



Western Cape
Government

Health



The South African Triage Scale (SATS)



Training manual 2012

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Dr Baljit Cheema and Dr Michèle Twomey

On behalf of the Paediatric Triage Working Group and the South African Triage Group

Paediatric Triage Working Group

Anthony Westwood
Baljit Cheema
Heloise Buys
Jean Augustyn
Heather Tuffin
Michael Lee
Andrew Argent
Shaheem de Vries
Lee Wallis
Zanele Nxumalo
Louise Cooke
Peter Lesch
Majedah Ismail
Liesl Strauss
Angela de Sá
Jaco Slabbert
Wendy Rosenthal
Michèle Twomey

ETAT-SA Working Group

Lesley Bamford
Gerry Boon
Heloise Buys
Baljit Cheema
Sue Harris
Mark Patrick
Cindy Stephen
Chris Sutton



Western Cape Government

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1 INTRODUCTION

Learning Objectives:

- Understand the purpose of triage and the benefits of implementing the SATS
- Be familiar with the requirements for standardised triage implementation
- Understand the terminology and key concepts around triage

A nine-month old baby boy is carried into the children's section of the outpatient department in his mother's arms. He appears to be asleep. At the triage desk he is seen by a nurse and found to have lips and tongue that are grey/blue in colour, and he is taken straight into the resuscitation room as an emergency.

In the resuscitation room he is given oxygen at 15 litres/minute by face mask with a non-rebreather reservoir bag. He is noted to be grunting and breathing very fast. His hands are cold to touch and the capillary refill time is prolonged to four seconds. An intravenous cannula is placed. A blood sample is taken at the same time for blood glucose, full blood count and blood culture. An intravenous infusion of normal saline is commenced at 20ml/kg to run as fast as it can go.

Other treatments are given, depending on the result of the investigations and the response to the treatment he receives. It is now 18 minutes since the baby came through the outpatient department's door, and his situation is stable. It is now time to take a full history and carry out a full examination to make a definitive diagnosis. He is diagnosed as having very severe pneumonia, and receives specific treatment for this. However, before coming to this diagnosis, no time was wasted, his status was stabilized, based on a few leading signs and symptoms, even when the medical staff did not know exactly what was wrong with him.

This was good triage and emergency management. Would it have happened like this in your hospital? In this training course, you are going to acquire the necessary knowledge for the correct triage of sick children and adults.

Many deaths in hospital occur within 24 hours of admission. Some of these deaths can be prevented if very sick patients (especially children) are quickly identified on their arrival and treatment is started without delay. In many hospitals around the world, children are not checked before a senior health worker examines them; as a result, some seriously ill patients have to wait a very long time before they are seen and treated. Children are known to have died of a treatable condition when waiting in the queue for their turn. The idea of triage is to prevent this from happening.

The purpose of triage is to prioritise patients based on medical urgency in contexts where there is a mismatch between demand and capacity (i.e. patient load overwhelms the available resources).

1.1 The benefits of implementing SATS

1. expedite the delivery of time-critical treatment for patients with life-threatening conditions.
2. ensure that all patients are appropriately prioritised according to their medical urgency.
3. improve patient flow.
4. improve patient satisfaction.
5. decrease the patient's overall length of stay.
6. facilitate streaming of less urgent patients.
7. provide a user-friendly tool for all levels of health care professionals.

By introducing the SATS at a public urban hospital in Cape Town, mean waiting times were reduced significantly for all priority levels except the non-urgent green category. The most dramatic reduction in waiting times was seen in patients coded as red (82%).¹

1.2 Triage requirements

Triage is simple to do, but in order to standardise the process and comprehensively implement the SATS as a validated tool certain requirements need to be met. Table 1 shows the equipment needed for the process and Appendix A on page 4 includes a detailed checklist of requirements.

Location	Equipment	Additional equipment
Privacy: Screen, partition or separate room.	Gloves, face masks & other barrier protective devices	Pulse oximeter with paediatric probes
Safety: Security/protected	Wall clock	ECG
Size of area: pushchairs, wheelchairs, stretchers	Low reading electronic/mercury thermometer	Finger prick machine, haemoglobin and glucometer measurement
Accessibility	Vital signs monitor OR baumanometer with paediatric cuffs	Urine collection containers, urine dipsticks & urine pregnancy tests
Baby-changing facilities	Dry dressings/ bandages	

Table 1: Requirements for adequate / efficient triage

1.3 Who should be the triage provider?

Nurse-based triage has been successfully implemented worldwide in the countries of North America, Europe, the Middle East and Australasia since the development of Emergency Medicine as a speciality about 30 years ago. Table 2 shows the number of medical practitioners and nurses per unit of population in South Africa, compared to some "developed" countries. Given the significantly lower doctor: nurse ratio in South Africa compared to countries where nurse triage is widely practiced, it is apparent that the development of nurse-based triage should be a priority in our setting.




Country	Rate per 100,000 population/ year		
	Doctors	Nurses	Doctor: Nurse ratio
South Africa	56.3	471.2	1 : 8.0
Canada	229	897	1 : 4.0
Australia	240	830	1 : 3.4
Israel	385	613	1 : 1.6
UK	164	479	1 : 3.0

Table 2: Doctor and nurse rates per 100,000 population per annum for selected countries

Nurses are the first medical contact for the patients attending the Emergency Centre in most instances. In South African studies, adequately trained Enrolled Nursing Assistants (ENAs) have been shown to be accurate to a degree comparable with international standards of nursing triage.^{2,3}

The South African Triage Scale should be known and applied by all health care professionals involved in the Emergency Centre. The triage provider can be the medical officer, the registered nurse, enrolled nurse or the ENA. The purpose of this training program is to empower the individual who participates with the knowledge to triage. It will only be through practice and repetition that a provider will become skilled with triage. Successful providers are therefore encouraged to participate in triaging as frequently as possible in order to stay in practice and up to date.

1.4 Terminology and key concepts

- Triage**, from the French word "trier", literally means: "to sort". The aim is to bring "the greatest good to the greatest number of people" – this is achieved through prioritising limited resources to achieve the greatest possible benefit. Patients are sorted with a scientific triage scale in order of urgency - the end result is that the patient with the greatest need is helped first.
- Patient to triage**: for the hospital or clinic context this refers to a patient that appears relatively stable and is able to mobilise him/herself to the designated triage area. This will be the type of triage used for most hospital and clinic cases.
- Triage to patient**: here the patient is usually unstable. The patient is unable to mobilise him/herself to the designated triage area and will need to be triaged where they are found. They may need to be referred directly to the resuscitation (resus) area if they are at a health facility. Triage may also be performed at the bedside and documented in retrospect. This type of triage will be used less often in the hospital context and predominantly in the pre-hospital context.
- Physiology** (i.e. vital signs): refers to the normal functioning of the different body systems. Some of the physiology can be readily measured (e.g. pulse, blood pressure, respiratory rate, temperature).
- TEWS: Triage Early Warning Score**. This is a composite score of the patient's physiology. The score is derived by assigning a number between 0 and 2 for each of the patient's vital signs. The higher the score the greater the urgency.
- Streaming**: the use of dedicated healthcare resources for each priority group of patients. For green patients, this may be a doctor or nurse practitioner; this person needs their own space to see these patients.
- Pain**: Severe pain is unbearable, the worst pain the patient has ever felt. It may be associated with sweatiness, paleness, and altered level of consciousness. Moderate pain is intense, but bearable. Mild pain is any other pain. Remember to do a pain assessment on every patient that you see.
-  **Additional Investigation**: You will find this exclamation icon in later chapters. It represents an additional investigation which may lead to a change in the patient's triage priority level. Checking the blood glucose concentration or measuring the oxygen saturation level are examples of additional investigations. Section six outlines all key additional investigations important at triage. They can also be found on the SATS charts.
-  **Warning**: The lightbulb icon indicates a warning that usually follows immediately after an additional investigation, implying that some immediate action is required (e.g. a child whose oxygen saturation levels are found to be 80% requires oxygen administration and should be taken to the resuscitation area).
-  **Additional tasks**: The icon with a red cross represents additional tasks that are beneficial to the patient if initiated at triage. These additional tasks do not change the patient's triage priority level. Examples include starting oral rehydration therapy for a child that is dehydrated, cooling a burn that occurred within 3 hours or applying direct pressure to an uncontrolled haemorrhage.

APPENDIX A: Checklist of triage emergency centre requirements

Structural Requirements			
Does the triage area meet the following criteria:		Yes	No
1	Is the triage area a dedicated space?		
2	Is the triage area well signed?		
3	Is the triage area secure (i.e. behind the security gate, or in easy view of security staff)?		
4	Is the triage area at least 10 square meters in size (i.e. should be able to accommodate a nurse, patient in a wheelchair and relative or carer)?		

Checklist of triage Infrastructure Requirements

Content Requirements			
Does the triage area contain the following:		Yes	No
1	A desk and chair?		
2	Triage paperwork for adult, children and infants?		
3	A wall clock with a second hand?		
4	A stethoscope?		
5	A low reading thermometer?		
6	Dry dressings and bandages?		
7	Gloves?		
8	Sphygmomanometer (manual, digital or electronic)?		
9	Blood glucose monitor?		
10	A measuring tape OR marks displayed on wall in triage area to measure children (i.e one mark at 95cm and one at 150 cm)?		
11	2 x different SATS posters prominently displayed in triage area?		
12	SATS manual readily available for triage office as a source of info?		
13	SATS patient info leaflet prominently displayed in the waiting area?		
14	Triage register or computer with register?		
15	White board to track and communicate to other staff acuity of those triaged?		

Assessment Questions

Clearly indicate whether the following statements are true or false:

- The purpose of triage is to prevent deterioration or death of a patient while waiting in the queue for their turn.
 True False
- The triage method should be known and applied by clinical nurse practitioners only.
 True False
- Streaming is the process of getting patients to wait for as long as possible.
 True False

Choose the correct answer:

- The benefits of triage are:
 - To facilitate streaming of green patients
 - To decrease the waiting time of life-threatening conditions
 - To ensure that patients are appropriately prioritized by urgency
 - To prevent children from dying in the waiting room
 - All of the above
- TEWS is short for:
 - Triage Early Warning System
 - Trauma Early Warning Scale
 - Triage Emergency Warning System
 - Triage Early Warning Score
 - Trauma Emergency Waiting Score

2 THE SATS PROCESS FLOWCHART

Learning Objectives:

- Understand the five step approach and SATS process flowchart
- Be familiar with the two versions of the SATS chart
- Be familiar with the priority levels of SATS

2.1 The five step approach



Figure 1: SATS five step approach

The process of triage starts with a question to the mother/carer/patient as to the reason for coming to the emergency centre. As this question is being asked and answered the triage process already commences with the triage practitioner rapidly assessing the patient for any **Emergency clinical signs**. The Airway, Breathing, Circulation, Coma, Convulsion, Dehydration, Other (ABC-c-c-DO) approach is used for paediatric patients. If emergency clinical signs are found, the patient is assigned a Red priority level and taken straight to the resuscitation area without delay.

