Chapter 21: Trauma and emergencies

The following conditions are emergencies and must be treated as such. Drugs used for treatment must be properly secured and their use recorded (time, dosage, routine) on the patient's notes and on the letter of referral.

21.1 Angina pectoris, unstable
See chapter 4 – Cardiovascular conditions

21.2 Bites and stings

21.2.1 Animal and human bites
T14.1

Note: Rabies and tetanus are notifiable conditions.

Description

Animal bites may be caused by:
» domestic animals (horses, cows, dogs, cats)
» wild animals (meerkats, jackals, mongooses)

Animal or human bites may result in:
» wound infection, often due to mixed aerobic and anaerobic infection
» puncture wounds
» tissue necrosis
» transmission of diseases, e.g. tetanus, rabies, HIV, hepatitis, syphilis

Suspected rabid bite
Any mammal bite can transmit rabies.
Rabies incubation period is at least 9–90 days, but could be much longer.

In suspected rabies exposure of a person by a domestic animal, observe the suspected rabid animal for abnormal behaviour for 10 days. If the animal remains normal for 10 days, rabies is unlikely.

Note:
In the event of having to put the animal down, care should be taken to preserve the brain as the brain is required by the state veterinarian for confirmation of diagnosis. Note that the animal must not be killed by shooting it in the head as this will damage the brain.

Classification of rabies exposure
Category 1
» touching or feeding the animal
» licking of intact skin

Category 2
» nibbling of uncovered skin
» superficial scratch and no bleeding
» licking of broken skin

Category 3
» bites and scratches which penetrate the skin and draw blood
» licking of mucous membranes

Prevention

» Regular vaccination of domestic cats and dogs.
» Pre-exposure vaccine may be given to those at risk, e.g. occupation, endemic areas, laboratories.

Drug treatment

Emergency management
All bite wounds and scratches need thorough and immediate treatment. Lacerations can be sutured later.

Irrigate and cleanse wound:
- Chlorhexidine 0.05%, solution
  or
  Povidone iodine 10%, solution

! CAUTION !
Do not suture puncture wounds.
Suture lacerations after thorough cleaning and debridement.
Do not apply compressive dressings.

Rabies Vaccine and Immunoglobulin
Rabies vaccine and immunoglobulin are available from the nearest district hospital and should be administered as follows:

Note:
For category 1 rabies exposure, do not administer rabies vaccine if history is reliable. If history is not reliable, treat as for category 2.
Stop vaccination if animal is rabies negative on laboratory test, or remains healthy after 10 days of observation.

Previously immunised patients	Non-immune patients	
	Less than 48 hours after exposure	More than 48 hours after exposure
Human anti-rabies immunoglobulin (RIG) Do not administer	**Human anti-rabies immunoglobulin (RIG)** Administer for category 3 exposure only 20 IU / kg ½ dose IM ½ dose injected in and around the wound	**Human anti-rabies immunoglobulin (RIG)** Administer for category 3 exposure only 20 IU / kg ½ dose IM ½ dose injected in and around the wound
Rabies vaccine (categories 1, 2, & 3) Adults: IM (deltoid muscle) Children: IM (anterolateral thigh) Two doses only: day 0 – single dose day 3 – single dose	**Rabies vaccine** (categories 1, 2, & 3) day 0 – single dose day 3 – single dose day 7 – single dose day 14 – single dose day 28 – single dose	**Rabies vaccine** (categories 1, 2, & 3) day 0 – **double dose** day 3 – single dose day 7 – single dose day 14 – single dose day 28 – single dose

Tetanus prophylaxis if not previously immunised within the last 5 years

- Tetanus toxoid vaccine (TT), IM, 0.5 mL

Note:
In a fully immunised person, tetanus toxoid vaccine or tetanus immunoglobulin might produce an unpleasant reaction, e.g. redness, itching, swelling or fever, but in the case of a severe injury the administration is justified.

Pre-emptive antibiotic only if the hand is bitten or for extensive wounds or for human bites

Data do not support the use of antibiotics in minor animal bites.
Amoxicillin/clavulanic acid is recommended in severe animal and human bites.

- Amoxicillin clavulanic acid, oral, 12.5–20 mg/kg of amoxicillin component, 8 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/ years
		Syrup		**Tablet** 500/ 125 mg	
		125/ 31.25 mg per 5 mL	250/ 62.5 mg per 5 mL		
≥ 3.5–5 kg	75/18.75 mg	3 mL	–	–	≥ 1–3 months
≥ 5–7 kg	100/25 mg	4 mL	2 mL	–	≥ 3–6 months
≥ 7–9 kg	125/31.25 mg	5 mL	2.5 mL	–	≥ 6–12 months
≥ 9–11 kg	150/37.5 mg	6 mL	3 mL	–	≥ 12–18 months
≥ 11–14 kg	187.5/46.9 mg	7.5 mL	4 mL	–	≥ 18 months–3 years
≥ 14–25 kg	250/62.5 mg	10 mL	5 mL	–	≥ 3–7 years
≥ 25–35 kg	375/93.75 mg	15 mL	7.5 mL	–	≥ 7–11 years
≥ 35–55 kg	500/125 mg	–	–	1 tablet	≥ 11–15 years
≥ 55 kg and above	500/125 mg	–	–	1 tablet	≥ 15 years and adults

Penicillin–allergic patients

- Erythromycin, oral, 10–15 mg/kg/dose 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	
≥ 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

plus

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Susp 200 mg/ 5mL	**Tablets** 200mg	**Tablets** 400mg	
≥5–7 kg	40 mg	1 mL	–	–	≥3–6 months
≥7–9 kg	60 mg	1.5 mL	–	–	≥6–12 months
≥9–11 kg	80 mg	2 mL	–	–	≥ 12–18 months
≥11-14 kg	100 mg	2.5 mL	–	–	≥18 months–3 years
≥14–17.5 kg	120 mg	3 mL	–	–	≥ 3–5 years
≥17.5-25 kg	160 mg	4 mL	–	–	≥ 5–7 years
≥25–35 kg	200 mg	5 mL	1 tablet	½ tablet	≥7–11 years
≥35–55 kg	300 mg	7.5 mL	1½ tablets	–	≥11–15 years
≥ 55 kg and adult	400 mg	–	2 tablets	1 tablet	≥ 15 years and adult

Referral

» Deep and large wounds requiring elective suturing
» Shock and bleeding
» Unimmunised or not fully immunised patients for tetanus immunoglobulin
» Possible rabies exposure (for immunoglobulin and vaccination)

21.2.2 Insect stings and spider bites

T63.2/3/4

Description

Injury from spider bites and stings by bees, wasps, scorpions and other insects. Symptoms are usually local such as pain, redness swelling and itching.

» **Bees and wasps**
  – venom is usually mild but may provoke severe allergic reactions such as laryngeal oedema or anaphylactic shock (see section 21.17).
» **Spiders and scorpions**
  – most are non-venomous or mildly venomous.

Drug treatment

Emergency treatment:

Treat anaphylactic shock. See section 21.17: Shock, anaphylactic

For severe local symptoms:

- 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
≥ 35 kg and above	4 mg	–	1 tablet	≥ 11 years and adults

- Calamine lotion, applied when needed

- **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	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Very painful scorpion stings

- Lignocaine 2%, 2 mL injected around the bite as a local anaesthetic

Referral

» Presence of systemic manifestations:
  – weakness
  – drooping eyelids
  – difficulty in swallowing and speaking
  – double vision

Note:
Send the spider or scorpion with the patient if available.

21.2.3 Snakebites

T63.0

Description

Of all the species of snakes found in South Africa, about 12% are considered to be potentially dangerous to humans. However, all snake bites should be considered dangerous until proven otherwise.

South African poisonous snakes can be broadly divided into 3 groups according to action of their venom although there is significant overlap of toxic effects in some snake venoms.

Cytotoxic venoms

» Venom causes local tissue damage and destruction around the area of bite.
» The bite is painful and symptoms usually start within 10 to 30 minutes after the bite.
» Examples include:
  – Puff adder,
  – Gaboon adder
  – Berg adder
  – Night adder
  – Some dwarf adders and the spitting cobras i.e. Mozambique spitting cobra, black spitting cobra, rinkhals

Neurotoxic venoms

» Neurotoxic venom causes weakness and paralysis of skeletal muscles and respiratory failure.
» Bite is not as painful as cytotoxic venom bites.
» Symptoms usually start in 15–30 minutes.
» Examples include:
  – Cape cobra
  – Black mamba
  – Green mamba
  – Berg adder (Berg adder venom is neurotoxic as well as cytotoxic)
  – Black spitting cobra
  – Rinkhals, etc.

Haemotoxic venoms

» Venom affects the clotting of blood causing bleeding tendency which may delayed.
  – Boomslang
  – Vine snake

Symptoms and signs of snakebite envenomation include:

Local

» Bite marks with or without pain.

» Swelling around the bite, which may be severe with discolouration of skin and or blister formation.

Systemic

» Nausea, vomiting
» Sweating and hypersalivation.
» Skeletal muscle weakness. Which may cause
  – drooping eyelids
  – double vision
  – difficulty in swallowing
  – difficulty in breathing
» Shock
» Rarely bleeding (epistaxis, haematuria, haematemesis or haemoptysis)

! CAUTION !
Do not apply a tourniquet.
Do not apply a restrictive bandage to the head, neck or trunk.
Do not squeeze or incise the wound.
Do not attempt to suck the venom out.

