



**Stabilization
Essentials in
Pediatrics**

Identification and Assessment of the Critically ill child





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Stabilization Essentials in Pediatrics (StEP) is an interdisciplinary two-day course with components of didactic lectures, high fidelity simulations and hands-on workshops, prepared and delivered by PICU faculty. The target audiences are MDs, RNs, and RTs who care for critically ill children over the short term, usually while they await transport. These practitioners may be part of different departments depending on local workflows (ie. ED4, Adult ICU or High Acuity Pediatric Units).

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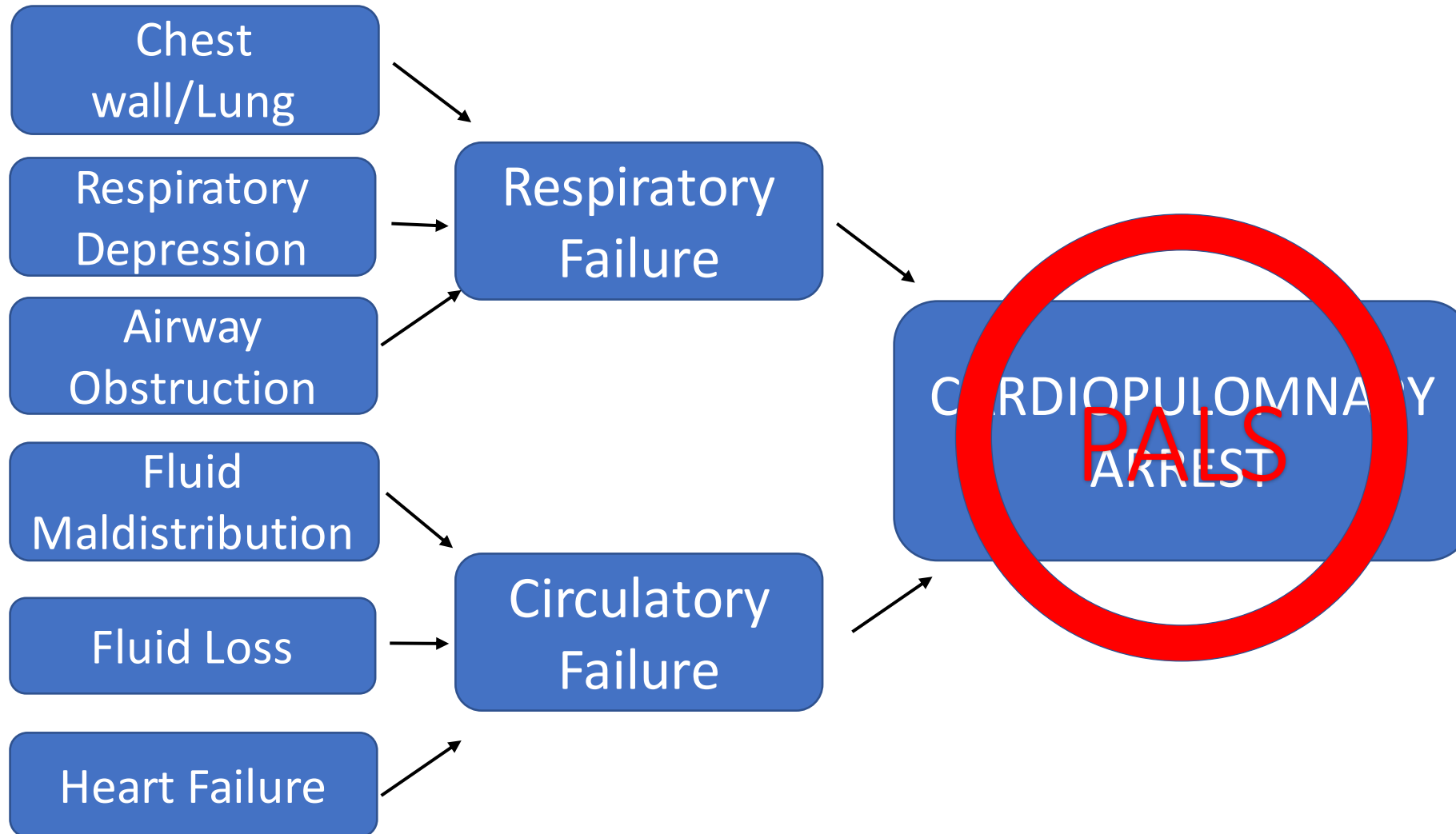


Objectives

- Utilize the Targeted Clinical Assessment
- Recognize features of a critically ill child
- Apply rapid assessment to guide resuscitation

