Common Pediatric Emergencies

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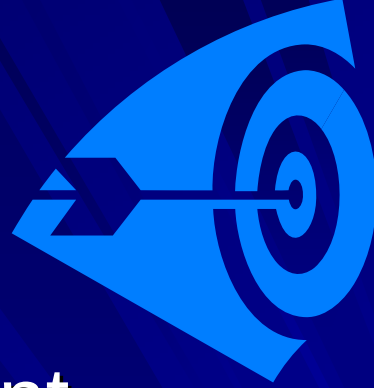
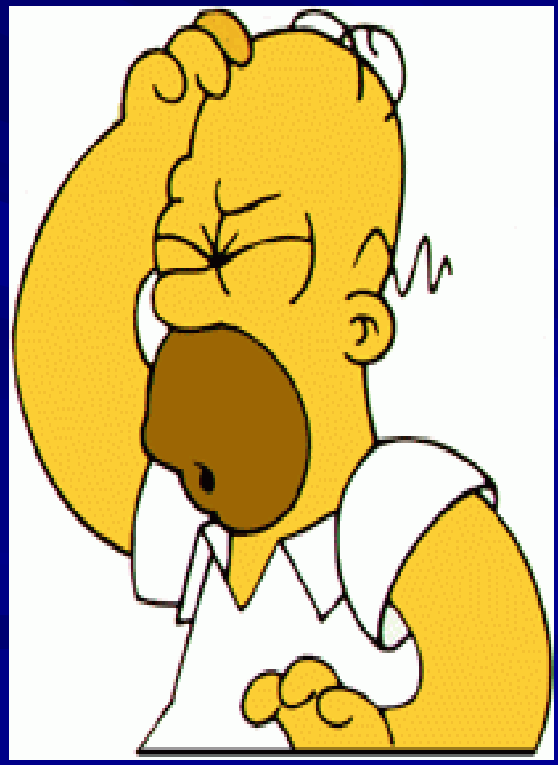
Goals and Objectives



By the end of this session, each student should be able to:

- Have systematic approach to sick child in ED
- Know the basics of cardiopulmonary resuscitation in Pediatrics
- Know the ED management of
  - Fever
  - Status epilepticus
  - Asthma

Lets start with the basics!!



Lets start with the basics!!

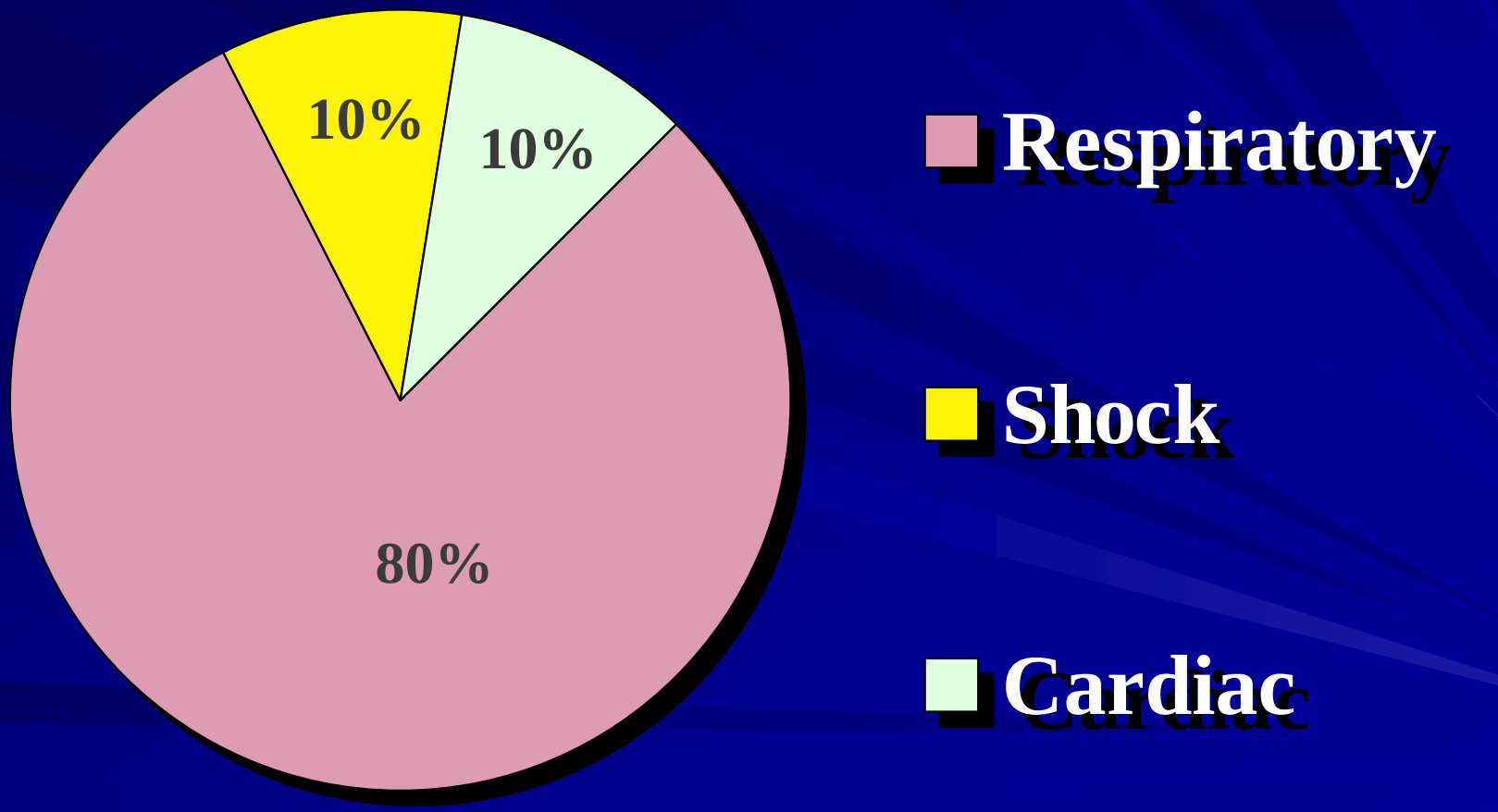
- Children are not young adults
- Adults are big children but with chest pain
- Different age group
- Age specific norms
- Remember important differences between adult and kids