General measures

Emergency treatment

Remove clothing from site of the bite and clean the wound thoroughly with chlorhexidine 0.05% solution.

For non-cytotoxic bites only:

» To prevent spread to vital organs, apply a wide crepe bandage firmly from just above the bite site up to 10–15 cm proximal to the bite site immediately. Apply no tighter than for a sprained ankle.
» Immobilise the affected part with a splint or sling.
» Try to obtain an accurate history e.g. time of bite, type of snake.
» If no sign and symptoms, observe the patient for 6–8 hours with repeated examinations.
» Absence of symptoms and signs for 6–8 hours usually indicates a harmless bite.
» However, observation for 24 hours is recommended.

Drug treatment

Venom in the eyes:

Irrigate the eye thoroughly for 15–20 minutes with water or any bland liquid

- Tetracaine 0.5%, drops, instilled into the eye(s) and cover with eye pads.

Refer patient.

For pain

Non-opioid analgesics according to severity – See section 20.2: Chronic non-cancer pain.

Shock
Treat if present.
See section 21.16: Shock

Tetanus prophylaxis
- Tetanus toxoid (TT), IM, 0.5 mL

! CAUTION !
Polyvalent antivenom is only effective for the following snake bites:
» Cape cobra
» Mambas
» puff adder
» gaboon adder
» rinkhals
» spitting cobras

Boomslang requires specific antivenom.

Antivenoms are available from the SAVP.
SAVP emergency number: 083 6520105
Snakebite antivenoms may be available from specific hospitals in each province.

Administration of snake bite antivenom

! CAUTION !
Antivenom can cause anaphylaxis.
Never administer without a good indication.
Always have resuscitative equipment and medication ready.

Note:
The majority of patients do not need and should not be given antivenom.
All patients with suspected black mamba bites should receive antivenom, even before onset of symptoms.
Patients with bites due to other species should only receive antivenom at the onset of any symptoms.
The dose of antivenom is the same for adults and children.

Criteria for antivenom administration
All patients with systemic signs and symptoms or severe spreading local tissue damage or should receive antivenom.
» signs of systemic poisoning
  – drooping eyelids
  – double vision
  – weakness
  – difficulty in swallowing
  – difficulty in breathing

» spreading local damage
  – swelling of a hand or foot within 1 hour of a bite (80% of bites are on hands or feet)
  – swelling extends to elbows or knees within 3–6 hours of a bite
  – swelling of the groin or chest at any time or if actively advancing
  – significant swelling of head or neck
  – muscle weakness and/or difficulty in breathing

- Polyvalent antivenom, slow IV infusion, 100 mL in 200 mL sodium chloride 0.9%. (Doctor initiated)
  - In children dilute 100 mL in 5 mL/kg of sodium chloride 0.9%.
  - In children less than 20 kg, seek advice and if not available, administer over 2 hours observing for signs of fluid overload.
  - Administer slowly for the first 15 minutes as most allergic reactions will occur within this period.
  - Increase the flow rate gradually until the infusion is completed within one hour.
  - Repeat if there is no clinical improvement after the infusion.
  - Black mamba bites may require up to 200 mL or more of antivenom.
  - Monitor for anaphylaxis for at least an hour after the infusion.
  - Prepare to treat possible anaphylaxis. See section 21.7: Shock, anaphylactic.

Note:
Ensure that the antivenom solution is clear.

Anaphylaxis
Administer adrenaline followed by hydrocortisone succinate.
See section 21.7: Shock, anaphylactic

Referral

» All patients with bites or likely bites even if puncture marks are not seen. If possible take the dead snake to the referral centre for identification.

21.3 Burns

T30.0

Description

Burns lead to skin and soft tissue injury and may be caused by:
» heat, e.g. open flame, hot liquids, hot steam
» chemical compounds
» physical agents, e.g. electrical/lightning) or
» radiation.

The extent and depth may vary from superficial (epidermis) to full-thickness burns of the skin and underlying tissues
Initially, burns are usually sterile.

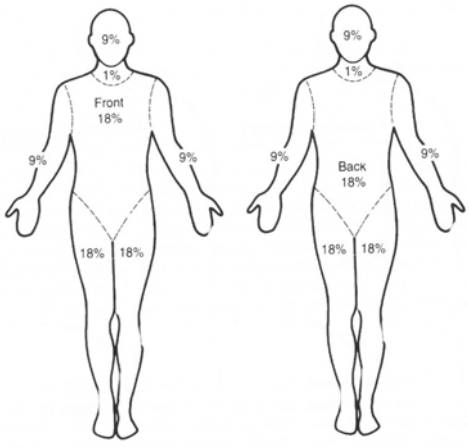
Assessment of burns

Depth of burn wound	Surface /Colour	Pain sensation/healing
Superficial or epidermal	Dry, minor blisters, erythema	» Painful » Heals within 7 days
Partial thickness superficial or superficial dermal	Blisters, moist	» Painful » Heals within 10–14 days
Partial thickness deep or deep dermal	Moist white or yellow slough, red mottled	» Less Painful » Heals within a month or more » Generally needs surgical debridement and skin graft
Full thickness (complete loss of skin)	Dry, charred whitish, brown or black	» Painless, firm to touch » Healing by contraction of the margins (generally needs surgical debridement and skin graft)

The figures below are used to calculate body surface area %[1]
These diagrams indicate percentages for the whole leg/arm/head (and neck in adults) not the front or back.

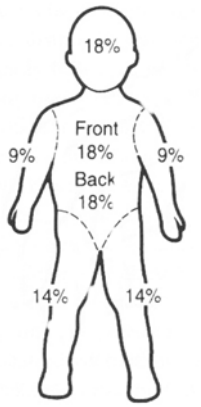
In children the palm of the hand is 1%.

Children 8 years and adults



Published with kind permission from SAMJ.
South African Burn Society burn stabilisation protocol. JS Karpelowsky, L Wallis, A Maderee and H Rode. SAMJ Vol 9, No 8 Page 574–7

Children < 8 years of age



Paediatric adjustments

< 1 year

» Head and neck are 18% of BSA
» Each leg is 14% of BSA

> 1 year

For each year of life:

» **Head** decreases by 1% of BSA until 8 years of age
» **Leg** gains $^1/_2$ % of BSA until 8 years of age

Emergency treatment

» Remove smouldering or hot clothing.
» Remove constrictive clothing/rings.
» To limit the extent of the burn, soak the affected area generously with, or immerse in cold water for 30 minutes after the burn.
» In all burns > 10% or where carbon monoxide poisoning is possible (enclosed fire, decreased level of consciousness, disorientation) administer high flow oxygen
» Examine carefully to determine the extent and depth of the burn wounds.
» Respiratory obstruction due to thermal injury or soot inhalation, production of black coloured sputum, shortness of breath, hoarse voice and stridor are serious signals.

Drug treatment

Fluid replacement

Burns under 10% TBSA (Total Body Surface Area):

- Oral fluids

Burns of over 10% of total body surface area (TBSA)

- IV fluid for resuscitation

Calculation of fluid replacement

Replacement fluids for burns

First 24 hours:

- Sodium chloride 0.9%, IV
  - Calculate total fluid requirement in 24 hours:
    Total % burn ____x weight (kg) ____x 4 mL
  - Give half this volume in the first 8 hours.
  - Administer remaining fluid volume in next 16 hours

Note:

If urine output not adequate, increase fluids for the next hour by 50%. Continue at a higher rate until urine output is adequate, then resume normal calculated rate.

Maintenance fluids in children

In children, add oral or intravenous maintenance fluid to above calculated volume.

Maintenance fluids	
≤1 year	120 mL/kg/24 hours
All children older than 1 year – the sum of the following:	
• first 10 kg body weight	100 mL/kg/24 hours
• second 10 kg body weight	50 mL/kg/24 hours
• additional weight greater than 20 kg body weight	20 mL/kg/24 hours

Example: 24 kg child with 10% burns	
1st 24 hours	
• replacement for expected losses: 4 mL/kg x 24kg x 10%	= **960 mL**
• maintenance: first 10 kg = 10 kg X 100 mL/kg/24 hours second 10 kg = 10 kg X 50 mL/kg/24 hours remaining 4 kg = 4 kg X 20 mL/kg/24 hours Total maintenance	 = 1 000 mL+ = 500 mL+ = 80 mL = **1 580 mL**
Total fluids in 1st 24 hours = 960 mL + 1 580 mL	= **2 540 mL**
Thus	
1st 8 hours = total 24 hour volume / 2 = 2 540 / 2	= **1 270 mL**
Next 16 hours = total 24 hour volume / 2 = 2 540 / 2	= **1 270 mL**

For pain

- **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	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Severe pain

See section 20.2: Chronic non-cancer pain.

