Pediatric Emergency Assessment: General Assessment For MO






CASE SCENARIO:

A 7 year old child came to the emergency with fever and lethargy.

How you will evaluate this child?

IMPORTANT CONSIDERATIONS

- Differs from adult assessment
- Adapt your assessment skills
- Have age-appropriate equipment
- Review age-appropriate vital signs

LEARNING OBJECTIVES

- Recognition of a sick child and act accordingly
- Masterly approach- "3R"

Recognition, Resuscitation, Refer

RECOGNIZE

RESUSCITATE

REFER

CONTD…

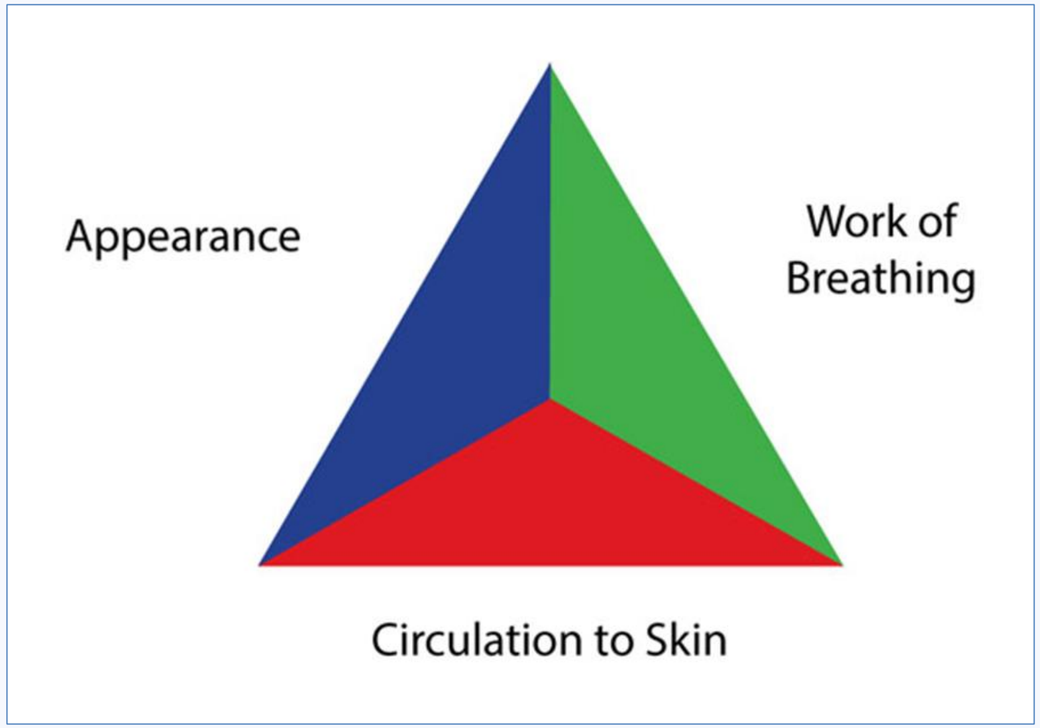
- Recognition of a sick child
- Paediatric Assessment Triangle
- Primary Assessment- Pentagon

1)Initial impression

2)Primary assessment

3)Secondary assessment

4)Diagnostic test



Appearance

Breathing

Color

Pediatric Assessment Triangle (PAT)

APPEARANCE

TICLS

- **T**one: general posture
- **I**nteractive: responsive/ unresponsive/ lethargic
- **C**onsolable: crying
- **L**ook : looking at mother/ vacant gaze
- **S**peech : able to/ paucity/ weak/ hoarseness of voice

Grossly abnormal appearance requires immediate life-support interventions

Abnormality in any parameter means brain dysfunction due to primary or secondary hypoxia (respiratory/circulatory insufficiency).

BREATHING

- Apnea
- Tachyapnea / bradypnea
- Audible sounds
- Regular smooth/ asynchronous
- Use of accessory muscles

Reflects attempt to compensate for abnormalities in oxygenation, ventilation

Grossly abnormal Breathing requires immediate life-support interventions

COLOUR

- Pallor- anemia/hemorrhage
- Bruises, ecchymosis, petechial-bleeding diathesis
- Mottling/dusky- vasomotor instability
- Cyanosis
- Active bleeding

