

RSS SESSION SIGN-IN SHEET

Pediatric Care Echo Series
Pediatric Assessment and Emergency Care
May 18, 2017
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RSS Global Objective(s): Assess pediatric trauma given the new skills and guidelines determined to be safe for children.
Identify proper tool and standardized measurement practices to improve diagnosis and treatment of pediatric patients.

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Assessment and Care of the Pediatric Patient!

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Pediatric Assessment

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Pediatric/Neonatal Critical Care
Transport Nurses

Children's Hospital Emergency
Transport Ambulance
(CHETA)



Objectives

- The provider will have an understanding of pediatric assessment including the Pediatric Assessment Triangle (PAT).
- The provider will be able to recognize respiratory distress, impending respiratory failure and airway management strategies.
- The provider will identify developmentally appropriate coping strategies for pediatric patients and their families - including pain management.

Disclosure Information

Leigh Hermanson

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- We have no financial or other conflicts of interest to disclose

Why we generally love kids, but are terrified of pediatric patients...?

- Pediatric care makes up just 10-20% of prehospital patient population
- “With pediatric patients, I feel the most ill-equipped and overwhelmed”. Sound familiar?
- And...sick or dying kids simply effect us more



Children are not “small adults”

- Children are still growing in every way
- Their bodies are different
- They perceive things and communicate differently
- The long term implications of treatment are not the same



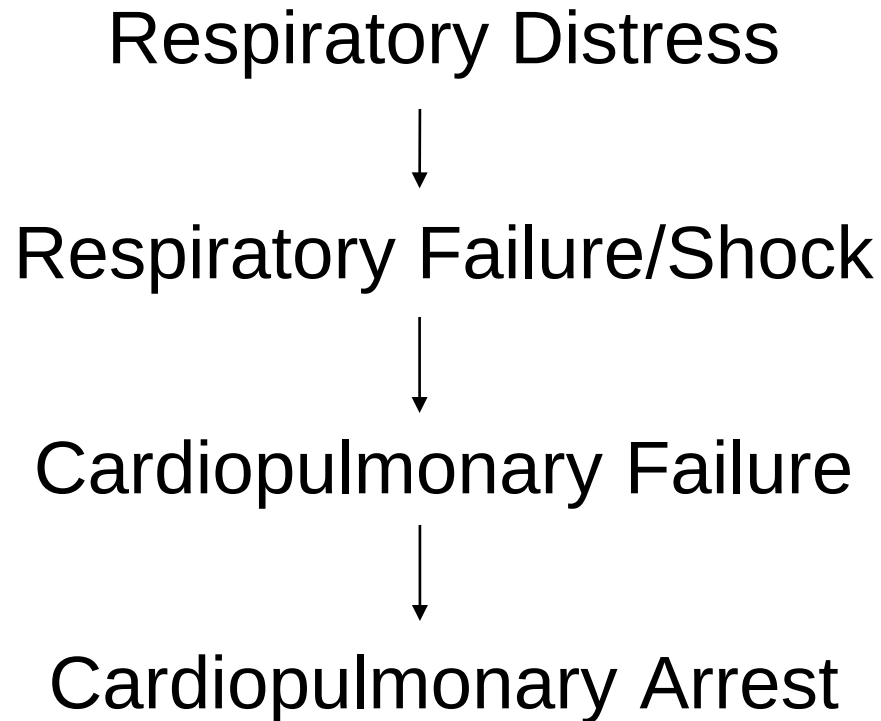
Pediatric Emergencies

#1 reason for pediatric hospital admissions is RESPIRATORY related

#1 cause of death during the first year of life (with the exception of congenital abnormalities) is RESPIRATORY related



Early Intervention is Critical



Sick or Not Sick... That is the question!!!!



- In **30 seconds**, you should be able to decide if that patient is “sick” or “not sick”
- “Sick” is defined as:
 - Physiologically unstable
 - Requires ***immediate*** intervention by you, **now!**
- “Not Sick” is defined as:
 - Physiologically stable
 - Need to assess further, and interventions may be needed



Sick or Not Sick?

- We can do an assessment and gather a lot of information in 30 seconds with:
 - Our senses
 - A few questions
 - Holding or touching a hand
 - All with **no** equipment
- How do you do that, Leigh and Bob?



Pediatric Assessment Triangle

- It is so useful, they now use it in Pediatric Advanced Life Support!
- Look at three things:
 - Appearance
 - Breathing
 - Circulation



PEDIATRIC ASSESSMENT TRIANGLE

Appearance

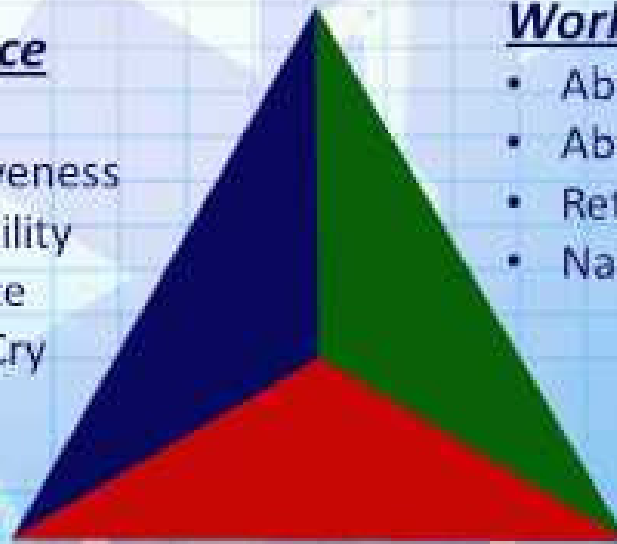
- Tone
- Interactiveness
- Consolability
- Look/Gaze
- Speech/Cry

