



# Little Kids, Big Problems

## Interesting Cases in Pediatric Emergency Medicine



**Children's Hospital Colorado**

Affiliated with



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# Financial Disclosures

- No relevant financial relationships with any commercial interests.

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# Objectives

- Review cases
- Discuss work-up/management of patients
- Discuss the causes and treatment of common pediatric respiratory issues
- Not kill any patients



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# 7 y/o F penetrating chest trauma arriving via chopper

- 7y/o female transferred via Children's One Chopper, with penetrating chest injury.
- Was hit by an arrow from a compound bow, while in her backyard. Per report, Pt ran out from protected area and FOC did not realize she was there.
- Seen at OSH and arrow was trimmed. Has been stable on 2L from sending hospital and in transport. Received morphine 2mg at sending hospital and 1mg in transport (around 1805). Has maintained airway, GCS 15. Also received Ancef and Tdap at sending hospital.





# Rm 2: "Chest Trauma"

- BP 113/68 | Pulse 98 | Resp 19 | Wt 21.8 kg | SpO2 99[1 liter NC[%
- General: She is active. She is not in acute distress. Normal respirations
- HENT: NC. Airway patent. EOMI Ears and TMs normal. Nose normal. OP clear
- Cardiovascular: RRR no m/r/g. Pulses 2+ throughout
- Pulmonary: effort normal. No distress. Normal BS.

**Noted fiberglass arrow entering chest near sternum, with stabilized exit near L scapula**

- Abdomen. ND. Soft. NTTP
- Skin: No additional abnormalities noted. Cap refill 2 seconds
- Neuro: No weakness.





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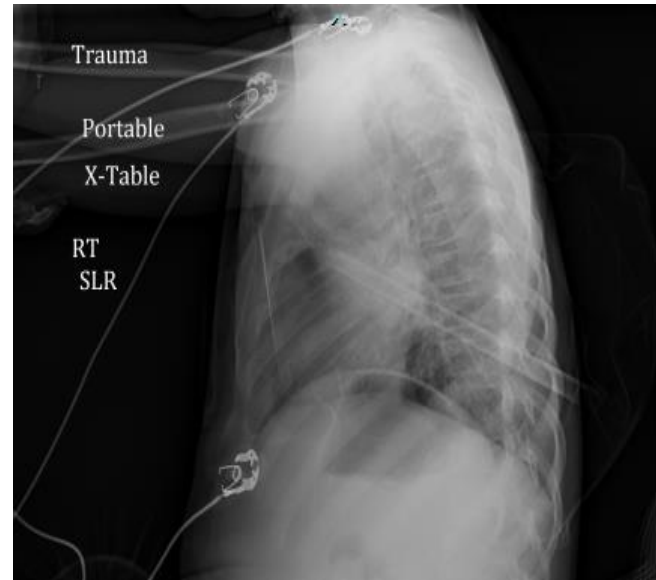




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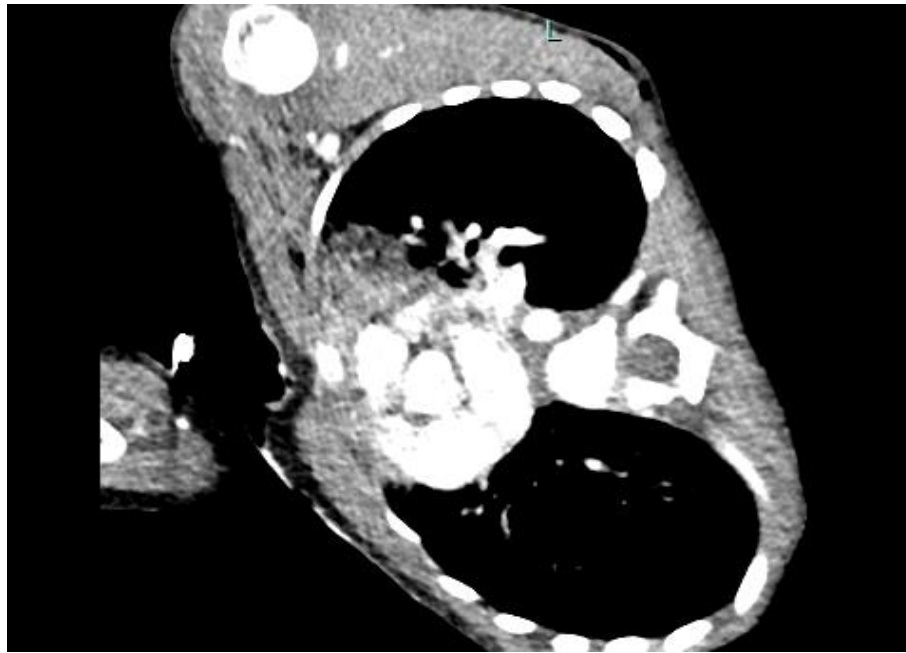
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# 6 y/o chest wound

- Trauma Red
  - CXR
  - Labs obtained
  - FAST performed
    - normal
  - CT scan chest