Wound cleansing

» Clean the burn wound gently
- Sodium chloride 0.9% or clean water

Burn dressing

For patients requiring referral:

» If within 12 hours, transfer wrapped in clean dry sheet and blankets
» If delayed by more than 12 hours paraffin gauze dressing and dry gauze on top
» For full thickness and extensive burns cover with an occlusive dressing

For patients not requiring transfer (burns that can be treated at home):

» Paraffin gauze dressing and then dry gauze on top

If infected burn:

- Povidone iodine 5%, cream, applied daily
  or
  Chlorhexidine 0.05%, solution, daily

Tetanus prophylaxis

If not vaccinated within the last 5 years:

- Tetanus toxoid (TT), IM, 0.5 mL

Referral

» All children less than 1 year
» All burns greater than 5% from 1–2 years of age
» Third-degree burns of any size in any age group
» Partial thickness burns greater than 10% total body surface area (TBSA)
» Burns of special areas – face, hands, feet, genitalia, perineum and major joints
» Electrical burns, including lightning injury
» Chemical burns
» Inhalation injury – fire or scald injury
» Circumferential burns of the limbs or chest
» Burn injury in a patient with pre-existing medical disorders which could complicate management, prolong recovery or affect mortality
» Any patient with burns and concomitant trauma
» Suspected child abuse
» Burns exceeding the capabilities of the referring centre
» Septic burn wounds

21.4 Cardiac arrest – cardiopulmonary resuscitation

I46.9

21.4.1 Cardiac arrest adults

Description

Cardiac arrest is the sudden and unexpected cessation of effective cardiac output, on the basis of asystole or a malignant tachyarrhythmia. Irreversible brain damage can occur within 2–4 minutes.

Clinical features include:
» sudden loss of consciousness
» absent carotid and all other pulses
» loss of spontaneous respiration
» dilatation of the pupils

Emergency treatment

» Diagnose rapidly.
» Make a note of the time of starting.
» Place the patient on a firm flat surface and commence resuscitation immediately.
» Call for skilled help.
» Initiate ABC (airways breathing circulation) sequence of CPR (cardiopulmonary resuscitation).
» A single powerful precordial thump is recommended for witnessed cardiac

arrest where a defibrillator is not immediately available.
» Document medication and progress.

Cardiopulmonary resuscitation

Airway

» Remove vomitus or foreign body and dentures from the mouth, if present.
» To open the airway, lift the chin forward with the fingers of the one hand and tilt the head backwards with other hand on the forehead. Do not do this where a neck injury is suspected.
» Insert artificial airway, if available

Where neck injury is suspected:

» To open the airway, place your fingers behind the jaw on each side.
» Lift the jaw upwards while opening the mouth with your thumbs

Breathing

» Keeping the airway open, check the breathing.
» If breathing well, place the patient on the side to protect the airway and support the patient by bending the uppermost arm and leg.
» If there is no breathing, apply artificial respiration at a rate of **8–10 breaths per minute**
  – mouth-to-mouth
  or
  – mouth-to-nose
  or
  – with Ambubag and face mask
  Continue until spontaneous breathing occurs
» Oxygenate with 100% oxygen
» Intubate as soon as possible. Oxygenate well before intubation.

Circulation

» Check for carotid pulse.
» If there is no pulse, start chest compressions at **100 compressions per minute.**
  Continue until return of the pulse and/or respiration
» Initiate IV fluids
• Sodium chloride 0.9%, IV

In pulseless tacchyarrythmias defibrillate if adequately trained.

Call a doctor, if available, without stopping CPR.

Immediate emergency drug treatment

Adrenaline is the mainstay of treatment and should be given immediately, IV or endobronchial, when there is no response to initial resuscitation or defibrillation.

- Adrenaline, 1:1 000, 1 mL, IV immediately as a single dose

or

If no IV line available

- Adrenaline, endobronchial, 1:1 000, 2 mL through endotracheal tube.
  - Dilute with 5–10 mL of sterile water or sodium chloride 0.9%.
  - Repeat every 3–5 minutes during resuscitation.

For bradycardia

- Atropine, IV, 0.5 mg.
  - Repeat after 2–5 minutes if no response.
  - Maximum dose: 3 mg.

Assess continuously until the patient shows signs of recovery.

Consider stopping resuscitation attempts and pronouncing death if:

» further resuscitation is clearly clinically inappropriate, e.g. incurable underlying disease

» no success after all the above procedures have been carried out for 30 minutes or longer

Consider carrying on for longer especially when:

» hypothermia and drowning

» poisoning or drug overdose or carbon monoxide poisoning

21.4.2 Cardiopulmonary arrest, children

For advance resuscitation training should be undertaken.

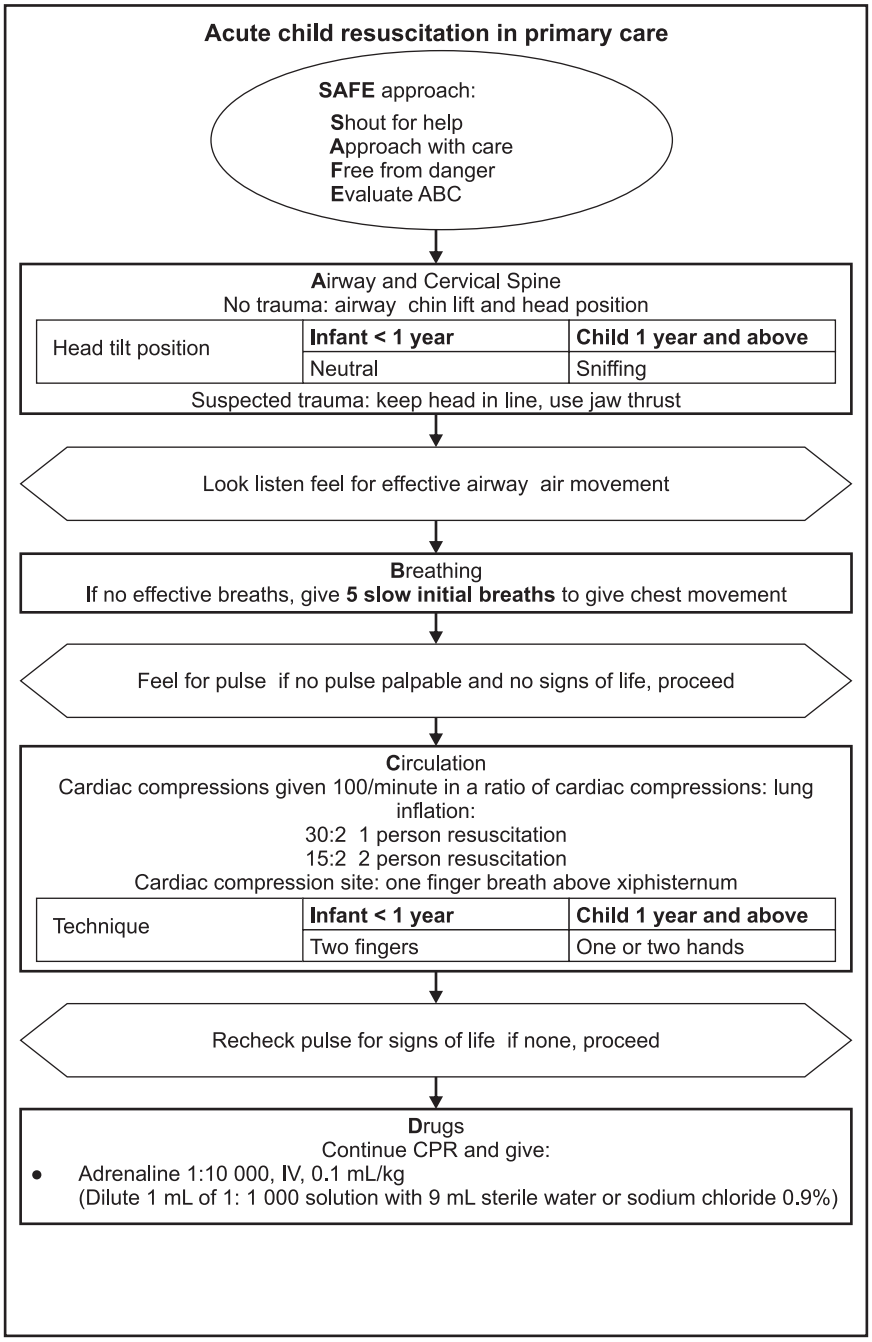
Description

Cardio-pulmonary arrest is the cessation of respiration or cardiac function and in children is usually a pre-terminal event as a result of a pre-existing critical illness. Resuscitation is less often successful in children and it is better to prevent cardio-pulmonary arrest by recognizing serious illness and managing it appropriately.

The effective treatment of cardio-respiratory arrest in children is the prevention of the arrest by early recognition and management of severe disease.

Cardio-respiratory arrest in children usually follows poor respiration, poor circulation or poor respiratory effort (neurological cause). If any of the following are present this is evidence of serious disease/impending failure and needs urgent effective management.

