Tiny Airways

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Emergency Medical Services for Children

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Objectives

- Identify major differences between adult and pediatric airway anatomy and physiology
- Explain the pros and cons of different airway management options
- Understand the role of airway management in overall resuscitation
- Be comfortable with how to manage difficult pediatric airways

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KIDS ARE SMALL ADULTS

Except for their airways.
And some other stuff

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(almost) all BLS

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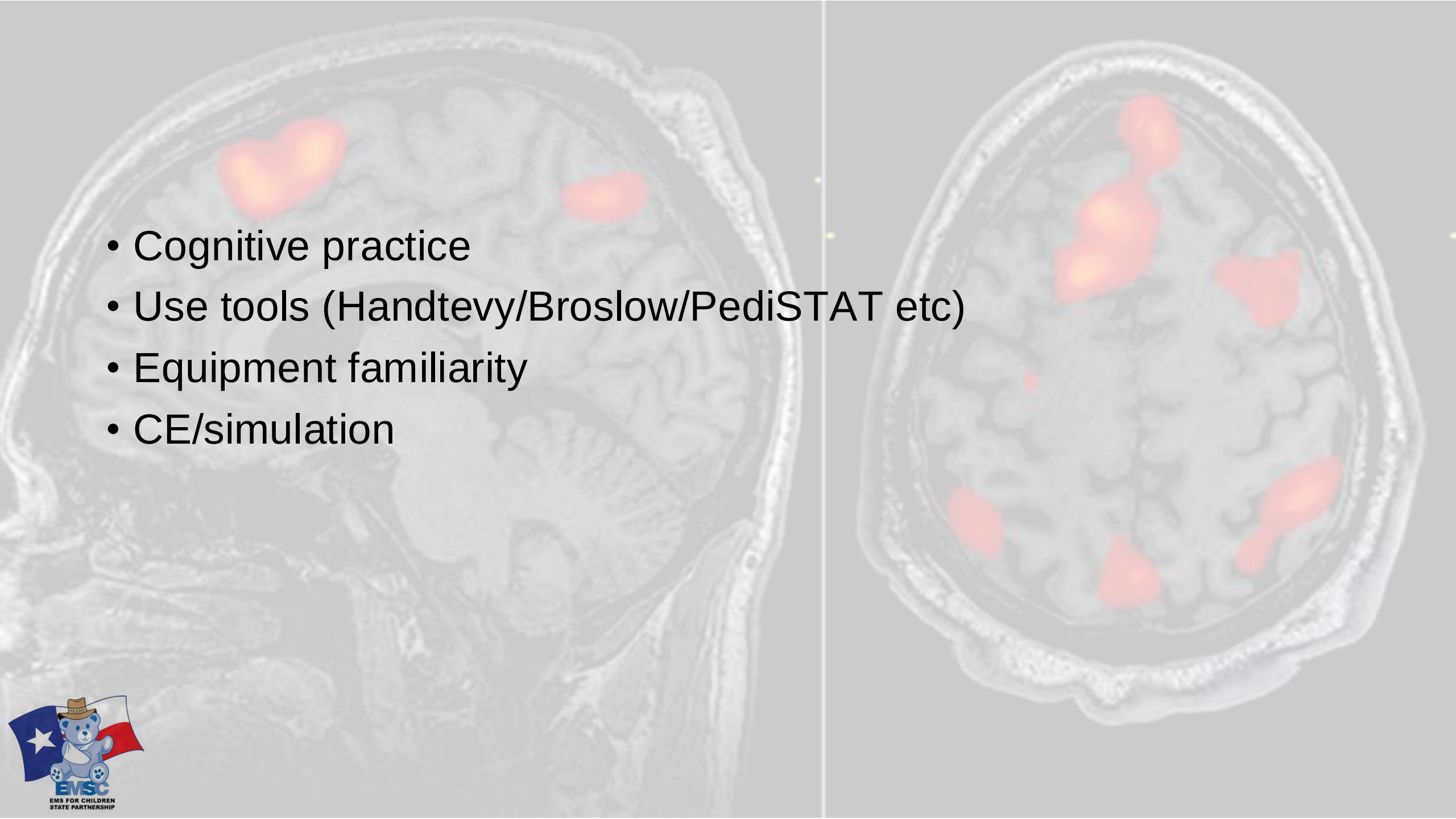
EMS = RESUS EXPERTS



- Cognitive practice
- Use tools (Handtevy/Broslow/PediSTAT etc)
- Equipment familiarity
- CE/simulation

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Tone
Interactiveness
Consolability
Look/Gaze
Speech

Breath Sounds
Positioning
Retractions
Flaring
Apnea/Gasping

Pallor
Mottling
Cyanosis

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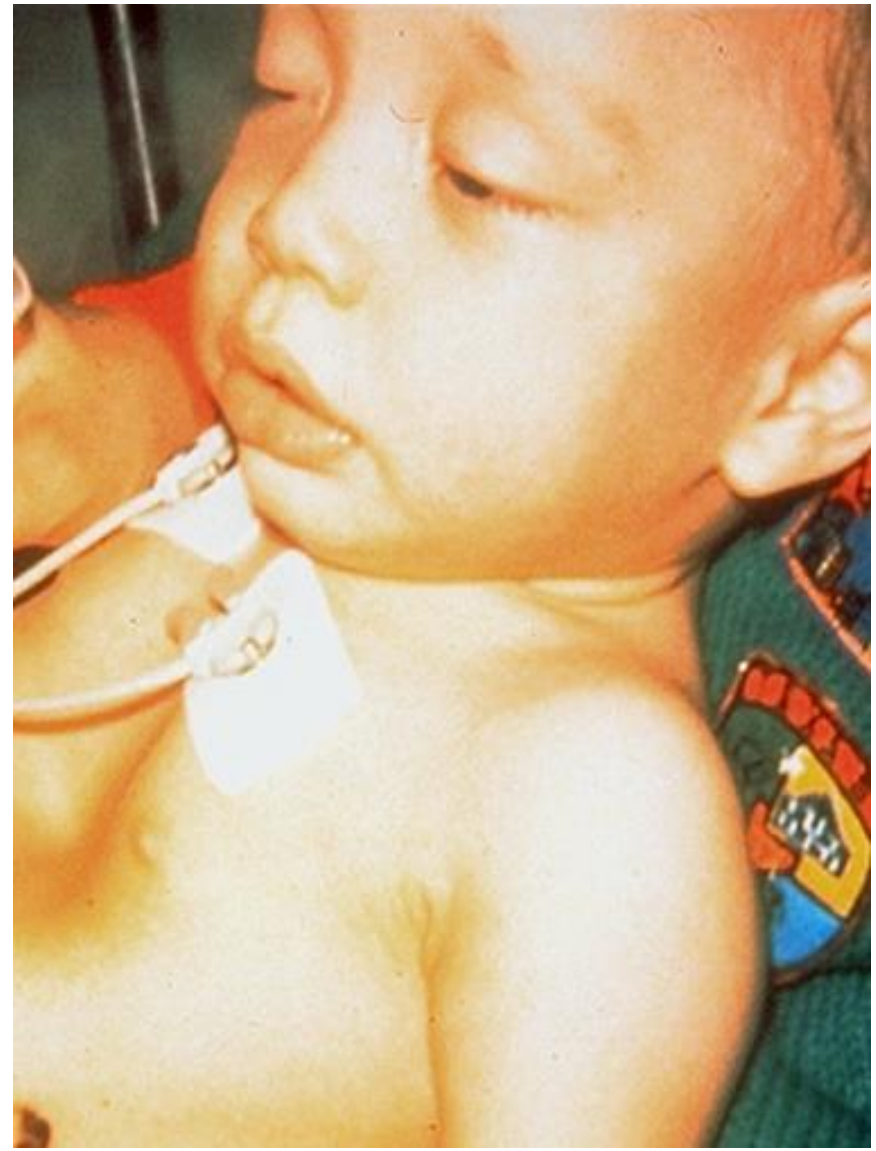