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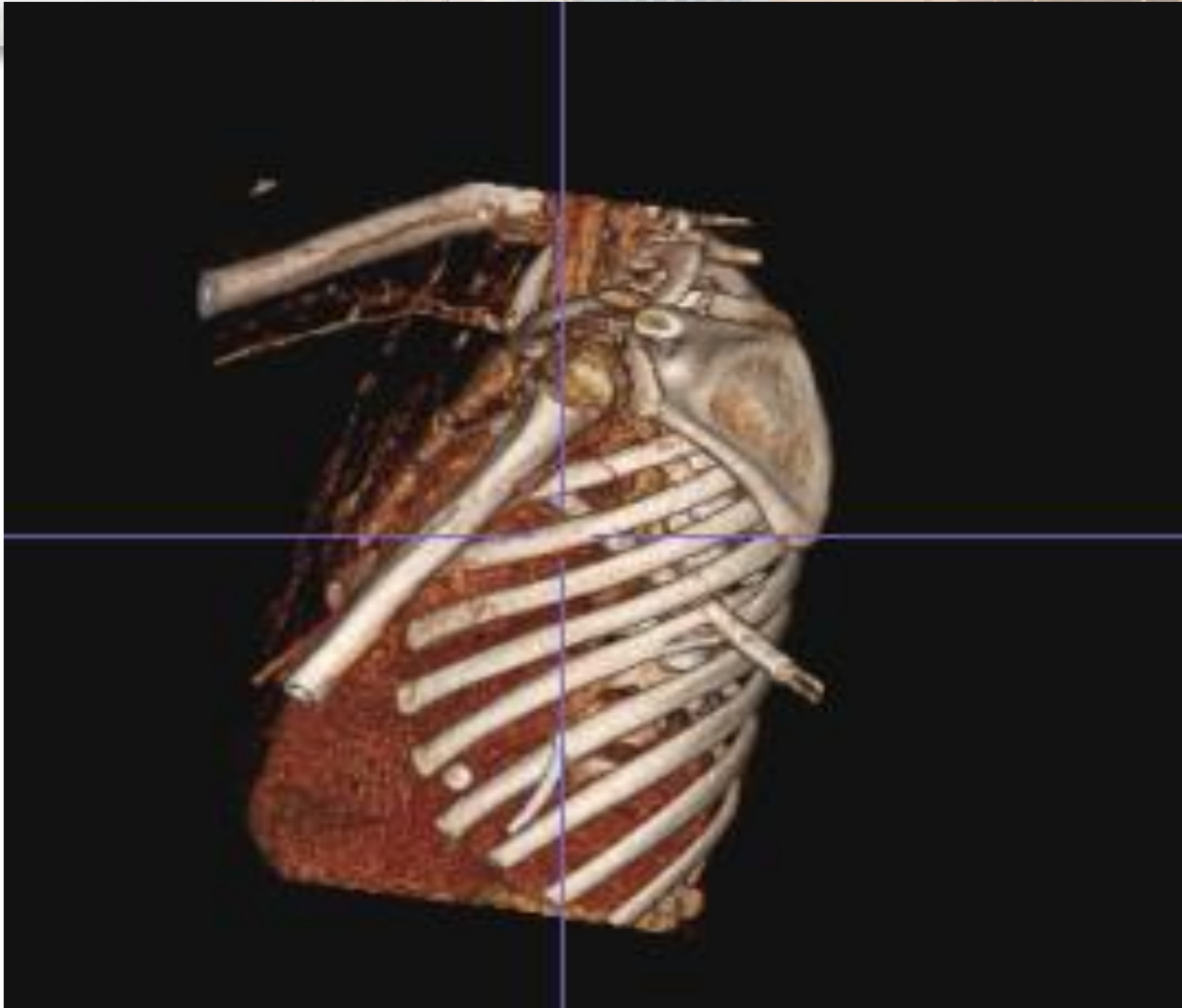
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# 6 y/o penetrating chest injury

## OP NOTE

- The arrow could be seen entering from the anterior mediastinum and traversing the lung and exiting posteriorly. Passing through the middle of the upper lobe.
- Under visualization, we pulled the arrow. There was some bleeding from the tract, but not significant amounts.
- There was also not much disruption of the lung parenchyma. Just a few air bubbles.
- We observed the mediastinum where it was close to large vessels, there was minimal bleeding. We suctioned this blood
- Chest tube placed









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# Traumatic Chest Injury

- ED management
  - ATLS
  - Common injuries include PTX, hemothorax
    - Needle decompression
    - Chest tube
  - MTP if hemorrhage
    - GSW penetrating into vascular bleed – consider thoracotomy



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# 6 y/o penetrating chest injury

- Admitted to TACs for chest tube management
- Antibiotics
- Chest tube removed on POD#3 after minimal drainage
- Discharged home POD #4

# 2 yo “Not breathing”

- Call to EMS:
  - “Help my child is not breathing. Please hurry”
- What are you thinking about when on way to home?
- What do you want to have ready to go?




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# 2 yo “Not breathing”

- Floppy and dusky child
- Now what?

# 2 yo "Not breathing"

- Position child to open airway
  - Any foreign body in mouth?  No
  - Any improvement with opening airway?  No
- Any chest rise?  No





- Right Size
- Right Positioning
- Right Rate



**Correct**  
Covers mouth, nose, and  
chin but not eyes



**Incorrect**  
Too large: covers eyes  
and extends over chin



**Incorrect**  
Too small: does not cover  
nose and mouth well

# 2 yo “Not breathing”

- 60 seconds after starting BVM
  - Improved color;
  - Stronger brachial pulses
  - Vital signs: Pulse Ox 90% HR: 100
- Now what?
- What is on your differential diagnosis?
- Anything you want to ask family?
- Any physical exam findings you looking for?

