Improving Team Function through Simulation-Based Learning

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Disclosures

• The presenters have no financial relationships to disclose or conflicts of interest to resolve.

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Learning Objectives

• Discuss the rationale of using simulation-based learning in team training

• Identify sources of information to conduct a needs assessment to improve team function

• Describe how learning objectives anchor scenario development pertinent to identified areas for team training

• Describe the process of developing and implementing a simulation-based learning session for team training
Case Study

- **Maternal presentation to Labor & Delivery:**
  - On a busy day, a G5P4 gestational diabetic presented at 36 wks in active labor. She was 7 cm dilated. The patient requested medication for pain and received nalbuphine. Shortly after, she had SROM of green-tinged fluid and became fully dilated.

- **Delivery of baby:**
  - The OB delivered the fetal head. However, the shoulder was unable to be delivered, even with repositioning of the patient. The fetus became bradycardic. The obstetrician performed maneuvers for shoulder dystocia. Ultimately, a male baby was delivered. The estimated time from delivery of head-to-body was 2 min.

- **Initial newborn assessment:**
  - The baby required intubation and resuscitation by Peds for respiratory depression. He had no clavicular fracture, but there was little-to-no movement of his right arm. He was shown to mom and taken to the NICU. There was no communication to her or the OB team about the concern for brachial plexus palsy.
Root Causes of Sentinel Events

- Poor team function
- Failure to recognize potential problems
- Failure to express concerns or clearly define problems
- Failure to seek senior input
- Unavailability of prenatal information
- Inadequate staff-patient communication and counseling

Factors that Affect Team Function

- Complex healthcare delivery by multiple teams
- High risk situations
- High patient volume
- Frequent interruptions
- Time constraints
- Shift work
- Many handoffs
Educational Factors Affecting Teams

- Variable orientation models
- Variable past clinical and educational exposure
- Apprenticeship model: “See one, do one, teach one”
- Lack of competency assessments
- Work hour regulations
- Limited faculty and staff development programs
IOM Recommendations

- Promote effective team functioning
- Anticipate the unexpected
- Create a learning environment
- Establish interdisciplinary team training programs
- Use simulation to practice team work and improve team function

What is Simulation?

“Simulation is a training and feedback method in which learners practice tasks and processes in lifelike circumstances using models or virtual reality, with feedback from observers, other team members, and video cameras to assist improvement of skills.”

Experience Outside of Medicine

Simulation in Medicine

- **Procedural skills training**
  - Task trainers

- **Resuscitation**
  - Mannequins

- **Teamwork training**
  - Standardized patients
  - Mannequins
  - Hybrid simulations
  - Virtual reality
  - Avatars
Simulation in Medicine

Simulation-Based Outcomes in Perinatal Medicine

- Promotes interdisciplinary collaboration ¹
- Establishes potentially better practices in perinatal care ¹
- Improves team function during resuscitation ²
- Reduces perinatal morbidity ³
- Improves neonatal outcomes ⁴
  - Reduced incidence of low Apgar scores and hypoxic ischemic encephalopathy
  - Increased use of shoulder dystocia maneuvers and decreased incidence of brachial plexus injuries

¹ Zabari M et al. Pediatrics 2006
What Does Simulation Offer?

- Experiential, immersive learning
- Repetitive, deliberate practice
- Exposure to common and uncommon events
- No risk to patients
- Critical group reflection
- Opportunity for team building
Active or Passive Learning

What We Remember

10% Reading
10% Being lectured
20% Viewing an exhibit
20% Watching a movie
30% Looking at pictures
30% Watching a demonstration
50% Seeing on location

70% Participating in a discussion
70% Giving a talk
70% Doing a dramatic demonstration

90% ★ SIMULATING THE REAL THING ★
90% Doing the real thing
Participate in simulation

Concrete experience

Reflect on experience during video review

Reflective observation

Learn during facilitated team debriefing

Abstract conceptualization

Apply new skills to patient care

Active experimentation

Experiential Learning

Assessing Frames to Reveal Improvement Opportunities

Adapted from: Rudolph JW et al. Anesthesiol Clin 2007
Polling Question #1

What simulation-based learning experiences do your staff participate in?
Please check all responses that apply.