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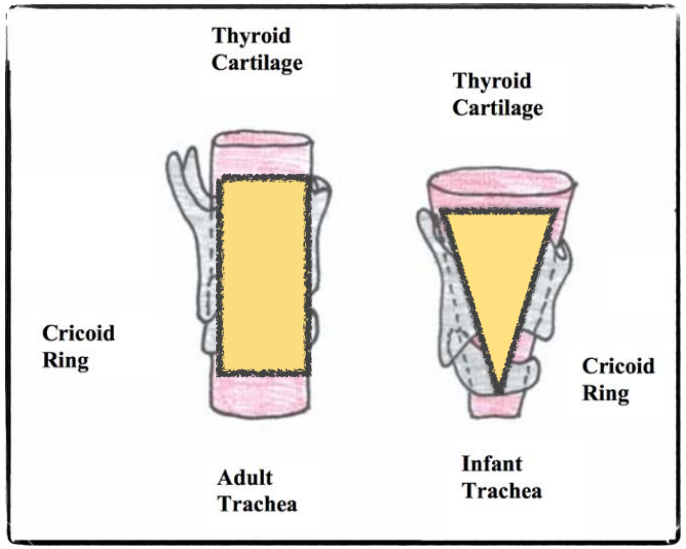
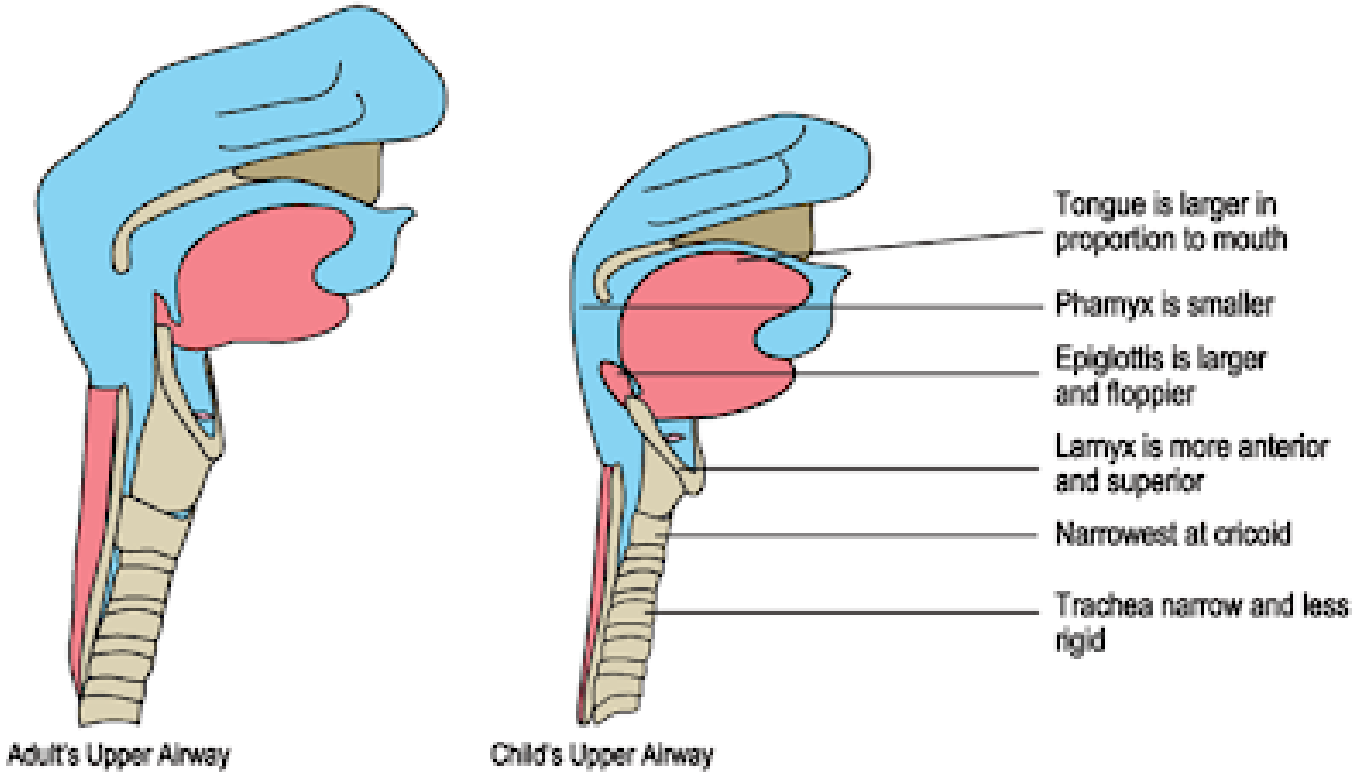


- Everything is shorter/closer together
  - must go stepwise down the airway!
- Vocal cords more pink than white
- Hand under head for better airway manipulation
- Twist/lube the tube to get it to pass the cords



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Glabella – Chin Plane 1

HORIZONTALLY ALIGNED

Neck 2

WIDE AND OPEN

External Auditory Meatus - Suprasternal Notch Plane 3

HORIZONTALLY ALIGNED

Shoulder Roll

Headrest

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Physiology differences

- 95% of all cardiac arrests in children are respiratory etiology
- higher oxygen metabolism
- faster heart rate
- fever increases RR and O2 demand even more

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Physiology differences

- Resuscitate *in order to* intubate
- Fast intubation is (almost) never part of initial resuscitation
- BVM / SGA will do the trick almost every time

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A
cm.
B

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Size 0 Size 0.5 Size 1.0 Size 1.5 Size 2