Identify
Any abnormality indicates- Primary circulatory insufficiency

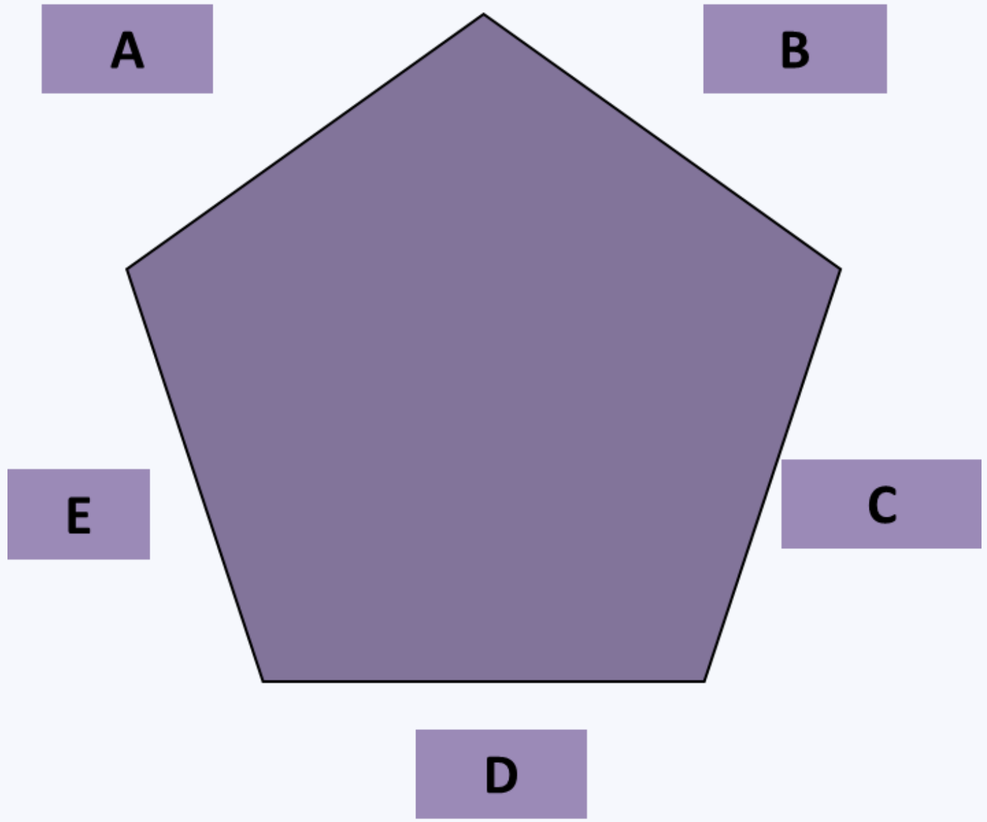
Requires immediate life-support interventions

- If Life-threatening on initial impression
  - Activate the Emergency response system
  - Initiate life-saving measures based on the scope of practice
    - Open The Airway and provide oxygen
    - Attach monitor and AED
    - Check for pulse
    - Provide CPR if needed (central pulse absent/<60)
    - I.V. / IO Access, Fluids, and medications

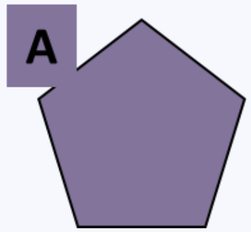
- Proceed for further evaluation after initial stabilization/ all parameters normal.

FURTHER EVALUATION: PRIMARY ASSESSMENT

- Airway
- Breathing
- Circulation
- Disability
- Exposure



ASSESSMENT PENTAGON



AIRWAY

Look for the movement of chest or the abdomen

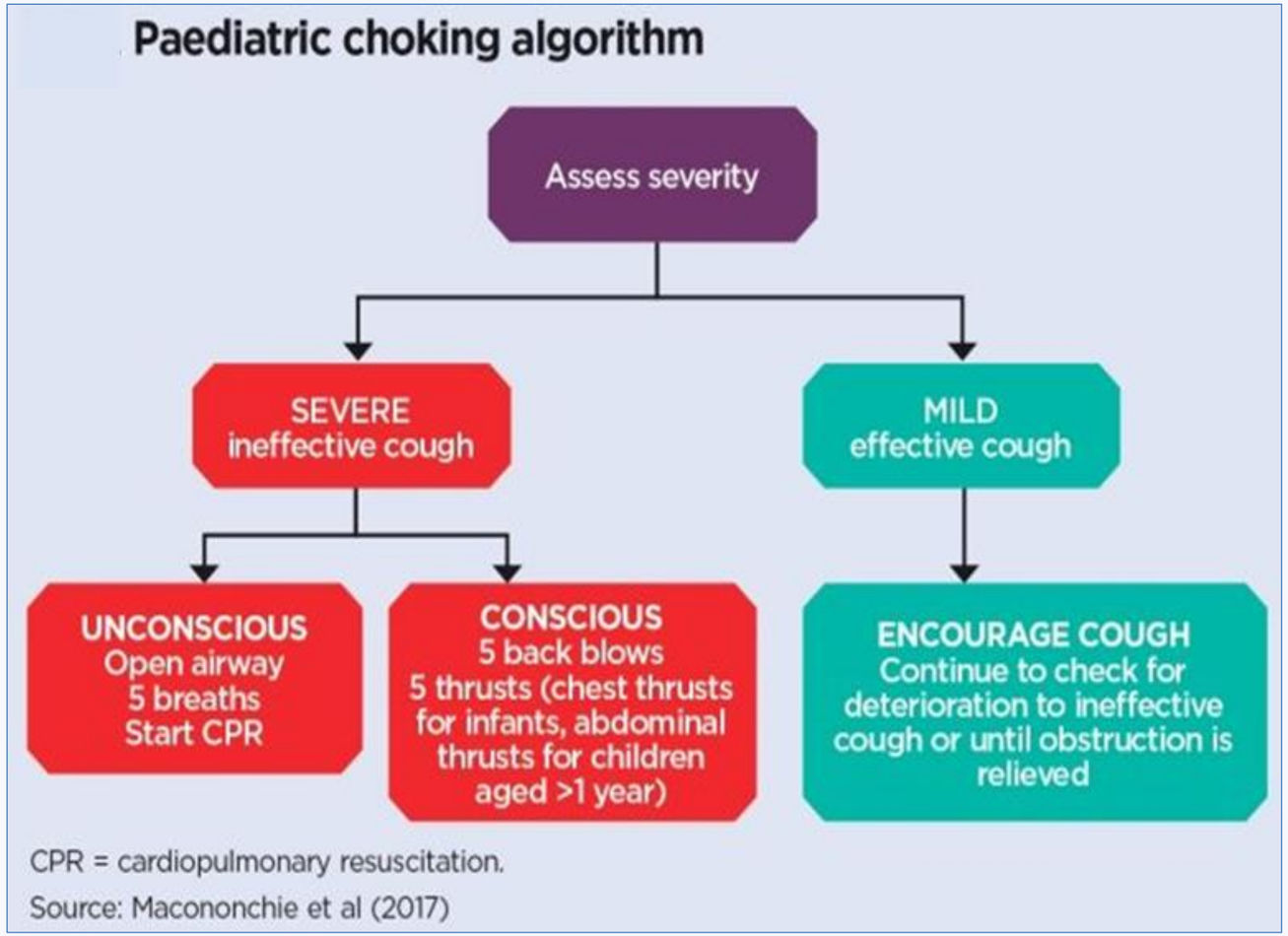
Listen for the air movement and breath sounds