a. We have not had the opportunity
b. For procedural skills training (e.g. IV placement, intubation, etc.)
c. During mock codes or scheduled simulations
d. During training for the Neonatal Resuscitation Program
e. During a team training program (e.g. TeamSTEPPS)
f. In preparation for a complicated delivery
Simulation Program Development

- Perform needs assessment
- Define goals
- Secure champions
- Obtain support
- Purchase equipment & designate space
- Identify & train instructors
- Develop curriculum
- Plan a roll-out period
Needs Assessment for Team Training

• Root Cause Analysis of Actual Patient events
• Near Misses
• Observed Behavior
• Feedback from Staff
• Risk management input
• Staff Safety Scores
• Identified knowledge gaps from previous educational programs
• New initiatives
Effective Teamwork

- Leadership
- Communication
- Mutual support
- Situational awareness
Case Study

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Case Study – Root Cause Analysis

• **Communication**
  - OB called Peds to attend delivery without stating the reason
  - Peds did not announce their arrival at the delivery because OB was busy
  - OB was preoccupied with the maternal event and only shared with Peds that there was a shoulder dystocia
  - Peds discussed with mom that they were taking the baby to NICU, but he was doing fine and just needed help breathing
  - Peds did not discuss infant’s absent arm movement with mom or OB

• **Mutual support**
  - Busy day with lots of admissions
  - OB did not call for appropriate additional resources

• **Education**
  - Mom’s nurse did not have prior experience with shoulder dystocia deliveries and never performed suprapubic pressure

• **Documentation**
  - Missing key elements
  - Differed in the mom’s and baby’s charts
  - Noted by Peds as a “difficult” delivery
Teamwork Goals

A pattern of insufficient or poor communication between OB and Peds was identified, impacting the ability to provide safe patient- and family-centered care and placing teams at risk for litigation.

- **Goal:** Improve communication between obstetric and neonatal teams prior to and after deliveries.

- **Goal:** Improve communication to patient and family during medical event and provide follow up information.
Why Create Learning Objectives?

• Serve as basis for the selection of instructional tools
• Serve as guide for staff expectations
• Guide instructors and facilitators during debriefing
• Determine appropriate ways to evaluate staff learning
Creating Learning Objectives

<table>
<thead>
<tr>
<th>Cognitive</th>
<th>What we know</th>
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</thead>
<tbody>
<tr>
<td>Technical</td>
<td>What we do with our hands</td>
</tr>
<tr>
<td>Behavioral</td>
<td>How we combine our Cognitive and Technical skills under pressure</td>
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</tbody>
</table>

**Example:**
The OB provider recognizes and verbalizes the presence of shoulder dystocia to the delivery room team.
## Creating Learning Objectives

<table>
<thead>
<tr>
<th>Specific</th>
<th>What the learner is expected to do</th>
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<tbody>
<tr>
<td>Outcome-based</td>
<td>What the learner should do after instruction</td>
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<tr>
<td>Measurable</td>
<td>What is seen or heard (quantify or qualify)</td>
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**Example:**
The OB team will verbalize the gestational age, fluid color, current maternal medications and fetal condition to the Peds team when they arrive at the delivery.
Scenario Development Tool

Scenario: Shoulder Dystocia (SD)  Learners: OB and Peds delivery teams

Learning Objectives:

Cognitive: 1. The OB provider recognizes and verbalizes the presence of SD to the delivery room team.