Size 3 Size 4 Size 5

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THE 30's ARE THE NEW 20's

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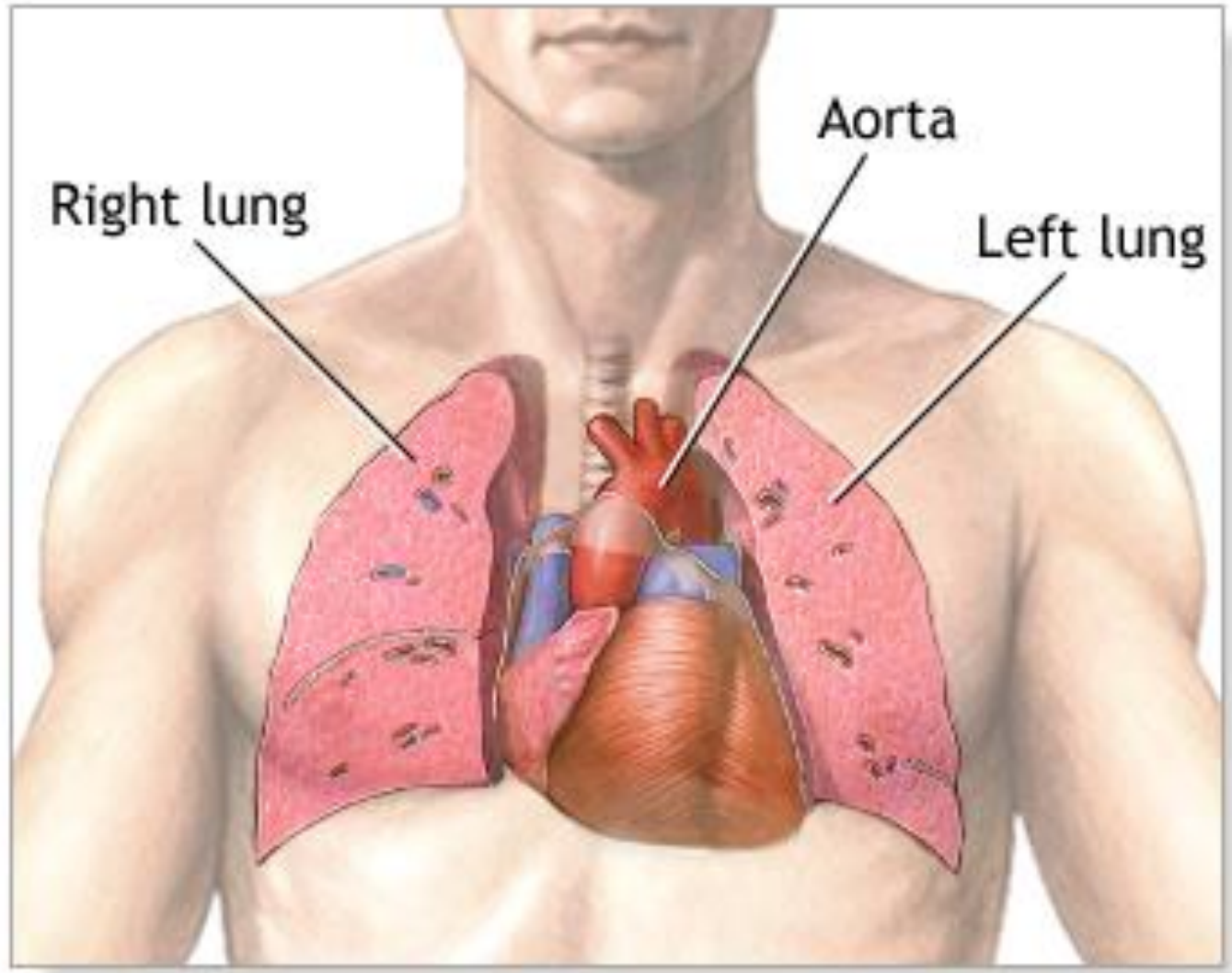

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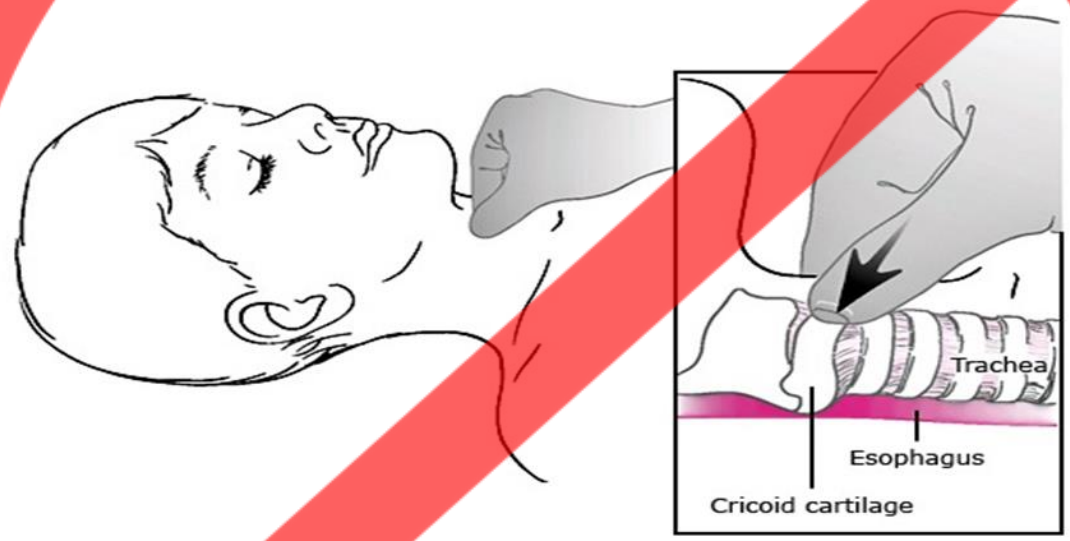
A.D.A.M.

Cricoid pressure (Sellick maneuver)



Cricoid pressure (Sellick maneuver). Posterior displacement of the airway cartilages occludes the compliant esophagus. In infants and young children, the tracheal cartilage is also very compliant, and excessive force while applying cricoid pressure may impair airway patency.