Case 1

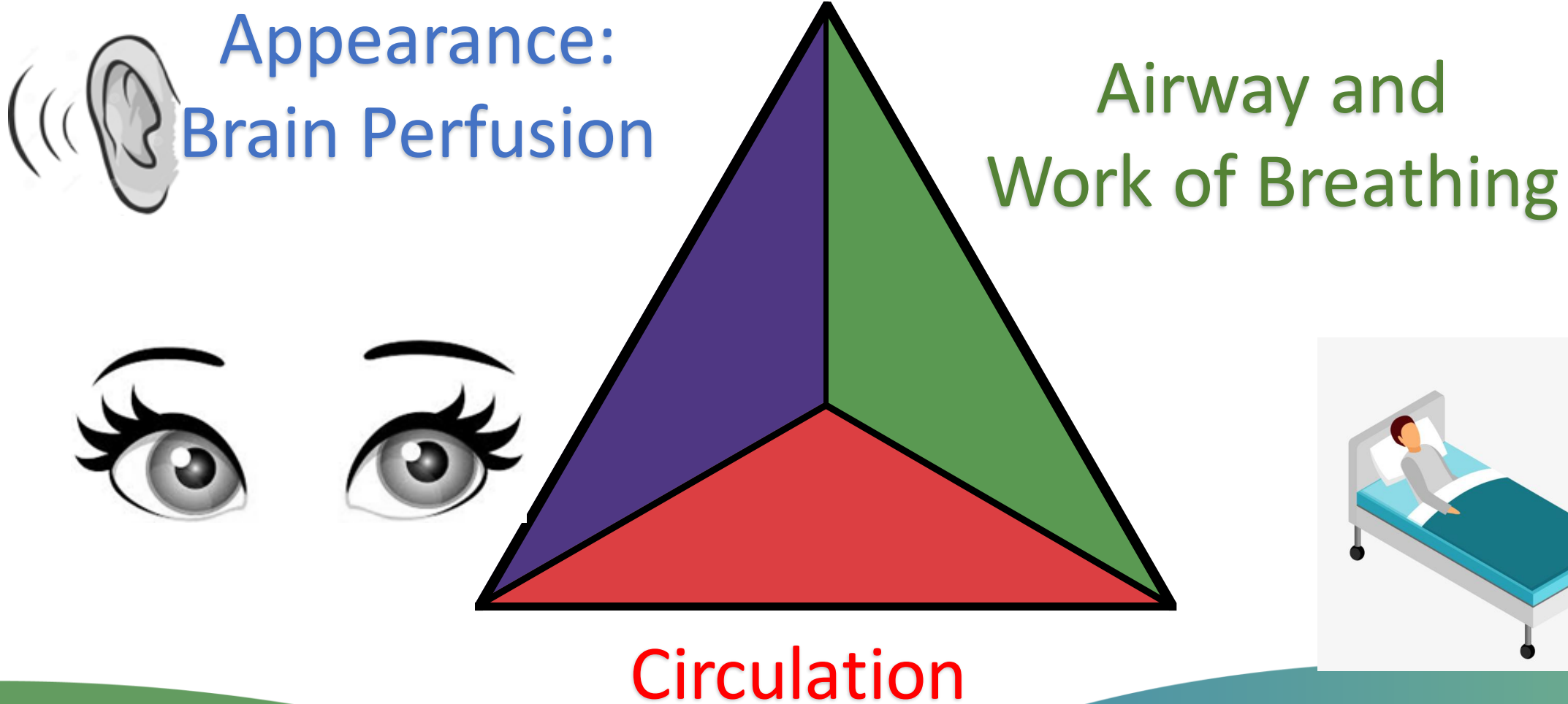
- 2 yo boy into ER with vomiting and headache
- Admitted last night with oral rehydration therapy, no IV
- Suddenly mom running from the room
- Not waking up



Pediatric Assessment Triangle (PAT)



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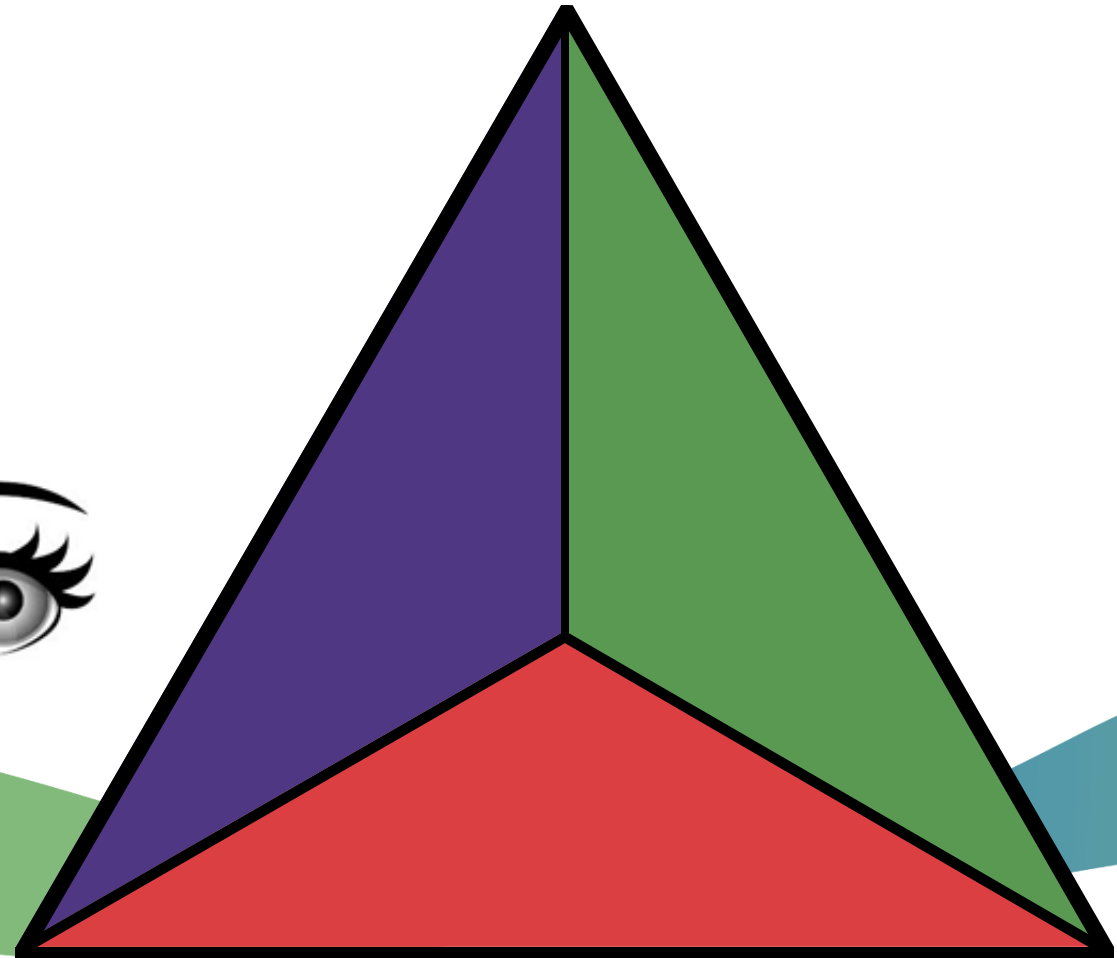