Work of Breathing

- Abnormal Breath Sounds
- Abnormal Positioning
- Retractions
- Nasal Flaring

Circulation to the Skin

- Pallor
- Mottling
- Cyanosis



Appearance

- Tone (as in muscle tone)
- Interactivity/mental status
 - Level of responsiveness
 - Interactive with caregiver
 - Response to situation/EMS/strangers
 - Is the child alert and attentive to his or her surrounding or uninterested and apathetic?
 - Age appropriate?
 - ALWAYS ask the parents/caretaker

Work of Breathing

- A child's work of breathing is a ***much better*** assessment tool of both

- oxygenation

- ventilation status

Than what we normally use in adults:

- breath sounds

- respiratory rate.



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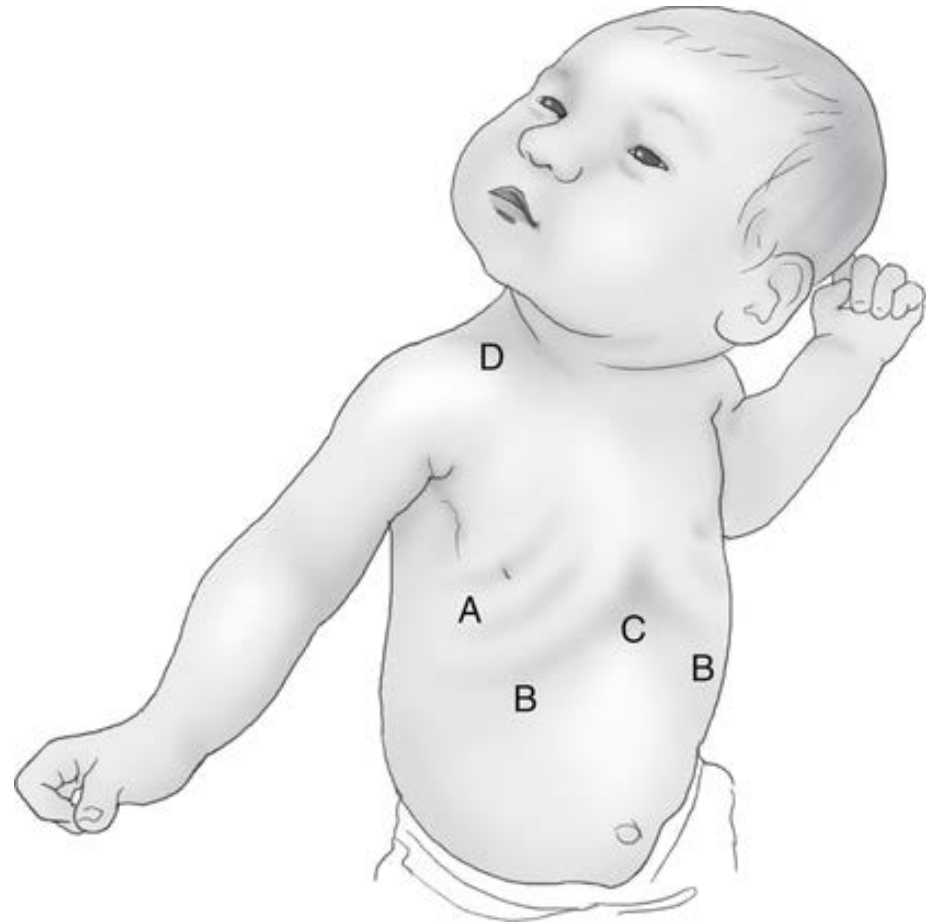
Kids are Different

- What determines WOB?
 - thoracic compliance
 - airway resistance
 - use of accessory muscles for inspiration or forced expiration
- Why are kids different?
 - their lungs are compliant
 - their chest are not calcified yet
 - they have increased airway resistance



Respiratory Assessment:

- Body position
- Visible movement of chest, abdomen, neck
 - D = suprasternal
 - C = substernal
 - A = intercostal
 - B = subcostal
- Respiratory rate
- Respiratory effort
- Audible airway sounds



Circulation

- Pulse rate and strength
- Color
- Temperature
- Capillary refill



Circulation

NORMAL:

- Color appears normal for race
- No obvious significant bleeding
- Ask the parents!

ABNORMAL:

- Cyanosis
- Paleness
- Mottling
- Blue vs Grey?
What is the difference?
- Noted significant bleeding

Capillary Refill

- Pinch Nailbeds
 - Brisk
 - 2-3 seconds
 - Over 3 seconds
- Press on Upper Chest
 - Brisk
 - 2-3 seconds
 - Over 3 seconds
- Central vs Peripheral Refill can tell you how far into shock the patient is in
- Nailbeds 5 seconds, chest 2 seconds?
- Nailbeds 2 seconds, chest brisk?
- Nailbeds blue, chest 5-6 seconds?
- Just in from outside?

So...In 30 seconds...