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PEDI-PART

Pediatric Prehospital Airway Resuscitation Trial

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SUCCESS
AHEAD

Newborn resuscitation

- **ABC**, not CAB
- Goal: **warm pink and sweet**
- **Room air is fine for initial resus**
- Pulse oximetry should NOT guide resuscitative efforts
  - color and work of breathing instead
    - pulse ox on RIGHT hand/wrist

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Meconium aspiration

- Airway obstruction, surfactant dysfunction, chemical pneumonitis
- Treat the *patient*
- Handle minimally - avoid agitation, can quickly become hypoxic

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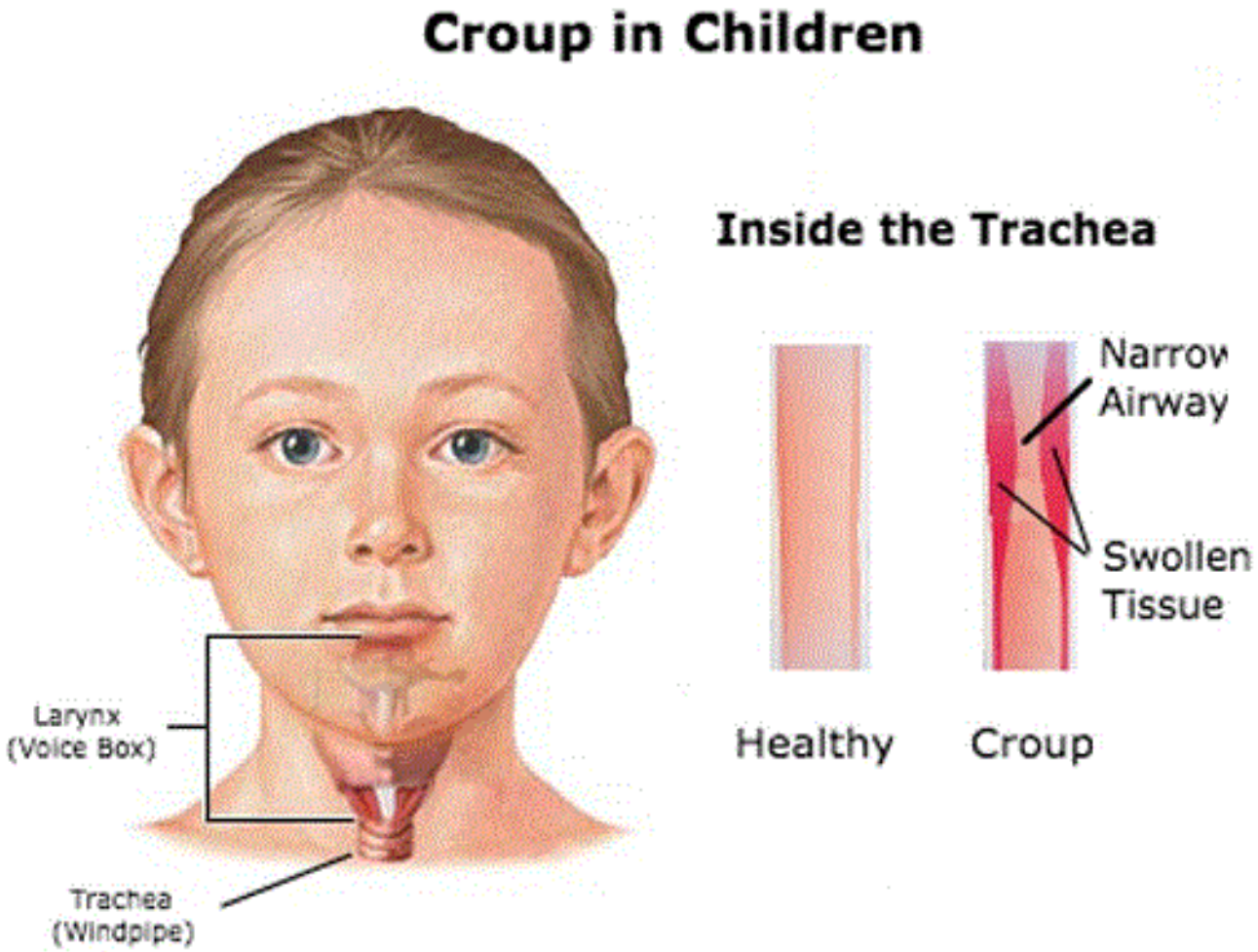
Croup

Stridor at Rest
Mod-Severe Resp Distress

5 mL of 1:10,000
epi Nebulized

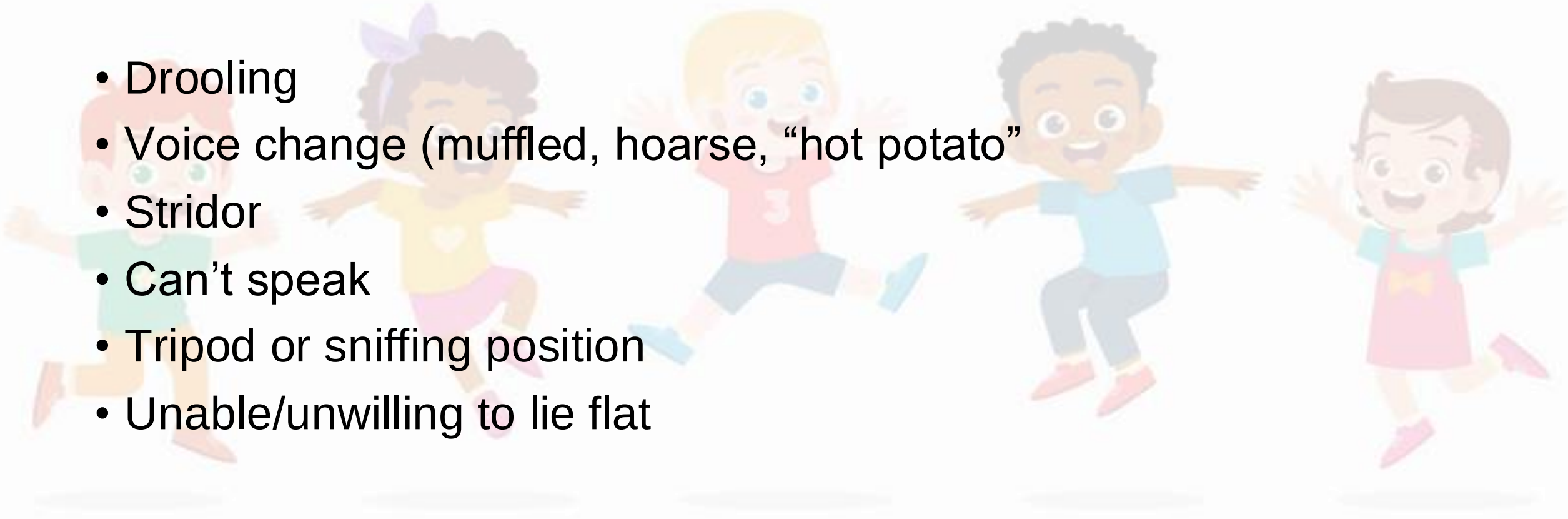


Rapid onset

Mom is panicked

CO2 is high because they're not exhaling well

Danger signs



- Drooling
- Voice change (muffled, hoarse, “hot potato”
- Stridor
- Can’t speak
- Tripod or sniffing position
- Unable/unwilling to lie flat

