Creating Simulation Cases to Teach and Assess the Pediatric Milestones: You Can Do It!

APPD/COMSEP 2013
WORKSHOP #6
4/12/13 10:15-11:45AM

Shannon E. Scott-Vernaglia, MD
Ariel S. Frey-Vogel, MD, MAT
Lindsay P. Carter, MD

Abstract
Patient-based student and resident training has long been the standard for delivering apprentice-model learning opportunities. However, duty hour restrictions, shift work, and an evolving landscape of medical care inevitably lead to more variability in training over time. While some medical schools and residency programs have used OSCE’s to evaluate clinical skills, more institutions are exploring simulation opportunities in order to standardize the (simulated) patient-based learning environment. The Pediatric Milestones Project provides a framework within which to teach, and ultimately assess, trainees with the use of simulation. This workshop is designed to encourage pediatric educators, independent of equipment resources, to consider simulation as a tool for providing trainees with standardized teaching and assessment of milestone attainment. The session will begin with a discussion-based presentation of examples of uses of simulation, including traditional team-based training, medical student- and intern-specific case-based teaching, multi-disciplinary communication training and interpreter collaborative training, with participants adding their own examples of varied simulation uses at their institutions. Since a barrier to launching a simulation program is often the development of cases, workshop leaders will present their experience with developing student and resident level-specific cases and provide a framework for use by participants. Small groups will develop cases designed to address specific pediatric milestones. Groups will be encouraged to design cases that can be implemented with varied resources, so as to represent realistic opportunities for the use of simulation in different settings. The workshop will conclude with participants discussing and refining the cases as an example of the realistic process of iterative case review by consensus of the simulation administrative team. Participants will leave the workshop with sample level-specific cases to try at their home institutions and will be asked to reflect on how they can use the skills learned in the workshop in the coming year.
Creating Simulation Cases to Teach and Assess the Pediatric Milestones: You Can Do It!

**Milestones Worksheets**

For the purposes of the workshop activities, we will focus on 7 of the 21 Pediatrics Milestones that will be reportable regularly to the ACGME. In the next pages, you will find the worksheets for these Milestones. We encourage you to consider all of the Pediatrics Milestones as you develop simulation cases.

This link, created by Patty Hicks, includes the original Pediatrics Milestones Project, as well as the new ACGME Report Worksheets and is bookmarked to easily find the 21 Milestones that will be reported:  

The 7 Milestones we will work with in the workshop are listed below and the associated worksheets follow:

- **PC1:** Gather essential and accurate information
- **PC4:** Make informed diagnostic and therapeutic decisions that result in optimal clinical judgment
- **PC5:** Develop and carry out management plans
- **PBL1:** Identify strengths, deficiencies, and limits in one’s knowledge and expertise
- **ICS1:** Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds
- **PROF4:** Self-awareness of one’s own knowledge, skill, and emotional limitation that leads to appropriate help-seeking behavior
- **SBP3:** Work in inter-professional teams to enhance patient safety and improve patient care quality

©2013 MassGeneral Hospital for Children
Permission for use by workshop attendees in educational projects, with attribution to author(s), is granted.
# PEDIATRICS MILESTONES

**ACGME Report Worksheet**

<table>
<thead>
<tr>
<th>PC1. Gather essential and accurate information about the patient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Not yet Assessable</strong></td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

---

Copyright © 2012 Accreditation Council for Graduate Medical Education and American Board of Pediatrics. All rights reserved. The copyright owners grant third parties the right to use the Pediatrics Milestones on a non-exclusive basis for educational purposes.
### PC4. Make informed diagnostic and therapeutic decisions that result in optimal clinical judgment

<table>
<thead>
<tr>
<th>Not yet Assessable</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Recalls and presents clinical facts in the history and physical in the order they were elicited without filtering, reorganization, or synthesis; demonstrates analytic reasoning through basic pathophysiology results in a list of all diagnoses considered rather than the development of working diagnostic considerations, making it difficult to develop a therapeutic plan</td>
<td>Focuses on features of the clinical presentation, making a unifying diagnosis elusive and leading to a continual search for new diagnostic possibilities; largely uses analytic reasoning through basic pathophysiology in diagnostic and therapeutic reasoning; often reorganizes clinical facts in the history and physical examination to help decide on clarifying tests to order rather than to develop and prioritize a differential diagnosis, often resulting in a myriad of tests and therapies and unclear management plans, since there is no unifying diagnosis</td>
<td>Abstracts and reorganizes elicited clinical findings in memory, using semantic qualifiers (such as paired opposites that are used to describe clinical information [e.g., acute and chronic]) to compare and contrast the diagnoses being considered when presenting or discussing a case; shows the emergence of pattern recognition in diagnostic and therapeutic reasoning that often results in a well-synthesized and organized assessment of the focused differential diagnosis and management plan</td>
<td>Reorganizes and stores clinical information (illness and instance scripts) that lead to early directed diagnostic hypothesis testing with subsequent history, physical examination, and tests used to confirm this initial schema; demonstrates well-established pattern recognition that leads to the ability to identify discriminating features between similar patients and to avoid premature closure; Selects therapies that are focused and based on a unifying diagnosis, resulting in an effective and efficient diagnostic work-up and management plan tailored to address the individual patient</td>
<td>Current literature does not distinguish between behaviors of proficient and expert practitioners. Expertise is not an expectation of GME training, as it requires deliberate practice over time</td>
</tr>
</tbody>
</table>