Appearance: Brain Perfusion



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Tone
Interactive
Consolability
Look/gaze
Speech/cry





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Airway and Work of Breathing

Stridor

Grunting

Retractions

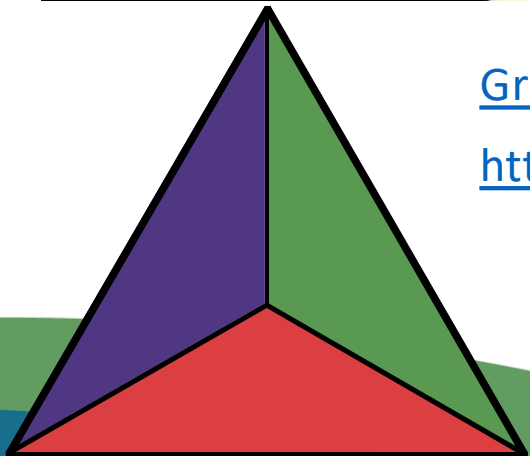
Accessory Muscle Use

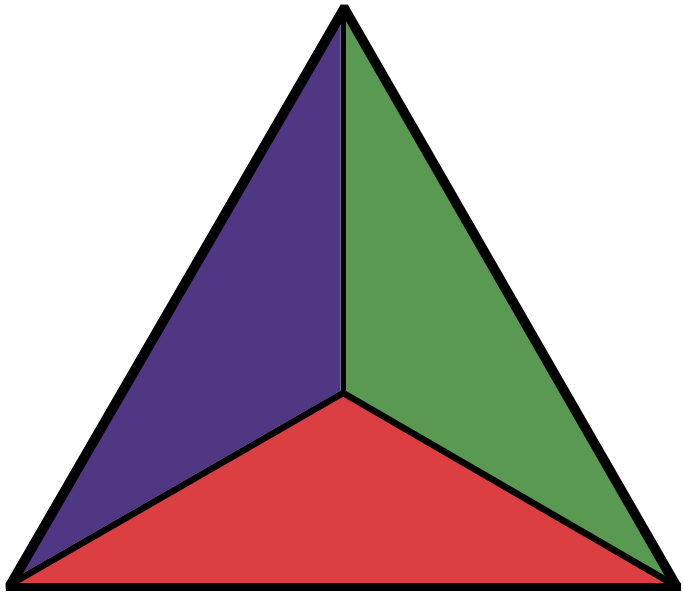
Tripoding



[Grunting Child – YouTube](https://www.youtube.com/watch?v=KQTEu1mpRY8&t=4s)

<https://www.youtube.com/watch?v=KQTEu1mpRY8&t=4s>



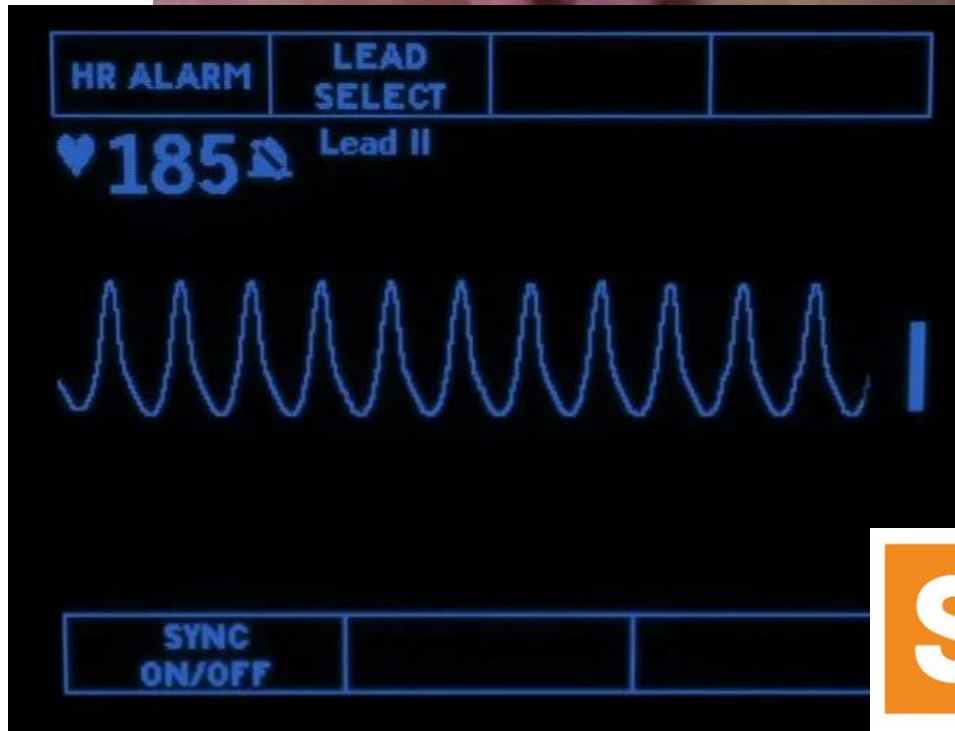


Circulation

Pallor

Mottling

Cyanosis



Critical Care

Appearance
Brain perfusion
Sedation
Medications
ICP/EEG



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Airway &
Work of
Breathing

Saturation

FiO₂

ETCO₂

Ventilation (NIV)

