GRASPIT

GLOBAL RECOGNITION & ASSESSMENT OF THE SICK PATIENT & INITIAL TREATMENT

National Resuscitation Council of Kenya

GLOBAL RECOGNITION AND ASSESSMENT OF THE SICK PATIENT AND INITIAL TREATMENT

It's as easy as ... A B C D E

v3/12.2015

GRASP IT

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GRASPIT is supported by the Tropical Health & Education Trust (THET) as part of the Health Partnership Scheme, which is funded by the UK Department for International Development (DFID) and the charities EGHO and MEAK.

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CONTENTS

Global Recognition and Assessment of the Sick Patient and Initial Treatment

Paediatric ABCDE

This pocket book manual aims to highlight the basic steps in assessment of the deteriorating patient including the initial management.

The failure to recognise the deteriorating acutely ill patient is well recognised as a significant risk factor for a poor outcome. This is often due to failure to take and record appropriate observations and/or a failure to recognise abnormal vital signs with appropriate timely actions. The interventions required are often relatively simple in nature (simple airway management, oxygen therapy, intravenous fluids coupled with escalation for senior clinical review), but have a profound impact on the patients chances for survival.

Using a structured approach to assessment ensures that the most life threatening problems are managed in a timely manner.

At each stage of assessment look, listen, and feel

AIRWAY

Is it patent? If not consider airway opening manoeuvres and airway adjuncts

BREATHING

Rate, rhythm, depth, symmetry
SpO2 and give oxygen if appropriate

CIRCULATION

Pulse - rate, rhythm, volume, peripheral temperature
Blood Pressure - capillary refill, urine output
Insert cannula and give IV fluids if appropriate

DISABILITY

Assess level of consciousness using AVPU
Check blood sugar and pupils if reduced

EXPOSURE

Top to toe examination and check temperature

AIRWAY

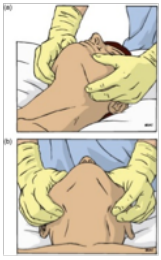
If the patient is not able to speak to you then you must assess the airway.

This should be done by **looking, listening and feeling** for signs of obstruction.

If you suspect a cervical spine injury think jaw thrust and immobilise.

Look and listen for any noises such as gurgling this may be due to liquid in the mouth or upper airway that could be suctioned.

Snoring may indicate tongue obstruction therefore perform the head tilt chin lift manoeuvre.



Jaw thrust

Head tilt, chin lift

UK Resuscitation Council

Stridor may indicate partial obstruction, feel for any air movement.

Any airway obstruction GET HELP IMMEDIATELY.

Give high flow oxygen!

Airway adjuncts

Oral pharyngeal

Size by measuring from the incisors to the angle of the jaw.

Naso pharyngeal

Size by measuring from tip of the nose to the tragus of the ear

BREATHING

Observe the rate, rhythm, depth and the symmetry of breathing. **Respiratory rate is the single most important vital sign for predicting the onset of critical illness.**

The normal respiratory rate is between 12-20 per minute. Start to investigate cause if rate is above 20 or below 10.

Note if there is any use of accessory muscles. Is the patient able to speak in complete sentences?

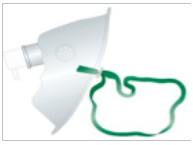
If you have access to pulse oximetry use it. Titrate oxygen delivery to a target O_2 saturation of 94-98% for most acutely unwell patients.

88-92% for those patients at risk of hypercapnic (CO_2 retention) respiratory failure.

Oxygen delivery devices

Nasal prongs

2-6 l/min oxygen flow which will deliver approximately 24-50% FiO_2



Simple face mask

5-10l/min oxygen flow which will deliver approximately 35-60% FiO_2

Venturi masks

oxygen delivery depends on adapter used 24%, 28%, 31%, 35%, 40% available

High concentration performance mask

15l/min oxygen flow rate and will deliver approximately 80% FiO_2

British Thoracic Society Guidelines (2008)

Interventions *Treat underlying cause.* Consider position of the patient, encourage deep breathing and coughing. Treat when indicated with nebulizers, antibiotics and analgesia.

CIRCULATION

Pulse rate is it regular or irregular, weak or bounding?

Blood pressure generally we should start to be concerned if the BP is below 100 systolic or the heart rate is above 100. However this is not an absolute, it is much more useful to monitor trends and if there are any effects from hypotension. This may include signs of dehydration, shallow rapid breathing, low urine output, cool peripheries,confusion or reduced level of consciousness.

Capillary refill press centrally for 5 seconds, colour should return within 2 seconds. If it is delayed it may be a sign of inadequate perfusion. This can be difficult to observe on black skin therefore use the nail bed.

Peripheries feel the limb temperature do they feel cold? This could be a sign of inadequate perfusion.

Regardless of numbers if you note that the heart rate is greater than the systolic blood pressure this is not a good sign and should be investigated.