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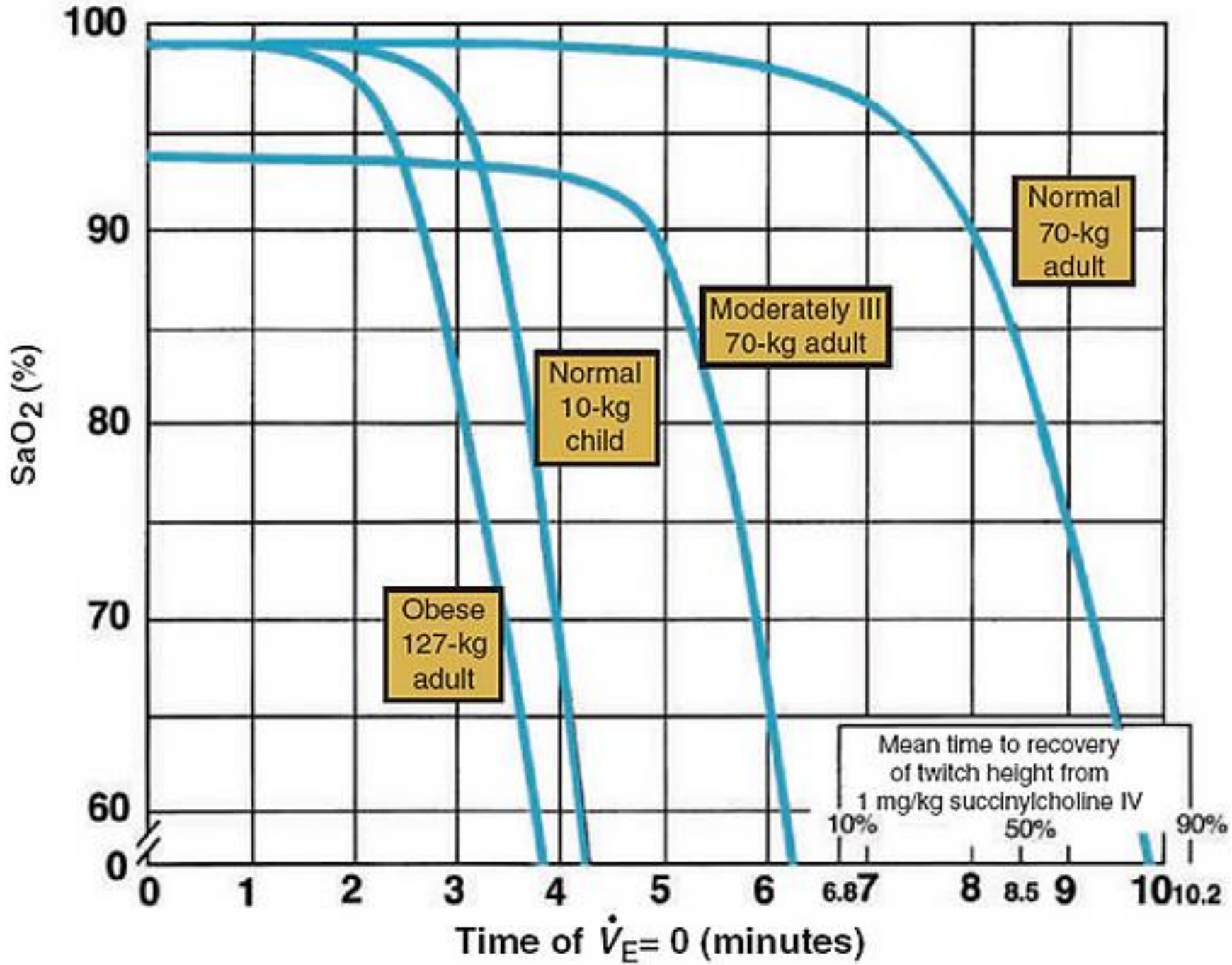

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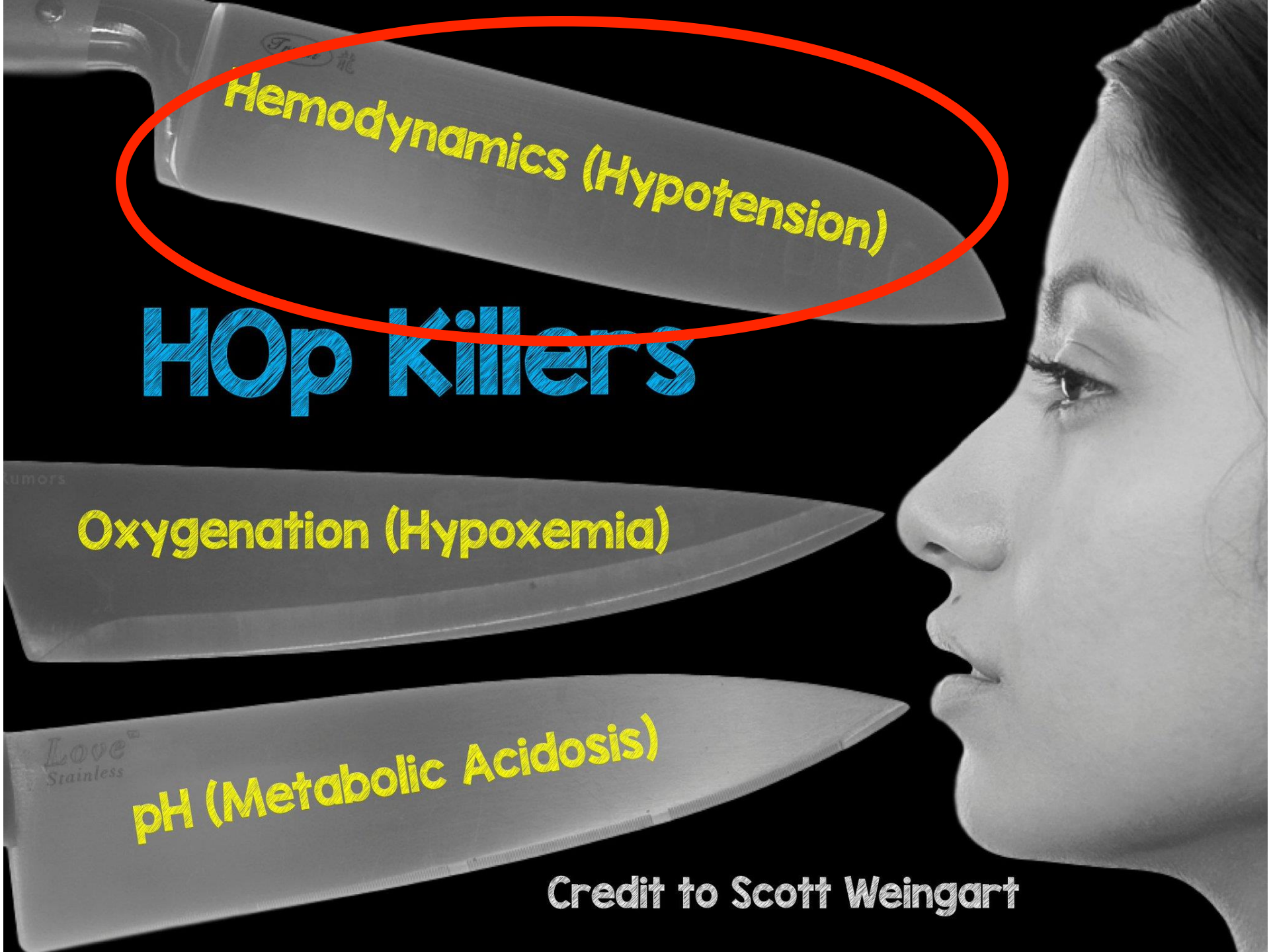