**Comments:**
### PC5. Develop and carry out management plans

<table>
<thead>
<tr>
<th>Not yet Assessable</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develops and carries out management plans based on directives from others, either from the health care organization or the supervising physician; is unable to adjust plans based on individual patient differences or preferences; communication about the plan is unidirectional from the practitioner to the patient and family</td>
<td>Develops and carries out management plans based on one’s theoretical knowledge and/or directives from others; can adapt plans to the individual patient, but only within the framework of one’s own theoretical knowledge; is unable to focus on key information, so conclusions are often from arbitrary, poorly prioritized, and time-limited information gathering; develops management plans based on the framework of one’s own assumptions and values</td>
<td>Develops and carries out management plans based on both theoretical knowledge and some experience, especially in managing common problems; follows health care institution directives as a matter of habit and good practice rather than as an externally imposed sanction; is able to more effectively and efficiently focus on key information, but still may be limited by time and convenience; begins to incorporate patients’ assumptions and values into plans through more bidirectional communication</td>
<td>Develops and carries out management plans based most often on experience; effectively and efficiently focuses on key information to arrive at a plan; incorporates patients’ assumptions and values through bidirectional communication with little interference from personal biases</td>
<td>Develops and carries out management plans, even for complicated or rare situations, based primarily on experience that puts theoretical knowledge into context; rapidly focuses on key information to arrive at the plan and augments that with available information or seeks new information as needed; has insight into one’s own assumptions and values that allow one to filter them out and focus on the patient/family values in a bidirectional conversation about the management plan</td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**
### PBL1. Identify strengths, deficiencies, and limits in one’s knowledge and expertise

<table>
<thead>
<tr>
<th>Not yet Assessable</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>The learner acknowledges external assessments, but understanding of his performance is superficial and limited to the overall grade or bottom line; has little understanding of how the performance measure relates in a meaningful way to his specific level of Knowledge, Skills and Attitudes (KSA)</td>
<td>Assessment of performance is seen as being able to do or not do the task at hand without appreciation for how well it is done and whether there is a need to improve the outcome</td>
<td>Prompts for understanding specifics of level of performance are internal and may be identified in response to uncertainty, discomfort, or tension in completing clinical duties; evidence of this stage is demonstrated by active questioning and application of knowledge in developing a rationale for care plans or in teaching activities</td>
<td>Prompted by anticipation or contemplation of potential clinical problems, the learner self-identifies gaps in KSA through reflection that assesses current KSA versus understanding of underlying basic science or pathophysiologic principles to generate new questions about limitations or mastery of KSA; evidence of this stage can be determined by the advanced nature and level of questioning or resource seeking</td>
<td>Prompted by a self-directed goal of improving the professional self, the practitioner anticipates hypothetical clinical scenarios that build on current experience and systematically addresses identified gaps to enhance the level of KSA; elaborate questioning occurs to further explore gaps and strengths</td>
<td></td>
</tr>
</tbody>
</table>

**Example:**

During a semiannual review, a learner is unable to describe in any specific terms how he has performed when asked to do so by his mentor. In response, the mentor reviews and interprets the learner’s evaluations and then asks the learner to reflect on the discussion. The learner

**Example:**

The learner seeks external assessment of performance as ability “to do” or “not able to do” with little understanding of what the assessment means. “Are these orders written correctly?” “Did I do that correctly?” Seeks feedback

**Example:**

Learner requests elaboration, clarification, or expansion on patient-care related task. “Why would we use this antibiotic for this condition?” or “The patient has underlying condition x. Does that alter therapy y

**Example:**

In caring for a patient with an illness not previously encountered, this practitioner says, “I have experience taking care of patients with this acute illness but have never had a patient with this acute illness who also had this

**Example:**

In caring for a patient, a practitioner becomes aware of a gap in KSA, and in response (with or without consultation from a mentor) seeks to understand more about the identified KSA gap. A PICO-formatted question (P =
| Comment | repeats the language used and recites the overall score/grade without interpretation of further meaning or inference regarding the reported performance assessment | approval on whether KSA were “right” or “wrong.” Does not seek “How?” or “Why?” as part of request for feedback to assist identification of KSA. | for this patient?” or “I think we should order study w for this patient, since sometimes this disease presents with underlying condition z.” | particular underlying condition and wonder if the chronic condition might alter his clinical course?” |

