Pediatric Trials and Tribulations
Improve your skills

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Introduction

- Every population has it’s challenges and rewards
- Every provider has some groups they like to take care of more or less than others
  - Geriatric
  - Pediatric
  - Trauma
  - Psych
  - Substance abuse
Objectives

- At the conclusion of this lecture, the provider will be able to...
  - List the most common challenges faced in dealing with the pediatric population
  - List the physiologic and developmental changes that affect the assessment of the pediatric patient
  - List different communication methods that can be utilized to facilitate assessment of the pediatric patient
  - List different techniques that can be used to counter provider stress over dealing with the critically ill or injured pediatric patient
  - List several techniques that can be used to help deal with difficult parents or caregivers on scene
  - List the most common skills that may degrade with lack of exposure to critically ill or injured pediatric patients
  - List several training methods that may be used to prevent skill degradation in the pediatric population
Background

- Patients under the age of 18 make up 10-20% of pre-hospital transports

- Although many aspects of disease and injury are similar to adult care, there are a number of traits unique to the pediatric population

- These challenges can make dealing with the pediatric population much more difficult as well as much more rewarding
Challenges: A&P

- The pediatric patient is a “moving physiologic and anatomic target”

- It is difficult to remember all the subtle changes that occur as the child grows

- Airway, body proportions, vital signs, language and communication skills are constantly changing
Challenges: Communication

✓ “85% of the diagnosis comes from the history”

✓ This is a common quote in medical teaching

✓ The very young child cannot give a history

✓ It may be just as difficult to communicate with an adolescent
Challenges: Caregivers

- **Parents!**
  - Although many patients have family members on scene, most of your attention can be directed towards the patient.
  - In pediatric patients, however, much more attention needs to be directed towards the caregiver as they are the decision makers for the patient.
  - This division of attention can often be distracting:
    - *It can slow down care and make the call go “less smoothly”*
  - It can also make for a difficult scene if the caregiver disagrees with your recommendations.
Challenges: Stress

- Provider anxiety
  - Most providers experience a greater degree of stress when dealing with the pediatric patient, especially the critically ill or injured patient
Challenges: Low Critically ill Pediatric Volume

- Fortunately, the critically ill child is much less common than the critically ill adult.

- Unfortunately, this means skills such as assessment, airway management, vascular access, immobilization techniques and others may degrade.
  - The less often a skill is practiced, the less skilled we become.
In order to overcome the challenge, we must first recognize it exists.

Then we create strategies for overcoming the challenge.

We must then practice overcoming the challenge.
Challenge 1: Development

- Growth is a continuum
- Not all children grow at the same rate
- Not all children develop at the same rate
- Not all children mature emotionally at the same rate
Development

- Taking this into account, we must develop a working knowledge of growth and development from newborn to adolescent.

- It is also important to have a quick reference available for normal vital signs by age and size.
Development

- **General considerations**
  - Head. The younger the child, the greater the proportion of head to body
  - The neck is proportionately shorter
  - The limbs are also proportionately smaller
Development

- **Airway**
  - More anterior in the infant
  - Neck is more flexible
  - Since head is bigger as well, it takes less head tilt to open the airway
    - Too much head tilt can occlude the airway
Airway Infants

- The diameter of the airway is smaller
- The airway is cone shaped
- It is more easily obstructed by foreign bodies or even secretions
- The trachea is more flexible
Airway

- The tongue in the infant is proportionately larger

  ✓ In the unconscious child, it is more likely to cause obstruction
Airway

Anatomy of pediatric airway

- Epiglottis (flatter, u-shaped)
- Airway (more anterior and higher)
- Hyoid bone
- Vocal cords
- Thyroid cartilage
- Cricoid ring (Narrowest)
- Trachea (more flexible)

Anatomy of adult airway

- Epiglottis (shorter)
- Hyoid bone
- Vocal cords (Narrowest)
- Thyroid cartilage
- Cricoid ring
- Trachea

SUSAN GILBERT
Airway

- Infants and newborns prefer to breath through the nose
  ✓ Nasal obstruction can cause airway obstruction
Breathing

- Abdominal muscles and diaphragm are the primary muscles of breathing for the infant.