Decide the status:

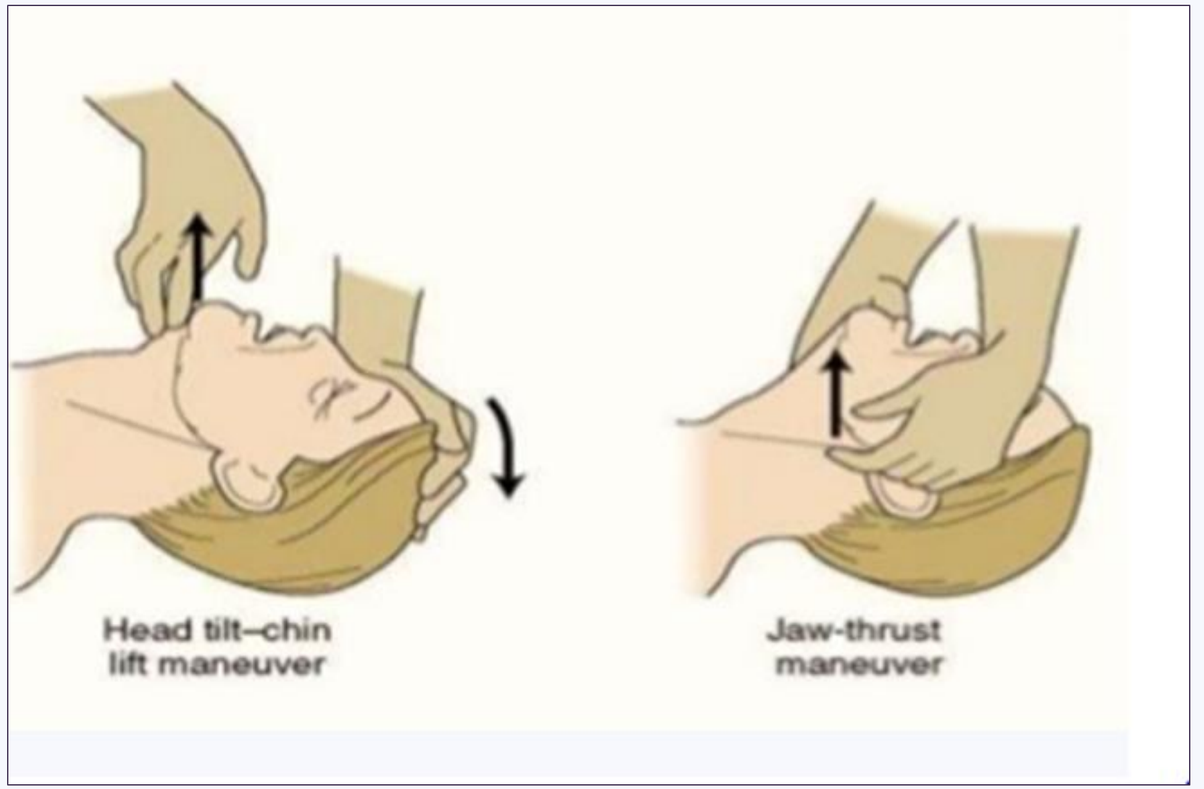
Identification	Intervention
Open airway	clear & unobstructed
Maintainable	Maintained by *simple measures*
Not Maintainable	Needs *advanced measures*

SIMPLE MEASURES:	Allow position of comfort, head tilt-chin lift, Hemlich or backslaps – chest thrusts, oropharyngeal /nasopharyngeal airway
ADVANCED MEASURES:	ET placement, LMA, Laryngoscopy/bronchoscopy for FB, CPAP

