

# Quick Case Reviews of Pediatric Care

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# Quick Case 1

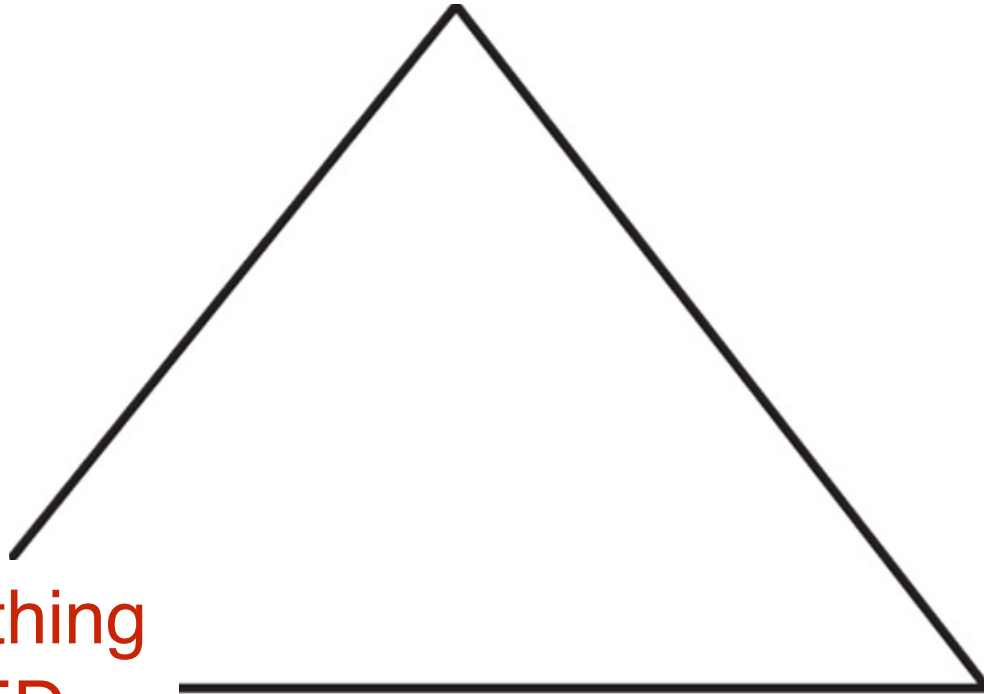
- A 4 y/o M presents lethargic in mom's arms and does not respond to verbal stimuli.
- Skin is cyanotic, cold, and diaphoretic, peripheral pulses are absent.
- RR = 10/min and shallow, HR = 70/min and regular, SpO<sub>2</sub> = 86% RA.

RESPIRATORY  
DISTRESS

Appearance  
ABNORMAL

Work of Breathing  
INCREASED

Circulation  
ABNORMAL



# Treatment

- Lay pt supine
- Chest compressions?
- Open Airway
  - Padding as necessary
- BVM ventilations with 100% O<sub>2</sub>
  - 12-20/min with normal chest rise/fall



# Airway Differences

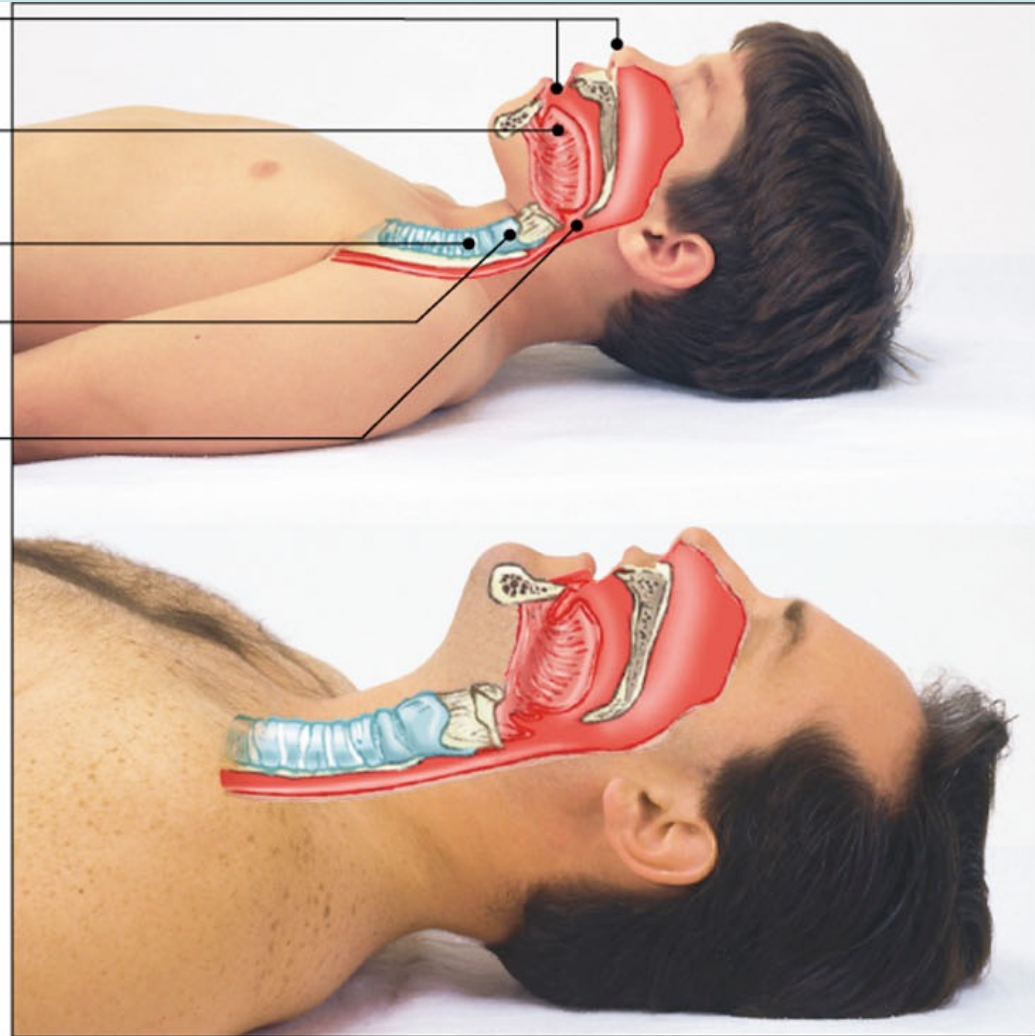
Child has smaller nose and mouth.

In child, more space is taken up by tongue.

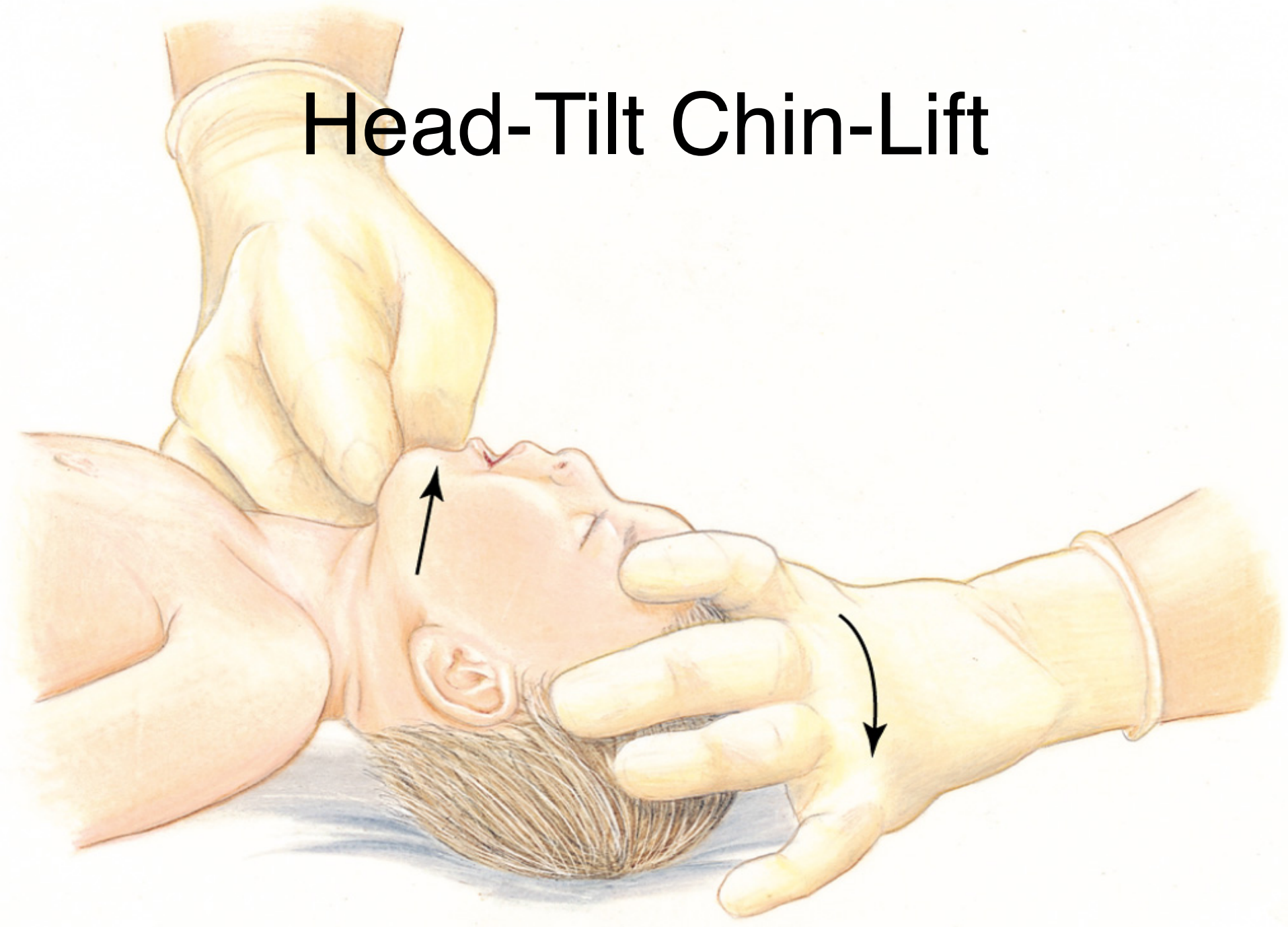
Child's trachea is narrower.