- The chest wall muscles are not well developed in young children.

- For this reason, babies tend to belly breath normally, and the chest wall retracts with increasing respiratory effort or distress.
Breathing

- Signs of respiratory distress include…
  - Intercostal retractions
  - Nasal flaring
  - Grunting
  - Head Bobbing in infants
# Breathing

## Normal rates

*If you don’t have this, print it and keep a copy handy*

<table>
<thead>
<tr>
<th>Age</th>
<th>Rate (breaths/ minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant (birth–1 year)</td>
<td>30–60</td>
</tr>
<tr>
<td>Toddler (1–3 years)</td>
<td>24–40</td>
</tr>
<tr>
<td>Preschooler (3–6 years)</td>
<td>22–34</td>
</tr>
<tr>
<td>School-age (6–12 years)</td>
<td>18–30</td>
</tr>
<tr>
<td>Adolescent (12–18 years)</td>
<td>12–16</td>
</tr>
</tbody>
</table>
Circulation

- Younger children and infants have baseline faster heart rates and lower blood pressure

- Children compensate shock and hypovolemia by increasing heart rate and vasoconstriction

- Blood pressure is a poor indicator of circulatory status as it will remain normal and drop very quickly once the child decompensates
More reliable indicators for circulatory status are skin perfusion, heart rate and mental status.
Normal Heart Rates

– If you don’t have this, print it and keep a copy handy

<table>
<thead>
<tr>
<th>Age</th>
<th>Low</th>
<th>High</th>
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</thead>
<tbody>
<tr>
<td>Infant (birth–1 year)</td>
<td>100</td>
<td>160</td>
</tr>
<tr>
<td>Toddler (1–3 years)</td>
<td>90</td>
<td>150</td>
</tr>
<tr>
<td>Preschooler (3–6 years)</td>
<td>80</td>
<td>140</td>
</tr>
<tr>
<td>School-age (6–12 years)</td>
<td>70</td>
<td>120</td>
</tr>
<tr>
<td>Adolescent (12–18 years)</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>
# Normal Blood Pressure

- If you don’t have this, print it and keep a copy handy

<table>
<thead>
<tr>
<th>Age*</th>
<th>Low Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant (birth–1 year)</td>
<td>greater than 60*</td>
</tr>
<tr>
<td>Toddler (1–3 years)</td>
<td>greater than 70*</td>
</tr>
<tr>
<td>Preschooler (3–6 years)</td>
<td>greater than 75</td>
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<tr>
<td>School-age (6–12 years)</td>
<td>greater than 80</td>
</tr>
<tr>
<td>Adolescent (12–18 years)</td>
<td>greater than 90</td>
</tr>
</tbody>
</table>
Summary of A&P differences

- Children are not just small adults
- Proportions are different
  - Head is larger
  - Limbs and neck are shorter
- Vital signs are different
  - RR and HR are faster
  - BP lower
Challenge 2: Communication

- History is our greatest asset in forming the correct impression

- Our ability to communicate is our greatest asset in obtaining a good history

- In children, our ability to communicate is often limited
Communication

- The way we communicate with a child needs to be dictated by the child’s developmental age and situation.

- Children often surprise the provider by being far more mature and cooperative than you would expect, or far less.

- Don’t generalize, and tailor your approach to the child’s behavior.

- The next section deals with the stereotypical development, but remember, not all children will follow the norms.
Communication Basics

- With all children
  - Remember you are usually communicating to both the caregiver and the patient
  - NEVER lie
  - Don’t ask permission to do something you will do anyway
    - Mind if I start an IV? If it really isn’t an option, don’t ask
Communications

- Tell the child what is going to happen just before you do it
  - “You are going to feel a pinch now”
  - “The cuff is going to get tight on your arm for a minute”

- Don’t tell the young child about events in the distant future
  - “They may need to operate on you tomorrow”
Infant

- 0-12 months
- Drastic changes occur during the first year of life
- For this reason we look at the infant from age 0-2 months, 2-6 months, and 6-12 months
Infant in general