CHOKING


Paediatric choking algorithm
Assess severity
SEVERE
ineffective cough
MILD
effective cough
UNCONSCIOUS
Open airway
5 breaths
Start CPR
CONSCIOUS
5 back blows
5 thrusts (chest thrusts for infants, abdominal thrusts for children aged >1 year)
ENCOURAGE COUGH
Continue to check for deterioration to ineffective cough or until obstruction is relieved
CPR = cardiopulmonary resuscitation.
Source: Maconochie et al (2017)

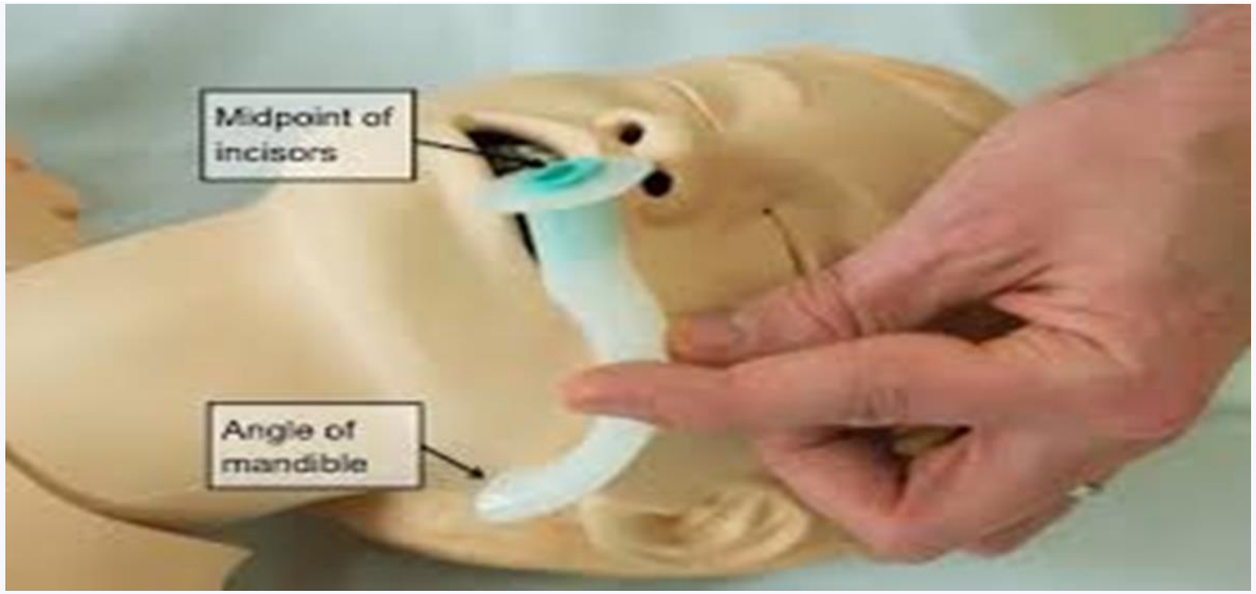
AIRWAY



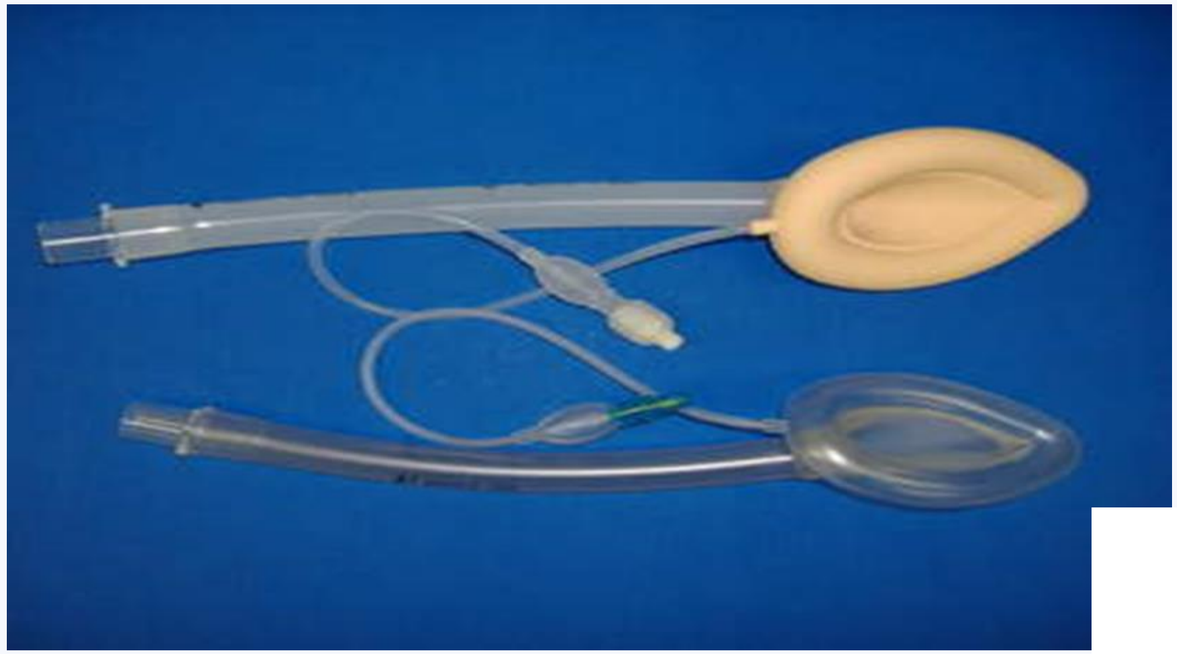
Oropharyngeal Airway (with color mark)