If no Emergency clinical signs are present then check for any **Very Urgent** or **Urgent** clinical signs. Whether these are present or not, vital signs are measured, the TEWS is calculated, key additional investigations are checked and the triage priority adjusted as shown in Figure 2.

It is important to note that if a patient has any emergency signs then a TEWS does NOT need to be calculated at triage. There should be no delay in taking the patient to the resuscitation area.

Finally the senior healthcare professional's (SHCP) discretion as seen in Figure 2, allows the clinical nurse practitioner or senior doctor to override the final triage priority assigned.

2.2 The SATS process flowchart

There are two versions of the SATS chart as seen in Figure 4 and 5. The paediatric version of the SATS chart is used to triage all patients younger than 12 years and smaller than 150 cm. The adult version of the SATS chart is used to triage patients older than 12 years or taller than 150 cm.

Both age specific versions have the exact same SATS process flowchart as depicted in Figure 2. The five steps in Figure 1 are integrated into this process flowchart. The differences are found in their respective clinical signs and their age appropriate TEWS. The next two sections describe in detail the adult and paediatric clinical signs respectively.

2.3 SATS priority levels

The South African Triage Scale has four priority levels as shown in Table 3. Each priority level should ideally be managed within the target time to treatment.

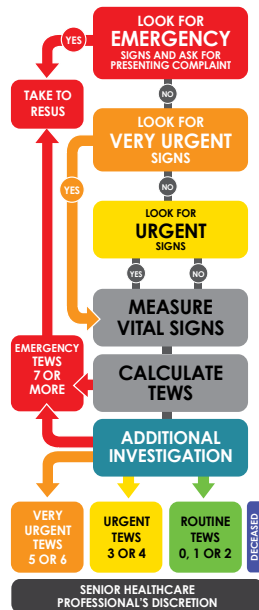


Figure 2: The SATS process flowchart

2.4 Terminology and key concepts

1. **Red vs Resus:** Patients may be triaged Red on the basis of their presentation, but not necessarily be a full resuscitation case. Conversely, if a patient presents to you as a resus you do not need a triage tool to tell you that they are a Red case. For those patients who present like this (e.g Cardiac arrest), triage before treatment is not necessary – if a patient is a resus, they are Red by definition.
2. **Majors vs Minors:** The majors area in a hospital is staffed by appropriately trained personnel and advanced equipment to deal with emergency, very urgent and urgent patients. The minors area is staffed by appropriately trained personnel and the respective equipment and resources to deal with routine or non-urgent patients.

Priority COLOUR	Target time	Management
RED	IMMEDIATE	Take to the resuscitation room for emergency management
ORANGE	< 10 mins	Refer to majors for very urgent management
YELLOW	< 1 hour	Refer to majors for urgent management
GREEN	< 4 hours	Refer to designated area for non-urgent cases
BLUE	< 2 hours	Refer to doctor for certification

Table 3: SATS priority levels and target times to be seen with-in

Assessment Questions

Clearly indicate whether the following statements are true or false:

1. There are two SATS charts – one for paediatric patients and one for adult patients.

True False
2. If an emergency sign is identified in the first step, the patient is taken to the resuscitation area immediately.

True False
3. If no emergency signs are identified in step one, but an urgent sign is identified in step two, the patient is immediately triaged yellow and asked to wait.

True False

Choose the correct answer:

4. The SATS priority level Orange is defined as:
 - (a) Emergency requiring immediate intervention
 - (b) Very Urgent requiring intervention within 10 minutes
 - (c) Urgent requires intervention within 60 minutes
 - (d) Routine requiring intervention within 240 minutes
 - (e) Life threatening but not requiring any intervention
5. The senior healthcare professional's discretion refers to:
 - (a) The junior nurse overriding the final triage decision
 - (b) The clinical nurse practitioner overriding the final triage decision
 - (c) The medical student overriding the final triage decision
 - (d) The medical officer overriding the final triage decision
 - (e) b and d above

LOOK FOR EMERGENCY SIGNS AND ASK FOR PRESENTING COMPLAINT

YES

TAKE TO RESUS

NO

LOOK FOR VERY URGENT SIGNS

YES

LOOK FOR URGENT SIGNS

YES

MEASURE VITAL SIGNS

EMERGENCY TEWS 7 OR MORE

NO

CALCULATE TEWS

ADDITIONAL INVESTIGATION

VERY URGENT TEWS 5 OR 6

URGENT TEWS 3 OR 4

ROUTINE TEWS 0, 1 OR 2

DECEASED

SENIOR HEALTHCARE PROFESSIONAL'S DISCRETION

EMERGENCY

- Obstructed Airway - not breathing
- Seizure - current
- Burn - facial / inhalation
- Hypoglycaemia - glucose less than 3
- Cardiac arrest

VERY URGENT

- High energy transfer (severe mechanism of injury)
- Shortness of breath - acute
- Level of consciousness reduced / confused
- Coughing blood
- Chest pain
- Stabbed neck
- Haemorrhage - uncontrolled (arterial bleed)
- Seizure - post ictal
- Focal neurology - acute (stroke)
- Aggression
- Threatened limb
- Eye injury
- Dislocation of larger joint (not finger or toe)
- Fracture - compound (with a break in skin)
- Burn over 20%
- Burn - electrical
- Burn - circumferential
- Burn - chemical
- Poisoning / Overdose
- Diabetic - glucose over 11 & ketonuria
- Vomiting fresh blood
- Pregnancy and abdominal trauma
- Pregnancy and abdominal pain
- Severe pain

URGENT

- Haemorrhage - controlled
- Dislocation of finger OR toe
- Fracture - closed (no break in skin)
- Burn - other
- Abdominal pain
- Diabetic - glucose over 17 (no ketonuria)
- Vomiting persistently
- Pregnancy and trauma
- Pregnancy and PV bleed
- Moderate pain

ADULT TEWS

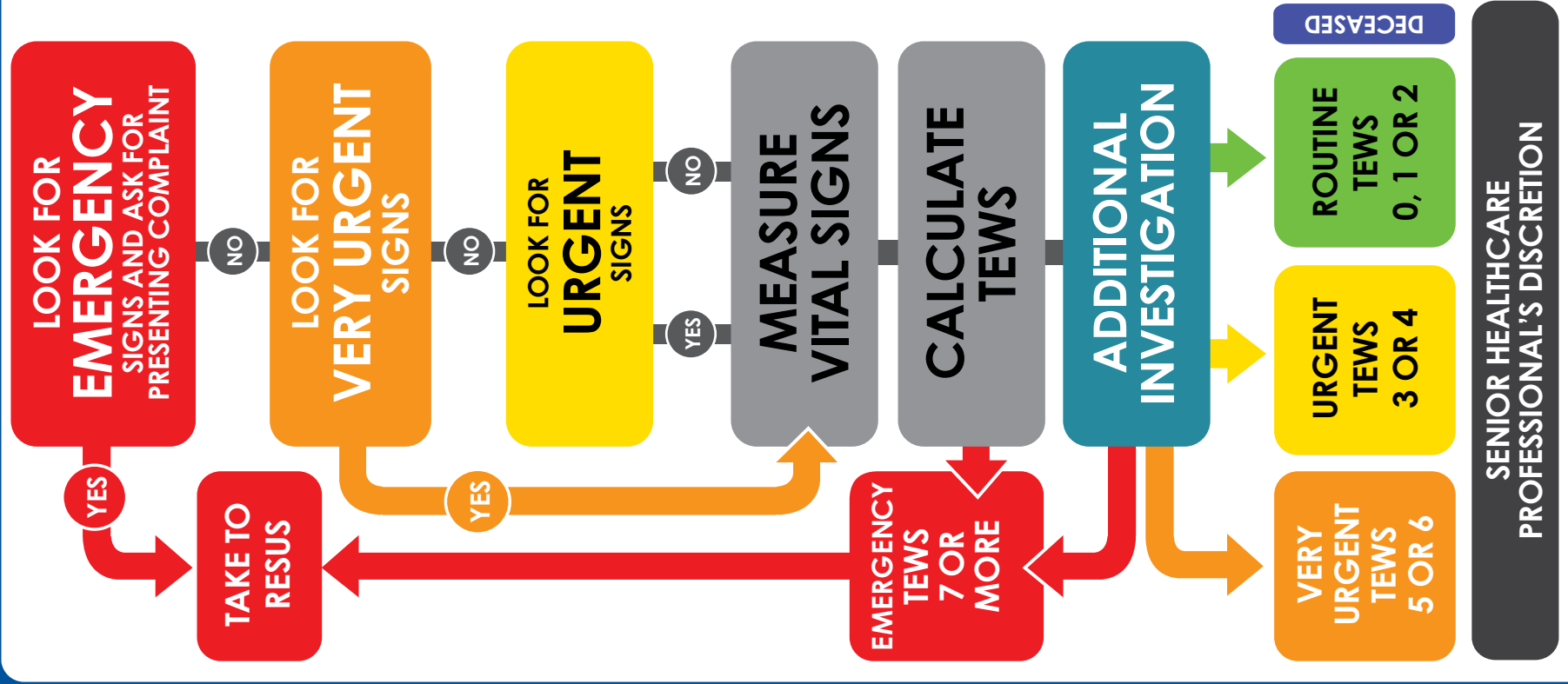
Older than 12 years / taller than 150 cm tall

Mobility	3	2	1	0	1	2	3
				Working	With Help	Stretcher/Immobile	
RR	less than 9	9 - 14	15 - 20	21 - 29	more than 29		
HR	less than 41	41 - 50	51 - 100	101 - 110	111 - 129	more than 129	
SBP	Less than 71	71 - 80	81 - 100	101 - 199	more than 199		
Temp		Cold OR Under 35°		35° - 38.4°	Hot OR Over 38.4°		
AVPU		Confused		Alert	Reacts to Voice	Reacts to Pain	Unresponsive
Trauma				NO	Yes		

CHECK FOR ADDITIONAL INVESTIGATIONS

- If RR scores 1 point or more on TEWS: Check SpO₂ and hand over to SHCP to give O₂; Do a finger prick glucose test if patient is diabetic.
- Reduced level of consciousness (not alert including confused): Do a finger prick glucose test and hand over to SHCP.
- Diabetes and Hyperglycaemia (glucose 11 mmol/L or more): Urine dipstick to check for ketones.
- Unable to sit up/ need to lie down: Do a finger prick glucose test and hand over to SHCP.
- Chest pain: Immediate ECG and hand over to SHCP.
- Active seizure / fitting: Do a finger prick glucose test and hand over to SHCP; IV access - NO intramuscular.
- History of diabetes: Do a finger prick glucose test and hand over to SHCP.
- Hyperglycaemia (glucose 3 mmol/L or less): Move to resus hand over to SHCP and give something to eat or drink.
- Abdominal pain or backache: female: Urine dipsticks and Urine pregnancy test.