Circulation & Perfusion

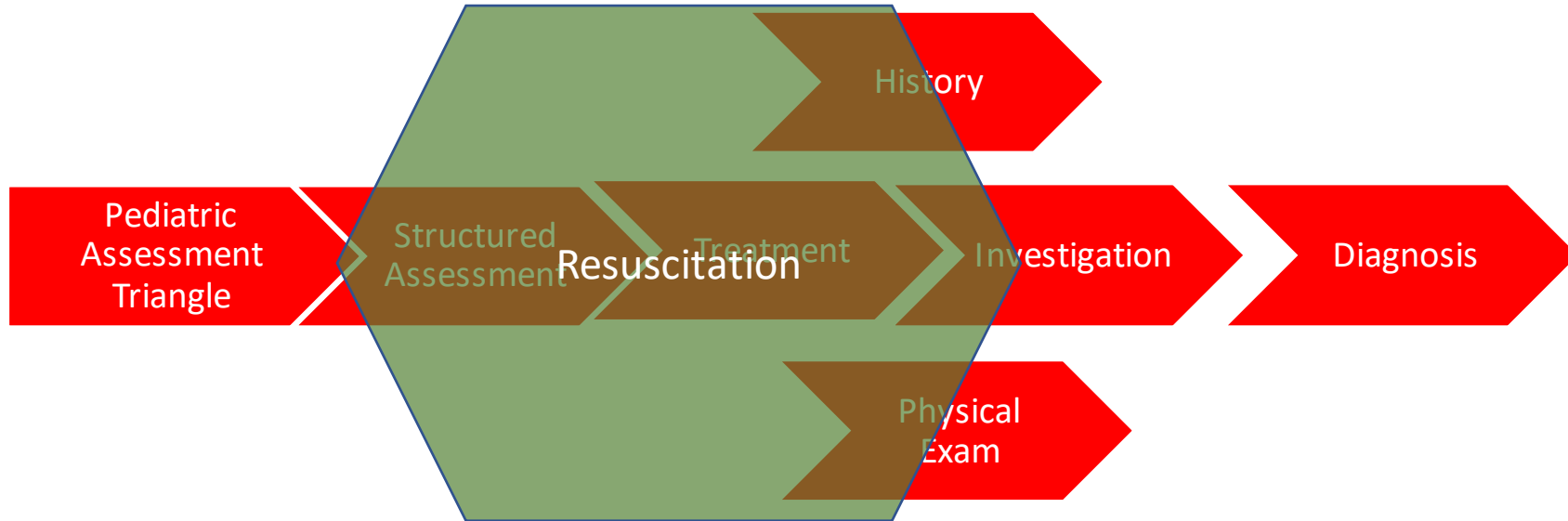
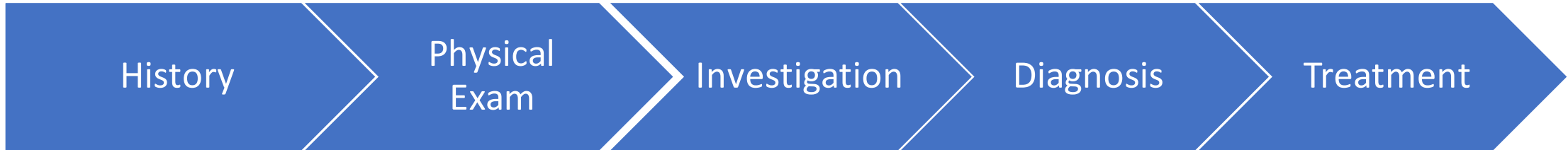
Heart Rate, Rhythm, NIBP Arterial Line,
Inotropes, Urine Output



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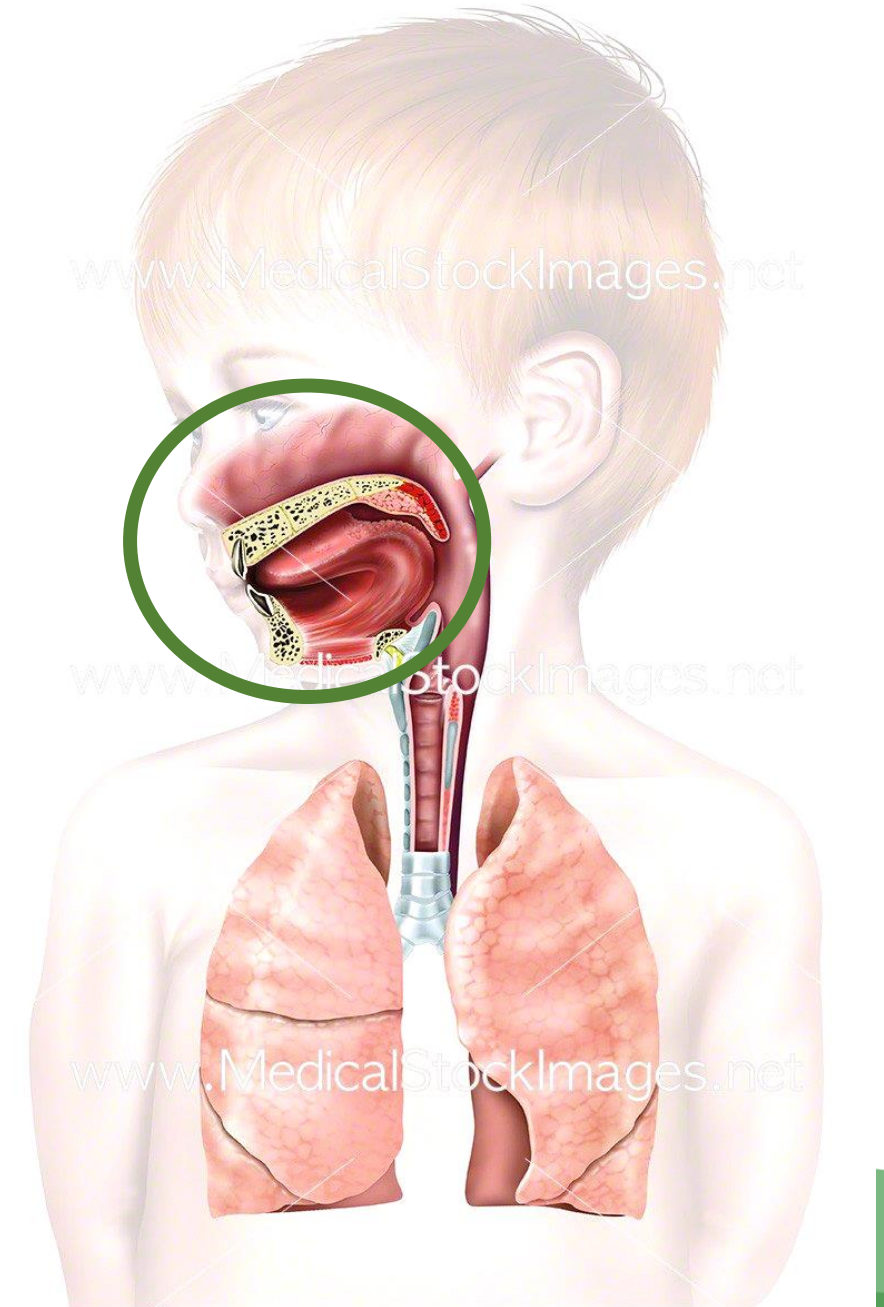
www.stuff.co.nz