Normal Pediatric Vitals…

- RR
  - > 60/min = abnormal
- BP
  - 60 mm Hg in term neonates (0 to 28 days)
  - 70 mm Hg in infants (1 month to 12 months)
  - 70 mm Hg + (2 x age in years) in children 1 to 10 years
  - 90 mm Hg in children 10 years of age
- HR
  - Newborn to 3 mths: 85-205
  - 3 months to 2yrs: 100-190
  - 2yrs to 10 yrs: 60-140
  - > 10yrs: 60-100
- **Wt Estimation**
  - **< 8 years:** 2x[Age]+8
  - **> 8 years:** 3x[Age]

PALS

Pediatric Cardiorespiratory Arrests

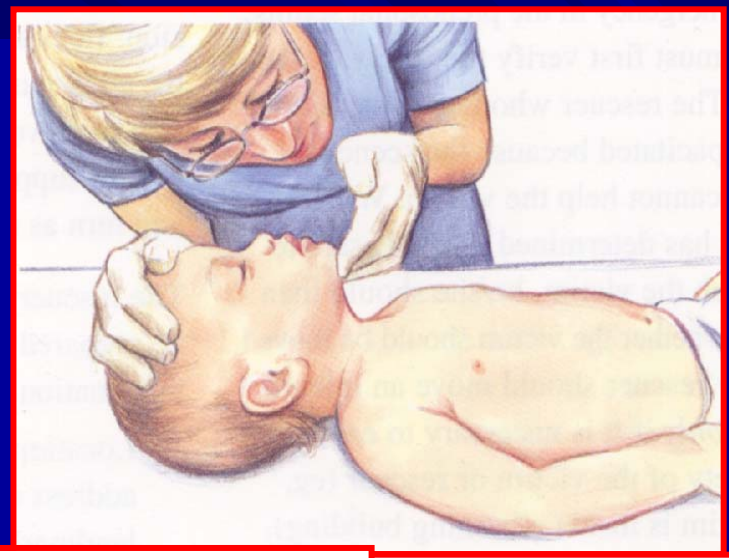


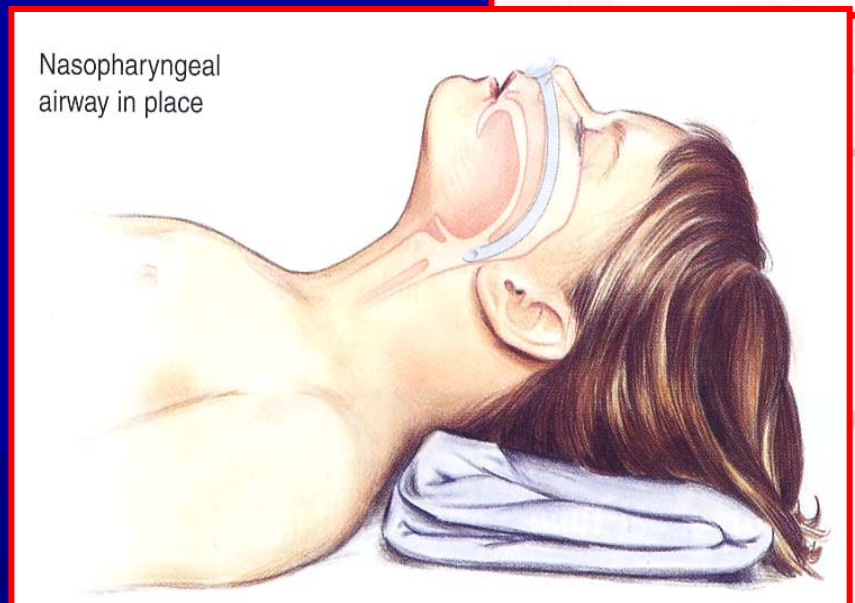
Rapid Cardiopulmonary Assessment

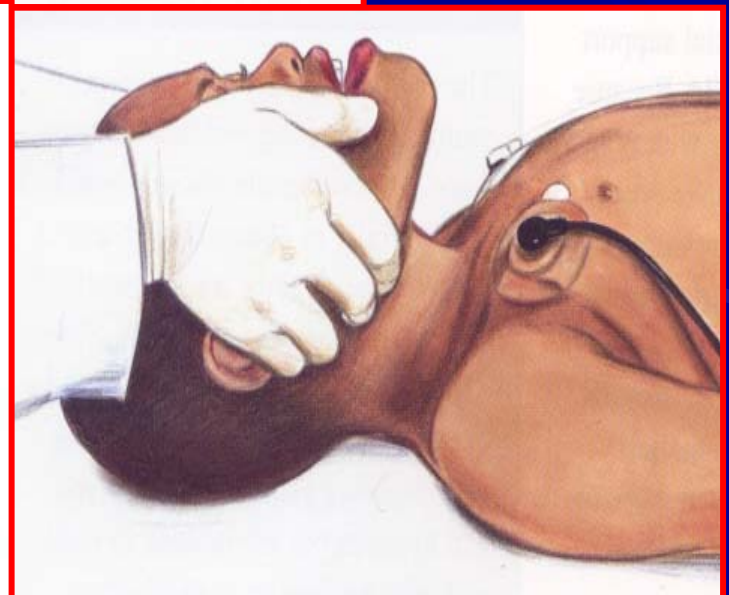
- Airway
- Breathing
- Circulation
- Should take less than 30 seconds to complete

Airway Assessment

- Patent
- Maintainable







Differences between the pediatric and the adult airway

Tongue	Larger in proportion to the oral cavity than in the adult
Epiglottis	Narrower, shorter, omega-shaped
Larynx	Higher in the neck (C3-C4) than in the adult (C5-C6); not only positioned more anteriorly in infants but positioned more cephalad
Cricoid	More conically shaped in infants; narrowest portion is at the cricoid ring, whereas in the adult it is at the level of the vocal cords
Trachea	Deviated posteriorly and downward (becomes anatomically similar to the adult between 8 and 10 years of age)
Head	Occiput relatively large compared with the adults' Optimal intubating position is with shoulder roll to prevent neck flexion in the supine position

Breathing

- RR
- *Respiratory Mechanics*
  - Retractions, Accessory Muscles use and Nasal Flaring
  - Head Bobbing
  - Grunting
  - Stridor
  - Wheezing
- Air Entry
  - Chest Expansion
  - Breath Sounds
- Color

Circulation

- Heart rate
- BP
  - Vol/strength of central pulses
- Peripheral pulses
  - Present/absent
  - Volume/strength
- Skin perfusion
- Cap.refill time
- Color
  - Mottling
- Temperature
- CNS perfusion
  - Responsiveness
  - Recognizes parents
  - Muscle tone
  - Pupil size
  - Posturing