If the patient is hypotensive, tachycardic with a slow capillary refill, consider giving a fluid challenge.

500mls Normal saline or Hartmann's over 5 minutes.

200mls if known cardiac history.

MONITOR EFFECT

If no effect, consider another fluid challenge.

If blood pressure improves but drops again, consider another fluid challenge.

If the blood pressure remains improved the patient may be adequately filled.

Interventions Initial treatment is a fluid challenge. Further treatment will depend on underlying cause.

SHOCK

Blood pressure insufficient to perfuse tissues =

- Hypotension + organ dysfunction
- DOES NOT CORRELATE TO A SET NUMBER

Systemic inflammatory response (SIRS) A non-specific clinical response including **2** of the following:

Temperature ›38.3°C or ‹36°C

Heart rate ›90 beats/min

Respiratory rate ›20/min

White blood cell count ›12,000/mm^3 or ‹4,000/mm^3 or ›10% immature neutrophils

As well as infection, SIRS can also be caused by trauma, burns, pancreatitis and other insults.

Sepsis = SIRS with a presumed or confirmed infectious process

Types of Shock

Hypovolaemic shock	Haemorrhage, diarrhoea, vomiting, dehydration, burns.
Distributive Shock	Sepsis, anaphylaxis, acute adrenal insufficiency, neurogenic shock.
Obstructive Shock	Pulmonary embolism, tension pneumothorax, cardiac tamponade.
Cardiogenic Shock	Cardiac failure.

OLIGURIA

Low urine output that may lead to acute kidney injury if not treated.

In the adult expect 0.3 - 0.5mls/kg/hr.
If this is not achieved consider why not?

Pre renal Is the blood pressure adequate to perfuse the kidneys?
Sepsis, diarrhoea, vomiting, haemorrhage?

Intra renal Is the kidney damaged?
Infection, nephrotoxic drugs, ischaemia, poisons?

Post renal Is there an obstruction to flow?
Prostate, renal stones, clots, tumour.

Investigate and treat the cause.

DISABILITY

Assess level of consciousness using the AVPU scale.

A Is the patient **A**lert?

V Is the patient only responding to **V**oice?

P Is the patient responding to **P**ainful stimuli?

U Is the patient **U**nresponsive?

Report if the patient is assessed to be V, P, or U.

Common causes of reduced level of consciousness.

HYPOXIA, HYPOTENSION AND HYPOGLYCAEMIA

Other causes might include drugs, low or high temperature, low sodium, reduced thyroid levels, a high CO2, or an intra cerebral problem.

EXPOSURE

Top to toe examination. Check the temperature. Look for signs of infection, bruising, rash. Is the abdomen tender? Is there any calf swelling/tenderness?

Consider further investigations such as:

Bloods/arterial blood gas

Infection screen

ECG/ECHO

Chest/abdominal X-ray

Ultra sound scan

CT

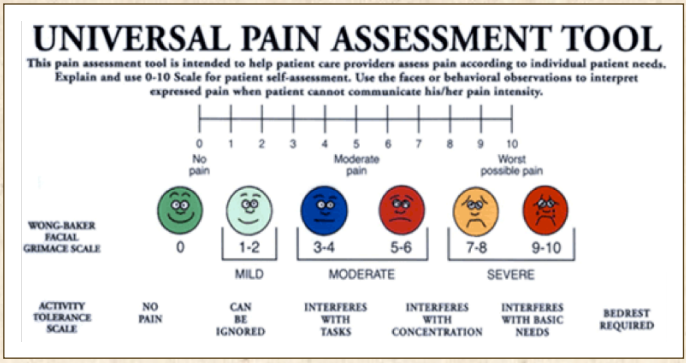
PAIN ASSESSMENT

It is very important to assess and manage the patient in pain.

Benefits of this may include early mobilization that will reduce the risk of pulmonary embolism, chest infection, ileus and pressure sores. It will also have an impact on early discharge from hospital.

Untreated acute pain may lead to chronic pain issues.

There are a number of available tools to assist with assessment of pain.



If pain occurs, there should be prompt oral administration of drugs in the following order: nonopioids (paracetamol/aspirin); then, as necessary, mild opioids (codeine); then strong opioids such as morphine, until the patient is free of pain.

For optimal benefit give analgesia regularly not on demand.

World Health Organisation (1986)

COMMUNICATION

Communication failures are a major contributing factor in adverse events in healthcare.

The SBAR tool aims to offer a structured approach to communication.

SITUATION	Who you are
	Where are you phoning from
	Name of the patient
	What is the main problem?
BACKGROUND	Admitting diagnosis
	Relevant past medical history
	Treatment to date
ASSESSMENT	Your assessment of the situation
RECOMMENDATION	What do you want from this person? be specific
	Is there anything I can do before you get here?
	Document the call
	Call again if you do not get the response you want

Consider further investigations and management plan.

