SOUTH AFRICAN PRIMARY HEALTHCARE ESSENTIAL MEDICINES LIST
PHC CHAPTER 21: EMERGENCIES AND INJURIES
NEMLC RECOMMEDATIONS FOR MEDICINE AMENDMENTS (2020-4 REVIEW CYCLE)

Medicine amendment recommendations, with supporting evidence and rationale are listed below.
Kindly review the medicine amendments in the context of the respective standard treatment guideline (STG) and supporting medicine reviews and costing analyses.
Note that the associated EML chapter has been subjected to subsequent clinical editing. These editorial amendments may not be reflected in the report below.

A: AMENDMENTS

SECTION	MEDICINE/ MANAGEMENT	ADDED/DELETED/AMENDED/NOT ADDED/ RETAINED
21.1.1 Cardiac arrest, adults	Cardiac arrest algorithm for suspected communicable diseases	Added
- Ventricular tachycardia	Amiodarone, IV	Not added
-Cardiopulmonary resuscitation	Guidance on fluid administration	Amended
- Additional guidance – termination of resuscitation (TOR)	Duration of asystole	Amended
21.1.2 Cardiopulmonary arrest, children	Cardiac arrest algorithm	Amended
	Paediatric resuscitation tape weight measurements	Added
	Age-based weight estimates	Added
	Guidance to continue resuscitation	Amended
21.1.5 Management of suspected choking/foreign body aspiration in children	Choking algorithm and related guidance	Amended
21.2 Medical Emergencies		
21.2.1 Paediatric Emergencies	Referral for children with cerebral palsy	Not Added
21.2.1.1 Rapid triage of children presenting with acute conditions in clinics and CHCS	Triage process of all sick children	Amended
21.2.4 Delirium *-Physical restraint*	Guidance on physical restraint	Added
21.2.4 Delirium *-Medicine treatment*	Guidance amended	Amended
21.2.4 Delirium *-Acute management*	Aligned to Section 16.1.2 and 16.1.3	Aligned
	Diazepam – dose frequency	Clarified
	Benzodiazepines – cautions amended	Amended
	Haloperidol, IM	Retained
	Olanzapine, oro-dispersible	Added
	Olanzapine, IM	Added
21.2.4 Delirium *- Alcoholics/ Malnourished (adults)*	Thiamine, parenteral	Dose & route of administration amended
21.2.6 Hypoglycaemia and hypoglycaemic coma	Thiamine, parenteral	Aligned
21.2.8 Pulmonary oedema, acute *- If patient very anxious or restless*	Morphine, IV	Deleted & caution added to the STG
21.2.9 Shock	Fluid replacement in children – sodium chloride 0.9%:	Dose amended
	Fluid replacement in children – ringers lactate	Added
21.2.10 Anaphylaxis	Guidance on anaphylaxis associated with vaccinations	Added
	Management – salbutamol nebulized	Dose clarified
	Management – ipratropium bromide nebulized	Dose clarified
21.3 Trauma and Injuries	Referral for patients with brain and spinal cord injuries	Not added
21.3.1.1 Animal bites *- Suspected rabid bite*	Wound irrigation	Amended
	Rabies vaccine	Directions for use amended
	Human rabies immunoglobulin	Directions for use amended
	Equine rabies immunoglobulin	Added

	Amoxicillin/clavulanic acid in children – 8hrly regimen	Retained
21.3.1.2 Human Bites	Amoxicillin/clavulanic acid in children – 8hrly regimen	Retained
21.3.1.3 Insect stings, scorpion stings and spider bites	Description	Editorial amendment
	Chlorphenamine oral	Indication amended
	Chlorphenamine oral	Caution deleted
	Paracetamol dosing guidance	Amended
	Contact information	Added
21.3.1.4 Snakebites **-** *Venom in the eyes*	Local anaesthetic, ophthalmic drop	Added as a therapeutic class
	Tetracaine 0.1%, ophthalmic drops	Retained as an example of class in the STG
	Oxybuprocaine 4%, ophthalmic drops	Added to the TI database as an example of class
- Snake antivenom	Antivenom	Criteria for administration amended
	Contact information	Amended
21.3.2 Burns **-** *Septic burns*	Paracetamol dosing guidance	Amended
	Povidone iodine, topical	Retained
	Silver sulfadiazine, topical	Not added
	Mupirocin, topical	Not added
	Nano-crystalline dressings	Not added
	Melaleuca alternifolia, topical	Not added
	Referral – rehabilitation services	Added
21.3.3 Exposure to poisonous substances		
- *Tricyclic poisoning*	Sodium bicarbonate, parenteral	Not added
- *Organophosphate and carbamate poisoning*	Atropinisation	Indication amended
	Atropine, IV	Directions for use not amended
- Opioid overdose	Naloxone, IV	Directions for use amended
- Paracetamol poisoning	N-acetylcysteine, oral	Dose not amended
- *Toxic alcohol (ethylene glycol and methanol) poisoning*	Ethanol loading dose	Not added – cross reference to AH Chp 19.17.2 included
21.3.6.1 Post exposure prophylaxis, occupational **-** *PEP for healthcare workers following hepatitis B exposure*	Hepatitis B Immunoglobulin	Amended
- Delay in obtaining HBsAb results	Time period of delay	Amended
21.3.6.2 Post exposure prophylaxis, occupational	General measures	Editorial amendment
	Adverse effects of PEP	Guidance amended
21.3.6.2 Post exposure prophylaxis, rape and sexual assault	HIV PEP – guidance for children	Amended
	HIV PrEP	Added as a cross reference to the PHC STGs and EML (PrEP section)
- Emergency contraception after pregnancy is excluded	Copper IUCD	Added (as first line option)
	Levonorgestrel, oral	Retained (as 2nd line option)
- *Obese women*	Levonorgestrel, oral	Dose not amended
- *STI prophylaxis for pregnant women*	Ceftriaxone, IM	Retained
	Azithromycin, oral	Retained
	Metronidazole, oral	Retained
	Cefixime, oral	Not added
	Erythromycin, oral	Not added
	Spectinomycin, parenteral	Not added
21.3.7 Soft Tissue Injuries	Paracetamol dosing guidance	Amended
	Referral of patients with haemophilia	Not added
21.3.8 Sprains and strains	Paracetamol dosing guidance	Amended
	Referral – rehabilitation services	Added

C. SUBSEQUENT UPDATES TO THE 2020-4 EDITION

Version no.	Section	Amendments
1.1	21.3.1.1 ANIMAL BITES	**Rabies vaccine and rabies immunoglobulin (RIG)** Guidance clarified on authorised prescribers.

21.1.1 CARDIAC ARREST, ADULTS

COVID-19 considerations

Cardiac arrest algorithm for suspected communicable diseases: *added*

Resuscitation Council of South Africa's "Advanced cardiac arrest algorithm - suspected respiratory communicable disease",[1,2] adapted with permission was included in this section – see Figure 21.2: Advanced cardiac arrest algorithm - suspected respiratory communicable disease below. The following adaptations have been made to the Resuscitation Council of South Africa's "Advanced cardiac arrest algorithm:

Added	Refer to Adult and Paediatric Hospital Level STG's and EML for guidance on use of anti-arrhythmic

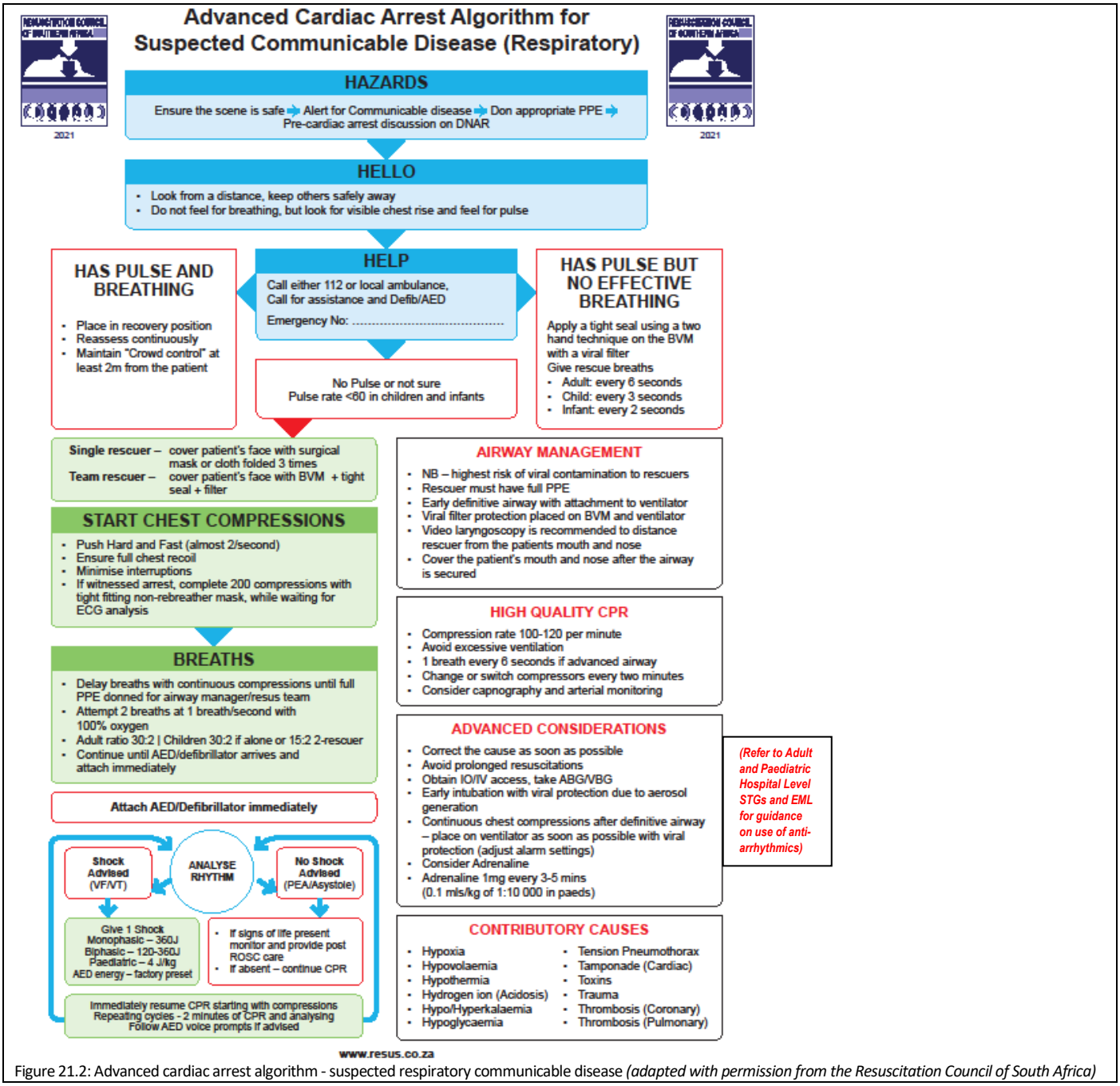


Figure 21.2: Advanced cardiac arrest algorithm - suspected respiratory communicable disease *(adapted with permission from the Resuscitation Council of South Africa)*

[1] Resuscitation Council of South Africa. Advanced Cardiac Arrest Algorithm for Suspected Communicable Disease (Respiratory), 2021. https://resus.co.za/

[2] Brown A, Schwarcz L, Counts CR, Barnard LM, Yang BY, Emert JM, et al. Risk for Acquiring Coronavirus Disease Illness among Emergency Medical Service Personnel Exposed to Aerosol-Generating Procedures. Emerg Infect Dis. 2021 Sep; 27(9): 2340-2348. https://pubmed.ncbi.nlm.nih.gov/34197282/

The following text was also included in the STG, aligned with guidelines:[3]

- » The infection risk that CPR poses to providers due to aerosolization of coronavirus particles is not negligible.
- » This potential risk should be weighed against the probability of achieving spontaneous return of circulation to inform the decision to initiate or stop CPR.
- » For in hospital cardiac arrest in patients with suspected COVID-19, CPR has been shown to not be beneficial unless an immediate reversible cause is suspected, e.g., dislodgement of ET tube, etc. and is therefore not recommended.
- » For out of hospital cardiac arrest in patients with suspected COVID-19, it is recommended to not start conventional CPR in unwitnessed cardiac arrest as it will likely not be beneficial.
- » Appropriate PPE should be worn by all staff before initiating CPR: FFP3 mask, visor, gloves and gown.

Guidance regarding PPE was based on a retrospective cohort study[4] that showed that overall, the incidence of rRT-PCR positive tests among EMS personnel following PPE protocols (wearing a mask, eye protection, gloves, and a gown) was low: 0.57 per 10,000 person-days (30 positive tests in 525,154 person-days).

Level of Evidence: Low certainty evidence

Amiodarone, IV: *not added*

The previous NEMLC recommendation not to include bolus amiodarone for management of ventricular fibrillations or pulseless ventricular tachycardia not responsive to defibrillation, in the PHC STGs and EML was upheld. Previously, NEMLC recommended that amiodarone IV/IO should be administered at secondary level facilities. Furthermore, previous review of amiodarone in the Adult Hospital STGs and EML, 2019 edition found that the role of antiarrhythmics in adult cardiopulmonary resuscitation was uncertain:

NEMLC report for the Adult Hospital Level Emergencies and injuries chapter (2017-9 review cycle):

However, recent meta-analyses suggest that there is uncertainty about the efficacy of antiarrhythmics in cardiac arrest to improve rates of return of spontaneous circulation, survival to hospital discharge or neurological outcomes when compared to placebo. Conflicting outcomes for survival to hospital admission was reported for use of antiarrhythmics in advanced life support: McLeod et al, 2017[5] showed that amiodarone (RR 1.18; 95% CI: 1.08 to 1.30) was associated with a statistically significant increase in survival to hospital admission, whilst Chowdury et al, 2017[6] showed that amiodarone had no significant effect on survival to admission (OR=1.33; 95% CI 0.91 to 1.97; I_2 = 92%; p=0.14).

Cardiopulmonary resuscitation (CPR)

Guidance on fluid recommendations: *amended*

The following text was deleted from the STG as not pragmatic for primary healthcare level of care:

Initiate fluids, IV/IO access

Sodium chloride 0.9%, IV, 1000 mL.