Airway



Child with inspiratory stridor - YouTube
<https://www.youtube.com/watch?v=oeoAze-CHng>



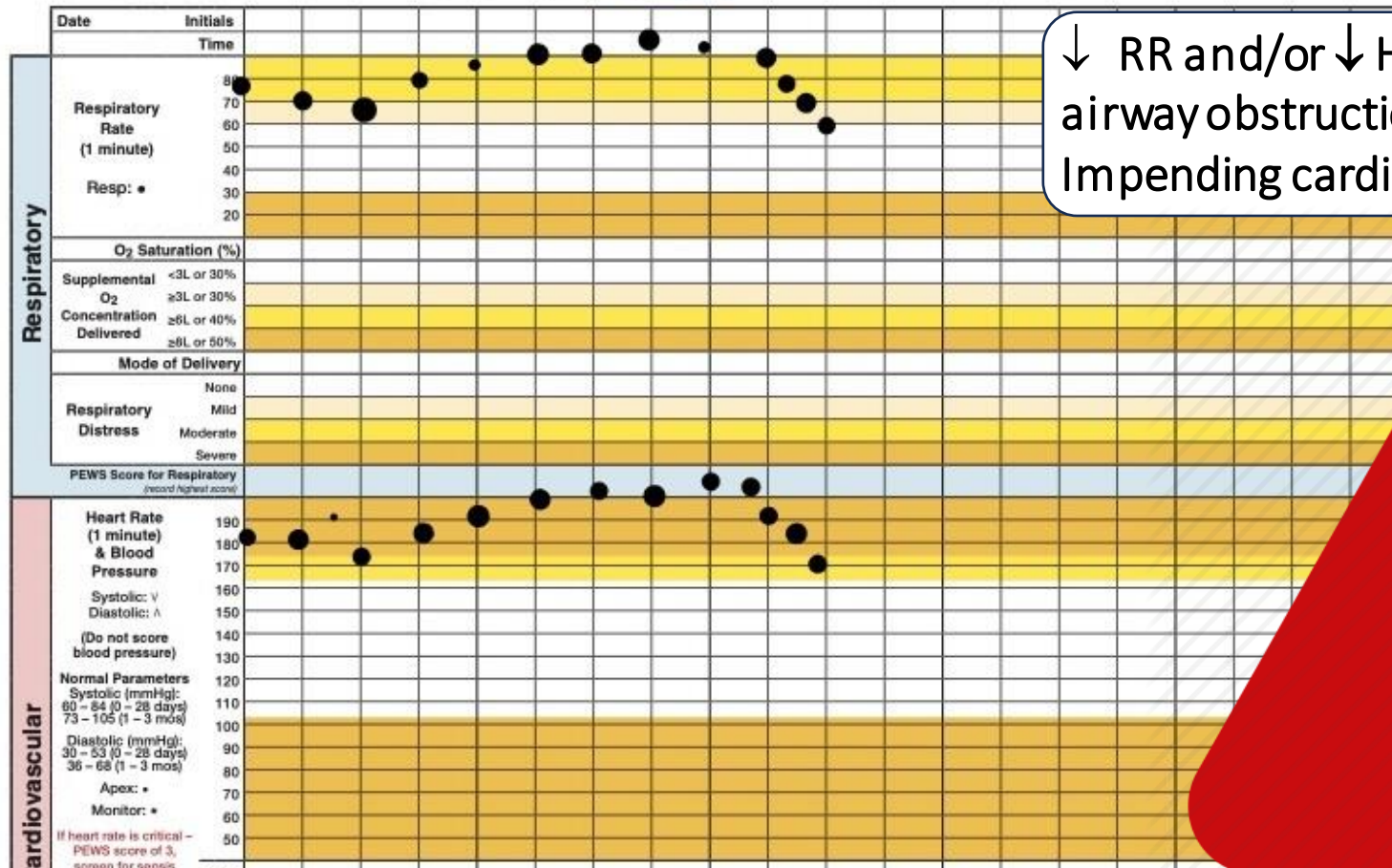
PEWS

Date: _____

24 Hour Flowsheet
0 – 3 MONTHS

Patient identification

PEWS Scoring Legend: 0 1 2 3



Breathing

- Respiratory Rate / Heart Rate
- Work of Breathing
- Activity level
- Auscultation
- Impending respiratory failure
 - Decreased HR/RR
 - **Agitation or lethargy**
 - Decreased work of breathing*



Consider the Ventilated Child

mild



severe

Case 2

- 5 week term infant
- RSV + bronchiolitis, Day 4
- Initially LF, now HFNP 2L/kg/min, 25% FIO₂
- RR = 60-70, HR increased today to 160
- Sat 92%

