Preparing for Office Emergencies

Disclosure
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I have no relevant financial relationships with the manufacturers of any commercial products and/or provider of commercial services discussed in the CME activity. I will discuss 1 drug where the safety and efficacy has not been established in children.

At the end of this presentation the participant should be able to:

- Apply an organized approach to preparation for the office emergency
- Review the recommendations of the AAP Policy Statement on Preparation for Emergencies in the Offices of Pediatricians and Pediatric Primary Care Providers – July 2007 Pediatrics
  http://pediatrics.aappublications.org/cgi/reprint/120/1/200
Success depends upon previous preparation and without such preparation there is sure to be failure

Confucius

Preparation is the path to the successful outcome of the pediatric office emergency

Confucius for Pediatricians

The Challenge of Preparing for the Office Emergency

- Interpreting the evidence
- The studies are retrospective
- Can we truly say one size fits all?
  - 0.9 – 38 /office/yr = rate of emergencies reported from primary care practices
- What is an emergency?
  - 1995 AAP periodic survey - 73% reported ≥1 patients per week
  - Hospitalization
  - Emergency treatment

Other Variations in Practice

- Where we practice
- Size of the practice
- Complexity of the patients in the practice

Photo courtesy of Dr. Bill Cohen, MD
Most Common Office Emergencies

- Respiratory
- Seizures
- Infections
- Dehydration

Getting Started

- Emergencies require the use of an Airway, Breathing, Circulation don’t forget Pain approach to management
- We’ll go through preparation by reviewing a series of real-life cases

Case One
A Baby with Noisy Breathing

A 6 day old girl is brought to the office for noisy breathing. She is feeding normally. The respiratory rate is 52 with an oxygen sat of 100%. She is discharged with a diagnosis of laryngomalacia.
Case One  
A Baby with Noisy Breathing

On day 10 of life the infant returns because of increased difficulty breathing. Mom reports cyanosis with feeding. 
On exam the infant has inspiratory stridor and retractions. The room air oxygen saturation is 88%-92%.

Case One  
A Baby with Noisy Breathing

During your exam the infant’s airway obstruction worsens dramatically. What should be done?

1. Reposition and suction the airway  
2. Apply oxygen  
3. Always use 2 person bag mask ventilation technique in infants and children - this will help you overcome the obstruction  
4. Occlude the pop off valve
Translating Research Into Practice
Two Person Bag Mask Ventilation

- Prospective, descriptive, blinded study of one VS two person bag mask technique
  - Infant and child manikins
- TV and peak pressure measured
- Two person ventilation provided significantly greater mean TV and PP in both infant and child models


Photo courtesy © Florence Yap & Katherine Lam 2006 available at
http://www.aic.cuhk.edu.hk/web8/Bag_mask_ventilation_two_person.jpg

The rest of the story

Case One
A Baby with Noisy Breathing

- CT scan revealed an esophageal duplication cyst
- The infant went to surgery that day and did well postoperatively

CT scan revealed an esophageal duplication cyst
The infant went to surgery that day and did well postoperatively
A is for Airway
Summary

- Apply oxygen
- Reposition the head
- Suction
- Use two person bag-mask ventilation in an effort to overcome the obstruction
- Summon help quickly
- Learn the Heimlich Maneuver for choking emergencies

Case Two
An Infant with Cough

A 10 month old boy presented to the pediatricians office with a 2 m. history of cough. 2 days prior he developed fevers to 40.3°C and was seen in an urgent care clinic. At the pediatricians office he was noted to be in severe respiratory distress and was rushed to the ED downstairs.

Case Three
A Cyanotic Baby

A 6 week old presented to the pediatricians office with a 1 day history of poor feeding. The baby became cyanotic during the physical examination. Resuscitation with oxygen was attempted but the oxygen tank was empty.
How prepared are you for the office emergency?  
How prepared should you be?

The 27 Question Office Self Assessment

- What type of emergencies do you see?  How often?
- Location, setting, resources?
- Staffing, training?
- Equipment, supplies, meds on hand?