	Neurological	**Respiratory**	**Circulatory**
Signs of impending failure/severe disease	Decreased level of consciousness	Increased respiratory rate > 60	Increased heart rate: > 160 in infants > 120 in children
	Abnormal posture	Chest indrawing	Decreased pulse volume
	Pupils - abnormal size or equality.	Grunting	Capillary refill time more than 3 seconds
	Presence of convulsions	Flaring alae nasae	


Acute child resuscitation in primary care
SAFE approach:
Shout for help
Approach with care
Free from danger
Evaluate ABC
Airway and Cervical Spine
No trauma: airway chin lift and head position
Head tilt position
Infant < 1 year
Child 1 year and above
Neutral
Sniffing
Suspected trauma: keep head in line, use jaw thrust
Look listen feel for effective airway air movement
Breathing
If no effective breaths, give 5 slow initial breaths to give chest movement
Feel for pulse if no pulse palpable and no signs of life, proceed
Circulation
Cardiac compressions given 100/minute in a ratio of cardiac compressions: lung inflation:
30:2 1 person resuscitation
15:2 2 person resuscitation
Cardiac compression site: one finger breath above xiphisternum
Technique
Infant < 1 year
Child 1 year and above
Two fingers
One or two hands
Recheck pulse for signs of life if none, proceed
Drugs
Continue CPR and give:
Adrenaline 1:10 000, IV, 0.1 mL/kg
(Dilute 1 mL of 1: 1 000 solution with 9 mL sterile water or sodium chloride 0.9%)

Emergency treatment

» Diagnose rapidly
» Make a note of the time of starting
» Place the patient on a firm flat surface and commence resuscitation immediately
» Call for skilled help
» Initiate ABC (Airways Breathing Circulation) sequence of CPR (Cardiopulmonary Resuscitation)
» Document medication and progress.
» Collect all ampoules used and total them at the end.

Airway

» Manually remove obvious obstruction from the mouth.

! CAUTION !
Do not use blind finger sweeps of the mouth or posterior pharynx as this can impact any obstruction further down the airway.

» In neonates and infants position head in neutral position, in children position in the sniffing position.
» Lift the chin forward with the fingers under the bony tip of the jaw.
» Look, listen and feel for air movement (breathing) to see if the airway is patent.
» If air movement is not good, insert oral artificial airway if necessary and available (airway size – from tip to top of airway should be the distance between the central upper incisors and the tragus [lobe] of the ear).
» If breathing spontaneously and well, lay the patient on the side to protect the airway and support the patient by bending the uppermost arm and leg.
» If a foreign body; if suspected follow a choking protocol – See section 21.4.3: Management of suspected choking/foreign body aspiration.

Breathing

» If there is **no breathing,** apply artificial respiration:
  – mouth-to-mouth
    or
  – mouth-to-nose
    or
  – preferably with Ambubag and face mask
» Breathe (inflate the chest) give 5 slow rescue breaths at 15 times/minute (faster in babies).
» **Do not** stop unless spontaneous breathing starts, even if cardiac compressions are started – see below.

! CAUTION !
Cardiac massage is ineffective unless there is an open airway and the lungs are being filled with air

Circulation

» Check for a pulse
  – carotid in the older child, or femoral or brachial pulse

If there is no pulse:

» Start cardiac compressions or massage at a rate of 100 beats per minute for 15 compressions then give the following ratio with lung inflations (ventilation):
  – Universal compression-ventilation ratio for all ages (except neonates) is 30 compressions to 2 breaths if there is one rescuer.
  – If two rescuers are present, use a compression – ventilation ratio of 15:2 when giving CPR to children and infants
» Continue until the pulse or respiration returns

Keep patient covered and warm while resuscitating.
Ventilate if there is a pulse but no breathing.

» Call a doctor, if available, without stopping CPR

Immediate emergency Drug treatment

» If still no pulse or signs of life after cardiac compressions and ventilations:

- Adrenaline, IV, 0.1 mL/kg of diluted solution.
  - Adrenaline 1:1 000, 1 mL diluted with sodium chloride 0.9% to 10 mL.

Weight kg	**Dose** mg	**Volume of diluted solution** (1: 10 000 solution)	**Age** months/years
≥ 2.5–7 kg	0.05 mg	0.5 mL	Birth–6 months
≥ 7–11 kg	0.1 mg	1 mL	≥ 6–18 months
≥ 11–17.5 kg	0.15 mg	1.5 mL	≥ 18 months–5 years
≥ 17.5–25 kg	0.2 mg	2 mL	≥ 5–7 years
≥ 25–35 kg	0.3 mg	3 mL	≥ 7–11 years
≥ 35–55 kg	0.5 mg	5 mL	≥ 11–15 years

Hypoglycaemia in sick children, especially infants

Look for evidence during resuscitation and treat proven hypoglycaemia:

- Dextrose 10%, solution, IV, 5 mL/kg.
  - Do not give unless hypoglycaemic or hypoglycaemia strongly suspected
  - Do not give excessive volumes.

Drug administration route:

» **IV** via a drip that flows well.
» Avoid administration of excessive IV fluid during resuscitation.
» Use 60 drop per minute IV administration sets for all drips unless the arrest is due to hypovolaemia.

Assess continuously until the patient shows signs of recovery.

Consider stopping resuscitation attempts and pronouncing death if:
» further resuscitation is clearly clinically inappropriate, e.g. incurable underlying disease
» no signs of life are present after 30 minutes of active resuscitation

However, **carry on** for longer in cases of:
» hypothermia and drowning
» suspected poisoning or drug overdose or carbon monoxide poisoning

Referral

» All patients should be transferred on supportive treatment with accompanying skilled worker until taken over by doctor at receiving institution.

21.4.3 Management of suspected choking/foreign body aspiration in children

T18.9

Choking child

Do not use back blows or chest/abdominal thrusts unless sure that foreign body obstruction is life threatening, i.e. apparently complete obstruction.

» To clear foreign body in conscious child with apparently complete obstruction
  – 5 back blows
  ↓
  – 5 chest/abdominal thrusts
  ↓
  – Reassess and repeat if necessary

» In unconscious child
  – Give 5 slow rescue breaths
  ↓
  – Then commence CPR in normal ratio

If the child is still **able to breathe**	Transfer urgently to hospital for treatment – with someone able to treat acute complete choking accompanying the child.
If the child is **able to talk and breathe**	Encourage him to cough repeatedly while arranging transfer urgently with supervision.
If the child is **not breathing or is in a life threatening situation with increasing dyspnoea in spite of correct positioning of the head and jaw**	Urgent attempts should be made to dislodge the foreign body. **These should not be done in a child who is able to breathe as in this situation they may make matters worse.**
If the child is **unconscious with no effective air movement**	Initiate full CPR after at least 2 slow rescue breaths and continue with full CPR.
If the child is **conscious but with no effective cough or air movements**	Give 5 back blows followed by 5 chest/ abdominal thrusts followed by re-assessment of breathing and then repeated as a cycle until recovery or failure of resuscitation.

Back Blows and chest/abdominal thrusts

Infants:

Place the baby along one of the rescuer's arms in a head down position.
Rest the arm along the thigh and deliver 5 back blows to the child.
If this is ineffective turn the baby over and lay it on the rescuer's thigh in the head down position.
Apply 5 chest thrusts – use the same landmarks as for cardiac compression but more slowly. If too large to carry out on the thigh this can be done across the lap.

Children:

In children back blows are also used but usually across the lap.
In place of the chest thrust, abdominal thrusts are used (Heimlich manoeuvre) and may be used standing, sitting, kneeling or lying.
For abdominal thrust in the standing, sitting or kneeling position the rescuer moves behind the child and passes his arms around the child's body.
One hand is formed into a fist and placed against the child's abdomen above the umbilicus and below the xiphisternum. The other hand is placed over the fist and both hands are thrust sharply upwards into the abdomen towards the chest.
In the lying (supine) position the rescuer kneels astride the victim and does the same manoeuvre except that the heel of one hand is used rather than a fist.

This is repeated 5 times and then the breathing reassessed. If not relieved the cycle of back blows →abdominal thrusts→reassessment is repeated until the relief of obstruction or failure of resuscitation.

21.5 Delirium with acute confusion and aggression in adults

F05.9

Description

Delirium is a medical emergency.
Delirium is a sudden onset state of confusion in which there is impaired awareness and memory and disorientation.
Delirium should not be mistaken for psychiatric disorders like schizophrenia or a manic phase of a bipolar disorder. These patients are mostly orientated for time, place and situation, can in a way make contact and co-operate within the evaluation and are of clear consciousness.
There are many possible causes including extracranial causes. Organic or physical illness should also be considered as possible causes.
The elderly are particularly prone to delirium caused by medication, infections, electrolyte and other metabolic disturbances.

Main clinical features are:
» acute onset (usually hours to days)
» impaired awareness
» confusion
» disorientation

Other symptoms may also be present:
» restlessness
» agitation
» hallucinations
» autonomic symptoms such as sweating, tachycardia and flushing
» patients may be hypo-active, with reduced responsiveness to the environment
» a fluctuating course and disturbances of the sleep-wake cycle are characteristic
» aggressiveness
» violent behaviour alone occurs in exceptional cases only

Risk factors for delirium include

» extremes of age
» HIV infection
» pre-existing dementia
» cerebrovascular disease
» pre-existing neurological disease e.g. epilepsy
» drugs such as anticholinergics and hypnotics
» substance intoxication and withdrawal

Checklist for diagnosis:
D – drugs
I – infections
M – metabolic
T – trauma
O – oxygen deficit
P – pre-existing neurological disease, e.g. epilepsy and dementia

Emergency treatment

» Calm the patient
» Manage in a safe environment

If the delirium is caused by seizures or substance withdrawal or if communication is difficult

- Diazepam, IV, 10 mg for immediate sedative or hypnotic action.
  - If no response give a second dose.
  - Do not administer at a rate over 5 mg/minute

  or

  Lorazepam, IM/IV, 2 mg.
  - If no response give a second dose.