VITAL SIGNS MONITORING PLAN

Regular and accurate vital signs monitoring is an essential component in recognising the deteriorating patient and when assessing response to treatment.

A clear written monitoring plan should therefore be established for the individual patient following assessment. This can be done by the nurse or the doctor. It is also useful to agree desirable parameters and to document clarity on when to call the doctor in the event of deterioration.

1 HOURLY	If the patient is very sick it may be appropriate to increase the vital signs monitoring and report further deterioration
2-4 HOURLY	If the patient shows signs of improvement following treatment
4-6 HOURLY	If the patient is at risk of deterioration but is currently stable
12 HOURLY	Would be appropriate for the clinically well patient who is maybe ready to home

Monitoring deterioration is of no use unless we act and often it is the simple things that can have the greatest impact.

Consider

Oxygen and appropriate positioning

Fluids

Antibiotics

Analgesia

Physiotherapy

Nutrition

Early mobilisation

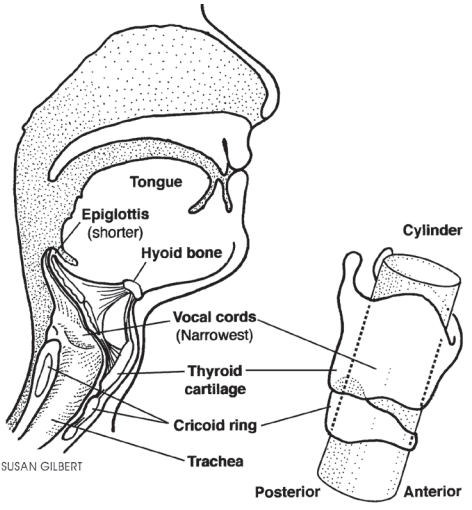
PAEDIATRIC ABCDE

Children are **NOT** mini adults, they differ:

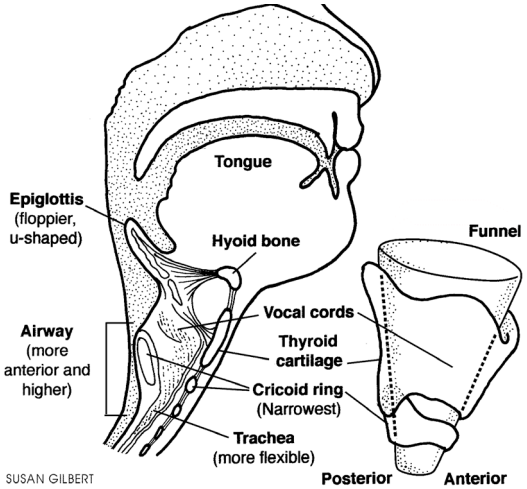
- Anatomically
- Physiologically
- Behaviourally
- Intellectually
- Socially
- Emotionally

ANATOMICAL DIFFERENCES:

Adult Airway - Anatomy of adult airway



Paediatric Airway - Anatomy of paediatric airway



KEY DIFFERENCES OF A CHILD'S AIRWAY AND BREATHING

- Head and neck; larger in relation to rest of body, protuberant occiput, can cause flexion on the neck, when child in supine position.
- More anterior and higher airway position thus, more difficult to visualise chords.
- Short neck – infant necks are short and chubby making it difficult to palpate a carotid pulse.
- "Floppy" epiglottis; narrow point at cricoid and pliable cartilage, therefore do not use Sellick's manoeuvre (cricoid pressure); cricoid rings not fully developed until 8yrs; alveoli (24 million at birth – 296 million at 8 years old) and surfactant is secreted at 32 weeks gest; soft palate.
- Supporting airway cartilage and airway muscles are not developed until school age so laryngospasm and bronchospasm may produce airway obstruction and perhaps can contribute to lack of infant response to bronchodilator therapy.
- Small, narrow airways so can plug off easily with mucous.

SIGNS OF INCREASED WORK OF BREATHING IN INFANTS AND CHILDREN

Sign	Infant	Child
Nasal flare	✗	✗
Substernal recession	✗	✗
Supraclavicular recession		✗
Subcostal recession	✗	✗
Intercostal recession	✗	✗
Sternal recession	✗	
See-saw breathing	✗	

PHYSIOLOGICAL DIFFERENCES

The following are key physiological differences between children and adults:

