


# NEONATAL & PEDIATRIC RESUSCITATION



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# *Objectives*

- Review neonatal and pediatric assessments
  - Discuss treatment option for various medical problems affecting neonates, infants, and older children
- 

# Most Common Complaints Presenting to ED (Medical Illness)

- Fever
- Ear pain
- Respiratory symptoms
- Vomiting
- Diarrhea
- Sore throat
- Rash
- Urinary tract symptoms
- Abdominal pain

# Pediatric Assessment Triangle

(First view of patient)

**Airway & Appearance**  
(Open/Clear – Muscle Tone / Body Position)

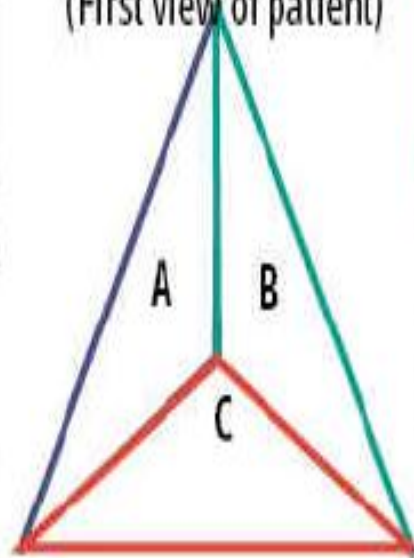
**Abnormal:** Abnormal or absent cry or speech.  
Decreased response to parents or environmental stimuli.  
Floppy or rigid muscle tone or not moving.

**Normal:** Normal cry or speech. Responds to parents or to environmental stimuli such as lights, keys, or toys.  
Good muscle tone.  
Moves extremities well.

**Work of Breathing**  
(Visible movement / Respiratory Effort)

**Abnormal:** Increased/excessive (nasal flaring, retractions or abdominal muscle use) or decreased/absent respiratory effort or noisy breathing.

**Normal:** Breathing appears regular without excessive respiratory muscle effort or audible respiratory sounds.



**Circulation to Skin**  
(Color / Obvious Bleeding)

**Abnormal:** Cyanosis, mottling, paleness/ pallor or obvious significant bleeding.

**Normal:** Color appears normal for racial group of child. No significant bleeding.

## Decision/Action Points:

- **Any abnormal findings or life-threatening chief complaint** such as major trauma/burns, seizures, diabetes, asthma attack, airway obstruction, etc (urgent) – proceed to Initial Assessment.
- **All findings normal** (non-urgent) – proceed to Initial Assessment.

What is the most important  
FIRST thing we should assure  
in children?



Oxygenation =  
Ventilation +  
Perfusion

# Neonates

What is a neonate?

Birth to 28 days old (Full-term infants)

Expected due date + 28 days (Pre-term or <37 wks)






# *Special Considerations*

- Birth complications
- Prematurity
- Small for gestational age
- Other

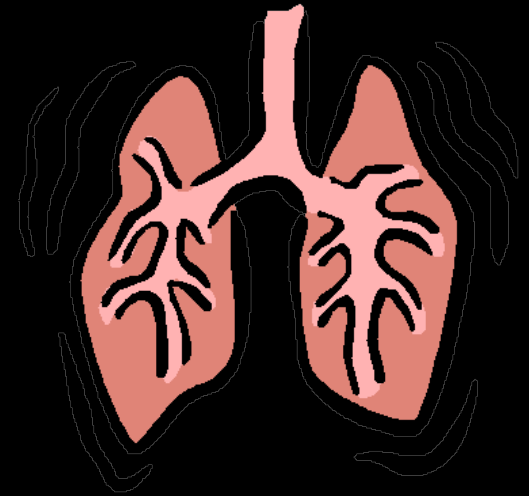


# *Most Common Complications in Newborns*

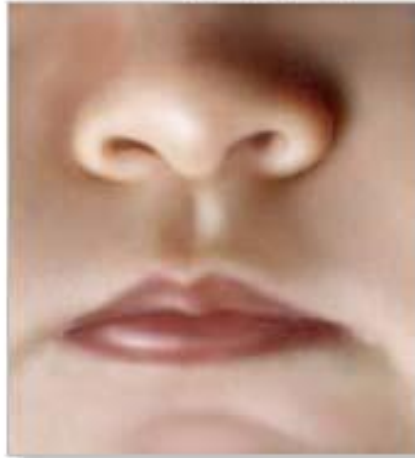
- Jaundice
  - Respiratory
  - Infections
  - Feeding problems
- 

# *Respiratory*

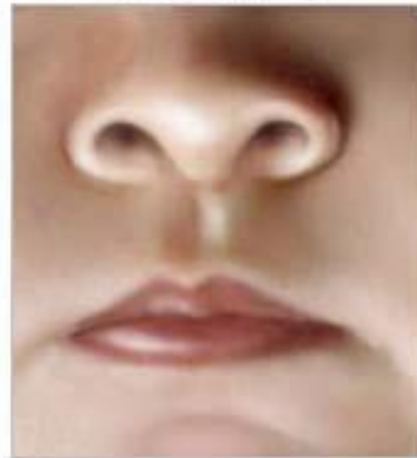
- Signs and Symptoms
  - tachypnea
  - nasal flaring
  - grunting
  - retractions
  - apnea



Normal nostrils



Flared nostrils



ADAM.

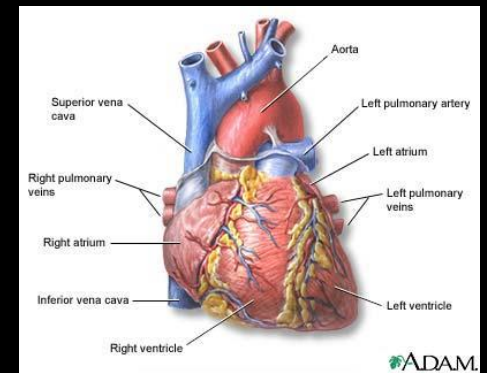


# Pediatric Respiratory Rates

<b>Age Rate</b>	<b>(breaths per minute)</b>
▪ Infant (birth–1 year)	30–60
▪ Toddler (1–3 years)	24–40
▪ Preschooler (3–6 years)	22–34
▪ School-age (6–12 years)	18–30
▪ Adolescent (12–18 years)	12–16

# Cardiovascular

- Signs and Symptoms
  - cyanosis – central vs acrocyanosis
  - tachycardia
  - tachypnea
  - murmur
  - gallop
  - pulses





# Pediatric Pulse Rates

<b>Age</b>	<b>Low</b>	<b>High</b>
▪ <b>Infant (birth–1 year)</b>	<b>100</b>	<b>160</b>
▪ Toddler (1–3 years)	90	150
▪ Preschooler (3–6 years)	80	140
▪ School-age (6–12 years)	70	120
▪ Adolescent (12–18 years)	60	100

*\*\*Pulse rates for a child who is sleeping may be 10 percent lower than the low rate listed.*

# Pediatric Systolic Blood Pressure

- *Infant (birth–1 year)* > 60\*
- *Toddler (1–3 years)* > 70\*
- *Preschooler (3–6 years)* > 75
- *School-age (6–12 years)* > 80
- *Adolescent (12–18 years)* > 90

*\*Note: In infants and children aged three years or younger, the presence of a strong central pulse should be substituted for a blood pressure reading*

How does the neonate  
maintain adequate cardiac  
output?