# 2 yo “Not breathing”

- Pt continues to require BVM.
- Not fighting BVM
- No movement of limbs.
  
- Call to ED:
  - This is \*\*\*\* coming lights and sirens with 2 y.o. female with unresponsiveness and requiring bagging. HR 90 Pulse ox 94% being bagged and delayed cap refill. We are 3-5 min out.



# 2 yo “Not breathing”

- Arrives to ED with BMV in progress.
  - Floppy child when moved to bed.
  - HR: 100 Pox: 94% BP: 78/44 T: 37.5
  - A: No structural abnormalities; no FB seen.
  - B: No respiratory effort. Fair aeration with bagging
  - C: 2+ brachial pulses.
  - D: No obvious major injuries; Dextrose: 94
  - E: Warm blankets asked for to make sure patient does not get cold
- 
- What else do you want to know?
  - What do you want to do?

# 2 yo “Not breathing”

- Decision made to give Narcan
- How much?
- Pt screams and starts to breath on own.
- Urine Fentanyl POSITIVE







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# 23:50

## Room 2 Rash and Fever

- HPI: 4 yo healthy boy who presents OSH ED withday ago w/ 2 days of painful rash. Started with pain all over, especially mouth. Did not want to open mouth. Pain got worse and then the patient complained of whole body pain.
- At NOC site
  - Exudative pharyngitis
  - Rapid strep negative
  - Dx: Viral illness
  - Sent home with Tylenol and Benadryl PRN
- Now with worsening rash, pain, and fever of 102.6F
- Rash spreading and forming blisters.

23:50

## Room 2 Rash and Fever

- HPI: Previously healthy 4 year old, fully vaccinated male who presents with blistering rash that started 4 days ago.
- Initially on his lower jaw with redness that progressed further on his groin, underarms, face and nose.
- Seen at PCP on 3 days ago and started oral steroids (pred) and topical mupirocin which did not seem to improve symptoms.
- Rash continued to progress until today where it started to cover his whole eyes/mouth. He was eating and drinking well until today where he has not wanted anything to eat.



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# 23:50

## Room 2 Rash and Fever

- Pt playing in high grass/ gardening weeds on the day prior to symptom onset. They personally do not use insecticides but their neighbors do. (A less severe version of facial redness occurred 1 year ago after gardening)
- Family went to a fish hatchery.
- Has a dog and a cat at home.
- Attends daycare.
- No similar syx in family members.



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# 23:50

## Room 2 Rash and Fever

- PE: T: 39.2 HR:122 RR: 24 BP:96/42 Pox:92% on RA
- GEN: appeared uncomfortable. Very fussy when touched. Non-toxic.
- HEENT:
  - Pt uncooperative with opening eyes and mouth.
  - Periorbital erythema and edema.
  - Nares and mouth with dried yellow crust.
  - Open blisters near mouth, with clear fluid.
  - No lips/oral lesions. No cervical lymphadenopathy
- CV: normal
- PULM: normal
- ABD: normal



23:50

# Room 2 Rash and Fever







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# 23:50

## Room 2 Rash and Fever

- SKIN: Crusting and erythema of perioral skin. Erythematous rash in periumbilical region. Multiple unroofed vesicles on chest, abdomen, back and wrists. Some desquamation of the skin on hands and in diaper region, normal urethral meatus
- Positive Nikolsky's sign (gentle stroking of the skin causes the skin to separate at the epidermis)
- NEURO: normal CNS exam

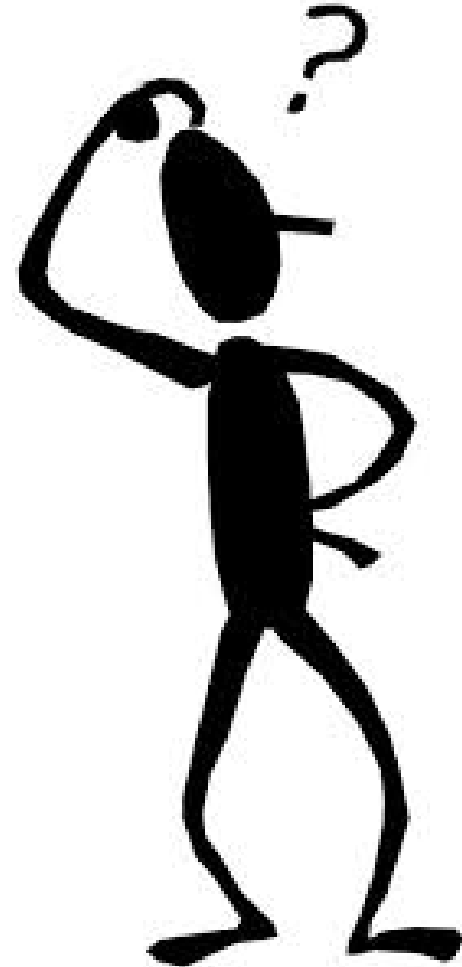




23:55

# Room 2 Rash and Fever

- What is going on?
- What do you want to do?
- Workup?