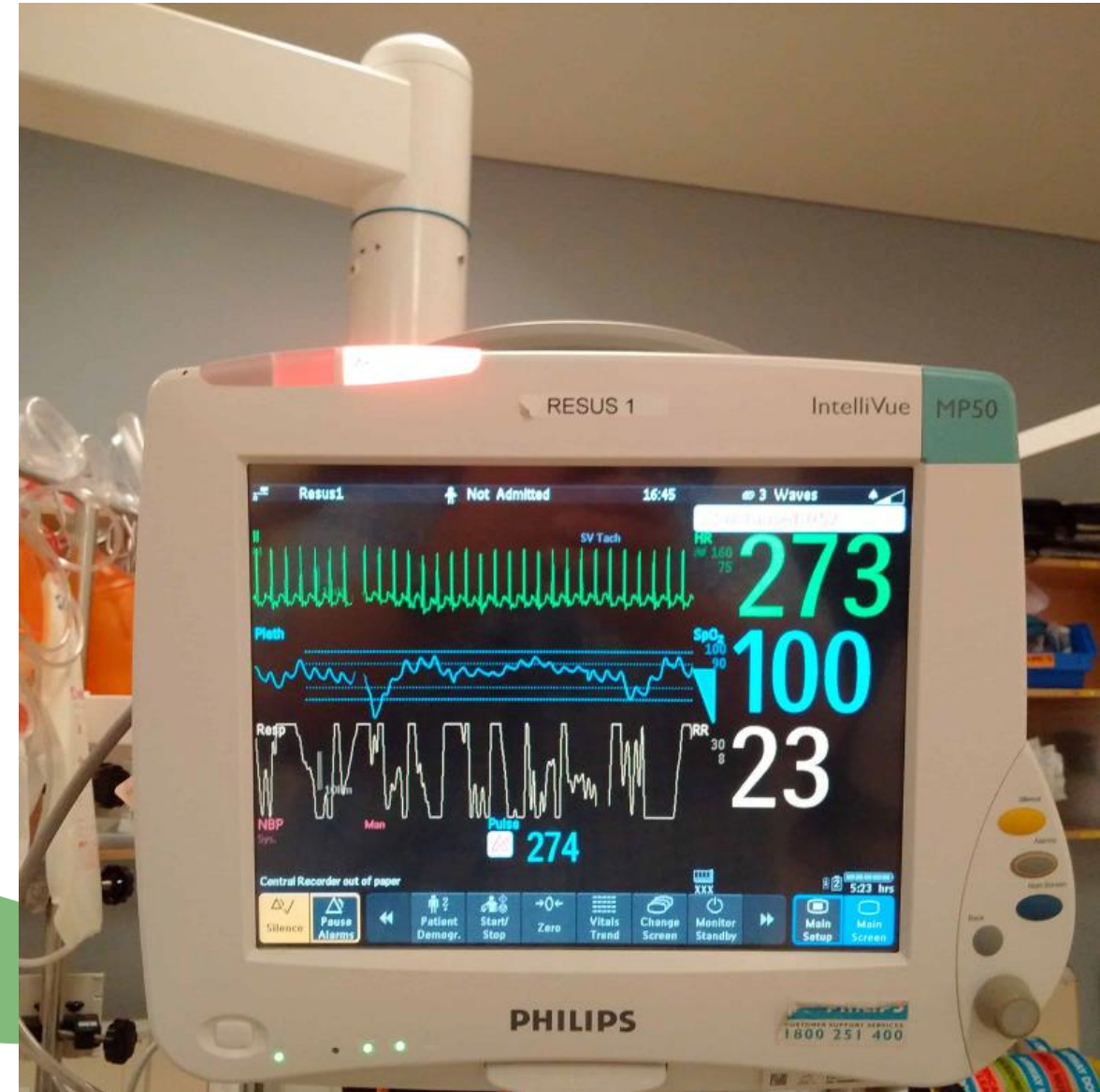
Sick or not sick?

Concerning:

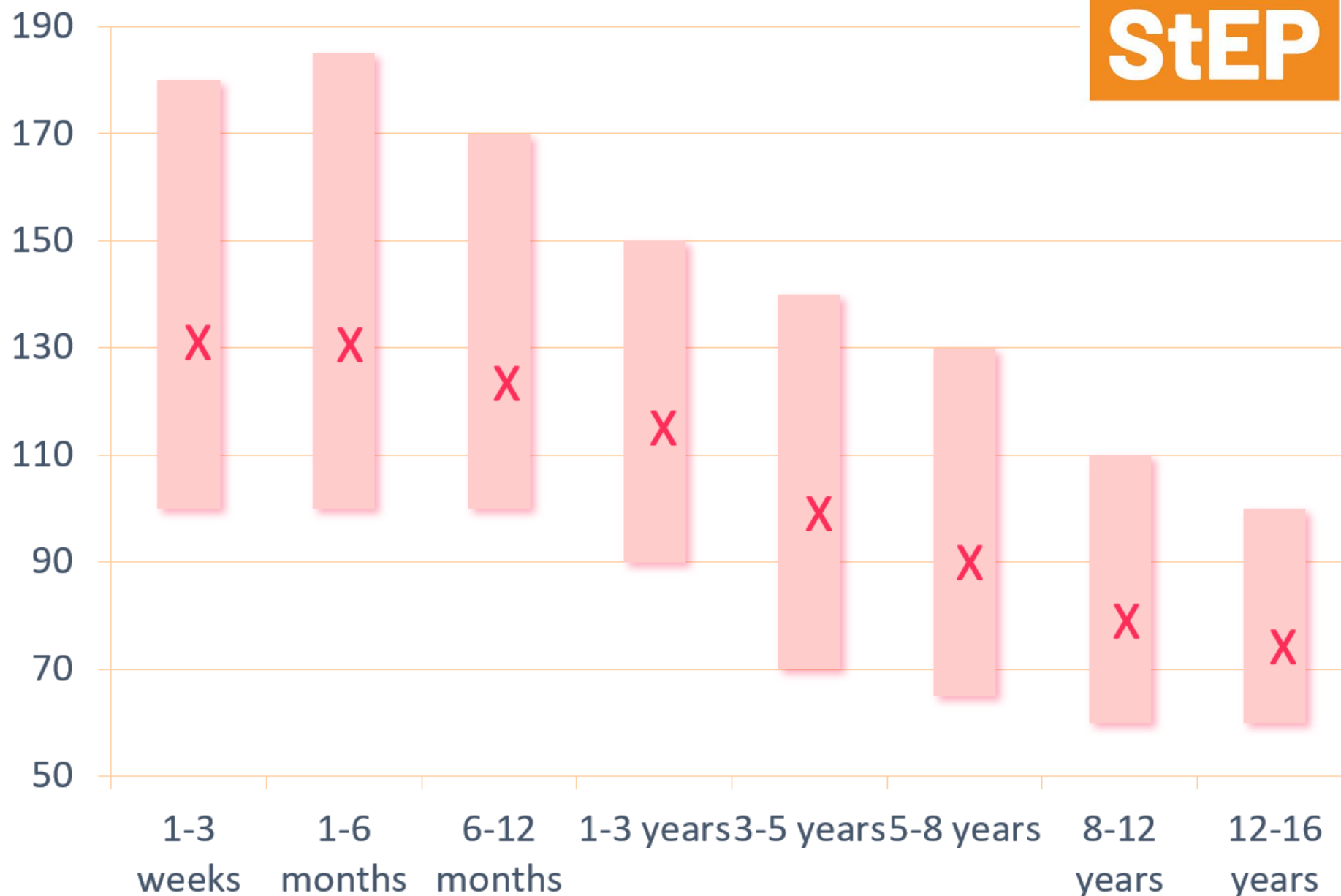
Progressive despite escalating therapy
Sleepy, decreased level of consciousness
Progressive and persistent abnormal vitals