Comments:
### ICS1. Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds

<table>
<thead>
<tr>
<th>Not yet Assessable</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uses standard medical interview template to prompt all questions; does not vary the approach based on a patient’s unique physical, cultural, socioeconomic, or situational needs; may feel intimidated or uncomfortable asking personal questions of patients</td>
<td>Uses the medical interview to establish rapport and focus on information exchange relevant to a patient’s or family’s primary concerns; identifies physical, cultural, psychological, and social barriers to communication, but often has difficulty managing them; begins to use non-judgmental questioning scripts in response to sensitive situations</td>
<td>Uses the interview to effectively establish rapport; is able to mitigate physical, cultural, psychological, and social barriers in most situations; verbal and non-verbal communication skills promote trust, respect, and understanding; develops scripts to approach most difficult communication scenarios</td>
<td>Uses communication to establish and maintain a therapeutic alliance; sees beyond stereotypes and works to tailor communication to the individual; a wealth of experience has led to development of scripts for the gamut of difficult communication scenarios; is able to adjust scripts ad hoc for specific encounters</td>
<td>Connects with patients and families in an authentic manner that fosters a trusting and loyal relationship; effectively educates patients, families, and the public as part of all communication; intuitively handles the gamut of difficult communication scenarios with grace and humility</td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**
PROF4. Self-awareness of one’s own knowledge, skill, and emotional limitations that leads to appropriate help-seeking behaviors

<table>
<thead>
<tr>
<th>Not yet Assessable</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Has a lack of insight into limitations that results in the need for help going unrecognized, sometimes resulting in unintended consequences</td>
<td>Shows concern that limitations may be seen as weaknesses that will negatively impact evaluations results in help-seeking behaviors, typically only in response to external prompts rather than internal drive</td>
<td>Recognizes limitations, but has the perception that autonomy is a key element of one’s identity as a physician, and the need to emulate this behavior to belong to the profession may interfere with internal drive to engage in appropriate help-seeking behavior</td>
<td>Recognizes limitations and has matured to the stage where a personal value system of help-seeking for the sake of the patient supersedes any perceived value of physician autonomy, resulting in appropriate requests for help when needed</td>
<td>Beyond recognizing limitations, has the personal drive to learn and improve results in the habit of engaging in help-seeking behaviors and explicitly role modeling and encouraging these behaviors in residents</td>
</tr>
</tbody>
</table>

Comments:
### SBP3. Work in inter-professional teams to enhance patient safety and improve patient care quality

<table>
<thead>
<tr>
<th>Not yet Assessable</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeks answers and responds to authority from only intra-professional colleagues; does not recognize other members of the interdisciplinary team as being important or making significant contributions to the team; tends to dismiss input from other professionals aside from other physicians</td>
<td>Is beginning to have an understanding of the other professionals on the team, especially their unique knowledge base, and is open to their input, however, still acquiesces to physician authorities to resolve conflict and provide answers in the face of ambiguity; is not dismissive of other health care professionals, but is unlikely to seek out those individuals when confronted with ambiguous situations</td>
<td>Aware of the unique contributions (knowledge, skills, and attitudes) of other health care professionals, and seeks their input for appropriate issues, and as a result, is an excellent team player</td>
<td>Same as Level 3, but an individual at this stage understands the broader connectivity of the professions and their complementary nature; recognizes that quality patient care only occurs in the context of the inter-professional team; serves as a role model for others in interdisciplinary work and is an excellent team leader</td>
<td>Current literature does not distinguish between behaviors of proficient and expert practitioners. Expertise is not an expectation of GME training, as it requires deliberate practice over time</td>
<td></td>
</tr>
</tbody>
</table>

Comments:
Creating Simulation Cases to Teach and Assess the Pediatric Milestones: You Can Do It!

Creating a Case Worksheet

Case Title:

Case Goals:

Case Stem:

Expected interventions/behaviors:

Identify which milestones will be used in evaluating the learners:
Sample Cases

We are delighted to share with you several simulation case examples from our own programs. We have purposefully included two level-specific cases, one designed for medical students, and one designed for interns, although we feel all cases can be used to assess learner’s attainment of the milestones depending on where you start/stop a case. In addition, we’ve included two cases that do not involve any high tech equipment, one from a multi-disciplinary workshop that uses role play, and one that is run with medical interpreters and a native Spanish-speaking volunteer (our clerkship coordinator) and focuses on communication with non-native English speakers.

We ask that any cases you may use or adapt be appropriately attributed to the authors as listed.

1. Third Year Medical Student Simulation.
2. PGY-1 Pediatrics Resident Simulation: Anaphylaxis. This case is used with 2 interns, one leads case and one assists. A faculty member (or chief resident) serves as the nurse. When available, an additional faculty member or non-physician volunteer plays the parents. A third team member runs the simulation machine (in this case, the Laerdal® SimJunior).
3. Communication Workshop for Residents: Communicating a Medical Mistake. This case is used as part of a multi-disciplinary training with residents, faculty, parents, nurses and social workers all taking part in role playing of the scenarios.
4. Interpreter Simulation for Residents. This case involves a resident speaking with a native Spanish speaking volunteer acting as a patient mother, and collaborating with a trained hospital medical interpreter.