Figure 4: Adult SATS chart



EMERGENCY						
A irway and B reathing	Not breathing or reported apnoea Obstructed breathing Central cyanosis or SpO ₂ less than 92% Respiratory distress (severe)					
C irculation	Cold hands +2 or more of the following: • pulse weak and fast • capillary refill time > 3 sec or more • lethargic Uncontrolled bleeding (not nose bleed)					
C onvulsions	Convulsing or immediately post-ictal and not alert					
C oma	AVPU: Responds only to Pain (P) OR Unresponsive (U) Confusion					
D ehydration	Diarrhoea +2 or more of the following: • lethargy / floppy infant • Very sunken eyes • Skin pinch very slow - 2 sec or more					
O ther	Facial / inhalation burn Hypoglycaemia recorded at any time Glucose less than 3 mmol/L Purpuric rash					
VERY URGENT						
Tiny baby - younger than 2 months	Some respiratory distress					
Incoltable crying / severe pain	Diarrhoea and vomiting +1 or more of the following: • sunken eyes • restless / irritable • increased urine output • dry mouth • crying without tears • skin pinch slow - less than 2 sec					
Presenting complaint - more sleepy than normal	Unable to drink / feed OR vomits everything					
Poisoning or overdose	Main nutrition (visible severe wasting)					
Focal neurology acute	Main nutrition Oedema (pitting oedema of BOTH feet)					
Severe mechanism of injury	Unwell child with known diabetes					
Burns 10% or more (Thermal, electrical, Chemical)	Any other burn less than 10%					
Eye injury	Closed fracture					
Fracture - open or threatened limb	Dislocation of larger joint (not finger or toe)					
Dislocation of larger joint (not finger or toe)						
YOUNGER CHILD TEWS						
3 to 12 YEARS OLD / SMALLER THAN 95 cm						
3	2	1	0	1	2	3
Mobility			Normal for age		Unable to move as normal	
RR	less than 20	20 - 25	26 - 39		40 - 49	50 or more
HR	less than 70	70 - 79	80 - 130		131 - 159	160 or more
Temp	Feels Cold Under 35°				Feels Hot 38.4° - 39.4°	
AVPU			Alert		Reacts to Voice	Unresponsive
Trauma			No	Yes		Pain
OLDER CHILD TEWS						
3 to 12 YEARS OLD / 95 to 150 cm tall						
3	2	1	0	1	2	3
Mobility			Normal for age		Unable to walk as normal	
RR	less than 15	15 - 16	17 - 21		22 - 26	27 or more
HR	less than 60	60 - 79	80 - 99		100 - 129	130 or more
Temp	Feels Cold Under 35°		Feels Hot Over 38.4°		Feels Hot Over 38.4°	
AVPU			Alert		Reacts to Voice	Unresponsive
Trauma			No	Yes		Pain
CHECK FOR ADDITIONAL INVESTIGATIONS						
If RR scores 1 point or more on TEWS	Check SpO ₂ - if below 92% give O ₂ and move to resus					
Reduced level of consciousness (not alert, including more sleepy than normal)	Do a finger prick glucose test and hand over to Senior Health Care Professional (SHCP)					
Unable to sit or move as normal for the child	Do a finger prick glucose test					
Diarrhoea	Start ORT					
Vomiting only and dehydration	Hand over to SHCP					
Main nutrition - visible severe wasting	Do a finger prick glucose test					
Main nutrition - with pitting oedema of BOTH feet	Do a finger prick glucose test					
History of diabetes	Do a finger prick glucose test if below 3 mmol/L move to resus if "H" check with SHCP					
History of bleeding, Bleeding PR, PO or from the site of trauma	Finger prick haemoglobin if 8 or less check with SHCP					

Figure 5: Paediatric SATS chart

3 ADULT CLINICAL SIGNS

Learning Objectives:

- Be familiar with the adult emergency signs
- Be familiar with the adult very urgent and urgent signs

3.1 EMERGENCY SIGNS

EMERGENCY
Obstructed airway – not breathing
Seizures - current
Burn – facial /inhalation
Hypoglycaemia – glucose less than 3 mmol/L
Cardiac arrest

It is important to note that if a patient has any emergency signs then a TEWS does NOT need to be calculated to categorise them as RED. There should be no delay in taking the patient to the resuscitation area. The first set of vitals may be obtained in the resuscitation area or in the ambulance.

Burn - facial inhalation

Any patient in whom the airway has potentially been exposed to heat (e.g. trapped in a house fire, hot water burn to face with possible steam inhalation or chemical burn to face or mouth) may get rapid swelling of the airway. Adults presenting with this emergency sign may have singed facial hairs (eyelashes, eyebrows), carbonaceous material in and around their nose/mouth and should be triaged Red.

Other emergency signs for adults include an obstructed airway (patient not breathing), a patient convulsing, and hypoglycaemia with a glucose less than 3 mmol/L or cardiac arrest.

3.2 VERY URGENT SIGNS

VERY URGENT		
High energy transfer (severe mechanism of injury)	Focal neurology – acute (stroke)	Burn – circumferential
Shortness of breath - acute	Aggression	Burn – chemical
Level of consciousness reduced / confused	Threatened limb	Poisoning / Overdose
Coughing blood	Eye injury	Diabetic – glucose over 11 and ketonuria
Chest pain	Dislocation of larger joint (not finger or toe)	Vomiting fresh blood
Stabbed neck	Fracture - compound (with a break in skin)	Pregnancy and abdominal trauma
Haemorrhage – uncontrolled (arterial bleed)	Burn over 20%	Pregnancy and abdominal pain
Seizure – post ictal	Burn – electrical	Severe Pain

High energy transfer (severe mechanism of injury)

In our context this refers to high speed injuries. Examples of these include a motor vehicle accident of 40 km/h or more, pedestrian vehicle accident, a fall from a roof or a high velocity gunshot wound.

Level of consciousness reduced / confused

Any patient that is not fully alert (i.e. confused, only responding to a verbal stimulus, painful stimulus or unresponsive).

- A** Is the patient **A**lert? If not,
- V** Is the patient responding to **V**oice? If not,
- P** Is the patient responding to **P**ain?
- U** The patient who is **U**nresponsive to voice **AND** to pain is **U**nconscious.

Threatened limb

A patient presenting with a painful, pale, pulseless, weak, numb limb.

A threatened limb presents as:

- P** Pain **P** Pulselessness **P** Capillary Refill Delay
- P** Pallor **P** Paralysis or pins & needles **P** Temperature

3.3 URGENT SIGNS

Haemorrhage - controlled

This refers to a situation where a patient presents with an active bleed and you as the triage provider apply direct pressure with a dry dressing and are able to control the bleed. This does not refer to a patient presenting with dry blood.

Abdominal pain

In all females of child-bearing age additional investigations (i.e. urine dipstick and urine pregnancy test) should be performed to pick up a possible ectopic pregnancy.

URGENT
Haemorrhage - controlled
Dislocation of finger OR toe
Fracture – closed (no break in the skin)
Burn - other
Abdominal pain
Diabetic – glucose over 17 (no ketonuria)
Vomiting persistently
Pregnancy & trauma
Pregnancy & PV bleed
Moderate pain

Assessment Questions

Clearly indicate whether the following statements are true or false:

- Singed facial hairs and soot around the nose and mouth are an indication of inhalation burn in a patient that has been trapped in a burning house.
 - True False
- Haemorrhage controlled refers to a patient whose active bleed was controlled by the triage provider by applying direct pressure with a dry dressing.
 - True False
- A patient in cardiac arrest is immediately categorised Red.
 - True False

Choose the correct answer:

- Examples of high energy transfers include:
 - (a) Motor vehicle accident at 60 km/h
 - (b) Fall from a height of ten meters
 - (c) Pedestrian vehicle accident at 50 km/h
 - (d) High velocity gunshot wound
 - (e) All of the above
- A threatened limb may present as:
 - (a) Pain in the affected limb
 - (b) A pale, pulseless affected limb
 - (c) A weak or numb affected limb
 - (d) The affected limb is cold and has poor perfusion
 - (e) All of the above

Learning Objectives:

- Be familiar with the paediatric emergency signs
- Understand the ABC-c-c-DO approach for emergency signs
- Be familiar with the paediatric very urgent and urgent signs

4.1 EMERGENCY SIGNS: The ABC-c-c-DO approach

Triage of patients involves looking for signs of serious illness or injury. These emergency signs relate to the Airway-Breathing-Circulation/Coma/Convulsion-Dehydration-Other and are easily remembered as "ABC-c-c-DO". Each letter refers to an emergency sign which, when identified, should alert you to a patient who is seriously ill and needs immediate intervention. It is important to note that if a patient has any emergency signs then a TEWS does NOT need to be calculated. There should be no delay in taking the patient to the resuscitation area. The first set of vitals may be taken in the resuscitation area or in the ambulance on the way to the hospital.

EMERGENCY	
A irway and B reathing	Not breathing or reported apnoea Obstructed breathing Central cyanosis or SpO ₂ less than 92% Respiratory distress (severe)
C irculation	Cold hands + 2 or more of the following: (i) pulse weak and fast (ii) capillary refill time 3 sec or more (iii) lethargic Uncontrolled bleeding (not nosebleed)
C oma	AVPU: Responds only to Pain (P) OR Unresponsive (U) Confusion
C onvulsions	Convulsing or immediately post-ictal and not alert
D ehydration	Diarrhoea or vomiting + 2 or more of the following: (i) Lethargy/floppy infant (ii) Very sunken eyes (iii) Skin pinch very slow - 2 sec or more
O ther	Facial /inhalation burn Hypoglycaemia recorded at any time - glucose less than 3 mmol/L Purpuric rash

HOW TO Triage?

Keep in mind the ABC-c-c-DO steps: Airway, Breathing, Circulation, Coma, Convulsion, Dehydration and Other.

4.1.1 AB AIRWAY AND BREATHING ARE USUALLY ASSESSED TOGETHER

The letters **A** and **B** in "ABC-c-c-DO" represent "airway and breathing". It is evident that an open (patent) airway is needed for breathing. An airway or breathing problem is life-threatening and must receive your attention before you move on to other systems. It is therefore convenient that the first two letters of the alphabet represent the two most important areas to look for emergency or priority signs. If there is no problem with the airway or breathing, you should look for signs in the areas represented by **C**.

