preferably by 24% or 28% facemask if available) and patients should be observed, as a small number may develop increasing hypercarbia deterioration of their condition.
- Salbutamol 0.5%, solution, nebulised over 3 minutes preferably driven by oxygen
 - Children: 0.5–1 mL in 3 mL of sodium chloride 0.9%
 - Adults: 1–2 mL in 3 mL of sodium chloride 0.9%
 - If no relief, repeat every 20–30 minutes in the first hour
 - Thereafter repeat every 2–4 hours if needed

If reversal of bronchospasm is incomplete after the first nebulisation:

Children with asthma

- Prednisone, oral, 1–2 mg/kg immediately then once daily for 7 days

Weight kg	Dose mg	Tablet 5 mg	Age months/years
≥ 11–14 kg	20 mg	4 tablets	≥ 2–3 years
≥ 14–17.5 kg	30 mg	6 tablets	≥ 3–5 years
≥ 17.5 kg and above	40 mg	8 tablets	≥ 5 years and adult

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If oral prednisone cannot be taken:

- Hydrocortisone, IV, 4–6 mg/kg immediately.
 - Maximum dose: 100 mg.

Weight kg	Dose mg	Injection 100 mg/2 mL	Age months/years
≥ 11–14 kg	50 mg	1 mL	≥ 2–3 years
≥ 14–17.5 kg	75 mg	1.5 mL	≥ 3–5 years
≥ 17.5 kg and above	100 mg	2 mL	≥ 5 years and adult

Adults with asthma or COPD

- Prednisone, oral, 40 mg immediately then 20–40 mg once daily for 7 days

If oral prednisone cannot be taken:

- Hydrocortisone, IV, 100 mg immediately

and

- Ipratropium bromide, solution, added to salbutamol solution
 - Children 0.5–1 mL (0.125–0.25 mg)
 - Adults 2 mL (0.5 mg)

If no nebuliser available

- Salbutamol, inhalation, 4–8 puffs, using a spacer, every 4 hours.
 - Inhale one puff at a time and allow for 4 breaths through the spacer between puffs.

If there is no immediate response:

add

- Ipratropium bromide, inhalation, 4 puffs, using a spacer, every 4 hours.

If no relief:

Repeat salbutamol every 20–30 minutes in the first hour.

Thereafter repeat every 2–4 hours if needed

Note:

Administering salbutamol via a spacer is as effective as and cheaper than using a nebuliser.

In severe cases, nebulisation must be given with oxygen.

! CAUTION !

Avoid sedation of any kind.

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Assessment of response in children

	Response	No response
PEF (if possible)	improvement by more than 20%	improvement by less than 20%
Respiratory rate	less than 40 per minute	more than 40 per minute
Chest indrawing or recession	absent	present
Speech	normal	impaired
Feeding	normal	impaired

Assessment of response in adults

	Response	No response
PEF (if possible)	improvement by more than 20%	improvement by less than 20%
Respiratory rate	less than 20 per minute	more than 20 per minute
Speech	normal	impaired

Patients responding to treatment:

- » Routine prescription of antibiotics is not indicated for acute asthma.
- » Review current treatment and possible factors causing acute attack including poor adherence and poor inhaler technique.
- » Advise patient or caregiver on further care at home, danger signs and of follow up required.
- » Caution patient on the high chance of further wheezing in the week following an acute attack.
- » Patients with a first attack should be fully assessed for maintenance treatment.
- » Ask about smoking: if yes, urge patient to stop.

Referral

Urgent

- » Any general danger sign and life-threatening features:
 - tachycardia (pulse > 120 before nebulisation)
 - drowsiness
 - confusion
 - silent chest
 - cyanosis
 - collapse
 - inability to complete a sentence in one breath
- » No response to initial treatment.

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- » PEFR of less than 75% of the predicted normal or of personal best value 15–30 minutes after nebulisation.
- » A lower threshold to admission is appropriate in patients when:
 - seen in the afternoon or evening, rather than earlier in the day
 - recent onset of nocturnal symptoms or aggravation of symptoms
 - previous severe attacks, especially if the onset was rapid

Referral

- » Patients needing repeated courses of oral corticosteroids (more than twice over six months) should be assessed for maintenance therapy (see chronic asthma below).

17.1.2 Asthma, chronic

J45.9

Description

A chronic inflammatory disorder with reversible airways obstruction. In susceptible patients, exposure to various environmental triggers, allergens or viral infections result in inflammatory changes, bronchospasm, increased bronchial secretions, mucus plug formation and if not controlled, eventual bronchial muscle hypertrophy of the airways' smooth muscle. All these factors contribute to airways obstruction. Asthma varies in intensity and is characterised by recurrent attacks of:

- » wheezing
- » dyspnoea or shortness of breath
- » cough, especially nocturnal and
- » periods of no airways obstruction between attacks

Acute attacks may be caused by:

- » exposure to allergens
- » respiratory viral infections
- » non-specific irritating substances
- » exercise

Asthma must be distinguished from chronic obstructive pulmonary disease, which is often mistaken for asthma – See section 17.1.3. The history is a reliable diagnostic guideline and may be of value in assessing treatment response.

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Asthma	COPD
<ul style="list-style-type: none">» Young age onset, usually before 20» History of hay fever, eczema and/or allergies.» Family history of asthma.» Symptoms are intermittent with periods of normal breathing in between.» Symptoms are usually worse at night or in the early hours of the morning, during an upper respiratory tract infection, when the weather changes or when upset.» Marked improvement with beta agonist.	<ul style="list-style-type: none">» Older age onset, usually after 40» Symptoms slowly worsen over a long period of time.» Long history of daily or frequent cough before the onset of shortness of breath.» Symptoms are persistent rather than only at night or during the early morning.» History of heavy smoking (more than 20 cigarettes/day for 15 years or more), heavy cannabis use or previous TB.» Little improvement with beta agonist.

Asthma cannot be cured, but it can be controlled with regular treatment.

Note:

The diagnosis of asthma can be difficult in children under 6 years of age.

If the diagnosis of asthma is uncertain, refer the patient.

General measures

- » No smoking by an asthmatic or in the living area of an asthmatic.
- » Avoid contact with household pets.
- » Avoid exposure to known allergens and stimulants or irritants.
- » Education on early recognition and management of acute attacks.
- » Patient and caregiver education including:
 - emphasising the diagnosis and explaining the nature and natural course of the condition
 - teaching and monitoring the technique for use of inhalers
 - reassuring parents and patients of the safety and efficacy of continuous regular controller therapy

Assessing response to therapy

Response to treatment is based primarily on symptoms:

- » Frequency of asthma symptoms
- » Use of reliever medication
- » Nighttime/early morning awakening
- » Limitation of daily activities

Peak Expiratory Flow Rate (PEFR)

Refer to pages xxx – xxxii for PEF charts

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The Peak Expiratory Flow Rate (PEFR) may provide additional information for assessing response to therapy. See below.

- » PEFR is best assessed in the morning and evening
 - The patient is requested to blow forcibly into the device after a deep inspiratory effort
 - Three blows are performed at each testing point.
 - The highest value is taken as the true value.
- » The PEFR can be helpful in confirming a diagnosis of asthma in primary care.
 - An improvement of 60 L/minute or 20% or more of the pre-bronchodilator PEFR, 10–20 minutes after inhalation of a beta agonist, e.g. 2 puffs of salbutamol 100 mcg, confirms a diagnosis of asthma.
 - A normal PEFR excludes the possibility of moderate and severe COPD.
- » PEFR may be useful in assessing response to therapy.
 - Any value more than 80% of the personal best prior to the use of a bronchodilator is regarded as adequate control. Ensure that pre-bronchodilator values are measured at follow-up visits.

Note:

Initiating and optimising inhalation corticosteroid therapy for moderate and severe asthma should always be done with the use of a peak flow meter to assess severity and treatment response of asthma.

Inhalation therapy

Inhaled therapy is preferable to oral therapy.

Spacer devices

- » Spacers are vital for an adequate therapeutic effect of inhaled therapy.
- » Spacer devices should be used for all inhaled medications in all age groups to improve efficacy of drug delivery and limit adverse effects.
- » Use the spacer appropriate for the age of the patient.

	Spacer volume	Face mask
Infants	150–250 mL	mandatory
Children	500 mL	highly recommended
Adolescents and adults	750 mL	

- » Inhalation spacer devices enable parents to administer inhaled therapy even to small children
- » Children under 3 years should have a spacer with a face mask while older children and adults can use the spacer with a mouth piece directly
- » Demonstrate steps 2–6 of the relevant inhaler technique more than once to ensure the correct procedure

Patient and caregiver education on inhaler and spacer techniques.

- » Under the age of 3 years a mask attachment should be used with the spacer.

Inhalation therapy without a spacer in adults:

1. remove the cap from the mouthpiece
2. shake the inhaler well
3. while standing or sitting upright, breathe out as much air as possible
4. place the mouth piece of the inhaler between the lips and gently close the lips around it
5. while beginning to inhale, press down the canister of the metered dose inhaler once to release one puff while breathing in as deeply as possible
6. hold the breath for 5–10 seconds, if possible
7. breathe out slowly and rest for a few breaths (30–60 seconds)
8. repeat steps 2–6 for the second puff

Inhalation therapy with a spacer in adults and older children:

1. remove the caps from the inhaler and the spacer
2. shake the inhaler well
3. insert the mouthpiece of the metered dose inhaler into the back of the spacer
4. insert the mouthpiece of the spacer into the mouth and close the lips around the mouthpiece. Avoid covering any small exhalation holes.
5. press down the canister of the metered dose inhaler once to release one puff into the spacer
6. immediately take 3–4 slow deep breaths.
7. repeat steps 4–6 for each puff prescribed, waiting at least 30 seconds between puffs
8. rinse mouth after inhalation of corticosteroids

Inhalation therapy with the spacer alone in younger children:

1. allow to breathe slowly in and out of the spacer continuously for 30 seconds
2. while still breathing, release one puff from the inhaler into the spacer
3. continue breathing for 3–4 breaths
4. if breathing is through the nose, pinch the nose gently while breathing from the spacer

Inhalation therapy with a spacer and mask for infants and small children:

1. remove the caps from the inhaler and the spacer
2. shake the inhaler well
3. infants may be placed on the caregiver's lap or laid on a bed while administering the medication
4. apply the mask to the face, ensuring that the mouth and nose are well covered
5. with the mask held firmly onto the face, press down the canister of the metered dose inhaler once to release one puff into the spacer
6. keep the mask in place for at least six breaths, then remove
7. repeat steps 4–6 for each puff prescribed, waiting at least 30 seconds between puffs

Drug treatment

Drug treatment is based on the severity of the asthma and consists of therapy to prevent the inflammation leading to bronchospasm (controller) and to relieve bronchospasm (reliever).