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# 23:55

## Room 2 Rash and Fever

- Differential:
  - Stevens Johnson Syndrome-
    - Rash: Target lesions; No separation of layers of skin; Mucous membranes involved
  - Scarlet Fever
    - Sandpaper rash
    - Strep positive
  - Kawasaki's Disease
    - 5 days of fever
    - Strawberry tongue
    - Non-exudative conjunctivitis
  - Toxic Shock Syndrome
    - Shock; multi-organ failure
  - Staph Scalded Skin Syndrome



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# 23:55

## Room 2 Rash and Fever

- Differential:
  - Stevens Johnson Syndrome
  - Staph Scalded Skin Syndrome
  - Scarlet Fever
  - Kawasaki's Disease
  - Toxic Shock Syndrome
- What to do?
  - IVF
  - Cultures:
    - Blood, Eye discharge, Throat, Nares/crusting skin
  - CBC, ESR/CRP
  - Antibiotics?



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# 23:50

## Room 2 Rash and Fever

- ED course:
  - IN fentanyl given for pain
  - Still unable to get patient to open eyes.
- Consult Burn and ophthalmology.
- Ketamine sedation for ophtho exam and wound cleaning/dressing
  
- No eye involvement and no oral lesion.



23:55

# Room 2 Rash and Fever

- 





# Staphylococcal scalded skin syndrome

- Signs and symptoms
  - Generalized tender erythematous skin
  - Flaccid bullae (large blisters) form
  - Bullae rupture easily producing large eroded areas surrounded by crust
  - No mucous membrane involvement
  - Positive Nikolsky sign
- How to make the diagnosis
  - Blister fluid usually sterile
  - Blood culture, urine and nasopharynx culture
  - Skin biopsy if diagnosis uncertain



# Staphylococcal scalded skin syndrome

- Caused by an exfoliative toxin produced by *S. aureus*.
  - Toxin is spread hematogenously from the primary site of infection.
  - Toxin cleaves the epidermis to lead to blister formation.
- Most often seen in children < 5 years old.
- Common initial sites of infection include conjunctivae, nares, perioral area, umbilical region or infected circumcision site.

# Staphylococcal scalded skin syndrome

- Treatment
  - Majority of cases are self-limited
  - Anti-staphylococcal antibiotics (IV Clindamycin)
  - Aggressive fluid resuscitation and monitoring of electrolytes
  - Vaseline gauze applied to denuded areas
  - Pt admitted to pediatric service
  - Consult dermatology in AM
- Prognosis
  - Prognosis is generally good
  - Skin heals without scarring
  - Neonates have increased morbidity and mortality



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# “My baby is having trouble breathing”

- What are you thinking of in route to scene?
- What are primary causes of respiratory distress in pediatric patients?
- What equipment/medications are you getting ready?

# A-B-C

- **Airway**
  - Is there anything preventing getting air in?
  - What can we do to improve/fix issues with getting air into/out of lungs
- **Breathing**
  - Is patient breathing? Is there respiratory effort?
  - Is oxygen getting into body? Is CO<sub>2</sub> getting out?
  - How can we support breathing?
- **Circulation**
  - Is heart pumping? Is body being perfused?
  - How can we help/support circulation?



# “My baby is having trouble breathing”

- 18 yo with 1 day history of cough, congestion, and fever of 101.
- Woke up from sleep with difficulty breathing.
- FOC and 15 yo brother Covid + 2 days ago





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# 18 mo w/ Respiratory Distress

- 02:22 Arrive at scene
- Pt in arms of mother; loud breathing; fussy/crying
- HR: 185 RR: 60 Pox: 92% Temp: 101.8
- What else do you want to ask?
- What physical exam findings are you looking for?
- What do you want to do?



# 18 mo w/Respiratory Distress

## Physical Exam:

- Vitals: HR: 185 RR: 40 Pox: 92% Temp: 101.8 BP: 89/42
- General: ill appearing in respiratory distress
- Mucous membranes dry, no lesions; + nasal discharge.
- Chest: intercostal and suprasternal retractions;
- Circulation = skin pale, mottled extremities, tachycardic

Now what?

What do you think is going on?



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# ABC of Pediatric Breathing Issues

- Majority of respiratory issues caused by the BIG THREE of pediatric respiratory diseases

A

B

C



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# ABC of Pediatric Breathing Issues

- Majority of respiratory issues caused by the BIG THREE of pediatric respiratory diseases

Asthma

Bronchiolitis

Croup



# Asthma vs Bronchiolitis vs Croup

## Asthma

- Lower airway
- Viral/allergy  
irritant/???
- Can't getting air out
- Tight cough
- Wheezing
- All day/night
- Eczema?
- Family Hx

## Bronchiolitis

- Upper and lower
- Viral etiology
- Hypoxia/WOB/Apnea
- Wet cough
- Crackles
- Seasonal
- Snot

## Croup

- Upper airway
- Viral etiology
- Can't getting air in
- Barky cough
- Stridor
- Middle of the night

# Asthma

- Lower respiratory tract issue
  - Combination:
    1. Airway constriction—smooth muscle
    2. Airway inflammation
- Physical Exam
  - Prolonged expiratory phase
  - Wheezing or minimal aeration
  - Retractions





# Asthma

- Treatment (Can find CHCO asthma pathway on website)
  - Albuterol-relaxes smooth muscles, thus opens airways
  - Atrovent-(only beneficial in start of treatment)
  - Steroids-decreases airway inflammation
    - Decadron 0.6 mg/kg (max 16mg) then second dose in 24 hours
  - Continuous albuterol (can be on for hours)
  - Magnesium-smooth muscle relaxation
    - Give IVF bolus as will drop BP with Mag