*Heart rate*

# *Central Nervous System*

- Signs and Symptoms
  - lethargy
  - irritability/tremors
  - hypotonia





# *It's Your Lucky Day*

- Called out to female, age 23 in active labor
- What are your initial steps?
  - History
    - 40 weeks gestation
    - No complications during pregnancy
    - No medications
    - Labor began 12 hours ago
    - Membranes ruptured within last 30 minutes
    - Some bleeding
  - Check mother






# *Assessment of the Newborn*

- Floppy
- No spontaneous respiratory effort
- What do you do?
  - Make sure airway clear
  - Stimulation
    - No spontaneous respiratory effort
  - Assist with manual resuscitator (bag-valve-mask)
  - Check pulse
    - Heart rate = 58



# *Interventions*

- Continue bagging
  - Continue chest compressions
  - Anticipate further interventions
- 

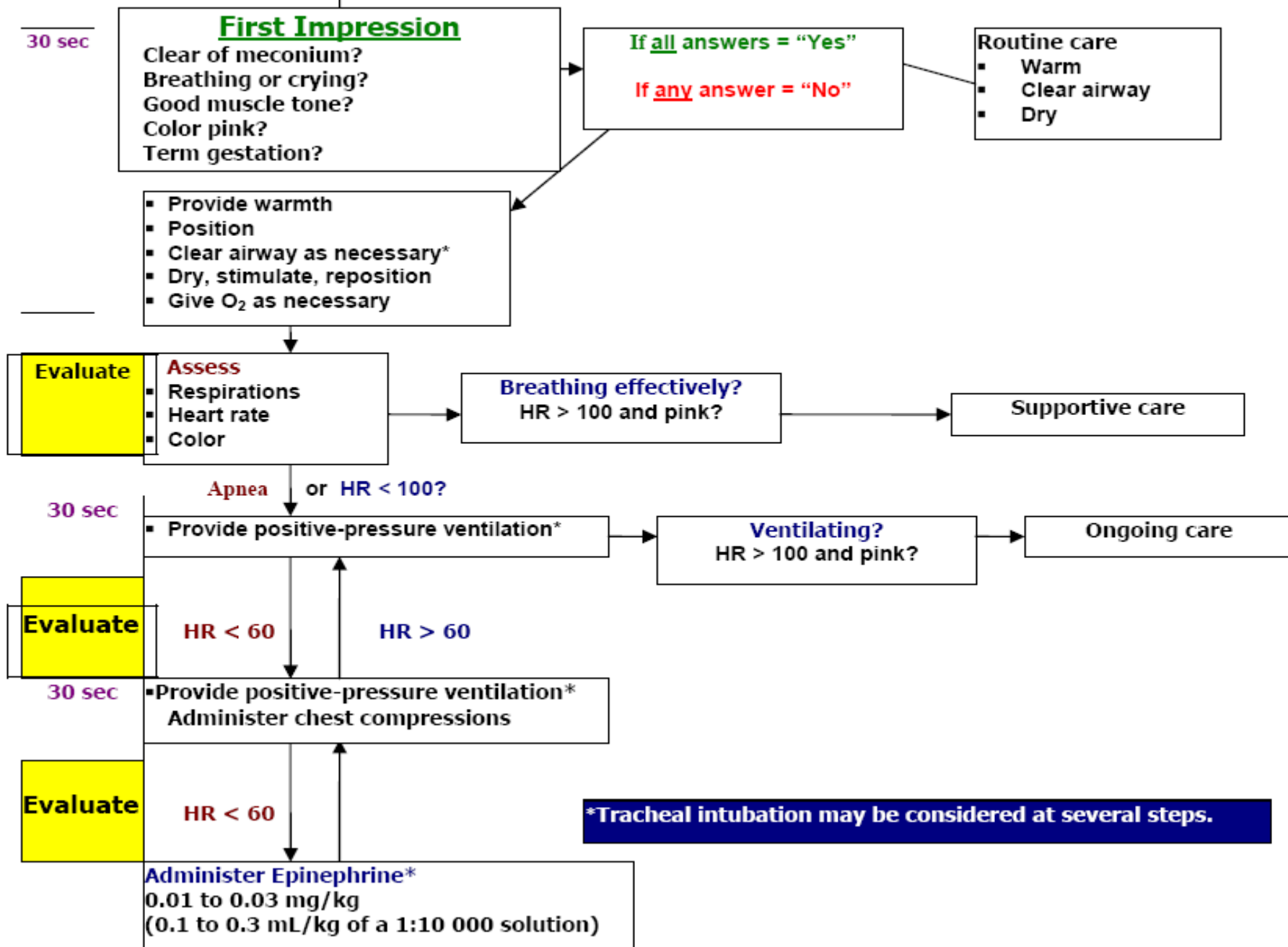


# *Outcome*

- Baby begins to spontaneously breath
  - Respiratory increases to 40
- Heart rate increases to 136
- What would you do to further support this baby?
  - Supplemental oxygen
  - Check glucose
  - Keep warm



# Birth




# What is the problem?

- Full-term baby delivered in back of ambulance
- Immediately crying and pinking up
- HR = 140, RR = 42
  
- 15 minutes later note baby to be sluggish
- HR = 72
  
- What do you do?



# Interventions


- Check glucose = 68
  - Baby feels cool to touch
    - Warm infant
  - More active, heart rate improves
  - Why did warming improve activity and heart rate?
- 

# Thermoregulation

- Neonates highly susceptible to *COLD STRESS*
- Increased body surface area to weight ratio leads to increased heat loss
- Do not have ability to regulate and produce heat
- Unable to shiver (until age 6 mos)
- Nonshivering thermogenesis to produce heat
  - Infant's metabolic rate increases
  - Leads to increase in oxygen and glucose consumption



# Thermoregulation

- Ability to compensate for additional physiologic demands is limited
  - Lead to hypoxia or accentuate existing hypoxia
  - Lead to hypoglycemia, increased renal excretion of water and solutes, and metabolic acidosis
- 

## Neonatal Resuscitation

Dry, Warm, Position, Tactile Stimulation.  
Suction Mouth then Nose.  
Call for ALS back-up. Administer O<sub>2</sub> as needed.