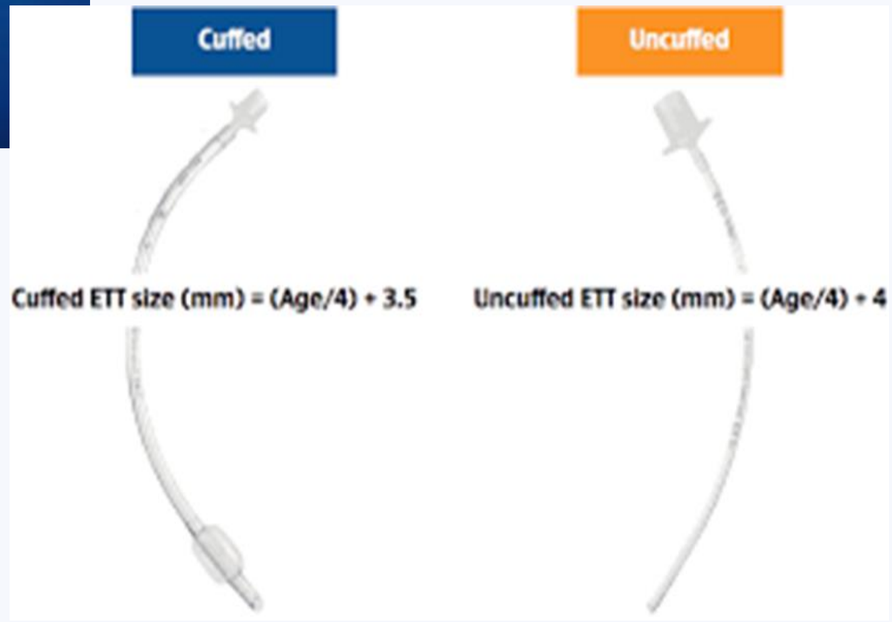
- Atraumatic rounded tip
- Color coding for size identification
- Sterile by EO gas, single use

编码 Code	规格 Size(#)	颜色 Color	长度（mm） Length(mm)
HR–OA–000	000	粉红Pink	40
HR–OA–00	00	蓝色Blue	50
HR–OA–0	0	黑色Black	60
HR–OA–1	1	白色White	70
HR–OA–2	2	绿色Green	80
HR–OA–3	3	黄色Yellow	90
HR–OA–4	4	红色Red	100
HR–OA–5	5	淡蓝Light blue	110
HR–OA–6	6	橙色Orange	120



ADVANCE AIRWAY





EVALUATION OF BREATHING

1. Respiratory rate

2. Work on breathing

3. Chest wall expansion

4. Auscultation for air entry and adventitious sounds

5. Pulse oximetry

>60 OR <10 ANY AGE

AGE	BREATH PER MINUTE
Infant	30-53
Toddler(1-3yr)	22-37
Pre-school(4-5yr)	20-28
School age (6-12yr)	18-25
Adolescent (13-18yr)	12-20

BREATHING: RESPIRATORY RATE

TACHYPNEA

- RR> normal
- Quiet tachypnea
- First physiological response to respiratory pathology.
- RR>60 is ab. for any age.

BRADYPNEA

- More omnious than tachypnea.
- ZZ**RR<10** is ab. for any age.
- Cause: respiratory failure, hypothermia, CNS insult, toxins

APNEA

- Cessation of breathing for ≥20 sec or earlier if associated with cyanosis, bradycardia, pallor, hypotonia.
- Can be central, obstructive, mixed.

AGE	BREATH PER MINUTE
Infant	30-53
Toddler(1-3yr)	22-37
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School age (6-12yr)	18-25
Adolescent (13-18yr)	12-20

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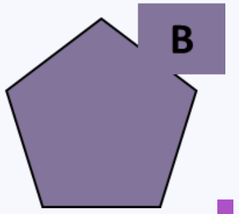
BREATHING: WORK ON BREATHING

- Nasal Flaring
- Retractions
- Grunting
- Head nodding
- Sea-saw respirations

BREATHING- PULSE OXIMETRY

- Detects low O2 saturation before clinically apparent cyanosis/ bradycardia
- SpO2 > 94% in Room air - adequate oxygenation
- Does not indicate O2 delivery or CO2 exchange
- Limited by poor perfusion states

If SpO2 < 90% on 100% O2, additional interventions required



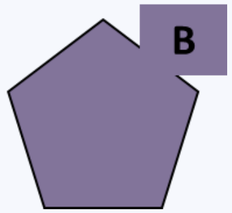
BREATHING- IDENTIFICATION

After completion of the evaluation, all respiratory insufficiency are categorized on the basis of -

- severity and
- anatomical site

BREATHING: SEVERITY

	Respiratory distress	Respiratory failure
Airway	Open and maintainable	Not maintainable
Breathing	Tachypnea, increased efforts, air entry equal	Marked tachypnea/bradypnea/apnea/, poor air entry
Circulation	Tachycardia, pallor	Marked tachycardia/ bradycardia, cyanosis
Disability	Irritable, anxious, agitated	Lethargic, unresponsive
Exposure	pallor	Cyanosis, variable temperature