# Croup

- Typical story:
  - 3 y.o. (6 months -6 years) wakes up in middle of the night and “can’t breath”.
  - Parents report pt was “coughing and wheezing”.
  - Has slight runny nose last evening before bed.
  - Has never had anything like this before.
  - Got better on ride in to ED.
  - When you go to examine pt gets upset and give horse cry

# Airway Resistance

|        | <u>Normal</u>  | <u>Edema</u>  | <u><math>\Delta</math> diameter</u> | <u><math>\Delta</math> resistance</u> |
|--------|--|---|-------------------------------------|---------------------------------------|
| Infant | <br>4 mm  | <br>2 mm  | $\downarrow$ 50 %                   | $\uparrow$ 16 $\times$                |
| Adult  | <br>8 mm | <br>6 mm | $\downarrow$ 25 %                   | $\uparrow$ 3 $\times$                 |





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# Differential of Stridor

- Infection
  - Croup
  - Bacterial tracheitis
  - Retropharyngeal abscess
- Foreign Body-(especially starting in middle of the day)
- Laryngomalacia/Tracheomalacia
- Less common causes:
  - vocal cord paresis,
  - subglottic hemangioma,
    - causes rapidly progressing stridor, sometimes associated with a facial hemangioma
  - vascular ring, vascular sling, fixed mediastinal mass

# Croup

- Accounts for over 90% of stridor with fever
- Subglottic stenosis secondary to edematous, inflamed mucosa
  - NOT SMOOTH MUSCLE ISSUE
- Most commonly caused by parainfluenza >>> RSV, adenovirus, and influenza
- With different waves of Covid, we saw large number of Covid+ croup with more recent variants

# Croup

- Treatment:
  - Mild-Barky cough, no stridor at rest
    - Decadron: standard dose 0.6mg/kg (max 8mg)
      - Studies have shown as doses as low as 0.2 mg/kg are just as affective
      - No studies have shown benefit from 2<sup>nd</sup> dose
    - Cool mist-no study to show this is beneficial
  - Severe-Stridor at rest and/or severe distress
    - Racemic epinephrine(0.5 ml of 0.25% solution dissolved in 2.5ml of NS)
      - Watch for 2-3 hours after treatment
    - Heliox-Use limited by hypoxia
  - Pt with significant hypoxia with croup are worrisome for severe disease/critical airways
- Albuterol does not help bc not a smooth muscle issue



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# 18 month with difficulty breathing

- CC: My child is having a hard time breathing and has a fever?
- 2 days of cough, congestion and tactile fever.
- Decreased drinking and post-tussive emesis
- 8 yo sibling with cold;
  
- Triage vital signs:
  - HR 173 RR: 54 Pulse Ox: 91% Temp: 38.8



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# 15 month with difficulty breathing

- PMHx: None.
- Allergies: Amoxicillin
- Family Hx: MOC: thyroid issues FOC: ulcerative colitis
- Immunizations: UTD
  
- What else do you need to ask?





# 15 month with difficulty breathing

- Physical Exam:
- Gen: Tired appearing in MOC's arms. cough
- HEENT: + nasal discharge; TM: erythematous bilat
- Lungs: + retractions; coarse BS with intermittent crackles and wheezing.
- Heart: S1S2 no mur. Tachycardiac
- Abd: soft, NT/ND. No HSM
- Ex: Cap refill 2-3 sec.

What is going on and what do you want to do?

# Bronchiolitis

- Acute viral infection- most commonly RSV
- Age  $\leq$  2 years of age
- Infant's sx are worsen for the first 3-5 days
- Infectious process  $\rightarrow$  **destruction in lining of bronchioles**
  - Bronchoconstriction
  - Mucous plugging
- Most common in winter and early spring
- Apnea= most concerning complication in infants

# Bronchiolitis

- **Signs/Symptoms**
- runny nose, coughing, sneezing, tachypnea, retractions, wheezing/crackles, volume depletion due to decreased oral intake, apnea, fever



# Bronchiolitis-Interventions

- Contact isolation-mask up
- Supportive care!!
  - SUCTION, SUCTION, SUCTION
  - Oxygen-heated high flow
  - Treat fever
  - ORT with Pedialyte
  - Positive pressure
  - SUCTION again