- Without touching a patient, with only your eyes and ears, you can see if someone is sick or not sick.
- After the across the room assessment is completed place the patient on the monitor and complete further interventions and treatments.



**ALWAYS REMEMBER TO
CONTINUOUSLY REASSESS AFTER
EACH AND EVERY INTERVENTION/
TREATMENT!!**

Respiratory Assessment

- Assess:
 - Airway
 - Patent??
 - Pattern
 - Regular or irregular?
 - Effort
 - Retractions, tracheal tugging, agonal?
 - Breath Sounds

“But Their Sats Are High...”

- Don't be reassured by “good sats”.
- Kids can maintain sats >94% by increasing work of breathing and respiratory rate until the point of respiratory arrest.



What Does Respiratory Distress Look Like?



Signs of Respiratory Distress

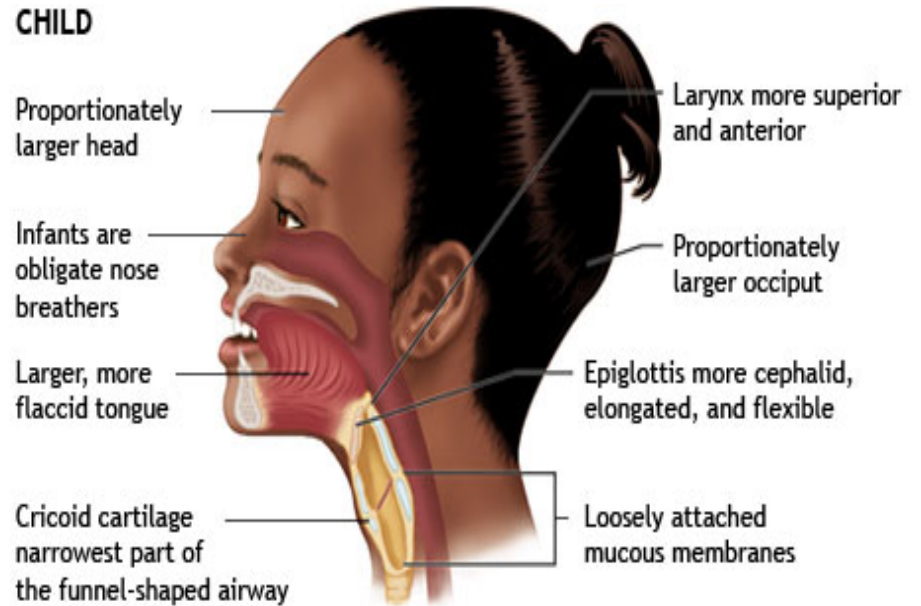
- Head-bobbing
- Flaring
- Retractions
- Orthopnea
- Drooling
- Breath Sounds
 - wheezing, grunting, stridor, or crackles

Signs of Respiratory Failure

- Reduced air entry
- Sweating
- Severe work
- Irregular breathing or apnea
- Cyanosis despite oxygen delivery
- Altered level of consciousness
- What else?

Why are children more vulnerable?

- “Obligate” nose breathers until 6 months
- Large tongue
- Lymphoid tissue achieves adult size at 2
- Large, anterior epiglottis
- Narrow subglottic region