Cricoid cartilage is less rigid and less developed.

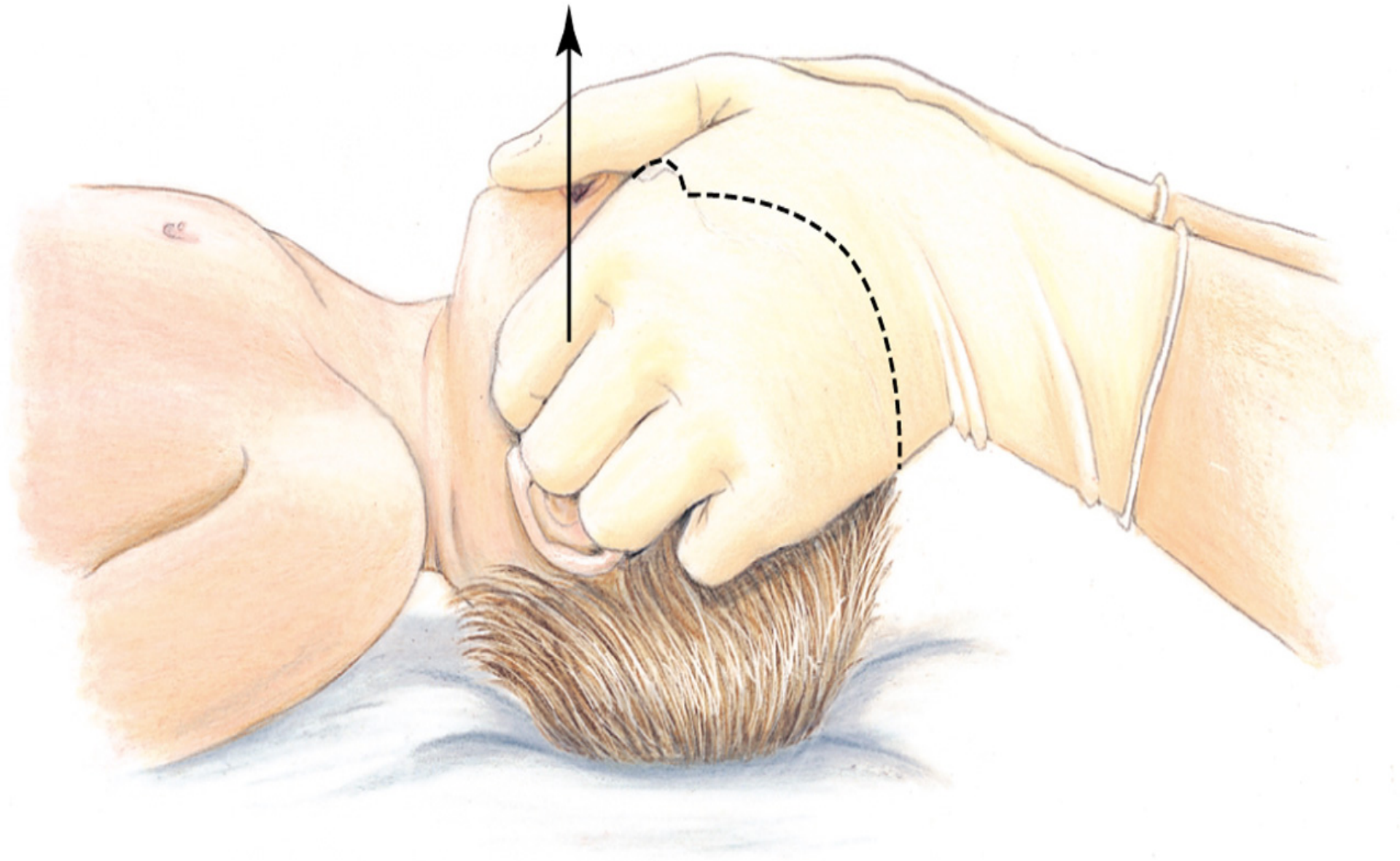
Airway structures are more easily obstructed.



