



# Respiratory Distress

National Pediatric Nighttime Curriculum

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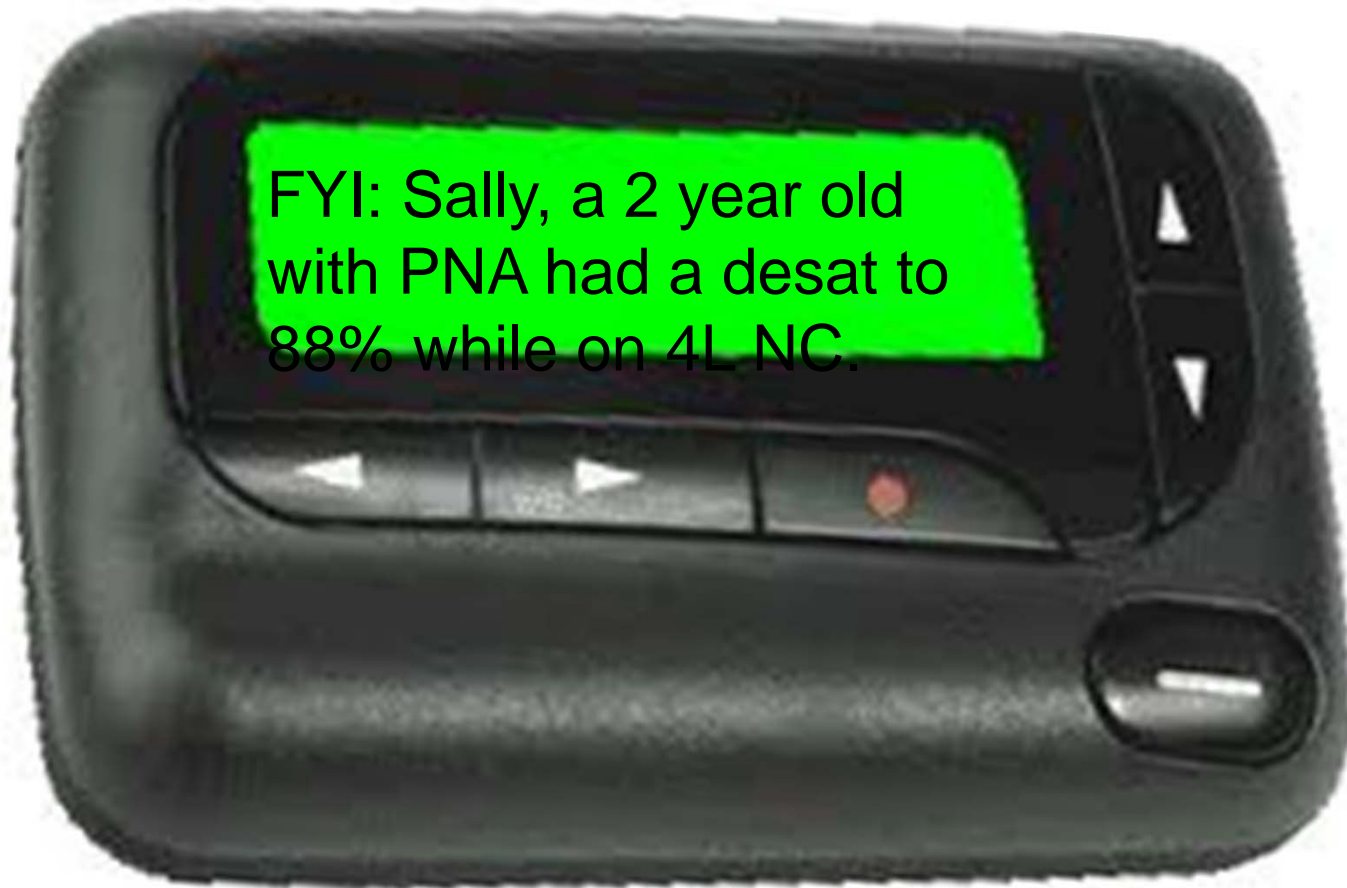