- ~~Consider giving a fluid bolus of 1 litre during CPR if an increase in preload may benefit the patient, e.g. hypovolaemia shock, distributive shock, haemorrhagic shock.~~
- ~~Avoid fluid boluses during CPR if an increase in the preload could be detrimental to the patient e.g. massive pulmonary embolism or cardiac tamponade.~~

Additional guidance – termination of resuscitation (TOR)

Duration of asystole: *amended*

A more objective statement was considered for inclusion in the PHC STG, *"Asystole of >20 minutes is considered unsurvivable".* However, there is a paucity of evidence that informs this decision, and most recommendations are based on consensus.[7]

The 2020 AHA guidelines note that in a recent meta-analysis of seven published studies (n=33,795 patients), only 0.13% (95% CI 0.03 to 0.58%) of patients who fulfilled the Basic Life Support (BLS) termination criteria survived to

[3] Atkins DL, Sasson C, Hsu A, Aziz K, Becker LB, Berg RA, et al.; 2022 Interim Guidance to Health Care Providers for Basic and Advanced Cardiac Life Support in Adults, Children, and Neonates With Suspected or Confirmed COVID-19: From the Emergency Cardiovascular Care Committee and Get With The Guidelines-Resuscitation Adult and Pediatric Task Forces of the American Heart Association in Collaboration With the American Academy of Pediatrics, American Association for Respiratory Care, the Society of Critical Care Anesthesiologists, and American Society of Anesthesiologists. Circ Cardiovasc Qual Outcomes. 2022 Apr;15(4):e008900. https://pubmed.ncbi.nlm.nih.gov/35072519/

[4] Brown A, Schwarcz L, Counts CR, Barnard LM, Yang BY, Emert JM, et al. Risk for Acquiring Coronavirus Disease Illness among Emergency Medical Service Personnel Exposed to Aerosol-Generating Procedures. Emerg Infect Dis. 2021 Sep;27(9):2340-2348. https://pubmed.ncbi.nlm.nih.gov/34197282/

[5] McLeod SL, Brignardello-Petersen R, Worster A, You J, Iansavichene A, Guyatt G, Cheskes S. Comparative effectiveness of antiarrhythmics for out-of-hospital cardiac arrest: A systematic review and network meta-analysis. Resuscitation. 2017 Dec;121:90-97. https://www.ncbi.nlm.nih.gov/pubmed/29037886

[6] Chowdhury A, Fernandes B, Melhuish TM, White LD. Antiarrhythmics in Cardiac Arrest: A Systematic Review and Meta-Analysis. Heart Lung Circ. 2018 Mar;27(3):280-290. https://www.ncbi.nlm.nih.gov/pubmed/28988724

[7] 2020 American Heart Association. 2020 American Heart Association Guidelines for CPR and ECC https://cpr.heart.org/en/resuscitation-science/cpr-and-ecc-guidelines

hospital discharge[8]. The BLS TOR rule recommends terminating resuscitation if all the following three criteria are met: the cardiac arrest was not witnessed by EMS personnel, no return of spontaneous circulation (ROSC) before transport, and no shock delivered before transport.
The 2020 AHA guidelines also note in a meta-analysis of two published studies (n=10,178), only 0.01% (95% CI, 0.00-0.07%) of patients who fulfilled the ALS termination criteria survived to hospital discharge. The ALS TOR rule recommends terminating resuscitation if all the following four criteria are fulfilled: the cardiac arrest was not witnessed, there was no bystander CPR, there was an absence of ROSC before transport, and an absence of defibrillation before transport.
Both the BLS and ALS TOR (termination of resuscitation) rules have been shown to have good predictive value.[9]
Level of Evidence: Low certainty evidence

NEMLC MEETING OF 23 JUNE 2022:
NEMLC accepted the proposed recommendation ("*Asystole of >20 minutes is considered unsurvivable"*). However, the STG text was amended further as below

Amended from:

~~Consider stopping resuscitation attempts and pronouncing death if:~~
- ~~Further resuscitation is clearly clinically inappropriate, e.g. incurable underlying disease, or~~
- ~~The decision to stop CPR attempts depends on the specifics of the individual patient and should be based on clinical judgement~~
- ~~Consider continuing CPR attempts until enough information is available to inform the decision to stop~~
- ~~This decision should take into consideration the potential risk that CPR poses to the rescuer, considering the prevalence of COVID-19.~~
- ~~Asystole of >20 minutes is considered unsurvivable.~~

~~Consider carrying on for longer especially when:~~
- ~~hypothermia and drowning~~
- ~~poisoning or medicine overdose~~
- ~~neurotoxic envenomation (e.g.black and green mamba or Cape cobra snakebite) – see Section 21.3.1.4: Snakebites~~

Amended To:

Termination of resuscitation:
- The decision to stop CPR attempts depends on the specifics of the individual patient and should be based on clinical judgement.
- Consider stopping resuscitation attempts and pronouncing death if there is incurable underlying disease, or if asystole > 20 minutes or in the absence of the factors for prolonging resuscitation as listed below.

Consider carrying on for longer especially with:
- hypothermia and drowning
- poisoning or medicine overdose
- neurotoxic envenomation (e.g.black and green mamba or Cape cobra snakebite) – see Section 21.3.1.4: Snakebites

This decision should take into consideration the potential risk that CPR poses to the rescuer e.g. infectious diseases.

21.1.2 CARDIAC ARREST, CHILDREN

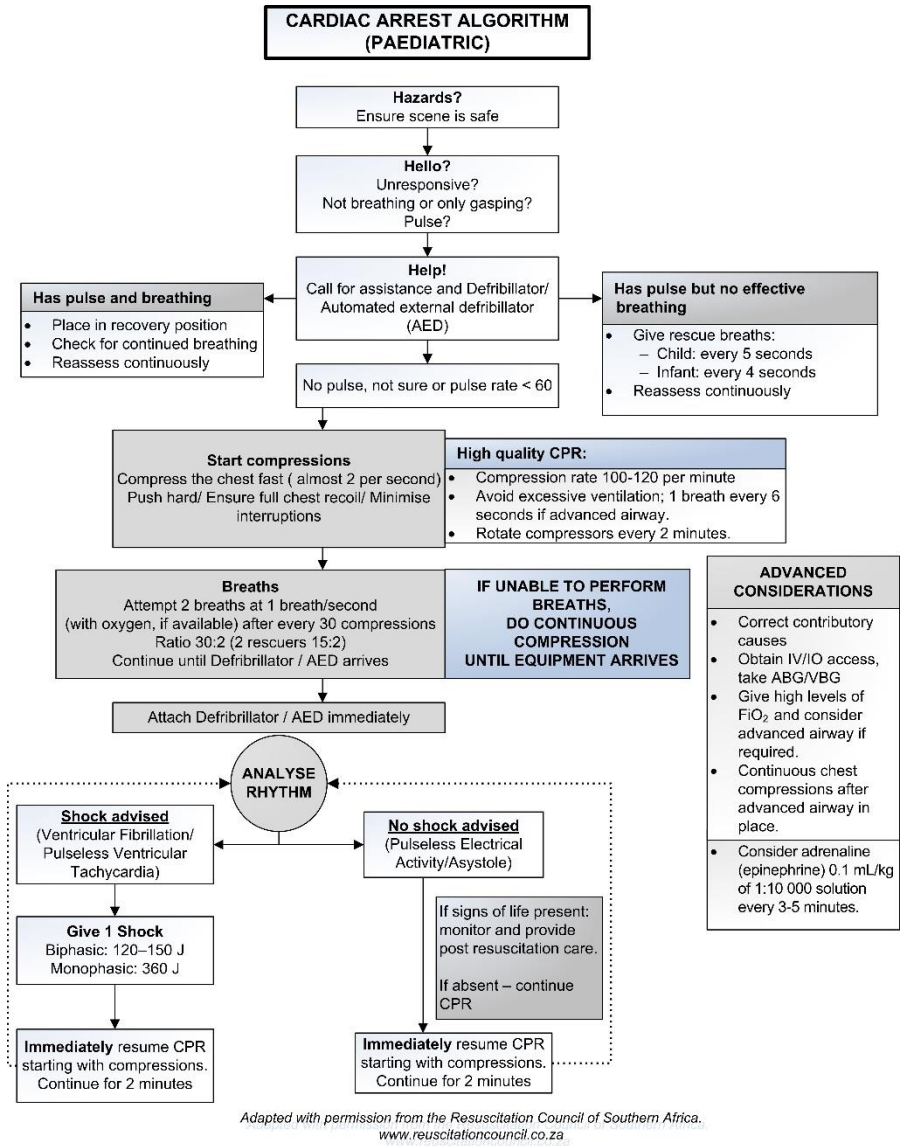
Immediate emergency medicine treatment
Cardiac arrest algorithm: Amended

The cardiac arrest algorithm has been updated in alignment with the most recent advanced cardiovascular life support (ACLS) and basic life support (BLS) guidance, which includes rescue breaths every 2 seconds for infants and every 3 seconds for children. According to the American Heart Association 2020 Guidelines for CPR (AHA 2020)[10], *"When performing CPR in infants and children with an advanced airway, it may be reasonable to target a respiratory rate range of 1 breath every 2 to 3 seconds (20-30/min), accounting for age and clinical condition. Rates exceeding these recommendations may compromise hemodynamics."*

[8] Ebell MH, Vellinga A, Masterson S, Yun P. Meta-analysis of the accuracy of termination of resuscitation rules for out-of-hospital cardiac arrest. Emerg Med J. 2019 Aug;36(8):479-484. https://pubmed.ncbi.nlm.nih.gov/31142552/
[9] Lin YY, Lai YY, Chang HC, Lu CH, Chiu PW, Kuo YS, Huang SP, et al. Predictive performances of ALS and BLS termination of resuscitation rules in out-of-hospital cardiac arrest for different resuscitation protocols. BMC Emerg Med. 2022 Mar 27;22(1):53. https://pubmed.ncbi.nlm.nih.gov/35346055/
[10] 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Last accessed online Mar 2024: https://professional.heart.org/en/science-news/2020-aha-guidelines-for-cpr-and-ecc

Following, engagement with the Resus Council of South Africa (RCSA) regarding the recommended number of rescue breaths for children and infants, we received confirmation that the RSCA has subsequently amended its algorithm to align with the AHA guidance i.e. rescue breaths every 2 seconds for infants and every 3 seconds for children[11].

Amended from:



Adapted with permission from the Resuscitation Council of Southern Africa.
www.reuscitationcouncil.co.za

[11] Email Correspondence on file. 10 May 2024

Amended to:

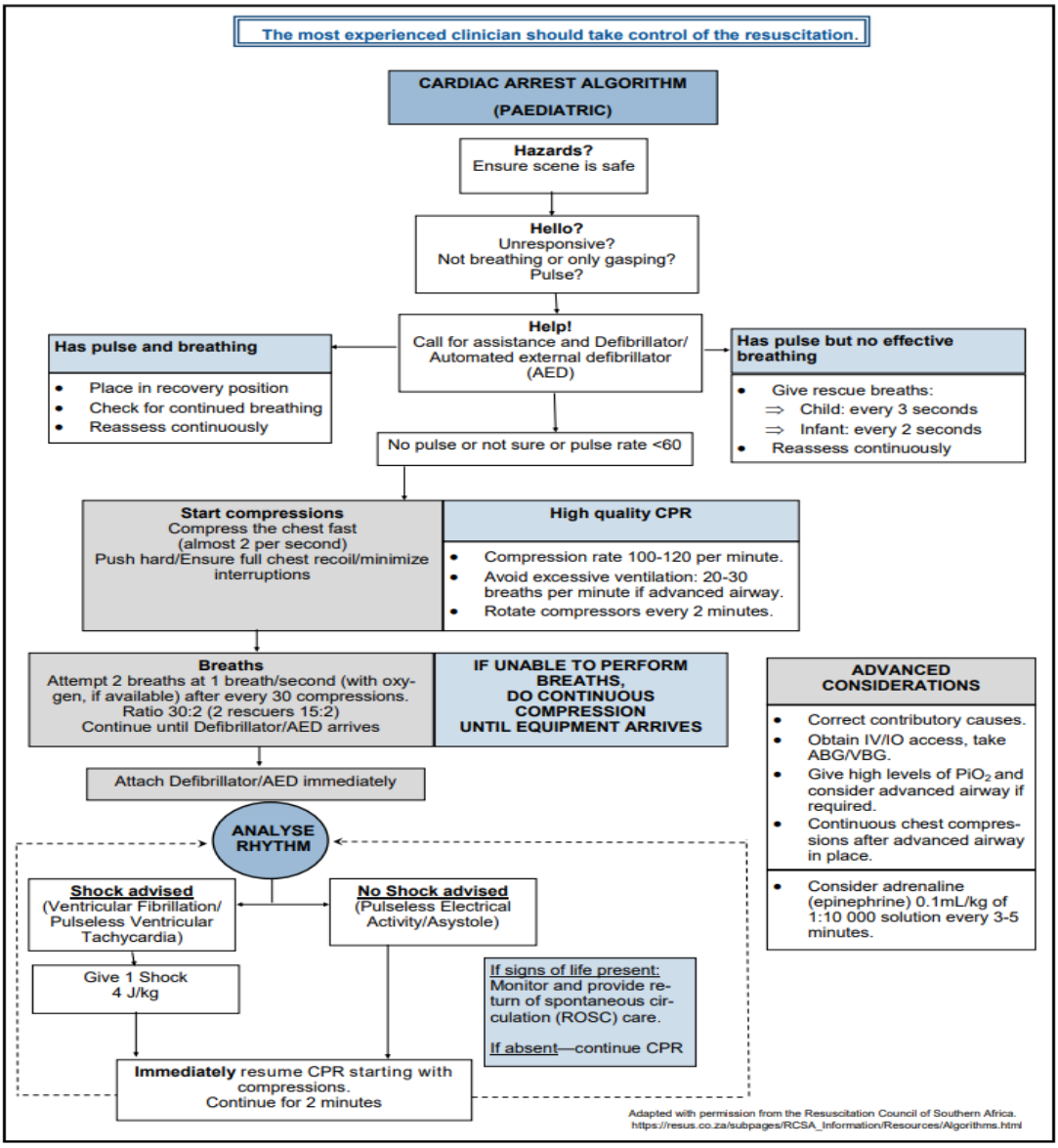


Figure 21.3 Advanced cardiac arrest algorithm for children

Paediatric resuscitation tape weight measurements: *Added*

Age-based weight estimates: *Added*

Child weight estimation using paediatric resuscitation tape, taking into consideration body composition and habitus,[12] has been included in the STG. Tape measurements are considered to be more accurate than age-based formulas and the PAWPER tape is the most accurate tape measure in the South African setting[13]; and it is validated in our setting[14]. If tape measures are not available (including the Broselow tape[15]), then age-based weight estimates may be used – the following formula is used in the Advanced Paediatric Life Support protocol: weight(kg) = (age (yrs) +4) X2, calculation.[16]

Level of Evidence: Low certainty

[12] Wells M, Goldstein LN, Bentley A. The accuracy of emergency weight estimation systems in children-a systematic review and meta-analysis. Int J Emerg Med. 2017 Sep 21;10(1):29. https://pubmed.ncbi.nlm.nih.gov/28936627/

[13] Manyoni MJ, Goldstein LN, Wells M. A comparison of four weight estimation systems for paediatric resuscitation. S Afr J Surg. 2019 Jun;57(2):40-46. https://pubmed.ncbi.nlm.nih.gov/31342683/

[14] Wells M. A validation of the PAWPER XL-MAC tape for total body weight estimation in preschool children from low- and middle-income countries. PLoS One. 2019 Jan 7;14(1):e0210332. https://pubmed.ncbi.nlm.nih.gov/30615693/

[15] Wells M, Goldstein LN, Bentley A, Basnett S, Monteith I. The accuracy of the Broselow tape as a weight estimation tool and a drug-dosing guide - A systematic review and meta-analysis. Resuscitation. 2017 Dec;121:9-33. https://pubmed.ncbi.nlm.nih.gov/28958796/

[16] Advanced Life Support Group (ALSG). Advanced Paediatric Life Support: A Practical Approach to Emergencies, 6th Edition. Chichester (West Sussex, UK): BMJ Books; 2016.