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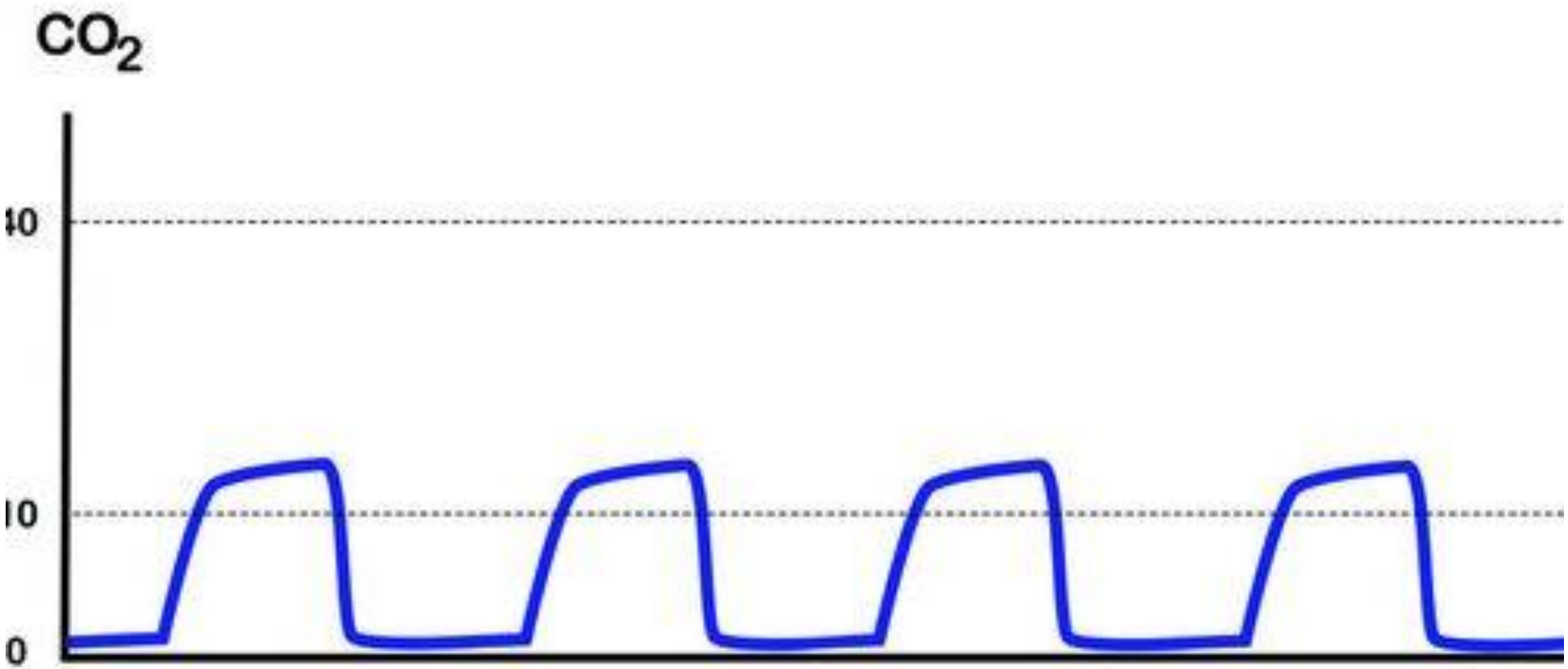