To assess if the child has airway or breathing problems you need to know:

- Is the child breathing?
- Is the airway obstructed?
- Is the child blue (centrally cyanosed)?

IS THE CHILD BREATHING?

If active, talking, or crying, the child is obviously breathing. If in any doubt you must **ASSESS** three things to check if the child is breathing (see Figure 6):

- **LOOK** - to see if the chest is moving.
- **LISTEN** - for any breathing sounds. Are they normal?
- **FEEL** - Can you feel the breath at the nose or mouth of the child?

If the child is not breathing (or you are not sure if there is breathing), you need to take the child to the resuscitation area where the breathing needs to be artificially supported by ventilating the child with a bag valve mask (BVM) device whilst the child is further assessed and managed appropriately.



Figure 6: Look, listen and feel

IS THE BREATHING OBSTRUCTED?

Noisy breathing can be a sign that the airway maybe threatened or partially obstructed. This is most common in patients with a decreased level of consciousness, upper respiratory tract infections or aspiration of foreign bodies. Obstructed breathing can also be due to blockage by the tongue or the patient's own secretions if these are not being swallowed.

ARE THERE ABNORMAL RESPIRATORY NOISES?

Are there any noises heard when breathing in? A harsh noise on breathing in is called **stridor**, a short noise when breathing out in young infants is called **grunting**. Both noises are signs of severe respiratory problems.

NB: A blocked nose is an extremely common cause of noisy breathing, but it is NOT life-threatening.

DOES THE CHILD SHOW CENTRAL CYANOSIS?

DEFINITION: Cyanosis occurs when there is an abnormally low level of oxygen in the blood. This produces a bluish or purplish discoloration of the tongue, the inside of the mouth and the skin. This sign may be absent in a child who has severe anaemia.

To **ASSESS** for central cyanosis:

LOOK - at the mouth and tongue. A bluish or purplish discoloration of the tongue and the inside of the mouth indicates central cyanosis.

MEASURE - If oxygen saturation monitoring is available you can check the child's oxygen levels. First ensure that the probe is correctly sited and that a good regular trace is showing on the monitor. If oxygen saturation is < 92% in room air the child has low oxygen levels and this is an emergency.

DOES THE CHILD HAVE SEVERE RESPIRATORY DISTRESS?

To **ASSESS** whether the child has severe respiratory distress check for the following signs:

- Is the child having trouble getting breath so that it is difficult to talk, eat or breastfeed?
- Is the child breathing very fast?
- Does the child have severe chest indrawing? This can be intercostal (between the ribs), subcostal (below the ribcage), suprasternal (above the sternum) or sternal indrawing (the breastbone is sucked in on inspiration).
- Does the child have nasal flaring or a grunting noise on expiration?
- Is the child using the accessory muscles of the neck for breathing? This can cause the head to nod or bob with every breath. This is particularly seen in young babies.
- Exhaustion: If the child's breathing is very laboured, especially if it has been like this for some time, then s/he may become exhausted? If this happens then the signs of increased work of breathing can actually decrease as the child is tired - this is a very dangerous sign.

If you see these signs then it is likely that the child has severe respiratory distress.

Signs of severe respiratory distress:

- Very fast breathing
- Severe lower chest wall indrawing
- Use of auxiliary muscles
- Head nodding
- Inability to feed because of respiratory problems
- Grunting and flaring

MEASURE: In any child with respiratory distress, you should check oxygen saturation levels if you have an oxygen saturation monitor. First ensure that the probe is well sited and that you have a good trace on the monitor – if the oxygen saturation is less than 92% in room air, this child has an emergency sign and needs oxygen therapy. **However if a child is obviously in severe respiratory distress, oxygen saturation levels do not need to be checked at triage to confirm this emergency sign, rather take the child to the resuscitation area immediately.**

If the child is breathing adequately, go to the next section to quickly continue the assessment for emergency signs. If the child has an airway or breathing problem, you should initiate appropriate treatment and then quickly resume the assessment.

4.1.2 C CIRCULATION ASSESSMENT

FIRST FEEL THE CHILD'S HANDS – IF THEY ARE WARM YOU DO NOT NEED TO CHECK THE CIRCULATION ANY FURTHER. MOVE ON TO THE NEXT EMERGENCY SIGN.

IF THE HANDS ARE COLD OR COOL – YOU NEED TO RAPIDLY ASSESS FOR OTHER SIGNS OF CIRCULATORY SHOCK: PULSE VOLUME AND RATE; CAPILLARY REFILL TIME AND LETHARGY.

IS THE PULSE WEAK AND FAST?

The radial pulse (the pulse at the wrist) should be felt. If this is strong and not obviously fast, the pulse is adequate; no further assessment is needed. The radial pulse is used as an initial screen because it is easy to access without undressing the patient.

If the radial pulse is difficult to find, you need to look for a more central pulse (a pulse nearer to the heart). In an infant (less than one year of age) the best place to look is at the middle of the upper arm, the brachial pulse. If the child is lying down you could look for the femoral pulse in the groin. The pulse should be strong. If the more central pulse feels weak, decide if it also seems fast. This is a subjective judgement and an exact count is not taken. If the central pulse is weak and fast, the child needs further assessment and possible treatment for shock.

All these procedures can and should be practised on yourself, your friends, your children and family, and finally on real patients. Practice is the best way to improve on finding pulses and measuring capillary refill.

Note that we do not recommend blood pressure to assess for shock at triage because of two reasons:

1) Low blood pressure is a late sign of shock in children and they will already have other obvious signs and 2) the blood pressure in children is less predictive at triage than in adults.

4.1.3 C-C COMA AND CONVULSIONS ASSESSMENT

IS THE CHILD IN A COMA?

A child who is awake is obviously conscious and you can move to the next component of the assessment. If the child is asleep, ask the mother if the child is just sleeping. If there is any doubt, you need to assess the level of consciousness.

Try to wake the child by talking to him/her, e.g. call his/her name loudly. A child who does not respond to this should be gently shaken. A little shake to the arm or leg should be enough to wake a sleeping child. If this is unsuccessful, apply a firm squeeze to the nail bed, enough to cause some pain. A child who does not wake to voice or being shaken or to pain is unconscious.

To help you assess the consciousness level of a child, a simple scale (AVPU) is used:

A child who is not alert, but responds to voice, is lethargic. An unconscious child may or may not respond to pain. **Any child with a coma scale of "P" or "U" is an emergency and needs to be taken to the resuscitation area immediately.**

- A** Is the child **Alert**? If not,
- V** Is the child responding to **Voice**? If not,
- P** Is the child responding to **Pain**?
- U** The child who is **Unresponsive** to voice (or being shaken) AND to pain is **Unconscious**.

To assess if the child has circulation problems you need to know:

- Does the child have cool or cold hands? **IF YES**
 - Is the capillary refill time (CRT) 3 seconds or more?
 - If the CRT is prolonged is the pulse weak and fast?
 - Is the child lethargic



Figure 7: Feeling the brachial pulse in an infant

To assess for coma and convulsions you need to know:

- (i) Is the child's level of consciousness disturbed?
- (ii) Is the child convulsing now?

IS THE CHILD CONVULSING NOW OR POST-ICTAL?

This assessment depends on your observation of the child and on the history from the parent. Children who have a history of convulsion, but are alert during triage, will need a complete clinical history and investigation by a clinician, but at triage they are not assigned an emergency clinical sign, as they do not usually require any resuscitation immediately.

The child may be seen to have a convulsion during the triage process or while waiting in the outpatient department. You can recognize a convulsion by the sudden loss of consciousness associated with uncontrolled jerky movements of the limbs and/or the face. There is stiffening of the child's arms and legs and uncontrolled movements of the limbs. The child may lose control of the bladder, and is unconscious during the convulsion and drowsy afterwards.

Sometimes, in small infants, the jerky limb movements may be absent, but there may be more subtle twitching movements of the face, mouth, eyes, hands or feet. You have to observe the infant carefully.

4.1.4 D SEVERE DEHYDRATION ASSESSMENT

In this section we will look at the assessment of severe dehydration in the child with diarrhoea or vomiting. If the child is severely malnourished the signs of dehydration are not as reliable.

DOES THE CHILD HAVE DIARRHOEA OR VOMITING?

This information comes from the parent or guardian.

If the child has no diarrhoea or vomiting, do not check for dehydration. Move to the next assessment. If the child has diarrhoea or vomiting assess for severe dehydration.

A history of diarrhoea or vomiting and the presence of two or more of the signs in the box above means the child has severe dehydration and needs to be taken to the resuscitation area immediately.

To assess if the child is severely dehydrated you need to know:

- Is the child lethargic?
- Does the child have very sunken eyes?
- Does a skin pinch take 2 seconds or more to go back?

IS THE CHILD LETHARGIC?

In the older child lethargy is quite easy to assess. You have already assessed the state of consciousness of the child using the AVPU scale. Now observe if the child appears drowsy and does not show interest in what is happening around him/her. A lethargic child may not look at the mother or watch your face when you talk. The child may stare blankly and appear not to notice what is going on around him/her.

Does the child know his/her name and answer questions sensibly? If the child responds to voice but remains drowsy, he/she is lethargic. In the younger child, signs of lethargy are harder to assess.



Figure 8: Sunken eyes

DOES THE CHILD HAVE VERY SUNKEN EYES?

Look at the child's eyes to determine if they appear unusually sunken in their sockets (see Figure 8). Ask the mother if the child's eyes are more sunken than usual.

DOES A SKIN PINCH GO BACK VERY SLOWLY (2 SECONDS OR MORE)?

This is a simple test to look at how elastic the skin is. If the child is not dehydrated, the skin will be elastic and, when pinched and released, will return to normal straight away. Try this on yourself.

The dehydrated child will have lost fluid. The body moves fluid from less important places, such as the skin, to maintain the circulation. The skin becomes less elastic and, when pinched, is slow to return. Locate the area on the child's abdomen halfway between

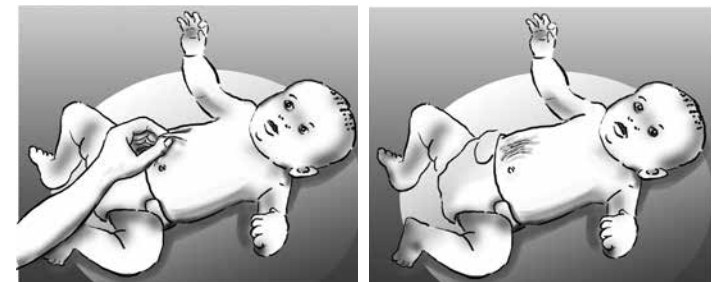


Figure 9: Skin pinch

the umbilicus and the side of the abdomen. Avoiding using your fingertips, as this is painful. Pinch the skin in a vertical (head to foot) direction and not across the child's body. You should pick up all the layers of the skin and the fat tissue underneath. Pinch for one second and then release. See whether the skin goes back very slowly (2 seconds or more).