Guidance to continue with resuscitation, *amended*

The following STG text was amended for correctness and consistency

Consider carrying on for longer especially with

- » hypothermia and drowning
- » ~~suspected~~ poisoning or medicine overdose ~~or carbon monoxide poisoning~~
- » neurotoxic envenomation (e.g.black and green mamba or Cape cobra snakebite) – see Section 21.3.1.4: Snakebites

This decision should take into consideration the potential risk that CPR poses to the rescuer e.g. infectious diseases.

21.1.5 MANAGEMENT OF SUSPECTED CHOKING/FOREIGN BODY ASPIRATION IN CHILDREN

Choking algorithm & related guidance: *Amended*

The algorithm for the management of choking in children has been updated to the latest algorithm (2021) from the Resus Council of South Africa[17]. Amendments are as tabulated below and include:

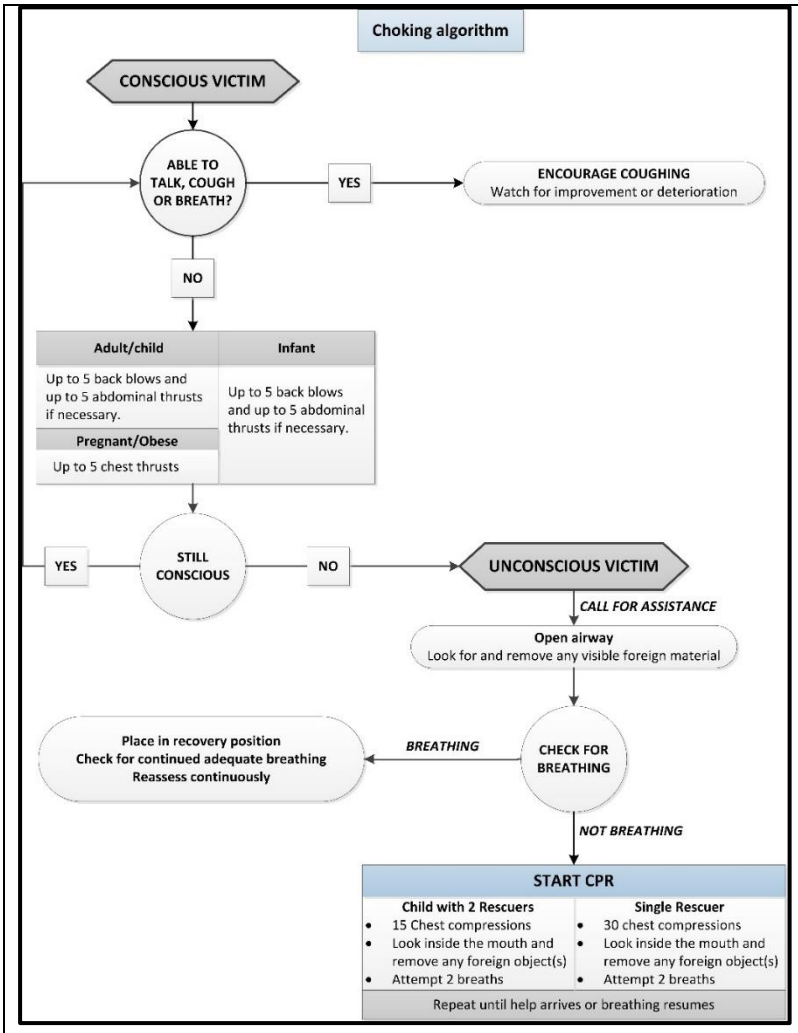
- Adults & children - amended from *'5 back blows & up to 5 abdominal thrusts if necessary'* to *'up to 5 abdominal thrusts and if ineffective up to 5 back slaps.'*
- Infants - amended from *'Up to 5 back blows and up to 5 abdominal thrusts'* to *'Up to 5 back slaps. And up to 5 chest thrusts if necessary.'*

Amended from:

If the child is **able to talk and breathe**	Encourage the child to cough repeatedly while arranging transfer to hospital urgently with supervision.
If the child is **conscious but with no effective cough or breathing**	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 child becomes unconscious. See differences below for infants and children.
If the child is **unconscious with no effective breathing**	Call for assistance. Open airway and check for any visible foreign body and remove. Start CPR: compressions and breaths (30:2) (check airway for foreign body each time before giving breaths).

(Infant: < 1 year of age; Child: > 1 year of age until puberty).

[17] Resus Council of S.Africa. Choking algorithm 2021 https://resus.co.za/Documents/Algorithms/RESUS%20CHOKING%20ALGORITHM.pdf



Amended to:

If the child is **able to talk and breathe**	Encourage the child to cough repeatedly while arranging transfer to hospital urgently with supervision.
If the child is **conscious but with no effective cough or breathing**	Give up to 5 abdominal thrusts and if ineffective up to 5 back slaps, followed by re-assessment of breathing. Repeat as a cycle until recovery or child becomes unconscious. See technique below and figure 21.4 for differences between infants and children.
If the child is **unconscious with no effective breathing**	Call for assistance. Open airway and check for any visible foreign body and remove. Start CPR: compressions and breaths (30:2) (check airway for foreign body each time before giving breaths).

(Infant: < 1 year of age; Child: > 1 year of age until puberty).

Table 21.3: Managing suspected choking/foreign body aspiration in children

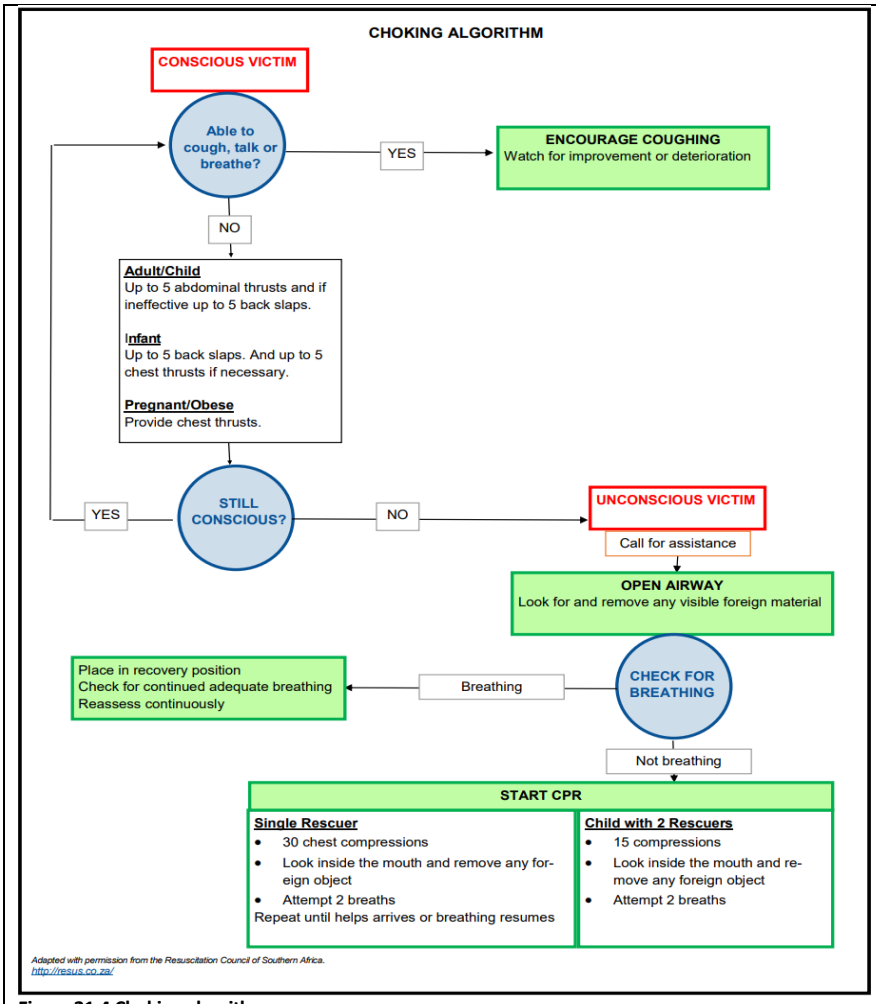


Figure 21.4 Choking algorithm

21.2. MEDICAL EMERGENCIES

21.2.1 PAEDITARIC EMERGENCIES

Referral for children with cerebral palsy: *Not added*

External comment received from RuRehab to refer children with cerebral palsy for neurodevelopmental assessment and rehabilitation was not supported in this section but has more appropriately been included under Section 15.7 Cerebral palsy.

21.2.1.1 RAPID TRIAGE OF CHILDREN PRESENTING WITH ACUTE CONDITIONS IN CLINICS AND CHCS

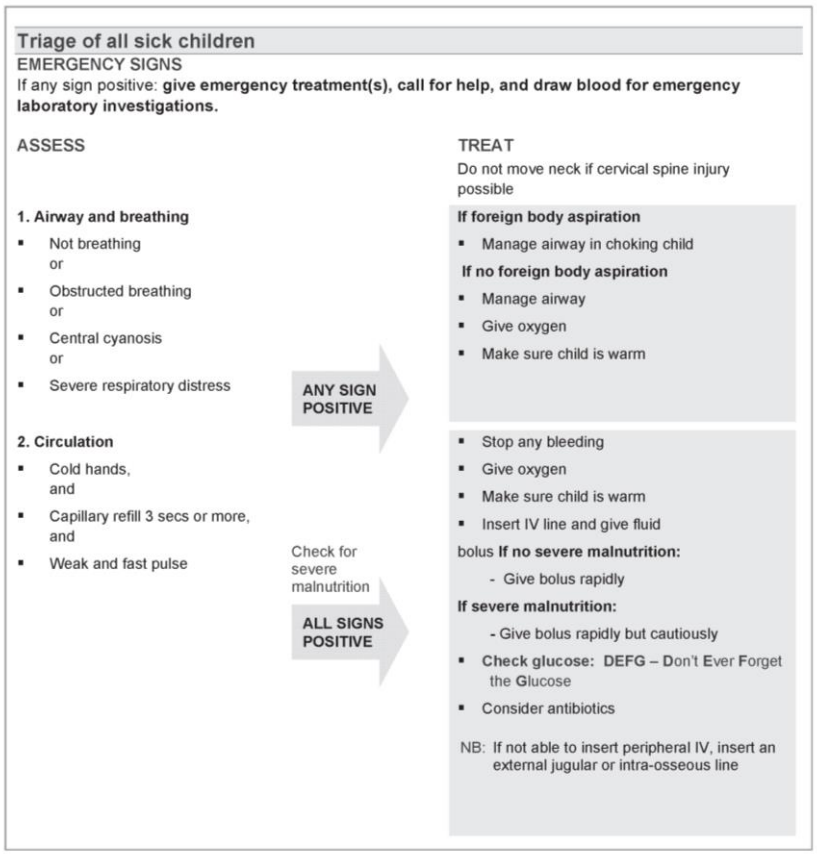
Triage process of all sick children**:** *Amended*

Guidance on the triage of sick children was updated to include cross references to other relevant sections of the EML for further information on management of sick children and duplicated text was removed. Guidance was also aligned to the Integrated Management of Childhood Illness (IMCI) guidelines 2022[18].

[18] National Department of Health. Integrated management of childhood illness. 2022 https://knowledgehub.health.gov.za/elibrary/integrated-management-childhood-illness-2022

Amended from:

Triage is the process of rapidly examining all sick children when they first arrive at clinics in order to place them in one of three categories (Emergency, Priority, Non-urgent):



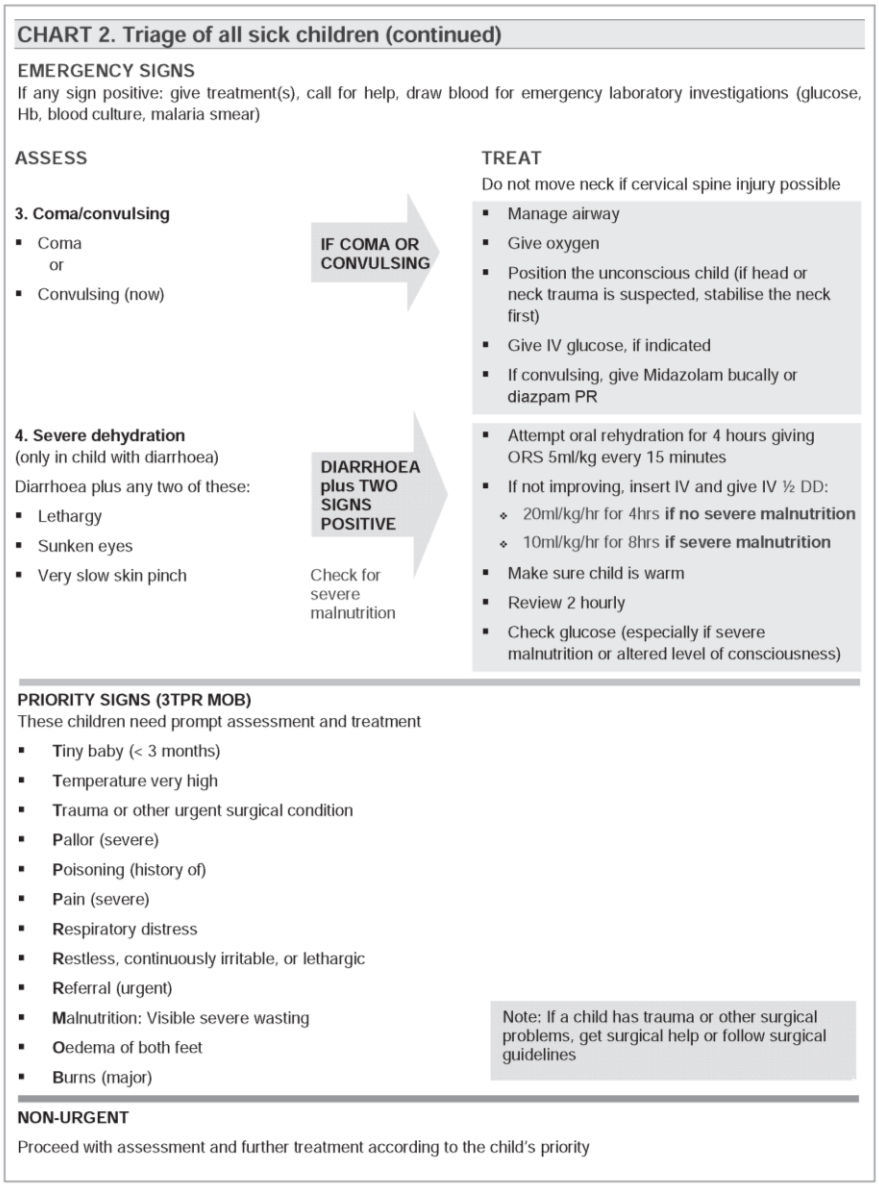


Figure 21.5: Triage of sick children
Adapted from Pocketbook of Hospital Care for Children. Management of Common Childhood Illnesses. National Department of Health, South Africa, 2016. www.health.gov.za/

If any emergency sign is present, give emergency treatment(s), call for help, and draw blood for emergency laboratory investigations as clinically indicated.