**Apnea/Gasping, HR <100 or central cyanosis**

Ventilate with BVM @ 40-60/min

**HR <60 after 30 sec BVM**

Chest Compressions @ 120/min - 3:1  
1/3 to 1/2 chest depth  
2 thumb encircle chest or 2 fingers

**ALS available & HR <60**

Intubate  
Epinephrine  
0.01-0.03mg/kg  
IV/IO/ET  
1:10,000  
q 3-5 min

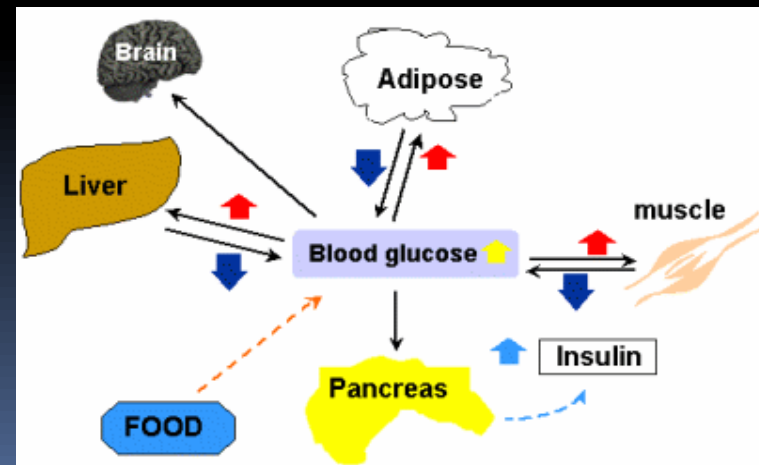
90%

9%

1%

# Glucose Administration

- glucose-containing solution in a dose of 0.5 to 1.0 g/kg
- 2-4 mL/kg of 25% glucose solution or
- 10-20 mL/kg of a 5% glucose solution (D5LR or D5NS).



# Epinephrine Administration

- Newborn resuscitation
  - Epinephrine
    - 0.01 to 0.03 mg/kg
    - repeated every 3 to 5 minutes if required
    - inadequate data to evaluate the efficacy and safety of higher doses of epinephrine in newborns
  - 0.1 cc/kg (**1:10,000 solution**) by IV or IO route or
  - 0.1 mg/kg (**0.1 cc/kg of 1:1,000 solution**) ET route



# Fever





# Fever

- Rectal temperature at least 38°C (100.4°F)
- May affect triage and treatment
  - Infants < 90 days of age
  - Immunocompromised patient
  - Chronic illness
  - Children < 2 years w/o identified source of infection


# Fever

- Affects physiologic function
  - Insensible fluid losses
  - Metabolic rate
  - Oxygen and caloric consumption
  - Heart rate and respiratory rate






# Fever & Associated Symptoms

- Dehydration
  - Lethargy
  - Seizures
- 




# History

- Objective/subjective temps
  - Duration
  - Associated sxs
    - Mental status changes
    - Decreased po
    - Vomiting, diarrhea
    - Decreased urination
    - Rash
    - Pain
- 



# Treatment

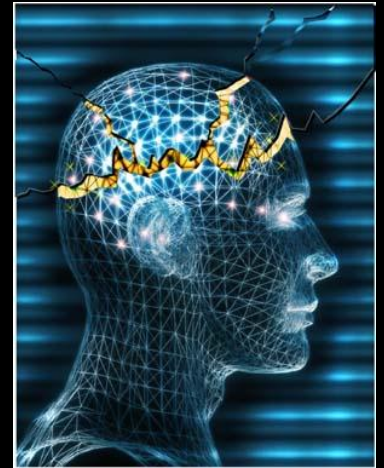
- A-B-Cs
  - IVF
  - Tylenol/Motrin
- 

# Child “Seizing”

- Respond to call for a 2 year old having what appears to be a seizure
- Upon arrival you find child
  - Minimally responsive
  - Airway intact & respirations 32 – unlabored
  - Skin color pink – cap refill < 2 secs
- What history will you obtain?

# Seizures

- Causes
  - Febrile illness
  - Infections
  - Metabolic disturbances
  - Toxins
  - Head trauma
  - Tumors
  - Unknown etiology
  - Noncompliance with seizure medications





# Types

- Generalized seizures
- Partial seizures
- Unclassified—febrile, neonatal



# Treatment

- Airway
- Breathing
- Oxygenation
  
- Positioning
  
- Midazolam (Nasal/IM/IV/PR)
- Lorazepam (IM/IV/PR)
- Diazepam (IV/PR)



# Treatment

- Glucose < 60
  - 10% Dextrose
  - Glucagon





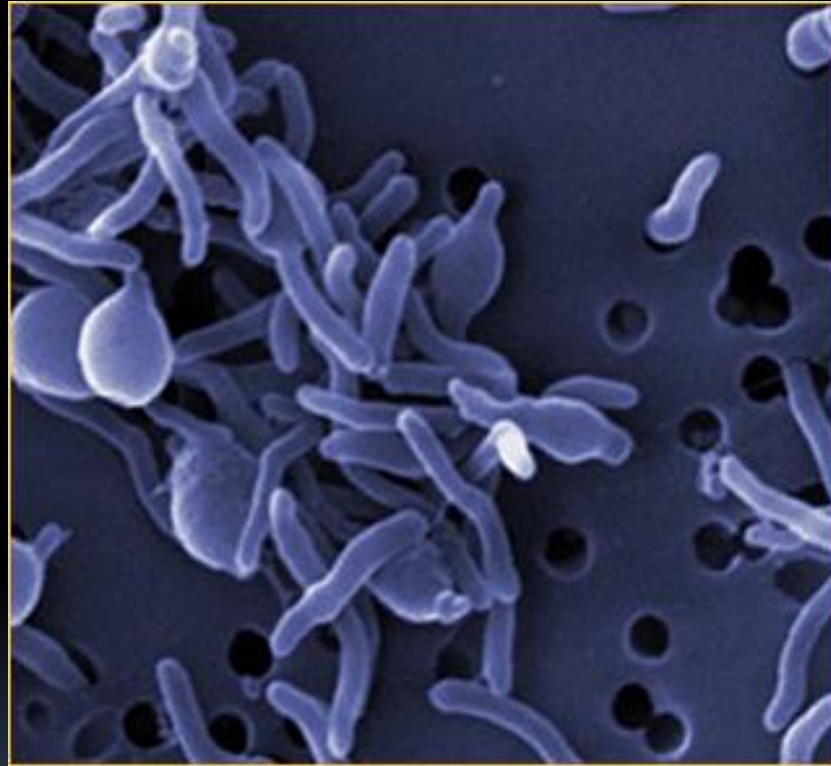
# What is this?