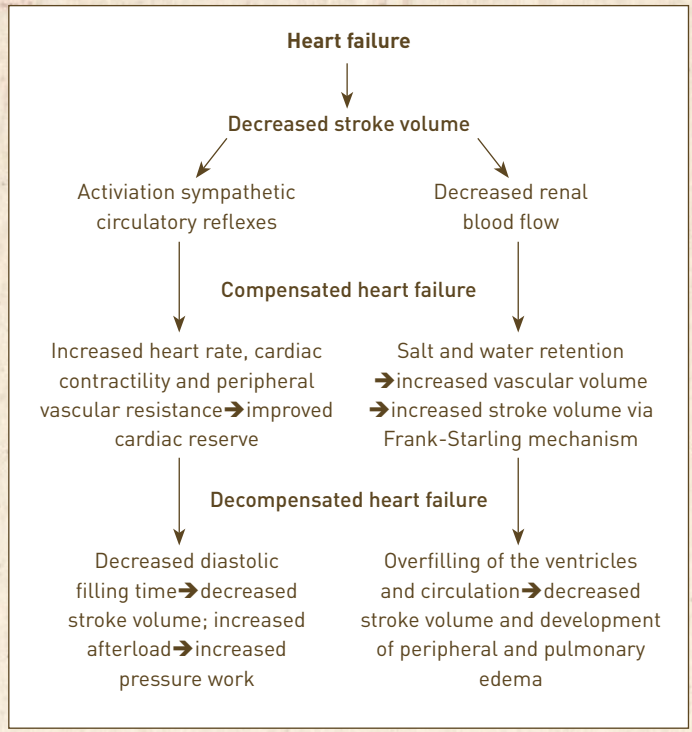
↑ RESPIRATORY RATE (RR)

- Preferential nasal breathers until 6 months of age.
- Lungs are immature.
- Diaphragm is predominant respiratory muscle and are diaphragmatic breathers until 2 years of age. Therefore, look at their abdomen to count respiratory rate.
- Gastric distension can then significantly impair ventilation.

↑ HEART RATE (HR)

- **Cardiac Output = Stroke Volume x Heart Rate.**
- Child cannot increase contractility therefore will increase HR to improve CO.

Sequence of events in compensated and decompensated heart failure



BLOOD PRESSURE (BP)

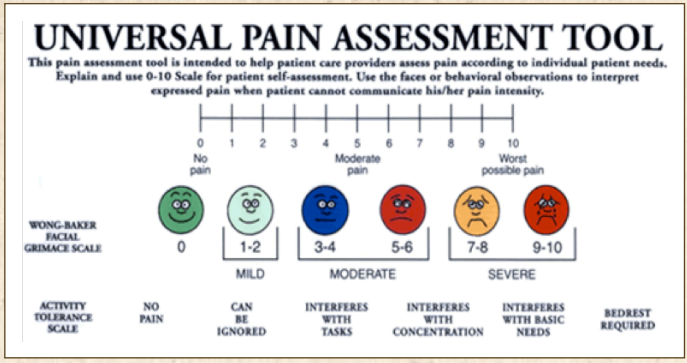
- Low BP is a pre-terminal sign & normal BP is a poor indicator of cardiac output.

ABILITY TO COMPENSATE

- Child has higher metabolic rate which explains the increased oxygen demand.
- Renal and hepatic systems are immature which will affect the ability to metabolise and clear drugs.
- Hyperthermia /Pain = increase sedation.

BEHAVIOURAL DIFFERENCES

- Appropriate for developmental stage.
- Know what is normal for the child.
- May regress to earlier stage due to illness/injury.
- Acknowledge parent/guardian's concern.
- A compliant child is an unwell child.



STRUCTURE – LOOK, LISTEN AND FEEL

A structured approach is crucial and should be done in a logical, sequential order using:

- **Airway** ventilation (+/- c spine)
- **Breathing** hypoxia/oxygenation
- **Circulation** hypovolaemia/perfusion
- **Disability** conscious level
- **Exposure** fully examine child

Airway – is the airway clear, compromised or obstructed?

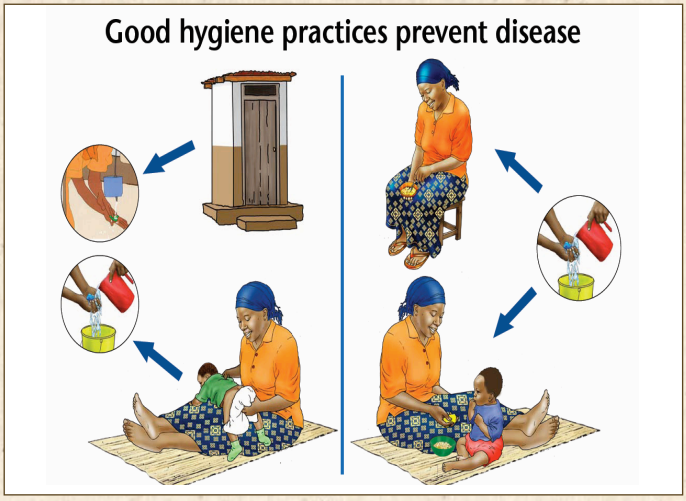
Breathing – work of breathing, accessory muscle use, nasal flaring, grunting, respiratory rate, oxygen saturations and colour.