(A&B) Airway and Breathing

Not breathing
or
Obstructed breathing
or
Central cyanosis
or
Severe respiratory distress

(C) Circulation

Cold hands
and
Capillary refill ≥3 seconds
and
Weak and fast pulse

(C) Coma/convulsing

Coma
or
Convulsing (now)

(D) Severe dehydration (e.g. in child with diarrhoea)

Diarrhoea

plus

Any two of:

- Lethargy
- Sunken eyes
- Very slow skin pinch

PRIORITY

Priority signs

These children need prompt assessment and treatment
Tiny baby (< 3 months of age)
High Temperature
Trauma or other urgent surgical condition
Pallor (severe)
Poisoning (history of)
Pain (severe)
Respiratory distress
Restless, continuously irritable, or lethargic
Referred for urgent attention
Malnutrition: visible severe wasting
Oedema of both feet
Burns (major)

NON-URGENT (queue)

No emergency or priority signs.
Proceed with assessment and further treatment according to the child's priority.

The Emergency Triage Assessment and Treatment (ETAT) tool, presented above, should be a minimum standard of triage in community health centres.

(Alternative tool P-SATS is available, see the Paediatric Hospital level STGs and EML).

Amended to:

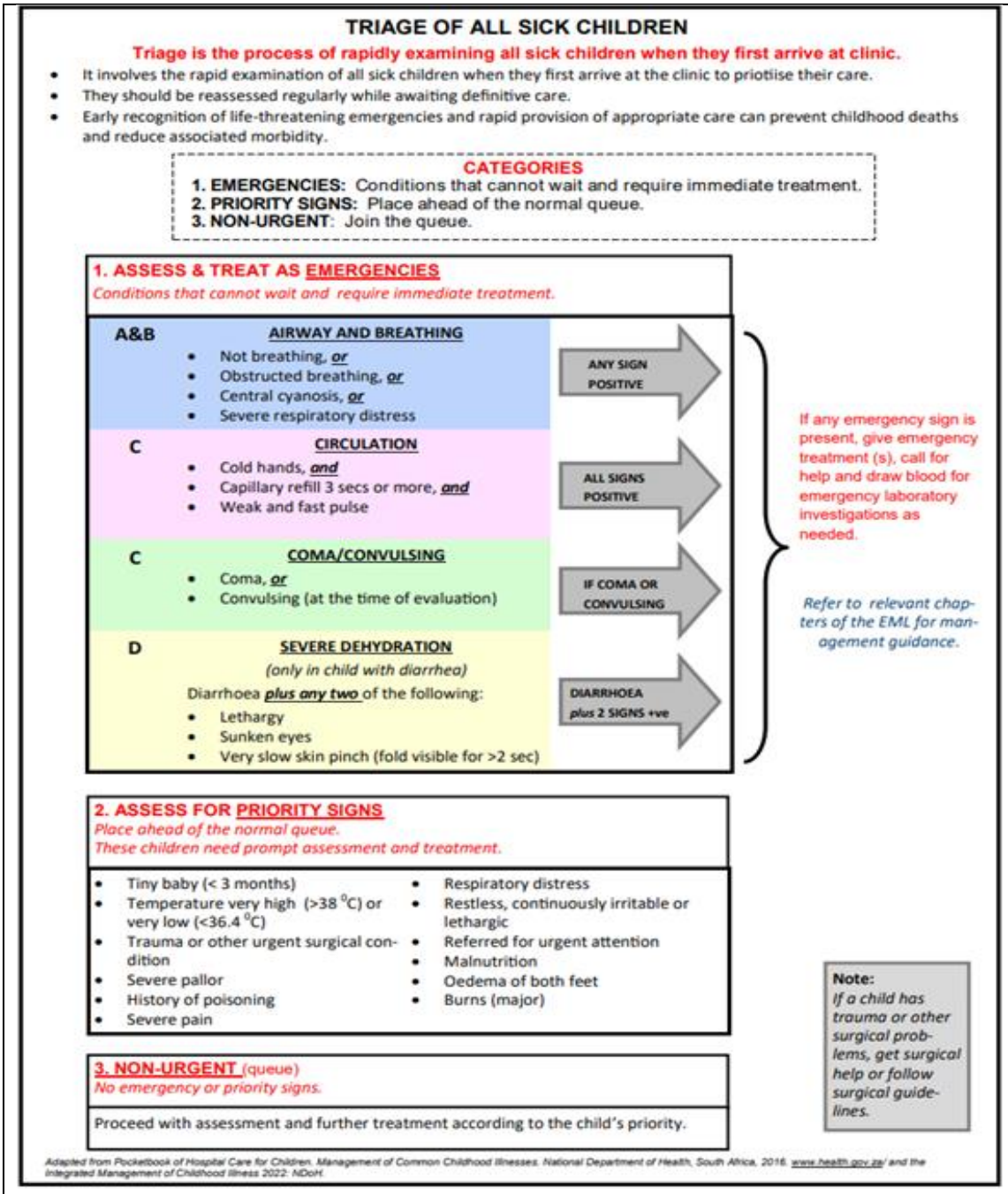


Figure 21.5: Triage of sick children

The Emergency Triage Assessment and Treatment (ETAT) triage process, presented above, should be a minimum standard of triage in community health centres.

For management guidance, refer to relevant sections of the EML as listed below:
For foreign body aspiration see Section 21.1.5
For acute asthma see Section 17.1.1
For acute bronchiolitis see Section 17.1.3
For croup see Section 17.2.1
For shock see Section 21.2.11
For hypoglycaemia and hypoglycaemic coma see Section 21.2.6
For acute diarrhoea see Section 2.9.1

21.2.4 DELIRIUM

Guidance on Physical Restraint: *added*

The guidance as tabulated below was added to the STG

CAUTION – Physical Restraint

- » Worsens the outcomes of delirious patients: this is a last resort when all else has failed and is a short-term measure until chemical restraint and other measures have been achieved.
- » Manual restraint: respectful, controlled, applied by personnel of the same sex as the patient.
- » Mechanical restraint: only if absolutely necessary to protect the patient and others for as short a time as possible. Document the type, sites and duration of any restraints used. 15-minute monitoring of vital signs, the mental state, restraint sites, and reasons for use.

Medicine treatment: *guidance amended*

Guidance on management of delirium amended as tabulated below

MEDICINE TREATMENT

- » ~~Treat the underlying medical condition.~~
- » Manage the underlying medical or surgical condition.
- » The aim is to contain the person while awaiting transfer to hospital and to enable initial care of the underlying condition.
- » Keep antipsychotic or benzodiazepine use to a minimum.
- » Use small doses regularly rather than large doses less frequently.
- » Adjust doses according to clinical circumstances, e.g., lower doses in the elderly, debilitated.

Acute management, *aligned*

Guidance for the acute management of delirium has been aligned with a cross reference to Section 16.1.2 and 16.1.3 of the STG as tabulated below

For ~~the management of~~ severe aggression and disruptive behaviour, see Section 16.1.2 ~~15.1~~: Aggressive, disruptive behaviour in adults or Section 16.1.3 Aggressive, disruptive behaviour in children and adolescents.

Diazepam – dose frequency: *Clarified*

The frequency for administering a second dose of diazepam IV has been specified as tabulated below:

AMENDED FROM

- Diazepam, slow IV, 10 mg no faster than 5 mg/minute for immediate sedative or hypnotic action.
  If no response, give a 2nd dose.

AMENDED TO:

- Diazepam, slow IV, 10 mg no faster than 5 mg/minute for immediate sedative or hypnotic action.
  - If no response, give a 2nd dose after 30 to 60 minutes.

Benzodiazepines, *amended*

The cautions for the use of benzodiazepines have been amended to accommodate for the addition of olanzapine and oral haloperidol to the STG as tabulated below

CAUTION - Benzodiazepines

- » Benzodiazepines, especially diazepam IV, can cause respiratory depression.
- » Monitor vital signs closely during and after administration. In the frail and elderly patient or where respiratory depression is a concern, reduce the dose by half.
- » The safest route of administration is oral followed by IM with the IV route having the highest risk of respiratory depression and arrest. Use the safest route wherever possible.
- » In patients with respiratory insufficiency: use oral haloperidol or olanzapine oro-dispersible tablets, IM, or oral instead of IM or IV benzodiazepines. ~~Use haloperidol instead of benzodiazepines in patients with respiratory insufficiency.~~
- » Do NOT use IM olanzapine with IM/IV benzodiazepines.
- » In the short-term, benzodiazepines can aggravate delirium.
- » Allow at least 15–30 minutes for the medication to take effect. Repeated IM doses of benzodiazepines may result in toxicity owing to accumulation.

Haloperidol, IM: *retained*
Olanzapine, oro-dispersible: *added*
Olanzapine, IM: *added*

Refer to the medicine review on the Knowledge Hub or included below for more information.

PHC/ADULT HOSPITAL LEVEL EXPERT REVIEW COMMITTEE RECOMMENDATION:					
Type of recommendation	We recommend against the option and for the alternative **(strong)**	We suggest not to use the option **(conditional)**	We suggest using either the option or the alternative **(conditional)**	We suggest using the option **(conditional)**	We recommend the option **(strong)**
				X	
Recommendation: The PHC/ Adult Hospital Level Committee suggests using olanzapine (orodispersible and parenteral formulations) as an option to manage delirium where non-pharmacological management is not sufficient and if haloperidol, intramuscular formulation is unavailable *Rationale:* Available low-quality evidence shows that olanzapine is comparable to haloperidol. **Level of Evidence: Low to very low certainty evidence** **Review indicator:** Evidence of harm, efficacy					
NEMLC RECOMMENDATION (20 OCTOBER 2022 MEETING): NEMLC recommended the use of olanzapine oro-dispersible tablet or IM injection for delirium with agitated and acutely disturbed behaviour. Once the patient is able to swallow, to continue with oral haloperidol or olanzapine, until behaviour is contained.					
Monitoring and evaluation considerations					
Research priorities					

Oro-dispersible olanzapine dissolves on the tongue and is absorbed via the oral mucosa and therefore may be administered in those who cannot/will not swallow which may be beneficial in agitated patients.

The STG has been amended as tabulated below:

Amended from:

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

- Haloperidol, IM, 5 mg, immediately.
  In elderly: 2.5 mg, immediately.
  If no response give a second dose.

Amended to:

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

- Haloperidol, oral, 0.75–1.5 mg, repeated in 30–60 minutes, if required

OR

If unable to swallow or oral medication declined:

- Haloperidol, IM, 0.5–1mg.

OR

If haloperidol, IM is not available:

- Olanzapine, oral dispersible tablet or IM, 2.5–5 mg.
  - Use lowest dose with caution in the elderly
  - May be repeated in 30–60 minutes, if required
  - Monitor vital signs and beware of oversedation, neuroleptic malignant syndrome, and acute dystonia.

Alcoholics/ Malnourished (adults)

Thiamine, parenteral: *dose & route of administration amended*

Refer to the evidence summary on Knowledge Hub for more information.

- *Thiamine dose:* There is limited evidence - a Cochrane review[19] reviewed one RCT (n=169)[20] in which participants with a history of chronic alcohol use were assigned to one of five doses of IM thiamine (5, 20, 50, 100 and 200 mg once daily), with outcomes measured after 2 days of treatment. On day 3 of treatment, participants were assessed by a psychologist on the delayed alternation test. This RCT demonstrated a significant difference favouring a dose of 200mg a day compared to 5mg/day in the number of trials taken to reach criteria on a delayed alternation test (MD -17.90, 95% CI -35.4 to -0.40, P = 0.04). Guideline recommendations on the dose of thiamine for the management of patients with suspected or diagnosed Wernicke's encephalopathy varies, with case series reports suggesting that doses of 500mg or more IV, were safe and efficacious. While the Cochrane reviewers concluded that no good evidence could be derived from available RCTs to help physicians choose the right dose, frequency, route or duration of thiamine treatment for preventing or treating WKS due to alcohol abuse, most guidelines recommend higher doses of thiamine i.e. 100mg and more.
- *Route of administration:* It was noted that the SAMF[21], 2016 as well as the British National Formulary[22] cautions about anaphylactic reactions associated with IV administration of thiamine; the latter citing MHRA/CHM advice, 2007:

  IMPORTANT SAFETY INFORMATION MHRA/CHM ADVICE (SEPTEMBER 2007):
  Although potentially serious allergic adverse reactions may rarely occur during, or shortly after, parenteral administration, the CHM has recommended that:
  - This should not preclude the use of parenteral thiamine in patients where this route of administration is required, particularly in patients at risk of Wernicke-Korsakoff syndrome where treatment with thiamine is essential;
  - Intravenous administration should be by infusion over 30 minutes;
  - Facilities for treating anaphylaxis (including resuscitation facilities) should be available when parenteral thiamine is administered.
- *Pragmatic implications:* Thiamine is only available as 100 mg/mL vials and a large volume e.g. 5 mL by IM injection may be poorly tolerated by patients and possibly considered to be impractical.

Recommendations:

- Dose be amended to a maximum of 200 mg IM in both the Adult Hospital and PHC STGs and EML for prevention of Wernicke's encephalopathy.

NEMLC MEETING OF 23 JUNE 2022:
NEMLC accepted the proposal to amend the dose of thiamine from "100mg" to "200mg", aligned with available RCT evidence, for the prevention of Wernicke's encephalopathy. NEMLC also deliberated on the route of administration and recommended that for the prevention of Wernicke's encephalopathy, that thiamine should be administered intramuscularly and not by the intravenous route.

21.2.6 HYPOGLYCAEMIA AND HYPOGLYCAEMIC COMA

Thiamine, IV/IM: *aligned*

Aligned with section 21.2.4: Delirium – see above.

21.2.8 PULMONARY OEDEMA, ACUTE

If patient very anxious or restless

Morphine, IV: *deleted & caution added to the STG*

[19] Day E, Bentham PW, Callaghan R, Kuruvilla T, George S. Thiamine for prevention and treatment of Wernicke-Korsakoff Syndrome in people who abuse alcohol. Cochrane Database Syst Rev. 2013 Jul 1;2013(7):CD004033. https://pubmed.ncbi.nlm.nih.gov/23818100/

[20] Ambrose ML, Bowden SC, Whelan G. Thiamin treatment and working memory function of alcohol-dependent people: preliminary findings. Alcohol Clin Exp Res. 2001 Jan;25(1):112-6. https://pubmed.ncbi.nlm.nih.gov/11198705/

[21] South African Medicines Formulary 14th Ed.

[22] British National Formulary, 2020

Refer to the medicine review on the Knowledge Hub or below or alternatively, the publication by Hendrikse et al.[23] for further detail.