Essential Equipment and Supplies For Office Emergencies

**Equipment**
- Oxygen-delivery system
- Bag-valve mask
- Suction
- Nebulizer
- Oropharyngeal airways
- Pulse oximeter

**Supplies**
- Cardiac arrest board
- Sphygmomanometer with cuffs
- Splints, sterile dressings

**Strongly Suggested**
- Vascular access and fluid management supplies
Essential Equipment and Supplies
For Office Emergencies

- Color-coded tape, card or preprinted drug doses
- Recognition works better than memory

Training for Pediatricians

- In the setting of a pediatric emergency, primary care pediatric providers must be able to provide basic airway management and initiate treatment of shock
- PEARS
- PALS
- APLS

Pediatric Emergency Assessment, Recognition and Stabilization

- Sometimes called PALS lite
- 1 day course
- Focuses on pediatric assessment and recognition skills
  - Recognition of respiratory distress and failure
  - Recognition of shock
  - CPR
- Lesser emphasis on management
- Lots of time for demonstration of skill competency
PALS and APLS

- Pediatric Advanced Life Support
  - 2 day course
  - Uses videos for consistency of teaching
- Teaching and testing stations

APLS

- Advanced Pediatric Life Support
- This is PALS plus
- 14.5 hours of instruction
- Many optional modules
  - Metabolic disease
  - Neonatal Emergencies
  - Procedural Sedation and Analgesia
  - More on Trauma
  - Disaster Management

Training for Physicians, Staff and Families
CPR Anytime®
The Future of Medical Education for the Care of Ill and Injured Children

- What people want
  - Flexibility
  - Relevancy to their practice
  - Competency-based

- What people need
  - Settings that provide practice without adverse consequences

Welcome to the Playroom
The Children's Mercy Hospital Sim Lab
Advantages of High Fidelity Patient Simulation

- Patient focused not instructor focused
- Patient reacts to therapy
- Scenario can be practiced without consequences
- Can be focused to the students needs
- Team-based

Other Resources

- Duke University Pediatric Office Preparedness Program
- AAP Policy Statement
  - Reception desk emergency card
  - Mock Code scenarios and forms
  - Instructions for calling for EMS
Reception Desk Emergency Card
Every person in the office should be trained to recognize a potential emergency
- Extremely labored breathing
- Blue or pale color
- Noisy breathing
- Altered mental status
- Seizure
- Agitation (in the parent)
- Vomiting
- Uncontrolled bleeding

The Office Emergency Response and Preparation
- All offices should have a plan for calling for help
- The level of office preparation is determined by:
  - Distance from ED/hospital
  - Quality of emergency response/prehospital care in your area
  - Size of practice

Essential Medications For Office Emergencies
Essential
1. Oxygen
2. Albuterol for inhalation
3. Epi 1:1000

Strongly recommended
- Antibiotics
- Activated charcoal
- Anticonvulsants - benzos
- Dextrose 25%
- Corticosteroids
- NS or LR
- Epi 1:10,000
- Diphenhydramine
- Atropine
- Naloxone
- Sodium bicarbonate 4.2%
- D5 0.45 NS
Case Two
The baby who was rushed to the ED

The Children's Hospital Transport Team was called. The transport team intubated the infant. After intubation he became bradycardic and CPR was initiated. The ET tube was replaced. The infant was resuscitated continuously during transport. On arrival to the PICU there was no aeration and the ET tube was pulled once again. The ET tube had a large plastic candy wrapper covering the distal tip. The infant was removed from life support the next day.

Case Three
The case where the oxygen tank was empty

When the paramedics arrived, the baby pinked up with oxygen. On arrival to the ED the infant was slumped over in an infant seat and cyanotic. With removal from the seat, head positioning and oxygen there was resolution of the cyanosis.

Case Three
A Cyanotic Baby

- flexible bronchoscopy showed bilateral aspiration pneumonitis
- UGI revealed a lactobezoar
B is for Breathing

Summary

■ Bag mask ventilation is your most important airway skill
■ Have someone trained to assist you in the procedure
■ Have a routine for checking your level of preparation eg drugs, equipment and supplies

Case Four
A Baby With A Seizure

■ At 4:00 am an ambulance was called to the home of a 3 month old baby who had a seizure
■ The temp was 103°F
■ EMS used oxygen to perk the baby up
■ It was felt that the baby had a febrile seizure and the infant was not transported
■ A recommendation was made to see the primary care physician in the morning

Case Four
A Baby With A Seizure

■ At 9:00 am the baby was brought to the primary care physician’s office
■ The primary care physician called an urgent care clinic for referral
■ The urgent care clinic recommended transport to an ED
■ The ambulance left the doctors office at 10:45 am and arrived at the children’s hospital at 11:35 am
■ EMS reported not being able to obtain an oxygen saturation en route
■ The baby became apneic and asystolic soon after arrival in the ED
■ Resuscitation was unsuccessful
Case Four
A Baby with a Seizure