Severe dehydration is present if the child has a history of diarrhoea plus any two of the following signs: lethargy, sunken eyes or very slow skin pinch (2 seconds or more).

4.1.5 OTHER EMERGENCY SIGNS

Facial inhalational burns

Any child in whom the airway has potentially been exposed to heat (e.g. trapped in a house fire, hot water burn to face with possible steam inhalation or chemical burn to face or mouth) may get rapid swelling of the airway. Children presenting with this emergency sign should be triaged Red.

Glucose <3mmol/L at any time

Children with a low blood sugar are often very sick and need to be seen immediately. They should be triaged Red if found to have a blood glucose concentration of less than 3 mmol/L.

Purpuric Rash

Children who present with a complaint of a rash - should be assessed to see if the spots blanch with pressure from fingertip or glass test (i.e. turns white when pressure is applied). If the spots are non-blanching (i.e. does not turn white when pressure is applied) - then there is a risk of meningococcal disease. Children presenting with this emergency sign should be triaged Red. If you are unsure about a child presenting with a rash ask the senior healthcare professional.

You have now learned how to recognize the obvious emergency signs in paediatric patients. The next section will cover the very urgent and urgent signs respectively. It is important to note that if a patient has any emergency signs then a TEWS does NOT need to be calculated. There should be no delay in taking the patient to the resuscitation area. The first set of vitals may be taken in the resuscitation area or in the ambulance on the way to the hospital.

- If any EMERGENCY signs have been found the TEWS should NOT be calculated at triage, the child is within the RED category and should be taken to the resuscitation area.
- Children within the RED category need emergency care and should be seen immediately.
- Always ensure that the child with emergency signs is handed over directly to a SHCP.

- If there are no EMERGENCY signs, check to see whether the child has any VERY URGENT signs.

4.2 VERY URGENT SIGNS

If the child does not have any of the emergency ABC-c-c-DO signs, the triage provider proceeds to assess the child on the very urgent signs. This should not take more than a few seconds. Some of these signs will have been noticed during the ABCD triage discussed so far, and others need to be re-checked. Follow the list of very urgent signs to quickly complete this section to decide whether the child has any very urgent or urgent signs that need prompt management.

The presence of obvious very urgent signs does not automatically make the child's triage priority ORANGE. Always calculate the TEWS and check key additional investigations to ensure that the child does not need to be assigned to the RED category and taken for emergency care

The frequency with which children showing these very urgent signs appear in your emergency centre depends on the local epidemiology.

Perform a finger prick gluco test in the following cases:

- Reduced level of consciousness
- Unable to sit or move as usual
- Current or recent seizure
- Known with diabetes
- Severe malnutrition

VERY URGENT
Tiny baby - younger than 2 months
Inconsolable crying / severe pain
Presenting complaint - More sleepy than normal
Poisoning or overdose
Focal neurology acute
Severe mechanism of injury
Burns (circumferential, electrical, chemical, 10% or more)
Eye injury
Fracture – open or threatened limb
Dislocation of larger joint (not finger or toe)

Tiny baby (less than two months of age)

If the child appears very young, ask the mother his age. If the child is obviously not a young baby, you do not need to ask this question.

Small babies are more difficult to assess properly, more prone to getting infections (from other patients), and more likely to deteriorate quickly if unwell. All tiny babies of under two months of age should therefore be seen very urgently.



ADDITIONAL TASK
Tiny baby → Refer to SHCP

Inconsolably crying/ severe pain

The inconsolable crying child is conscious but cries constantly and will not settle. Ask the parent of caregiver if the child is upset/frightened by the unfamiliar environment or whether this is the presenting complaint. If a child has severe pain and is in agony, s/he should be prioritized to receive very urgent assessment and pain relief. Severe pain may be due to severe conditions such as acute abdomen, meningitis, etc. You are not required to do a formal pain scale assessment, but for your information there are some examples of pain scales appended at the end of part four.



ADDITIONAL TASK
Pain → check with SHCP for analgesia initiation

Presenting complaint - 'more sleepy than normal'



ADDITIONAL INVESTIGATION
Reduced level of consciousness → do finger prick glucose test



WARNING
If glucose less than 3 mmol/L → take to resuscitation area

When the mother complains that her child that is more sleepy than normal (NOT just in natural sleep), the child may be in the early stages of serious conditions such as meningitis, hypoglycaemia, septicemia etc, and will need to be identified and managed very urgently. Even if the child appears alert at triage still assign a Very Urgent clinical sign as we have to take seriously the mothers concern.

Poisoning or Overdose

A child with a history of swallowing drugs or other dangerous substances needs to be assessed very urgently, as s/he can deteriorate rapidly and might need specific treatment depending on the substance taken. The mother will tell you if she has brought the child because of possible intoxication. Consult SHCP for advice regarding very urgent management.



ADDITIONAL TASK
Poisoning/Overdose → Refer to SHCP

Focal neurology acute

A child who is fully conscious but has new focal neurological signs will need very urgent assessment. In this case, the child does not require emergency treatment because they do not have any ABCD emergency signs, but may need urgent imaging and intervention. Examples of focal neurological signs include cranial nerve palsies and acutely paralysed limbs - their presence may indicate a form of vascular stroke and management may be time dependent. The child may have a weakness on one side of the body and may not be able to move as normal. The parent may also complain that their child has a new onset of a squint or a paralysed face.

Severe Trauma – severe mechanism of injury

Usually this is an obvious case, but one needs to think of motor vehicle accident injuries, falls from a height greater than one metre in height, gunshot wounds and other traumatic mechanisms of injury in this category. Remember the ABC-c-c-DO assessment would already have identified any life-threatening problems requiring immediate resuscitation.



ADDITIONAL TASK
Bleeding → apply pressure to the site of trauma and cover open wounds

Pain → check with SHCP for analgesia initiation

Burns

These include: Circumferential, Electrical, Chemical and any burn involving 10% or more of body surface area.

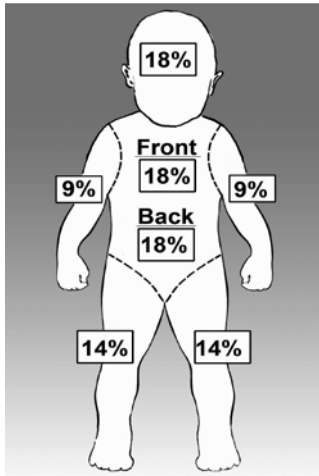
Burns are extremely painful and children who seem quite well can deteriorate rapidly.



WARNING
Any major burn → take to resuscitation area



ADDITIONAL TASK
Pain → check with SHCP for analgesia initiation



The size of the burn needs to be determined using the Rule of Nines method (the palmar method is more suitable for smaller burns - see page 23). For any child with a major burn resuscitation must be commenced. Follow the provincial burns management guidelines 2011 including analgesia.

The example left is of a one year-old child. Refer to Table in the provincial Emergency Management of Severe Burns manual for different ages.

Figure 10: Rule of Nines for burn surface area estimation in a one year old child

ADDITIONAL TASK
 If the burn occurred recently (within 3hrs) → it is still worthwhile to cool the burnt area with water, for example, by running cool tap water over the burnt area for 30 minutes. The child should then be dried and wrapped in a clean sheet or blanket to avoid hypothermia. The burn can be covered in cling wrap if available, or a clean dry sheet or towel will also be suitable.

Fracture – open

An open fracture may be associated with a large volume of blood loss that may be very obvious (external) or may be concealed (internal) – perhaps only recognisable by swelling around the fracture area. This needs very urgent attention.

ADDITIONAL TASK
 Pain → check with SHCP for analgesia initiation

Threatened limb

A threatened limb presents as:

- P Pain
- P Pallor
- P Pulselessness
- P Paralysis or pins & needles
- P Capillary Refill Delay
- P Temperature

ADDITIONAL TASK
 Pain → check with SHCP for analgesia initiation

Dislocation of large joint (not finger or toe)

Apart from being very painful, a large joint dislocation may compromise blood and nerve supply to the limb distal to the affected joint. Damage to the neurovascular bundle implies serious injury and needs very urgent attention.

ADDITIONAL TASK
 Dislocation of large joint → Hand over to SHCP.
 Pain → check with SHCP for analgesia initiation

- If any **VERY URGENT** signs have been found the TEWS should be calculated and key additional investigations should be checked to ensure that the child does not need to be assigned to the **RED** category and taken for emergency care.
- Children within the **ORANGE** category should be seen within 10 minutes.
- Handover all **ORANGE** category children personally to the health worker in the Orange area.
- Always check for additional tasks that should be done.
- If there are no **VERY URGENT** signs, check to see whether the child has any **URGENT** signs.

APPENDIX B: Examples of different pain scales

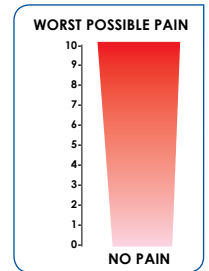
Behavioral Observation Pain Rating Scale

Categories	Scoring		
	0	1	2
Face	No particular expression or smile; disinterested	Occasional grimace or frown, withdrawn	Frequent to constant frown, clenched jaw, quivering chin
Legs	No position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid or jerking
Cry	No crying (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging, or talking to. Distractable	Difficult to console or comfort

Each of the five categories: (F) Face; (L) Legs; (A) Activity; (C) Cry; (C) Consolability is scored from 0 - 2, which results in a total score between 0 and 10.

Observe the child and score the child's pain according to the 'FLACC' scale.

'Faces' Pain Rating Scale



Ask the older child to point to the face that best describes how s/he feels.

4.3 URGENT SIGNS

These children do not have any of the emergency ABC-c-c-DO signs nor do they have any of the very urgent signs. The triage provider should proceed to assess the child on the urgent signs. This should not take more than a few seconds.

Even if there are obvious urgent signs – calculate the TEWS and carry out additional investigations to ensure that the patient is not possibly within the **RED** or **ORANGE** category.

Some respiratory distress

When you assessed the airway and breathing, did you observe any respiratory distress? If the child has severe respiratory distress, this is an emergency. There may however, be signs present that you do not think are severe, e.g. some lower chest wall indrawing (but not severe), or slight increase

ADDITIONAL INVESTIGATION
 RR scoring 1 point or more → measure oxygen saturation

URGENT
Some respiratory distress
Some Dehydration - Diarrhoea or vomiting + 1 or more of the following: (i) sunken eyes (ii) restless / irritable (iii) thirsty/ decreased urine output (iv) dry mouth (v) crying without tears (vi) skin pinch slow-less than 2 sec
Some Dehydration - Unable to drink/feed OR vomits everything + 1 or more of signs (i) – (vi) above
Malnutrition (visible severe wasting)
Malnutrition Oedema (pitting oedema of BOTH feet)
Unwell child with known diabetes
Any other burn less than 10%
Closed fracture
Dislocation of finger or toe

in breathing rate. In this case, the child does not require emergency treatment but will need urgent assessment. Understanding the level of severity of respiratory distress come with practice and experience. If you have any doubts, consult a senior health care professional immediately.