Circulation – pulse, palpate pulses peripherally and centrally, temperature, capillary refill time, blood pressure, fluid intake and urine output.

Disability – responsiveness using AVPU are they Alert, responding to Voice, responding to Pain or Unresponsive, pupil size and Don't Ever Forget Glucose.

Exposure – look front, back and head-to-toe for bleeding, bruises, breaks and burns.

Document what you find and what you don't find.



PAEDIATRIC VITAL SIGNS

AGE	RESPIRATIONS (Breaths per minute)
❮ 1 year	**30 - 40**
1 - 2 years	**26 - 34**
2 - 5 years	**24 - 30**
5 - 12 years	**20 - 24**
❯ 12 years	**12 - 20**

AGE	HEART RATE (beats per minute)
Newborn - 3 months	**140**
3 months - 2 years	**130**
2 years - 10 years	**80**
❯ 10 years	**75**

AGE	SYSTOLIC BLOOD PRESSURE
0 - 1 month	**❯ 60**
1 - 12 months	**80**
1 - 10 years	**90 + (2 x age in years)**
❯ 10 years	**120**

HELPFUL FORMULAS

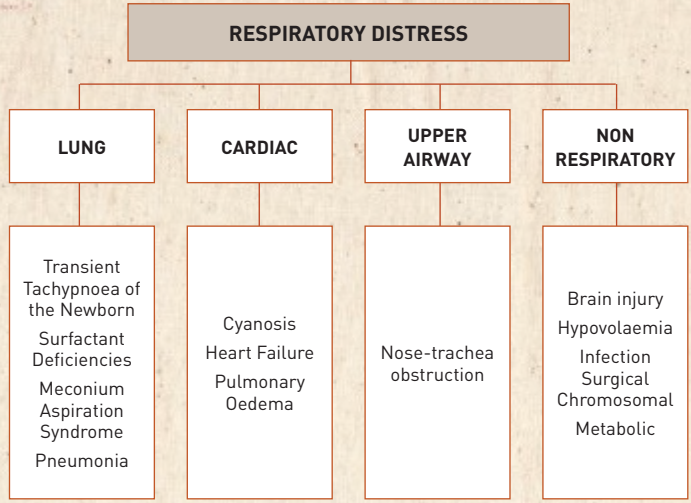
Estimating weight:		
Age in months +9 ÷ 2	OR	Age in years +4 x 2
Calculating Fluid:		
100mls/kg for the first 10kg	OR	4mls/kg for the first 10kg
50mls/kg for the next 10kg	OR	2mls/kg for the next 10kg
20mls/kg for every kg after	OR	1ml/kg for every kg after
e.g weight = 16kg		
100mls x 10kg = 1000mls	OR	4mls x 10kg = 40mls
+50mls x 6kg = 300mls	OR	+2mls x 6kg = 12mls
Total = 1300mls in 24 hours 1300 ÷ 24 = 54.2mls/hour	OR	Total = 52mls/hour

NEONATAL MANAGEMENT

- A **NEONATE** is defined as from birth to 1 month old.
- There are 2 factors that have a critical influence on foetal well-being throughout gestation: placental function and the inherent maternal resources.
- The interplay of these is a major determinant of foetal oxygenation, metabolism and growth.
- Apgars: **HEART RATE; RESPIRATORY EFFORT; MUSCLE TONE; REFLEX IRRITABILITY; COLOUR**. These are measured at the time of birth and 10 minutes after.

Management of the neonate requires following ABCDE and also considering the following:

Respiratory



Cardiovascular

- Consideration of **FOETAL CIRCULATION**. Foetal circulation enables the foetus to oxygenate. 3 shunts should close: ductus venosus; ductus arteriosus and foramen ovale.
- PVR is high in utero then falls. Cardiac output the infant can only really in increase HR because SV not fully controllable.
- Dysrrhythmias are not uncommon – due to immature conduction system

Thermoregulation

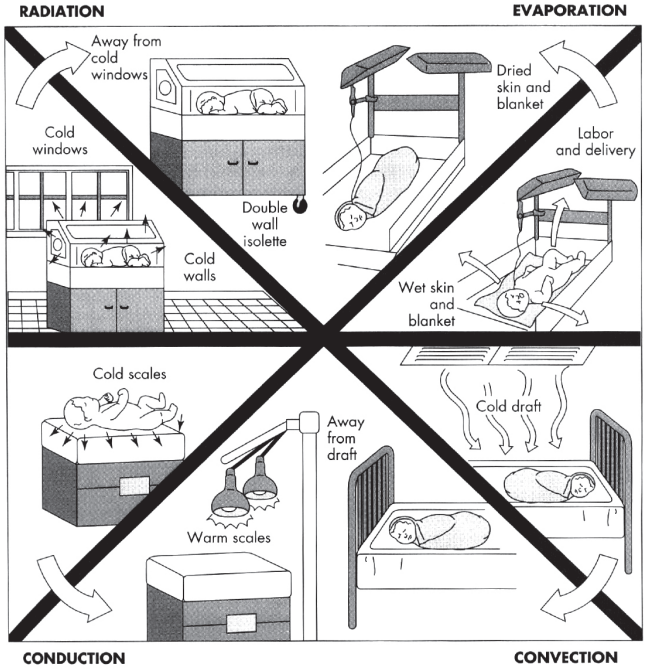
4 ways neonates lose heat are: **CONVECTION; CONDUCTION; EVAPORATION & RADIATION**.