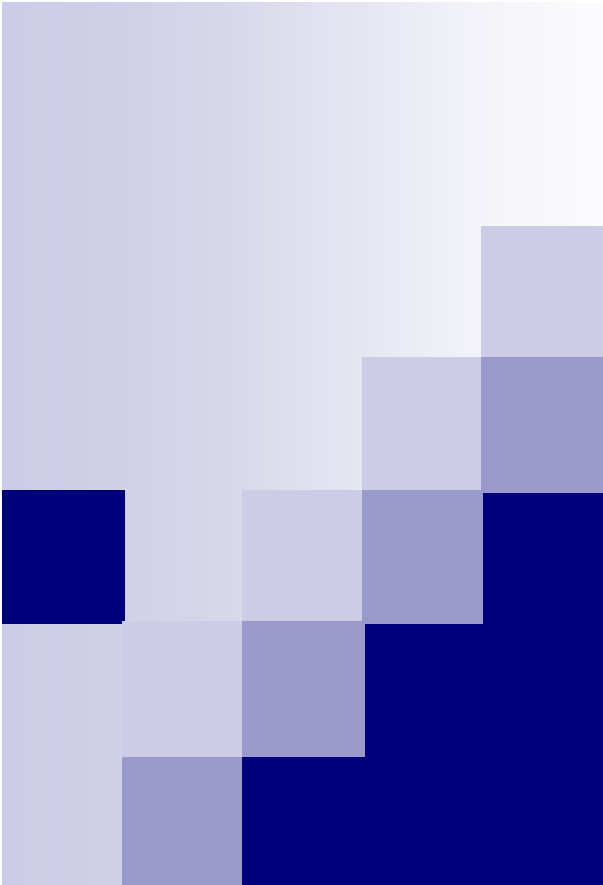
# Learning Objectives

- Review the initial assessment of patient in respiratory distress
- Review management of specific causes of respiratory distress
  - Upper airway obstruction
  - Lower airway obstruction
  - Lung tissue disease
  - Disordered control of breathing

During a busy night, you get the following page:



What do you do next? What initial management steps would you take?



How do you initially  
assess a patient in  
respiratory distress?



# Initial Assessment

- Rapid assessment
  - Quickly determine severity of respiratory condition and stabilize child
  - Respiratory distress can quickly lead to cardiac compromise
- **Airway**
  - Support or open airway with jaw thrust
  - Suction and position patient
- **Breathing**
  - Provide high concentration oxygen
  - Bag mask ventilation
  - Prepare for intubation
  - Administer medication ie albuterol, epinephrine
- **Circulation**
  - Establish vascular access: IV/IO



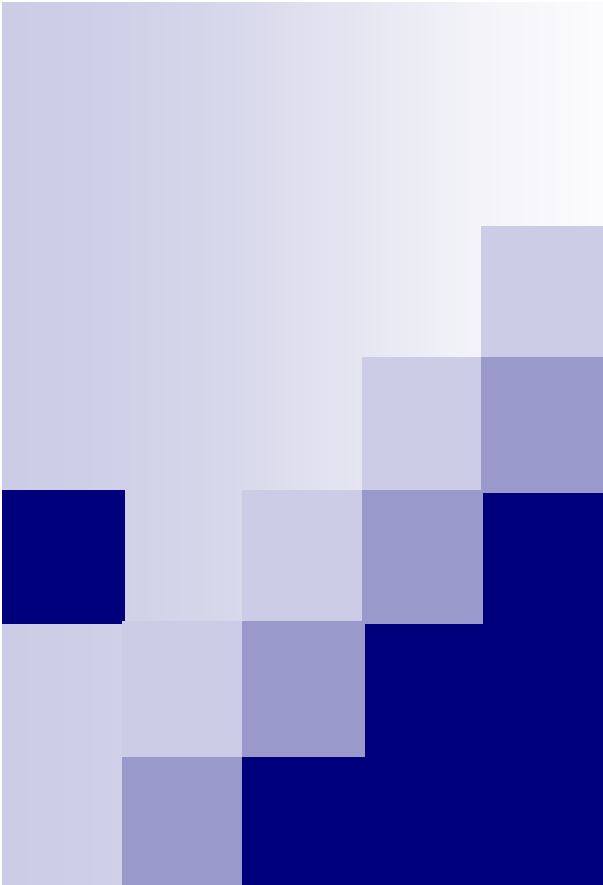
# History and Physical Exam

## History

- Trauma
- Change in voice
- Onset of symptoms
- Associated symptoms
- Exposures
- Underlying medical conditions

## Physical Exam

- Mental status
- Position of comfort
- Nasal flaring
- Accessory muscle use
- Respiratory rate and pattern
- Auscultation for abnormal breath sounds



What initial studies  
would you get for a  
patient in respiratory  
distress?



# Initial studies

- Pulse oximetry

- May be difficult in agitated patient
- May be falsely decreased in very anemic patients

- Imaging

- Chest X Ray

- Consider in patients with focal lung findings or respiratory distress of a unknown etiology