PHC/ADULT HOSPITAL LEVEL EXPERT REVIEW COMMITTEE RECOMMENDATION:					
Type of recommendation	We recommend against the option and for the alternative **(strong)**	We suggest not to use the option **(conditional)**	We suggest using either the option or the alternative **(conditional)**	We suggest using the option **(conditional)**	We recommend the option **(strong)**
		x			
Recommendation: The PHC/Adult Hospital Level Committee suggests not to use morphine for the treatment of acute pulmonary distress. *Rationale:* Available evidence shows that morphine may increase in-hospital and all-cause mortality and may result in a large increase in invasive mechanical ventilation compared to not using morphine. No available data could be found on whether morphine increases non-fatal adverse events, ICU or hospital length of stay. **Level of Evidence:** Low certainty of evidence **Review indicator:** New high-quality evidence of a clinically relevant benefit					
NEMLC RECCOMENDATION – 23 JUNE 2022: **NEMLC MEETING OF 23 JUNE 2022:** NEMLC accepted the proposal to remove morphine for the treatment of acute pulmonary distress. However, recommended that a caution be included in the STG, accordingly: **CAUTION** Do not use morphine for pulmonary oedema, as there is observational data providing a signal of harm. Furthermore, once the respective chapter is finalised, it was recommended that a circular be drafted and disseminated regarding the harms associated with use of morphine for distress in pulmonary oedema.					
Monitoring and evaluation considerations					
Research priorities					

21.2.9 SHOCK

Fluid replacement in children – sodium chloride 0.9%: *Dose amended*
Fluid replacement in children – ringers lactate: A*dded*

The dose of sodium chloride 0.9% as an IV bolus dose for the management of shock in children was amended from 20mL/kg as a rapid bolus to 10mL/kg over 20 minutes. This has been aligned to the Integrated Management of Childhood Illness (IMCI) guidelines 2022[24].

Furthermore, ringers lactate has been added as an alternative fluid replacement solution to sodium chloride 0.9% in alignment with the Paediatric EML.

21.2.10 ANAPHYLAXIS

General measures

Guidance on anaphylaxis associated with vaccinations: *added*
Guidance was included in the STG on non-pharmacological management of anaphylaxis associated with vaccinations, aligned with WHO guidance[25], as follows:

Anaphylaxis associated with vaccinations:
» Always keep a fully equipped emergency tray at the immunisation point.
» It is advisable to observe clients for 15 minutes after a vaccination. If a client is known with severe allergies, an observation period of 30 minutes is advised.

[23] Hendrikse C, Ngah V, Kallon II, Thom G, Leong TD, Cohen K, McCaul M. Signal of harm in morphine use in adults with acute pulmonary oedema: A rapid systematic review. S Afr Med J. 2023 Aug 3;113(8):39-43. doi: 10.7196/SAMJ.2023.v113i8.348. PMID: 37882120.
[24] National Department of Health. Integrated management of childhood illness. 2022. https://knowledgehub.health.gov.za/elibrary/integrated-management-childhood-illness-2022
[25] Immunization stress-related response. A manual for program managers and health professionals to prevent, identify and respond to stress related responses following immunization. Geneva: World Health Organization; 2019. https://apps.who.int/iris/handle/10665/330277

» Clients who develop symptoms should be assessed for possible vaccination associated anaphylaxis by considering the following:
  - If signs and symptoms are generalised – involving more than 2 body systems, manage as anaphylaxis.
  - If signs and symptoms are serious or life-threatening, even if only one body system is involved (including hypotension, respiratory distress significant swelling of lips or tongue), treat as anaphylaxis.
  - If isolated rash in an otherwise well client, monitor for 30 minutes.
» Collapse following vaccination might be due to anaphylaxis or other causes such as a vasovagal episode:
  - Call for help and put patient on his/her back and raise legs.
  - Check if responsive – if unresponsive, commence CPR (See section 21.1)
  - A vasovagal episode is usually associated with a transient loss of consciousness (< 1 minute), relieved by raising the legs when supine, transient low BP and low HR.
  - Collapsing after vaccination usually occurs 5-10 minutes post-vaccination, but can occur up to an hour afterwards.
  - Treat as anaphylaxis if loss of consciousness is not brief and not relieved by raising the legs, if any of the signs or symptoms of anaphylaxis occur.

	ANAPHYLAXIS	ACUTE STRESS RESPONSE	
		GENERAL	VASOVAGAL REACTION WITH SYNCOPE
Onset	Usually 5 min after immunization but may be delayed up to 60 min	Sudden, occurs before, during or shortly after (< 5 min) immunization	Sudden, occurs before, during or shortly after (< 5 min) immunization. May present after 5 min if the individual stands suddenly.
System			
Skin	Generalized urticaria (hives) or generalized erythema, angioedema, localized or generalized, generalized pruritus with or without skin rash, generalized prickle sensation, localized injection site urticaria, red and itchy eyes	Pale, sweaty, cold, clammy	Pale, sweaty, cold, clammy
Respiratory	Persistent cough, noisy breathing and airway constriction: wheeze, stridor. If very severe, respiratory arrest.	Hyperventilation (rapid, deep breathing)	Normal to deep breaths
Cardiovascular	↑ heart rate, ↓ blood pressure, circulatory arrest	↑heart rate, normal or ↑systolic blood pressure	↓ heart rate with or without transient ↓in blood pressure
Gastrointestinal	Nausea, vomiting, abdominal cramps	Nausea	Nausea, vomiting
Neurological and other symptoms	Uneasiness, restlessness, agitation, loss of consciousness, little response when supine or lying flat	Fearfulness, light-headedness dizziness, numbness, weakness, tingling around the lips, spasms in hands, feet	Transient loss of consciousness, good response once supine or lying flat, with or without tonic–clonic seizure

Table 21.5: Differences between anaphylaxis, general acute stress response and vasovagal reaction with syncope
Source: Immunization stress-related response. A manual for program managers and health professionals to prevent, identify and respond to stress related responses following immunization. Geneva: World Health Organization; 2019.
https://apps.who.int/iris/handle/10665/330277

Management – salbutamol nebulized: *Dose clarified*
Management – ipratropium bromide nebulized in adults and children: *Doses clarified*

The doses of nebulized salbutamol and ipratropium bromide for the management of wheeze have been aligned to updated guidance in the PHC Chp 17 Respiratory chapter Section 17.1.1 Acute asthma. Updates are as tabulated below:

Amended from:

If wheeze:

- Salbutamol 0.5%, solution, nebulised, with high flow oxygen.
  .5–1 mL (2.5–5 mg) salbutamol 0.5% solution, in 4 mL of sodium chloride 0.9%.

AND

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

Amended to:

If wheeze:

- Salbutamol 0.5%, (5mg/mL) solution, nebulised, with high flow oxygen.
  - Children: 0.5–1 mL (2.5–5 mg) salbutamol 0.5% solution,
  - Adults: 1 mL (5 mg) salbutamol 0.5% solution,

AND

- Ipratropium bromide, solution, added to salbutamol solution.
  - Children: Ipratropium bromide 0.25mg/2ml; nebuliser solution: 2mL (0.25 mg) nebulised with salbutamol and made up to a total volume of 4mL with sodium chloride 0.9%.
  - Adults: Ipratropium bromide 0.5mg/2ml; nebuliser solution, 2 mL (0.5 mg) nebulised with salbutamol and made up to a total volume of 4mL with sodium chloride 0.9%.

21.3.TRAUMA AND INJURIES

Referral for patients with brain and spinal cord injury: *Not added*

External comment received from RuRehab to refer patients with brain and spinal cord injuries for rehabilitation was not supported as this referral guidance has been more appropriately included under, Section 15.8 Spinal Cord injuries.

21.3.1.1 ANIMAL BITES

Suspected rabid bite

Background: At the NEMLC meeting of the 6 December 2018, NEMLC accepted the following proposed changes made by the previous Adult Hospital Level Committee for the PHC Rabies STG:

NEMLC MEETING OF 6 DECEMBER 2018:

A: POST EXPOSURE MANAGEMENT

AMENDMENT	EVIDENCE AND RATIONALE
2.1 Wound Management	
• Wound irrigation time changed from "5 to 10 minutes" to "15 minutes".	Thorough wound washing reduces the viral inoculum at the wound site[26]. **Level of Evidence: III Guidelines**
2.2.1 Response to different severity of exposure	
• Category risk assessment removed, and management based on severity of exposures, as per algorithm, below	Numbering of categories removed so that risk assessment is simpler and more pragmatic, encouraging acceptability by healthcare workers (and thus implementation more likely). **Level of Evidence: III Expert opinion**

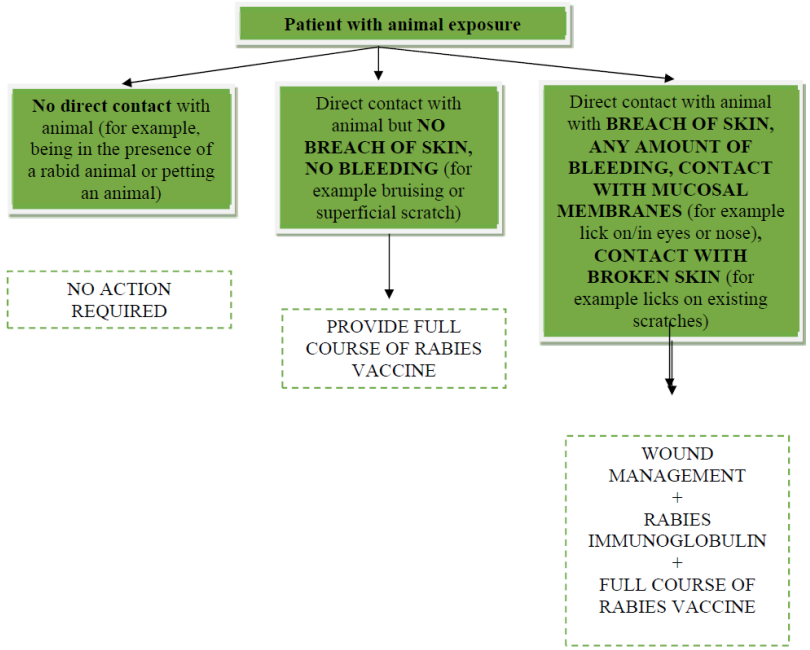


Figure 1: Algorithm for rabies PEP for patients with **no history of previous rabies PrEP or PEP.**

2.2.2 Regimen for rabies vaccine administration

[26] Kaplan MM et al. Studies on the local treatment of wounds for the prevention of rabies. Bull World Health Organ.1962;26:765–775.

• Doses in rabies vaccine regimen: ○ Immunocompetent: *not amended* - No change in dosing regimen ○ Immunocompromised*: amended* - Dosing regimen amended from a 5- to 4-dose regimen (with individual case management of severely immunocompromised e.g.: symptomatic HIV – to determine if additional dose is required if inadequate seroconversion after vaccination.).	Aligned with WHO Rabies Guidelines April 2018 update[27] that recommends the 4-dose Essen IM regimen to all HIV-infected and other potentially immunocompromised persons who are clinically stable (e.g: HIV-infected on ART with undetectable viral load). Studies[28] [29] [30] [31]have shown an immunogenic response by day 14 (subjects had neutralizing antibody concentrations ≥ 0.5 IU/ml) in the immunocompromised. WHO Guidelines states that clinically well HIV patients on ART reacts to administration of vaccines, similarly to the immunocompetent observed.[32] **Level of Evidence: III Immunogenicity studies, Guidelines**
• Directions for IM administration*: not amended* Deltoid muscle in adults, anterolateral thigh in small children (aged < 2 years)	n/a
• *Products available on the SA market:*	Currently only one product is available on the market. Alternate SAHPRA-registered product is unavailable due to GMP concerns at the API manufacturer.
2.2.3 Regimen for rabies immunoglobulin (RIG) administration	
• Directions for administration: *amended* Maximum infiltration of RIG in and around the wound with limited benefit from additional IM administration of any remaining RIG at a site distant to the wound.	Systematic review of in vitro and in vivo studies showed that maximum infiltration of the RIG dose (calculated by body weight) into and around the wound is effective; and there is possibly limited benefit of IM administration of the remaining RIG at a site distant to the wound.[33] It is suggested that the remaining RIG could be given to other patients (especially if RIG is in short supply).[34] [35] Data reported from rabies-endemic settings showed > 99% survival rate in the absence of RIG; but with effective wound management and immediate and completeness of course.[36] **Level of Evidence: III Immunogenicity studies, Observational studies**
• Time of RIG administration*: not amended* — Recommendation not to administer RIG in previously immunised patients or after day 7 following first rabies vaccine dose, retained. — WHO Guidelines recommend that if there are supply challenges with RIG, allocation should be prioritised[37] (high priority cases include: bat exposure; high risk exposure – multiple bites with breach of skin and mucosa exposure; severe immunodeficiency; animal is a confirmed or probable rabid case).	Aligned with April 2018 WHO Guideline recommendations. **Level of Evidence: III Guidelines**
• Equine rabies immunoglobulin: *added* Alternative to HRIG, when there are supply challenges with HRIG, dosed at 40 IU/kg. Anaphylaxis, though rare, can occur and treating healthcare worker should be prepared to manage this ADR (Skin testing before eRIG administration is not recommended as unreliable in predicting adverse effects.	Aligned with April 2018 WHO Guideline recommendations. **Level of Evidence: III Guidelines[38]**
2.3.1 Immunocompromised individuals	

[27] World Health Organisation. Rabies vaccines: WHO position paper – April 2018. Weekly epidemiological record: No 16, 2018, 93, 201–220. http://www.who.int/wer

[28] Sirikwin S, Likanonsakul S, Waradejwinyoo S, Pattamadilok S, Kumperasart S, Chaovavanich A, Manatsathit S, Malerczyk C, Wasi C. Antibody response to an eight-site intradermal rabies vaccination in patients infected with Human Immunodeficiency Virus. Vaccine. 2009 Jul 9;27(32):4350-4. doi: 10.1016/j.vaccine.2009.03.027.

[29] Thisyakorn U, Pancharoen C, Wilde H. Immunologic and virologic evaluation of HIV-1-infected children after rabies vaccination. Vaccine. 2001 Jan 8;19(11-12):1534-7.

[30] Sampath G, Parikh S, Sangram P, Briggs DJ. Rabies post-exposure prophylaxis in malnourished children exposed to suspect rabid animals. Vaccine. 2005 Jan 19;23(9):1102-5.

[31] Rahimi P, Vahabpour R, Aghasadeghi MR, Sadat SM, Howaizi N, Mostafavi E, Eslamifar A, Fallahian V. Neutralizing Antibody Response after Intramuscular Purified Vero Cell Rabies Vaccination (PVRV) in Iranian Patients with Specific Medical Conditions. PLoS One. 2015 Oct 6;10(10):e0139171. doi: 10.1371/journal.pone.0139171. eCollection 2015. Erratum in: PLoS One. 2015;10(10):e0142244.