CONVECTION = transfer of heat from body surface to the surrounding air via the current.

CONDUCTION = transfer of heat from one solid object to a cooler solid object which is in direct contact with it.

EVAPORATION = heat loss occurring during conversion of liquid to gas.

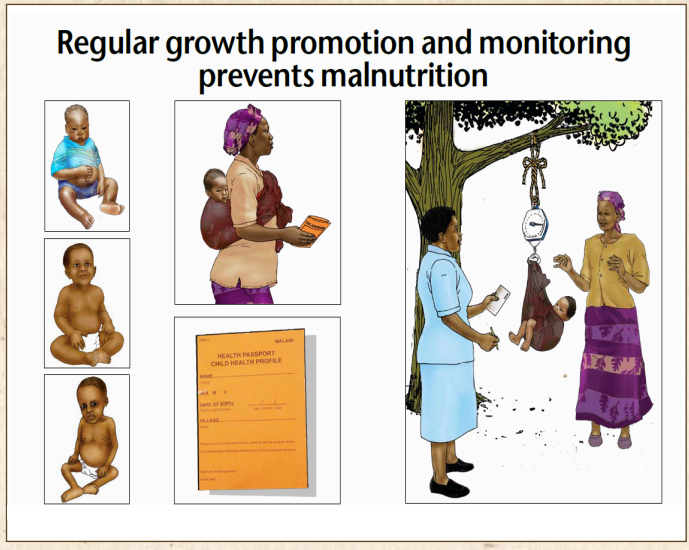
RADIATION = transfer of heat to cooler solid objects not in direct contact with the body.



Hypoglyacaemia – treat underlying causes; monitor fluid balance; increase in metabolic demands will decrease blood sugar.

Jaundice / Anaemia – monitor haemoglobin; observe for lethargy; promote feeding.

Nutrition – MONITOR REGULARLY and encourage calories.



ASSESSMENT AND MEASUREMENT OF MALNUTRITION

You need 4 things:

AGE	SEX	LENGTH (or HEIGHT)	WEIGHT

- Be accurate
- Use the same equipment for all
- Get a full date of birth
- Use the right chart for age and gender
- Document

Less than 2 years old – measure lying down

Consider also Mid-Upper Arm Circumference (MUAC)

System	Cut-off	Malnutrition classification
WHO	< -1 Z-score	mild
	< -2 Z-score	moderate
	< -3 Z-score	severe

Weight-for-Length Reference Card (below 87 cm)

