Asthma

21% of all asthma cases are school aged.

Identify 3 symptoms of an asthma exacerbation:
- Bronchospasm
- Edema of the bronchi
- Increased mucus production

Children are different...

Smaller airways

Do they compensate through increased tidal volume?

They increase their respiratory rate causing airways to dehydrate

Cough variant asthma

What is it and how does it present?

May not wheeze but continuously cough for 20 – 30 minutes after excitement or exercise

May also abruptly vomit without nausea

Symptoms of severe distress

Appearance: Exhausted, lethargic

Work of breathing: Severe SOB

SpO2: 94% or less

Capnography: EtCO2 elevated over 55 w/ shark fin waveform

Breath Sounds: Decreased or absent

HR: Bradycardia

A silent chest is...

WORRISOME

Why?

NO breath sounds means NO gas exchange and this child is in extremis
Hypoxemia + hypercarbia =

Acidosis  
Bradycardia

Children die from acidosis or hypoxia?

ACIDOSIS

Based on SOP...

What is the first line of treatment for a pt with mild to moderate distress?

ALBUTEROL 2.5 mg (3 mL) via HHN or mask

If pt remains hypoxic, what additional treatment modality can be given?

Supplement w/O2 6 L/NC if patient is hypoxic and using a HHN

When should transport begin?

Begin transport as soon as albuterol is started. Do not wait for a response.

Continue/repeat ALBUTEROL while enroute to hospital.

What symptoms are associated w/ a patient in severe distress?

Severe SOB
↓ BS
absent breath sounds
SpO₂ 94 or less
hypoxic
exhausted
brady
time sensitive

Based on the symptoms mentioned for a pt in severe distress, what is first line treatment?

Epinephrine (1:1000) 0.01 mg/kg IM

Maximum 0.3 mg

What equipment was needed?

Pt. is hypoxic, needs higher FiO₂.  
If albuterol is given 1st with only one source of oxygen, you are unable to give more than 6L until you get to the ambulance or bring in another portable tank.

If in the ambulance, EMS can give O₂ 6 L/ min in addition to 6 L/NC.

If patient is severely bronchoconstricted, nebulized albuterol may not reach target tissues.

The combination of epi and albuterol on a hypoxic heart can be lethal.

All are true

After epi...what is next?

Albuterol 2.5 mg/3 mL. via HHN, mask or BVM/ET.

Continue/repeat Albuterol enroute to the hospital.

May repeat epi X 1 in 10 minutes if minimal response.
And if the pt still isn’t getting relief?

**Magnesium**
25 mg/kg (max 2 Gm) mixed with NS to total 20 mL
slow IV/IO over 10-20 min.
What equipment is needed?

**What role does ipratropium play in pediatric patients with asthma?**
Use is only permitted after OLMC

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**Adults**
- stroke volume by inotropy (strength of contraction) & chronotropy (rate of contraction) when the SV decreases.

**Peds**
- can only increase chronotropy & has low compliance related to volume; therefore Ø compensate by SV.

Consequently, heart rate should be seen as significant
When a peds pt becomes bradycardic, it should be assumed that CO has been drastically ↓

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**Seizures**
Growing epidemic affecting 4.5% pop
Majority affect those < 20yrs of age
Cause known ~ 50%
Often when EMS is called, arrival is during post-ictal state or after activity ceases
Hx and PE crucial to pass along
Sz etiology helps determine tx
A good history can tell the future

Describe the event

Duration
Aura
Muscle rigidity
Post-ictal
Incontinence
General vs. local
Eye deviation
Trauma to oral cavity
Abnormal behavior (ie. lip smacking)

What are the two highest priorities when treating a pt with seizure activity?

When is a seizure pt to be treated?

Only if generalized tonic / clonic activity

Higher priority?

midazolam

blood glucose level

Reasons to identify if febrile

Hydration status
Infectious possibility

How is cooling accomplished?

Passive by removing clothing & cover lightly
Types of Seizures

Identify activity for documentation

General Tonic Clonic activity

Treat or not to treat?

Complex Partial seizure

Cardiac Arrest in Children
The common denominator for unexpected deaths in children is hypoxia.

A child’s metabolism is 2x an adult requires \( \uparrow \) quantities of oxygen.

The body’s source for oxygen comes from the pulmonary system, therefore children with respiratory issues will progress rapidly to cardiovascular compromise death.

*We will never treat what we do not recognize…*

**Therefore…**

Once bradycardia is identified in a respiratory compromised pediatric patient, intervention must be swift.

Otherwise, long term prognosis is poor for those who go into arrest, even if resuscitative efforts are successful.

**Identify an example for the following…**

- Hypoxemia
- Hypovolemia
- H+ acidosis
- Hypothermia
- Hyper/hypokalemia
- Hypoglycemia
- Toxins
- Tamponade
- Thrombosis
- Trauma
- Tension pneumo

**Infant vs. Child Compressions**

<table>
<thead>
<tr>
<th></th>
<th>Infant</th>
<th>Child</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location</strong></td>
<td>Just below nipple line</td>
<td>Lower ( \frac{1}{2} ) of sternum nipple line</td>
</tr>
<tr>
<td><strong>Depth</strong></td>
<td>( \frac{1}{3}-\frac{1}{2} ) depth of chest</td>
<td>( \frac{1}{3}-\frac{1}{2} ) depth of chest</td>
</tr>
<tr>
<td><strong>Rate</strong></td>
<td>100 / min</td>
<td>100 / min</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>2 thumbs encircling chest</td>
<td>Either 1 or 2 hands to compress</td>
</tr>
</tbody>
</table>

**4 critical elements of CPR**

1. Push HARD
2. Push FAST
3. RELEASE completely
4. MINIMIZE interruptions

**Defibrillation**
IO in pediatrics

PBPI Feedback

100% of pediatric cardiac arrests reviewed from 2011-2014 had compressions initiated immediately prior to defibrillation.

BLS adjuncts were not used in 2/3 of calls.

59% of calls did not include capnography documentation properly throughout resuscitation.

Scenario

PBPI Feedback

Capnography was not documented every 2 minutes in 76% of calls.

Amiodarone was used in 25% of calls in which it was indicated.

Epinephrine was documented as given correctly in 53% of calls.

Joules were not documented in any of the calls.