# Supplemental Oxygen

## Nasal Cannula



- Simple mask



- Non-rebreather



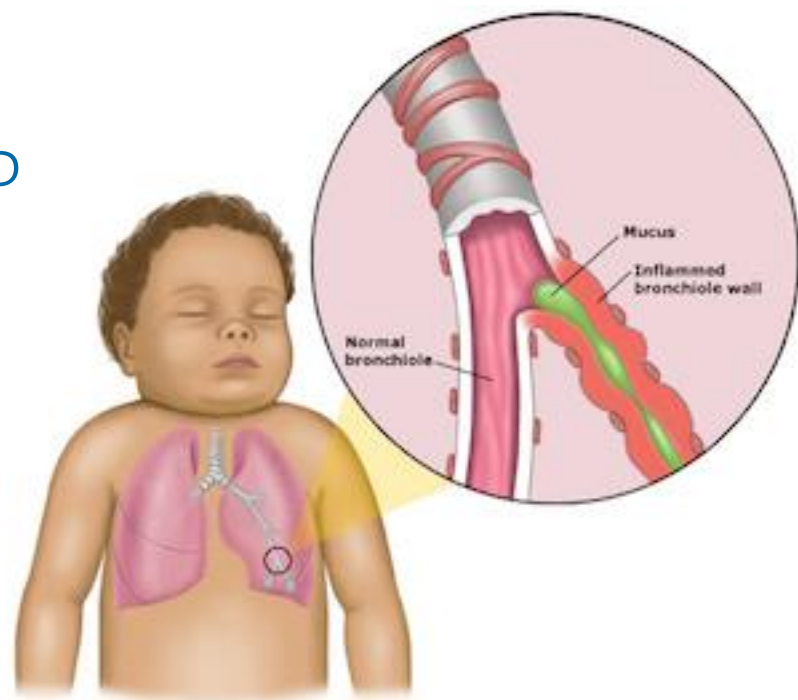


# Bronchiolitis

- Viral infection
  - RSV; human metapneumonia virus, parainfluenza, .....
- Clinical picture varies with age
  - Neonates/newborns
    - Apnea BEFORE onset of symptoms
  - Toddlers:
    - Nasal secretions/congestion
    - Wet cough
    - Poor PO intake
    - Coarse breath sounds/wheezing/crackles—washing machine
    - Tachypnea
    - +/- Fever
  - School aged
    - Cough-post nasal drip
    - Viral pneumonitis

# Bronchiolitis

- What is the problem?
  - Viral infection makes the bronchioles swell and become inflamed. Mucus collects in these airways, which can make it difficult for air to flow freely into and out from the lungs.
- How do we make diagnosis?
  - Clinical diagnosis—NO TEST NEEDED
  - CXR-
    - Unlikely to be helpful
    - Charge: ~\$450
  - Viral DFA
    - Who cares which virus?
    - We never use to care



# Bronchiolitis

- What do we do?
  - Suctioning—helps clear secretions in upper airway but not lower airway, but has proven beneficial
  - Supplemental O<sub>2</sub> when hypoxic
  - Things thought to possibly help, but evidence lacking:
    - Steroids—Decrease airway swelling??—no proven benefit
    - Hypertonic saline nebs: thin secretions/mucus plugging—  
Studies yet to show significant benefit
    - Albuterol—rarely helps more likely hurts



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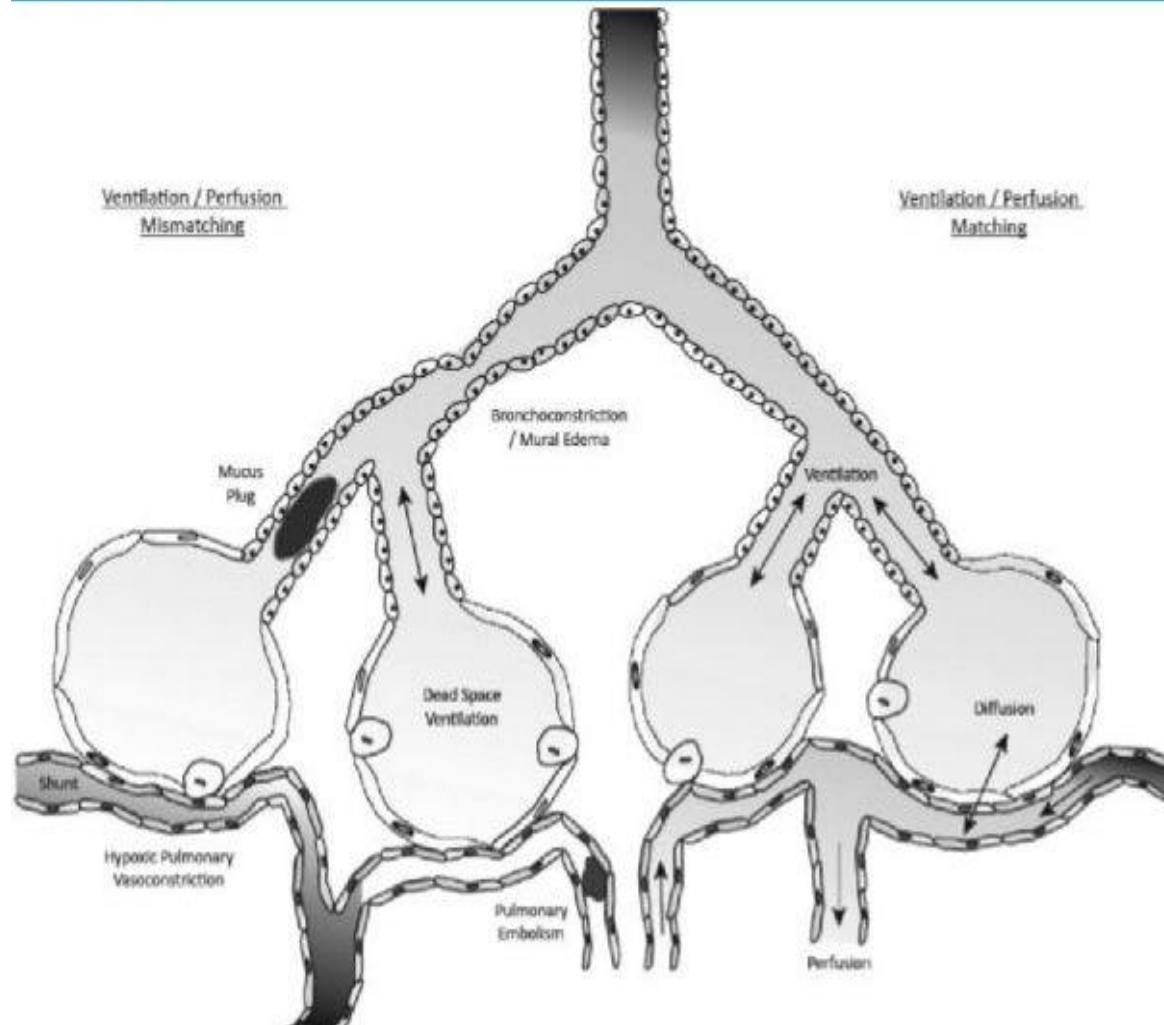
# Albuterol in bronchiolitis??