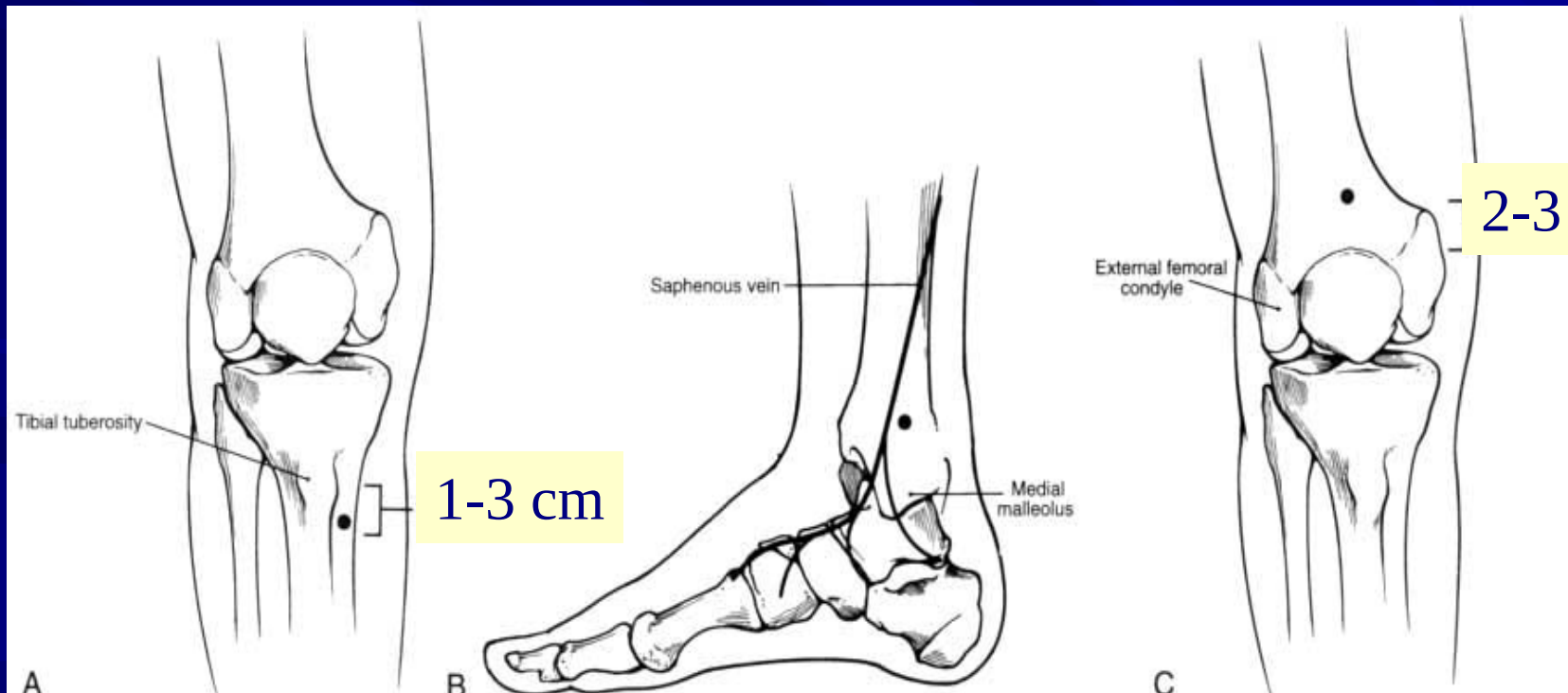
Capillary refill time alone is not a good indicator of circulatory volume
The most common cause of shock is hypovolemia

Shock

- Compensated
- Decompensated
  - BP
  - Volume expander
  - 20 ml/kg

Intraosseous Cannulation

- Media to tibial tuberosity
- Above medial malleolus
- Distal femur



Case # 1

- 4 days old baby boy brought by his parents with H/O fever since last night clinically looks well temp 38.5 C rectal
- How would you approach this child ?

Case # 2

- 3 weeks old baby girl brought by her grandmother complaining of fever for 2 days. Clinically looked well temp 37.5 C rectal
- How would you approach this child ?

Case # 3

- 4 month old boy brought to ED with H/O fever for 3 days associated with skin rash clinically looked sick lethargic temp 40 C rectal
- How would you approach this child ?

Case # 4

- 2 months old baby girl presented with fever for 3 days. Clinically looked well temp 38.9 C rectal
- How would you approach this child ?