# Head-Tilt Chin-Lift

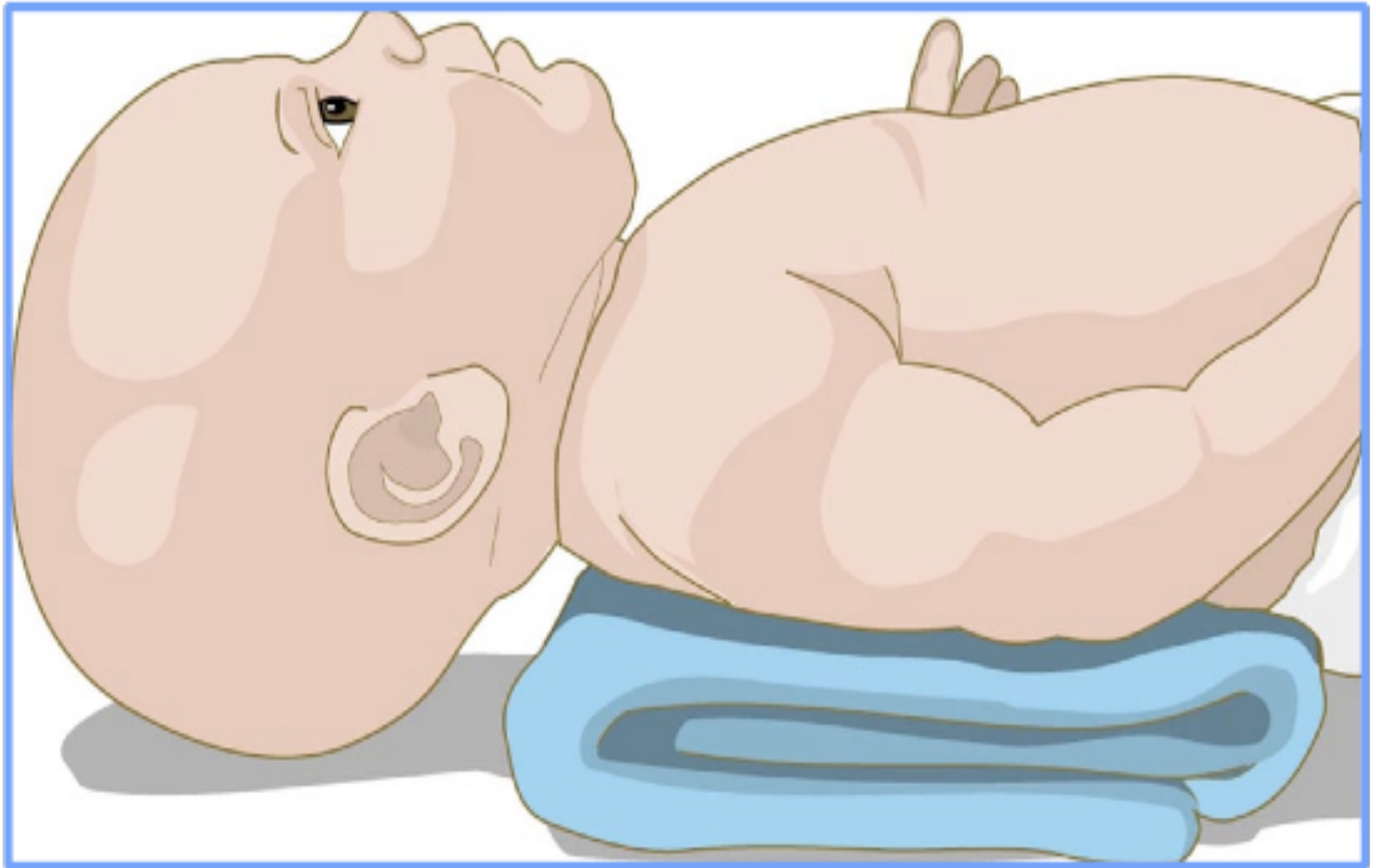


# Jaw-Thrust





**Open the airway using head-tilt,  
chin-lift without hyperextension.**





# Suction

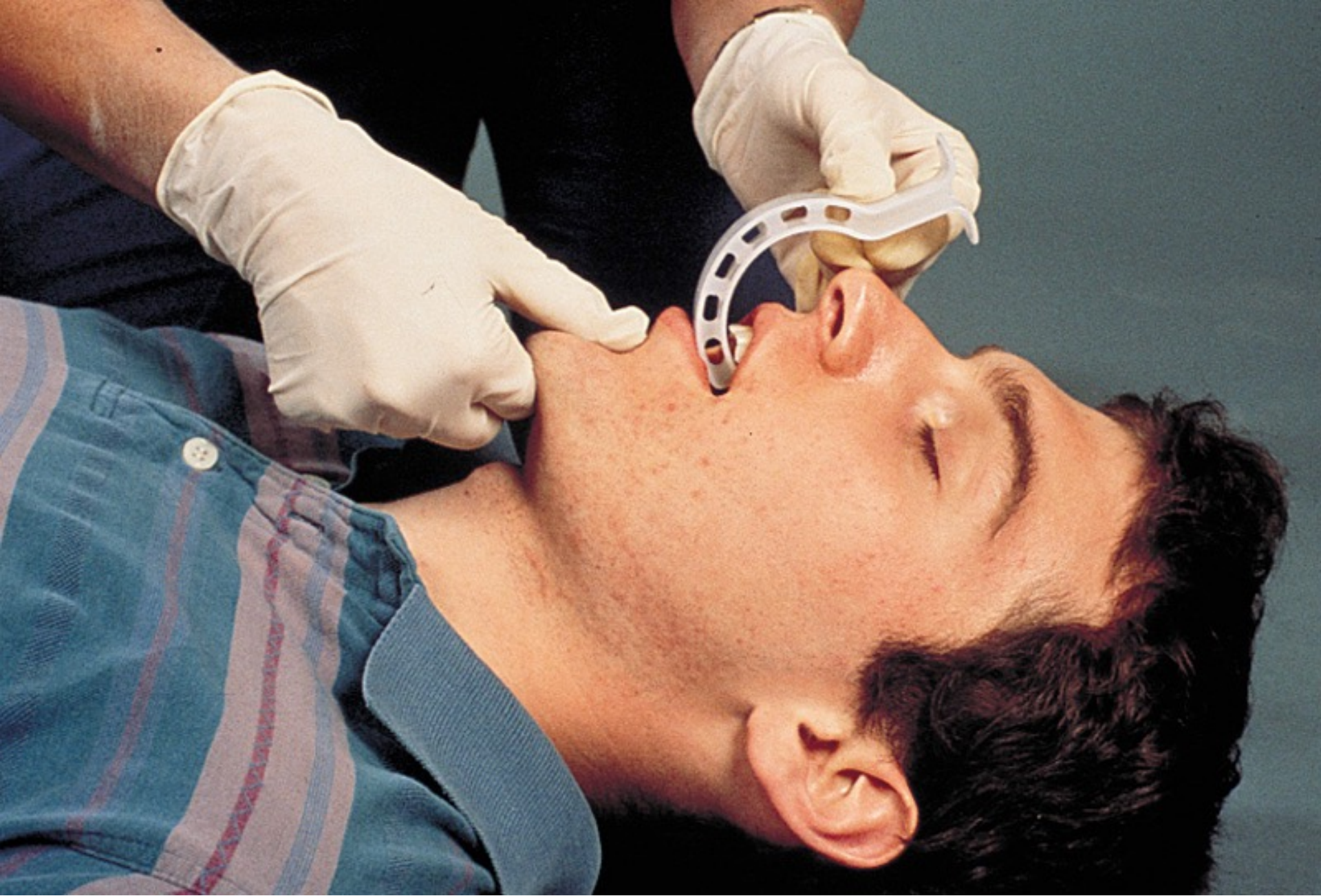
- Text says < 5 seconds
- More realistically, recognize that it needs to be done efficiently
- If not efficient:
  - bradycardia: vagal stimulation & hypoxia
  - hypoxia: inadequate ventilation

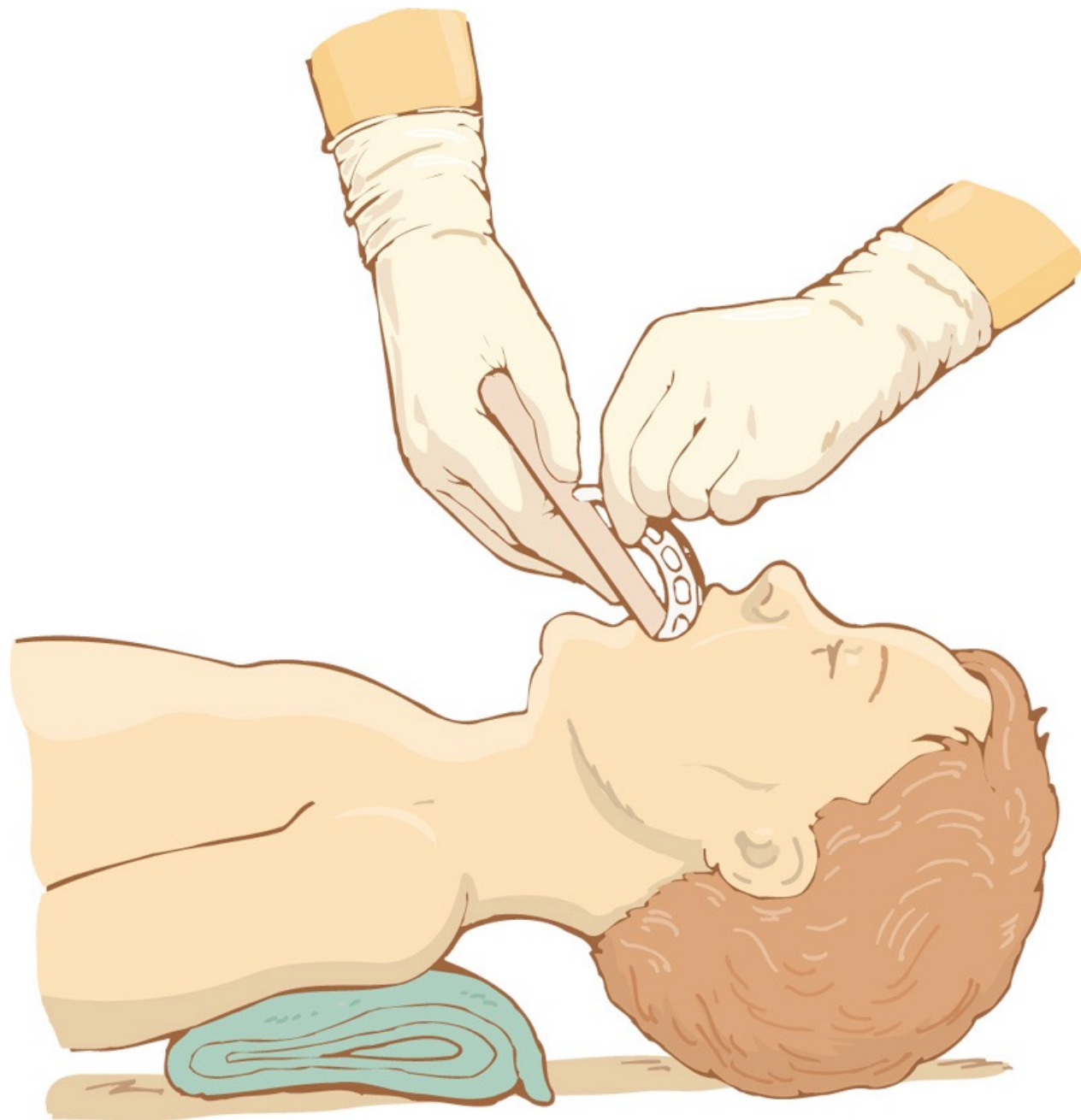
















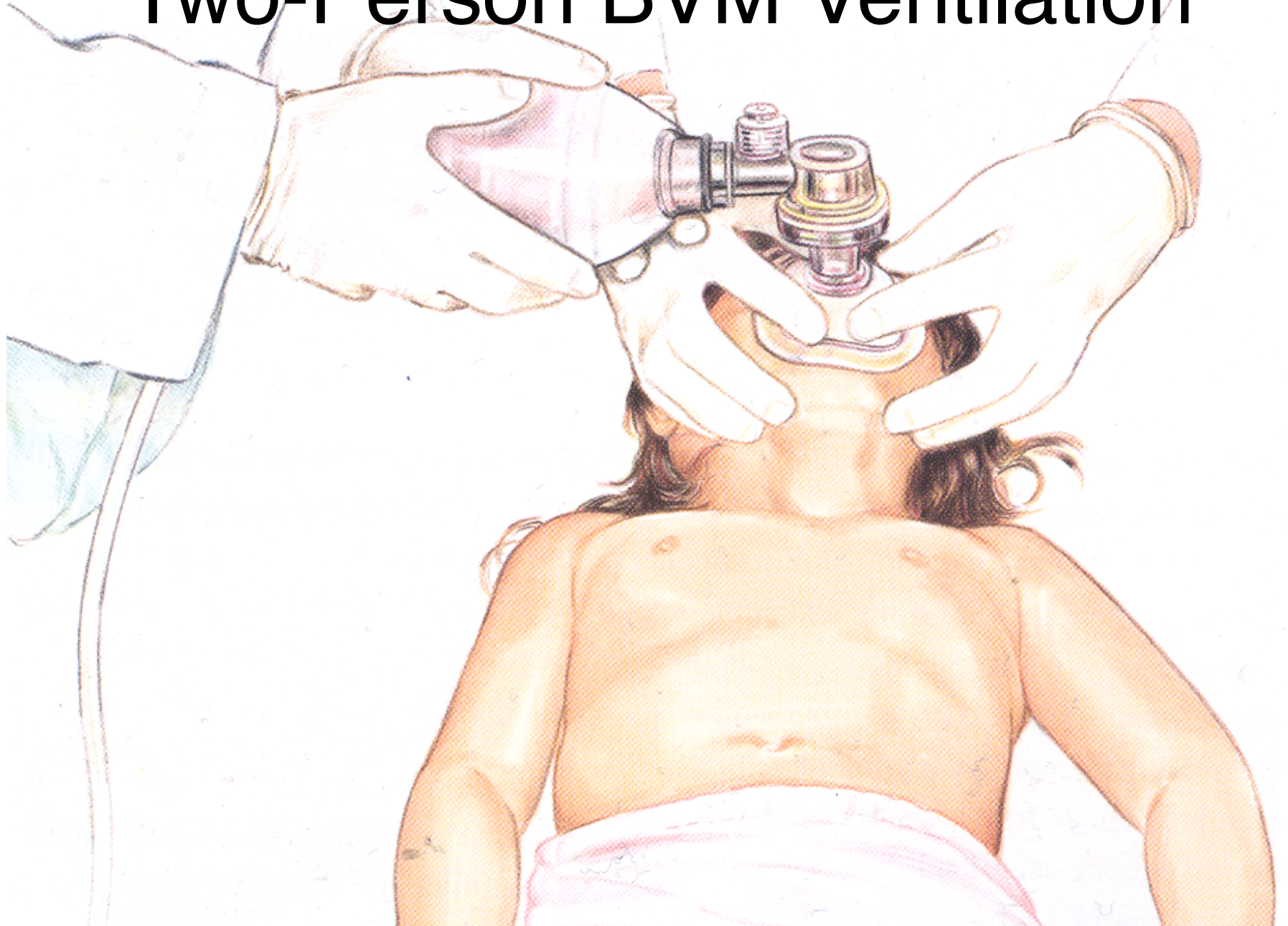


## Rate/depth?

- 12-20/min
- Each breath over 1 second
- Enough TV for normal chest rise/fall

What can be done better?