If you would like to collaborate further to adapt more of our level-specific cases to your program’s own needs, please email us:

Shannon Scott-Vernaglia  sscottvernaglia@partners.org
Ariel Frey-Vogel  asfrey@partners.org
Lindsay Carter  lpccarter@partners.org

©2013 MassGeneral Hospital for Children
Permission for use by workshop attendees in educational projects, with attribution to author(s), is granted.
Medical Student Pediatric Simulation Program – Croup

Learning Objectives:
At the conclusion of this simulation session, the participants will be able to:

1) Recognize the clinical signs of respiratory distress
2) Begin assessment of a patient with the ABCs (D/E)
3) Identify important aspects of a patient’s history who is in respiratory distress
4) Recognize and initiate management of a patient with upper airway obstruction secondary to croup
5) Delineate the differential diagnosis for upper airway obstruction
6) Discuss the pathophysiology of upper airway obstruction secondary to croup

Equipment Needs:

1) Infant mannequin and simulator
2) Fluids/medications
3) Equipment: Pediatric code cart; EZ IO
4) Paperwork: Cardiovascular/Respiratory flowsheet

Mannequin set-up: No IV access

Time Management:
Case – 15 min
Debrief – 35 min

Case #1 Presentation: 15moM brought in to the ED at 9pm by his mother for noisy breathing and a barky cough.

Initial Vital signs: HR 180  BP 90/60  RR 40  O2 sat 96%   T 100.6 R

Initial PE:
Gen: lying in mother’s arms, awake, not comfortable
Airway: audible stridor
Breathing: moderate respiratory distress with nasal flaring, subcostal retractions, and inspiratory stridor at rest; no wheezing
Circulation: tachycardic . Cap refill < 2 sec
Skin: normal color
Mouth: open, no drooling; no visible objects or swollen epiglottis, tonsils
Abdomen: soft, NTND
Neurologic: moving all extremities and alert; cries with any intervention

Additional Information (available by request only):

- Estimated weight: 10kg
- Two days of URI symptoms; parents report cough worsened last evening but then he seemed improved today. He was eating and drinking his normal amount. This evening, respiratory distress worsened.
- No known foreign body ingestion or choking episode
- No known allergies
- No medications
- All immunizations up to date
<table>
<thead>
<tr>
<th>Scenario Stage</th>
<th>Patient Condition</th>
<th>Simulator Parameters and Trends</th>
<th>Expected Intervention</th>
<th>Scripted Participant Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial assessment and decision</td>
<td>Gen: uncomfortable</td>
<td>HR 170s RR 40s BP 90/50s SaO2 98%</td>
<td>ABCs ECG and oximeter monitoring Comfort child; let him stay in mother’s lap</td>
<td>Mother: “What is that noise? What is wrong?”</td>
</tr>
<tr>
<td></td>
<td>Airway: not obstructed</td>
<td></td>
<td>Comfort child; let him stay in mother’s lap</td>
<td>Nurse (if students need prompting): “Should we do something about his airway? He seems to be having trouble breathing.”</td>
</tr>
<tr>
<td></td>
<td>Breathing: tachypneic, stridor, retraction</td>
<td></td>
<td>Humidified oxygen</td>
<td>Nurse: If IV proposed, can comment that patient seems worse with interventions</td>
</tr>
<tr>
<td></td>
<td>Circulation: normotensive, cap refill 2 sec</td>
<td></td>
<td>Propose possible interventions: Nebulized racemic epi 0.05cc/kg Dexamethasone 0.6mg/kg IM Tylenol for fever</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disability: awake</td>
<td></td>
<td>Discuss whether patient needs IV access and lab tests</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exposure: no access; no rashes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reassess after initial interventions</td>
<td>Initial good response to first epinephrine with resolution of stridor. Soon after, however, increasing stridor, retractions, and respiratory distress</td>
<td>HR 160-170s SaO2 90% RR 30s</td>
<td>Reassess ABCs Clear airway, suction if necessary Repeat epinephrine nebulizer Consider IV access Be prepared to bag mask</td>
<td>Mother: “He seems to be getting worse”</td>
</tr>
<tr>
<td>(for advanced students only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reassess after intervention</td>
<td>Recovery</td>
<td>HR 150s RR 26 SaO2 97%</td>
<td>Continuous monitoring and reassessment Airway support as needed Consider Fluid bolus Admit to wards</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pt recovers with 2nd epinephrine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>administration</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Key debriefing/learning points:

1) Assess ABCs
   - “A”: assess air movement: look, listen, and feel
   - “B”: chest wall excursion, symmetric, accessory muscle use, pattern
   - “C”: check pulses and perfusion
   - “D”: disability and D-stick
   - “E”: exposure (IV access)