- Child has been seizing continuously for 45 mins

Status epilepticus




# Infectious Disorders





# Gastroenteritis

- Inflammation of GI tract
    - Bacterial, viral, parasitic
  - Viral diarrhea caused by rotavirus most common form
  - History
    - Duration – vomiting, diarrhea, fever
    - Description diarrhea
    - Number of wet diapers/last urination
    - Use of antibiotics/other medications
    - Diet (chronic intake high solute, sugar, drinks)
    - Day care attendance, sick contacts, recent travel, pets in home
- 

# Signs & Symptoms

- Vomiting
- Diarrhea
- Fever
- Abdominal pain
- Lethargy/ irritability
- Signs of dehydration



11 mo old with 3 day hx of vomiting & diarrhea

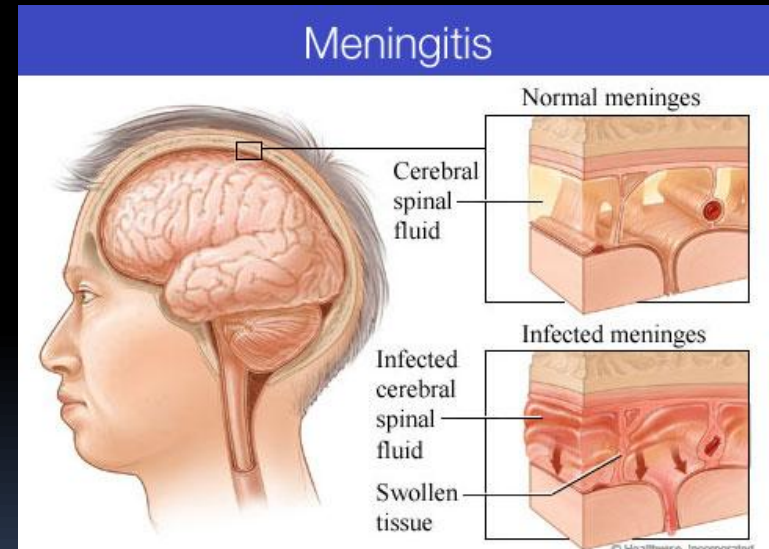


# Treatment



# Meningitis

- Inflammation of the meninges (brain, spinal cord)
- Bacterial
- Viral



# Assessment

- Fever
- Recent URI
- Headache or neck pain
- Altered level of consciousness or activity level
- Irritability
- Poor feeding/vomiting
- Bulging fontanel, headache
- Petechial or purpuric rash
- Seizure



# Treatment

- Meet oxygen requirements
- IVF
- Glucose
  
- Respiratory Precautions



# Meningococccemia

- Widespread blood infection
- ***Neisseria meningitidis***
  
- Potentially life threatening
- Young children and adolescents
- Death can occur within hours






# History

- Fever or temperature instability
- Altered mental status, irritability
- Poor feeding, vomiting
- Petechiae or purpura fulminans
- Bleeding from puncture sites
- Tachycardia, poor perfusion, hypotension (S&S of shock)
- Gangrene and tissue necrosis (late)






# Treatment

- Administer oxygen
  - IV fluids
  - Respiratory isolation (droplet precautions)
  - Cardiorespiratory, pulse oximetry and blood pressure monitoring
  - Anticipate the need for inotropic support or vasoactive agents
  - Antibiotic prophylaxis for household contact, daycare or healthcare providers with significant contact
- 




## 3 Week Old

- Respond to home of 3 week old
  - Baby not feeding over last 2 days
  - “sleeping a lot”
- 



# *History*

- What do you want to know?
    - Pregnancy complications
    - Birth complications
    - Newborn course
    - General appearance
    - Feeding amounts and schedule
    - Vomiting, diarrhea
    - How many wet diapers in last 24 hours
    - Anyone sick contacts
- 





# *Assessment*

- Open airway
- Respiratory rate of 18-20
- Capillary refill 2 secs
- Heart rate = 136 (but seems variable)
- No cyanosis
- “floppy”
- Minimally opens eyes to stimuli



# *Interventions*

- Check oxygen saturation = 85-98%
  - Blow by, cannula, face mask & monitor O<sub>2</sub>
  - Stimulation increases O<sub>2</sub> saturation
- Check glucose = 72
- What else would you like to do?




# *On-going Assessment*

- Respiratory rate declines at times to 10-12
- Oxygen saturation declines to 70's
- How would you manage this?
  - Stimulation
  - High flow oxygenation
  - Consider intubation
  - Check glucose





# *Interventions*

- You decide to assist ventilations
    - Heart rate increases to 120's
    - Continues to sustain rate unless you stop providing assisted ventilations
  
  - What is your continued course of action?
- 



# *Outcome*

- Arrive to ED
  - Child continues to require positive pressure ventilation to achieve maximal oxygenation & to sustain heart rate
  - Intubated in ED
  - CXR, IV access & blood work
- 




What was wrong with this  
baby?

Septic






# 12 week old baby

- Baby having trouble breathing
  - First step?
    - Pediatric Assessment Triangle
      - Appearance
      - Work of breathing
      - Circulation
    - Eyes open
    - Retracting with audible wheezing
    - Pink
- 



# Assessment

- PAT = Awake, increased work of breathing, pink
  - Next step?
    - Check pulse ox and provide blow by oxygen
    - Get a history
      - 3 days of nasal drainage, cough, increasing irritability, decreased feeding
      - Has not been taken to medical care (no car)
- 

# Assessment

- History
  - No pregnancy or newborn complications
  - Has been well until last 3 days
  - No medications given
  - 2 other children in house with colds
  - Taking ½ of feedings
  - Wet diapers less (8 to 3) in last 24 hours
- Physical Exam
  - Looking around
  - RR = 72, obvious intercostal retractions, wheezing
  - Heart rate 160, cap refill 2 secs

# *Interventions*

- What do you want to do?