Reliever drugs in asthma:

- Beta₂ agonists, e.g. salbutamol (short acting)
 - are indicated for the immediate relief of the symptoms of acute attacks
 - can be used as needed
 - increasing need for reliever drug indicates poor asthma control

Beta₂ agonists:

- Beta₂ agonists e.g. salbutamol, inhalation, 100–200 mcg (2 puffs), as required 4–6 hourly until relief is obtained (not continuously).

Controller drugs in asthma:

- Inhaled corticosteroids, e.g. budesonide and beclomethasone.
 - Must be used twice daily, even when the patient feels well.

Once symptoms and PEFr have improved, the dose should be reduced to the minimum maintenance dose needed for control.

Children:

- Budesonide or beclomethasone, inhalation, 100 mcg, 12 hourly regularly.

Adults:

- Budesonide or beclomethasone, inhalation, 200 mcg, 12 hourly regularly provided the efficacy is controlled with a peak flow meter.

If no improvement, refer to doctor.

Higher doses - doctor initiated as per peak flow results**Children:**

- Budesonide or beclomethasone, inhalation, 200 mcg 12 hourly regularly.

Adults:

- Budesonide or beclomethasone, inhalation, 400 mcg, 12 hourly regularly.

STEP 1: MILD INTERMITTENT ASTHMA

Indications for only intermittent reliever therapy:

- » not more than one or two episodes of daytime cough and/or wheeze per week
- » less than one night-time cough and/or wheeze per month
- » no recent (within the last year) admission to hospital for asthma
- » PEFr more than 80% predicted between attacks
- » exercise-induced asthma – inhaler should be used before exercise

Children and adults:

- Beta₂ agonist, e.g. salbutamol, inhalation, 1–2 puffs 3–4 times daily as needed until symptoms are relieved.

STEP 2: MILD PERSISTENT ASTHMA

- » 3–4 episodes of wheeze and /or cough per week
- » 2–4 episodes of night time wheeze or cough per month
- » PEFr more than 80% predicted between attacks

Children:

- Budesonide or beclomethasone, inhalation, 100 mcg, 12 hourly regularly.
- and**
- Beta₂ agonist, e.g. salbutamol, inhalation, 1–2 puffs 3–4 times daily as needed until symptoms are relieved.

Adults:

- Budesonide or beclomethasone, inhalation, 200 mcg, 12 hourly regularly.
- and**
- Beta₂ agonist, e.g. salbutamol, inhalation, 1–2 puffs 3–4 times daily as needed until symptoms are relieved.

STEP 3: MODERATE PERSISTENT ASTHMA

- more than 4 episodes of day time wheeze, tightness or cough per week
- more than 4 night time awakenings per month
- PEFr more than 60% but less than 80% predicted

Children:

- Budesonide or beclomethasone, inhalation, initiate with 100 mcg 12 hourly regularly.
 - If no response, refer to doctor to uptitrate to 200 mcg, 12 hourly regularly.
- and**
- Beta₂ agonist, e.g. salbutamol, inhalation, 1–2 puffs 3–4 times daily as needed until symptoms are relieved.

Adults:

- Budesonide or beclomethasone, inhalation, initiate with 200 mcg, 12 hourly regularly.
 - If no response, refer to doctor to uptitrate to 400 mcg, 12 hourly regularly.
- and**
- Beta₂ agonist, e.g. salbutamol, inhalation, 1–2 puffs 3–4 times daily as needed until symptoms are relieved.

STEP 4: MODERATE PERSISTENT ASTHMA NOT CONTROLLED ON THESE DOSAGESAdults:

Add slow release theophylline, doctor initiated.

- Oral theophylline has a limited place in the treatment of asthma after insufficient response to inhaled beta₂ stimulants and corticosteroids in sufficient doses and should be prescribed only on the basis of proven benefit via pulmonary function testing in individual patients.
- Ongoing use of theophylline should be re-evaluated periodically – if there is no benefit after 4 weeks it should be discontinued.
- Theophylline slow release, oral, initially 200 mg 12 hourly and may be increased to 300 mg 12 hourly. (Doctor initiated)
 - Higher dosages of theophylline in adherent patients should only be considered using blood level monitoring.
 - The elderly are more susceptible to theophylline toxicity.

CHRONIC MANAGEMENT ASPECTS OF ASTHMA**Stepping treatment down or up**

- » Review treatment every 3 months

Stepping down treatment:

- » Attempt a reduction in therapy if the patient has not had any acute exacerbation of asthma in the preceding 6 months
- » Gradually reduce the dose or stop regular inhaled corticosteroid therapy
- » If the symptoms are seasonal, corticosteroids may often be stopped until the next season
- » If symptoms reappear, increase the therapy to the level on which the patient was previously controlled

Stepping up treatment:

- » Therapy should be stepped up if a patient is not appropriately controlled
- » Inadequate control is recognised by:
 - increasing symptoms
 - increasing use of reliever
 - deteriorating peak flow rates as detected from record in an asthma diary

Referral

- » All children less than 6 years should be evaluated by a doctor for assessment and confirmation of diagnosis
- » Any patient who has received more than 2 courses of oral prednisone within a 6 month period
- » Brittle asthma (very sudden, very severe attacks)
- » Inadequate response to acute or chronic treatment

- » Diagnosis is uncertain
- » With or after a life-threatening episode
- » Pregnant women with aggravated asthma
- » Children not responding to treatment in step 3: moderate persistent asthma
- » Adults not responding to treatment in step 4: moderate persistent asthma not controlled on these dosages

17.1.3 Chronic Obstructive Pulmonary Disease (COPD)

J44.9

Also referred to as chronic obstructive airways disease (COAD), and includes chronic bronchitis and emphysema.

Description

Chronic bronchitis and emphysema are conditions manifested by:

- » chronic cough with or without sputum production on most days of 3 or more months for 2 or more consecutive years
- » dyspnoea or shortness of breath
- » wheezing

This condition is primarily caused by smoking.

The onset is very gradual with progressively worse symptoms. Due to the large reserve capacity of the lungs, patients often present when there is considerable permanent damage to the lungs. The airways obstruction is not fully reversible. The main causes of chronic bronchitis and emphysema are chronic irritation of the airways caused by smoking, air pollution, previous TB, previous cannabis (dagga) smoking although there are many other causes. It is not primarily an infection, but a degenerative condition.

Patients usually present with some of the following:

- » wheezing
- » shortness of breath
- » cough with or without sputum
- » manifestations of right-sided heart failure
- » acute bronchitis after a cold or flu with the above symptoms

Note:

The airways obstruction of chronic bronchitis and emphysema is not completely reversible as in asthma.

Oral corticosteroids may be required for acute exacerbations, but these have severe long-term complications and should only be used long term if benefit can be proven by lung function testing.

General measures

- » Smoking cessation, including cannabis (dagga), is the mainstay of therapy.
- » Chest physiotherapy to improve breathing and coughing mechanics and during infective episodes
- » Encourage adequate fluid intake especially in the elderly and those with prolonged dyspnoea

Drug treatment**Acute lower airways obstruction**

Treat as for acute asthma

Chronic obstruction management:

- » In a stable patient, check PEFr.
- » Then give a test dose of salbutamol – 2 puffs.
- » Repeat PEFr 15 minutes later.
- » If there is a 15% or greater improvement in peak flow, treat as for asthma. See section 17.1.2
- » The routine use of inhaled corticosteroids is not recommended, unless there is a 15% or greater improvement in PEFr after a test dose of salbutamol.

Patients failing to respond to the test dose of salbutamol:

- Beta₂ agonist, e.g. salbutamol, inhalation, 1–2 puffs 3–4 times daily as needed for relief of wheeze

and if not controlled:

- Ipratropium bromide, MDI, 2 puffs 6–8 hourly – doctor initiated

If response to inhaler therapy is poor:

- Theophylline slow release, oral, initially 200 mg 12 hourly (Doctor initiated)
 - May be increased to 300 mg 12 hourly.
 - Higher dosages of theophylline in adherent patients should only be considered using blood level monitoring.
 - The elderly are more susceptible to theophylline toxicity.
 - Theophylline interacts with many other drugs including antibiotics such as erythromycin and quinolones.

Acute infective bronchitis:

- Doxycycline, oral, 100 mg 12 hourly for 10 days
- or
- Amoxicillin, oral, 500 mg 8 hourly for 10 days

Prophylaxis against respiratory tract infections:

- Influenza vaccination, annually
- Pneumococcal vaccination, 5 yearly

Referral

- » Poor response to above therapy, for further investigations and adjustment of treatment

17.1.4 Bronchiolitis, acute in children

J21.9

Description

Acute bronchiolitis is a common cause of wheezing and cough in the first two years of life.

It is caused by viral infections and presents with lower airways obstruction due to inflammation and plugging of the small airways. Recurrent episodes can occur, usually during winter.

Child presents with:

- » rapid breathing
- » chest indrawing
- » decreased breath sounds
- » an audible wheeze

General measures

- » Minimise contact with other children.
- » Avoid use of antibiotics and corticosteroids.
- » Do not sedate child.

Drug treatment

- Oxygen, humidified, using nasal canula at 1–2 L per minute
- Salbutamol 0.5%, solution, 0.5–1 mL diluted to 2–4 mL with sodium chloride 0.9%, nebulised over 3 minutes (single dose)
 - Evaluate the response to salbutamol.
 - Send patient home on salbutamol metered dose inhaler with spacer if there is a good response.

Referral

- » Chest indrawing and distress not responding to salbutamol
- » Difficulty in feeding
- » Sleep disturbance
- » Previous admission for same problem
- » Oxygen saturation less than 90% in room air

17.2 Upper airways obstruction

J05

17.2.1 Croup (Laryngotracheobronchitis) in children

J05.0

Description

Croup is a common cause of potentially life-threatening airway obstruction in childhood. It is characterised by inflammation of the larynx, trachea and bronchi. Most common causative pathogens are viruses, including measles.