[32] Simani OE, Izu A, Violari A, Cotton MF, van Niekerk N, Adrian PV, Madhi SA. Effect of HIV-1 exposure and antiretroviral treatment strategies in HIV-infected children on immunogenicity of vaccines during infancy. AIDS. 2014 Feb 20;28(4):531-41. doi: 10.1097/QAD.0000000000000127.

[33] Madhusudana SN, Ashwin BY, Sudarshan S. Feasibility of reducing rabies immunoglobulin dosage for passive immunization against rabies: results of In vitro and In vivo studies. Hum Vaccin Immunother. 2013 Sep;9(9):1914-7. doi: 10.4161/hv.25431.

[34] Bharti OK et al. Injecting rabies immunoglobulin (RIG) into wounds only: A significant saving of lives and costly RIG. Hum Vaccin Immunother. 2017; 13(4):762–765.

[35] Bharti OK et al. Local infiltration of rabies immunoglobulins without systemic intramuscular administration: An alternative cost-effective approach for passive immunization against rabies. Hum Vaccin Immunother. 2016; 12(3):837–842.

[36] WHO. Rabies Working Group Report, SAGE meeting October 2017. Available at http://www.who.int/immunization/sage/meetings/2017/october/1_Background_paper_WG_RABIES_final.pdf?ua=1, accessed February 2018.

[37] WHO. Evidence to recommendation Table 3: prioritization of RIG. Available at http://www.who.int/immunization/policy/position_papers/rabies_prioritization_rig.pdf

[38] World Health Organisation. Rabies vaccines: WHO position paper – April 2018. Weekly epidemiological record: No 16, 2018, 93, 201–220. http://www.who.int/wer

• PEP dosing regimen: *amended* i. Regimen includes 4-doses of vaccines (days 0,7,14,28) ii. RIG x 1 dose only recommended for the severely immunocompromised (excludes clinically well HIV-infected patients on ART).	See discussion above - 2.2.2 Regimen for rabies vaccine administration.
2.3.2 Pregnant and lactating women	
Safety of rabies vaccine and RIG in pregnancy and breastfeeding noted.	Aligned with April 2018 WHO Guideline recommendations. **Level of Evidence: III Guidelines**[39]
2.3.3 Patients who have received previous PrEP or PEP	
• Rabies vaccine: *dosing not amended* • RIG: *recommendation not to administer RIG retained* — Repeat exposure <3 months after a previous exposure, and had received a complete PEP: only wound treatment is required; vaccine nor RIG is needed. — For repeat exposures occurring >3 months after the last PEP: 2-dose IM rabies vaccine on days 0 and 3 recommended and RIG is not indicated.	Aligned with April 2018 WHO Guideline recommendations. **Level of Evidence: III Guidelines**
2.3.4 Delayed presentation	
• Double dosing of vaccine: *deleted* The following recommendation *"If patient presents after 48 hours, administer double the initial dose on day 0"*, replaced by, *"Rabies PEP should ideally be provided as soon after exposure as possible. When patients, present well after the exposure event, regard the first day of presentation as day 0 for vaccine and RIG administration".*	Aligned with April 2018 WHO Guideline recommendations. **Level of Evidence: III Guidelines**

Recommendation: The Adult Hospital Level Committee recommends that the above-mentioned amendments pertaining to post exposure management be included in the respective STGs.

The STG was updated accordingly – see below (changes only):

Amended from:

2.1 Wound Management

Wash wound thoroughly with soap under running water for 5–10 minutes.

2.2.1 Response to different severity of exposure

Category	Type of exposure	Management
1	» Touching/feeding of animal. » Licking of intact skin.	» No treatment if history is reliable. » If history not reliable, treat as category 2.
2	» Nibbling of uncovered skin. » Superficial scratch without bleeding.	» Wound management. » Administer full course vaccine. Only stop if animal tested negative for rabies or is still healthy after 10 days' observation. » Don't give immunoglobulin, except in immunocompromised patients.
3	» Bites/scratches that penetrate the skin and with any visible blood. » Licking of broken skin or mucous membranes e.g. eyes and mouth. » Bat bites: – Any close contact with a bat: single or multiple bites or scratches and bruising (even with minor bites or unapparent skin penetration). – Direct physical contact with bat saliva or neural tissue; contact of mucous membranes with bat saliva, droppings or urine.	» Wound management. » Administer full course vaccine. » Only stop if animal tested negative for rabies or is still healthy after 10 days' observation. » Administer rabies immunoglobulin. » Administer tetanus vaccine. » Prescribe antibiotics.

2.2.2 Regimen for rabies vaccine administration

Rabies vaccination

Only indicated for category 2 and 3 exposure. Available from the nearest district hospital.

Children

- Rabies vaccine, 1 amp, IM anterolateral thigh.
  - Day 0 – single dose
  - Day 3 – single dose

Amended to:

2.1 Wound Management

Wash wound thoroughly with soap under running water for 15 minutes.

2.2.1 Response to different severity of exposure

PATIENT WITH ANIMAL EXPOSURE			
Severity of exposure	**No direct contact** with animal (for example, being in the presence of a rabid animal or petting an animal)	Direct contact with animal but **no breach of skin, no bleeding** (for example bruising or superficial scratch)	Direct contact with animal with **breach of skin, any amount of bleeding, contact with mucosal membranes** (for example lick on/in eyes or nose), **contact with broken skin** (for example licks on existing scratches), **any contact with a bat.**
Management based on severity of the exposure	Washing of exposed skin surfaces	Wound management ***AND*** Full course of rabies vaccine (Rabies immunoglobulin, only if severely immuno-compromised)	Wound management ***AND*** Rabies immunoglobulin ***AND*** Full course of rabies vaccine

2.2.2 Regimen for rabies vaccine administration

Rabies vaccination

Only indicated for direct animal contact.

Patients who have previously been fully immunised or who received PEP more than 3 months ago need only two doses: on Day 0 and Day 3.

Patients who have received previous PEP or PrEP within the previous 3 months do not require vaccination against rabies. Only wound treatment is required.

[39] World Health Organisation. Rabies vaccines: WHO position paper – April 2018. Weekly epidemiological record: No 16, 2018, 93, 201–220. http://www.who.int/wer

Day 7 – single dose Day 14 – single dose Day 28 – single dose(only if immunocompromised). <u>Adults</u> • Rabies vaccine, 1 amp, IM deltoid. Day 0 – single dose Day 3 – single dose Day 7 – single dose Day 14 – single dose Day 28 – single dose(only if immunocompromised).	Available from the nearest district hospital. <u>Children</u> • Rabies vaccine, 1 amp, IM anterolateral thigh. Day 0 – single dose Day 3 – single dose Day 7 – single dose Between day 14-28 – single dose <u>Adults</u> • Rabies vaccine, 1 amp, IM deltoid. Day 0 – single dose Day 3 – single dose Day 7 – single dose Between day 14-28 – single dose
2.2.3 Regimen for rabies immunoglobulin (RIG) administration	
Rabies immunoglobulin: Only indicated for: – Category 3, immunocompetent patients. – Category 2 and 3 immunocompromised patients. – All bat exposures. Available from the nearest district hospital. If not immediately available, source and give as soon as possible. • Rabies immunoglobulin 20 IU/kg. Infiltrate as much as possible in and around the wound and inject the rest IM (not buttock, unless the wound is on the buttock). Follow with a complete course of vaccine.	**Rabies immunoglobulin (RIG):** ○ Only indicated for: – Direct animal contact with breach of skin/ bleeding/ mucosal contact,, immunocompetent patients – Any direct animal contact, immunocompromised patients – All bat exposures ○ Patients who have received PEP or PrEP do not require RIG. Only wound treatment is required. ○ Available from the nearest district hospital. ○ If not immediately available, source and give as soon as possible. ○ When 7 days have lapsed since the initial rabies vaccination, RIG is no longer indicated as the vaccine induced immune response will be effective at that time. ○ Infiltrate as much as possible in and around the wound. ○ It is **no longer** recommended to inject the remainder of the calculated RIG dose at a site distant to the wound. ○ In the case of smaller wounds/areas where it is not possible to infiltrate the entire calculated dose, infiltrate as much as is anatomically feasible in and around the wound site/s without causing compartment syndrome. ○ In case of large and multiple wounds, RIG can be diluted with sodium chloride 0.9% solution if necessary to ensure infiltration of all wounds. ○ Follow with a complete course of vaccine. • Human-derived rabies immunoglobulin (HRIG), IM 20 IU/kg. Infiltrate as much as possible in and around the wound. **OR** • Equine-derived rabies Immunoglobulin (ERIG), IM 40 IU/kg. ○ Only administer ERIG in facilities where anaphylaxis or adverse reactions can be managed (Refer to Section 21.2.10). **Table 21.7:** Summary of regimen for HRIG and ERIG <table><tr><th>Product name</th><th>Max. dose</th><th>Description</th><th>Site of administration</th><th>Schedule</th></tr><tr><td colspan="3">HRIG</td><td rowspan="4">Infiltrate up to the maximum calculated dose in and around the wound site/s. For smaller wounds where it is not possible to infiltrate all of the calculated dose, infiltrate as much as is anatomically feasible in and around the wound site/s.</td><td rowspan="4">On day 0 (when patient presents for first time)/ as soon as possible after exposure to be effective to neutralise virus. When RIG is not available it should be sourced as a matter of urgency. When 7 days have lapsed since initial rabies vaccination, RIG is no longer indicated.</td></tr><tr><td>Rabigam®</td><td>20 IU/kg</td><td>150 IU/mL (Supplied in 2 mL vial)</td></tr><tr><td>KamRAB®</td><td>20 IU/kg</td><td>150 IU/mL (Supplied in 2, 5 and 10 mL vials).</td></tr><tr><td colspan="3">ERIG</td></tr><tr><td>Equirab®</td><td>40 IU/kg</td><td>200 IU/mL (Supplied in 5 mL vial).</td><td></td><td></td></tr></table>*Source: NICD updated human rabies prophylaxis guideline. www.nicd.ac.za*
2.3.1 Immunocompromised individuals	
n/a	Individuals with documented immunodeficiency, such as symptomatic HIV infection, patients with cancer on chemotherapy/radiotherapy, and patients on long-term corticosteroids dosed at 20mg/day for ≥2 weeks, should be evaluated on a case-by-case basis and receive a complete course of PEP including RIG and 4 doses of rabies vaccine in all exposures with direct animal contact. Note: HIV-infected individuals receiving ART who are clinically monitored and well managed are not considered immunocompromised. Such patients have been shown to respond normally to rabies vaccines.
2.3.3 Patients who have received previous PrEP or PEP	
n/a	Patients who have received PEP or PrEP do not require RIG. Only wound treatment is required.

Rabies vaccine and rabies immunoglobulin (RIG) – authorised prescribers: *Guidance clarified*

STG guidance has been updated to clarify that rabies immunoglobulin (RIG) is limited to prescribing by doctors only i.e. categorised as 'doctor prescribed.' Rabies vaccine has been categorised as 'doctor initiated' and any follow up doses as per STG guidance, may be prescribed by all authorised prescribers. Updates to version 1.1 of the STG are as tabulated below:

AMENDED FROM (Ed 2020-4 v1.0):

Rabies immunoglobulin (RIG):

Only indicated for:

- Direct animal contact with breach of skin/ bleeding/ mucosal contact, immunocompetent patients
- Any direct animal contact, immunocompromised patients
- All bat exposures

Patients who have received PEP or PrEP do not require RIG. Only wound treatment is required.

Available from the nearest district hospital.

If not immediately available, source and give as soon as possible.

When 7 days have lapsed since the initial rabies vaccination, RIG is no longer indicated as the vaccine induced immune response will be effective at that time.

Infiltrate as much as possible in and around the wound.

It is **no longer** recommended to inject the remainder of the calculated RIG dose at a site distant to the wound.

In the case of smaller wounds/areas where it is not possible to infiltrate the entire calculated dose, infiltrate as much as is anatomically feasible in and around the wound site/s without causing compartment syndrome.

In case of large and multiple wounds, RIG can be diluted with sodium chloride 0.9% solution if necessary to ensure infiltration of all wounds.

Follow with a complete course of vaccine.

- Human-derived rabies immunoglobulin (HRIG), IM 20 IU/kg. Infiltrate as much as possible in and around the wound.

OR

- Equine-derived rabies Immunoglobulin (ERIG), IM 40 IU/kg. Infiltrate as much as possible in and around the wound.
  Administer ERIG only in facilities where anaphylaxis or adverse reactions can be managed. (Refer to Section 21.2.10).

Product name	Max. dose	Description	Site of administration	Schedule
HRIG			Infiltrate up to the maximum calculated dose in and around the wound site/s. For smaller wounds where it is not possible to infiltrate all of the calculated dose, infiltrate as much as is anatomically feasible in and around the wound site/s.	On day 0 (when patient presents for first time)/ as soon as possible after exposure to be effective to neutralise virus. When RIG is not available it should be sourced as a matter of urgency. When 7 days have lapsed since initial rabies vaccination, RIG is no longer indicated.
Rabigam®	20 IU/kg	150 IU/mL (Supplied in 2 mL vial)		
KamRAB®	20 IU/kg	150 IU/mL (Supplied in 2, 5 and 10 mL vials).		
ERIG				
Equirab®	40 IU/kg	200 IU/mL (Supplied in 5 mL vial).		

Table 21.7: Summary of regimen for HRIG and ERIG
Source: NICD updated human rabies prophylaxis guideline.
www.nicd.ac.za

Rabies vaccination:

Only indicated for direct animal contact.

Patients who have previously been fully immunised or who received PEP more than 3 months ago need only two doses: on Day 0 and Day 3.

Patients who have received previous PEP or PrEP within the previous 3 months do not require vaccination against rabies. Only wound treatment is required.

Available from the nearest district hospital.

AMENDED TO (Ed 2020-4 v1.1)

Rabies immunoglobulin (RIG) – doctor prescribed:

Only indicated for:

- Direct animal contact with breach of skin/ bleeding/ mucosal contact, immunocompetent patients
- Any direct animal contact, immunocompromised patients
- All bat exposures

Patients who have received PEP or PrEP do not require RIG. Only wound treatment is required.

Available from the nearest district hospital.

If not immediately available, source and give as soon as possible.

When 7 days have lapsed since the initial rabies vaccination, RIG is no longer indicated as the vaccine induced immune response will be effective at that time.

Infiltrate as much as possible in and around the wound.

It is **no longer** recommended to inject the remainder of the calculated RIG dose at a site distant to the wound.

In the case of smaller wounds/areas where it is not possible to infiltrate the entire calculated dose, infiltrate as much as is anatomically feasible in and around the wound site/s without causing compartment syndrome.

In case of large and multiple wounds, RIG can be diluted with sodium chloride 0.9% solution if necessary to ensure infiltration of all wounds.

Follow with a complete course of vaccine.

- Human-derived rabies immunoglobulin (HRIG), IM 20 IU/kg (doctor prescribed). Infiltrate as much as possible in and around the wound.

OR

- Equine-derived rabies Immunoglobulin (ERIG), IM 40 IU/kg (doctor prescribed). Infiltrate as much as possible in and around the wound.
  Administer ERIG only in facilities where anaphylaxis or adverse reactions can be managed. (Refer to Section 21.2.10).