## **Wheezing**

Beta-Agonist

(Albuterol or other Beta-Agonist)

IV protocol if SaO<sub>2</sub> < 92 after treatment

No improvement: Repeat Beta-Agonist x3 +  
Ipratropium (if available)

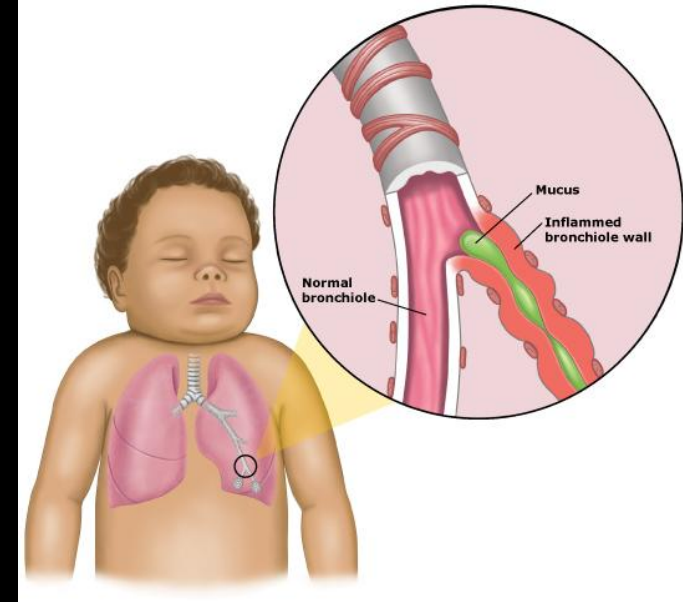
Methylprednisolone or Prednisone



*What is most likely wrong  
with this baby?*

# Bronchiolitis

- Lower respiratory tract infection
- Caused by virus
  - Respiratory Syncytial Virus (RSV)
- Age < 2 years
  - 90% will be infected by age 2 years
  - 40% will develop lower respiratory tract infection





# *Bronchiolitis*

- Occurs fall & winter months
- Risk factors include:
  - Exposure to cigarette smoke
  - Age younger than 6 months old
  - Living in crowded conditions
  - Lack of breast-feeding
  - Prematurity (being born before 37 weeks gestation)
- Prognosis
  - Usually symptoms get better within a week
  - Breathing difficulty usually improves by the third day
  - Mortality rate is less than 1%

# Treatment (AAP Guidelines)

- **RECOMMENDATION 2a**

- *Bronchodilators should **not** be used routinely in the management of Bronchiolitis (recommendation: evidence level B; RCTs with limitations; preponderance of harm of use over benefit)*

- **RECOMMENDATION 2b**

- *A carefully monitored trial of -adrenergic or –adrenergic medication is an option. Inhaled bronchodilators should be continued only if there is a documented positive clinical response to the trial using an objective means of evaluation(option: evidence level B; RCTs with limitations and expert opinion; balance of benefit and harm).*

# Treatment (AAP Guidelines)

## ■ RECOMMENDATION 3

- *Corticosteroid medications should not be used routinely in the management of Bronchiolitis (recommendation: evidence level B; based on RCTs with limitations and a preponderance of risk over benefit)*

## ■ RECOMMENDATION 7a

- *Supplemental oxygen if oxyhemoglobin saturation ( $Sp_{o_2}$ ) falls persistently below 90% in previously healthy infants*
- *If the  $Sp_{o_2}$  does persistently fall below 90%, adequate supplemental oxygen should be used to maintain  $Sp_{o_2}$  at or above 90%*


# 3 year old with “breathing problem”

- Respond to 3 yo male
- PAT: sitting in tripod position, ↑WOB, pink






# What do you want to know?

- History
    - Time of onset
    - Possibility of foreign body
    - Medical history
    - Medications
    - Fever or respiratory infection
    - Other sick siblings
    - History of trauma
- 



# Signs & Symptoms

- Wheezing
  - Stridor
  - Respiratory retractions
  - Increased heart rate
  - Altered level of consciousness
  - Anxious appearance
- 




- History:

- Fevers (103-104F) over last 2 days
- Sore throat
- Trouble swallowing, not eating, drooling
- Funny breathing noise
- No significant past medical history
- Are all immunizations up-to-date? "Not sure"



# Differentials

- Allergic Reaction
  - Asthma
  - Aspiration foreign body
  - Infection
    - Pneumonia
    - Croup
    - Epiglottitis
  - Congenital heart disease
  - Medication or Toxin
  - Trauma
- 

# *Interventions*


## **Stridor**

- Normal Saline nebulized
- If No Improvement Epinephrine nebulized treatment
- IV Protocol if  $SAO_2 < 92$  after first treatment
- If Available Methylprednisolone or Prednisone



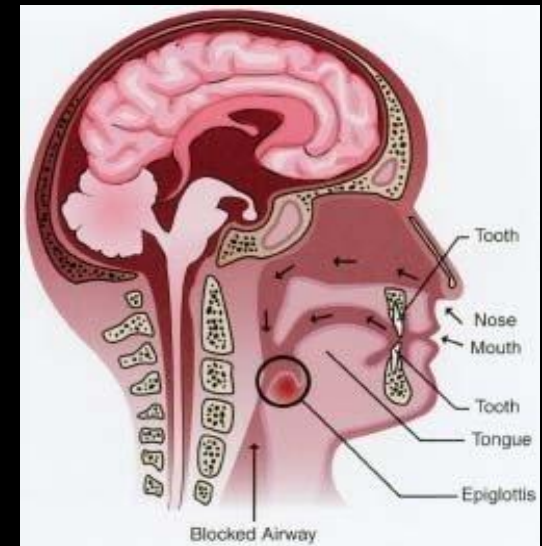
# *Interventions*

## Stridor

- If no improvement contact Medical Control
  - Consider Epinephrine IM, IV
  - Repeat Albuterol or Levalbuterol
- 

# What is wrong with this child?

- Epiglottitis
  - Swelling of the epiglottis
  - Usually caused by the bacteria *Haemophilus influenzae* (*H. influenzae*)
  - Incidence has decreased dramatically since *H. influenzae* type B (Hib) vaccine became a routine childhood immunization in the late 1980s