A clinical diagnosis of viral croup can be made if a previously healthy child develops progressive inspiratory airway obstruction with stridor and a barking cough, 1–2 days after the onset of an upper respiratory tract infection. A mild fever may be present.

Suspect foreign body aspiration if there is a sudden onset of stridor in an otherwise healthy child.

Suspect epiglottitis if the following are present in addition to stridor:

- » very ill child
- » high fever
- » drooling saliva
- » unable to swallow
- » sitting upright with head held erect

Assessment of the severity of airway obstruction and management in croup

Grade 1 inspiratory stridor only	<ul style="list-style-type: none"> • Prednisone, oral, 1–2 mg/kg, single dose <ul style="list-style-type: none"> ○ Do not give if measles or herpes infection present » Refer
Grade 2 inspiratory and expiratory stridor	<ul style="list-style-type: none"> • Adrenaline, 1:1 000 diluted in sodium chloride 0.9%, nebulised, immediately <ul style="list-style-type: none"> ○ Dilute 1 mL of 1:1 000 adrenaline with 1 mL sodium chloride 0.9% ○ Repeat every 15–30 minutes until expiratory stridor disappears • Prednisone, oral, 1–2 mg/kg, immediately as a single dose » Refer

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Grade 3 inspiratory and expiratory stridor with active expiration using abdominal muscles	» Treat as above » If no improvement within one hour, refer urgently (intubate before referral if possible)
Grade 4 Cyanosis, apathy, marked retractions, impending apnoea	» intubate (if not possible give treatment as above) » Refer urgently

General measures

- » Keep child comfortable.
- » Continue oral fluids.
- » Encourage parent or caregiver to remain with the child.

Drug treatment

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
 - In children under 6 months calculate dose by weight

Weight kg	Dose mg	Use one of the following:		Age months/years
		Syrup 120 mg/5mL	Tablet 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55kg and above	Up to 1000mg	–	Up to 2 tablets	≥ 15 years and adults

If the child requires referral - while awaiting transfer:

- Adrenaline, 1:1000, nebulised, immediately using a nebuliser.
 - If there is no improvement, repeat every 15 minutes, until the child is transferred
 - Dilute 1 mL of 1:1000 adrenaline with 1 mL sodium chloride 0.9%.
 - Nebulise the entire volume with oxygen at a flow rate of 6–8 L/minute
- Prednisone, oral, 1–2 mg/kg immediately then once daily for 7 days

Weight kg	Dose mg	Tablet 5 mg	Age months/years
≥ 11–14 kg	20 mg	4 tablets	≥ 2–3 years
≥ 14–17.5 kg	30 mg	6 tablets	≥ 3–5 years

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If epiglottitis suspected

- Ceftriaxone, **IM**, 50–80 mg/kg/dose immediately as a single dose

Weight kg	Dose mg	Use one of the following injections mixed with water for injection (WFI):			Age Months/ years
		250 mg WFI 2 mL	500 mg WFI 2 mL	1 000 mg WFI 3.5 mL	
≥ 2–2.5 kg	125 mg	1 mL	0.5 mL	–	
≥ 2.5–3.5 kg	200 mg	1.6 mL	0.8 mL	–	Birth–1 month
≥ 3.5–5.5 kg	250 mg	2 mL	1 mL	–	≥ 1–3 months
≥ 5–7 kg	375 mg	3 mL	1.5 mL	–	≥ 3–6 months
≥ 7–9 kg	500 mg	4 mL	2 mL	–	≥ 6–12 months
≥ 9–11 kg	625 mg	5 mL	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	750 mg	6 mL	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1 000 mg	–	4 mL	3.5 mL	≥ 3–5 years
≥ 17.5 kg and above	1 000 mg	–	4 mL	3.5 mL	5 years and adult

!CAUTION!

Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.

Contra-indicated in neonatal jaundice.

Annotate dose and route of administration in referral letter.

Management during transfer:

- » Give the child oxygen
- » Continue nebulisations with adrenaline
- » If grade 3 contact ambulance or nearest doctor
- » If grade 4 intubate and transfer

Referral

Urgent

- » All children grade 2 or more stridor
- » Children with
 - chest indrawing.
 - rapid breathing
 - altered consciousness
 - inability to drink or feed
- » For confirmation of diagnosis
- » Suspected foreign body
- » Suspected epiglottitis

17.3 Respiratory infections**17.3.1 Common cold and influenza**

J11.1

Description

Colds and influenza are self-limiting viral conditions that may last up to 14 days. Colds begin to clear within 3 days and influenza within 7 days.

Colds present with nasal stuffiness and throat irritation. In addition, influenza presents with headache, muscular pain and fever.

Malnourished children, the elderly and debilitated patients are at greater risk of developing complications.

!CAUTION!

Malaria, measles, and HIV sero conversion may present with flu-like symptoms.

Complications

Secondary bacterial infections, including:

- » pneumonia secondary to influenza
- » otitis media
- » sinusitis

General measures

- » “Steam” inhalations.
- » Bed rest if feverish.
- » Ensure adequate hydration.
- » Advise patient to return to clinic if earache, tenderness or pain over sinuses develops and cough or fever persists for longer than a week.

Drug treatment

Antibiotics are of no value for the treatment of the common cold and influenza.

Chapter 17

Respiratory conditions

Pain and fever:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
 - In children under 6 months calculate dose by weight

Weight kg	Dose mg	Use one of the following:		Age months/years
		Syrup 120 mg/5mL	Tablet 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55kg and above	Up to 1 000mg	–	Up to 2 tablets	≥ 15 years and adults

Infants:

- Sodium chloride 0.9%, instilled into each nostril

Referral

- » Severe complications

17.3.2 Bronchitis, acute in adults or adolescents

J20.9

Description

Acute airways, infections mostly of viral origin, accompanied by cough, sputum production and sometimes a burning retrosternal chest pain in patients with otherwise healthy lungs.

Clinical features:

- » initially – non productive cough
- » later – productive cough with yellow or greenish sputum

Viral bronchitis is usually part of an upper respiratory viral infection. It may be accompanied by other manifestations of viral infections. It is important to exclude underlying bronchiectasis or an acute exacerbation of chronic bronchitis in adults.

No antibiotics are indicated in uncomplicated acute bronchitis.

However, antibiotics may be considered for HIV positive patients because of the higher incidence of bacterial lower respiratory tract infections in this subgroup:

- Amoxicillin, oral, 500 mg 8 hourly for 5 days

In penicillin-allergic HIV positive patients:

- Erythromycin, oral, 500 mg 6 hourly for 5 days

For symptomatic relief

- Cough syrup, oral

17.3.3 Pneumonia

J18.9

Description

Infection of the lung parenchyma, usually caused by bacteria, especially Pneumococcus.

Management is guided by:

- » age
- » health status
- » severity of the pneumonia

Manifestations include:

- » malaise
- » fever, often with sudden onset and with rigors
- » cough, which becomes productive of rusty brown or yellow-green sputum
- » pleuritic type chest pain
- » shortness of breath
- » in severe cases, shock and respiratory failure

On examination there is:

- » fever
- » tachypnoea
- » crackles or crepitations
- » bronchial breath sounds

There may be a pleural rubbing sound or signs of a pleural effusion.

Predisposing conditions include:

- » the very young and old
- » other concomitant diseases
- » malnutrition
- » HIV infection

Pneumococcal pneumonia often occurs in previously healthy adults.

Adults with mild to moderately severe pneumonia may be managed at PHC level, depending on the response to initial treatment (see below).

17.3.4 Pneumonia in children

J18.9

Description

Pneumonia should be distinguished from viral upper respiratory infections. The most valuable sign in pneumonia is the presence of rapid breathing.

Assess the child for the severity of the pneumonia

Classify children according to the severity of the illness:

- » no pneumonia – fever and cough
- » pneumonia – fever, cough and rapid breathing
- » severe pneumonia – fever, cough, rapid breathing, chest indrawing (of the lower chest wall) and flaring nostrils.

Note:

Children less than 2 months of age with rapid breathing should be classified as having severe pneumonia.

Rapid breathing is defined as:

- » infants birth to 2 months 60 or more breaths per minute
- » infants 2 months to 1 year 50 or more breaths per minute
- » children 1–5 years 40 or more breaths per minute

Danger signs indicating urgent and immediate referral include:

- » low oxygen saturation of less than 90% in room air
- » inability to drink
- » impaired consciousness
- » cyanosis
- » age less than 2 months
- » grunting

General measures

- » Ensure adequate hydration
- » Continue feeding

Chapter 17**Respiratory conditions****Drug treatment****For pneumonia:**

- Amoxicillin, oral, 25–30 mg/kg/dose 8 hourly for 5 days

Weight kg	Dose mg	Use one of the following:			Age Months/ years
		Syrup		Capsule 250 mg	
		125 mg/ 5mL	250 mg/ 5mL		
≥ 3.5–5 kg	125 mg	5 mL	2.5 mL	–	≥ 1–3 months
≥ 5–7 kg	175 mg	7 mL	3.5 mL	–	≥ 3–6 months
≥ 7–11 kg	250 mg	10 mL	5 mL	1 capsule	≥ 6–18 months
≥ 11–14 kg	375 mg	15 mL	7.5 mL	–	≥ 18 months–3 years
≥ 14–25 kg	500 mg	–	10 mL	2 capsules	≥ 3–7 years
≥ 25–35 kg	750 mg	–	–	3 capsules	≥ 7–11 years
≥ 35 kg and above	1000mg	–	–	4 capsules	≥ 11 years and adult

Penicillin–allergic patients:

- » Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days

Weight kg	Dose mg			Age Months / years
		Syrup 125 mg/5 mL	Tablets 250 mg	
≥ 3.5–5 kg	50 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	75 mg	3 mL	–	≥ 3–6 months
≥ 7–9 kg	100 mg	4 mL	–	≥ 6–12 months
≥ 9–11 kg	125 mg	5 mL	–	≥ 12–18 months
≥ 11–14 kg	150 mg	6 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	200 mg	8 mL	–	≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25–35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adults

Chapter 17**Respiratory conditions**

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
 - In children under 6 months calculate dose by weight

Weight kg	Dose mg	Use one of the following:		Age months/years
		Syrup 120 mg/5mL	Tablet 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55kg and above	Up to 1 000mg	–	Up to 2 tablets	≥ 15 years and adults

Severe pneumonia:

» Oxygen, using nasal canula at 1–2 L per minute before and during transfer

- Ceftriaxone, **IM**, 50–80 mg/kg/dose immediately as a single dose

Weight kg	Dose mg	Use one of the following injections mixed with water for injection (WFI):			Age Months/ years
		250 mg WFI 2 mL	500 mg WFI 2 mL	1 000 mg WFI 3.5 mL	
≥ 2–2.5 kg	125 mg	1 mL	0.5 mL	–	
≥ 2.5–3.5 kg	200 mg	1.6 mL	0.8 mL	–	Birth–1 month
≥ 3.5–5.5 kg	250 mg	2 mL	1 mL	–	≥ 1–3 months
≥ 5–7 kg	375 mg	3 mL	1.5 mL	–	≥ 3–6 months
≥ 7–9 kg	500 mg	4 mL	2 mL	–	≥ 6–12 months
≥ 9–11 kg	625 mg	5 mL	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	750 mg	6 mL	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1 000 mg	–	4 mL	3.5 mL	≥ 3–5 years
≥ 17.5 kg and above	1 000 mg	–	4 mL	3.5 mL	≥ 5 years and adult

! CAUTION !

Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.

Contra-indicated in neonatal jaundice.

Annotate dose and route of administration on referral letter.

Chapter 17

Respiratory conditions

and

- Cotrimoxazole, oral, initial dose (before referral)

Weight kg	Use one of the following:		Age Month/years
	Suspension mL	Tablet 80/400 mg	
≥ 2.5–3.5 kg	2.5 mL	–	Birth–1 month
≥ 3.5–7 kg	5 mL	–	≥ 1–6 months
≥ 7–11 kg	7.5 mL	–	≥ 6–18 months
≥ 11–17.5 kg	10 mL	–	≥ 18 months–5 years
≥ 17.5–25 kg	15 mL	1½ tablets	≥ 5–7 years
≥ 25–35 kg and above	20 mL	2 tablets	≥ 7–11 years

Referral

Urgent

- » All children with severe pneumonia, i.e. chest indrawing (of the lower chest wall), flaring nostrils or cyanosis
- » All children under 2 months

Non-urgent

- » Inadequate response to treatment
- » Children coughing for more than 3 weeks to exclude other causes such as TB, foreign body aspiration, pertussis

17.3.5 Pneumonia, uncomplicated in adults

J18.9

A chest X-ray should ideally be taken in all patients to confirm the diagnosis. Two sputum smears to exclude TB should be done.

General measures

- » Encourage high oral fluid intake

Drug treatment

If not severely ill (see referral criteria below):

- Benzylpenicillin, IM, 2 MU immediately
- and
- Amoxicillin, oral, 1 000 mg 8 hourly for 5 days

If no response to treatment after 48 hours add:

- Erythromycin, oral, 500 mg 6 hourly for 5 days

In penicillin-allergic patients:

- Erythromycin, oral, 500 mg 6 hourly for 5 days

For fever:

- Paracetamol, oral, 1 000 mg oral 4–6 hourly when required to a maximum of four doses daily

Referral

Any of the following:

- » Confusion or decreased level of consciousness
- » Cyanosis
- » Respiratory rate of 30 breaths or more per minute
- » Systolic BP less than 90 mmHg
- » Diastolic BP less than 60 mmHg
- » Deterioration at any point
- » No response to treatment after 48 hours
- » Patients with pneumonia
 - from a poor socio-economic background
 - who are unlikely to comply with treatment
 - living a considerable distance from health centres
 - have no access to immediate transport

17.3.6 Pneumonia in adults with underlying medical conditions or over 65 years

J18.9

Common underlying conditions include:

- » Diabetes mellitus
- » HIV infection
- » Cardiac failure
- » COPD
- » Alcoholism
- » Chronic liver disease
- » Chronic kidney disease

Most of these patients will require referral to a doctor.

Mild pneumonia:

- Amoxicillin/clavulanic acid 250/125 (375), oral 8 hourly for 5–10 days
- plus**
- Amoxicillin, oral, 500 mg 8 hourly for 5–10 days.

17.3.7 Pneumonia, severe in adults

J18.9

Pneumonia is defined as severe by 2 or more of the following:

- » confusion or decreased level of consciousness
- » respiratory rate of 30 breaths or more per minute
- » systolic BP less than 90 mmHg
- » diastolic BP less than 60 mmHg
- » age over 65 years

While awaiting transfer:

- Oxygen

- Ceftriaxone, IV/IM, 1 000 mg, single dose before referral

! CAUTION !

Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.

Referral**Urgent**

- » All patients

17.3.8 Pneumocystis pneumonia in adults

B59

Description

Interstitial pneumonia occurring with advanced HIV infection due to *Pneumocystis jiroveci* (formerly *carinii*). Patients usually present with shortness of breath or dry cough with onset within 12 weeks.

Chest X-ray may be normal in the early stages but typically shows bilateral interstitial or ground glass pattern.

This diagnosis cannot be made without a chest X-ray.

General measures

- » Ensure adequate hydration

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Respiratory conditions

Drug treatment

- Cotrimoxazole, oral, 6 hourly for 14–21 days

Approx weight kg	Use one of the following	
	Tablet 80/400	Tablet 160/800
less than 40 kg	2 tablets	1 tablet
≥ 40–56 kg	3 tablets	1½ tablet
≥ 56 kg and above	4 tablets	2 tablets

For secondary prophylaxis:

- Cotrimoxazole, oral, daily

Use one of the following	
Tablet 80/400	Tablet 160/800
2 tablets	1 tablet

Referral

- » Breathing rate more than 24 per minute
- » Shortness of breath with mild effort
- » Cyanosed patients
- » All patients for ARVs

17.3.9 Tuberculosis

A16.9

Note: notifiable condition

TB guidelines are updated regularly. The most recent National Tuberculosis Control Programme Guidelines should be consulted.

Description

Tuberculosis is a disease due to infection by *Mycobacterium tuberculosis*. It is a serious and growing health problem in South Africa and is expanded and complicated by HIV/AIDS and multiple drug-resistant mycobacteria.

Note:

A standard TB register monitoring system and treatment guidelines have been introduced.

All patients on TB treatment must be entered into a TB register to enable the completion of quarterly reports for case finding and holding. This is essential for TB control at local, provincial and national level.

General measures

- » The relationship between the person providing the care and the patient is an important factor for compliance in patient-centred care
- » Care providers should explain the importance of completing treatment and the following should be discussed:
 - feelings and emotions
 - expectations
 - potential barriers or problems which may prevent success
 - habits and past experience
 - monitor
 - encouragement and motivation
 - provide feedback on progress
- » Lifestyle adjustment
- » Avoid the use of tobacco
- » Avoid alcohol
- » If more than two doses of treatment are missed, extra effort should be made to identify and manage any problems the patient might have

Note:

A private practitioner may elect to monitor the progress of the patient personally. In this case, the patient should remain on the clinic TB patient register.

Drug treatment

The total daily amount of each drug should be administered in one dose and not divided.

Ethambutol and isoniazid as single formulations will be retained to facilitate appropriate doses of available fixed-dose combinations in the continuation phase of treatment

Fixed-dose combinations are strongly encouraged in adults to enhance patient adherence and reduce the risk of inappropriate monotherapy.

Adult TB patients

- » during pregnancy
 - » in alcoholics
 - » with diabetes mellitus
 - » with epilepsy
 - » with HIV infection
- Pyridoxine, oral, 25 mg daily

Important drug interactions

Rifampicin reduces the efficacy of oral contraceptives, resulting in possible unplanned pregnancies (See chapter 7: Family planning)

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Respiratory conditions

- » Discuss contraception and explain the problem and the consequences
- » If necessary, alter the oral contraceptive to a high dose preparation for the duration of TB treatment or use an injectable contraception or IUCD
- » Combined oral contraceptives should contain at least 50 mcg of ethinylestradiol

! CAUTION !

Antiretroviral drugs frequently interact with TB drugs.
Consult the DoH antiretroviral treatment guidelines.

Contra-indications to TB drugs

- » Streptomycin should not be given to:
 - pregnant women
 - persons over 65 years old
 - persons with impaired renal function
- » Ethambutol should not be given to:
 - children under 8 years
 - persons with impaired renal function
- » All patients with jaundice and suspected drug induced hepatitis
 - manage at hospital level
 - stop treatment and refer

Adverse effects of TB drugs:

- » Nausea
 - May be a manifestation of liver dysfunction. If available, serum transaminase levels should be done in these patients.
 - taking drugs with meals can minimise nausea
- » Skin hypersensitivity or allergy
 - can be severe and may need anti-histamines, e.g. chlorpheniramine
 - discontinue treatment and refer if extensive.
- » Neuropathy (adults only)
 - can be prevented by taking pyridoxine on the same day as TB treatment

TB CHEMOPROPHYLAXIS

Initiate only after active disease is excluded.

See TB and HIV and AIDS section below

Indication for TB chemoprophylaxis:

- » Children less than 5 years in close household contact with a smear-positive case of pulmonary TB (Contacts of MDR or XDR TB should be referred for expert advice)

and

- » Children less than 5 years of age who have a positive tuberculin test but show no other evidence of disease, including on chest X-ray.

Chapter 17

Respiratory conditions

- Isoniazid, oral, 10–15 mg/kg daily for 6 months.
 - Maximum dose: 300 mg daily.

Weight kg	Daily isoniazid (INH) 100 mg tablet
≥ 2–3.4 kg	¼ tablet
≥ 3.5–6.9 kg	½ tablet
≥ 7–9.9 kg	1 tablet
≥ 10–14.9 kg	1½ tablets
≥ 15–19.9 kg	2 tablets
≥ 20–24.9 kg	2½ tablets
≥ 25 kg	3 tablets

plus for adults and children with HIV or malnutrition:

- Pyridoxine, oral, daily for duration of prophylaxis.
 - Adults: 25 mg
 - Children: 12.5 mg

TB AND HIV AND AIDS

Sputum smears in HIV and AIDS patients with TB are often negative as cavitation does not occur until the TB is far advanced. Sputum culture is more useful in these patients to confirm the diagnosis of tuberculosis.