WARNING
If oxygen saturation below 92% → give oxygen and move to resuscitation area

Some Dehydration - Diarrhoea or diarrhoea and vomiting + 1 or more signs of dehydration

Infants and children with diarrhoea or vomiting may have lost enough fluid to show one or more of the following signs of dehydration:

- | | |
|---------------------------------------|--|
| (i) sunken eyes- ask the mother | (iv) dry mouth |
| (ii) restless/ irritable | (v) crying without tears |
| (iii) thirsty/ decreased urine output | (vi) skin pinch slow - less than 2 seconds |

Because these children have losses that are ongoing and difficult to quantify, they need to commence oral rehydration therapy as soon as possible to avoid becoming severely dehydrated or shocked i.e. signs that would now place them into the RED category. Most of them are thirsty and their mothers need to offer them extra fluids according to the Oral Rehydration Corner guidelines. Infants and young children that are breast-fed should be encouraged to continue to do so whilst awaiting further urgent assessment.

ADDITIONAL TASK
Diarrhoe → start oral rehydration therapy (ORT)

Unable to drink/feed OR vomits everything

Infants and children that are not well enough to feed or are vomiting everything may have serious medical or surgical conditions affecting any of the body systems. Examples include septicaemia, meningitis, heart conditions, acute surgical abdomen, pneumonia etc.

Vomiting only and dehydration:

- beware the child may have an acute surgical bowel problem
- oral fluids may be contraindicated
- seek advice from a senior health professional

ADDITIONAL TASK
Vomiting only and dehydration → consult with SHCP

Malnutrition with visible severe wasting

ADDITIONAL INVESTIGATION
Malnutrition with visible severe wasting → do a finger prick glucose test and check with SHCP

WARNING
If glucose is below 3 mmol/L → move to resuscitation

Severe wasting is a form of severe malnutrition. These children are easy to pick up because their muscles are very wasted and they have loose skin folds particularly noticeable around their upper thighs, buttocks and upper arms. If you are concerned that a child might be malnourished look rapidly at these body areas. Severely malnourished children are prone to hypothermia, hypoglycaemia and infections and need to be managed urgently according to the WHO severe malnutrition guidelines to prevent complications.

Malnutrition with pitting oedema of both feet

This is another form of severe malnutrition. It is as dangerous as the one described above and is recognised by the pitting oedema of both feet; they may also present with general body swelling. If you are concerned that a child might be malnourished look rapidly at the child's feet and check for oedema of both feet. These children often appear listless and apathetic and have skin and hair changes. They are also prone to hypothermia, hypoglycaemia and infections and need to be managed urgently according to the WHO severe malnutrition guidelines to prevent complications.

ADDITIONAL INVESTIGATION
Malnutrition with visible severe wasting → do a finger prick glucose test and check with SHCP

WARNING
If glucose is less than 3 mmol/L → move to resuscitation

Unwell child with known diabetes

Children with diabetes often lose control of their sugar levels when they are unwell from acute illness and infections e.g. acute respiratory infections, (upper or lower) urinary tract infections or diarrhoea. They often develop high or low blood glucose levels because their insulin needs may increase or decrease whilst they are unwell and they are not eating as usual because of loss of appetite, nausea or vomiting.

ADDITIONAL INVESTIGATION
History of diabetes → do a finger prick glucose test

WARNING
If glucose is below 3 mmol/L → move to resuscitation

WARNING
If glucose result is 'HI' → check with SHCP

Burn less than 10% of body surface area

The size of the burn needs to be determined using the palmar method (patient's outstretched open palm including the fingers is ≈ to 1% of the body surface area).

ADDITIONAL TASK
Pain → check with SHCP for analgesia initiation

ADDITIONAL TASK
Burn less than 10% → follow the provincial burns management guidelines. If the burn occurred recently, within the last 3 hours, it is still worthwhile to cool the burnt area with water, for example, with cool tap water for at least 30 minutes. The burn should then be dried and covered with cling wrap or a clean dry sheet. The child should also be wrapped in a blanket and kept warm



Figure 11: Palmar method illustrating 1% of the body

Closed fracture (no break in the skin)

These children often present with pain on moving or refusal to move the affected limb. There may be deformity of the limb evident.

ADDITIONAL TASK
Pain → check with SHCP for analgesia initiation

ADDITIONAL TASK
Closed fracture → If required get a wheelchair or stretcher and immobilise the affected limb with a simple splint e.g. a padded wire splint or triangular bandage that does not interfere with the blood supply or nerve bundle, and provide analgesia according your site's guidelines.

Dislocation of finger or toe

This often causes an obvious deformity; the dislocated digit will need to be reduced under some form of anaesthesia.

ADDITIONAL TASK
Pain → check with SHCP for analgesia initiation

- If any **URGENT** signs have been found the TEWS should be calculated and additional investigations checked to ensure that the child does not need to be assigned to the **RED** or **ORANGE** category and taken for emergency or very urgent care.
- Children within the Yellow category should be seen within 60 minutes.
- Always check for additional tasks that should be done.
- If there are no **URGENT** signs, calculate the TEWS and check for additional investigations to determine what the child's final triage colour is.

Assessment Questions

Clearly indicate whether the following statements are true or false:

1. Grunting and nasal flaring are signs of severe respiratory distress.
 True False
2. Oxygen saturation levels should always be checked in a child that looks blue.
 True False
3. If no emergency sign is identified in step one, but an urgent sign is identified in step two, the patient is immediately taken to the majors area for urgent management.
 True False

Choose the correct answer:

4. In the ABC-c-c-DO approach ABC stands for airway, breathing, circulation. What does c-c-D stand for?
 (a) convulsions, chest pain, dehydration
 (b) coma, cancer, disabilities
 (c) coma, convulsions, dehydration
 (d) coma, craniopharyngioma, dehydration
 (e) chronic pain, constipation, dehydration
5. The following are emergency signs
 (a) oxygen saturation levels more than 92%
 (b) facial or inhalation burn
 (c) stridor, snoring and secretions
 (d) closed fracture
 (e) b and c above

5 TRIAGE EARLY WARNING SCORE TEWS

Learning Objectives:

- Be familiar with the different age appropriate versions of the TEWS
- Understand how to calculate the TEWS in paediatric and adult patients

The TEWS is a composite score representing physiologic parameters at triage. There are different age appropriate versions: the **younger child TEWS** is for patients smaller than 95cm or younger than 3 years (see Figure 12); the **older child TEWS** is for patients 96cm to 150cm or 3 years to around 12 years (see Figure 13); and the **adult TEWS** is for patients older than 12 years or taller than 150cm. Older children, where you are unsure which form to use, should be measured. If they are over 150cm then the adult version should be used. This standardised scoring system has been validated and many of the boxes in the TEWS calculator are shaded grey. These boxes cannot be assigned a score. This means that for temperature, for example, it is only possible to score 0 or 2 points, depending on the value of the recording.

YOUNGER THAN 3 YEARS / SMALLER THAN 95 cm	YOUNGER CHILD TEWS						
	3	2	1	0	1	2	3
Mobility				Normal for age		Unable to move as normal	
RR	less than 20	20 - 25		26 - 39		40 - 49	50 or more
HR	less than 70	70 - 79		80 - 130		131 - 159	160 or more
Temp		Feels Cold Under 35°		35° - 38.4°		Feels Hot Over 38.4°	
AVPU				Alert	Reacts to Voice	Reacts to Pain	Unresponsive
Trauma				No	Yes		

Figure 12: Younger Child TEWS (younger than 3 years)

3 to 12 YEARS OLD / 95 to 150 cm tall	OLDER CHILD TEWS						
	3	2	1	0	1	2	3
Mobility				Normal for age		Unable to walk as normal	
RR	less than 15	15 - 16		17 - 21	22 - 26	27 or more	
HR	less than 60	60 - 79		80 - 99	100 - 129	130 or more	
Temp		Feels Cold Under 35°		35° - 38.4°		Feels Hot Over 38.4°	
AVPU		Confused		Alert	Reacts to Voice	Reacts to Pain	Unresponsive
Trauma				No	Yes		

Figure 13: Older Child TEWS (age 3 - 12 years)

OLDER THAN 12 YEARS / TALLER THAN 150 cm tall)	ADULT TEWS						
	3	2	1	0	1	2	3
Mobility				Walking	With Help	Stretcher/ Immobile	
RR		less than 9		9 - 14	15 - 20	21 - 29	more than 29
HR		less than 41	41 - 50	51 - 100	101 - 110	111 - 129	more than 129
SBP	Less than 71	71 - 80	81 - 100	101 - 199		more than 199	
Temp		Cold OR Under 35°		35° - 38.4°		Hot OR Over 38.4°	
AVPU		Confused		Alert	Reacts to Voice	Reacts to Pain	Unresponsive
Trauma				No	Yes		

Figure 14: Adult TEWS (older than 12 years)

5.1 Observations at triage

To calculate the TEWS the first step is to perform the observations required by the TEWS.

DO NOT UPSET THE CHILD
this affects your observations for TEWS

RESPIRATORY RATE

The patient's respiratory rate is calculated by counting the breaths for 30 seconds and then multiplying by two. This should be done at the first opportunity when the child is quiet. If the child is small it is best to leave him/her in the mother's lap. Do not undress the child to count the respiratory rate as doing this may upset him/her. Count the breathing rate by observing rather than touching the child.

HEART RATE

To measure the heart rate, the triage provider can manually count the heart rate by feeling the pulse for 30 seconds and then multiplying by two. Alternatively a heart rate monitor can be used (ideally not from a saturation monitor – as the heart rate on these monitors can be unreliable and can change frequently if the child moves).

TEMPERATURE

The temperature is measured using either an electronic or mercury thermometer (preferably a low-reading thermometer). Rectal temperature should NOT be taken routinely.

AVPU

AVPU is done by seeing if the child is alert. If not obviously alert then the triage provider needs to observe the child's response to their (or the parent's) voice. If the child responds to voice and is then alert – he is an 'A' – but if he remains drowsy then he is a 'V'. If he makes no response to voice then the triage provider need to assess the response to a painful stimulus (e.g. nailbed pressure or sternal rub) – if the child responds to this s/he is a 'P'. If there is no response to either verbal or pain stimuli the patient is labelled as unresponsive.