# Two-Person BVM Ventilation





Yes or no?



# Quick Case 2

- A 4 y/o M presents CAO in respiratory distress.
- Good muscle tone, anxious
- RR = 40/min, normal TV
- Nasal flaring, some intercostal and substernal retractions.
- Skin warm, pink, dry.
- Capillary refill 2 seconds.

# Is This Patient In...

- Respiratory distress?
  - Compensated
- Respiratory failure?
  - Decompensated
- Respiratory arrest?



# Respiratory Distress

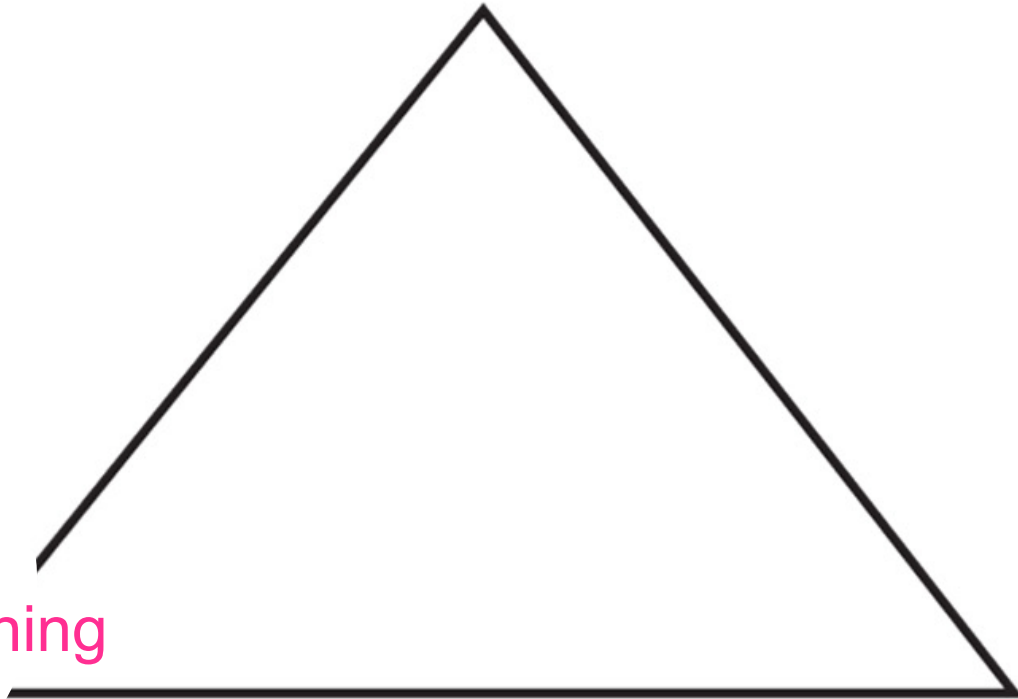
- Abnormal respiratory rate or effort.
- Can range from mild to severe
- Signs and symptoms include:
  - tachycardia, tachypnea
  - pale, cool skin
  - abnormal airway sounds
    - stridor, grunting, wheezing
  - increased respiratory effort
    - nasal flaring, retractions, accessory muscles

RESPIRATORY  
DISTRESS

Appearance  
NORMAL

Work of Breathing  
INCREASED

Circulation  
NORMAL



# Normal Respiratory Rates by Age

Age	Breaths/min
Infant (<1 yr)	30 to 60
Toddler (1-3 yrs)	24 to 40
Preschooler (3-6 yrs)	22 to 34
School Age (6-12 yrs)	18 to 30
Adolescent (13-18 yrs)	12 to 16

# Retractions and Levels of Difficulty Breathing

Breathing Difficulty	Location of Retraction	Description
Mild to Moderate	Subcostal	Retraction of abdomen, just below rib cage.
Mild to Moderate	Substernal	Retraction of abdomen at bottom of breastbone.
Mild to Moderate	Intercostal	Retraction between ribs.
Severe	Supraclavicular	Retraction in neck, above collarbone.
Severe	Suprasternal	Retraction in chest, above sternum.
Severe	Sternal	Retraction of sternum towards spine.

# Normal Heart Rates by Age

Age	Awake Rate	Mean
<3 months	85 to 205	140
3 months to 2 years	100 to 190	130
2 years to 10 years	60 to 140	80
>10 years	60 to 100	75

# Skin Signs

- Signs that may indicate inadequate oxygen delivery:
  - pallor
  - mottling
  - cyanosis

# Pallor

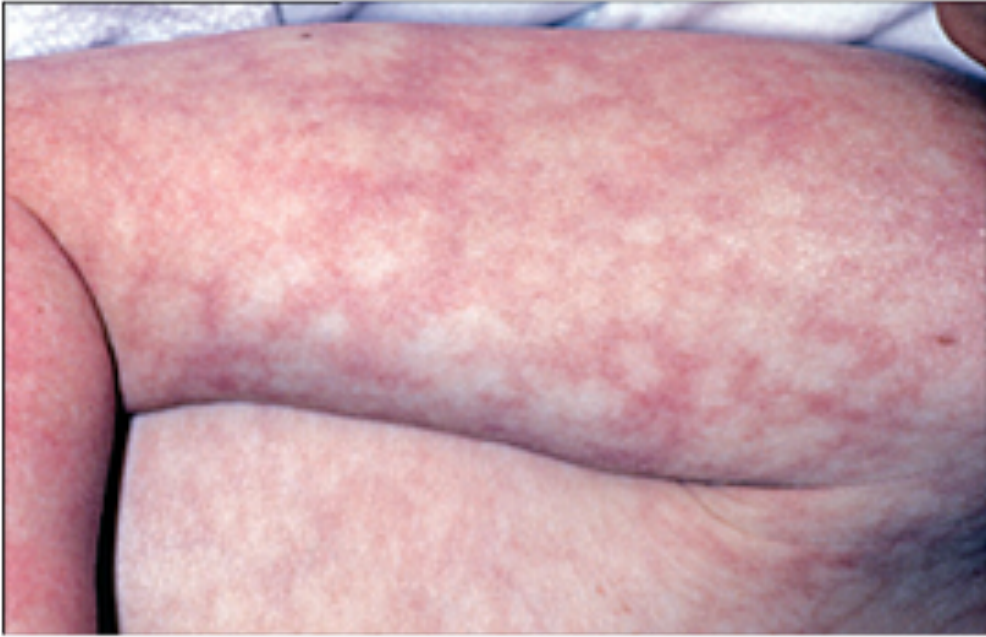


# Cyanosis





# Mottling



# Respiratory Distress:Treatment

- 100% O<sub>2</sub> via NRM 15 lpm
- POC
- Reevaluate ABC's frequently

# Quick Case 3

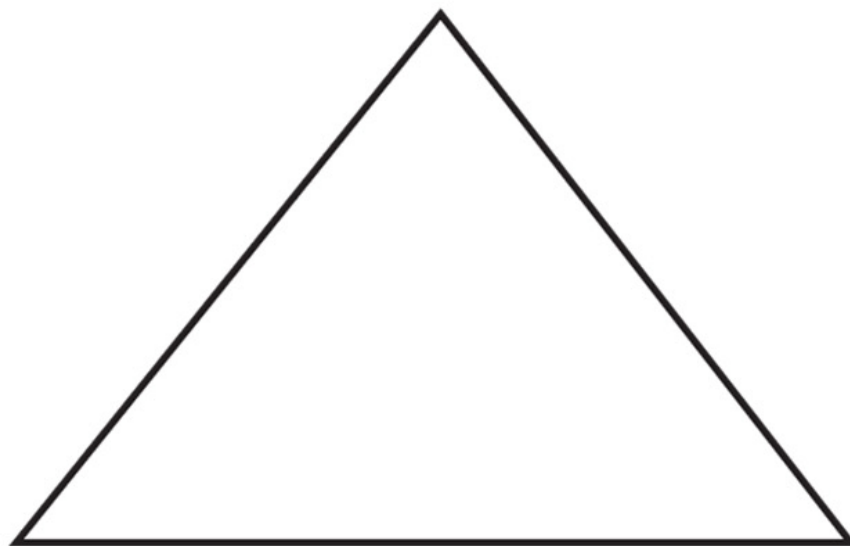
- 4 y/o M presents with a RR of 40/min and shallow.
- You note:
  - HR = 104/min
  - AMS, skin cool, pale, and moist
  - accessory muscle use, head bobbing, cyanosis
  - suprasternal & supraclavicular retractions

# Is This Patient In...

- Early respiratory distress?
  - Compensated
- Respiratory failure?
  - Decompensated
- Respiratory arrest?