HIV/AIDS patients with suspected TB should have two or more negative sputum smears before sputum is sent for culture.

Standard treatment regimens are also effective in patients with HIV/AIDS.

Advise HIV/AIDS patients to present to a clinic if they develop common TB symptoms:

- » persistent cough
- » night sweats
- » loss of weight

Side-effects of TB drugs are more pronounced in HIV/AIDS patients.

TB prophylaxis in HIV infection:

Indicated for patients with HIV who have either been in contact with a person with open TB or is tuberculin test positive **and** has no evidence of TB disease on chest X-ray or clinically.

Refer contacts of MDR or XDR for expert advice.

Chapter 17

Respiratory conditions

- Isoniazid, oral, 10–15 mg/kg daily for 6 months.
 - Maximum dose: 300 mg daily.

Weight kg	Daily isoniazid (INH) 100 mg tablet
≥ 2–3.4 kg	¼ tablet
≥ 3.5–6.9 kg	½ tablet
≥ 7–9.9 kg	1 tablet
≥ 10–14.9 kg	1½ tablets
≥ 15–19.9 kg	2 tablets
≥ 20–24.9 kg	2½ tablets
≥ 25 kg	3 tablets

plus for adults and children with HIV or malnutrition:

- Pyridoxine, oral, daily for duration of prophylaxis.
 - Adults: 25 mg
 - Children: 12.5 mg

MULTIPLE DRUG-RESISTANT (MDR) TB

All cases should be referred to a specialised centre.

MDR TB is usually the result of irregular adherence to TB treatment and is identified when there is resistance to rifampicin **and** isoniazid on sputum culture sensitivity testing. The current regimen is 18–24 months. The cure rate is only between 30–50%

Resistance can be prevented by ensuring cure the first time round.

The effectiveness of preventive therapy in persons exposed to MDR TB bacteria is not known. All close contacts should be screened for signs and symptoms of MDR TB and by sputum sampling to detect early disease.

TB CONTROL PROGRAM DRUG REGIMENS

Treatment should be given once daily **seven days per week** in both the intensive and continuation phases.

All adult patients and children with malnutrition or HIV infection should receive pyridoxine 25 mg daily for the duration of therapy.

R – Rifampicin
H – Isoniazid
Z – Pyrazinamide
E – Ethambutol

Fixed dose drug combination available	
Adults	Children
RH –150,75 mg	RH–60,30 mg
RH – 150,150 mg	RH–60,60 mg
RH –300,150 mg	RHZ–60,30,150 mg
RHZE–150,75,400,275 mg	

Chapter 17

Respiratory conditions

Regimen 1 – New cases with age above 8 years and adults

New smear-positive and new smear-negative patients and extrapulmonary TB

Pre-treatment body weight	Two months initial phase Treatment given 7 days a week	Four months continuation phase Treatment given 7 days a week	
	RHZE (150,75,400,275)	RH (150,75)	RH (300,150)
20–24 kg	1½ tablet	1½ tablet	–
25–29 kg	1½ tablet	2 tablets	–
30–37 kg	2 tablets	2 tablets	–
38–54 kg	3 tablets	3 tablets	–
55–70 kg	4 tablets	–	2 tablets
> 71kg	5 tablets	–	2 tablets

Regimen 2 – Retreatment cases

Previously treated TB patients after cure, completion, interruption and failure

Previously treated TB patients returning for treatment after cure or completion, default and failure.

Initial phase:

Pre-treatment body weight	Two months initial phase Treatment given 7 days a week		3 rd month initial phase Treatment given 7 days a week
	RHZE	Streptomycin	RHZE
	(150,75, 400,275)	(g)	(150,75,400,275)
30–37 kg	2 tablets	0.5	2 tablets
38–54 kg	3 tablets	0.75	3 tablets
55–70 kg	4 tablets	1.0	4 tablets
≥71 kg	5 tablets	1.0	5 tablets

Continuation phase: (after 3rd month initial phase)

Pre-treatment body weight	Five months continuation phase Treatment given 7 days a week			
	RH	E	RH	E
30–37 kg	(150,75)	(400)	(300,150)	(400)
38–54 kg	2 tablets	2 tablets	–	–
55–70 kg	3 tablets	2 tablets	–	–
≥71 kg	–	–	2 tablets	3 tablets

- » Streptomycin should NOT be given during pregnancy and to those over 65 years.
- » Keep strictly to the correct dose and the duration of treatment.
- » Cure of the new PTB patients depends on taking Regimen 1 for 6 months.

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Respiratory conditions

- » Cure of re-treatment PTB patients depends on taking Regimen 2 for 8 months.
- » The patient should be continued on the pre-treatment body weight throughout the treatment period, there is no need to adjust the dosages based on weight gain.

Regimen 3 – Children

For treatment of uncomplicated intrathoracic tuberculosis and extra pulmonary tuberculosis such as lymph gland and pleural effusion in children.

Body weight kg	Intensive Phase (2 months) Treatment given 7 days a week	Continuation phase (4 months) Treatment given 7 days a week
	RHZ* 60,30,150	RH 60,30
2–2.9 kg	½ tablet	½ tablet
3–5.9 kg	1 tablet	1 tablet
6–8.9 kg	1½ tablets	1½ tablet
9–11.9 kg	2 tablets	2 tablets
12–14.9 kg	2½ tablets	2½ tablets
15–19.9 kg	3 tablets	3 tablets
20–24.9 kg	4 tablets	4 tablets
25–29.9 kg	5 tablets	5 tablets
30–35.9 kg	6 tablets	6 tablets
36–40 kg	7 tablets	7 tablets

Keep strictly to the correct dose and the duration of treatment.

The patient should be weighed regularly and the dose adjusted according to the current weight.

Referral

- » All patients who cannot be managed on an ambulatory basis
- » Impaired renal function
- » Children under 12 years should have a chest X-ray for diagnostic purposes if mantoux positive and/or symptoms of TB (and sputum negative)
- » MDR or XDR TB patients
- » Retreatment cases of children
- » Children who are contacts of patients with open MDR or XDR TB

Chapter 18: Eye conditions

18.1 Conjunctivitis

18.1.1 Conjunctivitis, allergic

18.1.2 Conjunctivitis, bacterial (excluding conjunctivitis of the newborn)

18.1.3 Conjunctivitis of the newborn

18.1.4 Conjunctivitis, viral (pink eye)

18.2 Eye injuries

18.2.1 Eye injury, chemical burn

18.2.2 Eye injury, (blunt or penetrating) foreign body

18.3 Glaucoma, acute

18.4 Painful red eye

18.5 Structural abnormalities of the eye

18.6 Visual problems

18.1 Conjunctivitis

H10

An inflammatory condition of the conjunctiva. It may be caused by:

- » allergies
- » bacterial or viral (pink eye) infections

18.1.1 Conjunctivitis, allergic

H10.1

Description

An inflammatory condition caused by allergy to pollen, grass, animal fur, medication, cosmetics etc. There is usually a history of allergies, including hay fever. Common features include:

- » itching, watery eyes and photophobia
- » conjunctiva may appear normal or slightly red
- » conjunctival swelling in severe cases
- » normal cornea, iris and pupil
- » normal visual acuity

General measures

- » Cold compresses to relieve symptoms, i.e. a clean moistened cloth over the eyes for 10 minutes

Drug treatment**Adults and children over the age of 6 months:**

- Oxymetazoline 0.025%, eye drops, instil 1–2 drops 6 hourly for 7 days
or
Antazoline/tetrahydrozoline HCl 0.05/0.04% eye drops, instil 1–2 drops 6 hourly for 7 days

Severe cases or rhinoconjunctivitis:

For long term use in adults and school going children:

- Cetirizine, oral, once daily at night

Weight kg	Dose mg	Use one of the following:		Age Months / years
		Syrup 1mg / mL	Tablet 10 mg	
≥ 14 – 25 kg	5 mg	5 mL	–	≥ 3–7 years
≥ 25 – 55 kg	10 mg	10 mL	1 tablet	≥ 7–15 years
≥ 55 kg and above	10 mg	–	1 tablet	≥ 15 years and adults

Chapter 18**Eye conditions**

or

Chlorpheniramine, oral, 0.1 mg/kg/dose 6–8 hourly

Weight kg	Dose mg	Use one of the following:		Age months/years
		Syrup 2 mg/5mL	Tablet 4 mg	
≥ 9–11 kg	1 mg	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	1.2 mg	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1.5 mg	4 mL		≥ 3–5 years
≥ 17.5–25 kg	2 mg	5 mL	–	≥ 5–7 years
≥ 25–35 kg	3 mg	7.5 mL	–	≥ 7–11 years
≥35kg and above	4 mg	–	1 tablet	≥ 11 years and adults

Referral

- » No response to treatment
- » Persons wearing contact lenses

18.1.2 Conjunctivitis, bacterial (excluding conjunctivitis of the newborn)

H10.9

Description

An inflammatory purulent condition of the conjunctiva caused by bacteria and characterised by:

- » itchy eyes and swollen lids
- » stickiness of eyelids on awakening in the morning
- » discharge from one or both eyes
- » redness especially of conjunctival angles (fornices)

General measures

- » Patient education on personal hygiene to avoid spread.
- » Educate patient on correct application of ophthalmic ointment.
- » Advise patient:
 - to wash hands thoroughly before applying ophthalmic ointment
 - not to not share ophthalmic ointments or drops
 - not to rub eyes
 - never to use urine or milk to wash the eyes

Drug treatment

- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 7 days

Chapter 18

Eye conditions

Pain relief, if required:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
 - In children under 6 months calculate dose by weight

Weight kg	Dose mg	Use one of the following:		Age months/years
		Syrup 120 mg/5mL	Tablet 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9 kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55kg and above	Up to 1 000mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

- » No response after 5 days
- » Loss of vision
- » Irregularity of pupil
- » Haziness of the cornea
- » Persistent painful eye

18.1.3 Conjunctivitis of the newborn

P39.1

Description

Inflammation of the conjunctiva in the neonatal period presenting with purulent discharge, inflamed conjunctiva and eyelid oedema (in severe cases).