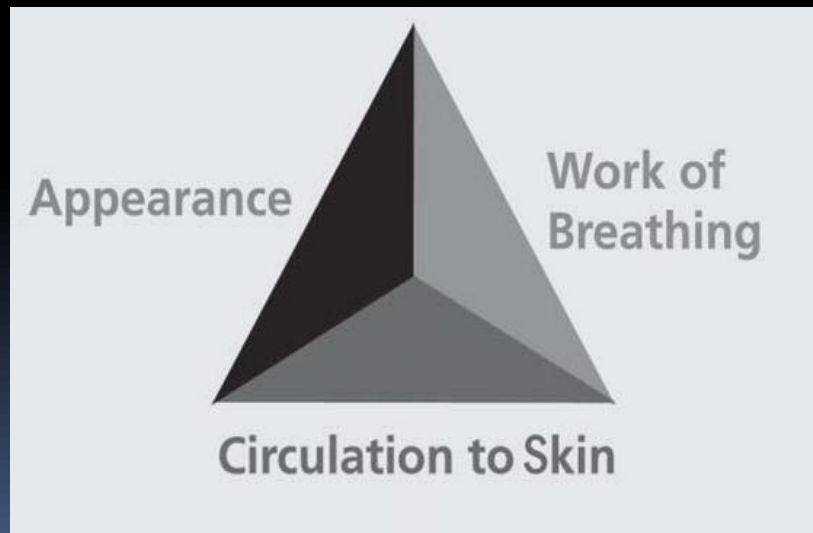


# 10 year female with respiratory distress

- Respond to a 10 year female having difficulty breathing
- Upon arrival, you find the child on the ground with many people standing around
- History
  - Mom and child were riding in car
  - Mom looked over and child was “purple”
  - Pulled over and removed child from car
  - Attempted Heimlich Manuver just in case it was a foreign body but she did not think child had been eating anything

# Assessment

- What do you want to know?
- PAT



Appearance: face& ears purple

Work of Breathing: high pitched stridor, struggling to breath

Circulation: skin purple



# Interventions

- What will you do?
  - Attempt to get an open airway
  - Try abdominal thrusts
  - Nothing observed in mouth
  - Attempt to oxygenate with BVM

What is the problem?



# 9 month old


- Call for respiratory distress
- Runny nose for past 2 days
- Developed cough middle of night
- Temp 100.6
- Non-toxic appearing



What is the problem?




# What do you want to know?

- History
    - Time of onset
    - Possibility of foreign body
    - Medical history
    - Medications
    - Fever or respiratory infection
    - Other sick siblings
    - History of trauma
- 




# Signs & Symptoms

- Wheezing
  - Stridor
  - Respiratory retractions
  - Increased heart rate
  - Altered level of consciousness
  - Anxious appearance
- 




# Differentials

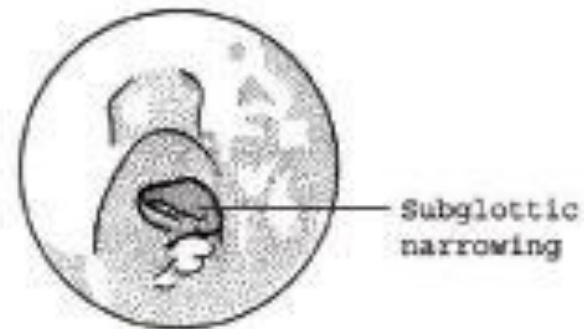
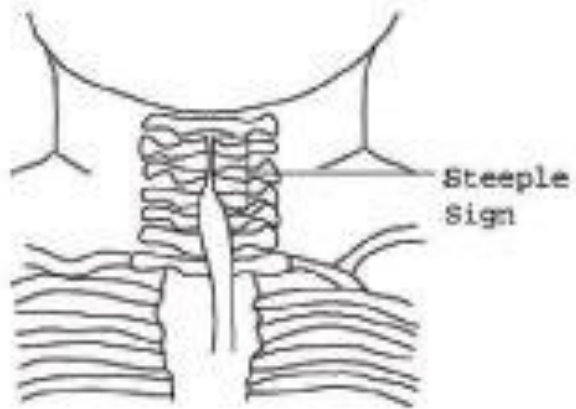
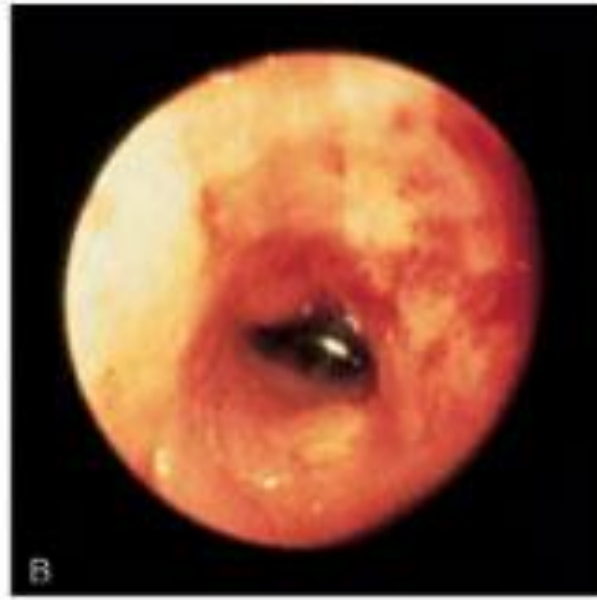
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  - Trauma
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# Croup

## (Laryngotracheobronchitis)

- Common childhood viral illness
  - Most common between age of 6 months & 3 years
  - Occurs usually late fall, winter, early spring
  - Sxs develop about 2-6 days being exposed to someone with croup
- 



# Croup Score

## Inspiratory Stridor

None (0 points)

When agitated (1 points)

On/off at rest (2 points)

Continuous at rest (3 points)

## Retractions

None (0 points)

Mild (1 points)

Moderate (2 points)

Severe (3 points)

## Air Movement/Entry

Normal (0 points)

Decreased (1 points)

Moderately decreased (2 points)

Severely decreased (3 points)

## Cyanosis (Color)

None (0 points)

Dusky (1 point)

Cyanotic on room air (2 points)

Cyanotic with supplemental oxygen (3 points)

## Level of Alertness (Mentation)

Alert (0 points)

Restless or anxious (1 points)

Lethargic/Obtunded (2 points)

Mild = <4

Mild/moderate = 5-6

Moderate = 7-8

Severe = > 9



# Management

- Depends on degree of severity of sx's
- Cool, humidified air
- Oxygen
- Steroids
- Racemic Epinephrine inhaled


# 4 yo with respiratory distress

- Find child to be sitting up
- Intercostal retractions
- Began having breathing problems yesterday and worse today
- What do you do now?






