Where's The Panic Button? Managing Emergencies That Present To The Pediatric Office

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Disclaimer

I have no financial or personal conflicts of interest to disclose.

Goals of this lecture

- Setting up your clinic for success
 - Resources, equipment, personnel training, supply location
- Recognize common pediatric emergencies encountered by the general pediatrician
- Review the basics of stabilizing care while awaiting emergency services



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Survey

- How often does your office have a patient requiring emergency intervention?
 - Once a year
 - Once a month
 - Once a week
 - Several times a week



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Background

> Pediatr Emerg Care. 2015 Jul;31(7):493-5. doi: 10.1097/PEC.000000000000310.

Outpatient Emergency Preparedness: A Survey of Pediatricians

Amber L Pendleton ¹, Michelle D Stevenson

- Almost 50% of clinics refer patients to the ED once or more a week
- 39% had patients requiring emergency treatment in the office before transfer once or more a month

Background

- Survey studies have also found:
 - 82% of practices have appropriate equipment
 - 57% have policies/protocols in place
 - 21% had PALS, 42% had BLS certifications
 - When participating in sims on asthma and seizure, appropriate measures were done 60-70% of the time
 - 25% had participated in mock emergencies

3980.

Jesse Hackell; Preparedness for Emergencies in the Pediatric Office. *Pediatrics* September 2021; 148 (3): e2021051830. 10.1542/peds.2021-051830 Pendleton AL, Stevenson MD. Outpatient Emergency Preparedness: A Survey of Pediatricians. Pediatr Emerg Care. 2015 Jul; 31(7): 493-5. doi: 10.1097/PEC.0000000000000310. PMID: 25513980.

Background



% of Respondents

How to Prepare

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How to prepare – Resources

- AAP Pediatric Preparedness Resource Kit
 - <u>www.aap.org</u> under professional resources for disaster preparedness
 - AAP Preparedness Checklist for Pediatric Practices
- Best to have a written clinic policy outlining procedure

Clinic Needs Assessment

• All clinic risks and needs are different.

1. How often and what type of medical emergencies have occurred or might occur in your office?	5. What is your emergency dosage (tape-based/dosage book) and documentation strategy?
2. What emergency equipment and supplies (including oxygen, airway equipment, automated external defibrillator) do you have on site? Does your staff know where to access and how to use them?	6. Do staff know how to access the emergency medical services (EMS) system and what is the EMS response time?
3. Have nonclinical staff been trained to recognize a potential or actual emergency and act accordingly even when clinical staff are not onsite?	7. How far is your office from the nearest emergency department (ED)?
4. Are there external resources that could be used during an office emergency?	8. How do you and your staff maintain skills and readiness?

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Equipment and Formulary

- Recommended Essential Equipment
 - Oxygen delivery system: with nonrebreather as well as BVM
 - Suction
 - AED
 - Nebulizer
 - Glucometer
 - EKG
 - Backboard/CPR
- Strongly Suggested*
 - C-collar
 - Oral airway
 - IV access/fluid management
 - Magill forceps
 - others

Formulary Tips for success: - Meds and equipment need to be stored and labeled for quick access and ID - Policy/Plan in place for training staff on use, as well as maintaining/checking expirations

rerials

Albuterol
 ephrine autoinjector

and 0.3 mg

Epinephrine

IM corticosteroids (e.g. lasone)

xtrose/glucose (e.g. juice)

glucagon

- Ceftriaxone
- Diphenhydramine
- Ondansetron
- Naloxone

Patient Room Setup

- Patient Room Set up
- In case of emergency, do you move the patient to a treatment area?
 - Optimize patient positioning and access for staff and EMS
 - Clear signage for meds and equipment
- Clinic Factors
 - EMS accessibility
 - Designate staff to meet and direct EMS



Typical set-up

EXAMINATION TABLE

Ideal set-up

DOOR

13

Risky set-up

Personnel Preparedness

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Identify team members

(ex: Provider, MA, nurse, front office staff)

Will this be affected by shift variations (e.g. time of day or day of week) Plan process for notification and response

BLS, q2 years Mock codes/simulations Frequency of training

Arranging Transfer

Training

Information of local EMS providers and EDs BLS vs. ALS

Transport: ALS vs. BLS

- Two-tiers if medical care in the prehospital setting:
 - First Tier: Basic Life Support (BLS)
 - Emergency Medical Responder (EMR) or First Responder (FR)
 - Emergency Medical Technician-Basic (EMT-B)



- Second Tier: Advanced Life Support (ALS)
 - Advanced Emergency Medical Technicians (EMT-I, EMT-85, EMT-99)
 - Paramedics (EMT-P)