Behavioral: 1. The OB team will verbalize the gestational age, fluid color, maternal medications and current fetal condition to Peds.
   2. Peds will report the infant’s condition and interventions to OB prior to departure.
   3. Providers will introduce themselves to the patient/family and provide information on the infant’s condition and anticipated plan of care.
   4. Members of OB and Peds teams will huddle prior to leaving the delivery to share maternal event, patients’ conditions, interventions and follow up care.
Scenario Development Tool

Maternal History

Age: 23  Pregnancy: G5P4, GA 35 wks  Weight: 188  Meds: Vitamins

Medical: Patient developed gestational diabetes during this pregnancy (abnormal GTT). She was placed on an ADA 2200 calorie diet at GA 29 wks, but still has elevated fasting BGs (110-140 mg/dL). She gained 26 lbs during this pregnancy. The EFW was 3558 grams 1 wk ago. She was admitted for uncontrolled gestational diabetes management, large fetal size and evaluation of preterm labor. She presents with lightly green-tinged SROM at 7 am.

Labs: Hb/HCT = 12/36; Platelets = 190,000; Last Hb A1C = 9; Blood type = A pos; GBS = neg; HIV = neg; Chlamydia = neg; Syphilis = neg

Vitals: Vaginal exam: 7 cm dilated, 100% effaced; Contractions: Initially q2-8 min, becoming stronger

Newborn Presentation: Cyanotic, floppy, apneic, HR = 60, right arm does not move
Scenario Development Tool

Scenario Setup

Confederate roles: Mom and anxious family member (“Is everything alright?”)

Mannequins: Pelvic task trainer, baby mannequin

Equipment/supplies: For IV placement, FHR monitor strip, stool, cue cards

Meds: Nalbuphine, pitocin

Scenario Logistics

Expected interventions:

- **OB team:** Perform suprapubic pressure and McRobert’s maneuver
  Hand off maternal and fetal information to Peds team

- **Peds team:** Provide positive pressure ventilation, intubate
  Discuss infant status, interventions and care to OB and family

Expected endpoint: Peds communicates infant’s status and interventions to OB and family
Behavioral Checklist

Information exchanged between OB and Peds, when Peds is asked to attend a delivery

- Peds’ announcement of their arrival at the delivery
- Brief reason why Peds is needed
- Gestational age
- Maternal risk factors (If none, it should be stated.)
- Maternal medications (If none, it should be stated.)

Peds’ communication to OB and family after infant stabilization

- Resuscitative efforts
- Infant’s current clinical status
- Abnormal exam findings
- Anticipated plan of care
# Debriefing

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<tr>
<th>Phases</th>
<th>Examples of Facilitation Questions</th>
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</table>
| **Emotion** | • How do you feel going through the simulation?  
              • What are your first impressions? |
| **Analysis** | • Tell us what went well?  
                • Tell me your thoughts about the information you got when you joined the delivery?  
                • Ok, you said there was a good handoff. What was good about it? |
| **Application** | • What would you have liked to have done differently?  
                  • Going forward, how would you do things the next time given the same clinical situation? |
| **Summary** | • Here is what I heard you say... (list changes identified by staff).  
               • What are the key take away points from simulation today? |
Assessment and Evaluation

- Direct Observations
- Checklists
- Global Rating Scales
- Video and audiotape review
- Evaluations: Take away points from simulation
## Simulation tracking

<table>
<thead>
<tr>
<th>Date</th>
<th>Simulation</th>
<th>NICU Staff</th>
<th>OB Staff</th>
<th>Team Strengths</th>
<th>Areas for Improvement</th>
<th>Plan of Action</th>
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Why Simulation-Based Team Training?

• **Feedback to staff and leadership (tracking from training)**
  - Closes the loop with staff
  - Reinforces buy-in
  - Emphasizes value gained

• **Findings from studies**
  - Increases staff job satisfaction
  - Increases staff perception that they are being respected
  - Improves staff perception that they provide quality patient care

Summary

• Establishing simulation-based team training is an effective method to improve team function.

• Performing a needs assessment helps to direct goals and learning objectives for team training.

• Well-defined learning objectives can direct the creation, implementation and assessment of simulation-based team training.

• Simulation-based team training can improve interprofessional collaboration and communication, which leads to a team culture that promotes patient safety.
Thank You!

• **Future webinar:**
  October 29, 2013
  Linking Simulation and Debriefing to Quality Improvement

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