Boys' weight (kg)					Length	Girls' weight (kg)				
-4 SD	-3 SD	-2 SD	-1 SD	Médian	(cm)	Médian	-1 SD	-2 SD	-3 SD	-4 SD
1.7	1.9	2.0	2.2	2.4	45	2.5	2.3	2.1	1.9	1.7
1.8	2.0	2.2	2.4	2.6	46	2.6	2.4	2.2	2.0	1.9
2.0	2.1	2.3	2.5	2.8	47	2.8	2.6	2.4	2.2	2.0
2.1	2.3	2.5	2.7	2.9	48	3.0	2.7	2.5	2.3	2.1
2.2	2.4	2.6	2.9	3.1	49	3.2	2.9	2.6	2.4	2.2
2.4	2.6	2.8	3.0	3.3	50	3.4	3.1	2.8	2.6	2.4
2.5	2.7	3.0	3.2	3.5	51	3.6	3.3	3.0	2.8	2.5
2.7	2.9	3.2	3.5	3.8	52	3.8	3.5	3.2	2.9	2.7
2.9	3.1	3.4	3.7	4.0	53	4.0	3.7	3.4	3.1	2.8
3.1	3.3	3.6	3.9	4.3	54	4.3	3.9	3.6	3.3	3.0
3.3	3.6	3.8	4.2	4.5	55	4.5	4.2	3.8	3.5	3.2
3.5	3.8	4.1	4.4	4.8	56	4.8	4.4	4.0	3.7	3.4
3.7	4.0	4.3	4.7	5.1	57	5.1	4.6	4.3	3.9	3.6
3.9	4.3	4.6	5.0	5.4	58	5.4	4.9	4.5	4.1	3.8
4.1	4.5	4.8	5.3	5.7	59	5.6	5.1	4.7	4.3	3.9
4.3	4.7	5.1	5.5	6.0	60	5.9	5.4	4.9	4.5	4.1
4.5	4.9	5.3	5.8	6.3	61	6.1	5.6	5.1	4.7	4.3
4.7	5.1	5.6	6.0	6.5	62	6.4	5.8	5.3	4.9	4.5
4.9	5.3	5.8	6.2	6.8	63	6.6	6.0	5.5	5.1	4.7
5.1	5.5	6.0	6.5	7.0	64	6.9	6.3	5.7	5.3	4.8
5.3	5.7	6.2	6.7	7.3	65	7.1	6.5	5.9	5.5	5.0
5.5	5.9	6.4	6.9	7.5	66	7.3	6.7	6.1	5.6	5.1
5.6	6.1	6.6	7.1	7.7	67	7.5	6.9	6.3	5.8	5.3
5.8	6.3	6.8	7.3	8.0	68	7.7	7.1	6.5	6.0	5.5
6.0	6.5	7.0	7.6	8.2	69	8.0	7.3	6.7	6.1	5.6
6.1	6.6	7.2	7.8	8.4	70	8.2	7.5	6.9	6.3	5.8
6.3	6.8	7.4	8.0	8.6	71	8.4	7.7	7.0	6.5	5.9
6.4	7.0	7.6	8.2	8.9	72	8.6	7.8	7.2	6.6	6.0
6.6	7.2	7.7	8.4	9.1	73	8.8	8.0	7.4	6.8	6.2
6.7	7.3	7.9	8.6	9.3	74	9.0	8.2	7.5	6.9	6.3
6.9	7.5	8.1	8.8	9.5	75	9.1	8.4	7.7	7.1	6.5
7.0	7.6	8.3	8.9	9.7	76	9.3	8.5	7.8	7.2	6.6
7.2	7.8	8.4	9.1	9.9	77	9.5	8.7	8.0	7.4	6.7
7.3	7.9	8.6	9.3	10.1	78	9.7	8.9	8.2	7.5	6.9
7.4	8.1	8.7	9.5	10.3	79	9.9	9.1	8.3	7.7	7.0
7.6	8.2	8.9	9.6	10.4	80	10.1	9.2	8.5	7.8	7.1
7.7	8.4	9.1	9.8	10.6	81	10.3	9.4	8.7	8.0	7.3
7.9	8.5	9.2	10.0	10.8	82	10.5	9.6	8.8	8.1	7.5
8.0	8.7	9.4	10.2	11.0	83	10.7	9.8	9.0	8.3	7.6
8.2	8.9	9.6	10.4	11.3	84	11.0	10.1	9.2	8.5	7.8
8.4	9.1	9.8	10.6	11.5	85	11.2	10.3	9.4	8.7	8.0
8.6	9.3	10.0	10.8	11.7	86	11.5	10.5	9.7	8.9	8.1

Weight-for-Height Reference Card (87 cm and above)