# RESPIRATORY FAILURE

Appearance  
ABNORMAL



Work of Breathing  
INCREASED

Circulation  
NORMAL OR ABNORMAL

# Respiratory Failure

- Inadequate oxygenation and/or ventilation.
- Can range from mild to severe
- Signs and symptoms include:
  - tachycardia (early), bradycardia (late)
  - tachypnea (early), bradypnea (late)
  - increased or decreased resp effort
  - poor air movement
  - cyanosis, hypoxia, **AMS**

# Respiratory Failure:Treatment

- 100% O<sub>2</sub> via NRM 15 lpm
  - BVM assist as needed
- POC
- Reevaluate ABC's frequently

# Quick Case 4

- 5 y/o F presents with a RR of 4/min.
- You note:
  - No response to pain
  - Limp muscle tone
  - HR = 42/min
  - No peripheral pulses

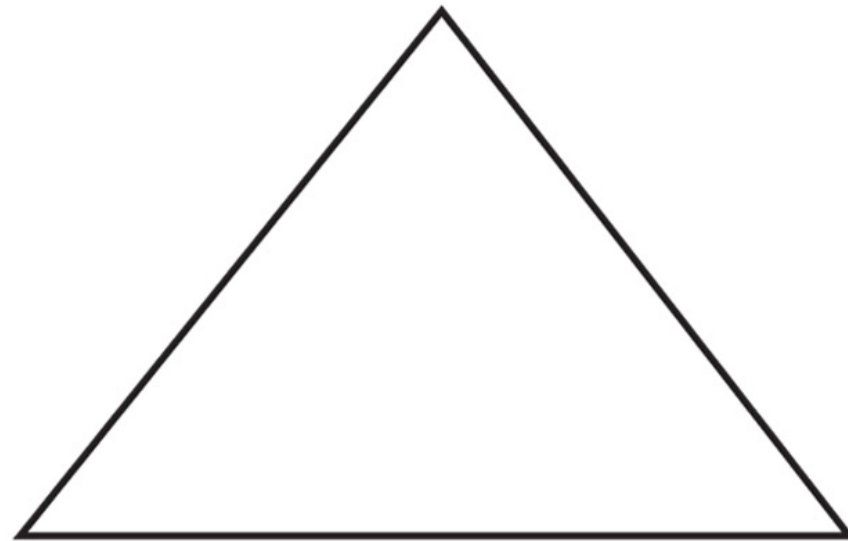


# Is This Patient In...

- Early respiratory distress?
  - Compensated
- Respiratory failure?
  - Decompensated
- Respiratory arrest?

**IMMINENT  
RESPIRATORY  
ARREST**

Appearance  
ABNORMAL



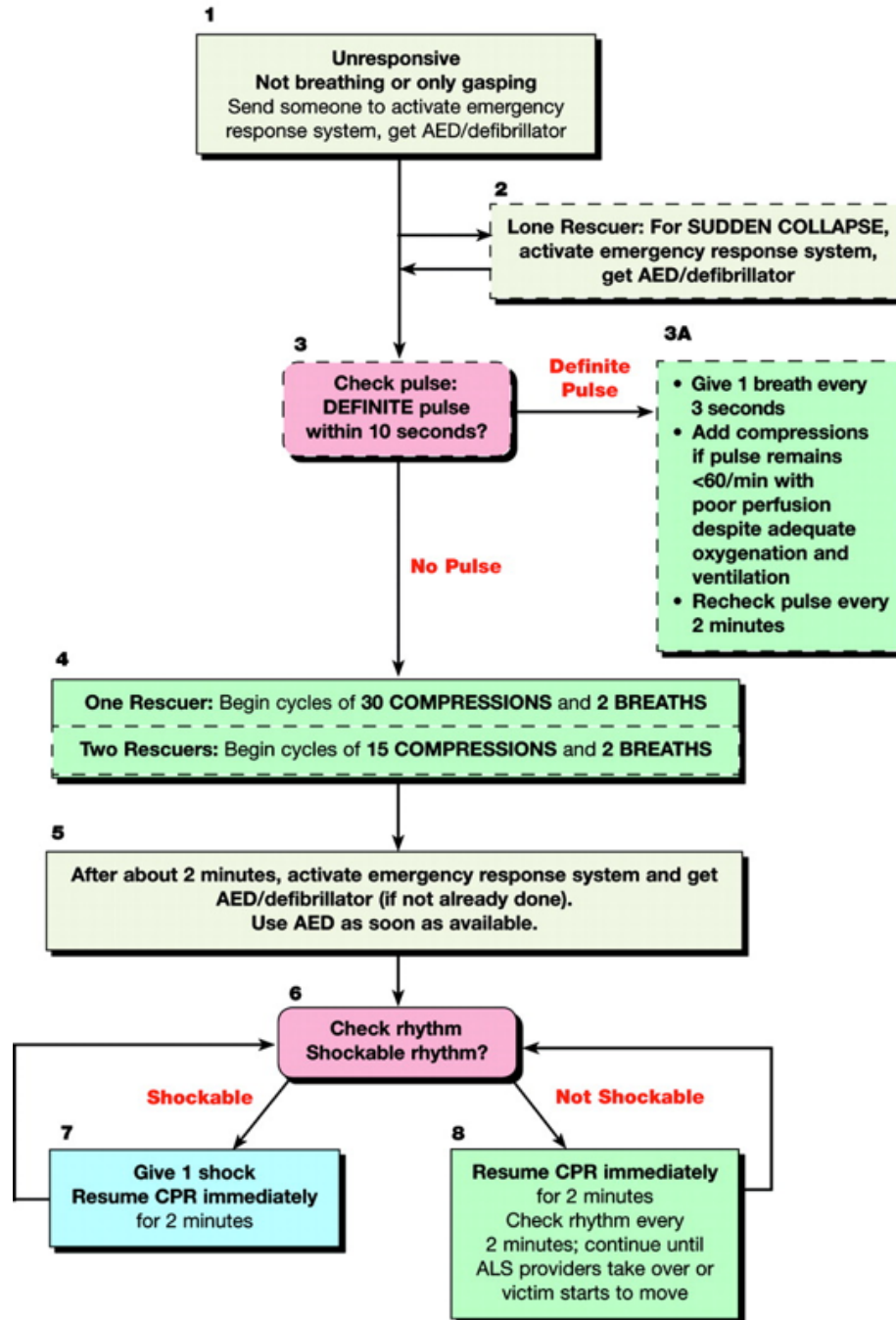
Work of Breathing  
DECREASED

Circulation  
NORMAL OR ABNORMAL

# Respiratory Arrest:Treatment

- Lay pt supine, position
- Open airway, keep it open
  - Suction
  - OPA/NPA
- O<sub>2</sub> via BVM 15 lpm
  - Vent rate 12-20/min
- CPR if HR < 60/min

## Pediatric BLS Healthcare Providers



### High-Quality CPR

- Rate at least 100/min
- Compression depth to at least  $\frac{1}{3}$  anterior-posterior diameter of chest, about  $1\frac{1}{2}$  inches (4 cm) in infants and 2 inches (5 cm) in children
- Allow complete chest recoil after each compression
- Minimize interruptions in chest compressions
- Avoid excessive ventilation

# Quick Case 5

- 11 m/o M presents lethargic in mother's arms with weak cry.
- Mom describes 3-day history of fever, N/V, diarrhea
- PE reveals “tenting” of skin, dry diaper, no tears when infant cries
- VS:
  - HR = 180/min, RR = 52/min GTV, SpO<sub>2</sub> = 95% RA
  - No peripheral pulses

# Shock?

- Is this patient in shock?
  - HR = 180
  - RR = 52
  - No peripheral pulses
- What kind of shock?
  - Hypovolemic

# Hypotension by Systolic BP and Age

Age	Systolic BP (mmHg)
Term Neonates (0-28 days)	<60
Infants (1 to 12 months)	<70
Children 1 to 10 years	<70+ (age in years x 2)
Children >10 years	< 90

# Shock in Peds

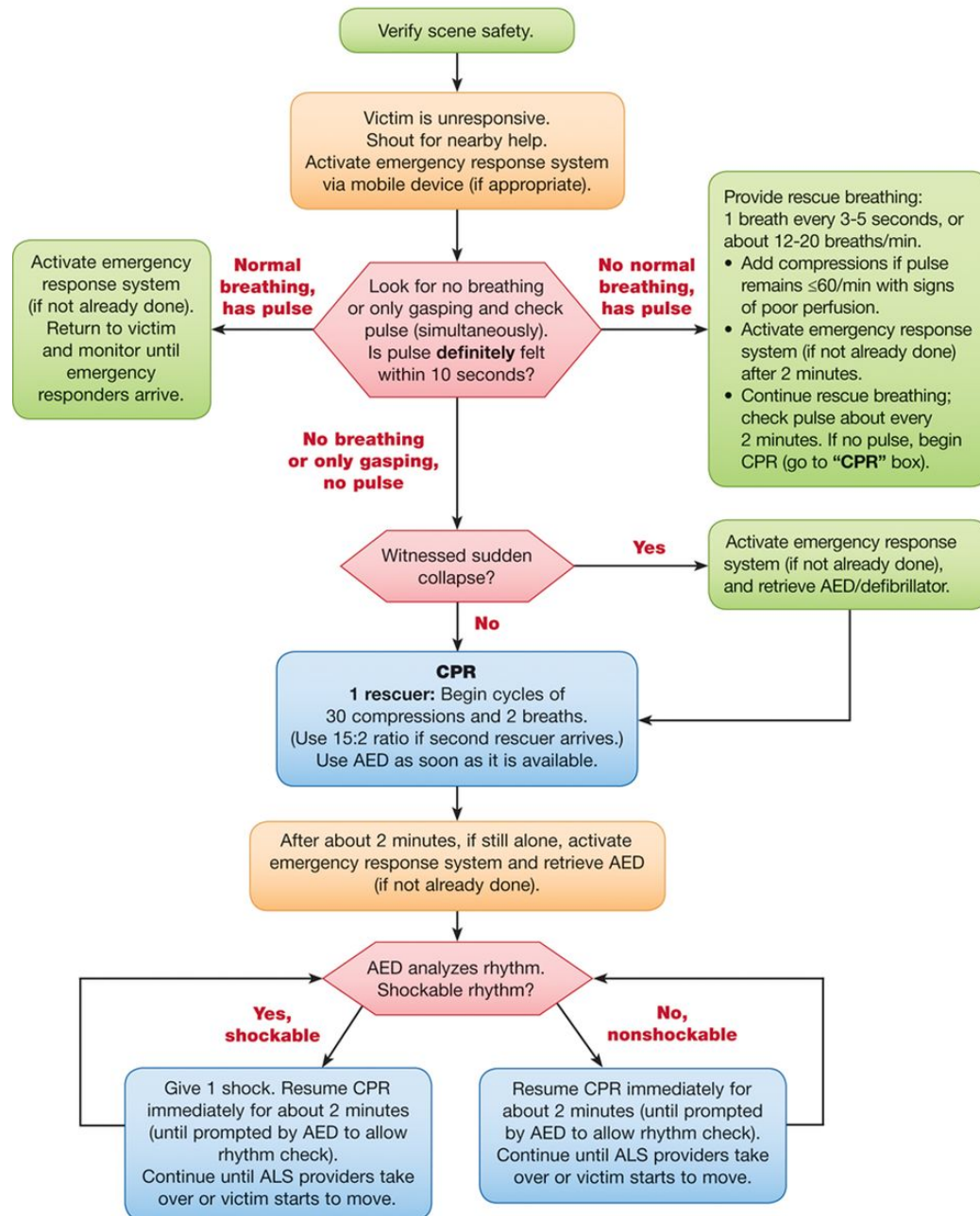
- Compensate with tachycardia.
- Deteriorate faster, more severely than adults.
- Assessment finds:
  - AMS/LOC
  - Loss of peripheral pulses
  - Delayed cap refill time