Pearls for Optimizing 911 Call

- Who is making the call, what information is conveyed
 - Pt age/sex
 - Chief Complaint
 - Vital signs
 - Interventions given
 - Pertinent physical exam findings
 - Any special instructions on getting to office or accessing patient. "My front office staff will meet you in the lobby and escort you up to 5th floor"

Resources for Training

 Sanseau E, Reid J, Stone K, Burns R, Uspal N. Pediatric Simulation Cases for Primary Care Providers: Asthma, Anaphylaxis, Seizure in the Office. *MedEdPORTAL*.
 2018;14:10762. <u>https://doi.org/10.15766/mep_2374-8265.10762</u>



- Has simulation cases with checklists, PowerPoint slides, handouts, and debriefing scripts

• BLS course through American Heart Association

Case Review

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Case 1

- Conner is a 2 mo M presenting for his WCC. His parents note 2-3 days of progressive increase work of breathing and copious nasal/oral secretions. Now with poor feeding, 1 wet diaper in last 24 hours, increased fatigue.
 - VS: Temp: 37.6, RR 65, sats 86% on RA, HR 190, BP 90/50



Your first course of action is:

- A. Suction and place on nonrebreather oxygen mask
- B. Call 911 and arrange transport to ED
- C. Proceed with 2 month well child visit
- D. Swab for RSV and flu



Respiratory Failure

- Clinical signs:
 - Tachypnea
 - Accessory muscle use (e.g. retractions, nasal flaring, head bobbing)
 - Stridor at rest
 - Hypoxia/central cyanosis
 - Lethargy
- Examples: Bronchiolitis, pneumonia, croup with stridor at rest, acute asthma exacerbation
- Immediate Action Plan
 - Airway
 - Arrange Transfer
 - Provide life saving treatments as able

Respiratory Failure Office Management Pearls



- You can do a LOT with resources available in clinic
 - Positioning of the patient (out of carseat, in bed with shoulder roll "sniffing position", or sitting up in parents lap, head tilt chin lift)
 - Suctioning this is clearing mechanical obstruction
 - Meds: Albuterol, racemic epi, dexamethasone typically on formulary
 - Supplemental oxygen through nonrebreather or nasal cannula

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Case 2

- Sam is a 6-year-old male with PMH of seasonal allergies presenting to the clinic with cough for the past 6 weeks. No fevers. Cough is worse at night. On exam, you hear faint wheezing in the bases bilaterally. What is the next best step in management?
 - A. Chest X-ray
 - B. Ask about aspiration events
 - C. Trial albuterol
 - D. Start daily antihistamine



Acute Asthma Exacerbation

- Titrate O2 supplementation to SpO2 >90%
- SABA (e.g. Albuterol):
 - MDI with spacer: 8-10 puffs every 20 minutes
 - SVN: 2.5mg to 5mg every 20 to 30 minutes
- Glucocorticoid:
 - Dexamethasone 0.6mg/kg (max 16mg)
 - Prednisone 1 to 2 mg/kg/d div 1 to 2 times daily (max 60mg/day)
- Severe exacerbation
 - IM or subQ epinephrine

Acute Asthma Exacerbation

- Additional Pearls:
 - Not hearing wheeze on exam isn't always reassuring
 - Can be a sign of severe respiratory compromise



https://maximusglobe.com/asthma-in-children-causes-diagnosis-treatment/

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Acute Asthma Exacerbation

- Additional Pearls:
 - It can be normal to drop O2 sats a bit when responding to breathing treatments
 - V/Q mismatch: Occurs when part of the lung starts receiving oxygen without blood flow



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Case 3

 Jimmy is an 18-month-old male presenting for painful left ear. He recently completed treatment for an ear infection with Augmentin and today diagnosed with a recurrence. Jimmy's mother has trouble giving him oral medications, so it was decided to treat him with IM ceftriaxone. About 5 minutes after receiving the antibiotic, the nurse calls you into the room because Jimmy isn't looking so well. He appears to be in moderate respiratory distress.

VS: RR 50. Sats 91% on RA. HR 140, temp 37.5. BP 90/50. Wt. 12 kg. He has diffuse wheezing on exam with urticarial rash

- Next best step in management:
 - A. Call 911
 - B. Administer 0.15 mg Epipen in thigh via autoinjector
 - C. Administer 0.3 mg Epipen in thigh via autoinjector
 - D. Give albuterol and reassess.