- How does albuterol work?
- Where does it have its effect?
- Why might this make bronchiolitis worse?



# V/Q Mismatch

Medscape





# Remember the Basics!!

Albuterol ≠ "All-better-ol"





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# 15 month with difficulty breathing

- Pt suctioned with nasal saline flush for large amount of thick secretions.
- Pt able to drink 8 ounces.
- Motrin given
  
- 30 min later:
- HR: 145 RR: 55 Pulse Ox: 84% Temp: 37.5
  
- Now what?



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# 15 month with difficulty breathing

- Pt placed on O<sub>2</sub> via low flow nasal cannula, but pulls it out immediately
- How do we delivery needed O<sub>2</sub>?
  - Blow by?
  - Facemask?
  - Keep trying nasal cannula?





# Why Not Blow-by?

- A manikin of a child with a facemask of appropriate size was transported along a 60 m corridor from OR to the PACU. O<sub>2</sub> delivery to the face of the manikin was measured during transport.
- Six blow-by methods were tested with oxygen flows of 3, 6, and 10 L/min and with the facemask at 0 cm from the face and at 5 cm from the face.
- The outcome parameter was: blow-by method reaching and maintaining an FiO<sub>2</sub> >50% during transport from OR to the PACU.





# Why Not Blow-by?

- At 0 cm from the face, blow-by methods maintained a  $FiO_2 > 50\%$
- At 5 cm only at 10 L/min flow blow-by methods were able to maintain an  $FiO_2 \sim 50\%$
- At distance greater than 5cm from face or at flow rates less than 10 L/min,  $FiO_2$  decreased to  $\sim 21\%$ .
- The decrease in  $FiO_2$  typically started within 6-12 meters from the start of the transport





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# 15 month with difficulty breathing

- Nasal cannula put back on with Tender Grips
- Have parent hold child wrapped in blanket.
- Distraction:
  - Provide toys/movie
- 30 minutes later:
  - HR: 145 RR: 52 (with retractions and head bobbing)
  - Pox: 92% on 2Liters
- Now what?







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# 15 month with difficulty breathing

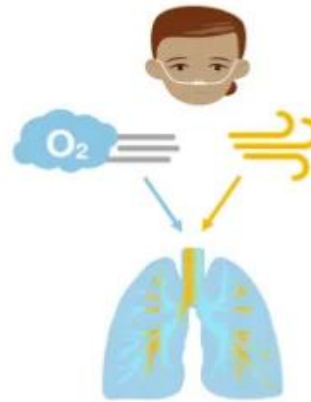
- Pt suctioned and O2 turned up to 4 liters w/out improvement.
- Decision made to increase respiratory support by starting patient on Heated-High Flow
- How does HHF work?



# How does HHF work?

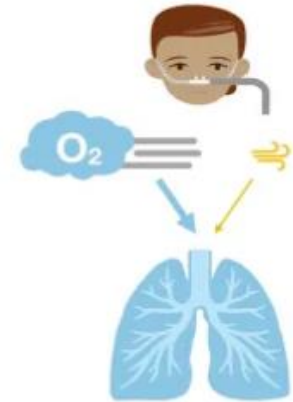
- There are three main proposed benefits of HFNC:
  1. Precise oxygen delivery
  2. Functional residual capacity enhancement
  3. Dead space washout

Nasal cannula



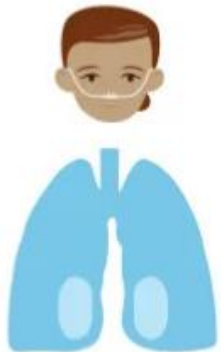
Room air entrainment  
Oxygen dilution

HFNC



Minimal room air entrainment  
Greater oxygen delivery

Nasal cannula



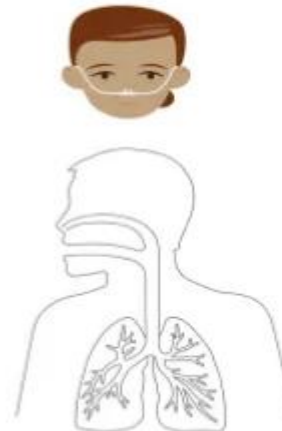
HFNC



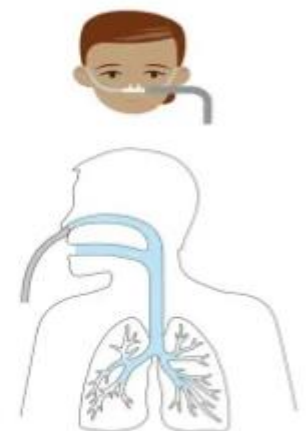
↑ 25%

Functional residual  
capacity (FRC)