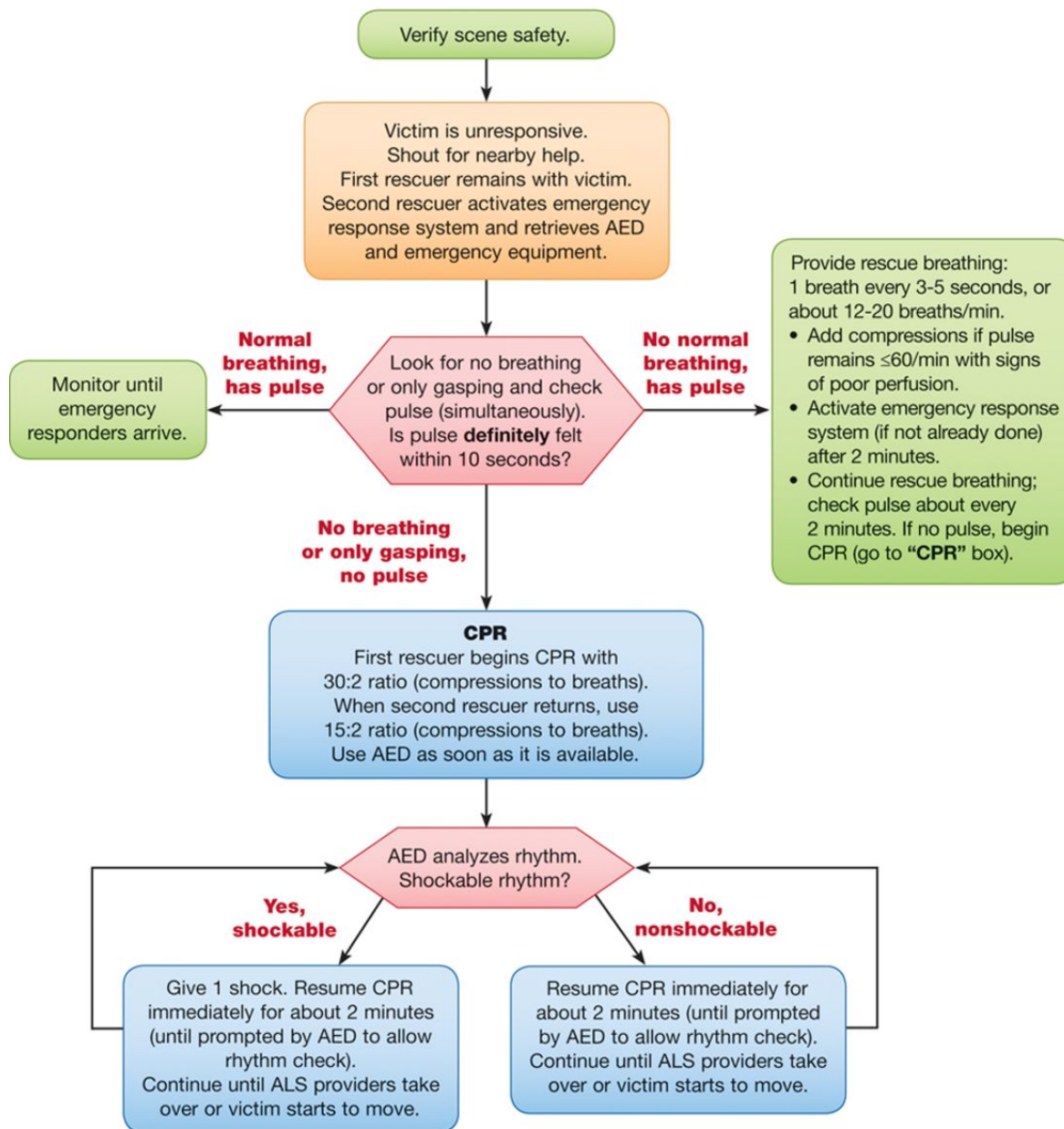
# Shock: Treatment

- Open airway, keep it open
  - Suction, BLS adjuncts as necessary
- O<sub>2</sub> via NRM 15 lpm
  - BVM if necessary
- Stop any external bleeding
- Keep pt warm
- Consider ALS
- Rapid transport

**BLS Healthcare Provider  
Pediatric Cardiac Arrest Algorithm for the Single Rescuer—2015 Update**



**BLS Healthcare Provider**  
**Pediatric Cardiac Arrest Algorithm for 2 or More Rescuers—2015 Update**





# Quick Case 6



# Child Abuse

- EMT's are mandated reporters in the state of CA
- You must report suspected child abuse
  - Neglect, physical abuse, sexual abuse
- Penalties include jail time and fines
- “Reasonable suspicion” is criteria for reporting.

# “Reasonable Suspicion”

- "Reasonable Suspicion" occurs when "it is objectively reasonable for a person to entertain such a suspicion, when based upon the facts that could cause a reasonable person in a like position, drawing when appropriate on his or her training and experience, to suspect child abuse."

(California Penal Code 11166[a])



# Dealing With the Situation

- Try to get the cops there.
- Examine the child well.
- Be discrete when questioning the child.
- Don't tip off the caregivers.
- Keep child in your sights.
- Make your concerns known in the ED.
- Document well.
- Fill out appropriate paperwork.

# How to Report?

- The Mandated Reporter must call a "Child Protective Agency" as soon as possible to make verbal report of "Reasonable Suspicion."
- Mandated Reporter must file a written report on Department of Justice Suspected Child Abuse Report Form SS 8572 within 36 hours of their verbal report.
- Mandated Reporters are required to give their name.

# Quick Case 7

- 6 y/o M presents CAOx4 after falling off of a jungle gym. Your clinical exam reveals.....



# Special Considerations?

- Head
- Chest
- Abdomen





# Treatment Considerations

- Spinal Immobilization
  - Ensure a true neutral, in-line position
- Open airway, keep it open
- Administer high-flow O<sub>2</sub>
  - Provide/assist ventilations as necessary
- Identify developing shock
  - Or, SUSPECT it early based on MOI!

# Quick Case 8

- 5 y/o F presents CA in obvious respiratory distress sitting on the edge of her bed tripodding and drooling. Mom states that the child went to bed with a fever and sore throat, woke during the night with diff brth.

Glottis (open)

POSTERIOR

Glottis (closed)