BREATHING- ANATOMICAL SITE

- Upper airway obstruction
- Lower airway obstruction
- Lung parenchymal disease
- Disordered control of breathing

BREATHING- INTERVENE

Type of respiratory problem	Clinical example	ER intervention
Medical upper airway obstruction	Viral croup	Humidified oxygen, nebulised budesonide, injectable steroid
Mechanical upper airway obstruction	Foreign body Faucial diptheria	Back slap/ chest thurst/ Heimlich maneuver Anti-diphtheria serum, tracheostomy
Lower airway obstruction	Asthma, bronchiolitis	Inhaled SABA
Lung parenchymal disease	Bacterial pneumonia	Antibiotics after cultures
Disordered control of breathing	Seizure or coma	Anticonvulsants, advanced airway, bag-mask or tube ventilation

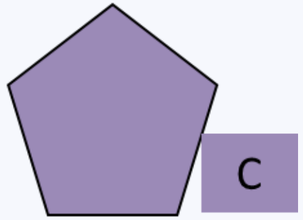
C CIRCULATION

Circulatory insufficiency can be identified by bedside clinical parameters

- Heart rate and rhythm
- Peripheral and central pulses
- Capillary refill time
- Skin color and temperature
- Blood pressure

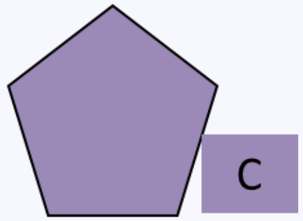
Additional information about the efficacy of circulation:

- Sensorium
- Urine output



CIRCULATION- HEART RATE

- Increased HR is the first response to insufficiency.
  - Tachycardia is non-specific
  - Can be seen in anxiety, pain, fever, crying
  - Increase proportionately to the clinical condition- sinus tachycardia
- Increase disproportionate- tachyarrhythmia.



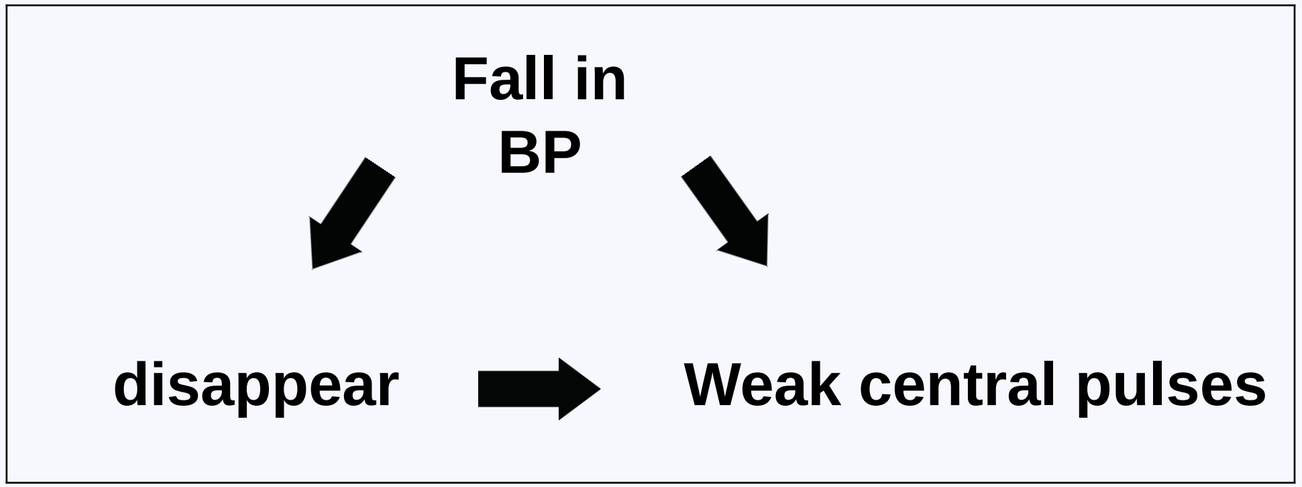
CIRCULATION- HEART RATE

Age	Awake HR	Sleeping HR
Neonate	100-205	90-160
Infant	100-180	90-160
Toddler (1-3yr)	98-140	80-120
Pre-school (4-5yr)	80-120	65-100
School age (6-12yr)	75-118	58-98
Adolescent (13-18yr)	60-100	50-90

C CIRCULATION- PULSES

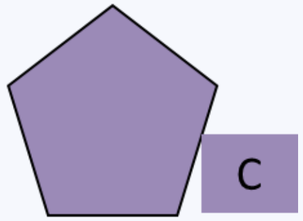
- Central pulses- carotid in older children
  femoral and axillary in infants
- Peripheral pulses- radial, temporal, posterior tibial

In the low cardiac output



Peripheral pulses

Become weak



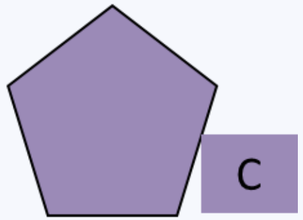
CIRCULATION- CRT

- Normal 2-3sec
- While assessing independent part extremity must be elevated above the level of heart-
    - Is sensitive to ambient temperature.
    - Brisk in warm shock.