# What do you want to know?

- History
    - Time of onset
    - Possibility of foreign body
    - Medical history
    - Medications
    - Fever or respiratory infection
    - Other sick siblings
    - History of trauma
- 




# Signs & Symptoms

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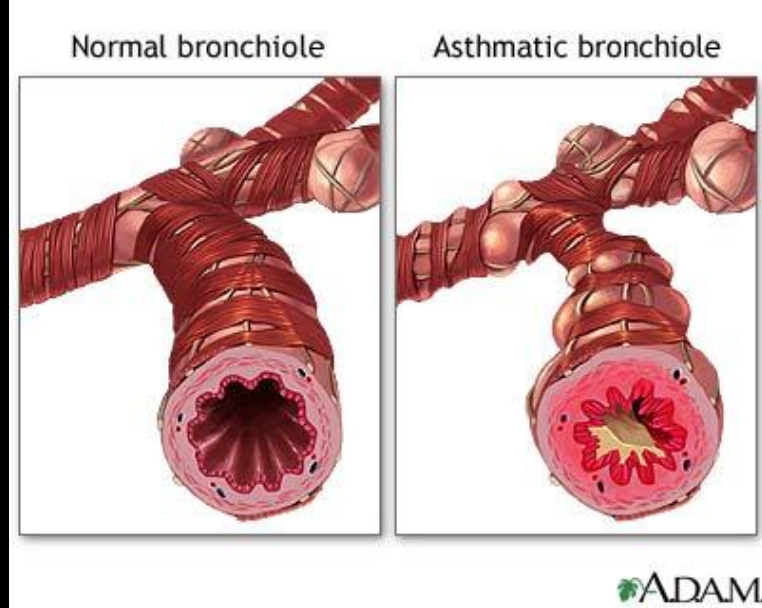


# Differentials

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  - Congenital heart disease
  - Medication or Toxin
  - Trauma
- 

# Asthma

- Most common chronic illness in children
- Chronic inflammation of airways
- Hyper reactive airways
- Bronchospasm
- Mucous plugging



# Management

- Position of comfort
- Oxygen
- Beta-Agonist
  - Albuterol
- $SAO_2 < 92\%$  ---IV
- No improvement
  - Repeat Beta-Agonist x3
  - Add Ipratropium
  - Methylprednisolone or Prednisone
- No improvement
  - Contact Medical Control
    - Epinephrine

*SHOCK*




# Types of Shock

- Hypovolemic
- Cardiogenic
- Distributive
- Obstructive




# Hypovolemic

- Overall decrease in circulating blood or fluid volume
  - What conditions lead to hypovolemic shock?
    - Vomiting, diarrhea
    - Blood loss
    - Sepsis
    - Burns
    - Diabetic ketoacidosis
- 



# Cardiogenic

- Inability of myocardium to maintain adequate cardiac output
  - What conditions may lead to Cardiogenic shock?
    - Heart defect
    - Open heart surgery
    - Viral myocarditis
    - Drug ingestion
    - Cardiac dysrhythmia
- 

# Distributive

- Vasodilatation and pooling of blood in the peripheral vasculature
- **Septic**
  - One of most common types of shock in pediatric patients
  - Infectious
    - E.coli, Strep, Neisseria meningitis, Staph
- **Neurogenic**
  - Loss of sympathetic tone
  - Spinal cord trauma
  - Anesthetic agents
  - Ingestion of drugs (Barbiturates)



# Obstructive

- Inadequate circulating volume due to obstruction or compression of great vessels, aorta, pulmonary arteries, heart
- Causes
  - Pericardial tamponade
  - Tension pneumothorax
  - Mediastinal mass
  - Congenital abnormality of great vessels

# Degrees of Shock

- Compensated
  - Body will attempt to compensate for alterations in perfusion
  - Increase CO by increasing heart rate
    - $CO = SV \times HR$
- Tachypnea, mild irritability, decreased peripheral perfusion

It's all about maintaining perfusion to the brain, heart, and kidneys



# Degrees of Shock

- Decompensated
  - Signs of shock + systolic hypotension






# History

- Blood loss
  - Fluid loss
    - Vomiting
    - Diarrhea
    - Fever
    - Infection
  - Cardiac disease
  - Medications
  - Toxins
- 



# Signs & Symptoms

- Restlessness
  - Confusion
  - Weakness
  - Dizziness
  - Increased HR, rapid pulse
  - Decreased BP
  - Pale, cool, clammy skin
  - Delayed capillary refill
- 

# Differentials

- Dehydration
  - Vomiting
  - Diarrhea
  - Fever
- Infection
- Cardiac disease
- Trauma
- Burns
- Toxic ingestions
  - Medications
- Anaphylaxis

# 2 yo with vomiting & diarrhea

- 2 yo with lethargy
- Vomiting & diarrhea x 2 days
- Decreased po intake
  
- Pale, cap refill 4 secs
- Heart rate = 160
- BP = 60/38



What is wrong with this child?

Hypovolemic Shock

What is the treatment?



IVF (Normal Saline or LR) Bolus



The child weighs 15 kgs

How much fluid do you give?

300 mls

or

20 mls/kg







# *Case Scenarios*

# 8 yo male with “fast” heartbeat

- No previous hx
- No recent illness
- Was sitting reading when heart starting beating fast



What is your assessment?

# What do you want to do?



- **Stable or Unstable**
- Consider: Vagal Maneuvers (no delay)
- **ADENOSINE**
  - 6mg, rapid IV push,
  - 1-2 min, 12 mg, rapid IV push
- Go to Synchronized Cardioversion

# 3 month old with poor feeding

- Poor feeding x3 days
- Pale, lethargic
- Poor capillary refill
  
- Place child on monitor

What is the normal heart rate for a child this age?