Aryepiglottic fold

Corniculate  
cartilage

Conoid  
cartilage

Epiglottic  
fold

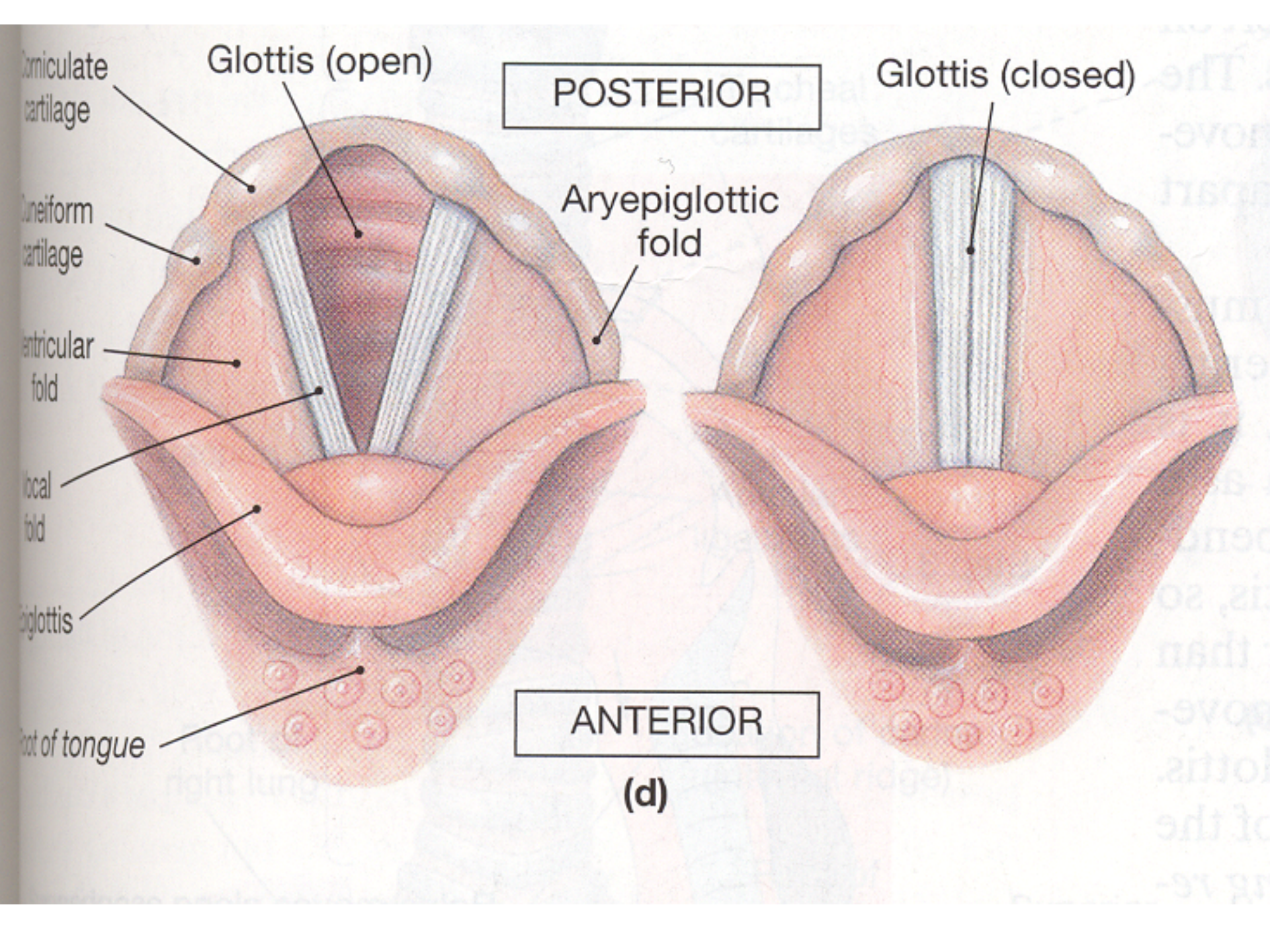
Glottal  
fold

Epiglottis

Root of tongue

ANTERIOR

(d)









# Clinical Presentation

- Onset of muffled voice, weak cough progressing rapidly to sore throat, shallow breathing, high fever, dyspnea, inspiratory stridor, and drooling
- Pt will typically present in “tripod” position, will not lay supine





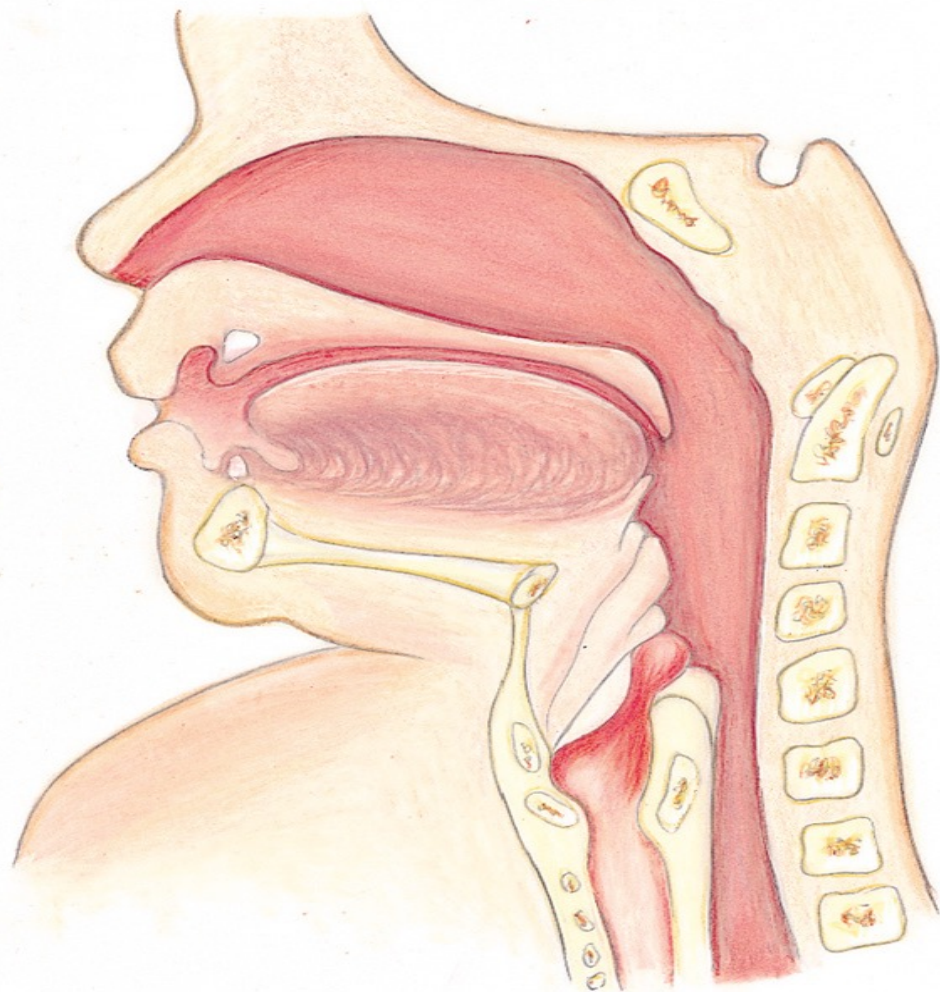
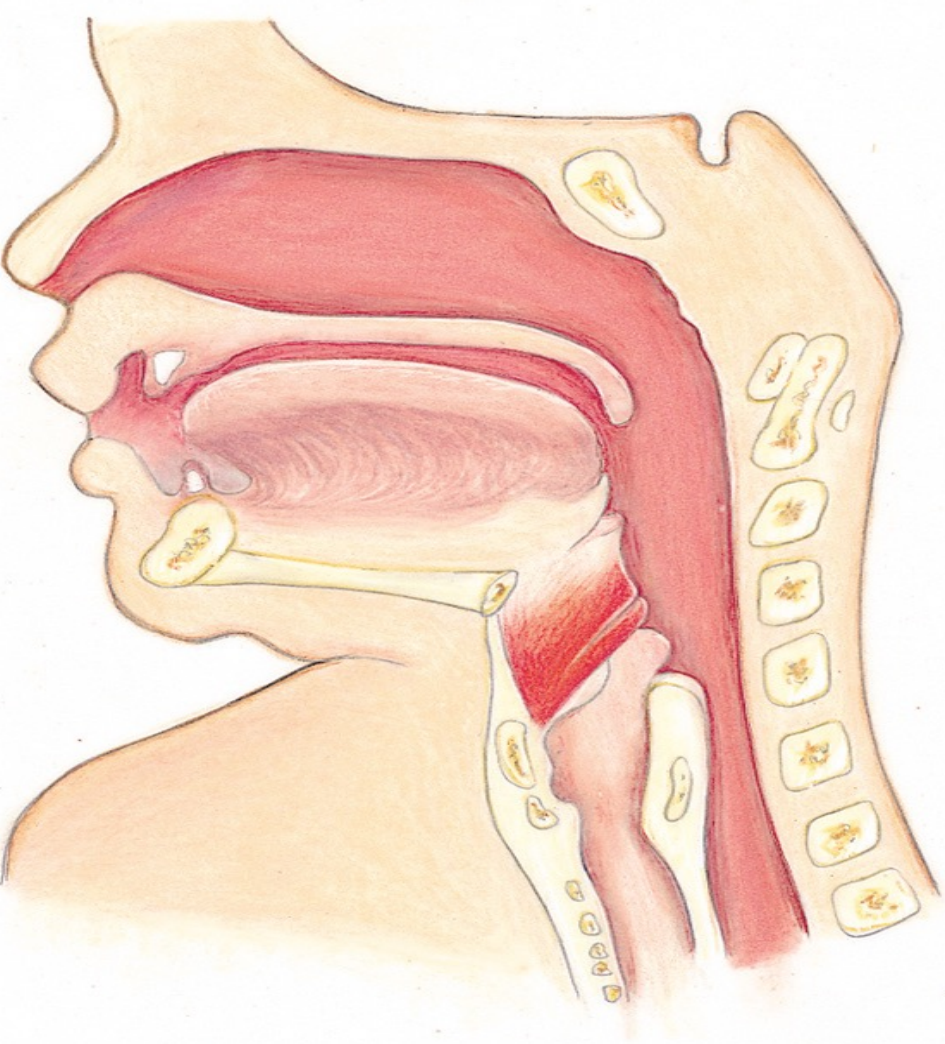




# Epiglottitis: Treatment

- Maintain airway
- Ensure adequate oxygenation (humidified)
- POC, reduce anxiety
- NO VISUALIZING THE AIRWAY!
- Be alert for impending airway obstruction!