Switch to oral once containment is achieved.
» Secure airway
» Exclude hypoglycaemia
» Monitor for respiratory depression

If the most likely cause of delirium is a medical disorder and if very restless:

- Haloperidol, IM, 5 mg, immediately.
  - If no response give a second dose.

Referral

Urgent
» All cases

21.6 Exposure to poisonous substances

T65.9

Note: Poisoning from agricultural stock remedies is notifiable.

MAJOR POISON INFORMATION CENTRES	
Gauteng: (office hours)	(011) 678 2332 Pharmnet Amayeza Info Centre
Free State: (24-hours, every day)	(051) 401 3111 (051) 401 3177 082 410 4229
Western Cape: (24-hours, every day)	
Tygerberg:	(021) 931 6129
Red Cross:	(021) 689 5227

If the above centres cannot be contacted, enquire at the nearest trauma and emergency unit.

Description

Acute poisoning is a common medical emergency. Poisoning may occur by ingestion, inhalation or absorption through skin or mucus membranes. Frequently encountered poisons include:

» analgesics
» anti epileptic agents
» antidepressants and sedatives
» pesticides
» volatile hydrocarbons, e.g. paraffin
» household cleaning agents
» vitamins and minerals, especially iron in children
» antihypertensive and antidiabetic agents
» theophylline

Signs and symptoms vary according to the nature of poisoning.

General Measures

» Remove the patient from the source of poison, especially pesticides, e.g. clothing, etc.
» If skin contact has occurred, especially pesticides, wash the skin with soap and water, ensuring your safety with protective measures e.g., gloves, gowns, masks, etc.
» Establish and maintain the airway.

» Ensure adequate ventilation and oxygenation.
» Take an accurate history.
  – Obtain collateral information as well, especially in patients with impaired consciousness.
  – A special effort should be made to obtain tablets, packets, containers, etc. of the suspected agent used in order to identify poisons involved.
» Document and respond to abnormalities of:
  – pulse rate
  – blood pressure
  – respiratory rate
  – level of consciousness
  – pupillary size and reaction

Ingested poisons

- Activated charcoal, through nasogastric tube.
  - Adults: 100 g mixed as a slurry with water.
  - Children: 1 g/kg mixed as a slurry with water.
  - Add 300 – 600 mL of water to charcoal and not vice versa.
  - Do not administer orally if the level of consciousness is reduced. Administer via nasogastric tube to avoid the danger of aspiration.

Weight kg	**Dose** g	**Age** Months/years
≥ 3.5–7 kg	5 g	≥ 1–6 months
≥ 7–11 kg	10 g	≥ 6–18 months
≥ 11–17.5 kg	15 g	≥ 18 months–5 years
≥ 17.5–35 kg	25 g	≥ 5–11 years
≥ 35–55 kg	50 g	≥ 11–15 years
≥ 55 kg and above	100 g	15 years and adult

» Activated charcoal should not be given in the case of:
  – volatile hydrocarbon poisoning, e.g. paraffin, petrol
  – corrosive poisons, i.e. acids or alkalis
  – camphor and other convulsants
  – metals, e.g. iron, lithium etc and
  – all alcohols.

» Protect the airway
  – Place in lateral position if decreased level of consciousness.
  – If level of consciousness is depressed to the state where aspiration is likely, intubate the patient.
» Identify the poison and keep a sample of the poison or container.
» Contact the nearest hospital or poison centre for advice

Emergency management

» If the patient is unconscious, perform resuscitation – See section 20.4: Cardiac arrest – cardiopulmonary resuscitation
» Take a history and identify the nature and route of poisoning.
» Thoroughly wash off any poison from the skin with soap and water and remove contaminated clothes in organophosphate poisoning

Note:
Health care workers and relatives should avoid having skin contact with the poison.

Specific antidotes

Hypoxia, especially in carbon monoxide poisoning:

- Oxygen

Organophosphate and carbamate poisoning

Signs and symptoms of organophosphate poisoning include:

» diarrhoea
» vomiting
» hypersecretions (hypersalivation, sweating,lacrimation, rhinorrhoea)
» brochospasm and bronchorhoea, causing tightness in the chest, wheezing, cough and pulmonary oedema
» bradycardia
» muscle twitching
» weakness
» miosis/mydriasis
» confusion
» convulsions
» coma

- Atropine, IV
  - Adults: initial dose 1 mg, repeat doses are 2–4 mg
  - Children: 0.05 mg/kg/dose
  - Repeat the dose every 10–15 minutes until there is control of bronchial secretions.
  - Refer all patients urgently.
  - Response to a first dose suggests organophosphate poisoning.

Weight kg	**Dose** mg	**Use one of the following injections:**		**Age** months/years
		0.5 mg/mL	1 mg/mL	
≥ 3.5–5.5 kg	0.2 mg	0.4 mL	0.2 mL	≥ 1–3 months
≥ 5–7 kg	0.3 mg	0.6 mL	0.3 mL	≥ 3–6 months
≥ 7–9 kg	0.4 mg	0.8 mL	0.4 mL	≥ 6–12 months
≥ 9–11 kg	0.5 mg	1 mL	0.5 mL	≥ 12–18 months
≥ 11–14 kg	0.6 mg	1.2 mL	0.6 mL	≥ 18 months–3 years
≥ 14–17.5 kg	0.8 mg	1.6 mL	0.8 mL	≥ 3–5 years
≥ 17.5 kg and above	1 mg	2 mL	1 mL	≥ 5 years and adults

Opioid drug overdose in adults

- Naloxone, IV, 0.4–2 mg immediately.
  - Repeat 0.4 mg every 5 minutes until reversal or pupils dilate.
  - Total effective dose is 10 mg.
  - May be administered endotracheally.
  - Duration of action is short, i.e. 45 minutes.
  - Repeat doses over 24 hours may be required

  All patients need to be kept under direct observation until the effect of the opiates has completely worn off.
  Further doses of naloxone may be needed while awaiting and during transport as naloxone has a short duration of action.
  Refer all patients.
  In some patients addicted to opioids, naloxone may precipitate an acute withdrawal syndrome after several hours – this must not prevent the use of naloxone.

Paracetamol poisoning

All patients should be referred **urgently** for paracetamol blood level and consideration of N-acetylcysteine.

Referral

» All intentional overdoses
» All symptomatic patients
» All children in whom toxicity can be expected, e.g. ingestion with:
  – paracetamol > 6 mL/kg (or 140 mg/kg)
  – anti-epileptics
  – warfarin
  – tricyclic antidepressants
  – sulphonylureas
  – paraffin (unless patient has a normal respiratory rate after 6 hours)
  – iron tablets

If in doubt, consult the referral or poison centre.

Note:

Send the following to hospital with the patient:

» written information
» a sample of the poison or the empty poison container

21.7 Eye, chemical burn (See Chapter 18 – Eye conditions)

T26.5

21.8 Eye injury, foreign body (See Chapter 18 – Eye conditions)

S05.9 / S05.5

21.9 HIV prophylaxis, post exposure (PEP)

Z29.2

21.9.1 Penetrative sexual abuse or sexual assault

T74.2

Description

Sexual assault, sexual abuse or rape is considered when a person intentionally and unlawfully commits an act of sexual penetration with another person by force or threat.

Sexual penetration is defined broadly and refers to any act which causes penetration to any extent whatsoever by:

» the genital organs of one person into the mouth, anus or genital organs of another person
» any object, any part of the body of one person into the anus or genital organs of another person in a manner that simulates sexual intercourse.

A person who has sexual intercourse with another person without disclosing that he/she is HIV positive will be guilty of rape, as the consent given will not be valid due to the fact that it was obtained by false pretences.

General measures

If indecision exist with any of the following offer a 1st dose of antiretroviral PEP as soon as possible – the following matters can then be resolved in due course:

» Obtain informed consent from the patient and written consent from parent in case of minors before HIV testing and PEP.
  – Children over the age of:
    (i) 12 years of age or older; or
    (ii) under the age of 12 years and of sufficient maturity to understand the benefits, risks and social implications of such a test; may sign their own consent.
» Determine the patient's HIV-status before initiating PEP.
  – Prophylaxis given to a previously infected HIV person will have no clinical benefit and may lead to the development of viral resistance.