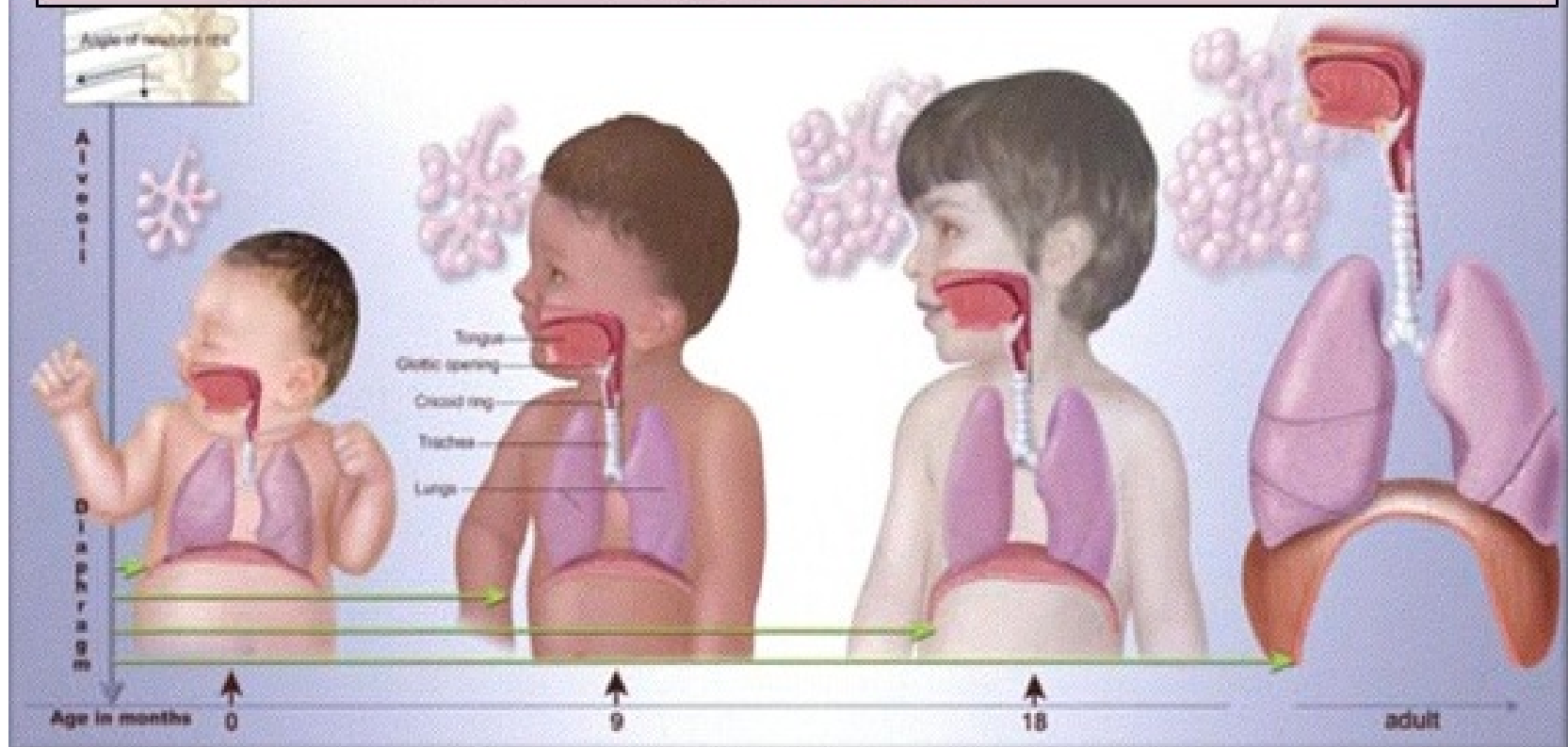


Infants and young children rely on the diaphragm to breathe more than adults do.

Why are children still more vulnerable?

- Fewer alveoli
- Smaller airways: Hagen-Poiseuille's Law
- Decreased cartilage in airways
- Increased chest wall compliance
- Increased metabolic rate, increased O₂ consumption
 - Typical oxygen consumption 6-8 ml/kg/min in a child vs. 3-4 ml/kg/min in adult

7. The process of alveolization continues beyond the infant age
20-50 million alveoli at birth in a term infant
300 million by the age of 8 years



Airway Resistance

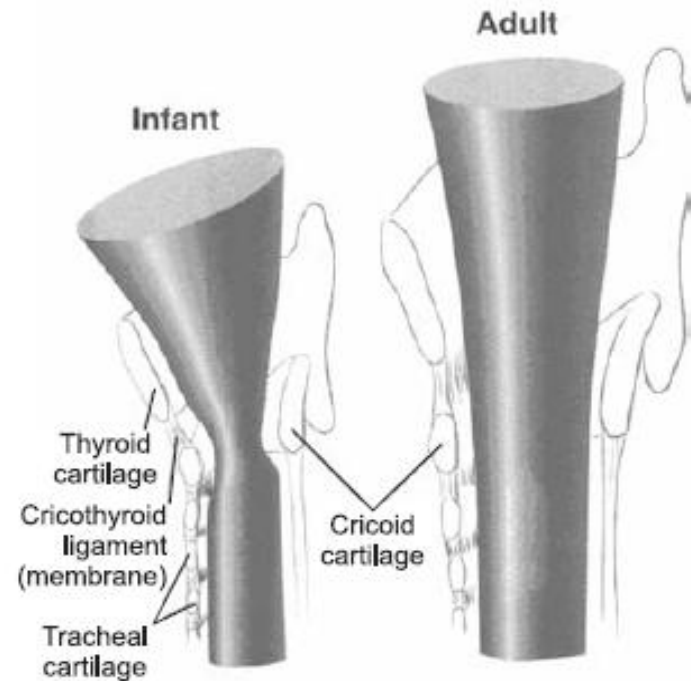
Adult Airway

1mm of edema, the diameter will be 81% of normal.

Full Term Newborn Airway

1mm of edema, the diameter will be 44% of normal.