2) Recognize signs and symptoms of respiratory distress
   - Hypoxia
   - Tachypnea
   - Retractions; use of accessory muscles
   - Stridor

3) Identify aspects of history that are relevant
   - History of foreign body aspiration or choking
   - Preceding symptoms or sudden onset
   - Recent illness/fever
   - H/O airway problems

4) Describe mechanism of stridor
   - Inspiratory stridor is caused by tracheal narrowing in subglottic area (extrathoracic respiratory obstruction). There is both a fixed and dynamic obstruction. Fixed obstruction is caused by inflammation around the firm cartilaginous rings and dynamic obstruction is caused by a combination of high
negative pressure in distal extrathoracic trachea and the floppy tracheal wall when the child becomes upset.

5) Differentiate causes of upper airway obstruction
   □ Foreign body aspiration: wheezing, cough, and decreased breath sounds; no recent URI, may have h/o choking
   □ Peritonsillar or retropharyngeal abscess: asymmetry of oropharynx. May refuse to swallow. Retropharyngeal more common in younger age group.
   □ Epiglottitis: usually older child who appears very ill. Acute onset with high fever, drooling, and "sniffing" position. Not likely in immunized children.
   □ Bacterial tracheitis: copious secretions, usually high fever, frequently toxic appearing; much less common.

6) Recognize and manage upper airway obstruction
   □ Humidified air or oxygen
   □ Avoid agitating child
   □ Dexamethasone: PO administration as effective as IM. Will not have acute effects; needs at least a few hours for onset. Shown to reduce hospitalization and intubation rates
   □ Racemic epinephrine: alpha adrenergic vasoconstriction. Return of symptoms is possible after 2-4 hrs.

7) Teamwork skills
   □ Effective communication
     i. Using people’s names, pointing, eye contact
     ii. Noise control
     iii. Positioning around bed
     iv. Closed loop/feedback
     v. Frequent reassessment aloud so everyone knows what’s going on; invites others to help, feed thoughts back to leader
   □ Role Clarity
     i. Using people’s names, pointing, eye contact
     ii. Positioning around bed
   □ Workload allocation
     i. meds/access/airway/family member
**Program in Longitudinal Pediatric Simulation**

**Intern Case #4**

**Anaphylaxis, MGH Wards, SimJunior**

MGHSIMTEST Four   F     MRN 560-41-26

**Parent Role**

**Case Overview:**
The intern will encounter a 2 year old patient during pre-rounding who was admitted in the early AM for pneumonia after failing outpatient therapy. The patient received vancomycin in the ED and currently is receiving ceftriaxone when the intern walks into the room at 7:30 AM to check on the patient.

**Case Goal:**
The goal of the case is for the intern to recognize an allergic reaction progressing to anaphylaxis, appropriately manage the patient, anticipate potential further compromise and demonstrate good communication and professional skills.

**Getting Started:**
You will orient the residents to the simulation process and then will play the role of the patient’s parent.

- Orient residents to the longitudinal simulation program
- Describe abilities of SimJunior which include: breath sounds, chest rise, can be intubated, ventilated with mask, pulses
- Remind residents that as they examine the child, they can describe what they are looking for and that the examination findings will be conveyed by the simulation coordinator.
- Encourage residents to “think out loud” and to utilize their co-resident when in the room
- Have the residents choose who will be the patient’s primary intern
- At the start of the case, you will be at the patient’s bedside
- Throughout the simulation, you should act in the role of the parent.

**Role Background:**
You are at the bedside of your 2 year old daughter Breanna. She was sick with a cough for 4 days, and had a fever 2 days ago to 102. Her pediatrician diagnosed her with pneumonia and treated her with azithromycin. Last night her breathing was worse and her temperature hit 104. Your spouse spent the night in the ED with her last night and you have just arrived in the last hour. She has been sleeping since you arrived, but had been up most of the night in the emergency room. You know that she has some oxygen (blowby) to help her breathe and you have noticed that her O2 saturations were about 90 when the nurse said that you should move the tube to be closer to her face. You did notice that she has a lacy pink rash on her belly and trunk that has some tiny bumps.

**Simulation**
When the residents come in, you will answer their questions, but shortly into that, you should ask, “What do you think about her rash?”

If you are asked, you should provide the following additional history:

- Her breathing looks better now than it did last night when you sent her in with your spouse.
- She has an allergy to penicillins (rash from amoxicillin when she was 1 all over her body) that it turns out your spouse forgot to tell them last night
- She has had 2 ear infections in the past. Both were treated with amoxicillin. The second time she developed an all over body rash after the second dose and was switched to another medicine
- She has no other medical problems or surgeries.
- She has a healthy 4 month old sibling at home

You may ask questions, demonstrate anxiety (“What are you going to do for her?” “Why do you think this happened?”) and console your child.