» It is the patient's choice to have immediate HIV testing.
  – If the patient declines, only a 3-day starter pack of PEP should be given and the patient encouraged to reconsider testing within those 3 days. **No further PEP will be given in the case of continued refusal of HIV testing.**
» A patient presenting after 72 hours will not be given PEP but should be counselled about the possible risk of transmission.
  – HIV testing should still be offered at the time of presentation and 3 months later.
» Perform a pregnancy test before initiating PEP.
  – Pregnant rape patients should be referred.
» HIV Elisa positive tested sexually abused children under the age of 18 months must have an HIV DNA PCR (polymerase chain reaction) performed.
  – If HIV uninfected or if the child has no access to PCR, they should receive prophylaxis.
» Explain the side effects of the ARV drugs, e.g. tiredness, nausea and flu-like symptoms.
» Emphasise the importance of compliance with ARV treatment.
» Counsel all sexually assaulted patients and caregivers in the case of children
» Provide psychosocial support pertaining to:
  – medical risks, e.g. transmission of sexually transmitted infections including HIV, syphilis, hepatitis-B and C
  – risk of pregnancy
  – psycho-emotional-social effects of the sexual assault according to their level of understanding and maturity
  – identify need for support and refer if needed
» Discuss issues relating to stress management at subsequent visits.
  Post traumatic stress may eventually cause exhaustion and illness. Inform the patient of the signs and symptoms of post traumatic stress, including:
  – general irritability
  – trembling
  – pain in neck and/or lower back
  – change in appetite
  – change in sleep pattern
» Medico-legal assessment of injuries
» Complete appropriate registers

Note:
Refer very young or severely traumatised children to a specialised unit or facility. Children with external signs of genital trauma may need an examination under anaesthesia and should be referred. Trauma to the genital area increases transmission. The character of the exposure should be classified as:
» low risk – non receptive or non traumatic intercourse
» high risk – vaginal and/or rectal penetration and traumatic intercourse

» Blood tests
  – The patient should sign a consent form for both testing and PEP
  – Voluntary rapid HIV testing should be made available and should be done on all opting for PEP
  – Further blood tests should include full blood count VDRL-RPR and Hepatitis B serology.
  – Full blood count should be repeated at 2 and 4 weeks if patient receives PEP
  – Blood should be taken at 4 weeks, 3 months and 6 months for HIV testing
  – RPR at baseline and after 6 weeks

Drug treatment

Note:

» Offer PEP if the patient presents within 72 hours of being raped and is HIV non-infected.
» Obtain consent for HIV testing from all patients before initiating PEP.
» Initiate PEP as soon as possible provided the patient is not HIV-infected prior to the incident
  – For low risk exposure, initiate dual therapy.
  – For high risk exposure and children with very physically traumatic assaults, refer for management of these physical injuries and to consider the use of triple therapy. During referral dual therapy should be initiated immediately.
» In children under the age of 15 months antiretroviral therapy should be used while arranging transfer and awaiting confirmation of HIV results
» Initiating therapy within 24 hours is most likely to be effective at preventing transmission of HIV
» Do a pregnancy test in all women and female adolescents. In the case of children who are clearly pre-pubertal this may be omitted.

STI prophylaxis

Non-pregnant women, men:

- Doxycycline, oral, 100 mg 12 hourly for 7 days
- Cefixime, oral, 400 mg immediately as a single dose
- Metronidazole, oral, 2 g immediately as a single dose

Pregnant women:

- Amoxicillin, oral, 500 mg 8 hourly for 7 days
- Cefixime, oral, 400 mg immediately as a single dose
- Metronidazole, oral, 2 g immediately as a single dose

Children:

<table>
<tr><td>Under 8 years:</td><td>
• Amoxicillin, oral, 8 hourly
<table>
<tr><th rowspan="2">Weight
kg</th><th rowspan="2">Dose
mg</th><th colspan="2">Syrup</th><th rowspan="2">Age
Months/
years</th></tr>
<tr><th>125mg/
5mL</th><th>250mg/
5mL</th></tr>
<tr><td>≥ 2 – 2.5</td><td>50</td><td>2 mL</td><td>–</td><td>34–36 weeks</td></tr>
<tr><td>≥ 2.5 – 3.5</td><td>62.5</td><td>2.5 mL</td><td>–</td><td>Birth–1 month</td></tr>
<tr><td>≥ 3.5 – 5.5</td><td>75</td><td>3 mL</td><td>–</td><td>≥ 1–3 months</td></tr>
<tr><td>≥ 5 – 7</td><td>125</td><td>5 mL</td><td>2.5 mL</td><td>≥ 3–6 months</td></tr>
<tr><td>≥ 7 – 9</td><td>150</td><td>6 mL</td><td>3 mL</td><td>≥ 6–12 months</td></tr>
<tr><td>≥ 9 – 11</td><td>187.5</td><td>7.5 mL</td><td>–</td><td>≥ 12–18 months</td></tr>
<tr><td>≥ 11–17.5</td><td>250</td><td>10 mL</td><td>5 mL</td><td>≥ 18 months–5 years</td></tr>
<tr><td>≥ 17.5 – 20</td><td>375</td><td>15 mL</td><td>7.5 mL</td><td>≥ 5–7 years</td></tr>
</table>
</td></tr>
<tr><td>8–12 years:</td><td>• Doxycycline, oral, 100 mg once daily for 7 days</td></tr>
<tr><td>Over 12 years:</td><td>• Doxycycline 100 mg 12 hourly for 7 days</td></tr>
</table>

plus

- Ceftriaxone, IM
  - Under 25 kg 125 mg
  - Over 25 kg 250 mg

! CAUTION !
Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.
Contra-indicated in neonatal jaundice.
Annotate the dose and route of administration on the referral letter.

plus

- Metronidazole, oral, as a single dose
  - 1–3 years 500 mg
  - 3–7 years 600–800 mg
  - 7–10 years 1 g

Post-coital contraception to prevent unintentional pregnancy in women of reproductive age

- Levonorgestrel 0.75 mg, oral, 2 tablets as a single dose as soon as possible after unprotected intercourse

Or if unavailable:

- Norgestrel/ethinyl oestradiol 0.05/0.5 mg mg, oral, 2 tablets as soon as possible after unprotected intercourse, followed by 2 tablets 12 hours later.

! CAUTION !
Tablets must be taken as soon as possible, preferably within 72 hours of unprotected intercourse and not more than 5 days later.

An anti-emetic if needed

Hepatitis-B vaccination
See section 13.2: Dosage and administration (Chapter 13: Immunisation)

PEP treatment
Children:
As the body surface area is very difficult to calculate, the following guidelines are provided:

- Zidovudine, oral, 12 hourly for 28 days.
  - Paediatric dose: 180 mg/m2
  - Maximum: 300 mg/dose.
    Solution: 10 mg/mL; capsules: 100 mg; tablets: 300 mg (not scored)

Weight (kg)	
≥ 5–5.9 kg	6 mL
≥ 6–6.9 kg	7 mL
≥ 7–7.9 kg	8 mL
≥ 8–8.9kg	9 mL or 1 capsule
≥ 9–11.9 kg	10 mL or 1 capsule
≥ 12–13.9 kg	11 mL or 1 capsule
≥ 14–19.9 kg	2 capsules in the morning and 1 capsule in the evening
≥ 20–29.9 kg	2 capsules
≥ 30–40 kg	1 tablet

plus

- Lamivudine, oral, 4 mg/kg/dose 12 hourly for 28 days.
  - Maximum: 150 mg/dose.
    Solution: 10 mg/mL; tablet: 150 mg

Weight (kg)	
≥ 5–6.9	3 mL
≥ 7–9.9	4 mL
≥ 10–11.9	5 mL
≥ 12–13.9	6 mL
≥ 14–19.9	7½ mL or ½ tablet (if divisible tablet)
≥ 20–24.9	1 tablet in the morning and 7½ mL or ½ tablet (if divisible tablet) in the evening
≥ 25–40	1 tablet

Dosages may be varied by up to 1 mg/kg/dose more or less to allow a convenient volume of medication.
In children needing more than the maximum dose, use the adult dosage regimen.

Adults

- Zidovudine, oral, 300 mg 12 hourly for 28 days

plus

- Lamivudine, oral, 150 mg 12 hourly for 28 days
  - Initially supply medication for 2 weeks.
  - Evaluate patient after 2 weeks at which the remainder of the PEP treatment should be supplied.

Follow up visits should be at 6 weeks, 3 months and 6 months after the rape.
HIV testing should be performed at each of these visits.

Referral

» All patients with severe physical or psychological injuries
» Infants with significant evidence of sexual assault need referral after beginning dual therapy as soon as possible.

Note:
Refer if there are inadequate resources with regard to:
» counseling
» laboratory for testing
» medico-legal examination
» drug treatment

21.9.2 Occupational post-exposure HIV prophylaxis for health-care workers (HCW)

Z29.2

Description

Exposure to infectious material from HIV seropositive patients including:
» blood
» CSF
» semen
» vaginal secretions
» synovial, pleural, pericardial, peritoneal, amniotic fluid
» The risk of acquiring HIV following occupational exposure is estimated at 0.3%.
» There is a higher risk when:
» the injury is deep
» involves a hollow needle
» or when the source patient is more infectious, e.g.:
  – terminal AIDS

- seroconversion illness
- or known to have a high viral load

Where the source patient is on ARVs or has been on ARVs normal prophylaxis should be started and expert opinion should be sought. An extra blood sample (unclotted - EDTA) of the source patient should be stored in case of need for further viral testing.

Other blood borne infections that can be transmitted include hepatitis B, hepatitis C and syphilis and all source patients should be tested.
Comprehensive and confidential pre-test counselling should be offered.