- Compliment the child to show respect for the caregiver
- Have the caregiver remove the child’s clothes and replace them as soon as possible
Infant development

- **0-2 months**
  - Sleep, eat
  - Hearing is well developed
  - Soothed by being held and rocked
0-2 months

- How do you communicate with an infant this young?
  - Obviously, you can’t get a standard history from the child
  - History usually comes from the caretaker
Tips 0-2 months

- Have caretaker hold and comfort the child when possible
- Keep warm and covered when possible
- Avoid loud noises and sudden movements as this will startle the infant
- Learn the child’s name and use it
- Remember to ask birth history
2-6 months

- At this age, the infant starts to interact with the environment
- They make eye contact
- May grab toys
- Can look at loud noises or caregiver’s voice
2-6 months

- Although the 2-6 month old cannot talk, they will respond to a soothing voice.

- Just like the 0-2 month old, have the infant held by the caregiver when possible.

- Keep comfortable, warm and dry.

- History comes from the caregiver.
6-12 months

- At this age, the child becomes much more interactive with the environment

- The infant will start to develop separation anxiety

- Start becoming mobile
  - Crawling and even walking
6-12 months

- **Talk to the child**
  - Will have limited understanding but may cooperate better if you show concern
  - Also shows the caregiver your concern and will help gain confidence in your ability

- Most can babble, but will not be able to give a history or tell what is wrong

- Must still rely on the caretaker for history

- Offer a toy to distract the child
Toddler

- 1-3 years old
- Mobile
- Opinionated
- Cannot be reasoned with
  - But afraid of strangers
- Learn by trial and error
Toddlers 1-3

- Language skills vary
- Most can understand what you say
- Most have had experience with health care providers involving vaccinations and may be mistrustful
- Tremendously self centered
Toddlers 1-3

- When talking to toddlers, talk about them
- Keep physical contact to a minimum in the beginning
- Sit or squat down next to the toddler so you are close to eye level
- Praise begets cooperation
  - Great job!
  - What an excellent patient you are!
Toddlers 1-3

- Offer real choices to give the toddler a sense of control
  - Do say “would you like me to check your back or your belly first?”
  - Do NOT say “may I check your belly?” if you need to examine them any way
Toddlers 1-3

- If the child is uncooperative, use the caregiver to help in the exam
  - For example, have the parent gently palpate the belly to see if there is tenderness

- It is sometimes helpful to do a toe to head exam instead of a head to toe
  - Start with the less threatening areas of the body and proceed from there
  - It is much easier to hear heart and lung sounds if they are not crying
Toddlers 1-3

- Use toys to distract the toddler
  - Pen light
  - Stuffed animal
Preschoolers

- 3-6 years old
- Most have fair understanding of language and can express thoughts in some fashion
- Are still illogical thinkers and have misconceptions about their bodies
Preschool Hints 3-6

- Use simple terms

- Be on the lookout for misconceptions
  - If the child looks worried because you say you are going to take their blood pressure, it may be because they are wondering if you will give it back

- If possible demonstrate on a stuffed animal or doll
Preschool Hints 3-6

- If possible, let them handle equipment
  - Touch the blood pressure cuff or listen with the stethoscope

- Set limits
  - You can cry, but don’t move your arm

- Praise good behavior

- Play games and keep them distracted
School age Children

- 6-12 years old

- Getting a better understanding of their bodies and illness, still with misconceptions

- Fear separation form peers

- May be more modest and insecure about their bodies

- By 8 years old, anatomy and physiology is that of a small adult
School age 6-12

- Speak to the child first, then the care giver
- Explain things simply but accurately
- If it is going to hurt, tell them
  - If you say “this won’t hurt a bit” and it does, they will not believe anything else you say
- If the child needs to be restrained, do it
- Praise the child for good behavior
School age 6-12

- You may do the exam in the head to toe fashion
- Remember they are modest, ensure privacy and keep the patient covered when exposure is not needed
- Reassure the child that you are doing procedures to help them, not punish them
Adolescents