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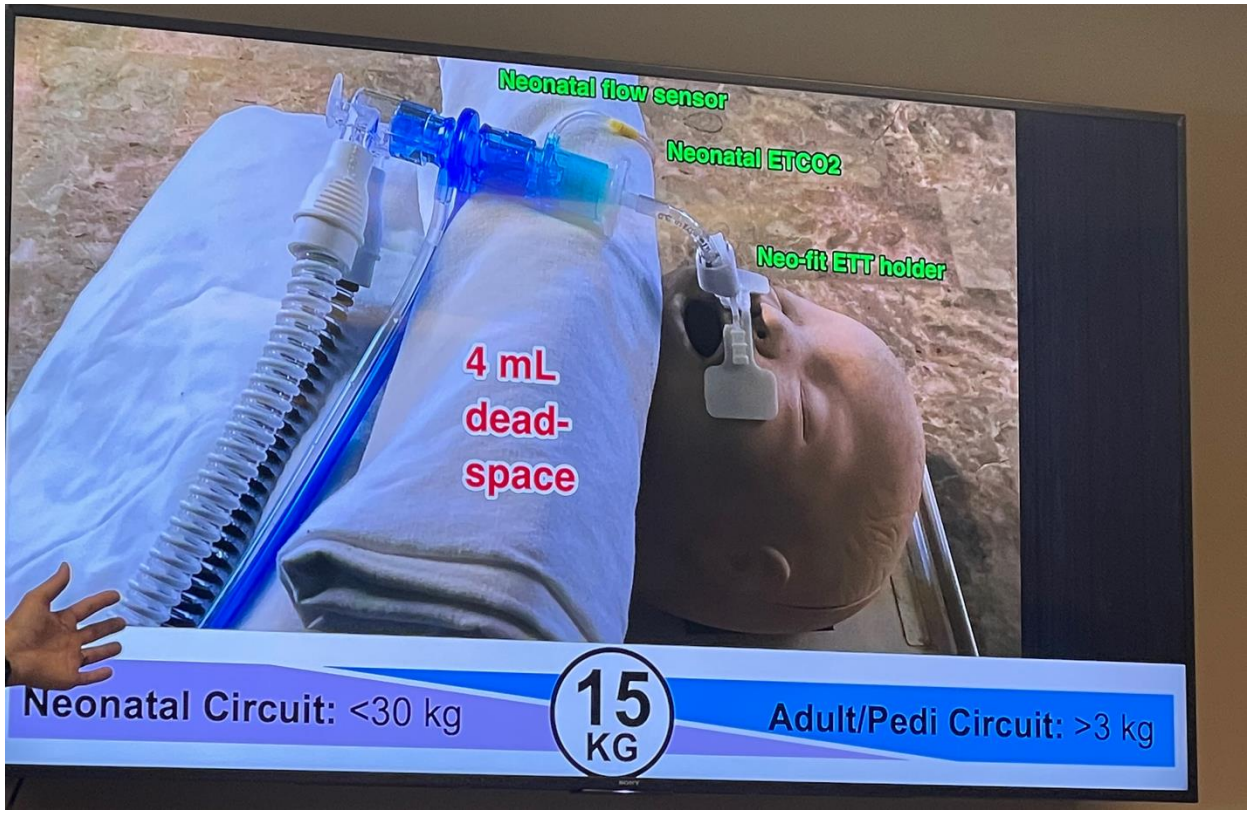
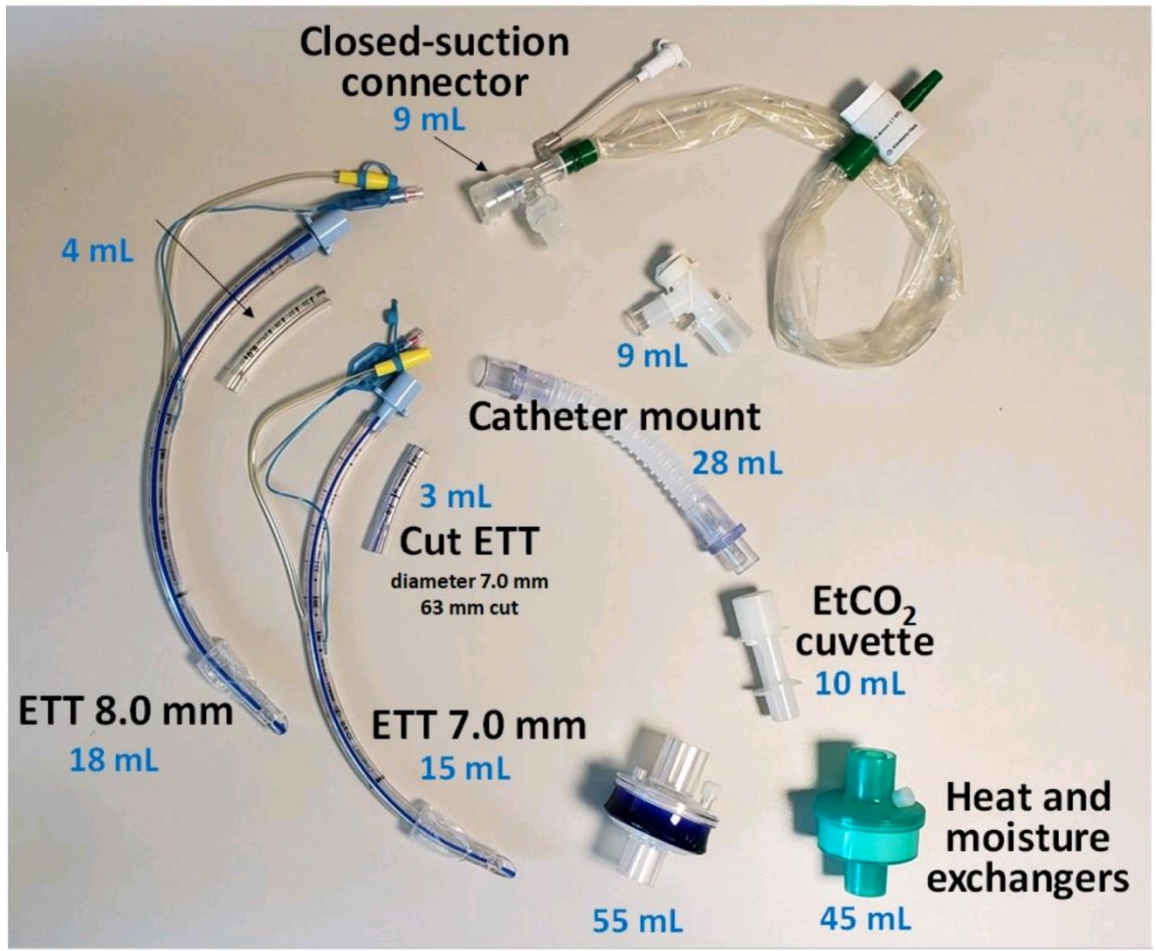


Ventilo



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30-40% of a child's cardiac output goes to work of breathing when critically ill


PANIC!

What if no chest rise?

- Reposition head
- suction
- NO cricoid pressure
- Consider foreign body aspiration

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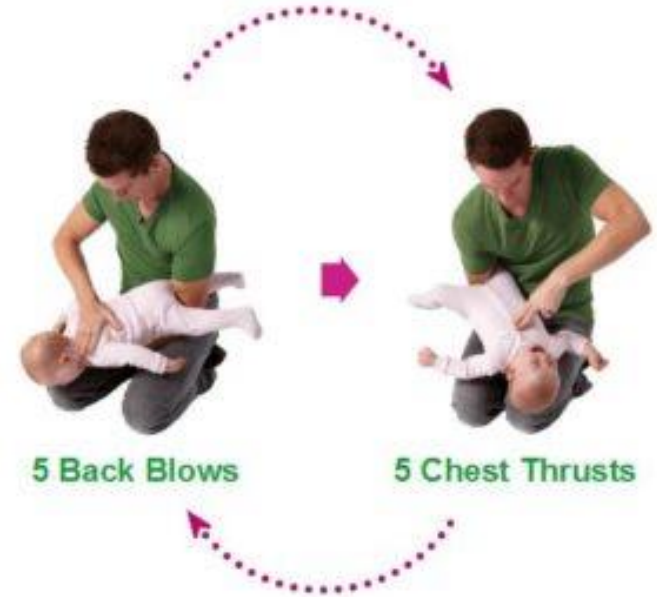