V means the patient is not fully alert and **RESPONDS ONLY TO YOUR VOICE. Another way of describing this = 'lethargic'**

P means the patient is not alert and does not respond to your voice but **RESPONDS ONLY TO A PAINFUL STIMULUS**

MOBILITY

Mobility is observed by noting the mode in which the patient has to be mobilised. A small baby is carried by the carer – as might a small infant or child. You need to assess if the level of movement is normal for that particular child. In the event that the child or adult is in a wheelchair due to permanent paralysis 2 points are given for mobility as the child in a wheelchair is more at risk.

TRAUMA

Trauma is present if there is ANY injury to the patient within the past 48 hours.

5.2 Terminology and key concepts

- Confusion:** An older child may be reported to have confused behaviour or this may be discovered at triage. A confused child appears disorientated, s/he may not be interacting normally with the carer or the environment, s/he may be delirious or hallucinating. A confused child may be talking a lot and aggressive or s/he may be quiet and fearful looking. This sign is difficult to detect in younger children who are usually pre-verbal - so it is only included on the TEWS for the older child.
- Acute vs Chronic:** Many patients in South Africa are chronically unwell with serious conditions such as TB or HIV/AIDS. In these patients, daily resting physiology such as respiratory rate may be abnormal. This is important to bear in mind, as their TEWS will be high and they will be given an overly high triage code (they may be overtriaged). It is not for the inexperienced triage provider to decide whether this is the case or not, as sick patients may be missed. However, it is appropriate to ask a senior doctor or sister to review the patient's triage code.
- The younger and older child:** Younger and older children have different resting vital signs to adults. These are often difficult to obtain, and the patients often cry, which pushes up their respiratory and heart rate. The values still need to be recorded as you measure them, so that a correct score can be given in the TEWS, but tell the senior doctor or sister that the child was crying when they were recorded. These staff members can then decide whether the child has been overtriaged or not.

Assessment Questions

Clearly indicate whether the following statements are true or false:

- If a child is nine years old we use the older child TEWS.
 True False
- Always undress a child and weigh them so that it is easier to obtain their vital signs.
 True False
- To accurately obtain a respiratory rate always start when the patient is at rest, count respirations for 30 seconds and multiply by two.
 True False

Choose the correct answer:

- The adult TEWS consists of the following parameters:
 - Mobility, respiratory rate, heart rate, temperature and blood pressure
 - Mobility, capillary refill time, heart rate, temperature and blood pressure
 - Mobility, respiratory rate, heart rate, temperature, systolic blood pressure, AVPU and trauma
 - Mobility, respiratory rate, heart rate, temperature, AVPU and trauma
 - Mobility, respiratory rate, oxygen saturation level and blood glucose concentration
- The older child TEWS consists of the following parameters:
 - Mobility, respiratory rate, heart rate, temperature and blood pressure
 - Mobility, capillary refill time, heart rate, temperature and blood pressure
 - Mobility, respiratory rate, heart rate, temperature and trauma
 - Mobility, respiratory rate, heart rate, temperature, AVPU and trauma
 - Mobility, respiratory rate, oxygen saturation level and blood glucose concentration

ADDITIONAL INVESTIGATIONS

Learning Objectives:

- Be familiar with the additional investigations and when to perform them
- Know how additional investigations may change the triage priority level

For all patients (especially children) immediate **additional investigations** may be indicated to identify potentially serious complications of their presenting conditions. Check if the patient has any of the conditions listed below and act accordingly.

RESPIRATORY RATE (RR) SCORES MORE THAN 1 POINT ON TEWS:

ADDITIONAL INVESTIGATION
Measure oxygen saturation (for children on finger, toe, hand or earlobe, depending on available saturation probe and co-operation)

A raised RR for age may indicate serious underlying pathology such as chest infection requiring supplemental oxygen

REDUCED LEVEL OF CONSCIOUSNESS

All patients that are not fully alert (i.e. confused or only responding to verbal or painful stimulus) need to have a finger prick glucotest done and should be handed over to the senior healthcare professional.

If the child is not alert, or the caregiver volunteers that the child is more sleepy than normal, this may indicate a serious evolving medical condition such as meningitis or if associated with a history of trauma there could be a traumatic brain injury.

Any sick child who has not been feeding well or has been vomiting may become drowsy because of a low blood sugar level. Tiny babies and malnourished children are particularly at risk of hypoglycaemia.

UNABLE TO SIT OR MOVE AS NORMAL

If the patient is unable to walk or move as normal or the caregiver reports that the child is lethargic or unable to move as usual, this may also be a sign of serious illness or of a low blood sugar level.

RECENT SEIZURE/FIT

The patient who is actively fitting will have been taken to the resuscitation area. In any child with a history of recent seizure there could be easily identifiable and treatable causes, including hypoglycaemia, pyrexia (febrile seizure) or high blood pressure.

HISTORY OF DIABETES

All patients with diabetes are at risk of either becoming hypoglycaemic (usually drowsy or confused) or hyperglycaemic with diabetic ketoacidosis (DKA). All therefore need a glucotest done at presentation.

ADDITIONAL INVESTIGATION
Perform a finger prick glucotest immediately to exclude hypoglycaemia

WARNING
For children if oxygen saturation is below 92% on room air → Move to resuscitation area and administer nasal prong or facemask oxygen

ADDITIONAL INVESTIGATION
Perform a finger prick glucotest immediately to exclude hypoglycaemia

WARNING
If glucose is below 3 mmol/L → move to resuscitation and hand over to SHCP

ADDITIONAL INVESTIGATION
Perform a finger prick glucotest immediately to exclude hypoglycaemia

WARNING
If glucose is below 3 mmol/L → move to resuscitation and hand over to SHCP

WARNING
If glucose is below 3 mmol/L → move to resuscitation and hand over to SHCP
If glucose is Hi → hand over to SHCP

DIABETES AND HYPERGLYCAEMIA (GLUCOTEST 11 OR MORE)

All patients with a glucose concentration of 11 mmol/L or more require a urine dipstick to check for ketones.

ADDITIONAL INVESTIGATION
Perform a urine dipstick to check for ketones

CHILD HAS MALNUTRITION WITH SEVERE VISIBLE WASTING or WITH PITTING OEDEMA OF BOTH FEET

This child is at risk of hypoglycaemia, as well as hypothermia

ADDITIONAL INVESTIGATION
Perform a finger prick glucotest immediately to exclude hypoglycaemia

WARNING
If glucose is below 3 mmol/L → move to resuscitation and hand over to SHCP

PERFORM A FINGER PRICK GLUCOTEST IN THE FOLLOWING CASES:

- Reduced level of consciousness
- Unable to sit or move as usual
- Current or recent seizure
- Known with diabetes
- Severe malnutrition

ABDOMINAL PAIN OR BACKACHE IN FEMALES

The adult female with abdominal pain may have an ectopic pregnancy leading to severe pain and discomfort as time progresses. She may be at risk for a ruptured ectopic or other complications in pregnancy requiring emergency surgery.

These additional investigations may rapidly identify very ill patients and change their category. They also prevent and/or identify serious complications.

ADDITIONAL INVESTIGATION
Perform a urine dipstick and urine pregnancy test

Assessment Questions

Clearly indicate whether the following statements are true or false:

1. A patient with a glucose of 11 mmol/L needs to have a urine dipstick done to check for ketones in the urine.
 True False
2. Check the finger prick haemoglobin on all patients that have a history of diabetes.
 True False
3. Do a urine dipstick and urine pregnancy test on all adult females presenting with abdominal pain.
 True False

Choose the correct answer:

4. Perform a finger prick glucotest on the following cases:
 - (a) Current or recent seizure
 - (b) Facial burn
 - (c) Reduced level of consciousness
 - (d) History of diabetes
 (e) a, c and d
5. The following two additional investigations may upgrade a patient to the Red category:
 - (a) Oxygen saturation levels in children and finger prick haemoglobin
 - (b) Finger prick haemoglobin levels and urine dipstick
 - (c) Urine dipstick test and oxygen saturation levels
 - (d) Finger prick glucotest and oxygen saturation levels
 - (e) Finger prick glucotest and finger prick haemoglobin

7 ADDITIONAL TASKS

Learning Objectives:

- Be familiar with the additional tasks
- Know when to perform additional tasks

For **all patients (especially children)** whether triaged **RED, ORANGE, YELLOW OR GREEN** immediate **additional tasks** may be indicated to stabilise the patient and/or identify or prevent potentially serious complications. Check if the child has any of the conditions listed below and act accordingly.


TINY BABY UNDER 2 MONTHS

Small babies under 2 months are more difficult to assess, their symptoms are often non-specific, they have lower immunity than other children so are more prone to infections, and they deteriorate more quickly. They therefore need to be assessed as a priority.

 **ADDITIONAL TASK**
Tiny baby under 2 months → refer to SHCP


POISONING OR OVERDOSE

Toddlers are inquisitive and like to explore their environments. They may accidentally ingest a variety of household substances, pesticides or medications. A child who has ingested a poison can deteriorate quickly. They may require a specific antidote and if a poison or medication has been ingested recently immediate intervention may be needed (e.g. activated charcoal). It is therefore important to consult a SHCP for children and adults even if the patient appears stable.

 **ADDITIONAL TASK**
Poisoning /overdose → refer to SHCP


IF CHILD APPEARS TO BE IN PAIN or IS INCONSOLABLY CRYING

This may be due to a medical cause like an ear infection or from severe headache due to meningitis. Or there may be an obvious cause such as a fracture or laceration. Pain is obviously unpleasant for both the child and carer. It is good practice to initiate analgesia as soon as possible for children and adults.


 **ADDITIONAL TASK**
Pain or inconsolable crying → check with SHCP for initiation of analgesia and review

BURN

The patient will be experiencing pain and especially children have the potential to deteriorate rapidly from significant fluid losses and may develop hypothermia.


 **ADDITIONAL TASK**
Pain → check with SHCP for initiation of analgesia and review

If the burn is recent (<3hrs) immediate intervention may limit the extent of tissue damage.

 **ADDITIONAL TASK**
If the burn occurred recently (within 3hrs) → it is still worthwhile to cool the burnt area with water, for example, by running cool tap water over the burnt area for 30 minutes. The child should then be dried and wrapped in a clean sheet or blanket to avoid hypothermia. The burn can be covered in cling wrap if available, or a clean dry sheet or towel will also be suitable.

TEMPERATURE 38.5°C OR MORE

A very high temperature will result in physiological changes that may affect the TEWS, and make the patient feel uncomfortable and in some children may be associated with a febrile seizure.

 **ADDITIONAL TASK**
High temperature → remove excessive clothing and check with SHCP for initiation of analgesia and review

TEMPERATURE 35.5°C OR LESS

Hypothermia might be a sign of severe sepsis with very small babies, ex-premature babies and severely malnourished children being the most at risk.