Case 3

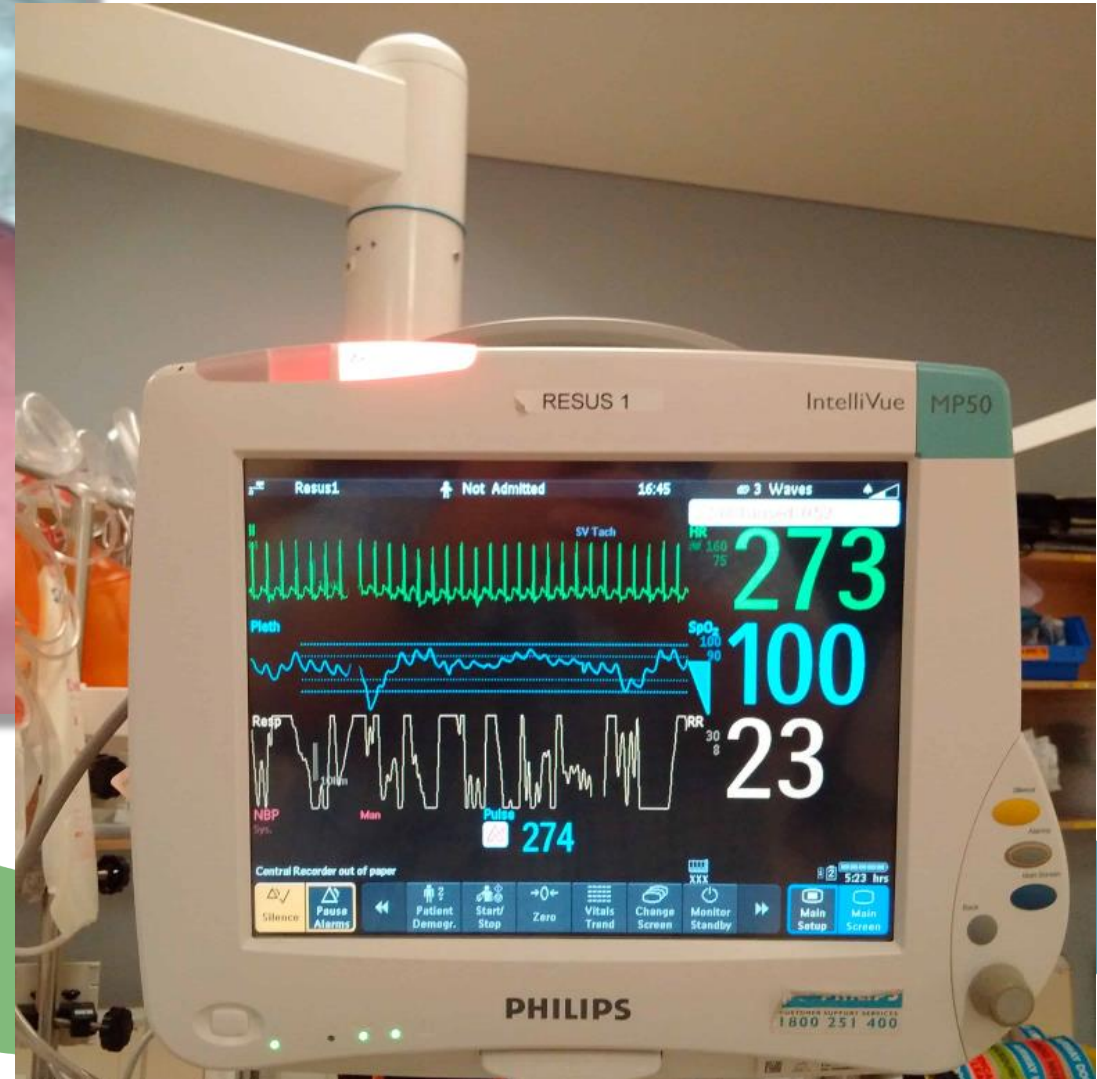
- 4 week male presented to the ER
- Irritable with poor feeding
x 24h
- Urgent request pediatric support



Heart rate
(bpm)