**Debrief**
Participate fully in debrief and evaluate the lead resident, with the additional comment section box used for feedback for the secondary resident as well.
Nurse Role

Case Overview:
The intern will encounter a 2 year old patient during pre-rounding who was admitted in the early AM for pneumonia after failing outpatient therapy. The patient received vancomycin in the ED and currently is receiving ceftriaxone when the intern walks into the room at 7:30 AM to check on the patient.

Case Goal:
The goal of the case is for the intern to recognize an allergic reaction progressing to anaphylaxis, appropriately manage the patient, anticipate potential further compromise and demonstrate good communication and professional skills.

Getting Started:
You will initially prepare the simulation setting and then will play the role of the patient’s nurse.
- Set Up Sim Junior
  - Dress in pjs and cover with sheet
  - Gather airway supplies (including nebulizer mask)
  - Set up Blowby O2 near face with oxygen connected and on
  - Hang IV bag marked Ceftriaxone
  - Tape IV tubing on hand

Role Background:
You have recently received pass-off from the night RN about a new admission, 2 year old Breanna. She is here for pneumonia and has required some blowby for sats in the low 90s. She arrived on the floor at 6:30 AM and you went in at 7:00 AM and hung ceftriaxone which had been sent up because it wasn’t given in the ED. The patient was sleeping so you told mom you’d be back in after you checked on your other patients. You are not in the room when the residents enter to pre-round.

Simulation
Enter the room a few minutes after the residents have gone in to pre-round on the patient.

If you are asked, you should provide the following additional history:
- Patient Weight: 12 kg
- Temp (on admission): 101
- Meds:
  - Vancomycin 120 mg Q6hr (10 mg/kg/dose Q6hr)
  - Given at 5:30 AM in ED
  - Ceftriaxone 450 mg Q12hr (75 mg/kg/day div Q12hr)
  - Hung at 7:00 AM, running now

You will alert the residents that the patient vomits as they are completing the PE: “Oh, the patient just vomited all over!”

Let the residents try to work through the case, but do ask them open questions such as “Is there anything you would like me to do?” If they are really struggling, you can ask more leading questions as the case progresses, but always let them try to talk it out first. Even if they head in the wrong direction initially, they often find their way back.

Debrief
Participate fully in debrief and evaluate the lead resident, with the additional comment section box used for feedback for the secondary resident as well.
Case Overview:
The intern will encounter a 2 year old patient during pre-rounding who was admitted in the early AM for pneumonia after failing outpatient therapy. The patient received vancomycin in the ED and currently is receiving ceftriaxone when the intern walks into the room at 7:30 AM to check on the patient.

Case Goal:
The goal of the case is for the intern to recognize an allergic reaction progressing to anaphylaxis, appropriately manage the patient, anticipate potential further compromise and demonstrate good communication and professional skills.

Getting Started:
You will get the simulator up and running while the RN role gathers supplies and the parent orients the residents. For the case, you will set the scenario for the residents and then run the simulator and come in at the end as the Senior Resident.

- Turn on Manikin and Computer:
- Set up vital signs
  1. Display on monitor only **O2 Saturation 93%**
  2. Prepare other vital signs for start of case but do not display:
     - Temp 101°C
     - RR 40s
     - BP 88/40
     - HR 100s

Role Background:
You will describe for the residents the history that they received in sign-out:
- “Breanna is an 18 month old female admitted by the night team for bacterial pneumonia. The patient had been treated with azithromycin as an outpatient but after two days was still febrile and coughing. She presented to the ED with a temp of 104. She was started on ceftriaxone and vancomycin and given blow-by O2 for sats intermittently in the low 90s when asleep. Because of the respiratory distress, you decide to pre-round and introduce yourself to family before rounds; one parent has just come in after the other was with her all night. It is about 7:30 AM.”

Simulation
During the case, as the residents describe their examination of the patient, you should let them know what findings they would see/feel/hear, but do not offer findings unless they perform the exam needed to elicit findings. You are also the primary faculty member for completing the checkbox evaluation of case-specific demonstrated knowledge, skills and attitudes during the simulation.

If the residents call for help, acknowledge that the person “has been paged”, etc, but is not immediately available. The microphone is turned on by a switch on the handle. Talk close to the microphone when speaking