Drug treatment

» Initiate PEP immediately after the injury and within 72 hours.
  - Do not wait for the confirmatory test results on the source patient and health care worker.
» With very high risk exposures, initiation of treatment may be considered beyond 72 hours.
  - The risks of prophylaxis in this setting may outweigh the benefits.
» Do not consider initiating HIV prophylactic treatment beyond 7 days after exposure.
» Duration of prophylactic treatment is 4 weeks.
» PEP should not be offered for exposures to body fluids which carry no risk of infection, e.g. vomitus, urine, faeces or saliva.
» PEP is not indicated for health care workers who are HIV-infected.
» PEP is not indicated when the source is HIV sero-negative unless there are features suggesting seroconversion illness.
  - Continue prophylaxis until the results of additional tests are available.
  - These cases should be discussed with virologists
» Test for HIV infection at the time of the exposure and again at 6 weeks, 3 months and 6 months
» Advise about the need to take precautions, e.g. condom use, to prevent infection of their own sexual partners, should seroconversion occur
» Stop PEP if HIV test of the health care worker is positive at the time of the injury
» Perform full blood count after 2 and 4 weeks on PEP

Combinations of anti-retroviral drugs are used in the prevention of HIV infection:
- Lamivudine, oral, 150 mg 12 hourly

plus
- Zidovudine, oral, 300 mg 12 hourly

With high-risk exposures the addition of a third agent, a protease inhibitor, is recommended.
* High risk HIV source patients include terminal AIDS, seroconversion illness or known to have a high viral load.

Exposure of Healthcare worker	HIV status of source patient		
	Unknown	Positive	High risk*
Intact skin	No PEP	No PEP	No PEP
Mucosal splash or non-intact skin	• Zidovudine + • lamivudine	• zidovudine + • lamivudine	• zidovudine + • lamivudine
Percutaneous – sharps	• zidovudine + • lamivudine	• zidovudine + • lamivudine	• zidovudine + • lamivudine + • lopinavir/ ritonavir
Percutaneous needle in vessel or deep injury	• zidovudine + • lamivudine	• zidovudine + • lamivudine + • lopinavir/ ritonavir	• zidovudine + • lamivudine + • lopinavir/ ritonavir

Referral

» Patients in need of a protease inhibitor

Note:

Refer if there are inadequate resources with regard to:

» counselling
» laboratory for testing
» medico-legal examination
» drug treatment

21.10 Hyperglycaemia and ketoacidosis

See Section 9.4: Diabetic emergencies

21.11 Hypoglycaemia and hypoglycaemic coma

E16.2

Description

Hypoglycaemia is a blood sugar less than 3.5 mmol/L (< 2.6 mmol/L in neonate) and can rapidly cause irreversible brain damage and/or death.

Clinical features include:

» tremor
» sweating
» confusion
» delirium

- » tachycardia
- » dizziness
- » hunger
- » headache
- » impaired concentration
- » coma
- » convulsions
- » transient aphasia or speech disorders
- » irritability

There may be few or no symptoms in the following situations:
- » chronically low blood sugar
- » patients with impaired autonomic nervous system response, e.g.
  - – the elderly
  - – very ill
  - – malnourished
  - – those with long-standing diabetes mellitus
  - – treatment with beta-blockers

People at risk of hypoglycaemia:
- » neonates with low birth weight or ill or not feeding well
- » malnourished or sick children
- » shocked, unconscious or convulsing patients
- » alcohol binge
- » liver disease
- » diabetics on treatment

Hypoglycaemia may be a marker of deteriorating renal function.

Emergency treatment

- » Obtain blood for glucose determination immediately.
- » Establish blood glucose level with glucometers or testing strip.

Conscious patient, able to feed

Breastfeeding child
- – administer breast milk

Older children and adults
- – sweets, sugar, glucose by mouth
  or
  oral sugar solution
  Dissolve 3 teaspoons of sugar (15 g) in a 200 mL cup of water.

Conscious patient, not able to feed without danger of aspiration

Administer via nasogastric tube
- – Dextrose 5%
  or
  milk
  or
  sugar solution

Unconscious patient:

Children

- Dextrose 10%, IV, 5 mL/kg
  - 10% solution – e.g. 4 mL 50% dextrose drawn up to 20 mL with water for injection

IV administration of dextrose in children with hypoglycaemia

» Establish an IV line – do not give excessive volumes of fluid
» Take a blood sample for emergency investigations and blood glucose
» Check blood glucose
  – if low, i.e. less than 2.5 mmol/L or if testing strips are not available, administer 5 mL/kg of 10% dextrose solution IV rapidly
    In the majority of cases an immediate clinical response can be expected.
» Recheck the blood glucose after infusion
  – if still low, repeat 5 mL/kg of 10% dextrose solution
» After recovery, maintain with 5% dextrose solution until blood glucose is stabilised.
» Feed the child as soon as conscious

Adults

- Dextrose 50%, IV, 50 mL immediately and reassess.
  - Followed with dextrose 10% solution.
  - In the majority of cases an immediate clinical response can be expected.
  - Maintain with 5% dextrose solution after recovery until blood glucose is stabilised.

Alcoholics

- Thiamine, IV/IM, 100 mg immediately.

! CAUTION !
Thiamine should be preferably be administered prior to intravenous glucose to prevent permanent neurological damage.
Do not delay the dextrose administration in a hypoglycaemic patient.

Referral

Urgent

» All hypoglycaemic patients on oral hypoglycaemic agents
» Hypoglycaemic patients who do not recover completely after treatment
» All children who have had documented hypoglycaemia unless the cause is clearly identified and safe management instituted to prevent recurrence

21.12 Injuries

T14

Description

Soft tissue injury may present as follows:
» pain only
» traumatic swelling
» bruises with intact skin
» cuts
» abrasions
» puncture wounds
» other open wounds of varying size and severity

Injury to internal organs must be recognised and referred, including subtle signs of organ damage, e.g.:
» blood in the urine – kidney or bladder damage
» shock – internal bleeding
» blood or serous drainage from the ear or nose – skull base fracture

Referral must not be delayed by waiting for a diagnosis.

Human and animal bites can cause extensive injuries and infection. See section 21.2.1: Animal and human bites
An injury causing a sprain or strain may be initially overlooked.
Exclude fractures.
Closed injuries and fractures of long bones may be serious and damage blood vessels. Contamination with dirt and soil complicates the outcome of treatment.

Emergency management

» Immobilise injured limb.
» Monitor vital signs.
» Monitor pulses below an injury on a limb with swelling.

Wound care
» Clean the wound
» Suture or splint when needed
» Avoid primary suture if the wound is infected:
  – dirty or contaminated
  – crushed
  – in need of debridement
  – projectile inflicted
  – caused by bites

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
≥ 7–9 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	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Tetanus prophylaxis

If not previously immunised within the last 5 years

- Tetanus toxoid (TT), IM, 0.5 mL

Note

In a fully immunised person, tetanus toxoid vaccine might produce an unpleasant reaction, e.g. redness, itching, swelling or fever, but in the case of a severe injury the administration is justified.

Referral

Urgent

» Extensive closed or open wounds
» Injury to vital structures or internal organs
» Sepsis
» Shock
» Anaemia
» Blood in the urine
» Infants and young children except when the injury is minor
» Enlarging and/or pulsating swelling

21.13 Myocardial infarction, acute (AMI)

See section 4.6 Myocardial infarction, acute (AMI)

21.14 Nose bleed (epistaxis)

R04.0

Description

Nose bleed may be caused by local or systemic diseases, or local trauma, especially nose picking and occurs from an area anterior and inferior to the nasal septum. Consider other conditions associated with nosebleeds, especially if recurrent, e.g. hypertension and bleeding tendency.

Management

Acute episode

Most bleeding can be controlled by pinching the nasal wings (alae) together for 5–10 minutes.

If this fails, insert nasal tampons or BIPP stripping into bleeding nostril(s).

Identify the cause.

Referral

» Recurrent nose bleeds
» Failure to stop the bleeding

21.15 Pulmonary oedema, acute

J81

Description

A life-threatening condition with abnormal accumulation of fluid in the lungs. Acute heart failure is a common cause.

Persons with pulmonary oedema may present similarly to acute bronchospasm. It is important to distinguish this condition from an acute attack of asthma.

! CAUTION !
Morphine is contraindicated in acute asthma.

Emergency treatment

Place the patient in a sitting or semi-Fowler's position.

Children:

- Oxygen, using face mask **or** nasal cannula at 2–3 L per minute

- Furosemide, IV, 1 mg/kg immediately.
  - Do not put up a drip or run in any IV fluids

Weight kg	Dose mg	Injection 10 mg/mL	Age Months/years
≥ 3.5–5 kg	4 mg	0.4 mL	≥1–3 months
≥ 5–7 kg	6 mg	0.6 mL	≥ 3–6 months
≥ 7–9 kg	8 mg	0.8 mL	≥ 6–12 months
≥ 9– 11 kg	10 mg	1 mL	≥12–18 months
≥ 11–14 kg	12 mg	1.2 mL	≥18 months–3 years
≥ 14– 7.5 kg	15 mg	1.5 mL	≥ 3–5 years
≥ 17.5–25 kg	20 mg	2 mL	≥ 5–7 years
≥ 25–35 kg	30 mg	3 mL	≥ 7–11 years
≥ 35 kg and above	40 mg	4 mL	≥ 11 years and adults

Adults:

- Oxygen, using face mask to deliver 40% oxygen at a rate of 6–8 L per minute
- Furosemide, IV, 40 mg

If response is adequate follow with:

- Furosemide, IV, 40 mg in 2–4 hours

If no response within 20–30 minutes:

- Furosemide, IV, 80 mg
- Morphine, IV.
  - Dilute 10 mg to 10 mL and administer slowly at 1 mg/minute.
  - Discontinue when patient experiences relief.
  - Maximum dose: 10 mg

and/or

- Isosorbide dinitrate sublingual 5 mg 4 hourly.
  - Do not administer if hypotensive.