C CIRCULATION- CRT

Prolonged capillary refill (10 seconds) in a

3-month-old with cardiogenic shock



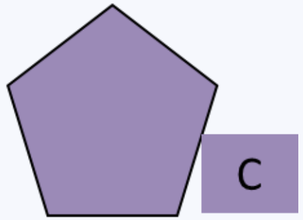
CIRCULATION-COLOR AND TEMPERATURE

Circulatory insufficiency results in decreased perfusion and oxygenation of extremities

Look for :

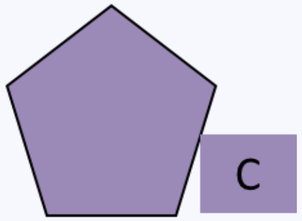
- **Cold extremities**
- **Pallor**
- **Mottling**
- **Cyanosis**

Consider ambient environmental conditions & Monitor line of demarcation of temperature difference over extremities with treatment



CIRCULATION- BLOOD PRESSURE

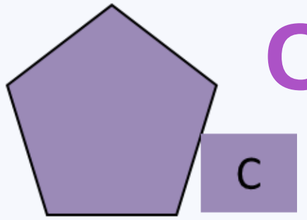
- It is measured by a traditional sphygmomanometer or oscillometric method.
- Cuff covers- 50% arm length between acromion and olecranon process, the bladder should wrap 75-80% of the mid-arm circumference.
- Hypotension is <5th centile for age, sex and height.
- Hypotension is a late sign.



CIRCULATION- BLOOD PRESSURE

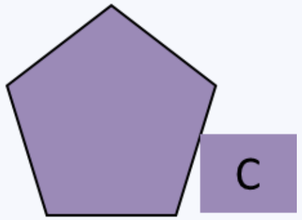
Definition of Hypotension	
Age	Systolic BP (mm Hg)
Term Neonates (0-28 days)	< 60
Infants (1-12 months)	< 70
Children 1-10 yrs	70 + (age x 2)
Children > 10 yrs	< 90
Hypotension with hemorrhage: > 20-25% acute blood loss.	

Fall of 10 mm of SBP from the observed level is significant



CIRCULATION- URINE OUTPUT

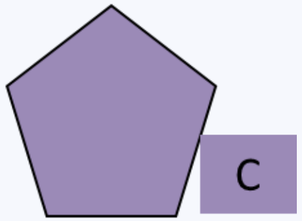
- Indirect indicator of adequate circulation
- Indicates kidney perfusion and function
- Helps to monitor response to treatment
- An indwelling catheter is important to monitor ongoing perfusion of the kidneys.
- Normal in infants= 1.5-2ml/kg/hr
- Children= 1ml/kg/hr



CIRCULATION- IDENTIFY

- Based on severity-
  - Compensated shock
  - Hypotensive shock

- Based on underlying etiology-
  - Hypovolemic
  - Distributive
  - Cardiogenic
  - Obstructive



CIRCULATION- INTERVENE

Type of circulatory problem	Clinical example	ER intervention
Hypovolemic shock	Diarrhea and dehydration	Humidified O2, IO/IV access, crystalloid bolus
Distributive shock	Septic shock	Humidified O2, IO/IV access, crystalloid bolus, antibiotics, vasoactives, source control
Cardiogenic shock	Acute myocarditis	Humidified O2, IO/IV access, ionotropes
Obstructive shock	Tension pneumothorax	Needle thoracocentesis FIRST EVEN Assisted ventilation, IO/IV access,

TAKE HOME MESSAGE

- Paediatric Assessment Triangle- Using Appearance, Breathing & Skin Colour is quick way to identify sick child
- Primary assessment Pentagon of ABCDE
- Assessment need to be followed by identifying the problem and intervention accordingly.

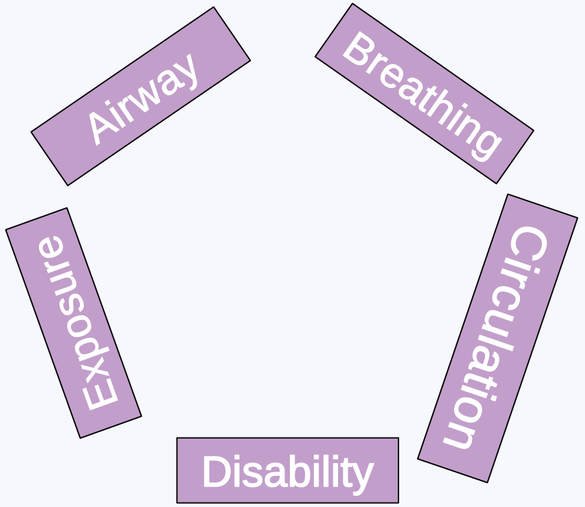
CASE DISCUSSIONS

CASE 1

- 8 YEAR OLD FEMALE CHILD
- COUGH X 1 DAY
- BREATHING DIFFICULTY SINCE EVENING RAPIDLY WORSENING
- DIFFICULTY IN SPEAKING
- PAST HISTORY – H/O NEBULIZATION 4-6 TIMES NOT ON REGULAR MEDICATIONS
- MOTHER HAVING HISTORY OF ASTHMA