- 12-18 years old

- Can be similar to toddlers
  ✓ No sense of danger
  ✓ Unable to communicate feelings
  ✓ Very mobile

- Becoming more independent

- Relying on peers, not parents
Adolescents 12-18 hints

- Speak to the teen directly
- Shake hands
- Introduce yourself
- Use the patient’s name
- Never be condescending or judgmental
- Respect privacy
  ✓ Are often dealing with issues of sexuality, independence and maturity
Adolescents hints 12-18

- Involve the teen in their health care
- Let them make decisions if possible
- If you need help convincing the patient to do something, involve their friends to persuade the patient
  - Use peer pressure to your advantage
Challenge 3: Parents and caregivers

- Parents and Caregivers are usually the most avid advocates for the patient.

- They are usually the best source for history

- Unfortunately, this often makes them a barrier to patient care
Caregivers

- The reaction of parents and caregivers to an acute illness or injury is variable.

- The caregiver usually has the best interest of the child in mind, but in trying to ensure the best care possible, they often interfere with care.
Dealing with caregivers: General principles

- The main goal is to gain the confidence of the caregiver
  - Have confidence in your abilities
  - Show them your primary concern is for the child
  - If you do not know the answer to a question, have enough confidence to say so
Dealing with the caregiver: General Principles

- Never make promises about the future if you don’t know for sure
  - “everything will be ok” in a cardiac arrest

- Never appear judgmental

- Recognize that all people deal with stressful situations differently

- Remember both you and the parents usually have the same ultimate goal, a good outcome for the child
Dealing with the caregiver

- The angry parent
  - Some caregivers may express their stress as anger towards the provider/EMT
    - “what took you so long!”
    - “If anything happens to my child I will kill you”
  - Never let your own emotions get in the way of taking care of the patient
    - Stay professional at all times
    - Avoid the urge to argue with the caregiver as this just wastes valuable time
The angry parent

- **Try to redirect the caregiver to the priority at hand**
  - “I am here to help your son but I need you to tell me what happened”

- **If the situation is non-urgent, you may opt to let the parent dictate care, giving a sense of control**
  - Example, stable child with mild asthma exacerbation, say “normally we would start an albuterol treatment, would you like us to start now or wait to see the ER physician?"
  - Remember, you can only let them dictate care if it will not have an adverse effect on the child

- **If the caregiver persists in interfering with the medical care of the critically ill or injured patient, they must be removed**
  - The welfare of the child supersedes the right of the parent to refuse care
The angry parent

- If the caregiver is threatening enough, consider the scene unsafe

- As always, your own safety, and that of your partner is the first priority
  - Rule number 1: don’t become a victim

- Enlist the aid of the police if the situation warrants
  - Example, unstable pediatric victim of a multiple roll over MVC, father yelling “no one touches my child!” You attempt to communicate the seriousness of the child’s condition, but he remains unreasonable. In this scenario, not only do you need to start treatment immediately, the father is interfering with critical care. He needs to be separated from the patient immediately. If the father was also in the accident, he needs to evaluated and treated as well.
Caregivers in Denial

- The caregiver may appear unconcerned about the severity of the illness or injury because they are in denial.

- Try to focus them if you need their help
  - “Your child appears very ill, I need you to tell me if he has any medical problems”
Guilt

- The caregiver may be overwhelmed by the thought that the illness or injury is their fault
  - “If I didn’t put her in daycare, she would be fine”
  - “I shouldn’t have let her ride her bike today”
Guilt

- Assigning blame does not help you take care of the child

- Try to focus the parent if you need their help
  - “What we need to do now is get him on this backboard so we can get him to the hospital”
  - “I need you to tell me if he is allergic to any medications”
The demanding parent

- In an attempt to regain a sense of control, many parents will try to dictate the medical care, often inappropriately
  - “You need to put on the numbing cream before starting an IV”
  - “My child just got hit by a car and you want to strap her to that backboard? No way”
The demanding parent

- The parents need to have confidence in your ability and faith that you have the best interest of the child in mind in order to relinquish care to you

- Keep answers and explanations short, logical and confident
  - I need to start the IV without the cream because
    - We don’t carry the cream
    - It takes ½ hour to work
    - Your child is in shock and needs fluid now

  - I understand you child is in pain, we still need to place her on the backboard because it reduces the chance of spinal cord injury and paralysis
The demanding parent

- If there is a choice the caregiver can make, let them
  - To which hospital would you like us to take your child?