Anaphylaxis

Anaphylaxis	is highly likely when ONE of the following 3 criteria are fulfilled, usually within minutes to 2-3 hours					
following a possible allergen exposure:						
Criteria 1	 Acute onset of an illness with involvement of the skin, mucosal tissue, or both (e.g., generalized 					
	hives, pruritus or flushing, swollen lip-tongue-uvula) AND at least one of the following:					
	 Respiratory compromise 					
	 Reduced blood pressure or associated symptoms of end-organ dysfunction 					
	 Persistent gastrointestinal symptoms, significant abdominal pain and/or significant vomiting 					
Criteria 2	 Two or more of the following that occur rapidly after exposure to a LIKELY ALLERGEN for that 					
	patient:					
	 Involvement of the skin-mucosal tissue 					
	 Respiratory compromise 					
	 Reduced blood pressure or associated symptoms 					
	 Persistent gastrointestinal symptoms 					
Criteria 3	 Reduced blood pressure after exposure to a KNOWN ALLERGEN for that patient 					

Turner PJ, Ansotegui IJ, Campbell DE, Cardona V, Carr S, Custovic A, et al. WAO Anaphylaxis Committee and WAO Allergen Immunotherapy Committee. Updated grading system for systemic allergic reactions: Joint Statement of the World Allergy Organization Anaphylaxis Committee and Allergen Immunotherapy Committee. World Allergy Organ J. 2024 Feb 10;17(3):100876. doi: 10.1016/j.waojou.2024.100876. PMID: 38361745; PMCID: PMC10867340.

Anaphylaxis Management: Updated WAO Recommendations

- When in doubt, treat with IM epinephrine
 - First line treatment is Epinephrine IM
 - Lower incidence of medication error and adverse side effects when given via autoinjector in the thigh.
 - Dosing: <25kg = 0.15mg; >25kg = 0.3mg
 - Ampule dosing: 0.01mg/kg
- Potential Adjuncts: Most no longer recommended
 - Albuterol if ongoing wheeze after epi
 - Cetirizine if any residual rash

Anaphylaxis Management: Updated WAO Recommendations

- Biphasic reaction
 - Half happen in first 6-12 hours, but can happen up to 48 hours later
 - New studies find steroids ineffective at preventing and can even be harmful \rightarrow no longer recommended
- Observation time after IM epi
 - Clinic observation time 1-4 hours
 - Do not HAVE to transfer to the ED
 - Similarly, do not HAVE to go to the ED if Epipen used at home
- Allergy Referral

Case 4

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Case 4

- Shakira is a 3-year-old female with a PMH of epilepsy who presents to the clinic for 3 days of fever, vomiting, and URI symptoms. They are compliant with home medications including Keppra, but mother notes he has had vomiting after meds and meals with this illness. While obtaining VS, the MA calls you over to say patient is having a seizure.
 - VS: HR 156, Temp: 38.5, Sats: 93% RR: unable to obtain BP: not done
 - Exam: Patient with active generalized tonic clonic movements, foaming at the mouth and has perioral cyanosis.
- What is your next best step in management?
 - A. Call 911
 - B. Ask mother to administer home rescue clonazepam wafer
 - C. Give supplemental oxygen via nonrebreather
 - D. Begin CPR



Seizure Office Management Pearls

• ABCs

- Ensure patient in safe space
- Position patient to optimize airway, suction PRN, supplemental oxygen
- EMS has IM and IV benzodiazepines, so calling emergency services is high priority
- Recommend parents bring home meds to office visits
 - Good for med review, also can have rescue med administered by parent
- Consider checking blood sugar

Disposition

- Patients with epilepsy **will** have breakthrough seizures
 - In ED:
 - If patient has reason for lowered seizure threshold (medication noncompliance or vomiting, or illness), attempt to address cause
 - History and exam, with associated indicated workup, regarding illness
 - Zofran
 - Parental education
 - If back to neurologic baseline and seizures characteristic of prior seizures, often d/c from ED (+/- neurology phone consultation)

Febrile Seizures

- Seizure associated with fever without evidence of intracranial infection or defined cause. Typically presents between 6 months and 5 years.
 - Simple Febrile Seizure:
 - Last < 15 minutes</p>
 - Do not recur in a 24-hour period
 - Generalized tonic clonic
 - Complex Febrile Seizure
- Unknown cause, likely a genetic component, male predominance



Febrile Seizures

- Febrile seizure ≠ epilepsy
- 30% chance of another febrile seizure in future
- Most grow out of them by age 6



Febrile Seizures

- Management:
 - Good history and physical
 - If everything consistent with simple febrile seizure and patient returned to neurologic baseline:
 - Discuss seizure precautions at home
 - No follow-up required
 - If complex febrile seizure but patient back to neurologic baseline
 - No immediate workup required \rightarrow Outpatient neurology follow-up
 - If patient not back to neurologic baseline or other concerning history/physical
 - ED referral for further workup and management