**Table 2-12****SYMPTOMS OF CROUP AND EPIGLOTTITIS****Croup**

Slow onset

Generally wants to sit up

Barking cough

No drooling

Fever approx. 100–101° F

**Epiglottitis**

Rapid onset

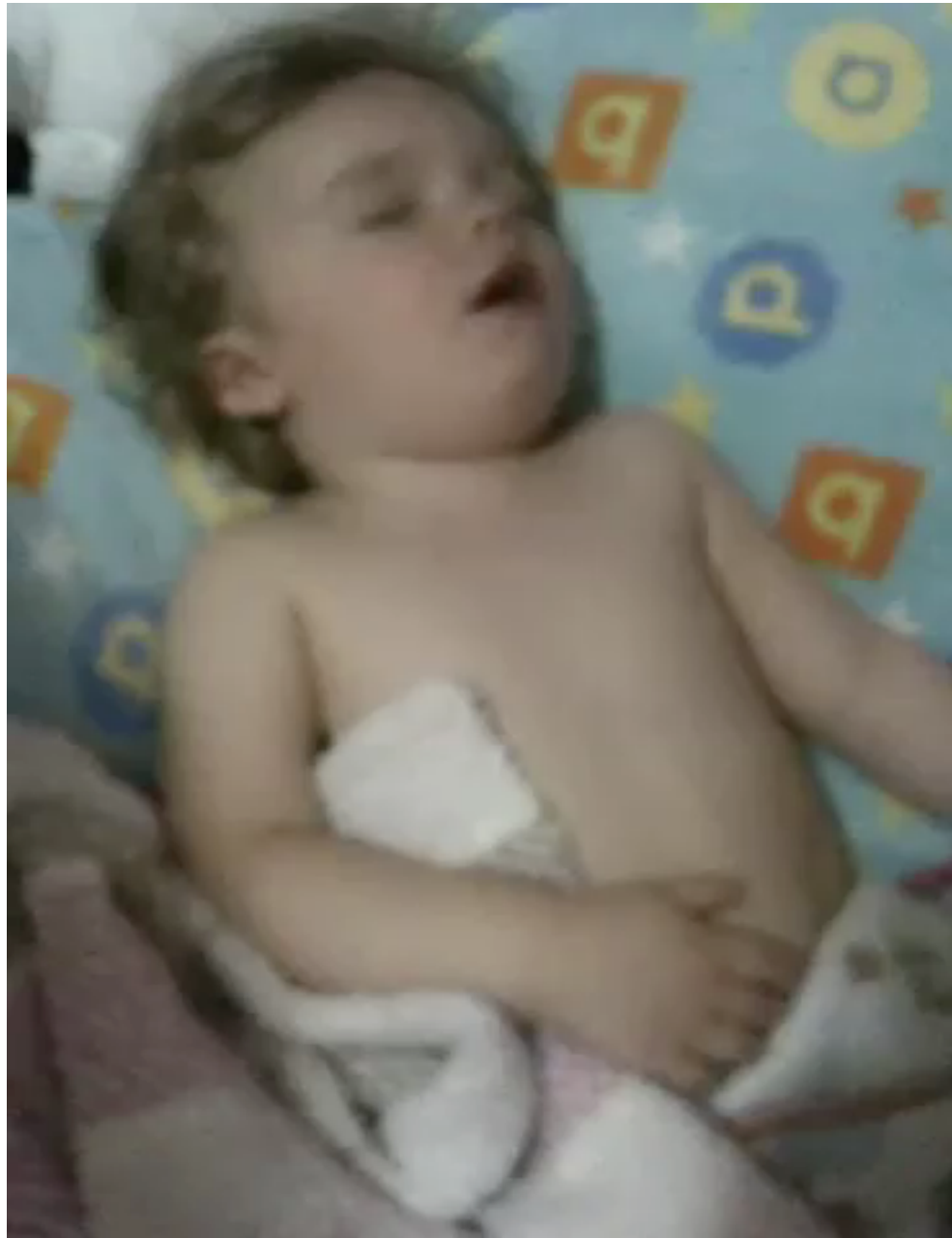
Prefers to sit up

No barking cough

Drooling; painful to swallow

Fever approx. 102–104° F

Occasional stridor







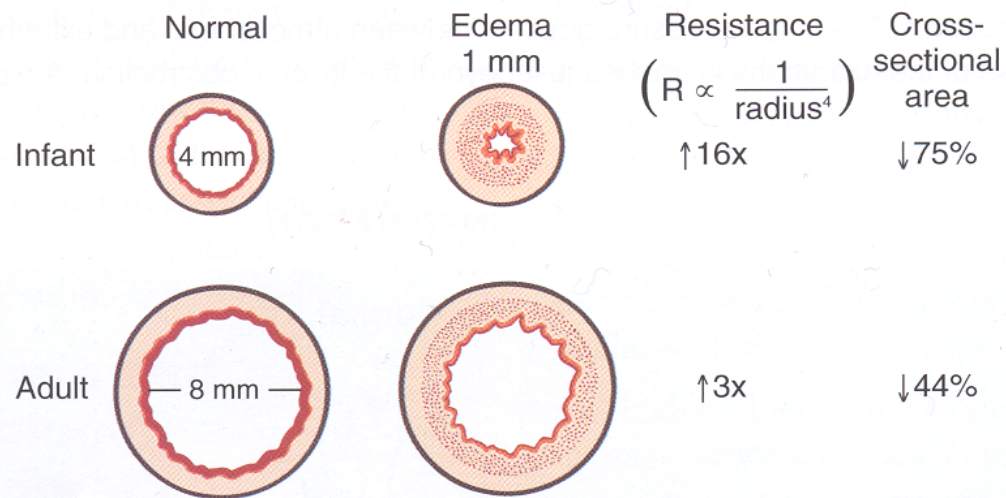
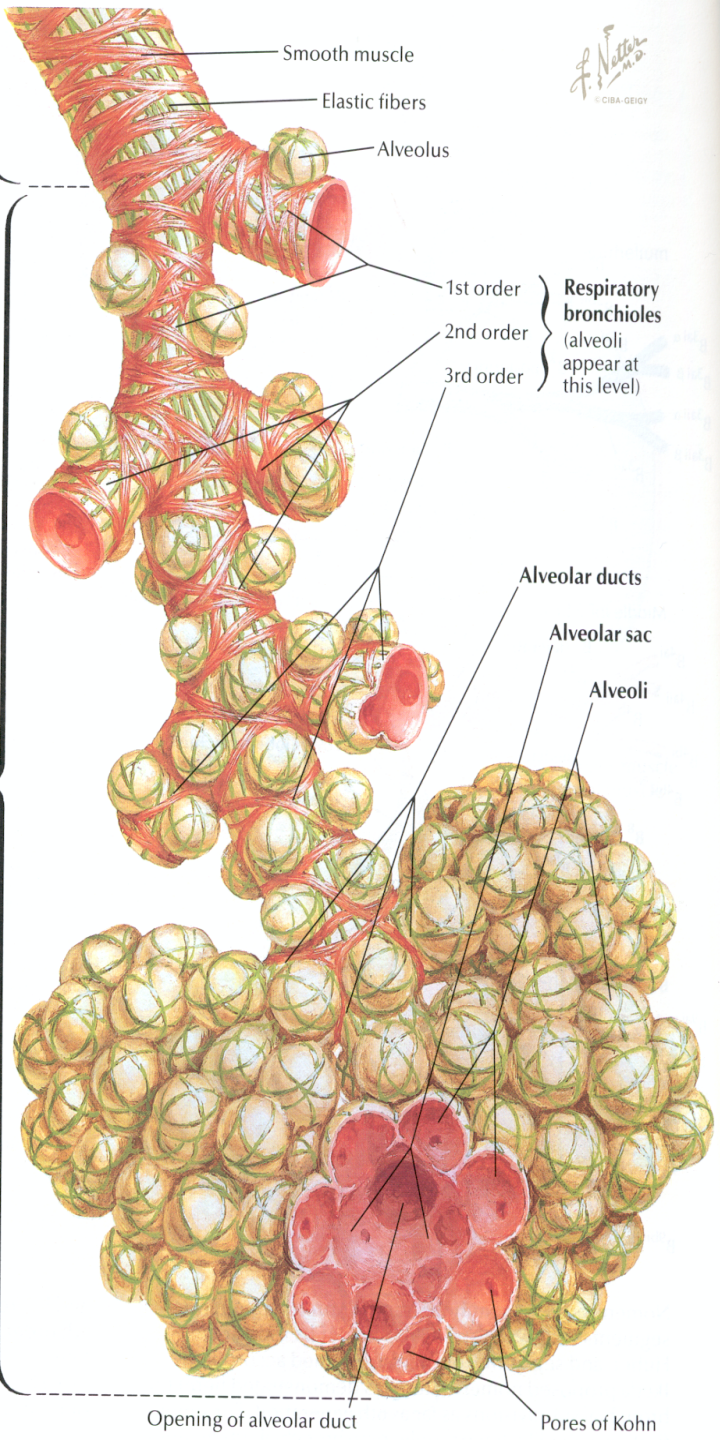


# Case 6

- 6 y/o male presents conscious though altered in obvious respiratory distress
  - Tachypnea, retractions, nasal flaring, prolonged expiratory phase, head bobbing.
- Diffuse wheezing to the upper lobes and no air movement to the lower lobes bilaterally.
- You note a home nebulizer on the table next to him, mom states that the machine is broken....

# Asthma

- Usually occurs in children  $> 2$  y/o.
- Very common
  - Incidence and mortality have been rising steadily
- Characterized by airway obstruction, inflammation, and hyperresponsiveness
- Child typically has history of asthma
- Triggered by URI's, allergies, changes in temperature, physical exercise



# Asthma

- Signs/Symptoms:
  - Respiratory distress or failure
  - Tachycardia, tachypnea
  - Appears anxious
  - Wheezes, silent chest
  - Prolonged expiratory phase

# Asthma

- Treatment:
  - Assure open airway and proper ventilation
  - 100% O<sub>2</sub> via appropriate delivery device
    - Severe cases may require ETI and BVM ventilations
  - Nebulized bronchodilators
    - Albuterol 2.5 mg
    - Atrovent 500 mcg

# FBAO

- Partial? Leave alone!
- Full & responsive?
  - child = abdominal thrusts
  - infant = 5 back blows:5 chest compressions
- Full & unresponsive?
  - all = 30 compressions, open the airway, visualize (sweep), attempt 2 breaths

# Seizures

- Treat like an adult.
- What's the deal with febrile seizures?



# Fever

- Complications?
  - seizures
  - dehydration
  - brain damage with fever above 104°F
- Every child under the age of 3 years old with a fever should go to the hospital, period.

# SIDS

- Sudden, unexplained death of a child under the age of 1 year.
  - requires unk cause of death after autopsy
- Most likely between 2 and 4 months
- May be caused by:
  - lack of sleep arousal
  - inability to detect hypercapnia
- How should you react on scene?