When the case has run 10 minutes, or has reached a natural stopping point earlier, arrive in the room as the senior resident and ask the residents to present the patient to you. Ask questions to help reveal their deeper understanding of the patient, or to justify their management of the patient.
<table>
<thead>
<tr>
<th>Physical Examination</th>
<th>Vital Signs and Trends</th>
<th>Expected Intervention</th>
<th>Response to Calls for Help</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gen: Sleeping in bed, awakens with exam HEENT: mmm, no cyanosis, no stridor Resp: mild intercostal retractions, coarse b/l, poor aeration left base, no wheezing Skin: Fine lacy pink rash on trunk; urticarial rash on back if examined Ext: wwp</td>
<td>Temp 101 RR 40s BP 88/40 HR 100s when asleep to 120s when crying SaO2 90% with BBO2 not very close, 95% when awake or when near to face Trend: SaO2 up to 97% on FM O2</td>
<td>• Clarify history • Examine patient • Recognize allergic reaction • Stop antibiotics • Initial interventions (O2, diphendhydramine, acetaminophen)</td>
<td>Senior busy with decompensating patient, will come soon. RR/Code Call would prompt immediate response.</td>
</tr>
<tr>
<td>Gen: Distressed HEENT: mmm, no cyanosis, no stridor Resp: worsening intercostal retractions, ++wheezing GI: Vomiting when moved/examined</td>
<td>RR 50s BP stable 85/38 HR trending up to 130s SaO2 trending down to mid 80s if BBO2, 91% if on face mask or NC Trend: NO intervention: -&gt; mild stridor develops, worsening respiratory distress -&gt; RR increases, SaO2 decreases Nonrebreather: SaO2 to 95+% Epinephrine: improvement in RR, resolution of wheezes, HR to 150s Bronchodilator: Improved wheezing but ongoing distress, shortlived</td>
<td>• Recognize worsening respiratory distress as sign of anaphylaxis • Assess ABCs and provide respiratory support—O2 by face mask, place supine • Call for Senior or RR • Administer epinephrine • Administer albuterol, but don’t delay epinephrine • Consider H2 blocker • Consider increasing fluids/second IV • Administer steroids (IV after emesis) to reduce risk of recurrent symptoms • Communicate with parent</td>
<td>Senior transporting patient to PICU, will be there in 3 minutes. RR/Code Call would prompt RR therapist immediately and then senior</td>
</tr>
<tr>
<td>Gen: Crying HEENT: mmm, no cyanosis, no stridor Resp: more comfortable breathing, coarse b/l, poor aeration left base, no wheezing Skin: improving rash Ext: wwp</td>
<td>RR – 40s BP – 88/50 HR – 150s SaO2 – 98% on face mask or NRB</td>
<td>• Present case to senior • Explain to mother anaphylaxis, cross-reactivity between penicillins and cephalosporins, need for epi-pen in future</td>
<td></td>
</tr>
</tbody>
</table>

Silence monitor beeping by closing the active window on the computer at the end of the case.

**Debrief**
Participate fully in debrief and evaluate the lead resident, with the additional comment section box used for feedback for the secondary resident as well. During the simulation you should have completed the checkbox evaluation of demonstrated knowledge, skills and attitudes.

**Shut down Simulator**
Key Learning Points—ANAPHYLAXIS CASE:

1. Always assess and reassess ABCs
   - “A-Airway”: assess airway, evaluate for stridor, airway patency: look, listen, feel
     o Stridor may develop in anaphylaxis and may initially be difficult to appreciate in a crying child if not listening for it (ascultate neck)
   - “B-Breathing”: assess aeration, work of breathing (including respiratory rate, accessory muscle use), oxygenation, breath sounds
     o It is very important to continue to assess respiratory status during treatment for allergic reaction
     o Identify wheezing as sign of systemic illness and anaphylaxis
   - “C-Circulation”: check pulses, perfusion, hydration
     o Hypotension occurs frequently in anaphylaxis and requires monitoring to identify and intravenous access and IV fluids to treat after identified, in addition to treating with epinephrine emergently
     o May consider elevating legs if hypotensive
     o Tachycardia expected when epinephrine administered
   - “D-Disability/Differential”: assess patient level of alertness, think through possible causes of worsening clinical picture
     o Recognize that sudden deterioration minutes into second infusion of antibiotic associated with rash is consistent with anaphylaxis despite baseline work of breathing from pneumonia.
   - “E-Exposure” evaluate rash, recognize importance of exposing child, assess access
     o Important to completely examine patient’s skin

2. Appreciate evolution of clinical picture
   - Obtain relevant history of prior allergic reaction
     o Recognize not all caregivers may know pt’s allergy status, ask again in setting of new meds, new symptoms
     o Recognize contribution of pneumonia and fever to respiratory status—discuss how it may seem initially like the worsening respiratory status is due to the pneumonia
     o Recognize evolution to anaphylaxis

3. Immediate steps for allergic reaction → anaphylaxis
   - Stop trigger (antibiotics)
   - ABC’s
   - Oxygen, monitoring (be sure to check BP again as won’t happen automatically)
   - Consider patient position/ repositioning