**Infant (birth–1 year)      100- 160**

# What do you want to do?

- Oxygenate



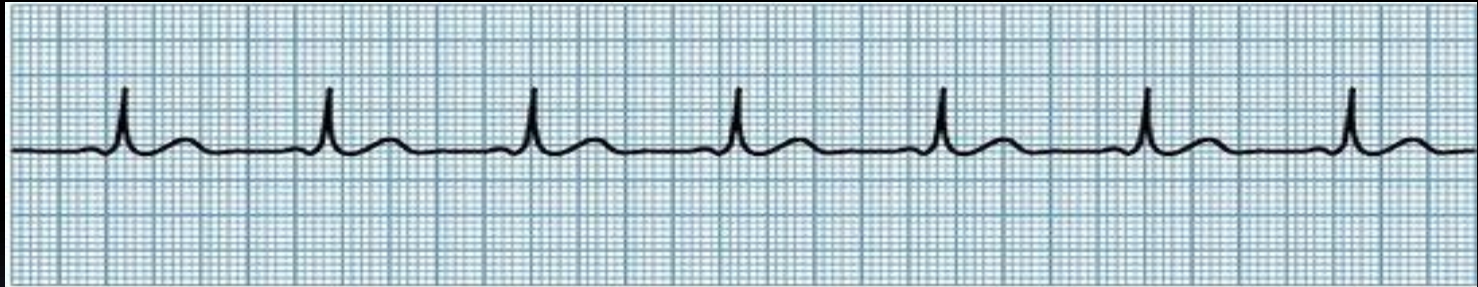
- Epinephrine

- 0.01mg/kg 1:10,000 IV/IO



# What do you do?

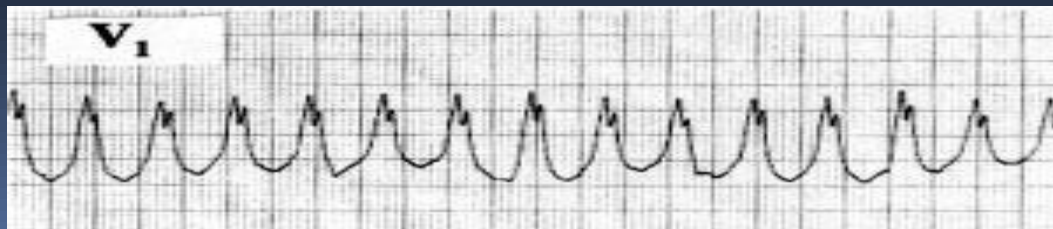
- Atropine 0.02mg/kg
  - Minimum 0.1mg (for child)
  - Maximum 0.5mg (for child)



- What is going on with this baby?  
Something increasing the vagal tone in this child

# 16 year old with fainting

- History:
  - Began feeling dizzy
  - “passed out”
  - Feels like heart is beating “weird”
- Assessment
  - BP: 70/43, Heart rate: 170 weak



# What do you want to do?

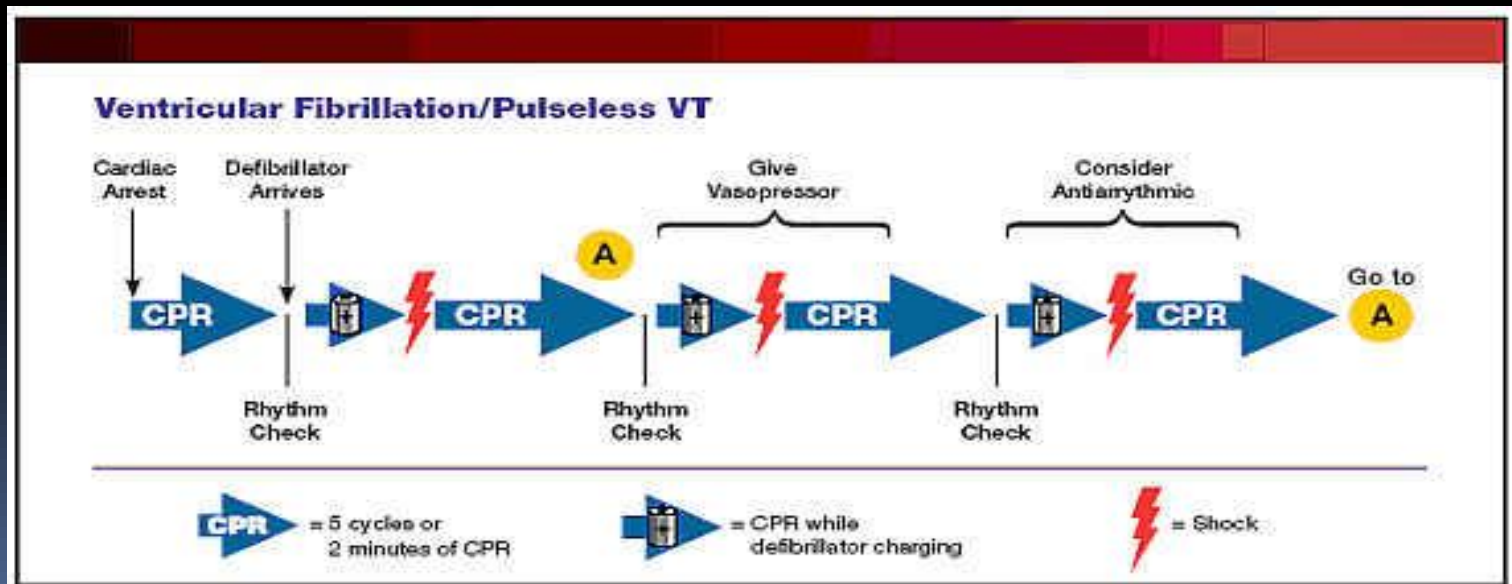


- **Stable or Unstable**
- Synchronized Cardioversion
  - 0.5-1J/kg, then to 2J/kg
- Consider Anitarrhythmics:
  - Amiodorone: 5mg/kg IV over 20-60min
  - Procainamide: 15mg/kg IV over 30-60 min

# 6 yo with sudden collapse



- What do you want to do?



# Seizures in Children

- **History**
  - **Fever**
  - **Prior history of seizures**
  - **Seizure medications**
  - **Reported seizure activity**
  - **History of recent head trauma**
  - **Congenital abnormality**
  - **Possible toxin ingestion**

# Treatment

- **Actively seizing**
  - Midazolam (Nasal/IM/IV/PR)or
  - Lorazepam (IM/IV/PR)or
  - Diazepam (IV/PR)
- **Rectal Diazepam/Fentanyl/Lorazepam:**
  - Draw drug dose up in a 3 ml syringe.
  - Remove needle from syringe and attached syringe to an IV extension tube.
  - Cut of the distal end of the extension tube leaving about 3 or 4 inches of length.
  - Insert tube in rectum and inject drug.
  - Flush extension tube with 3 ml of air and remove

# When would you give Atropine to a pediatric patient?

- Asystole
- Bradycardia secondary to increased vagal tone
- Organophosphate poisoning

# Cardiac Arrest

- Pediatric cardiac arrest is common

True or False

- Sudden cardiac arrest in children is caused by primary cardiac arrhythmias

True or False

- The most common precipitating event leading to cardiac arrest in the pediatric patient is:

Hypoxia



# Causes of Cardiac Arrest in Children

- Bronchospasm / respiratory infection
- Burns
- Drowning
- Dysrhythmias
- Foreign Body Aspiration
- Gastroenteritis (vomiting and diarrhea)
- Sepsis
- Seizures
- Trauma



*Questions?*