Case 5

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Case 5

- Mateo is a 9-year-old male with 4 days of fever, cough, and sore throat. Mother initially thought patient had viral illness, but today started having increased lethargy, poor PO intake, decreased UOP, and is acting confused.
 - VS: Temp 39.5, HR 160, RR 40, BP 75/40, sats 95% on RA.
 - Exam: Pt ill appearing, brisk, bounding pulses, flash cap refill.
- What is your next best step in management?
 - A. Give Tylenol and test for flu and strep
 - B. Activate emergency action plan, including calling emergency services
 - C. Obtain blood culture and give IV Ceftriaxone
 - D. Reassure mother that patient has a viral illness.



Sepsis Office Management Pearls

- Sepsis can be difficult to differentiate from the well child who is acutely febrile, but maintaining a high index of suspicion is key.
- Only factors shown to reduce mortality in sepsis is timely antibiotics and fluid resuscitation
- Ideal to obtain blood culture first, then administer broad spectrum antibiotics
 - If difficulty with access, however, we should give antibiotics prior to culture (do not delay antibiotics)

Sepsis Alert Trigger

Table 1. High risk conditions

- Malignancy
- Asplenia (including SCD)
- Bone marrow transplant
- · Central or indwelling line/catheter
- Solid organ transplant
- Severe MR/CP
- Immunodeficiency, immunocompromise or immunosuppression

Table 2. Vital signs (PALS)						
Age	Heart rate	Resp rate	Systolic BP	Temp (°C)		
0 d – 1 m	> 205	> 60	< 60	< 36 or >38		
≥ 1 m – 3 m	> 205	> 60	< 70	< 36 or >38		
≥ 3 m – 1 r	> 190	> 60	< 70	< 36 or >38.5		
≥ 1 y – 2 y	> 190	> 40	< 70 + (age in yr × 2)	< 36 or >38.5		
≥ 2 y – 4 y	> 140	> 40	< 70 + (age in yr × 2)	< 36 or >38.5		
≥ 4 y – 6 y	> 140	> 34	< 70 + (age in yr × 2)	< 36 or >38.5		
≥6 y – 10 y	> 140	> 30	< 70 + (age in yr × 2)	< 36 or >38.5		
≥ 10 y − 13 y	> 100	> 30	< 90	< 36 or >38.5		
> 13 y	> 100	> 16	< 90	< 36 or >38.5		

Table 3. Exam abnormalities						
	Cold shock	Warm shock	Non-specific			
Pulses (central vs. peripheral)	Decreased or weak	Bounding				
Capillary refill (central vs. peripheral)	≥3 s	Flash (< 1 s)				
Skin	Mottled, cool	Flushed, ruddy, erythroderma (other than face)	Petechiae below the nipple, any purpura			
Mental status			Decreased, irritability, confusion, inappropriate crying or drowsiness poor interaction with parents, lethargy, diminished arousability, obtunded			

Alert triggers: 3 or more clinical criteria OR high-risk condition + 2 clinical criteria

Eisenberg, M.A., Balamuth, F. Pediatric sepsis screening in US hospitals. *Pediatr Res* 91, 351–358 (2022). https://doi.org/10.1038/s41390-021-01708-y

Basics of Stabilizing Care

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Cardiac Arrest - Question

- What is the most common cause of cardiac arrest in pediatrics?
 - A. Cardiac dysrhythmia
 - B. Respiratory Failure
 - C. Trauma
 - D. SIDS



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Cardiac Arrest – Airway Support

• Correct BVM technique





Cardiac Arrest – Airway Support

• Correct BVM technique – Add an oral airway if possible





Cardiac Arrest - CPR basics

- Compression rate: 100-120/min
- Depth: at least 1/3 depth of the chest
- Ensure adequate recoil

Adult: 2 hands Child: 1-2 hands Baby: 2 fingers



CPR basics

- Compressions to Breaths Ratio
 - 30:2
 - Adult cardiac arrest
 - 1 person child/infant CPR
 - 15:2
 - 2-person child and infant CPR
 - Continuous
 - Only if you have a definitive airway

Summary

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Take Aways

- Pediatric emergencies in office happen
 - Important to optimize clinic setup, supply accessibility, and staff training
 - Practice makes perfect
- BLS training strongly recommended
- Basics of managing the most common emergencies
 - ED is here for you

References

- Jesse Hackell; Preparedness for Emergencies in the Pediatric Office. *Pediatrics* September 2021; 148 (3): e2021051830. 10.1542/peds.2021-051830
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