Product name	Max. dose	Description	Site of administration	Schedule
HRIG			Infiltrate up to the maximum calculated dose in and around the wound site/s. For smaller wounds where it is not possible to infiltrate all of the calculated dose, infiltrate as much as is anatomically feasible in and around the wound site/s.	On day 0 (when patient presents for first time)/ as soon as possible after exposure to be effective to neutralise virus. When RIG is not available it should be sourced as a matter of urgency. When 7 days have lapsed since initial rabies vaccination, RIG is no longer indicated.
Rabigam®	20 IU/kg	150 IU/mL (Supplied in 2 mL vial)		
KamRAB®	20 IU/kg	150 IU/mL (Supplied in 2, 5 and 10 mL vials).		
ERIG				
Equirab®	40 IU/kg	200 IU/mL (Supplied in 5 mL vial).		

Table 21.7: Summary of regimen for HRIG and ERIG
Source: NICD updated human rabies prophylaxis guideline.
www.nicd.ac.za

Rabies vaccination – doctor initiated:

Only indicated for direct animal contact.

Patients who have previously been fully immunised or who received PEP more than 3 months ago need only two doses: on Day 0 and Day 3.

Patients who have received previous PEP or PrEP within the previous 3 months do not require vaccination against rabies. Only wound treatment is required.

Children – Rabies vaccine, 1 amp, IM anterolateral thigh. Day 0 – single dose Day 3 – single dose Day 7 – single dose Between day 14-28 – single dose Adults – Rabies vaccine, 1 amp, IM deltoid. Day 0 – single dose Day 3 – single dose Day 7 – single dose Between day 14-28 – single dose **CAUTION** Do not administer rabies vaccine into buttocks (gluteus maximus).	Available from the nearest district hospital. Children – Rabies vaccine, 1 amp, IM anterolateral thigh (doctor initiated). Day 0 – single dose Day 3 – single dose Day 7 – single dose Between day 14-28 – single dose Adults – Rabies vaccine, 1 amp, IM deltoid (doctor initiated). Day 0 – single dose Day 3 – single dose Day 7 – single dose Between day 14-28 – single dose **CAUTION** Do not administer rabies vaccine into buttocks (gluteus maximus).

Antibiotic treatment in children - Amoxicillin/clavulanic acid: *Retained*
Dosing guidance on the use of amoxicillin/clavulanate as an 8 hourly regimen has been retained. The 14:1 amoxicillin/calvulanate BD suspension that is currently on tender is not registered for use for animal or human bites. The dose of clavulanate may not be sufficient to provide adequate anaerobe cover that is usually required for bites. The guidance will be reviewed once a more suitable BD suspension formulation is available on tender.

21.3.1.2 HUMAN BITES

Antibiotic treatment in children - Amoxicillin/clavulanic acid: *Retained*
See Section 21.3.1.1 animal bites above.

21.3.1.3 INSECT STINGS, SCORPION STINGS AND SPIDER BITES

Description: *editorial amendment*
Chlorphenamine, oral: *indication amended*
Chlorpheniramine, oral: *caution amended*
Paracetamol – dosing guidance: *amended*
The dose guidance for the use of paracetamol has been aligned to the PHC and AH Pain chapters.

Spiders and scorpions
An editorial amendment to the STG was proposed and supported as follows: 'Most are non-venomous or mildly venomous, but some may be extremely venomous resulting in neurotoxicity and constitute a medical emergency.'

The STG text was editorially amended accordingly for clarity purposes with specific guidance that oral antihistamines should only be used if there is severe itching. The caution against use in children less than 2 years of age was deleted to align with SAMF recommendations[40] and the updated PHC Chp 5 Skin (refer to NEMLC report 2020-23 Section 5.2). Updated STG text for medicine treatment follows on below:

Emergency treatment:
Treat anaphylaxis (bee/wasp stings). See Section 21.2.10: Anaphylaxis.
Local symptoms:
- Calamine lotion, apply when needed.

If severe itch:
Children
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 23.3.

~~**CAUTION**~~
~~Do not give an antihistamine to children < 2 years of age~~.

Adults

[40] South African Medicines Formulary 14th Ed.

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

AND

If there is a wide local response to insect bite with inflamed lesion, see Section 5.10.4: Papular urticaria.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 500mg -1 g 4–6 hourly when required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

Very painful scorpion stings:

- Lidocaine 2%, 2 mL injected around the bite as a local anaesthetic.
  - Local application of ice, if tolerated.

Cytotoxic lesions:

Avoid giving prophylactic antibiotics for bites and stings.

If secondary skin infection (site red, swollen, hot, tender, pus may be present), manage as cellulitis. See Section 5.4.3: Cellulitis.

Spider bites and scorpion stings:

Tetanus prophylaxis (Z23.5)

If not immunised within the last 5 years:

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

Contact information: *Added*

Contact information added as for snakebites as tabulated below:

For guidance on the identification and clinical management of snake/spider/scorpion bites, contact:
Poisons Information Helpline: 0861555777

For procurement of snake/spider/scorpion antivenom, contact:
South African Vaccine Producers (SAVP):
Telephone (011) 386 6062/6063/6078 (0ffice hours only) or
Email: Benita.mouton@nhls.ac.za
In the rare event that antivenom needs to be released/procured afterhours:
Tel 071 680 9897

21.3.1.4 SNAKEBITES

Venom in the eyes

Local anaesthetic, ophthalmic drops: *added as a therapeutic class*

Tetracaine 1%, ophthalmic drops: *retained as an example of class in the STG*

Oxybuprocaine 0.4%, ophthalmic drops: *added to the TI database as an example of class*

Aligned with the section 18.8: Surgical and diagnostic products of chapter 8: Eye conditions of the Adult Hospital Level STGs and EML, 2019 edition.

Antivenom

Antivenom: *criteria for administration amended*

The following STG text was accepted for deletion for correctness:

~~All patients with systemic signs and symptoms or severe spreading local tissue damage should receive antivenom.~~

Contact information: *Updated*

Contact information updated as tabulated below:

Amended from:

South African Vaccine Producers (SAVP):
Office hours: (011) 386 6062/6063/6078
After hours: (011) 386 6000 or 071 680 9897

Amended to:

For guidance on the identification and clinical management of snake/spider/scorpion bites, contact:
Poisons Information Helpline: 0861555777

For procurement of snake/spider/scorpion antivenom, contact:
South African Vaccine Producers (SAVP):
Telephone (011) 386 6062/6063/6078 (Office hours only) or
Email: Benita.mouton@nhls.ac.za
In the rare event that antivenom needs to be released/procured afterhours:
Tel 071 680 9897

21.3.2 BURNS

Pain

Paracetamol dosing – adults: *Amended*

The dose guidance for the use of paracetamol in adults has been aligned to the PHC and AH Pain chapters as tabulated below:

Amended from:

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  Maximum dose: 15 mg/kg/dose.

Maximum dose: 4 g in 24 hours

Amended to:

Adults

- Paracetamol, oral, 500mg -1 g 4–6 hourly when required (to a maximum of 4 g in 24 hours).
  Maximum dose: 15 mg/kg/dose.

Septic burns

Povidone iodine, topical: *retained*
Silver sulfadiazine, topical: *not added*
Mupirocin, topical: *not added*
Nano-crystalline dressings: *not added*
Melaleuca alternifolia, topical: *not added*

Refer to scoping review on the Knowledge Hub or included below for further detail.

PHC/ADULT HOSPITAL LEVEL EXPERT REVIEW COMMITTEE RECOMMENDATION:

Type of recommendation	We recommend against the option and for the alternative **(strong)**	We suggest not to use the option **(conditional)**	We suggest using either the option or the alternative **(conditional)**	We suggest using the option **(conditional)**	We recommend the option **(strong)**
		X			

Recommendation: Current standard of care in the STG to be retained – topical povidone iodine for infected burns.
Rationale: No new evidence could be identified for alternative treatment options for septic burns.
Level of Evidence: Low to very low certainty
Review indicator: New evidence sufficient to change the recommendation

NEMLC RECOMMENDATION (MEETING OF 23 JUNE 2022):

NEMLC accepted the review and proposed recommendation, but recommended that the PHC/Adult Hospital Level Committee consider reviewing other dressings for wounds, noting that this topic would be prioritised in the topic prioritisation project plan and may be reviewed in the next review cycle. Furthermore, it was noted that wound dressings are not funded from the Provincial Pharmaceutical budgets.

Monitoring and evaluation considerations

Research priorities

Referral – rehabilitation services: *Added*
In response to the request from RuRehab, the following statement has been added to the list of referral criteria:
"Consider rehabilitation services for reducing the risk of contractures and disfigurement."

21.3.3 EXPOSURE TO POISONOUS SUBSTANCES

Tricyclic poisoning
Sodium bicarbonate, parenteral: *not added*
The proposal to add guidance for tricyclic poisoning to the PHC STGs was not accepted as sodium bicarbonate is not listed on the PHC EML.
Level of Evidence: Expert opinion

Organophosphate and carbamate poisoning – atropinisation: *indication amended*
Atropinisation in this clinical setting should probably only be assessed by monitoring secretions in the chest with improvement of oxygenation. The STG text was amended, accordingly:

Reassess after 3–5 minutes for evidence of atropinisation as indicated by reduced bronchial secretions, ~~dry skin, increasing heart rate and blood pressure, and dilating pupils (note: pupil dilatation may be delayed)~~ improvement of oxygenation and decreased oxygen requirements.

Level of Evidence: Expert opinion

Atropine, IV: *directions for use not amended*
The proposal to include atropine infusion after atropinisation was not accepted for primary level of care. It was considered to be impractical to continuously administer large quantities of 80 x 0.5 mg atropine ampoules at primary level of care. However, it was reported that the emergency fraternity is currently querying the availability of IV atropine with SAHPRA.
Recommendation: Retain bolus dosing of atropine in the PHC STG, until such time that a SAHPRA-registered product is available for IV administration of atropine. However, IV infusion of atropine could be considered for inclusion in the Adult Hospital Level STGs and EML.
Level of Evidence: Expert opinion

Opioid overdose
Naloxone, IV: *directions for use amended*
Dosing of naloxone in children was simplified and aligned with the Paediatric Hospital Level STG and expert opinion. Sivilotti (2016)[41] mentions that naloxone for the reversal of respiratory depression, after adequate management of airway and breathing, should be used early in the resuscitation algorithm.
Level of Evidence: Expert opinion

Amended from:

- Naloxone, IV (preferable) or IM

Age and weight	Initial dose (IV/IM)	**Repeat dose:** Reassess every 2 minutes. If breathing still inadequate, give further naloxone every 2–3 minutes.
Children:		
< 5 years or ≤ 20 kg	– 0.1 mg/kg immediately (maximum 2 mg/dose)	Repeat 0.1mg/kg (maximum 2 mg/dose), up to total dose of 10 mg.
≥ 5 years or > 20 kg	– 0.4–2mg immediately	Repeat 0.1mg/kg (maximum 2mg/dose), up to total dose of 10 mg
Adults:		
Adults	– 0.4–2 mg immediately	Double the dose each time (e.g.: 0.8mg, 2mg, 4 mg), up to total dose of 10 mg.

  - Naloxone has a short duration of action (45 minutes) - continue to monitor closely as further doses of naloxone may be needed while awaiting and during transport.
  - In patients addicted to opioids, naloxone may precipitate an acute withdrawal syndrome after several hours. This must not prevent the use of naloxone.
  - Refer all patients

[41] Sivilotti ML. Flumazenil, naloxone and the 'coma cocktail'. Br J Clin Pharmacol. 2016 Mar;81(3):428-36. https://pubmed.ncbi.nlm.nih.gov/26469689/

Amended to:

- Naloxone, IV (preferable) or IM

	Initial dose (IV/IM)	Repeat dose: Reassess every 2 minutes. If breathing still inadequate, give further naloxone every 2–3 minutes.
Children	– 0.1 mg/kg immediately	Repeat 0.1 mg/kg (maximum 2 mg/dose), up to total dose of 10 mg.
Adults	– 0.4 mg immediately	Double the dose each time (e.g.: 0.8 mg, 2 mg, 4 mg), up to total dose of 10 mg.

- Naloxone has a short duration of action (45 minutes) - continue to monitor closely as further doses of naloxone may be needed while awaiting and during transport.
- In patients addicted to opioids, naloxone may precipitate an acute withdrawal syndrome after several hours. This must not prevent the use of naloxone.
- Refer all patients.

Paracetamol poisoning

N-acetylcysteine, oral: *dose not amended*

Oral dose of N-acetylcysteine was confirmed to be correct - NEMLC-approved in the previous review cycle of the Adult Hospital Level STGs and EML, 2019 – see NEMLC report below:

NEMLC report for the Adult Hospital Level Emergencies and injuries chapter (2017-9 review cycle):

N-acetylcysteine, oral: retained and dosing regimen added

Where parenteral formulation is unavailable, oral NAC recommended as a safe alternative where IV administration is not an option. Previous recommendation of oral NAC if IV formulation is unavailable has been expanded to include a dosing regimen, as follows:

If N-acetylcysteine, IV is unavailable:

- *N-acetylcysteine, oral, 140 mg/kg, followed by 70 mg/kg 4 hourly for seventeen doses.*

Note: Avoid giving activated charcoal if giving N-acetylcysteine orally as it will reduce the systemic absorption and thus negate the effect of oral N-acetylcysteine.

Level of Evidence: III Observational studies[42] [43] [44]

Recommendation: Guidance for oral NAC to be updated in the PHC STGs and EML.

Toxic alcohol (ethylene glycol and methanol) poisoning

Ethanol: *loading doses not added*

Guidance for alcohol and toxic alcohol poisoning was not considered appropriate for inclusion in the Primary Healthcare STG as management is complex and not pragmatic for primary level of care. However, a cross-referral could be made to the Adult hospital Level STGs and EML.