- Soft tissue radiograph of lateral neck

- May identify a retropharyngeal abscess or radiopaque foreign body

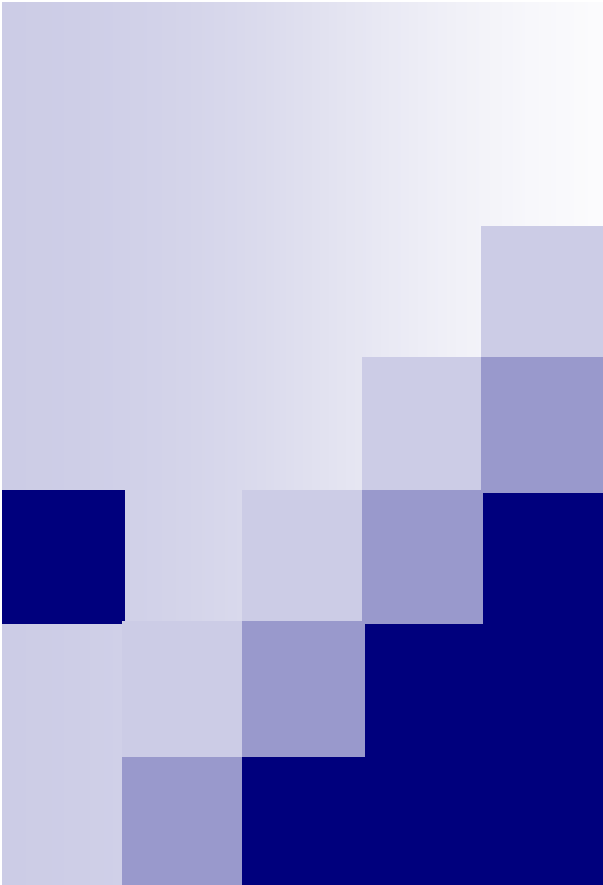
- Labs

- ABG/VBG

- Chemistry: calculate anion gap

- Urine toxicology and glucose if patient has altered mental status





What are some  
examples of life  
threatening conditions?



# Life threatening conditions

- Complete upper airway obstruction
  - No effective air movement, speech or cough
- Respiratory failure
  - Pallor or cyanosis, altered mental status, tachypnea, bradypnea, apnea
- Tension pneumothorax
  - Absent breath sounds on affected side, tracheal deviation and compromised perfusion
- Pulmonary embolism
  - Chest pain, tachycardia, tachypnea
- Cardiac tamponade
  - Apnea, tachycardia, hypotension, respiratory distress



# Specific Causes of Respiratory Distress

- Upper airway obstruction
- Lower airway obstruction
- Lung tissue disease
- Disordered control of breathing



# Upper Airway Obstruction

- Causes: foreign body, tissue edema, trauma, viral infection, intubation, tongue movement to posterior pharynx with decreased consciousness
- Symptoms
  - Partial obstruction: noisy inspiration (stridor), choking, gagging or vocal changes
  - Complete obstruction: no audible speech, cry or cough
- Management
  - Rapidly decide if advanced airway is needed
  - Avoid agitation
  - Suction only if blood or debris are present
  - Reduce airway swelling
    - Inhaled epinephrine
    - Corticosteroids
- Croup and anaphylaxis require additional management



# Lower Airway Obstruction

## ■ Bronchiolitis

- Symptoms: copious nasal secretions, wheezes and crackles in child less than 2 years
- Management
  - Oral or nasal suctioning
  - Viral studies, CXR, ABG/VBG
  - Trial of nebulized albuterol

## ■ Asthma

- Symptoms: wheezing, tachypnea, hypoxia
- Management
  - Mild-moderate: oxygen, albuterol, oral corticosteroids
  - Moderate to severe: oxygen, albuterol-ipratropium (Duo-Neb), corticosteroids (IV), magnesium sulfate
  - Impending respiratory failure: oxygen, albuterol-ipratropium, corticosteroids, assisted ventilation (bag-mask ventilation, BiPAP, intubation), adjunctive agents (terbutaline, magnesium sulfate), heliox



## Case 2

Your intern calls you from the bedside of Jonathan, a 2 year old with Pompe's disease who is BiPAP dependent overnight with settings of 18/5 and a backup rate of 18. Over the past few hours, he has had an increase in his oxygen requirement from an FiO<sub>2</sub> of 21 to 40% and has spiked to 39.2. What steps do you take to evaluate and manage him overnight?



# Lung Tissue Disease

- Etiologies of lung tissue disease
  - Infectious pneumonia
  - Aspiration pneumonitis
  - Non-cardiogenic pulmonary edema (ARDS)
  - Cardiogenic pulmonary edema (ARDS)
- Consider positive expiratory pressure (CPAP, BiPAP or mechanical ventilation with PEEP) if hypoxemia is refractory to high concentrations of oxygen



# Disordered Control of Breathing

- Abnormal respiratory pattern produces inadequate minute ventilation
- Altered level of consciousness
  - Elevated intracranial pressure
    - Cushing's triad
  - Poisoning or drug overdose
    - Administer specific antidote if available
  - Hyperammonemia
  - Metabolic acidosis
- Neuromuscular disease
  - Restrictive lung disease => atelectasis, chronic pulmonary insufficiency, respiratory failure
- Support oxygenation and ventilation while treating the underlying problem





# Take Home Points

- The initial assessment of a patient in respiratory distress should be rapid and focused on quickly determining the severity of respiratory distress and need for emergent interventions
- Specific causes of respiratory distress can be categorized as upper and lower airway obstruction, lung tissue disease and disordered control of breathing and require specific interventions



# References

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