4. Administer appropriate medications and understand why used
   - Histamine blockade—diphenhydramine reasonable for rash only and in addition to (but do not delay) epinephrine in anaphylaxis; role of H2 blockers to augment histamine blockade
   - Epinephrine as the drug for anaphylaxis
     o Administer IM
     o IM: 0.01 mg/kg (0.01 mL/kg/dose of 1:1000 solution) not to exceed 0.3-0.5 mg every 5-15 minutes
       ▪ Realize it is a commonly mis-dosed drug and check dosing prior to ordering
       ▪ EpiPen Jr (15-29 kg): 0.15 mg IM, may be repeated in 5-15 mins if needed
       ▪ EpiPen (30 kg and above): 0.3 mg IM, may be repeated in 5-15 mins if needed
     o Albuterol for wheezing/bronchospasm if not improved with epinephrine
     o Steroids for rebound symptoms, recurrent anaphylaxis
   - Practical Tip: Omnicells contain an anaphylactic kit that contains diphenhydramine, ranitidine, epinephrine & solumedrol. If an MD were to order ranitidine IV in POE they would receive a call from RPh stating it’s for anaphylaxis only. The reason for this is that our formulary H2 reuptake antagonist is now famotidine but it requires refrigeration so ranitidine was kept for the kits to be stored at room temp.

5. Communicate effectively with family
   - Discover prior history of penicillin allergy (ideally, although recognizing reaction to ceftriaxone independent of prior allergy is key)
   - Keep family updated during acute situation, manage anxiety, consider assigning second intern to talk with family.
The Communication, Connection and Quality Workshop teaches participants the importance of connecting with patients to improve communication and patient safety. Participants include parents, physicians, nurses, social work, chaplaincy and child life services. The 3-4 hour simulation workshops focus on real-life health care communication challenges were developed to improve residents’ comfort and skill with difficult conversations. Participants role play (with a partner) both in their “typical” role on the care team as well as in other roles (e.g. a parent and resident may flip roles for a case). Cases are authored by workshop organizers, based on communication challenges residents report having experienced.

**Communicating a Mistake**
You are a resident caring for Lily, age 5, on the wards. She has chronic lung disease with exacerbation and developed a low potassium in the setting of frequent albuterol nebs. Last night Lily received 10 times her ordered dose of potassium from one of your team members. She was on a cardiac monitor overnight, had an EKG and had repeat labs drawn. She has been stable and there are no expected lasting effects.

Lily’s mother and father are very upset and want to know how a medication error could have occurred. The parents want to know ‘who did it” and want to speak with the attending, not the resident.
**Goal**

Provide practice and instruction in communication using an interpreter to both obtain further history and to explain a disease process (asthma).

**Initial Information to Provide the Intern**

You are called to the bedside of a recently admitted 4 yo with respiratory distress secondary to a presumed asthma exacerbation, to explain to the mother what has been going on. You received minimal history from the daycare provider other than the child developed cough with difficulty breathing over the course of the morning after being dropped off by his mother.

His initial O2 sat was 90% RA, RR 50, BP 90/60, HR 100. He responded well to stacked nebs in the ED and was given steroids.

He is currently sleeping with blow by O2 and sats of 98% on q 2 nebs.

No known meds or allergies per the daycare provider. He seemed fine the day before in day care. No known history of asthma but has only been in this daycare for a few months.

The child was brought in by their daycare provider, as they were unable to contact the mother who was working as a housecleaner.

The mother has just arrived per nursing and is Spanish speaking only. The OA has called for an interpreter.

**Information for the person acting as the Spanish speaking mother**

You have rushed to the hospital in between your two jobs and are a bit upset and agitated because you went to pick up your child at daycare and he was not there, the daycare provider told you he was at the hospital.

Your phone battery had died during the day.

You have very limited understanding about asthma, you don’t understand how he could be fine in the morning, then so bad that he needs to be in the hospital now. You are worried about missing work and about how to pay for the hospital bill.

Your son has always been healthy, does have noisy breathing and cough frequently especially with colds and worse at night. He does have a red rash on his elbows and neck that is scaly and itchy especially in the winter.

You are seeking reassurance that he will get better and that you can get help with financial issues and with missing work.
### Addendum 1: Evaluation checklist for interns*

<table>
<thead>
<tr>
<th>Behavior/skill assessed</th>
<th>Never (0 pt)</th>
<th>Almost Never (1 pt)</th>
<th>Sometimes (2 pts)</th>
<th>Almost Always (3 pts)</th>
<th>Always (4 pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Intern gave interpreter an overview of the case/explained goals prior to entering the room and beginning the consult with the patient/family.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Intern introduced self and interpreter to the patient/family.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Intern spoke directly to the patient/family.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Intern maintained eye contact with the patient/family, even when the interpreter was speaking.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Intern re-focused the patient/family, when necessary.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Intern paused appropriately to allow time for interpreter to interpret the message.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Intern avoided the use of jargon, idioms, and technical terms.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Intern clarified and/or simplified technical terms and/or procedures as requested by the patient/family.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Intern restated/summarized agreed next steps.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Intern documented the presence of the medical interpreter in the patient’s chart.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL**

---

*Provided by the MGH Interpreter Services Office

©2013 MassGeneral Hospital for Children
Author: MGH Interpreter Services Office
Permission for use by workshop attendees in educational projects, with attribution to author(s), is granted.