Common infectious agents include *N. gonorrhoea*, *S. aureus*, and *Chlamydia*.

! CAUTION !

If not treated immediately this condition can become worse, damage the cornea and lead to blindness.

General measures

- » Screen all pregnant women for sexually transmitted infections (STI) and treat
- » Cleanse or wipe eyes of all newborn babies with a clean cloth, cotton wool or swab
- » Advise against harmful applications, such as urine, to the eyes of newborn babies

Drug treatment**PREVENTION****Routine administration for every newborn baby:**

- Chloramphenicol 1%, ophthalmic ointment, applied as soon as possible after birth

TREATMENT**Purulent discharge:**

- Ceftriaxone, IM, 50 mg/kg immediately as a single dose
 - Contraindicated in neonatal jaundice

! CAUTION !

Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.

Contra-indicated in neonatal jaundice.

Annotate dose and route of administration in referral letter.

- Sodium chloride 0.9%, eye washes, initially then hourly until referral.

Sticky eye without purulent discharge:

- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 7 days

Referral**Urgent**

- » All neonates with purulent discharge

18.1.4 Conjunctivitis, viral (pink eye)

B30.9

Description

A highly contagious, viral infection, which is spread by contact with:

- » hands
- » towels
- » face cloths

It may start in one eye and spread to the other, or more commonly both eyes are infected. Common symptoms include:

- » itchy eyes
- » sore eyes, feeling of grittiness (roughness) or burning which can be painful
- » photophobia
- » watery discharge. A yellow discharge indicates a secondary bacterial infection.
- » reddened and swollen conjunctiva, which may become haemorrhagic
- » swelling of the eyelids
- » enlarged pre-auricular node

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Eye conditions

- » The cornea, iris and pupil are completely normal with normal visual acuity.

General measures

- » Advise on correct cleansing or rinsing of eyes
- » Cold compresses for symptomatic relief

Drug treatment

Adults and children over 6 months:

- Oxymetazoline 0.025%, eye drops, instil 1–2 drops 6 hourly for 7 days

Pain relief:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
 - In children under 6 months calculate dose by weight

Weight kg	Dose mg	Use one of the following:		Age months/years
		Syrup 120 mg/5mL	Tablet 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55kg and above	Up to 1 000mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

- » A unilateral red eye for more than one day
- » Suspected herpes conjunctivitis indicated by vesicles on skin next to eye
- » No response after 5 days
- » Loss of vision
- » Irregularity of pupil
- » Haziness of the cornea
- » Persistent painful eye

18.2 Eye injuries

18.2.1 Eye injury, chemical burn

T26.9

This is a medical emergency.

Description

Damage to one or both eyes caused by contact with irritating chemical substances e.g. alkali or acid, presenting with:

- » pain
- » inability to open eye
- » blurred vision
- » excessive teary and watery eye

General measures

- » Irrigate or wash the eye immediately and continuously with clean water or saline for at least 20 minutes
- » In severe alkaline burn cases, irrigation should be prolonged further.

Drug treatment**Local anaesthetic if needed:**

- Tetracaine 0.5% eye drops, instil 2 drops in the affected eye
 - repeat irrigation or washing out of eye
 - evert upper eyelid and remove debris with cotton bud
- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly

Pain relief:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
 - In children under 6 months calculate dose by weight

Weight kg	Dose mg	Use one of the following:		Age months/years
		Syrup 120 mg/5mL	Tablet 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55kg and above	Up to 1 000mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

- » All cases within 12 hours

18.2.2 Eye injury, (blunt or penetrating) foreign body

S05.9/S05.5

Description

A foreign body may be embedded in the conjunctiva or cornea or deeper, causing:

- » possible corneal abrasion
- » disturbance of vision which is serious
- » complaints of something in the eye
- » pain

General measures

- » Establish the cause
- » Wash eye with clean water or sodium chloride 0.9%,
- » Remove foreign body if visible on sclera or conjunctiva with cotton tipped stick or bud.
- » If foreign body is not visible, check visual acuity first, before testing with fluorescein
- » Stain with fluorescein to reveal corneal foreign body or complications such as abrasion.
- » Check after removal of foreign body
- » Cover injured eye with eye pad.

Drug treatment

- Sodium chloride 0.9%, eye washes or irrigations as soon as possible.
 - If sodium chloride 0.9% is not available use cooled boiled water or sterile water.

Deep corneal or scleral injuries

Cover with an eye shield and refer immediately

If immediate referral is not possible, while awaiting transfer:

- Atropine, 1%, drops, instilled immediately
- Chloramphenicol 1%, ophthalmic ointment applied immediately

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Eye conditions

Pain relief:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
 - In children under 6 months calculate dose by weight

Weight kg	Dose mg	Use one of the following:		Age months/years
		Syrup 120 mg/5mL	Tablet 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55kg and above	Up to 1 000mg	–	Up to 2 tablets	≥ 15 years and adults

! CAUTION !

Review the problem daily
Do not use an eye pad with ecchymosis, lid oedema or bleeding

Referral

Immediately:

- » If the foreign body cannot be removed or an intraocular foreign body is suspected
- » Laceration, perforation or diffuse damage to the cornea or sclera
- » Damage to other structures of the eye, including the eyelid
- » Visual abnormalities or limitation of movement of the eye

18.3 Glaucoma, acute

H40.9

Description

Glaucoma is damage to the optic nerve caused by a level of intra-ocular pressure (often raised), which results in loss of vision usually in one eye only.

Clinical features:

- » the pupil is moderately dilated and may be oval in shape
- » corneal haziness
- » pericorneal conjunctival inflammation
- » sudden onset of extremely severe, bursting pain and eye redness
- » a unilateral, temporal headache, after being exposed to a period of darkness, e.g. cinema

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Eye conditions

- » coloured haloes around lights (bright rings)
- » the eye feels hard, compared to the other eye, when measured with finger palpation (this is not an accurate test)
- » severe pain in eye (acute)
- » nausea and vomiting in severe cases

Emergency drug treatment before referral (Doctor initiated)

- Acetazolamide, oral, 500 mg, immediately, followed by 250 mg 6 hourly.
- Pilocarpine, 1%, eye drops, instilled into the affected eye every 15 minutes for 4 doses

Referral

Urgent

- » All patients to an ophthalmologist within 12 hours

18.4 Painful red eye

H57.1

Description

Pain and redness of the eye indicate inflammation of the anterior structures of the eye.

- » Exclude bacterial or viral conjunctivitis (often bilateral and associated with irritation, rather than pain)
- » Consider acute glaucoma and manage appropriately – See section 18.3: Glaucoma, acute

Referral

Urgent:

- » All patients (excluding those with conjunctivitis)

18.5 Structural abnormalities of the eye

These include:

- » eyelashes rubbing on the cornea (trichiasis)
- » eyelids bent into the eye (entropion)
- » eyelids bent out too much (ectropion)
- » ptosis (drooping eyelid)

Referral

- » All patients

18.6 Visual problems

H53.9

Description

Visual problems may be due to refractive errors, or to damage to the eye or optic nerve. They may be an indication of underlying disease such as diabetes or hypertension.

Assessment**Look for abnormalities of the eye**

Determine visual acuity accurately in both eyes by Snellen chart. If vision is diminished (less than 6/12) perform the following tests:

Pin hole test

- » Make a hole of about 1 mm wide in a piece of dark/black paper.
- » Ask the patient to look through this hole at the Snellen chart.
- » If vision improves, this means that the patient has a refractive error.

Red reflex test

The patient looks past the examiner's head focussing on a distant target.

- » with the ophthalmoscope at 0 (zero) the examiner keeps it close to his eye and then focuses the beam of light so that it falls on the pupillary area of the cornea
- » the examiner stands about 60 cm away from the patient
- » in normal individuals, the examiner should be able to see a red or pink colour (reflex) through the pupil which comes from the retina

Significance of an absent red reflex

If there is a history of trauma or diabetes the absence of a red reflex is probably due to:

- » retinal detachment
- » a vitreous or internal haemorrhage
- » mature cataract

If there are cataracts one usually sees:

- » black shadows against the red reflex in immature cataracts
- » absence of red reflex in mature cataracts

In a patient above the age of 50 years with no history of trauma, diabetes or previous eye disease, an absent red reflex is almost sure to be due to cataract formation, especially with decreased visual acuity.

Note:

Associated diabetes or hypertension should be adequately managed before referral, as surgery can only be considered with appropriately managed disease.

Referral**Urgent: within 12–24 hours**

- » Sudden visual loss **in one or both eyes**
- » Pain or redness **in one eye only** or unilateral watery eye especially with visual and pupil abnormalities,
- » Recent proptosis of one or both eyes or enlargement of the eye (buphthalmos / keratoglobus) in children
- » Hazy cornea in children
- » Squint of recent onset

Within days

- » Chronic glaucoma
- » Double vision except following recent injury
- » Leucokoria (white reflex from the pupil)
- » Squint at any age if not previously investigated by ophthalmologist
- » Visual loss in patients with systemic disease such as diabetes

Non-urgent referral

- » Cataracts
- » Refractive errors
- » Long-standing blindness – first visit to health facility

Chapter 19: Ear, nose and throat conditions

19.1 Allergic rhinitis

19.2 Epistaxis

19.3 Otitis

19.3.1 Otitis externa

19.3.2 Otitis media, acute

19.3.3 Otitis media, chronic, suppurative

19.4 Sinusitis, acute, bacterial

19.5 Tonsillitis and pharyngitis

19.1 Allergic rhinitis

J30.4

Description

Recurrent inflammation of the nasal mucosa due to hypersensitivity to inhaled allergens, e.g. pollen, house dust, grasses and animal proteins.

Allergic rhinitis is characterised by recurrent episodes of:

- » blocked stuffy nose
- » watery nasal discharge
- » frequent sneezing, often accompanied by nasal itching and irritation
- » conjunctival itching and watering
- » oedematous pale grey nasal mucosa
- » mouth breathing
- » snoring at night

Exclude other causes, such as infections, vasomotor rhinitis, overuse of decongestant drops, side effects of antihypertensives and antidepressants.

General measures

- » Avoid allergens and irritants.

Drug treatment

- Corticosteroid, e.g. beclomethasone, aqueous nasal solution, 2 sprays in each nostril twice daily
 - Aim the nozzle vertically and not to the back of the throat.
 - Do not sniff vigorously.