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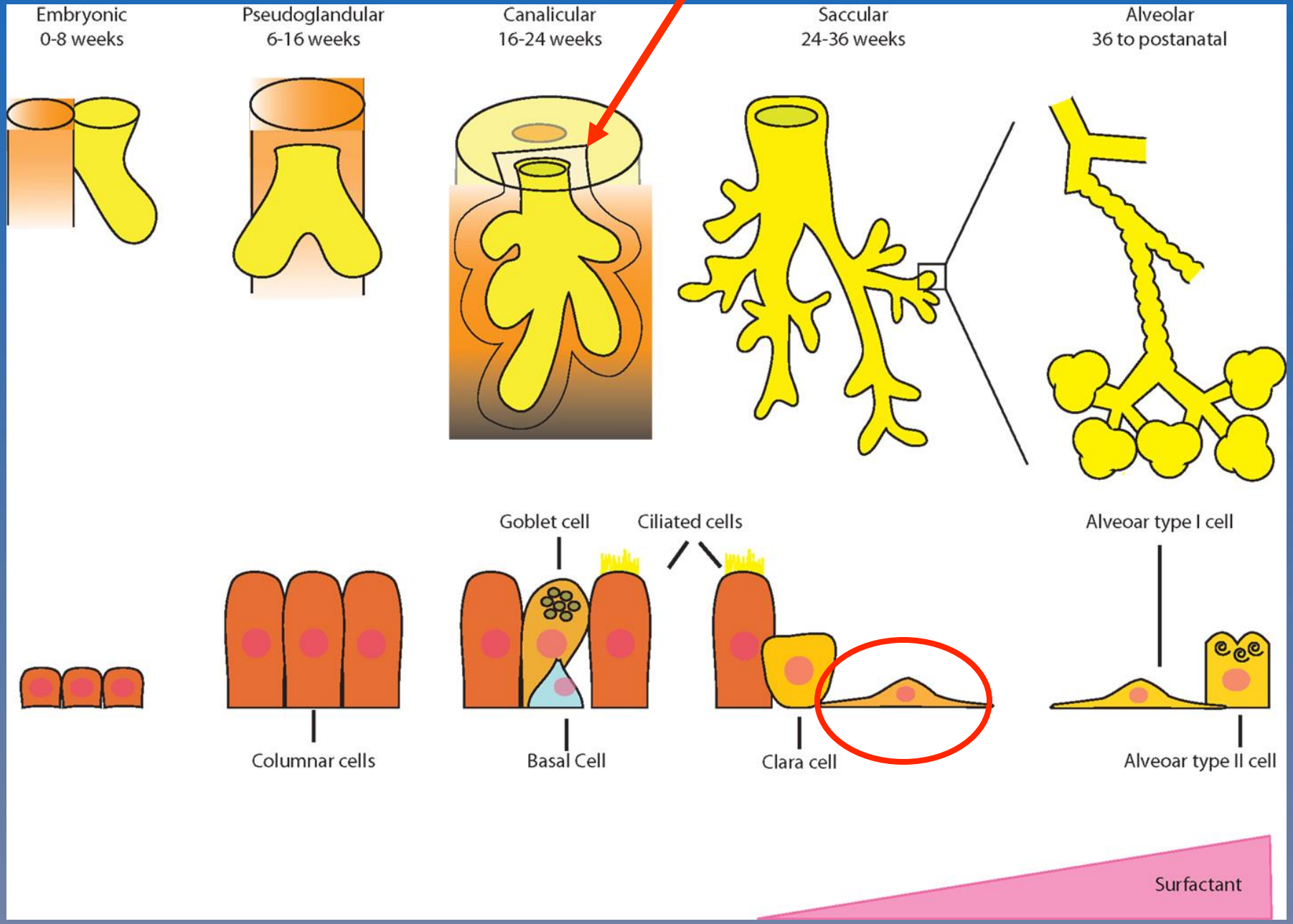
WHAT IS A MICROPREEMIE

- birth weight < 500 grams
- less than 24 weeks

- fundus less than umbilicus = less than 20 weeks
- if mom is unsure on dates, go with “20 weeks”

- finger webbing usually gone by 12 weeks
- eyes fused till 26 weeks
- skin will be gelatinous
- head the size of a tennis ball

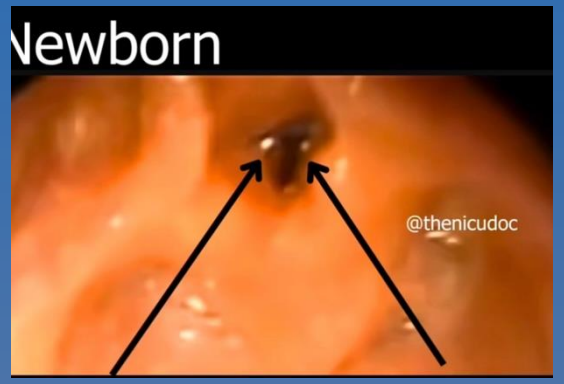

Embryonic
0-8 weeks
Pseudoglandular
6-16 weeks
Canalicular
16-24 weeks
Saccular
24-36 weeks
Alveolar
36 to postanatal
Goblet cell
Ciliated cells
Alveoar type I cell
Columnar cells
Basal Cell
Clara cell
Alveoar type II cell
Surfactant

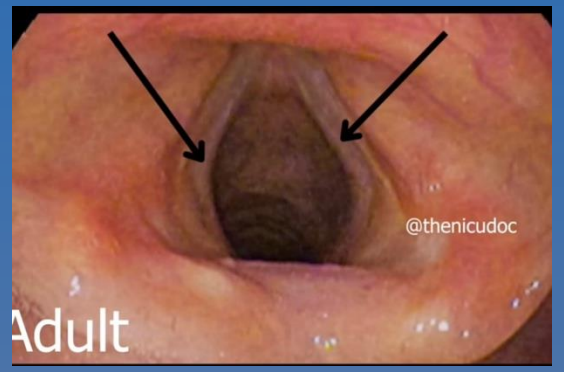
PRIORITIES

- Positive pressure ventilation
- Circulatory stabilization
- Transport sooner rather than later…

FOR EVERY 30 SECONDS THAT VENTILATION IS DELAYED, THE RISK OF PROLONGED ADMISSION OR DEATH INCREASES BY 16%.

AIRWAY

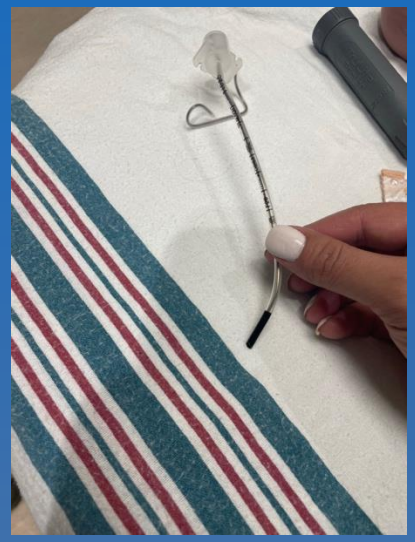




- NO routine/deep suctioning unless indicated
- don’t tube unless you have to
    - CPAP reduces death/BPD, NNT 25

- very anterior
- probably need laryngeal manipulation
- cords don’t look like cords
- 00 blade, 2.0/2.5 ETT
- X cut elastic tape for securing tube

BREATHING



- breathe 1/second
- pay attention to Vt, chest rise and fall
- PPV to clear out fluid, open alveoli
- start with room air - too much O2 is bad (unless CPR)
    - risk causing BPD, bacterial sepsis, neuro impairment
- stabilize before tube, just like with any other patient
    - SpO2 >80, HR > 100