Fever

- Definition: temperature > 38 C (100 F) rectal
- Fever due to an infectious origin in children are rarely above 42 C
- Serious bacterial infection
  - Bacteremia
  - Meningitis
  - Osteomyelitis
  - Septic arthritis
  - UTI
  - Bacterial enteritis
  - Periorbital cellulitis
  - Abscess
  - Cellulitis

Approach to febrile child ….

- Age dependant
- Documentation of fever
- Detailed History
- Duration of fever
- Associated symptoms

- Look for the focus
  - History
  - Physical exam
  - Investigations
- Management options
  - Age
  - General condition
  - Focus of the fever

Approach to sick young febrile child …

- Acute care area
- ABC
- Quick IV access is important
- Consider all of the following
  - Infection
  - Metabolic
  - Cardiac
  - Abuse
- Abx should be given even before definitive C/S

Fever in Children 0-36 months

Risks in infants <12 weeks

Problem	Toxic	Non-toxic	Low risk
Bacteremia	11%	2%	1.1% (0.2-2.6)
Meningitis	4 %	1 %	0.5 % (0.0-1.0)
SBI	17%	8.6%	1.4 % (0.4-2.7)

Clinical judgment and febrile infant protocols do not work in neonates (age 0- 1 month)

Mandatory work up

- CBC with diff
- UA and cath culture
- Blood C/S
- CSF + -
- Stool C/S if diarrhea bloody or watery

Treat if …….

- Neonates ≤ 1 month of age who are febrile
- Toxic infants ≤ 3 months of age

Treatment options

Ampicillin 200 mg/kg/ day q 6h

Gentamycicn 7.5 mg/kg/day q 8h

(if CSF negative)

OR

Amoicillin 200 mg/kg/ day q 6h

Cefotaxime 200 mg/kg/day q 6h

Low risk infants 29- 90 days

- Non-toxic, normal exam
- No focus of infection
- Negative past history
- WBC 5- 15,000/mm
- Band <1500/mm
- Normal UA

Treatment options in low risk group

Option one

- No Abx and return in 24 – 48 hour

Option tow

- Ceftriaxone: 50 mg/kg and repeat examination at 24 h and 48 h

3 - 36 months of age

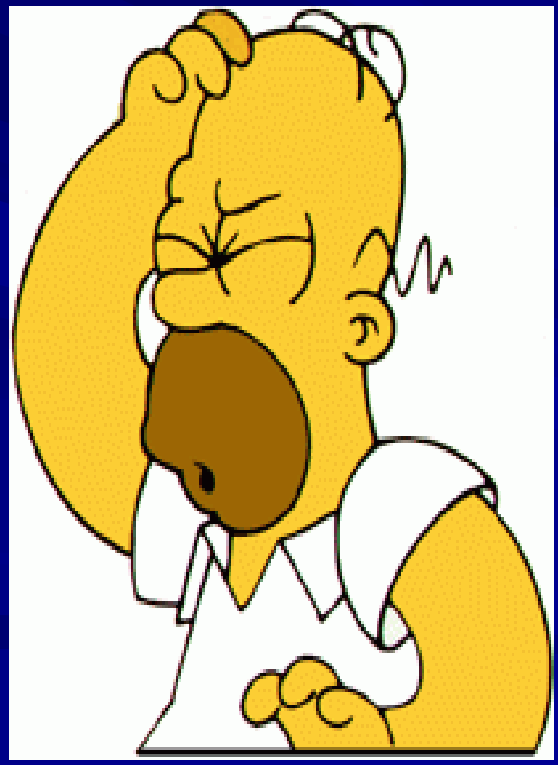
- Overall rate of bacteremia if fever> 39 C is 4-7%
- Increases percent as temperature increases
- Most common organism of sepsis is S. pneumoniae
- Treatment of the focus e.g. OM, UTI

Antibiotics options

Age Group	ETIOLOGIC AGENTS	IV ANTIBIOTICS
Neonate< 2 months	E. coli. Group B streptococci Listeria	**Ampicillin** 50 mg/kg/dose q 4-6 hrs +**Cefotaxime** 50 mg/kg/dose q 12 hrs ***or*** **Gentamicin** 2.5 mg/kg/dose q 8 hrs
2 months – 9 years	N. Meningitidis S. Pneumoniae Group A Strep H. Influenzae (rare)	**Cefotaxime** 50 mg/kg/dose q 6 hrs **Ampicillin** 50 mg/kg/dose q 4-6 hrs
> 9 years	N. Meningitidis S. pneumoniae	**Penicillin** G250,00 u/kg/24 hrs q 4 hrs **or Cefotaxime**50 mg/kg/dose q 6 hrs

Note: any third generation cephalosporin can substitute for cefotaxime

Back to the cases …..