21.3.6.1 POST EXPOSURE PROPHYLAXIS, OCCUPATIONAL

PEP for healthcare workers following hepatitis B exposure

Hepatitis B Immunoglobulin: *amended*

Aligned with the National Clinical Guidelines of post-exposure prophylaxis (PEP) in occupational and non-occupational exposures, December 2020[45] - STG text was updated as follows:

Vaccination status and antibody response status of HCW	Source patient			
	Vaccination status	**HBsAg positive**	**HbsAg negative**	**HBsAg unknown**
	Unvaccinated or vaccination incomplete	• HBIG, IM, 500 units* • Hep B vaccine (3 doses at monthly intervals)	• Initiate Hep B vaccination (month 0, 1 and 6)	• HBIG, IM, 500 units* • Hep B vaccine (3 doses at monthly intervals)
	Vaccinated **AND** known to have HBsAb	No treatment	No treatment	No treatment

[42] Yarema MC, Johnson DW, Berlin RJ, Sivilotti ML, Nettel-Aguirre A, Brant RF, Spyker DA, Bailey B, Chalut D, Lee JS, Plint AC, Purssell RA, Rutledge T, Seviour CA, Stiell IG, Thompson M, Tyberg J, Dart RC, Rumack BH. Comparison of the 20-hour intravenous and 72-hour oral acetylcysteine protocols for the treatment of acute acetaminophen poisoning. Ann Emerg Med. 2009 Oct;54(4):606-14. https://www.ncbi.nlm.nih.gov/pubmed/19556028

[43] Williamson K, Wahl MS, Mycyk MB. Direct comparison of 20-hour IV, 36-hour oral, and 72-hour oral acetylcysteine for treatment of acute acetaminophen poisoning. Am J Ther. 2013 Jan;20(1):37-40. https://www.ncbi.nlm.nih.gov/pubmed/23299230

[44] Rumack and Bateman. Acetaminophen and acetylcysteine dose and duration: past, present and future. Clin Toxicol (Phila) 2012;50(2):91-98. https://www.ncbi.nlm.nih.gov/pubmed/22320209

[45] National Clinical Guidelines of post-exposure prophylaxis (PEP) in occupational and non-occupational exposures, December 2020. https://www.knowledgehub.org.za/elibrary/national-clinical-guidelines-post-exposure-prophylaxis-pep-occupational-and-non

	>10 units/mL#			
	Vaccinated **AND** HBsAb <10 units/mL or level unknown	• HBIG, IM, 500 units * • If HBIG <10 units/mL, repeat HBIG at 1 month • Repeat Hep B vaccine (3 doses at monthly intervals)	No treatment	• HBIG, IM, 500 units* • If HBIG <10 units/mL, repeat HBIG at 1 month • Repeat Hep B vaccine (3 doses at monthly intervals)

Delay in obtaining HBsAb results

Time period of delay: *amended*

Aligned with the National Clinical Guidelines of post-exposure prophylaxis (PEP) in occupational and non-occupational exposures, December 2020[46]- STG text was updated as follows:

If the delay in obtaining HBsAb results is more than ~~24 hours~~ 7 days initiate treatment as for vaccinated AND HBsAb < 10 units/mL.

21.3.6 POST EXPOSURE PROPHYLAXIS

21.3.6.1 POST EXPOSURE PROPHYLAXIS, OCCUPATIONAL

General measures: *Editorial amendment*

An editorial amendment was made as follows for improved clarity:

Where the source patient is on ARVs or has been on ARVs, initiate prophylaxis and seek expert opinion. An extra blood sample (unclotted, EDTA) of the source patient should be stored in case of need for further ~~viral~~ resistance testing.

Adverse effects of PEP: *Guidance amended*

Guidance on when consultation with a virologist or infectious disease specialist is recommended, has been amended as tabulated below:

Amended from:

Note: Adverse effects of PEP:

» PEP is generally not well tolerated. Adverse effects occur in about half of cases and therapy is discontinued in about a third. Efavirenz is not recommended as it is very poorly tolerated in PEP.

TDF is contra-indicated in renal disease or with concomitant use of nephrotoxic medicines, e.g. aminoglycosides (check baseline creatinine clearance). Where TDF is contraindicated, switch to AZT. If AZT is not tolerated, consult or refer for further management.

» Zidovudine often causes nausea and headache and so should only be given if TDF is contraindicated.

If dolutegravir is not tolerated, give ATV/r as the first choice protease inhibitor as LPV/r frequently causes gastrointestinal side effects. ATV/r may commonly cause jaundice (i.e. unconjugated hyperbilirubinaemia without hepatitis) which is harmless.

When the source patient is known to be on a failing ART regimen, modify the PEP regimen

- If the patient is on AZT or stavudine then TDF should be used.
- If the patient is on TDF then AZT should be used.
- If the patient is on efavirenz or nevirapine then ATV/r or LPV/r should be used.

Patients on a failing second line ART regimen almost always have no resistance to protease inhibitors, so ATV/r or LPV/r should still be effective.
Consultation with a virologist or infectious diseases physician is recommended for advice on which antiretroviral medicines to use for PEP.

Amended to:

Note: Adverse effects of PEP:

» PEP is generally not well tolerated. Adverse effects occur in about half of cases and therapy is discontinued in about a third. Efavirenz is not recommended as it is very poorly tolerated in PEP.

» TDF is contra-indicated in renal disease or with concomitant use of nephrotoxic medicines, e.g. aminoglycosides (check baseline creatinine clearance). Where TDF is contraindicated, switch to AZT. If AZT is not tolerated, consult or refer for further management.

» Zidovudine often causes nausea and headache and so should only be given if TDF is contraindicated.

» If dolutegravir is not tolerated, give ATV/r as the first choice protease inhibitor as LPV/r frequently causes gastrointestinal side effects. ATV/r may commonly cause jaundice (i.e. unconjugated hyperbilirubinaemia without hepatitis) which is harmless.

» If the source patient is known to be on a failing ART regimen, modification of the PEP regimen may be required. Consultation with a virologist or infectious diseases physician is recommended for advice on which antiretroviral medicines to use for PEP

[46] National Clinical Guidelines of post-exposure prophylaxis (PEP) in occupational and non-occupational exposures, December 2020. https://www.knowledgehub.org.za/elibrary/national-clinical-guidelines-post-exposure-prophylaxis-pep-occupational-and-non

» If the patient is on AZT or stavudine then TDF should be used.

» Patients on a failing second line ART regimen almost always have no resistance to protease inhibitors, so ATV/r or LPV/r should still be effective.

21.3.6.2 POST EXPOSURE PROPHYLAXIS, RAPE AND SEXUAL ASSAULT

HIV PEP – guidance for children: *Amended*

Guidance on the use of PEP in children has been amended to include a dolutegravir based regimen in line with the South African HIV Clinicians Society Guidelines for PEP[47] as tabulated below:

Amended from:

Children

- Zidovudine (AZT), oral, 12 hourly for 28 days.
  Paediatric dose: 180–240 mg/m2. See dosing table, pg 23.9.
  Maximum: 300 mg/dose.

AND

- Lamivudine (3TC), oral, 4 mg/kg 12 hourly or 8mg/kg daily for 28 days.
  Maximum: 150 mg/dose if given 12 hourly or 300 mg/dose if given daily. See dosing table, pg 23.6.

AND

- Lopinavir/ritonavir (LPV/r), oral 12 hourly for 28 days.
  Paediatric dose: 300/75mg/m2. See dosing table, pg 23.7.
  Maximum: 400/100 mg/dose.

Dosages may vary by±1 mg/kg/dose, to allow a convenient volume of medication.
Use the adult dosage regimen if children require more than the maximum dose.
Follow-up visits should be at 2 weeks, 6 weeks, and 4 months after the rape.

Adults

Management for HIV prevention is the same as for occupational HIV exposure. See section 21.3.6.1 Post-exposure prophylaxis, occupational.

Amended to:

Children <10 years and < 30kg

- Zidovudine (AZT), oral, 12 hourly for 28 days.
  Paediatric dose: 180–240 mg/m2. See Section 23: Standard Paediatric dosing tables.
  Maximum: 300 mg/dose.

AND

- Lamivudine (3TC), oral, 4 mg/kg 12 hourly or 8mg/kg daily for 28 days.
  Maximum: 150 mg/dose if given 12 hourly or 300 mg/dose if given daily. See Section 23: Standard Paediatric dosing tables.

AND

- Dolutegravir (DTG), oral, for 28 days.
  For dosing guidance, see Section 23: Standard Paediatric dosing tables.

Dosages may vary by±1 mg/kg/dose, to allow a convenient volume of medication.
Use the adult dosage regimen if children require more than the maximum dose.
Follow-up visits should be at 2 weeks, 6 weeks, and 4 months after the rape.

Adults and children ≥ 10 years and ≥ 30 kg

Management for HIV prevention is the same as for occupational HIV exposure. See section 21.3.6.1 Post-exposure prophylaxis, occupational.

HIV PrEP: *added as a cross reference to the PHC STGs and EML*

For patients at ongoing high risk of HIV acquisition, guidance was provided to transition from PEP to PrEP as follows:

HIV PrEP

If patient is at ongoing high risk of HIV acquisition, commence PrEP after PEP has been completed.
Perform HIV test 4-weeks after initiating PrEP.

[47] Horak J, Venter WDF, Wattrus C, Papavarnavas N, Howell P, Sorour G, Wallis C, Gill K, Conradie F, Bekker LG. Southern African HIV Clinicians Society 2023 Guideline for post-exposure prophylaxis: Updated recommendations. South Afr J HIV Med. 2023 Sep 28;24(1):1522. doi: 10.4102/sajhivmed.v24i1.1522. PMID: 37795431; PMCID: PMC10546897.

Emergency contraception
Copper IUCD: *added (as first line option)*
Levonorgestrel, oral: *retained (as 2nd line option)*

Copper IUCD placed as the first line option as this agent has less drug-drug interactions compared to oral levonorgestrel 1.5mg and is the agent of choice for obese women. Copper IUCD can also be used as a long-acting reversible contraceptive.[48] [49]

Emergency contraception for obese women
Levonorgestrel, oral: *dose not amended*
An external comment was received that there is no need to double the dose of levonorgestrel for obese women for emergency contraception. Limited data suggests that obese women have an increased risk of pregnancy after use of levonorgestrel and ulipristal acetate emergency contraception compared to those who are not obese.[50] In a pharmacokinetic study with 10 participants, levonorgestrol Cmax in obese participants was half that achieved in participants with normal BMI, and doubling the levonorgestrol dose in obese participants resulted in a similar Cmax to that seen in those with normal BMI[51]. Faculty of Sexual & Reproductive Healthcare (FSRH) Overweight, Obesity and Contraception Guidelines of April 2019, therefore recommends "double-dose (3 mg) of levonorgestrel emergency contraception, if BMI >26 kg/m2 or weight >70 kg". However, the effectiveness of double-dosing in preventing pregnancy is unknown.[52] In a randomised pharmacodynamic study with 70 obese participants, doubling the levonorgestrol dose did not result in improved inhibition of ovulation: proportion of women with no follicle rupture within 5 days of levonorgestrol administration was similar with standard and double dosing.[53] This suggests that doubling the dose may not be sufficient to improve the efficacy of oral levonorgestrol in obese women, although this study did not directly explore the effect of double dosing on subsequent rates of pregnancy. Therefore, until new evidence emerges the recommendation of double-dosing of levonorgestrel amongst obese/overweight women will be retained, aligned with Guidelines. Available evidence also suggests that the effectiveness of the copper IUCD is not affected by body weight or BMI. The copper IUCD is therefore the preferred method for emergency contraception in the obese.[54]
Level of Evidence: Guidelines

The caution box in the STG was amended as follows:

CAUTION
Emergency contraceptive tablets must be taken as soon as possible, preferably within 72 hours of unprotected intercourse, and not later than 5 days.
Enzyme inducers (including efavirenz and carbamazepine) cause a significant reduction in levonorgestrel concentrations.
Women on these medicines should preferably have copper IUCD inserted **or** alternatively double the dose of levonorgestrel.
Women > 80 kg or BMI ≥ 30 should also preferably have copper IUCD inserted **or** alternatively double the dose of levonorgestrel.

STI prophylaxis for pregnant women
Ceftriaxone, IM: *retained*
Azithromycin, oral: *retained*
Metronidazole, oral: *retained*
Cefixime, oral: *not added*

[48] FSRH Guideline (April 2019) Overweight, Obesity and Contraception. BMJ Sex Reprod Health. 2019 Apr;45(Suppl 2):1-69. https://pubmed.ncbi.nlm.nih.gov/31053605/
[49] Turok DK, Jacobson JC, Dermish AI, Simonsen SE, Gurtcheff S, McFadden M, Murphy PA. Emergency contraception with a copper IUD or oral levonorgestrel: an observational study of 1-year pregnancy rates. Contraception. 2014 Mar;89(3):222-8. https://pubmed.ncbi.nlm.nih.gov/24332433/
[50] Jatlaoui TC and Curtis KM. Safety and effectiveness data for emergency contraceptive pills among women with obesity: a systematic review. Contraception 94 (2016) 605–611. https://www.ncbi.nlm.nih.gov/pubmed/27234874
[51] Edelman AB, Cherala G, Blue SW, Erikson DW, Jensen JT. Impact of obesity on the pharmacokinetics of levonorgestrel-based emergency contraception: single and double dosing. Contraception. 2016 Jul;94(1):52-7. https://pubmed.ncbi.nlm.nih.gov/27000996/
[52] FSRH Guideline (April 2019) Overweight, Obesity and Contraception. BMJ Sex Reprod Health. 2019 Apr;45(Suppl 2):1-69. https://pubmed.ncbi.nlm.nih.gov/31053605/
[53] Edelman, Alison B. MD, MPH; Hennebold, Jon D. PhD; Bond, Kise PSM; Lim, Jeong Y. PhD; Cherala, Ganesh PhD; Archer, David F. MD; Jensen, Jeffrey T. MD, MPH Double Dosing Levonorgestrel-Based Emergency Contraception for Individuals With Obesity, Obstetrics & Gynecology: June 9, 2022 - Volume - Issue - 10.1097/AOG.0000000000004717 doi: 10.1097/AOG.0000000000004717
[54] Turok DK, Jacobson JC, Dermish AI, Simonsen SE, Gurtcheff S, McFadden M, Murphy PA. Emergency contraception with a copper IUD or oral levonorgestrel: an observational study of 1-year pregnancy rates. Contraception. 2014 Mar;89(3):222-8. https://pubmed.ncbi.nlm.nih.gov/24332433/

Erythromycin, oral: *not added*
Spectinomycin, parenteral: *not added*
STI prophylaxis for pregnant women is the same as for non-pregnant women, aligned with the PHC STI chapter, Section 12.1.2: Sexually active women. It is noted that the NDoH PEP Guidelines[55] has outdated recommendations (cefixime, erythromycin and spectinomycin) which will be communicated to the relevant NDoH Program.

21.3.7 SOFT TISSUE INJURIES

Paracetamol dosing – adults: *Amended*
The dose guidance for the use of paracetamol has been aligned to the PHC and AH Pain chapters and as detailed under Section 21.3.2 burn above.

Referral for patients with haemophilia: *Not added*
External comment received from RuRehab to refer persons with haemophilia for rehabilitation was not supported as these patients are usually under the care of specialised haemophilia centres with responsibility for directing further referrals accordingly. EML guidance of the management of haemophilia is included in the AH Chp 2: BBFO.

21.3.8 SPRAINS AND STRAINS

Paracetamol dosing – adults: *Amended*
The dose guidance for the use of paracetamol has been aligned to the PHC and AH Pain chapters and as detailed under Section 21.3.2 burn above.

Referral – rehabilitation services: *Added*
In response to the request from RuRehab, the following statement has been added to the list of referral criteria: *"Consider rehabilitation services for sprains, strains, and overuse injuries to improve joint stability and assist with pain management."*

[55] National Department of Health. National Clinical Guidelines of post-exposure prophylaxis (PEP) in occupational and non-occupational exposures, December 2020. https://www.knowledgehub.org.za/elibrary/national-clinical-guidelines-post-exposure-prophylaxis-pep-occupational-and-non