Nasal cannula



HFNC



Dead space washout



# How does HHF work?

## Summary of Actions:

|   |   |
|---|---|
|   |   |
| <b>Dead space washout</b>   | Reduce dead space making minute ventilation more efficient  |
| <b>Reduce inspiratory work of breathing</b>                       | Exceed inspiratory flow thus eliminating nasal resistance   |
| <b>Improved lung Mechanics</b>                                    | Warmed, humidified gas has been shown to improve conductance, lung compliance and lung elasticity                                     |
| <b>Eliminates metabolic work associated with gas conditioning</b> | Attenuates the energy and water loss associated with conditioning inspiratory gas   |
| <b>Provision of mild distending pressure</b>                      | Provides positive distending pressure for lung recruitment. It prevents alveolar collapse   |
| <b>Improve secretion mobilisation</b>                             | Ideal humidification of the inspired gas has been shown to restore muco-cilliary function and reduce symptoms of airway exacerbations |

Table adapted from: High Flow Nasal Cannula Therapy in Neonatology (TL Miller 2013).



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# 15 month with difficulty breathing

- Pt improves initially on HHF, but later in the night had increased RR (58) and difficulty maintaining pulse ox (86%)
- Now what?



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# 15 month with difficulty breathing

- Decision made to increase respiratory support and place patient on BiPAP to transfer
- Scuba mask
- IVF (Pt needs to be NPO)
- Sedation:
  - Dexmedetomidine (Precedex)







# 15 month with difficulty breathing

- Transferred via critical care transport team
- Arrived in ED (no bed available in PICU)
  - HR: 125 RR: 32 Pulse Ox: 97% on CPAP BP: 88/48
  - Pt sleeping but wakes up with exam. No increased WOB
  - Lungs: good aeration with intermittent crackles.
- Pt transferred to PICU after 4 hours in ED.
- Pt transitioned to HHF after 24 hours in PICU and transferred to floor.
- D/c home 48 hours after arriving to CHCO on 0.5 L via NC



# Bronchiolitis

## Interventions

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- American Academy of Pediatrics on Bronchiolitis:2014 Clinical Practice Guideline Stated:
- “Clinicians should not administer albuterol or racemic epinephrine to infants and children with a diagnosis of bronchiolitis. Evidence Quality: B Strong Recommendation”

# Stop the madness!!

## NOT recommended:

- Nebulized meds: Albuterol/racemic
- CXRs
- Viral testing
- Steroids
- Antibiotics
- Chest physiotherapy
- Antiviral administration







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# Nosefrida



# Respiratory ABC (with help from ChatGPT)

- Asthma as a limerick:

*Inhaler in hand, she did wheeze,  
Asthma's grip made her gasp for ease.  
With a puff and a breath,  
She fought against certain death,  
In the end, she found sweet release.*

- Croup as a haiku:

*Child's cough in the night,  
Hoarse and barking, airway tight,  
Croup's grip, a frightful fight.*





# Bronchiolitis as a Sonnet

*Bronchiolitis' grasp, a cruel wintertime woe,  
Tiny chest heaving, with each raspy sigh,  
Parents anxiously watching, oh, how they'd cry.*

*The virus danced through bronchioles so small,  
Inflammation, congestion, a harsh, relentless  
thrall,*

*Tiny lungs struggled, as the days did pass,  
A battle for each breath, a fear that would  
amass.*

*In the dim-lit room, a nebulizer's hum,  
A fragile life held in the hands of some,  
Doctors and nurses, with knowledge and grace,  
Fought for the child's life in that cold, sterile  
place.*

*Through dark nights and dawns, they tirelessly  
fought,  
To free the young soul from this viral onslaught.  
With love and with science, they joined in the race,  
To heal and to mend, to bring back the child's  
grace.*

*And as the weeks passed, hope began to ignite,  
Tiny lungs healed, with each day's new light,  
Bronchiolitis, relenting, at last did abate,  
Leaving behind a tale of strength and of fate.*



# THE END

## Questions?

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Colorado

# 5 yo vomiting and difficulty breathing

- 13:10 911 call– Something is wrong with my son, he is vomiting and having trouble breathing.
- What are you thinking as you are driving to home?



# 5 yo vomiting and difficulty breathing

- 13:18 Arrive at home
  - MOC w/ patient meet you at the door.
  - Pt coughing and then has his 4th episode of emesis
  - HR: 140 RR: 36 Pox: 92% on RA
  - Pale appearing and coughing
  - Heart: S1 S2 tachycardic
  - Lungs: coughing with every deep breath; poor aeration
  - Derm: diffuse erythematous rash on trunk and lower extremities
- What else do you want to know?
- What is going on?



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# Anaphylaxis

- Severe life-threatening allergic rx
- Symptoms can develop rapidly-seconds/minutes
- Can lead to anaphylactic shock (distributive shock)-massive vasodilation





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# Anaphylaxis-Symptoms

- Flushed/red skin
- Hives
- Intense itching
- Angioedema
- Noisy breathing (stridor, wheezing)
- Tachycardia
- Hypotension
- Anxiety
- N/V





# Anaphylaxis- Interventions

- Maintain open airway
- Keep calm
- Oxygen
- IV fluid bolus if suspect severe rxn/BP ↓
- Bronchospasm- albuterol
- Antihistamines
- Corticosteroids
- Auto-injector epi
- Epinephrine (1:1000)
  - 0.01 mg/kg (0.01 mL/kg)  
**IM- lateral thigh**





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# 8 yo vomiting and difficulty breathing

- 16:10 911 call– Something is wrong with my son, he is vomiting and having trouble breathing.
- What are you thinking as you are driving to home?