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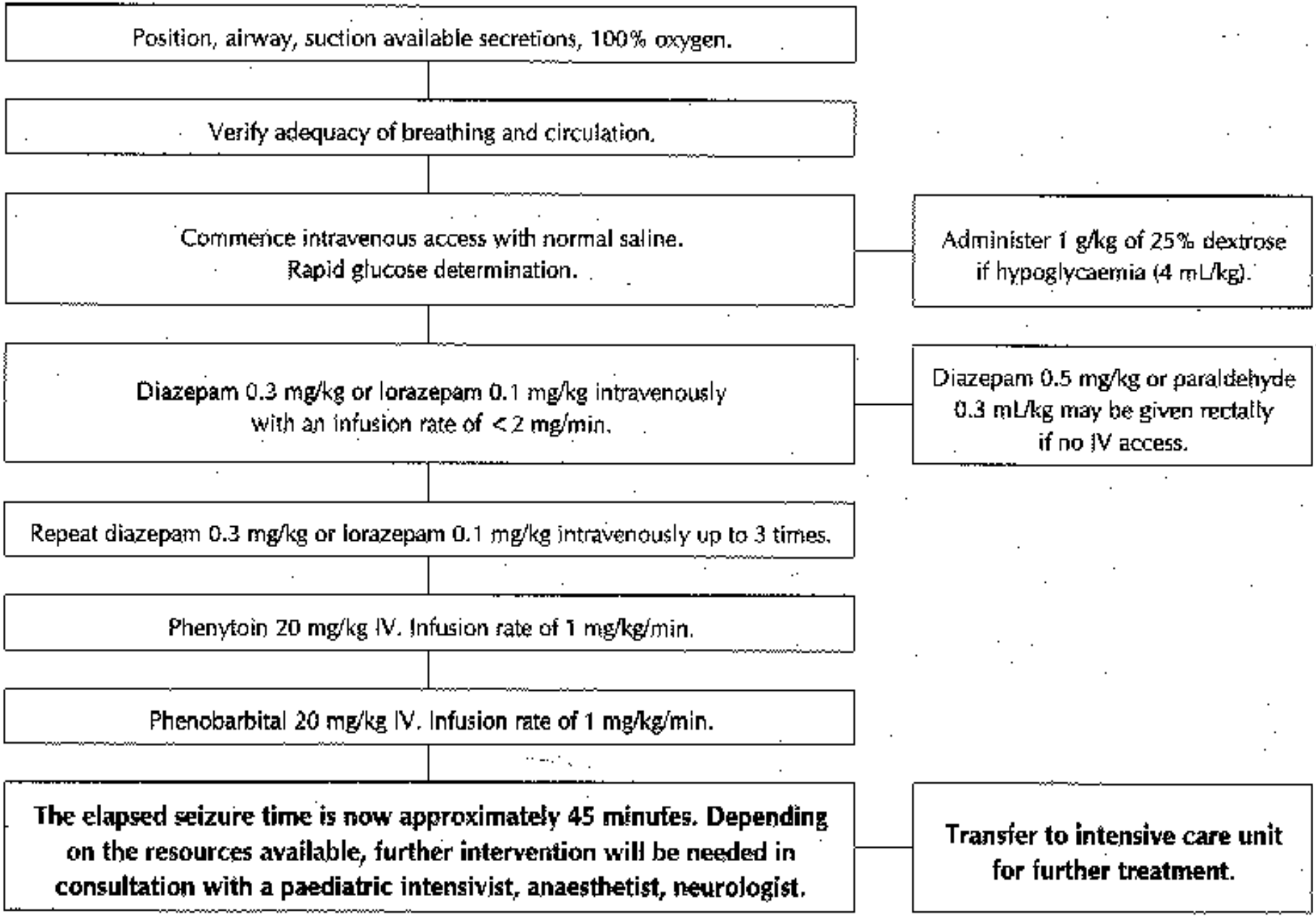
Case # 5

- 2 years old child brought by his parents in generalized convulsion
- How would you approach him?