Figure 1. Comparison Of Infant And Adult Airway

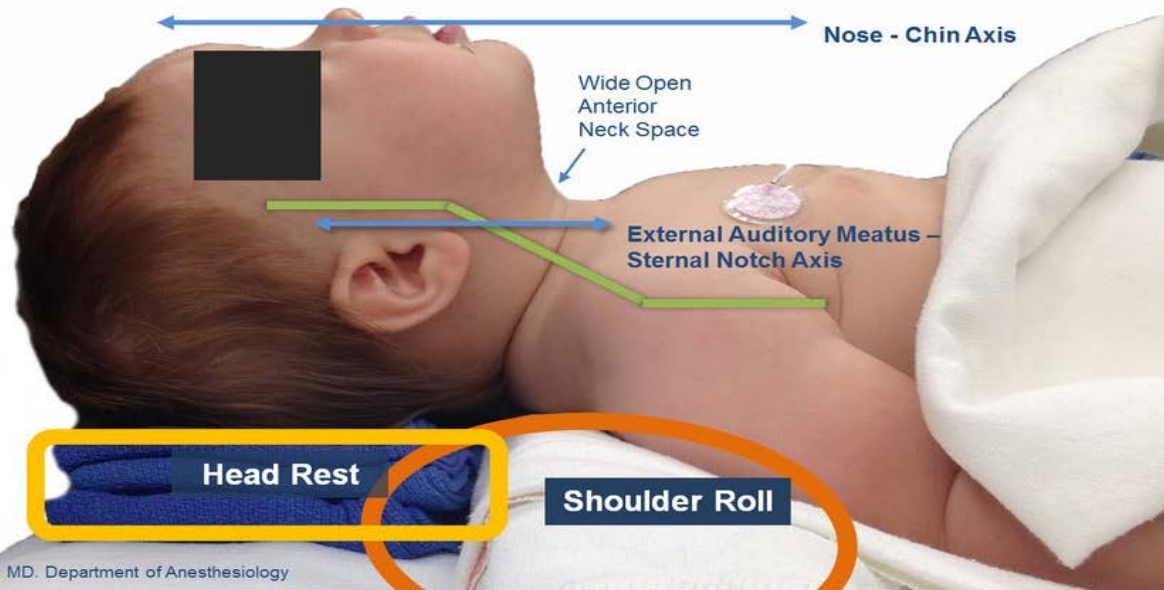


From: Henretig, et al. Textbook of Pediatric Emergency Procedures

Airway Position

- In Children from birth to 8 years old
 - Sniffing Position
 - Blanket/towel under shoulders

POSITIONING INFANTS FOR AIRWAY MANAGEMENT



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SEMI FIRM OR BED SURFACE

The head of an infant is large in relation to the trunk, and tends to naturally flex at the neck. Simply extending the neck can bring an infant into optimal sniffing position. More often than not, a combination of a shoulder roll and head rest is required as shown in the graphic above. Notice, how the nose - chin axis is near horizontal to the ceiling, and the anterior neck space is wide open. Neck over-extension must be avoided as it can make laryngeal exposure difficult.



What Can We Do??



If Impending Respiratory Failure, What are the Options?

- Nasopharyngeal airway
- Oropharyngeal airway
- LMA/King airway
- Endotracheal Tube
 - Dangers? Contraindications?



Airways

- How do determine the correct size of nasopharyngeal (NP) or Oropharyngeal (OP) airway?



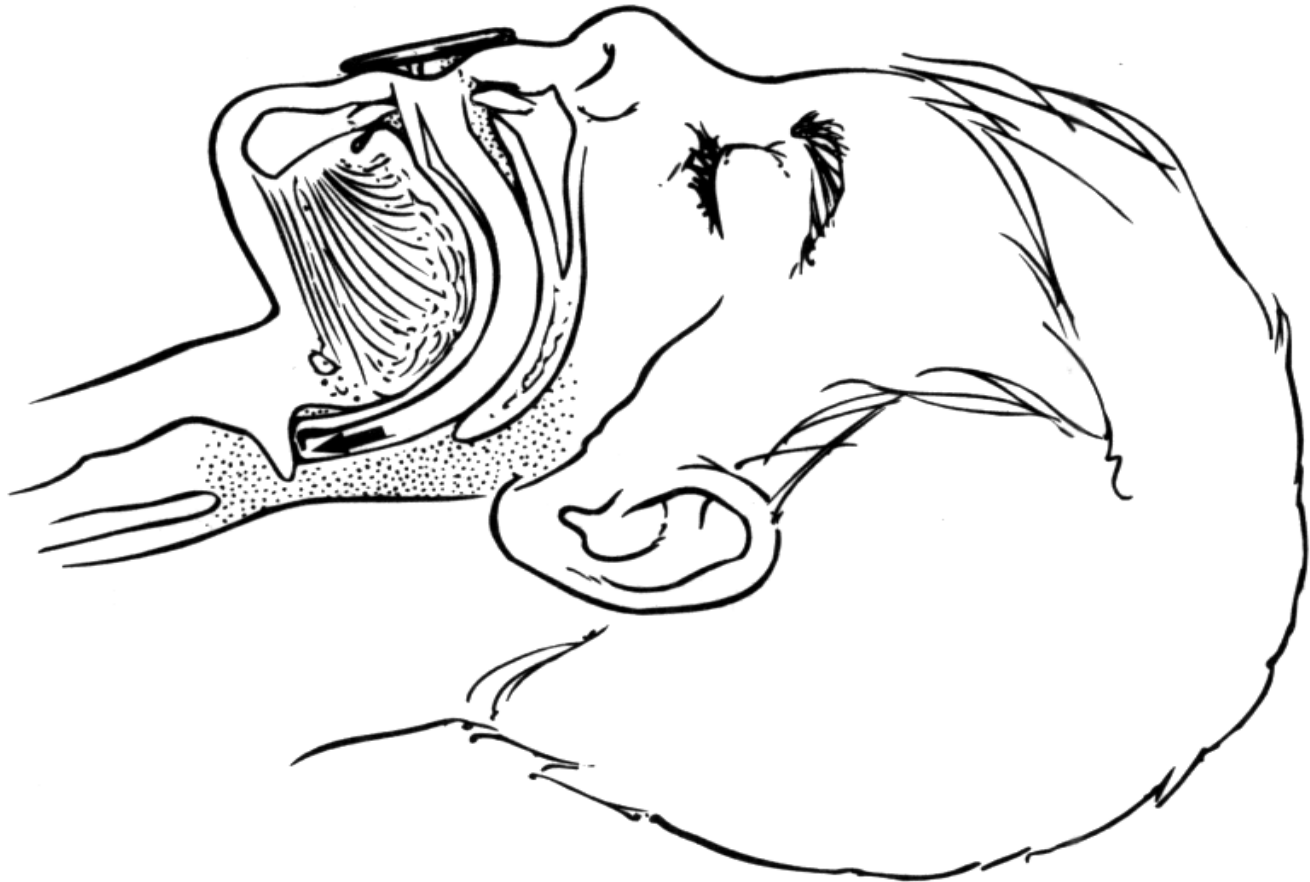
Oropharyngeal (OP) Airway

- Measure from corner of mouth to the angle of jaw.