 **ADDITIONAL TASK**
Low temperature → warm the patient with additional blankets for children with a cap if available and hand over to SHCP


DIARRHOEA & VOMITING

Even if the child has no or some dehydration, the child is at risk of becoming dehydrated whilst waiting to be seen and should receive oral rehydration to treat and/or prevent further dehydration

 **ADDITIONAL TASK**
Diarrhoea & vomiting → take child to ORT corner and advise caregiver to start ORT by cup and spoon


VOMITING WITHOUT DIARRHOEA AND THE CHILD IS DEHYDRATED


Vomiting alone which is severe enough to result in dehydration may indicate a diagnosis other than simple gastroenteritis e.g. urinary tract infection; a surgical problem with bowel obstruction; diabetic ketoacidosis or even meningitis or another severe infection. It may **not** be appropriate to automatically commence this child on a trial of oral rehydration – and so senior advice should be sought.

 **ADDITIONAL TASK**
Vomiting without diarrhoea → refer to SHCP for assessment

IF THE CHILD HAS A CLOSED FRACTURE

These children will be experiencing significant pain - both medication and immobilization of the affected limb will provide some relief from the pain and should be initiated prior to formal assessment

 **ADDITIONAL TASK**
Pain → check with SHCP for initiation of analgesia and review
Closed fracture → immobilise affected limb with simple padded splint or a triangular bandage sling and get a wheelchair or stretcher if required


 **ADDITIONAL TASK**
Chest Pain → perform an ECG to rule out potential AMI and hand over to SHCP

CHEST PAIN

Patients with chest pain may be having an acute myocardial infarct (AMI). An immediate ECG is required to rule out a potential AMI.


ACTIVE ONGOING BLEEDING

Children have a small circulating blood volume, and are at risk of becoming shocked quickly if there is ongoing bleeding from a trauma site

 **ADDITIONAL TASK**
Active bleed → apply direct pressure to the site of trauma with a dry dressing and perform finger prick haemoglobin to obtain a baseline and hand over to SHCP

HISTORY OF RECENT BLEEDING - EITHER RECTAL, ORAL OR FROM A SITE OF TRAUMA

This patient may be anaemic from blood loss

 **ADDITIONAL TASK**
History of bleeding → check finger prick haemoglobin. If less than 8 g/dl then hand over to SHCP

PRESENTING COMPLAINT IS ABDOMINAL PAIN

Abdominal pain is a common complaint in children and it has a wide variety of possible causes including urinary tract infection, diabetic ketoacidosis, hepatitis or other causes. A urine dipstick for children and adults will assist in excluding or diagnosing these.

 **ADDITIONAL TASK**
For a younger child → Place a urine bag, if olderchild, give container

These additional tasks may assist to rapidly identify very ill patients and prevent and identify serious complications. They also improve quality of care by providing relief from pain.

A senior healthcare professional should be alerted in the following cases:

- Tiny baby younger than 2 months old
- Reduced level of consciousness
- A child in pain including fractures and burns
- Poison ingestion or overdose
- Very high or very low temperatures
- Vomiting only with dehydration
- The severely malnourished child
- A child with active bleeding

Additional Tasks at triage

ADULT PATIENTS	
PROBLEM	IMMEDIATE TASKS
1. Temperature 38.5° or more	Paracetamol 1 g orally stat (document in the notes)
2. Temperature 35° or less	Warm the patient with blankets if available
3. Diabetes and hyperglycaemia (glucotest 11 mmol/L or more)	Urine dipstick to check for ketones
4. History of bleeding	Finger prick haemoglobin
5. Bleeding PR, PO or from the site of trauma	Finger prick haemoglobin
6. Abdominal pain or backache in males	Urine dipsticks
7. PV bleeding	Urine dipsticks, Urine pregnancy test Finger prick haemoglobin

PAEDIATRIC PATIENTS	
PROBLEM	IMMEDIATE TASKS
1. Poisoning OR overdose	Refer to Senior Healthcare Professional (SHCP)
2. Child in pain OR inconsolable crying	Check with SHCP for analgesia initiation
3. Child with a burn	Check with SHCP for analgesia initiation If burn occurred within 3 hours, cool the burnt area Cover burn in clingwrap or clean dry sheet
4. Temperature 38.5 ° or more	Remove excessive clothing & discuss with SHCP
5. Temperature 35 ° or less	Warm the child with blankets if available. Refer to SHCP
6. Diarrhoea	Take to ORT corner and advise caregiver to give ORT by cup and spoon
7. Vomiting without diarrhoea but with dehydration	Refer to SHCP for assessment
8. Presenting complaint - abdominal pain	younger child - urine bag / older child - urine container
9. Closed fracture	Check with SHCP for analgesia initiation Immobilize affected limb with a simple padded splint or triangular bandage
10. Active ongoing bleeding	Apply pressure to the site of trauma Perform finger prick haemoglobin to obtain a baseline Refer to SHCP
11. History of recent bleeding	Perform finger prick haemoglobin If less than 8 g/dl then refer to SHCP

Assessment Questions

Clearly indicate whether the following statements are true or false:

- A tiny baby under two months should always be referred to the SHCP once they have been comprehensively triaged.
 True False
- A patient with an active ongoing bleed should place the bleeding area under running water.
 True False
- A child that is vomiting only with no diarrhoea should first be referred to the SHCP for further assessment before commencing the child on a trial oral rehydration.
 True False

Choose the correct answer:

- In a child with a burn injury from boiling oil that occurred 20 minutes ago:
 - The burnt area may be covered in cling wrap if available
 - Cool running tap water over the burnt area for 30 minutes may limit the extent of tissue damage
 - The burnt area should be wrapped in a clean sheet to prevent hypothermia
 - a and b
 - a, b and c
- The senior healthcare professional should be consulted in the following cases:
 - Poison ingestion and overdose
 - A severely malnourished child
 - Vomiting only with dehydration
 - a and c
 - a, b and c

8.1 Pre-Hospital

The use of triage within a pre-hospital setting is generally well accepted and understood universally. Whilst this need is quite obvious (even critical) during major incidents, it's the daily application of triage principles in the despatch of ambulance resources where it has the most benefit. In these scenarios, triage permits the EMS dispatcher to apply rules based decision making to what is an otherwise impossible choice.

The pre-hospital use of triage in the field varies from region to region, but is generally categorised into four priorities (represented by the colours red, yellow, green and blue). Such triage typically uses instability of vital signs to differentiate high from low priority patients. Discrepancies in triage appear when personnel of differing levels of medical experience and qualifications need to assess patients as there are no clear definitions of 'unstable' physiology. The terms 'stable' and 'unstable' are poorly understood and fail to accurately reflect the patient's clinical condition.

Accurate pre-hospital triage is essential for appropriate call out of secondary resources, accurate notification of receiving hospitals, and quality assessment and audit of the ambulance service. This is particularly pertinent in aeromedical callout requests and use of this specialised resource. For these reasons triage tools based on objective physiological discriminators are essential.

8.2 Patient streaming

Triage assigns the patient to an acuity level, which then dictates the amount of time the patient can wait safely before being seen: Red immediate, Orange within 10 minutes, Yellow within an hour and Green within four hours. It is the recommended practice to "stream" these patient categories to different areas and/or healthcare providers within the facility. The normal streaming pattern would be Reds to resus, Oranges and Yellows to Majors and Greens to Minors, which would be manned by staff dedicated to these areas. For the most part, streaming patients according to acuity will also stream them according to resource use: full monitoring, access to high-powered drugs and interventions with full team response is necessary to effectively treat the Red patient, while a room with a chair and a single practitioner may be all that is necessary to see and treat the patients in the Green stream. How and where patients are streamed depends on the load, manning and infrastructure of the Emergency Centre or Health Facility.

It is important in any system that prioritises order-to-be-seen by anything other than "first-come-first-served" to have a plan to see the lower priority patients. Streaming is a possible mechanism to achieve this. Without streaming, the Green patient will keep being pushed to the back of the queue by the patient of higher acuity, who by necessity should be seen first. With streaming, the higher acuity patients are seen before they die while the lower acuity patients are seen in another area before they leave!

8.3 Infrastructure

Triage is a process, not a place, but for the most part will need an area for triage of those patients not sent directly through to resus or majors. This area should allow for privacy and be set up in order to perform the vital signs for the TEWS, additional investigations and tasks.

The room should preferably allow for one-way flow of patients from the waiting room into a subwaiting area in the area to which they have been streamed. If not possible, some sort of demarcation of the area or patients should be made in order to separate those already triaged from those who have not been assessed by the triage officer.

8.4 Alignment of staff to temporal flow of patients

It is important that triage, the tool to ensure that patients are assessed timeously, does not become the bottleneck in the system. Importantly, if the doctor is ready for the next patient, but cannot see them as they are "first getting triaged", the object is being defeated!

More often the bottleneck occurs due to failure to align staff with the flow of patients. For the most part, it is possible to predict the times of day when the flow of patients into the EC is heavier (typical "saddle-shaped" curve). Staffing for triage needs to reflect this flow.

There should also be some sort of plan in place to deal with unexpected influx of patients: each facility should have an upper limit of patients that they are willing to have waiting for triage, over which a contingency plan needs to be activated: eg a regional hospital has an agreement that if there are five or more patients needing triage, a nurse is called from majors to help triage the patients until the level is back down to less than five waiting.

SUMMARY

Triage is an essential first step in efficient and effective emergency care –whether on the roadside or in the public or private hospital arena. A robust triage tool will help to save lives and reduce morbidity. The South African Triage Scale has been derived by a panel of experts in Emergency Medicine (doctors, nurses and paramedics), and is scientifically proven. It has been shown to improve waiting times and make the emergency centre run more smoothly. However, attention needs to be paid to those patients triaged Green, especially in peak times, and the SATG recommends the use of streaming with a clinical nurse practitioner or doctor to see this group.

The SATS has been validated as part of a Masters in Philosophy (MPhil) with 700 public sector patients, an MPhil with 2000 private sector patients and a PhD. Feedback following publication in four major journals has contributed to the process.

This is Edition 3 and we accept that the tool may not be perfect, that is why your feedback is so important. In addition, there will be ongoing research aimed at keeping the tool accurate and appropriate. If necessary, subsequent editions will follow.

Online resources:

For further information please visit

www.emssa.org.za/sats

Contact details:

Michele Twomey

SATS Implementation Advisor

082 850 3281

micheletwomey@gmail.com

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Department of Health
PO Box 2060, Cape Town, 8000
For more information contact:
Michele Twomey (SATS Implementation Advisor)
Mobile: +27 850 3281 **email:** micheletwomey@gmail.com
Departmental Website: www.health.gov.za
Provincial Website: www.westerncape.gov.za



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