Figure 1: Treatment of paediatric generalized convulsive status epilepticus



Status Epilepticus

- Rule out treatable causes
  - Hypoglycemia
  - Intracranial pathology
  - Toxic ingestion
- Management
  - ABC's
  - Short acting benzodiazepines
  - Long acting anti epileptics

SE treatment

- 1st line anticonvulsants
  - IV
    - Lorazepam 0.1mg/kg
    - Diazepam 0.2 mg/kg
    - Midazolam 0.2 mg/kg
  - Rectal diazepam
    - 0.5 mg/kg
  - IM, intranasal, buccal midazolam

SE treatment

- 2nd line agents
  - Phenytoin 20 mg/kg
  - Fosphenytoin 15-20 mg/kg
- 3rd line agents
  - Phenobarbital 20mg/kg
  - Repeat prn 5-10mg/kg
  - Maximum 40 mg/kg *or* 1 gram

Refractory SE treatment

- Consider midazolam
  - 0.2 mg/kg bolus
  - Then 1-10 mcg/kg/min infusion
- Induce barbiturate coma
  - Pentobarbital 5-15 mg/kg @ 25 mg/min
  - Then 1-5 mg/kg/hour
- Others
  - Valproic acid
  - Paraldehyde, chloral hydrate
  - Propofol, inhalational anesthesia, paralysis
  - Lidocaine

Case # 6

- 6 years old buoy known asthmatic on ventolin & flexotide came to ED with H/O cough. Clinically looked well SPO2 100% in RA by auscultation prolonged exp phase
- How would you manage this child?

Case # 7

- 11 year old girl presented to ED with progressive SOB for 2 days. She is on ventolin almost regularly for the last 10 days, had previous ICU admission for BA, clinically looked distressed, SPO2 88% RA has wheezing ++ using accessory muscles
- How would you manage this girl?

Case # 8

- 5 year old child known BA brought to ED with SOB, cough & fever . Clinically has temp 39C diffuse wheeze SPO2 96% with decrease air entry on both bases
- How would you manage this child ?

Asthma exacerbation

Asses severity…….

- Don’t forget your ABC
- Asses severity based on:
  - Work of breathing
  - Accessory muscle use
  - RR
  - SPO2
  - Air entry
  - Wheezing
  - LOC
- Mild
- Moderate
- Severe

Mild Asthma exacerbation

- Minimum distress
- Normal SPO2
- Salbutamol
  - Inhaler
  - Neubelization
  - Intermittent dosed

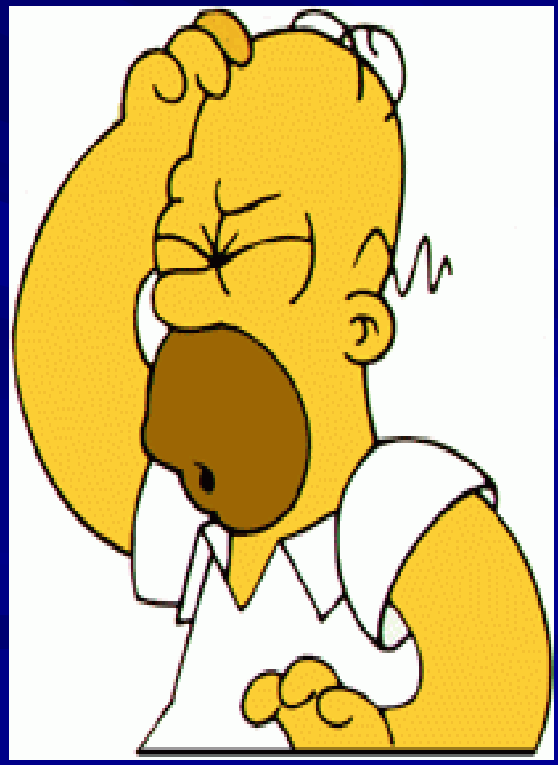
Moderate Asthma exacerbation

- Use of accessory muscles
- Normal saturation
- Decreased air entry
- Salbutamol
  - Inhaler
  - Neubelization
  - Intermittent dosed
  - Steroids
    - PO, IV, Inhaler, or Neubelization ?

Severe Asthma exacerbation

- Significant distress
- Desaturation
- Accessory muscle use
- Silent chest
- Salbutamol & Atrovent
  - 3 doses back to back
- Steroids
- $MgSO_4$
- IV salbutamol
- Thiophyline
- Intubation
- Paralysis

Back to the cases …..



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Thank you…..