Wrong Size: Too Long

C



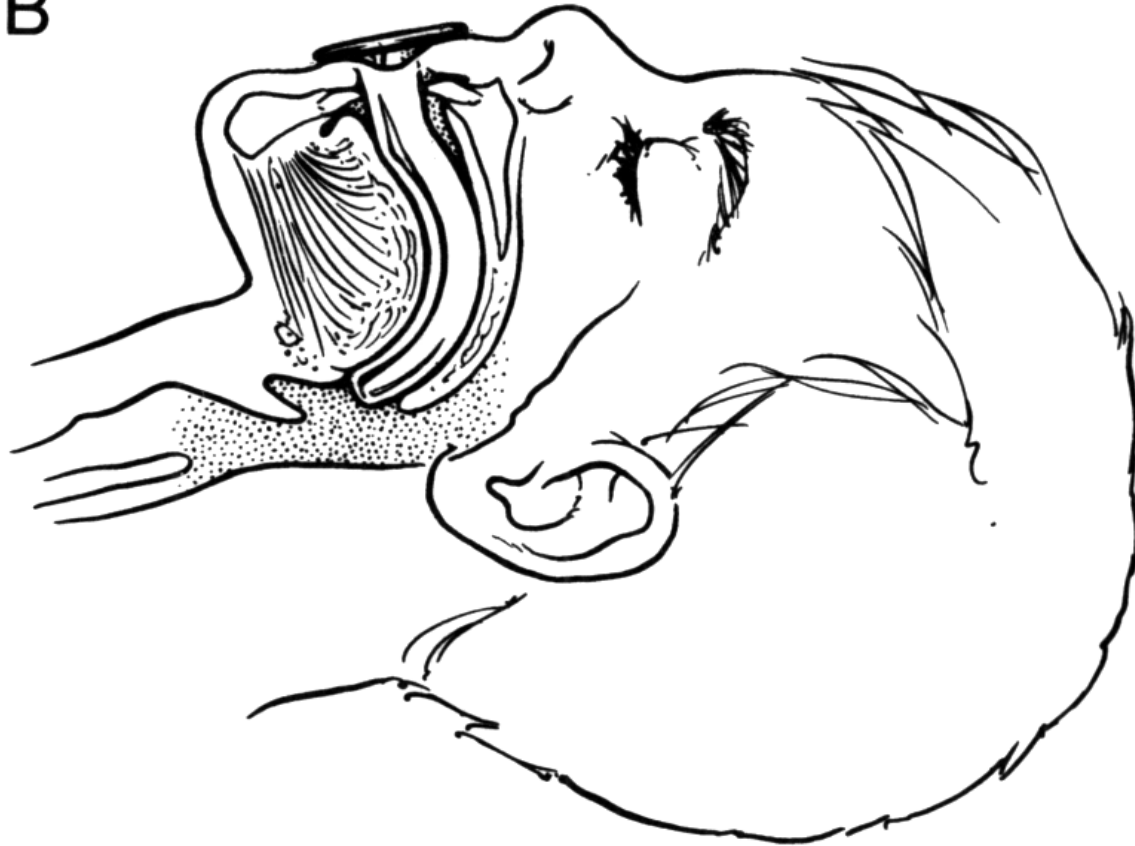
Wrong Size: Too Short

D



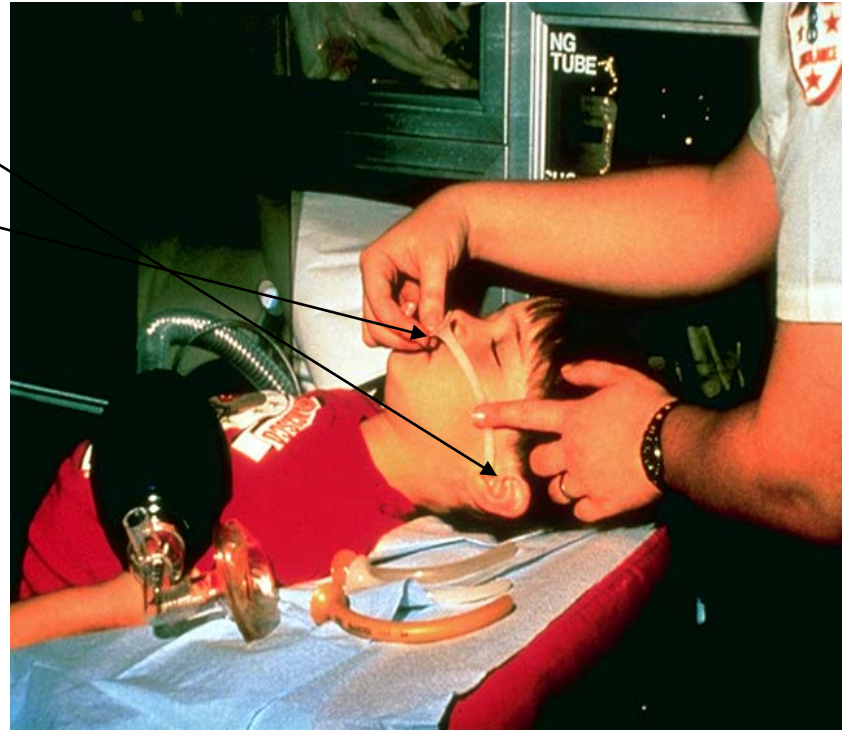
Correct Size: Just Right

B



Nasopharyngeal Airway

- Nare to Tragus
- Contraindications
 - Basilar Skull Fracture
 - CSF leak
 - Coagulopathy