For short term symptomatic use:

- Chlorpheniramine, oral, 0.1 mg/kg/dose 6–8 hourly

Weight kg	Dose mg	Use one of the following:		Age months/years
		Syrup 2 mg/5mL	Tablet 4 mg	
≥ 9–11 kg	1 mg	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	1.2 mg	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1.5 mg	4 mL	–	≥ 3–5 years
≥ 17.5–25 kg	2 mg	5 mL	–	≥ 5–7 years
≥ 25–35 kg	3 mg	7.5 mL	–	≥ 7–11 years
≥ 35kg and above	4 mg	–	1 tablet	≥ 11 years and adults

Long-term antihistamines should only be used after an adequate trial of intranasal corticosteroids and should be added to steroid therapy.

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For long-term use in adults and school going children:

- Cetirizine, oral, once daily at night

Weight kg	Dose mg	Use one of the following:		Age months / years
		Syrup 1 mg / mL	Tablet 10 mg	
≥ 14 – 25	5 mg	5 mL	–	≥ 3–7 years
≥ 25 – 55	10 mg	10 mL	1 tablet	≥ 7–15 years
≥ 55 kg and above	10 mg	–	1 tablet	≥ 15 years and adults

Referral

- » Chronic persistent symptoms
- » Severe symptoms

19.2 Epistaxis

(See Chapter 21 - Trauma and emergencies)

19.3 Otitis

19.3.1 Otitis, externa

H60.9

Description

Inflammation of the external ear may be one of the following two types:

Type	Description
» diffuse	Usually due to an infection, usually a mixed infection, involving one or more of the following organisms: <ul style="list-style-type: none">» Staphylococcus» <i>P. aeruginosa</i>» <i>E. coli</i>» Streptococcus» Proteus species Infections are usually due to: <ul style="list-style-type: none">» mixed infections» allergic dermatitis (often caused by shampoo or soaps)» swimming pool chemicals» trauma caused by scratching, e.g. matchsticks, earbuds.
» furuncular	Usually caused by Staphylococcus

General measures

- » Exclude any underlying chronic otitis media before commencing treatment.

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- » Most cases recover after thorough cleansing and drying of the ear.
- » Keep the ear clean and dry.
- » Do not leave pieces of cotton wool, etc. in the ear.
- » Do not instil anything into the ear unless prescribed.

Drug treatment

Diffuse

Does not usually require an antibiotic.

Make a wick where possible, using ribbon gauze or other suitable absorbent cloth, e.g. paper towel to clean and dry the ear.

- Acetic acid 2% in alcohol, topical, instilled into the ear every 6 hours for 5 days
 - Instill 3–4 drops after cleaning and drying the ear

Furuncular

- Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days

Weight kg	Dose mg	Use one of the following:		Age Months / years
		Syrup 125 mg/ 5mL	Capsule 250 mg	
≥ 2.5–5 kg	62.5 mg	2.5 mL	–	Birth–3 months
≥ 5 – 11 kg	125 mg	5 mL	–	≥ 3–18 months
≥ 11 – 25 kg	250 mg	10 mL	1 capsule	≥ 18 months–7 years
≥ 25 kg and above	500 mg	–	2 capsules	≥ 7 years and adults

Penicillin–allergic patients

- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly

Weight kg	Dose mg	Use one of the following:		Age Months / years
		Syrup 125 mg/5 mL	Tablets 250 mg	
≥ 2.5 – 3.5 kg	35 mg	1.4 mL	–	Birth–1 month
≥ 3.5 – 5 kg	50 mg	2 mL	–	≥ 1–3 months
≥ 5 – 7 kg	75 mg	3 mL	–	≥ 3–6 months
≥ 7 – 9 kg	100 mg	4 mL	–	≥ 6–12 months
≥ 9 – 11 kg	125 mg	5 mL	–	≥ 12–18 months
≥ 11–14 kg	150 mg	6 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	200 mg	8 mL	–	≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25–35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adults

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Ear, nose and throat conditions

Referral

- » No response to treatment

19.3.2 Otitis, media, acute

H66.9

Description

Inflammation of the middle ear characterised by:

- » pain
- » loss of the normal light reflex of the eardrum
- » red bulging eardrum
- » drum perforation
- » fever in about half of the cases
- » loss of hearing

Mild redness of the eardrum and rubbing the ear are not reliable signs.

General measures

- » Do not instil anything into the ear.
- » Avoid getting the inside of the ear wet.
- » Do not plug the ear with cotton wool, etc.

Drug treatment

- Amoxicillin, oral, 25–30 mg/kg/dose 8 hourly for 5 days

Weight kg	Dose mg	Use one of the following:			Age Months/ years
		Syrup		Capsule 250 mg	
		125 mg/ 5mL	250 mg/ 5mL		
≥ 3.5–5 kg	125 mg	5 mL	2.5 mL	–	≥ 1–3 months
≥ 5–7 kg	175 mg	7 mL	3.5 mL	–	≥ 3–6 months
≥ 7–11 kg	250 mg	10 mL	5 mL	–	≥ 6–18 months
≥ 11–14 kg	375 mg	15 mL	7.5 mL	–	≥ 18 months–3 years
≥ 55 kg and above	500 mg	–	10 mL	2 capsules	≥ 3 years and adult

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Ear, nose and throat conditions

Penicillin–allergic patients:

- Erythromycin, oral, 6 hourly for 5 days

Weight kg	Dose mg	Use one of the following:		Age Months / years
		Syrup 125 mg / 5 mL	Tablets 250 mg	
≥ 2.5 – 3.5 kg	35 mg	1.4 mL	–	Birth–1 month
≥ 3.5 – 5 kg	50 mg	2 mL	–	≥ 1–3 months
≥ 5 – 7 kg	75 mg	3 mL	–	≥ 3–6 months
≥ 7 – 9 kg	100 mg	4 mL	–	≥ 6–12 months
≥ 9 – 11 kg	125 mg	5 mL	–	≥ 12–18 months
≥ 11–14 kg	150 mg	6 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	200 mg	8 mL	–	≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25–35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adults

For pain relief:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
 - In children under 6 months calculate dose by weight

Weight kg	Dose mg	Use one of the following:		Age months/years
		Syrup 120 mg/5mL	Tablet 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55kg and above	Up to 1 000mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

- » Severe pain, fever or vomiting, not responding to treatment after 72 hours (if otoscopy confirmed) or after 24 hours (if otoscopy unconfirmed).
- » Recurrent otitis media
- » Painful swelling behind the ear or tenderness on percussion of the mastoid
- » Suspected meningitis

19.3.3 Otitis media, chronic, suppurative

H66.3

Description

A purulent discharge from the ear for more than 2 weeks.

If the eardrum has been ruptured for 2 weeks or longer, a secondary infection with multiple organisms usually occurs. Multiple organism infection makes oral antibiotic treatment ineffective and patients may need to be referred.

TB is an important cause of a chronically discharging ear in South Africa.

If pain is present, suspect another condition or complications.

Note:

A chronically draining ear can only heal if it is dry.

Drying the ear is time consuming but it is the most effective treatment.

General measures

- » Dry mopping is the most important part of the treatment. It should be demonstrated to the child's caregiver or patient if old enough.
 - roll a piece of clean absorbent cloth into a wick
 - carefully insert the wick into the ear with twisting action
 - remove the wick and replace with a clean dry wick
 - repeat this until the wick is dry when removed
- » Do not leave anything in the ear.
- » Do not instill anything else in the ear.
- » Avoid getting the inside of the ear wet while swimming and bathing.
- » Exclude TB as a cause.

Referral

- » All sick children, vomiting, drowsy, etc.
- » Painful swelling behind the ear
- » No improvement after 4 weeks
- » Any attic perforation
- » Any perforation not progressively improving after 3 months or closed by 6 months, even if dry
- » Moderate or severe hearing loss

19.4 Sinusitis, acute, bacterial

J01.9

Description

Bacterial infection of one or more sinuses that occurs most often after a viral nasal infection or allergic rhinitis.

Bacterial sinusitis is characterised by:

- » deterioration of a common cold after 5–7 days

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- » purulent nasal discharge, especially if unilateral
- » pain and tenderness over one or more sinuses
- » nasal obstruction
- » occasional fever

Note:

Sinusitis is uncommon in children under 5 years, as sinuses are not fully developed.

General measures

- » Steam inhalation may be effective in liquefying and removing secretions blocking the nose.

Drug treatment

- Amoxicillin, oral, 500 mg 8 hourly for 5 days

Weight kg	Dose mg	Use one of the following:		Age Months/ years
		Syrup 250 mg/ 5 mL	Capsule 250 mg	
≥ 14 kg and above	500 mg	10 mL	2 capsules	≥ 3 years and adult

Penicillin–allergic patients:

- Erythromycin, oral, 10–15 mg/kg 6 hourly for 5 days

Weight kg	Dose mg	Use one of the following:		Age Months / years
		Syrup 125 mg/ 5 mL	Tablets 250 mg	
≥ 14–17.5 kg	200 mg	8 mL	–	≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25–35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adult

Note:

Erythromycin is suboptimal therapy for this because of pneumococcal resistance.

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For pain relief:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
 - In children under 6 months calculate dose by weight

Weight kg	Dose mg	Use one of the following:		Age months/years
		Syrup 120 mg/5mL	Tablet 500 mg	
≥ 14–17.5 kg	120 mg	5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55kg and above	Up to 1 000mg	–	Up to 2 tablets	≥ 15 years and adults

- Oxymetazoline, nose drops, 2 drops in each nostril 6–8 hourly for not more than 5 days continuously
 - Children: 0.025%
 - Adults: 0.05%

and/or

- Sodium chloride 0.9%, nose drops, use frequently and in fairly large volumes.