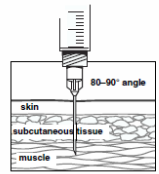
Boys' weight (kg)					Height	Girls' weight (kg)				
-4 SD	-3 SD	-2 SD	-1 SD	Médian	(cm)	Médian	-1 SD	-2 SD	-3 SD	-4 SD
8.9	9.6	10.4	11.2	12.2	87	11.9	10.9	10.0	9.2	8.4
9.1	9.8	10.6	11.5	12.4	88	12.1	11.1	10.2	9.4	8.6
9.3	10.0	10.8	11.7	12.6	89	12.4	11.4	10.4	9.6	8.8
9.4	10.2	11.0	11.9	12.9	90	12.6	11.6	10.6	9.8	9.0
9.6	10.4	11.2	12.1	13.1	91	12.9	11.8	10.9	10.0	9.1
9.8	10.6	11.4	12.3	13.4	92	13.1	12.0	11.1	10.2	9.3
9.9	10.8	11.6	12.6	13.6	93	13.4	12.3	11.3	10.4	9.5
10.1	11.0	11.8	12.8	13.8	94	13.6	12.5	11.5	10.6	9.7
10.3	11.1	12.0	13.0	14.1	95	13.9	12.7	11.7	10.8	9.8
10.4	11.3	12.2	13.2	14.3	96	14.1	12.9	11.9	10.9	10.0
10.6	11.5	12.4	13.4	14.6	97	14.4	13.2	12.1	11.1	10.2
10.8	11.7	12.6	13.7	14.8	98	14.7	13.4	12.3	11.3	10.4
11.0	11.9	12.9	13.9	15.1	99	14.9	13.7	12.5	11.5	10.5
11.2	12.1	13.1	14.2	15.4	100	15.2	13.9	12.8	11.7	10.7
11.3	12.3	13.3	14.4	15.6	101	15.5	14.2	13.0	12.0	10.9
11.5	12.5	13.6	14.7	15.9	102	15.8	14.5	13.3	12.2	11.1
11.7	12.8	13.8	14.9	16.2	103	16.1	14.7	13.5	12.4	11.3
11.9	13.0	14.0	15.2	16.5	104	16.4	15.0	13.8	12.6	11.5
12.1	13.2	14.3	15.5	16.8	105	16.8	15.3	14.0	12.9	11.8
12.3	13.4	14.5	15.8	17.2	106	17.1	15.6	14.3	13.1	12.0
12.5	13.7	14.8	16.1	17.5	107	17.5	15.9	14.6	13.4	12.2
12.7	13.9	15.1	16.4	17.8	108	17.8	16.3	14.9	13.7	12.4
12.9	14.1	15.3	16.7	18.2	109	18.2	16.6	15.2	13.9	12.7
13.2	14.4	15.6	17.0	18.5	110	18.6	17.0	15.5	14.2	12.9
13.4	14.6	15.9	17.3	18.9	111	19.0	17.3	15.8	14.5	13.2
13.6	14.9	16.2	17.6	19.2	112	19.4	17.7	16.2	14.8	13.5
13.8	15.2	16.5	18.0	19.6	113	19.8	18.0	16.5	15.1	13.7
14.1	15.4	16.8	18.3	20.0	114	20.2	18.4	16.8	15.4	14.0
14.3	15.7	17.1	18.6	20.4	115	20.7	18.8	17.2	15.7	14.3
14.6	16.0	17.4	19.0	20.8	116	21.1	19.2	17.5	16.0	14.5
14.8	16.2	17.7	19.3	21.2	117	21.5	19.6	17.8	16.3	14.8
15.0	16.5	18.0	19.7	21.6	118	22.0	19.9	18.2	16.6	15.1
15.3	16.8	18.3	20.0	22.0	119	22.4	20.3	18.5	16.9	15.4
15.5	17.1	18.6	20.4	22.4	120	22.8	20.7	18.9	17.3	15.6

How to Administer Intramuscular (IM) Injections

Administer these vaccines via intramuscular (IM) route: DTaP, DT, Td, Hib, hepatitis A, hepatitis B, influenza, PCV7. Administer IPV and PPV23 either IM or SC.

Patient age	Site	Needle size	Needle insertion
Infants (birth to 12 mos. of age)	Vastus lateralis muscle in anterolateral aspect of middle or upper thigh	7/8" to 1" needle, 23–25 gauge	Use a needle long enough to reach deep into the muscle. Insert needle at an 80–90° angle to the skin with a quick thrust. There are no data to document the necessity of aspiration.* Multiple injections given in the same extremity should be separated by a minimum of 1".
Young children (12 to 36 mos. of age)	Vastus lateralis muscle preferred until deltoid muscle has developed adequate mass	7/8" to 1" needle, 23–25 gauge	
Older children (>36 mos. of age) and adults	Thickest portion of deltoid muscle—above level of armpit and below acromion	1" to 2" needle, 23–25 gauge	

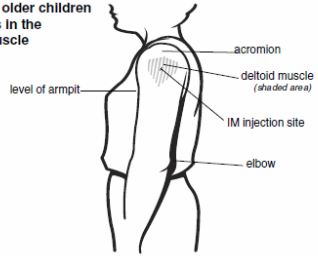
*American Academy of Pediatrics. *2000 Red Book: Report of the Committee on Infectious Diseases*: p.18.



IM site for infants and young children in the anterolateral thigh

Insert needle at an 80–90° angle into vastus lateralis muscle in the anterolateral aspect of middle or upper thigh.

IM site for older children and adults in the deltoid muscle



Insert needle at an 80–90° angle into densest portion of deltoid muscle—above the level of armpit and below the acromion.

Adapted by the Immunization Action Coalition courtesy of the Minnesota Department of Health

www.immunize.org/catg.d/p2020.pdf • Item # P2020 (07/02)

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Notes

It's as easy as ... A B C D E

Adults and Children

AIRWAY

Is it patent? If not consider airway opening manoeuvres and airway adjuncts

BREATHING

Rate, rhythm, depth, symmetry
SpO2 and give oxygen if appropriate

CIRCULATION

Pulse - rate, rhythm, volume, peripheral temperature
Blood Pressure - capillary refill, urine output
Insert cannula and give IV fluids if appropriate

DISABILITY

Assess level of consciousness using AVPU
Check blood sugar and pupils if reduced

EXPOSURE

Top to toe examination and check temperature

GRASPIT is supported by the Tropical Health & Education Trust (THET) as part of the Health Partnership Scheme, which is funded by the UK Department for International Development (DFID) and the charities EGHO and MEAK.