- The CBC showed a WBC count of 46,000
- The glucose was less than 20
- The infant grew E. coli on blood culture

Transport Rules to Live By

- The person arranging transport is responsible for the safety of the patient
- Call ahead and talk to a doctor
- Have a plan for arranging transport
  - How
  - Where

Translating Research Into Practice
Early Resuscitation of Septic Shock in Children

- 9 year retrospective review of infants and children with sepsis transferred from community hospitals
- Outcomes
  - Reversal of shock
  - Resuscitation consistent with guidelines
- Measurements in 1 hour increments using the time of initial call for transport team as reference
  - Duration of persistent shock
  - Delay in resuscitation by guidelines
  - PRISM assessed severity of illness
Early Resuscitation and Reversal of Septic Shock in Children

- 91 pts met criteria for septic shock
- Mortality rate of 29%
- 26% patients had reversal of shock by the transport teams arrival (median time: 75 mins)
- Successful shock reversal by community physicians was associated with 96% survival and >9 fold increased odds of survival

Survival with Reversal of Shock By Community Physicians

- Survival with reversal of shock by community physicians was associated with 96% survival and >9 fold increased odds of survival

Office Resuscitation of Shock

- Make the diagnosis
  - Temperature
  - Tachycardia
  - Decreased perfusion
- Rapidly push 20 cc/kg normal saline boluses up to and over 60 cc/kg
- Correct hypoglycemia

*Carcillo JA, Fields AI. Crit Care Med 2002;30:1365*
Shock in Children
The Bottom Line

- Early recognition, resuscitation and reversal of septic shock in children makes a difference – it improves outcome
- Therapy should be initiated from the time of diagnosis not transport
- Fluid therapy tends to be too conservative
- Remember it’s the first person not the last person who sees a child with septic shock that makes a difference

Han YY, Carillo JA, Dragotta M et al. Pediatrics. 2003;112;793-799

Case Five
The Infant Who Won’t Wake for Feeding

- The mother of a 5 week old called her pediatrician to say that she was alarmed because her baby slept for a long time last night and did not awaken for feeding as usual.
- Today she has not taken the breast well. Mom reports rapid breathing and what sounds like mottling.
- Mom wants to have her baby seen. She is instructed to come to the office.

On arrival the baby is mottled with respirations at 100 rpm.
- The infant is crying vigorously. The infant's heart rate is too fast to count.
- Oxygen is applied and transport is quickly arranged.
- In the ED, the heart rate is 295. An IV is started and adenosine is given with successful conversion of the SVT.
C is for Circulation
Summary

- PALS scenario's happen in real life
- There are emergencies handled successfully by offices everyday
- Early recognition and treatment is important for shock
- Some offices use Mock Codes to stay in practice
- Pediatric training is important for EMS providers

Case Six
Rollerblading Injury

- The mother of a 12 year old roller blader brings him to your office after a fall.
- He is holding his arm and saying it hurts. Mom thinks he's trying to get out of homework.

Source: http://www.hawaii.edu/medicine/pediatrics/pemxray/pemxray.html

P is for Pain
Rollerblading Injury

- Pain is an emergency
- Splint fractures, check distal circulation
- Even ibuprofen can help with pain relief
Rollerblading Injury
Oral Analgesic Therapy

- Acetaminophen with oxycodone is a good choice for oral analgesia
- Stronger opioid than codeine
- Does not have the problems of codeine metabolism
  - CYP2D6 poor metabolizers get all the side effects without any of the analgesia
- Safety and efficacy has not been established in children
- Liquid preparation: – 325 acetaminophen, 5 mg of oxycodone per 5 ml
  - Individual dose is based on oxycodone component: 0.05-0.15 mg/kg/dose up to 5 mg/dose every 4-6 hours as needed
  - Total daily dose is based on the acetaminophen component <45 kg: 90 mg/kg/day

Summary

- Perform a self-assessment of office readiness for emergencies
- The level of office preparation is determined by:
  - Distance from ED/hospital
  - Quality of emergency response/prehospital care in your area
  - Size of practice
- Use two person bag mask technique for better ventilation
- Early recognition, resuscitation and reversal of septic shock in children improves outcome
- Refresh and renew your skills
- Don’t neglect the treatment of pain

References

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