PRIMARY ASSESSMENT

- Maintainable



No rashes

- Increased work of breathing RR 58/min
- SpO_2 – 70% on room air
- Severe retractions
- Audible wheeze

- E3V2M5
- Pupil B/L reacting

- HR- 170/min
- PP – low volume
- CFT - 4 sec
- Cold peripheries
- BP- 90/57 mm of Hg

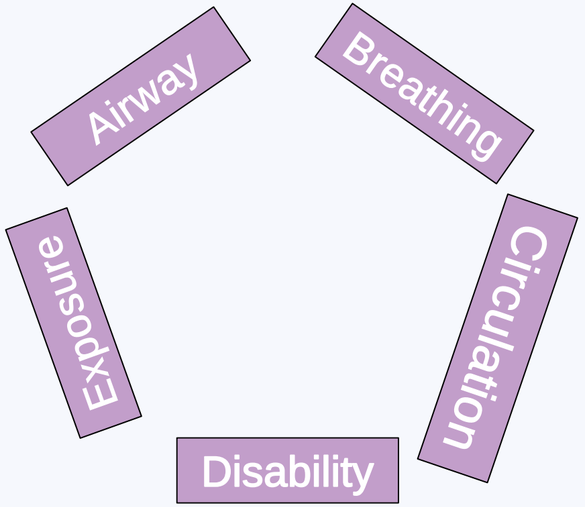
.Respiratory Failure
Airway disease
Status asthmaticus

CASE 2

- 3YEAR OLD MALE CHILD
- Fever x 3 day high grade
- No rashes
- Decrease activity 1 day
- No past significant history

PRIMARY ASSESSMENT

- Maintainable



- RR 44/min
- SpO2 – 94% on room air
- NO retractions

No rashes

- E3V2M5
- Pupil B/L reacting

- HR- 170/min
- PP – low volume
- CFT - >3 sec
- Cold peripheries
- BP- 70/40mm of Hg

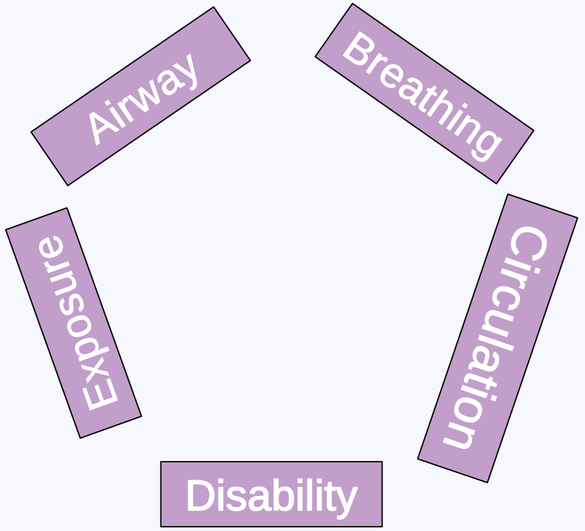
HYPOTENSIVE SHOCK
SEPSIS

CASE 3

- 1 YEAR OLD MALE CHILD
- Diarrhea x 3 day , 8- 10 episodes/day
- Vomiting x 4 episodes non bilious
- Decrease activity 1 day
- On bottle feeding
- No past significant history

PRIMARY ASSESSMENT

- Maintainable



- RR 54/min
- SpO2 – 94% on room air
- NO retractions

No rashes

- E3V2M5
- Pupil B/L reacting

- HR- 170/min
- PP – low volume
- CFT - 2 sec
- Cold peripheries
- BP- 76/40mm of Hg
- Skin turgor >3sec

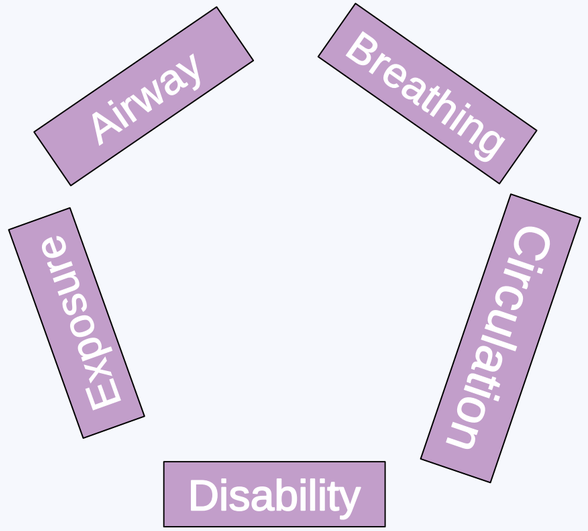
Diarrhea with severe dehydration

CASE 4

- 2 YEAR OLD MALE CHILD
- Fall from 1st floor

PRIMARY ASSESSMENT

- **STRIDOR +**



- **RR 18/min**
- **SpO_2 – 78% on room air**
- **retractions**

Multiple abrasions

- **E1V1M3**
- **Anisocoria**

- **HR- 88/min**
- **PP – low volume**
- **CFT - 4 sec**
- **Cold peripheries**
- **BP- 76/40mm of Hg**
- **Skin turgor >3sexc**

Respiratory failure, Severe TBI, Raised ICP,

Thank You