Age of child



BP = 76/51
The BP is OK,
but perfusion is not

Circulation - perfusion

Skin Color and Temperature

Capillary Refill time

Pulse Volume

Heart Rate



Normal vital signs



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- Estimate SBP (>1y)
 - $70 + 2 \times \text{age (in years)}$ is the 5th percentile
 - $90 + 2 \times \text{age (in years)}$ is the 50th percentile
- Estimate MAP
 - $40 + 1.5 \times \text{age (in years)}$ is the 5th percentile
 - Or as a rule of thumb:
 - Neonate: GA
 - Infants: 40-45
 - Toddler: 50
 - Child: 55
 - Teen: 60

Age	Heart Rate (beats/min)	Respiratory Rate (breaths/min)
0-3 months	110-160	35-55
3-6 months	110-160	30-45
6-12 months	90-160	22-38
1-3 years	80-150	22-30
3-6 years	70-120	20-24
6-12 years	60-110	16-22
>12 years	60-110	12-20

PALS

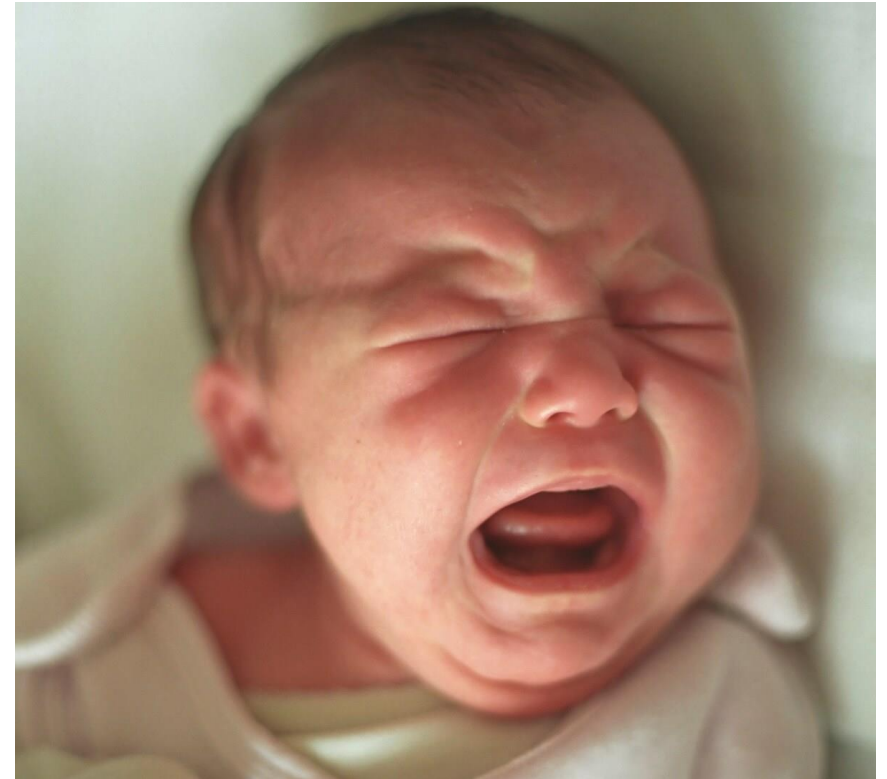
Brain perfusion / Disability

Altered mentation

- Agitation/irritability VS lethargy/LOC
- Broad differential diagnosis
 - Neurological disease?
 - Severe systemic disease? Brain perfusion?
 - Non-Accidental Injury

Assess pupils and GCS frequently

Glucose Check



www.washingtonpost.com

Glasgow Coma Scale (GCS)

Glasgow Coma Scale (GCS)

Sign/score	GCS	GCS for children <2yo/non-verbal
<u>Eye opening</u>		
<u>4</u>	Spontaneous	Spontaneous
<u>3</u>	To command	To sound
<u>2</u>	To Pain	To pain
<u>1</u>	None	None
<u>Verbal response</u>		
<u>5</u>	Oriented	Age appropriate (coos/babbles)
<u>4</u>	Confused	Irritable, cries (consolable)
<u>3</u>	Inappropriate words	Cries in response to pain
<u>2</u>	Incomprehensible sounds	Moans in response to pain
<u>1</u>	None	None
<u>Motor response</u>		
6	Obeys commands	Spontaneous / obeys commands
5	Localizes pain	Withdraws to touch
4	Withdraws to pain	Withdraws to pain
3	Abnormal flexion to pain	Abnormal flexion to pain
2	Abnormal extension to pain	Abnormal extension to pain
1	None	None



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Summary

- 1) Rapid Focus Assessment*
- 2) Concurrent Structured Assessment and Resuscitation*
- 3) Frequent Reevaluation and consideration of patient trajectory*





Stabilization Essentials in Pediatrics

References:

- Dieckmann RA, Brownstein D, Gausche-Hill M. The Pediatric Assessment Triangle: A Novel Approach to Pediatric Assessment. *Pediatric Emergency Care*, Vol 26, No 4, 2010: 312-315, 2010
- Grunting Child – freely accessible on YouTube: <https://www.youtube.com/shorts/KQTEu1mpRY8>
- Mottled Child images and work of breathing – Pediatric Basic Course
- Dehydrated infant :<https://www.stuff.co.nz/national/health/102378164/>
- Child with inspiratory stridor – freely accessible on YouTube: <https://www.youtube.com/watch?v=oeoAze-CHng>
- Duncan, H., Hutchison, J., & Parshuram, C. (2006). The pediatric early warning system score: A severity of illness score to predict urgent medical need in hospitalized children. *Journal of Critical Care*, 21, 271- 279.
- Haque IU, Zaritsky AL. Analysis of the evidence for the lower limit of systolic and mean arterial pressure in children. *Pediatr Crit Care Med*. 2007 Mar;8(2):138-44.
- Harman M, et al. (2011). Pediatric emergency and resuscitation. In RM Kliegman et al., eds., *Nelson Textbook of Pediatrics*, 19th ed., p. 280. Philadelphia: Saunders Elsevier