Pulmonary oedema due to a hypertensive crisis
ADD
To treat hypertension

- ACE inhibitors

Referral

Urgent

» All cases
Continue oxygen during transfer.

21.16 Shock

R57.9

Description

Shock is a life threatening condition characterised by hypotension.

Signs and symptoms of shock

» Low blood pressure (systolic BP below 80 mmHg) is the key sign of shock.
» Weak and rapid pulse
» Rapid shallow breathing.
» Restlessness and altered mental state
» Weakness
» Low urine output

Types of shock		Additional symptoms
» Hypovolemic shock	– Most common type of shock – Primary cause is loss of fluid from circulation due to haemorrhage, burns, diarrhoea, etc.	Weak thready pulse, cold and clammy skin.
» Cardiogenic shock	– Caused by the failure of heart to pump effectively e.g. in myocardial infarction, cardiac failure, etc.	Distended neck veins, weak or absent pulses.
» Septic shock	– Caused by an overwhelming infection, leading to vasodilation.	Elevated body temperature
» Neurogenic shock	– Caused by trauma to the spinal cord, resulting in sudden decrease in peripheral vascular resistance and hypotension.	Warm and dry skin
» Anaphylactic shock	– Caused by severe allergic reaction to an allergen, or drug.	Bronchospasm, angioedema and/or urticaria

Signs and symptoms of shock in children

Shock must be recognised while still in the compensated state to avoid irreversible deterioration. Therefore, the following are primarily assessed in children:

1. Prolonged capillary filling (more than 3 seconds)
2. Decreased pulse volume (weak thready pulse)
3. Increased heart rate (>160/minute in infants, > 120 in children)
4. Decreased level of consciousness (poor eye contact)
5. Rapid breathing

Decreased blood pressure and decreased urine output are late signs and while they can be monitored the above signs are more sensitive in detecting shock before irreversible.

Emergency treatment

Treatment depends on the type of shock. Intravenous fluid therapy is important in the treatment of all types of shock except for cardiogenic shock. Prompt diagnosis of underlying cause is essential to ensure optimal treatment.

» Maintain open airway
» Administer oxygen with face mask and if needed after intubation with assisted ventilation
» Check for and manage hypoglycaemia

Fluid replacement (Not for cardiogenic shock)

Adults:

- Sodium chloride 0.9%, IV, 1 L as a rapid bolus.
  - Repeat bolus until blood pressure is improved.

Children:

- Sodium chloride 0.9%, IV, 20 mL/kg as a rapid bolus.
  - Repeat bolus if no adequate response.

Note:

Do not administer IV fluids in case of cardiogenic shock but maintain IV access. If patient develops respiratory distress, discontinue fluids.

Septicaemia in children

All children with shock which is not obviously due to trauma or simple watery diarrhoea should receive antibiotic cover for probable septicaemia.

- 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.

Referral

» All patients urgently after resuscitation.

21.17 Shock, anaphylactic

T78.2

Description

A very severe allergic reaction that usually occurs within seconds or minutes after exposure to an allergen, but may be delayed for up to 1 hour. The reaction may be life threatening.
Clinical features include:
» hypotension and/or shock
» bronchospasm
» laryngeal oedema or angioneurotic oedema

Emergency treatment

» Resuscitate (ABC) immediately, (see section 21.4)

Drug treatment

Adrenaline is the mainstay of treatment and should be given immediately

- Adrenaline, IM,

Age years	Dose mg	Injection 1 mg/mL (1:1 000)
< 2 years	0.1 mg	0.1 mL
≥ 2 – 5 years	0.2 mg	0.2 mL
≥ 6 – 12 years	0.3 mg	0.3 mL
≥ 12 – 15 years	0.5 mg	0.5 mL
≥ 15 years and adults	1 mg	1 mL

  - Repeat in 5 minutes if no improvement.

- Hydrocortisone IM/slow IV, 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

- Promethazine, IM/slow IV
  - Children over 2 years: 0.25 mg/kg
  - Adults: 25–50 mg

Weight kg	Dose mg	Use one of the following injections:		Age Months/ years
		25 mg/mL	50 mg/2 mL	
≥ 11–17.5 kg	5 mg	0.2 mL	0.2 mL	2–5 years
≥ 17.5–25 kg	7.5 mg	0.3 mL	0.3 mL	5–7 years
≥ 25–35 kg	10 mg	0.4 mL	0.4 mL	7–11 years
≥ 35–55 kg	15 mg	0.6 mL	0.6 mL	11–15 years
≥ 55 kg and above	25 mg	1 mL	1 mL	> 15 years and adult

Referral

» All patients

Note:
Adrenaline administration may have to be repeated due its short duration of action. Close observation during transport is essential.

21.18 Sprains and strains

T14.3

Description

Soft tissue injuries.
Clinical features include:
» pain, especially on movement
» tenderness on touch
» limited movement
» history of trauma
May be caused by:
» sport injuries
» slips and twists
» overuse of muscles
» abnormal posture
Note:
In children always bear non-accidental injuries (assault) in mind.

Emergency treatment

» Immobilise with firm bandage and/or temporary splinting

Children over 12 years and adults:
- Ibuprofen, oral, 200–400 mg 8 hourly with or after a meal

plus
- **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	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

» Severe progressive pain
» Progressive swelling

» Extensive bruising
» Deformity
» Joint tenderness on bone
» No response to treatment
» Severe limitation of movement
» Suspected serious injury
» Recurrence
» Previous history of bleeding disorder

21.19 Status epilepticus

G41.9

For initial treatment of seizures, see Section 15.2: Seizures

Description

This is a medical emergency.

A series of seizures follow one another lasting more than 30 minutes with no intervening periods of recovery of consciousness. The seizure may be generalised or partial, convulsive or non-convulsive.

Status epilepticus has the potential for causing high mortality.

General measures

» Place the patient in a lateral - prone (recovery) position.
» **Do not** place anything (spoon or spatula etc) in the patient's mouth.
» Do not try to open the patient's mouth.
» Maintain airway.
» Assist respiration and give high flow oxygen.
» Prepare for suction and intubation.
» Check blood glucose (exclude hypoglycaemia!)
» Monitor vital signs every 15 minutes.
» Establish an IV line (dextrose 5% in sodium chloride 0.9%).

Drug treatment

Children < 12 years

- Diazepam, rectal, 0.5 mg/kg/dose for convulsions as a single dose.
  - Diazepam for injection 10 mg in 2 mL is used undiluted.
  - Draw up the required volume in a 2 mL syringe.
  - Remove needle then insert the whole barrel of the lubricated syringe into the rectum and inject the contents.
  - Remove syringe and hold buttocks together to minimise leakage

Weight kg	Dose mg	Ampoule 10 mg/2 mL	Approx age
≥ 3–6 kg	2 mg	0.4 mL	Less than 6 months
≥ 6–10 kg	2.5 mg	0.5 mL	≥ 6 months–1 year
≥ 10–18 kg	5 mg	1 mL	≥ 1–5 years
≥ 18–25 kg	7.5 mg	1.5 mL	≥ 5–8 years
≥ 25–40 kg	10 mg	2 mL	≥ 8–12 years

- Maximum dose: 10 mg in 1 hour.
- May be repeated after 10 minutes if convulsions continue.
- Expect a response within 1–5 minutes.

If no response after the second dose of diazepam or if the convulsion has lasted more than 20 minutes, add:

- Phenobarbitone, oral, crushed and given by nasogastric tube, 20 mg/kg as a single dose.
  - Maximum dose: 210 mg

Weight kg	Dose mg	Tablet 30 mg	Age Months/ years
≥ 2.5–3.5 kg	45 mg	1½ tablets	Birth–1 month
≥ 3.5–5.5 kg	60 mg	2 tablets	≥ 1–3 months
≥ 5–7 kg	90 mg	3 tablets	≥ 3–6 months
≥ 7–9 kg	120 mg	4 tablets	≥ 6–12 months
≥ 9–11 kg	150 mg	5 tablets	≥ 12–18 months
≥ 11–14 kg	180 mg	6 tablets	≥ 18 months–3 years
≥ 11 kg and above	210 mg	7 tablets	≥ 3 years

Adults

- Diazepam, slow IV, 10–20 mg at a rate not exceeding 2 mg/minute
  - Repeat within 10–15 minutes if needed
  - Maximum dose: 30 mg within 1 hour
  - Expect a response within 1–5 minutes

  or

  Lorazepam, IM/IV, 4 mg as a single dose
  - Repeat after 10–15 minutes, if needed
  - Maximum dose: 8 mg within 12 hours

! CAUTION !
Avoid diazepam IM since absorption is slow and erratic.
Do not mix with other drugs.

plus

- Phenytoin, oral or by nasogastric tube at a loading dose of 20 mg/kg as a

single dose.

Referral

Urgent

» Any child where the seizures cannot be controlled within 30 minutes

Non-urgent

» All patients once stabilised
Clinical notes including detail on medication given should accompany patients.