Bagging

- Good seal is everything!
- E-C technique



Two Hands

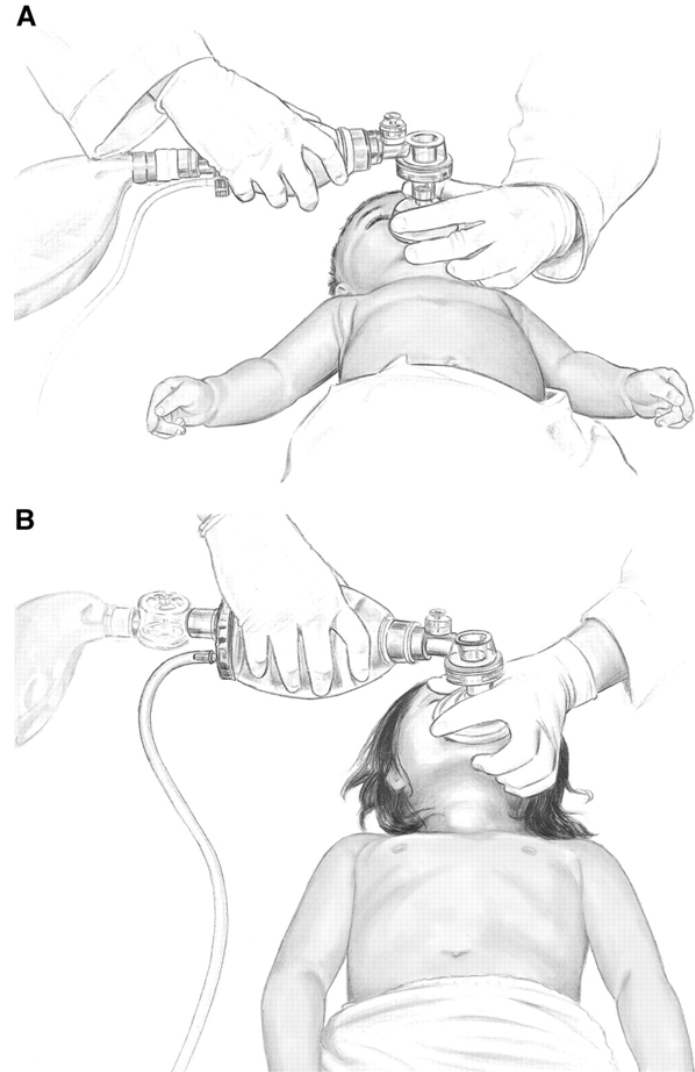


Bagging cont.

You can bag ***anyone*** if:

- You position well
- You make a good seal
- There is no foreign bodies or other obstructions

If you are bagging,
place an OP or NP
airway!



When do you know it is working?

- CHEST RISE!!!
- If you can see chest rise from bagging, that is enough!
- So **don't** bag:
 - Too frequently
 - Too large of volume
- Try to bag with the patient's natural rate, if there is one!
- Chest rise is all you need, this is true in any patient population!!

Lets think about it....

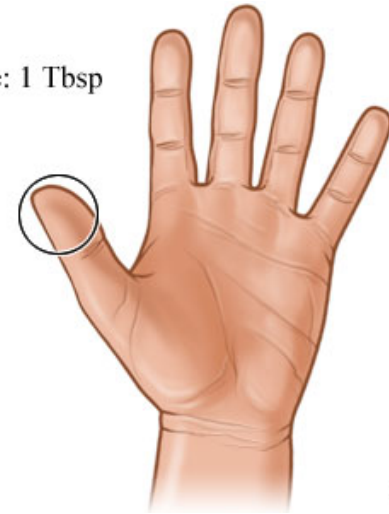
- Never squeeze the whole **bag on pediatrics or neonates!**
- ANYTHING more than chest rise can easily cause a full stomach and/or a pneumothorax
- So when you bag (ETT, LMA, or facemask), your job is:
 - the airway
 - good seal (if facemask),
 - and ADEQUATE breathing



Think About Each Breath for a Bit...

- **Think about volume...**
 - Lung volume is 6-8 ml/kg for **every** patient.
 - How much volume in a peds or neo ambu bag?
- **Also, think about exhaling...**
 - Let the patient exhale
 - Don't try to bag air in if they are exhaling
- So.... ya, don't over bag, or give too much pressure

Serving size: 1 Tbsp



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Well, What Is Too Much?

Overextended abdomen

- Takes up space where the lungs need to expand
- Emesis = complicated airway, aspiration pneumonia, etc.