- If the caregiver has a concern, ask for an explanation
  - “you can’t start an IV in that arm”
  - “Why not?”
  - “Last visit to the hospital, he got a blood clot and the doctor said no IV’s in that arm for 6 months”
The demanding parent

- Avoid using the following explanations
  - We need to do it because we know what we are doing
    - This does not help many parents feel like giving up control
  - Protocol says we need to do it this way
    - Most people don’t care about your protocols or even know what a protocol is
Challenge 4: Provider anxiety

- It is common and normal to feel uncomfortable dealing with sick or injured children
  - Human nature to feel that bad events occurring in children is worse than the same bad event happening to adults
  - Parental instinct to help the helpless
  - Increases the pressure to “not screw up”
Provider anxiety

- It is also normal to feel less comfortable when our usual approach to patients needs to be modified.

- The logistics of dealing with children is different from scene arrival to Emergency department drop off:
  - The way we get history, physical findings, deal with relatives, doses of medications are all different.

- This means we need to divide our attention and still account for all the variables on the scene.

- This makes even straightforward calls more difficult simply because the patient is pediatric.
Provider anxiety

- It is also normal to feel uncomfortable performing complicated procedures which are not performed routinely

  - Fortunately, we encounter the critically ill child much less commonly than the critically ill adult
    - About 5% of critical patients are pediatric
    - 95% are adult
  
  - Unfortunately, this leads to skill degradation
    - Airway management, CPR, vascular access, immobilization
Countering provider anxiety

- Training
- Training
- Training
- Also, Training

- Studies have shown that training for an event leads to much less anxiety and better performance during the event.

- Specifically, implementing pediatric training can substantially decrease provider anxiety while dealing with the critically ill or injured child.

- A survey of EMT confidence in dealing with pediatric emergencies in Maine showed more pediatric CE’s led to more confidence. The other factor that improved confidence was call volume and experience. The more pediatric calls done, the greater the confidence level.
Summary: provider anxiety

- If you don’t take care of sick kids routinely, train routinely to take care of sick kids
  - Courses like PALS or PEPP, when taken periodically can improve confidence and decrease scene and post call anxiety

- Use realistic scenario-based training to practice dealing with the patient and caregivers at the same time

- Realize that it is normal to feel more stressed when dealing with children than adults
Challenge 5: Low pediatric call volume

- Most of us do not take care of critically ill pediatric patients on a routine basis

- Because of this, skills degrade

- A skill that is difficult to do in practice is harder in real life, and harder still under pressure
Low pediatric call volume

- **Skills that tend to degrade**
  - **Assessment**
    - The most important tool we have in pediatrics is our initial impression and primary assessment
    - If the child looks sick, they probably are
    - If we see very few sick children, we may not recognize one when we see one
  - **Practice**
    - Make a routine of using the pediatric assessment triangle on all pediatric patients
      - Note general appearance
      - Work of breathing
      - Skin color on normal children
    - If you practice assessing stable children, and you then see a child that is abnormal in any of the above categories, you are much more likely to notice
Low pediatric call volume

- **Airway**
  - Most providers rarely manage a child’s airway
  - Some may spend an entire career without encountering a compromised pediatric airway
  - When we do, having mastered the skills of pediatric airway will make the difference between life and death

- **Routine practice on manikins will improve field management**
  - Scenario based drills, will further improve management
  - Courses such as PALS or PEPP are excellent for keeping skills sharp
Vascular access

- Pediatric IV’s and IO’s can be intimidating procedures

- Anecdotally, we found during QI review, many critically ill and cardiac arrest patients were not getting IV’s or IO’s placed or even attempted. After several M&M’s and further training, we have seen the trend reverse.
Vascular access