Referral

- » Fever lasting longer than 48 hours
- » Poor response after 5 days
- » Dental focus of infection is present, e.g. apical tooth abscess causing maxillary sinusitis
- » Complications, e.g. periorbital cellulitis with periorbital swelling
- » Oedema over a sinus
- » Recurrent sinusitis
- » Meningeal irritation

19.5 Tonsillitis and pharyngitis

J03.9

Description

A painful red throat and/or enlarged inflamed tonsils. Yellow exudates may be present. Tender anterior cervical lymphadenopathy may be present. Viruses are the cause in the majority of cases. However, streptococcal pharyngitis/tonsillitis may cause local suppurative complications as well as rheumatic fever, which can cause serious heart disease. Antibiotics to eradicate streptococci should be given to patients with pharyngitis/tonsillitis who are at risk for rheumatic fever (age 3 to 15 years) **unless** one of the following features of viral infection is present (do **not** give antibiotics if these are present):

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- » runny nose
- » cough
- » a rash (excluding scarlet fever)

General measures

- » Homemade salt mouthwash, gargle for 1 minute twice daily:
 - ½ medicine measure of table salt in a glass of lukewarm water
 - do not give to children unable to gargle
- » Advise adequate hydration.
- » Avoid irritants e.g. vaporubs inserted into nostrils.

Drug treatment

Preferred treatment option:

- Benzathine benzylpenicillin, IM, immediately as a single dose

Weight kg	Dose units	Use one of the following injections		Age Months/ years
		1 200 000 mixed with 4 mL WFI	2 400 000 mixed with 8 mL WFI	
Less than 15 kg	300 000	1 mL		18 months–3 years
15 – 30 kg	600 000	2 mL		3–11 years
More than 30 kg	1 200 000	4 mL		11–15 years

or

If IM injection refused:

- Phenoxymethylpenicillin, oral, 12 hourly for 10 days

Weight kg	Dose mg	Use one of the following:		Age Months/ years
		Syrup 250 mg/ 5 mL	Tablet 250 mg	
≥ 11–35 kg	250 mg	5 mL	1 tablet	≥ 18 months –11 years
≥ 35 – 55 kg	500 mg	–	2 tablets	≥11–15 years
≥ 55 kg and above	500 mg	–	2 tablets	Adults

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Penicillin–allergic patients

- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly

Weight kg	Dose mg	Use one of the following:		Age Months / years
		Syrup 125 mg/5 mL	Tablets 250 mg	
≥ 11–14 kg	150 mg	6 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	200 mg	8 mL	–	≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25–35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adult

For pain relief:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
 - In children under 6 months calculate dose by weight

Weight kg	Dose mg	Use one of the following:		Age months/years
		Syrup 120 mg/5mL	Tablet 500 mg	
≥ 3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9 kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥ 55 kg and above	Upto 1 000mg	–	Upto 2 tablets	≥ 15 years and adults

For children under 6 years of age:

- Simple linctus or tussi infans, oral, 8 hourly for 3 days
 - 0 – 6 months: 2.5 mL
 - 6 months – 5 years: 5 mL

Referral

- » Any suppurative complications, e.g. retropharyngeal or peritonsillar abscess.
- » Suspected acute rheumatic fever.
- » Suspected acute glomerulonephritis.
- » Tonsillitis accompanied by difficulty in opening the mouth (trismus).
- » History of previous rheumatic fever or rheumatic heart disease.
- » Heart murmurs not previously diagnosed.

Chapter 20: Pain

- 20.1 Pain control**
- 20.2 Chronic non-cancer pain**
- 20.3 Chronic cancer pain**

20.1 Pain control

R52.9

Description

Pain is an unpleasant sensation or emotional experience associated with actual or potential tissue injury. It is always subjective. It is affected by the patient's mood, morale and the meaning the pain has for the patient.

Self-report is the key to pain assessment.

In non- or pre verbal children, facial expression is the most valid indicator of pain.

Consider using visual analogue scale or faces pain scale to assess severity.

Pain should be assessed by:

- » duration
- » severity, e.g. does the patient wake up because of the pain
- » site
- » character, e.g. stabbing, throbbing, crushing, cramp like
- » persistent or intermittent
- » relieving or aggravating factors
- » accompanying symptoms
- » distribution of pain
- » referred pain

Assessment of pain in children

Pain Score (The Alder Hey Pain Triage Score)			
Response	Score 0	Score 1	Score 2
1. Cry Voice	» no complaint/ cry » normal conversation	» consolable » not talking negative	» inconsolable » complaining of pain
2. Facial expression	» normal	» short grimace » < 50% of time	» long grimace » > 50% of time
3. Posture	» normal	» touching / rubbing / sparing	» defensive/ tense
4. Movement	» normal	» reduced or restless	» immobile or thrashing
5. Colour	» normal	» pale	» very pale/"green"

This system does not give an absolute assessment of severity of pain, but rather increases observer sensitivity to the presence of pain, the response to analgesia and the child's experience of pain.

The Pain Score should be used as a tool, to guide interpretation of pain and adequacy of response to analgesia.

General measures

- » Patient counselling.
- » Lifestyle adjustment.

ACUTE PAIN CONTROL**Drug treatment****Acute, mild pain**

- » Non-opioid treatment

Non-inflammatory or post trauma

Children:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
 - In children under 6 months calculate dose by weight

Weight kg	Dose mg	Use one of the following:		Age months/years
		Syrup 120 mg/5mL	Tablet 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9 kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55kg and above	Up to 1000mg	–	Up to 2 tablets	≥ 15 years and adults

Pain associated with trauma or inflammation

Adults:

- Ibuprofen, oral, 400 mg 6–8 hourly with food, to a maximum of 2400 mg daily
 - Nurse may only prescribe up to 1 200 mg per day

orAdults:

If no relief after two or three doses, combine paracetamol and ibuprofen at the above dosages.

Acute, moderate painChildren:

- » If no relief to paracetamol, refer.

If pain is moderate or severe consider careful use of morphine while arranging and during transfer (See **Precautions and special comments on the use of morphine** below)

Adults

If still no relief to simple analgesics as above,

add

- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose. (Doctor initiated)
 - May be increased to a maximum of 400 mg daily.

Acute severe pain

If no response to Step 3 in moderate pain, initiate one of the following opioids:

Children:

» Refer

If pain is severe consider careful use of morphine while arranging and during transfer (See **Precautions and special comments on the use of morphine** below)

Adults:

- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose. (Doctor initiated)
 - May be increased to a maximum of 400 mg daily.

plus

- Paracetamol, oral 1 000 mg 4–6 hourly, when required to a maximum of eight tablets (4 g) daily

OR

- Morphine, IM, 10–15 mg, 4–6 hourly when required. (Doctor initiated)

OR

- Morphine, IV, 10–15 mg 4–6 hours as required. (Doctor initiated)
 - Dilute in 10 mL sodium chloride 0.9%
 - Administer slowly over 4–5 minutes
 - Titrate dose slowly

Patients requiring morphine for acute pain of unknown cause or pain not responding with 1 dose must be referred for definitive treatment.

Precautions and special comments on the use of morphine

- » Morphine may cause respiratory depression. This can be reversed with naloxone. Refer to section 21.6: Exposure to poisonous substances.
- » **Do not administer** morphine in:
 - advanced liver disease
 - severe head injury
 - acute asthma
 - advanced chronic obstructive bronchitis, emphysema or other respiratory disease with imminent respiratory failure
 - untreated hypothyroidism

A systematic review has shown that morphine can be used for acute abdominal pain without leading to surgical misdiagnosis.

- » **Use** morphine **with extreme care** if there is:
 - recent or concurrent alcohol intake or other CNS depressants

Chapter 20

Pain

- hypovolaemia or shock
- in the elderly

In these circumstances use:

Children:

- Morphine, IV, 0.1 mg/kg/dose 4–6 hourly as necessary
 - Give small portions of the dose every 10 minutes until pain relief is adequate or the maximum dose is reached.

Weight kg	Dose mg	Injection 10 mg/ mL	Age Months/ years
≥ 7–9 kg	0.5 mg	0.05 mL	≥ 6–12 months
≥ 9–11 kg	0.75 mg	0.075 mL	≥ 12–18 months
≥ 11–14 kg	1 mg	0.1 mL	≥ 18 months–3 years
≥ 14–17.5 kg	1.25 mg	0.125 mL	≥ 3–5 years
≥ 17.5–25 kg	1.5 mg	0.15 mL	≥ 5–7 years
≥ 25–35 kg	2 mg	0.2 mL	≥ 7–11 years
≥ 35 – 55 kg	3 mg	0.3 mL	≥ 11–15 years

Adults:

- Morphine, IV, small incremental doses, starting at 2–5 mg with increments of 2 mg every 10 minutes.
 - Maximum dose: 10–15 mg depending on body weight

If morphine has been administered the time and dose should be clearly documented on the referral letter as this may alter some of the clinical features of acute abdomen or head injury.

Referral

- » All children with moderate and acute severe pain
- » No response to oral pain control and unable to initiate opioid therapy
- » Uncertain diagnosis
- » Management of serious underlying conditions

20.2 Chronic non-cancer pain

R52.2

Description

Pain that is present for more than 4–6 weeks.

It can arise from:

- » tissue damage (nociceptive pain), e.g. arthritis, fibromyalgias, lower back pain, pleurisy, cancer pain (discussed below) etc.; or
- » injury to nerves (neuropathic pain) e.g. post herpetic neuralgia (pain following shingles), trigeminal neuralgia, diabetic neuropathy, HIV related

Breakthrough pain

Breakthrough pain is pain that occurs before the next regular dose of analgesia. This is due to an inadequate regular dose.

It is recommended that the full dose equivalent to a 4 hourly dose of morphine be administered for breakthrough pain, but it is important that the next dose of morphine be given at the prescribed time, and not be delayed because of the intervening dose.

The dosage should be titrated upward against the effect on pain in the following way:

- » add up the amount of “breakthrough morphine” needed in 24 hours.
- » divide this amount by 6 (the number of 4 hourly doses in 24 hours)
- » the next day increase each dose by that amount.

Example:

Patient gets 10 mg morphine every four hours.

The patient has 3 episodes of breakthrough pain:

$$3 \times 10 \text{ mg} = 30 \text{ mg}$$

$$30 \text{ mg} \div 6 = 5 \text{ mg}$$

The regular 4 hourly dose of 10 mg will be increased by 5 mg

$$\text{i.e. } 10 \text{ mg} + 5 \text{ mg} = 15 \text{ mg}$$

The increased morphine dose will be 15 mg 4 hourly

Referral

- » Uncontrolled pain
- » Pain uncontrolled by step 1 if no doctor available
- » Severe emotional or other distress which may aggravate the perception of pain
- » Nausea and vomiting associated with pain in children