So...Just enough to see the ***chest rise*** a bit.
That is it.



Getting Definitive Care in the Field

- On Intubating kids in the EMS world...
 - Studies have shown:
 - Higher rates of complications and failure with intubation in children than in adults
 - No demonstrable advantage in survival outcome following compared with a group managed via BVM.
- If you haven't called for help/backup (Medic intercept/local flight program), should you?
- Is it better to load and go than stay and play?



Getting Definitive Care in the Hospital Setting

Know your resources!

- Pediatric code cart/PALS book/Broselow Tape/resource books
- Hospital pharmacist at bedside if medication needed
- If airway issues, call your hospital anesthesia/CRNA
- Local or regional Children's Hospital for advice
- Flight/ground pediatric specialty team

ABC's then DEFG

- Don't
- Ever
- Forget the
- **GLUCOSE!!**
- The smaller a kid is, the less they can store glucose and the higher metabolism they have
- Therefore, when they get even a bit sick, their glucose drops.



Full set of Vitals

- Rate and depth of respirations
- Rate and quality of pulse
- Oxygen saturation*
- Blood pressure*
- Temperature
- Weight (kg) – **Broselow!!!**
 - For congenital heart disease, take in all four extremities.
 - **For EMS - If cannot obtain a BP – capillary refill**

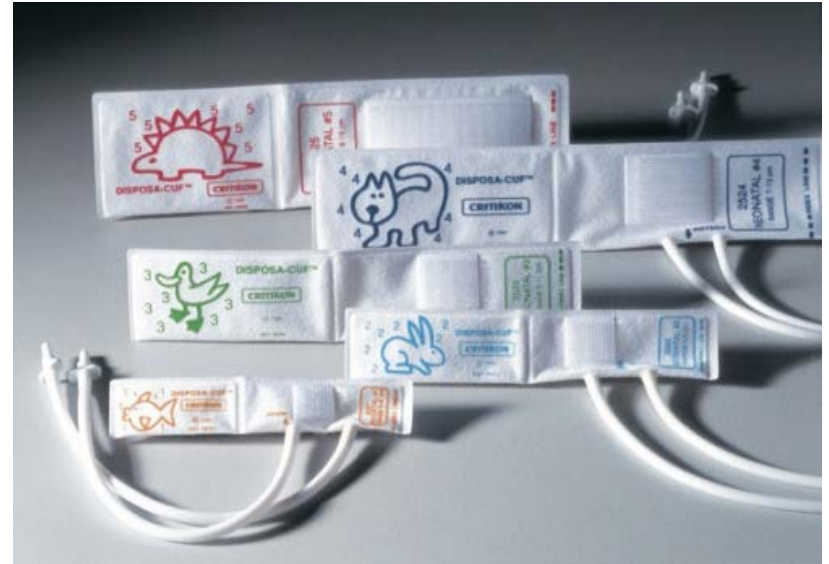
Patient History

■ CIAMPEDS

- Chief complaint
 - Normal/abnormal:
 - Color, acting, eating, drinking, looking, walking, etc.?
- Immunizations
- Allergies
- Medications?
- Past medical history
- Events leading up to
- Diet/Diapers
- Symptoms associated

One More Thing...

Don't forget to
change your
monitor settings
to Neonatal or
Pediatric!!



Advanced Airway Not Working?

- **D.O.P.E.**

- Displacement
- Obstruction
- Pneumothorax
- Equipment Problem
 - Always assume and check equipment first!



Pain Control

- Don't forget PAIN CONTROL
- Non-pharmacological
 - Sweet-ease
 - J-tip
 - Heat and Cold
 - Swaddling
 - Buzzy
 - Distractions
 - Examples?
- Pharmacological
 - Topical, PO, IV, IM, etc.



Family Presence



Comfort Positioning



- **What is it?**
 - Placing a child in a safe and comforting position for a procedure
- **Why use it?**
 - Child feels safe and has a sense of control
 - Gives caregiver a comforting role
 - Works with children of all ages
 - Isolates the part of the body needed to complete the procedure
 - Creates a more positive environment
 - Can be used for any procedure, very adaptive

Comfort Holds



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Things To Consider...

1. Build trust

- Introduce yourself and explain why you are there
- Don't rush, avoid asking too many questions at once
- Listen to the child and parent/caregiver
- Have good eye contact, get on their level
- Talk to them about non-medical things
- Bring a toy in with you

2. Give appropriate choices

3. Show a child what you would like them to do

- Taking deep breathes, how to hold their arm, Coaching for Comfort



Things To Consider...

4. Consider the Environment

- Remain calm regardless of patient/caregivers' reaction
- Use One Voice

5. If it's not going well...

- Offer a break
- Assess pharmacological interventions: Midaz?

6. Be concrete and use child friendly terms and language

- Only say you are done WHEN you are completely done

Coping Plan

1. Who will be the main Support Person?

- What is their comfort level to provide support, give parent a comforting role
- Do not ask a parent to restrain their child, consider a Coaching for Comfort position

2. Does the child want to help?

- Take off tegaderm, or have them take a deep breath as you are poking

3. Does the child want to watch the procedure or play or both?

4. What do they want to play with during the procedure?



Dr. Harvey Karp

The 5 S's

Use to turn on the calming reflex

1. Swaddling
2. Side-lying position
3. Shushing
4. Swinging
5. Sucking





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