- **Practice**
  - When possible, work with your local ER or OR to practice IV access. It is a straightforward skill when done routinely, but gets rusty quickly.
  - For Intraosseous training, there are a variety of commercially available training aides. The author personally prefers chicken bones. They have the closest feel to actual pediatric bone. You can also infuse the leg with food coloring to see how quickly intraosseous infusions access the circulation.
    - Always wear gloves when handling raw poultry.
Summary

- The pediatric population is a rewarding population with which to work

- There are, however, a number of challenges that are unique to this group

- Recognizing what the challenges are and addressing them ahead of time will substantially reduce provider stress and likely improve patient outcome and confidence in the provider
Scenario #1

- You are called to the scene of a child with a chief complaint of difficulty breathing. You arrive to find a patient who on initial impression has greatly increased work of breathing, skin is pale and diaphoretic, and he appears lethargic.
- What else do you need to know?
Scenario #1

- What you already know is that this child is critically ill. There are red flags on every part of the initial impression.
- If the child looks sick, he probably is
- You still need to get some quick information in order to treat properly
  - What is his age and size?
  - What are his vitals? O2 sat?
  - Quick secondary survey
  - History of present illness, Past Medical History
  - Meds
  - Allergies
Scenario #1

- He is 3 years Old
- RR 50 Labored, audible wheezes
- O2 saturation of 85%
- HR 165
- SBP 90
- History of asthma
- Recent URI symptoms
- Breathing much worse over the past 4 hours with no improvement with home albuterol
Scenario #1

- So how is this child doing?
  - HR and Respiratory rate are elevated
  - O2 Sat is low
  - Blood pressure is normal
    - Does this give you much information?
  - Known history of asthma
Scenario #1

- By knowing the normal vitals, and asking a few questions it is easy to categorize this patient as critically ill. Although the vitals are abnormal, it is by combining them with the initial impression that gives us the most valuable data. The same set of vital signs on a patient that is awake, with normal perfusion, puts the child in a much less serious category.

- Practice the initial assessment often, as it is one of the most important tools in the pediatric evaluation.
Scenario #2

- You are en route to the scene of a 6 year old with a leg injury. Your partner states “I don’t like taking care of kids, because I have no idea how to communicate.” “What can a 6 year old do?”
- Having just completed this lecture, you can let him know some generalizations about this age group
Scenario #2

- You tell your partner
  - Most 6 year olds have a general idea about what is going on with their bodies, but still have a few misconceptions
  - They often respond better if you kneel down and talk at their eye level
  - Letting them see, touch and handle the equipment is a good way to alleviate fears
  - Praise every good behavior, and every time they cooperate well
  - Toys are helpful
  - Demonstrate on stuffed animals or dolls when feasible
Scenario #3

- You arrive on scene to find a 5 year old girl who has fallen off a ladder
- The father is on scene and when you asked what happened, he just replies over and over “I should have been watching her more closely”
- What are some strategies to deal with this type of reaction?
Scenario #3

- This is a parent with the guilt reaction
  - They tend to be useless unless refocused
  - You need to try to refocus the caregiver to get vital information
    - How far did she fall?
    - Did you see it happen?
    - Did she lose consciousness?
    - Does she have any medical problems?
    - Allergies? Medications?
Scenario #3

- Try to refocus the caregiver
  - Use words like “I really need your help now”
  - “There is some important information I need, so I want you to concentrate for a few minutes”
- Without this, you are often left guessing
Scenario #4

- You are in charge of training for your department and are asked to talk to a crew after a pediatric code, a 2 month old with presumed SIDS. You go through the run sheet and noticed they picked up the patient and delivered him to the hospital without a single intervention. When asked why, the EMT who ran the call responds, “I don’t like working on babies, so we just got it to the ER”
Scenario #4

- What is a good strategy to reduce crew anxiety when dealing with the critically ill pediatric patient?
  - Recognize it is human nature, but we still need to perform the necessary interventions and follow protocol, weather ALS, or BLS level
  - If your service does not routinely treat sick children, train routinely to treat sick children
  - Concentrate on skills that tend to degrade over time, such as assessment, airway management, and vascular access