Linking Simulation and Debriefing to Quality Improvement

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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 how simulations and debriefings serve to identify areas for improvements in patient care, as part of quality improvement (QI) initiatives.

• Discuss how simulations can be used as part of QI to track attainment of clinical, technical and behavioral skills in patient care.
What Does Quality Improvement (QI) Mean to You?
QI Domains

- HEALTH: Clinical Care
- CARE: Systems Performance
- LEARNING: Provider Knowledge

PATIENT OUTCOMES

“From the Benches to the Trenches”

- Basic Research
- Translational Research
- QI and Clinical Research
- Improved Practice

Improved Patient Outcomes
PDSA Cycle

PLAN
Define objective & plan QI project.

DO
Carry out QI project & track data.

ACT
Implement change & plan next cycle.

STUDY
Analyze data & summarize results.

Shewhart WA. 1939; Deming WE. 1986.
Transformation of Care and Learning

**POLICY:**
- Change protocols & standardize practice

**PRACTICE:**
- Trial changes
- Obtain evidence for change & support
- Obtain feedback
Debriefing and Simulation in QI

Debriefing & Simulation

Provider Knowledge

Clinical Care Model

Systems Performance

Patient Outcomes
Sentinel Events (per 1000 deliveries)

Compensation Payments

QI Initiatives in Obstetrics & Neonatology
Improving Deliveries in the ED

• What is the objective of the QI initiative?
  o To identify areas for improvement during simulated deliveries of infants in the ED, as part of a needs assessment

• How do we achieve the objective?
  o Develop and implement a simulated precipitous delivery, followed by a facilitated debriefing
    – Who, what, where, when?
  o Designate types of performance improvements to focus on during simulation and debriefing
  o Develop tools for data collection
  o Choose 3 areas for improvement identified during session to focus practice changes
Simulating the ED Delivery

- **Background**
  - 35-ye G3P2 woman at 34-2/7 wks presents to ED with husband in 2nd stage of labor. They recently moved to Rochester.

- **Expected events**
  - Premature infant is delivered in ED, and care handed off to NICU staff. The placenta is delivered.
  - Mom’s vitals and bleeding are within normal limits. Newborn is cyanotic, which resolves with positive pressure ventilation. Vitals are stable.
  - Simulation ends after teams communicate with parents regarding newborn status and infant transfer to NICU.
Capturing Areas for Improvement

• During simulation
  o Monitor response times of teams
  o Record the number of participating staff and roles in the delivery
  o Note strengths and weaknesses in team function and patient care

• During debriefing
  o Record areas for improvement identified by staff during debriefing

• After debriefing
  o Complete observer checklist
  o Conduct a post-debriefing debrief among organizers to discuss initial findings & next steps
Identified Areas for Improvement

• **Systems-Based Practice**
  - Teams paged to go to ED with no information about situation
  - Warmer placed near mom, but position not accessible to O2 and suction equipment
  - ED team did not know how to access methergine and pitocin
  - Too many (n=35) people were present

• **Clinical Care**
  - Delivery pack missing from ED
  - Newborn radiant warmer not ready for delivery
  - NICU team did not have an oximeter for resuscitation

• **Teamwork & Communication**
  - No identifiable team leader for each patient
  - Staff did not introduce themselves to teams or family
  - No dedicated staff member to address family concerns
# Observer Checklist

<table>
<thead>
<tr>
<th>Response/Preparation</th>
<th>Observed</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ED determined location for:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Patient</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>• Infant (separate room set-up)</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>• Family</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td><strong>Equipment was available and prepared</strong></td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td><strong>Communication of location and situation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Teams arrived to appropriate location</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>• Teams had accurate info about patient upon arrival</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td><strong>Information exchange:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Participants introduced themselves to each other</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>• Participants introduced themselves to the patient/family</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>• Participants ask others their names</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>• Individuals exchanged information</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>• Family/Patient provided clinical updates</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>• Participants sought out information if needed</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td><strong>Did you observe any of the following:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Identified Room leader</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>• Participants appeared to know who the leader was</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>• Person appointed for crowd control</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>• Family support</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>• Brief</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>• Huddle</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>• Handoff</td>
<td>Y N</td>
<td></td>
</tr>
</tbody>
</table>
### Observer Checklist Results

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED determined a separate location for infant</td>
<td>100% answered NO</td>
</tr>
<tr>
<td>Equipment was available and ready</td>
<td>100% answered NO</td>
</tr>
<tr>
<td>Participants identified self to family and other providers</td>
<td>100% answered NO</td>
</tr>
<tr>
<td>A leader for each team was clearly identified</td>
<td>100% answered NO</td>
</tr>
<tr>
<td>A person was appointed for crowd control</td>
<td>100% answered NO</td>
</tr>
</tbody>
</table>
Implementing Change

• Discuss findings among organizers and key stakeholders
• Identify the most important opportunities to change first
• Discuss how practice should be changed for each item
• Develop a process for implementing changes
• Delegate individual responsibilities for overseeing changes
• Share findings and plans with all staff
• Begin planning the next PDSA cycle
### Tracking Identified Opportunities

**Date, Location:** 7/31, Emergency Room (in situ)  
**Delivery Scenario:** Premature vaginal delivery

<table>
<thead>
<tr>
<th>NICU</th>
<th>OB</th>
<th>ED</th>
<th>Strengths</th>
<th>Areas for Improvement</th>
<th>Plan of Action</th>
</tr>
</thead>
</table>
| Attending RD | Attending TO TG Resident SV ET Nurse SG MA AG | Attending ML LS RS Resident VL AR EL Nurse TC | 1. ED activated appropriate resources and called the OB & NICU teams in timely manner.  
2. All teams assembled in ED within 3 minutes of patient arrival. | 1. **Resources & patient placement**  
- Delivery pack was missing a bulb syringe.  
- The newborn warmer was not ready for resuscitation; it was placed near mom, but there was no access to O₂ and suction.  
2. **Teamwork & communication**  
- Team leaders were not identified for each patient.  
- Staff did not introduce themselves & roles to other teams or family.  
3. **Crowd control**  
- 35 people present in the room. |  
**ED:** Initiate weekly checks on infant warmer and supplies.  
**OB and NICU:** Trial use of ID tags during deliveries in off-service areas (e.g., OB nurse, OB attending, etc.). Tags will be in delivery totes.  
**10/1:** Start trialing changes for 6 mo. |
Take Away Points

• Simulation & debriefing as a QI tool
  o Allow organizers to control certain variables
    – Control patient scenario, timing of implementation, etc.
  o Guide future direction of QI initiative by revealing areas for improvement
    – Focus on a few areas at a time to increase success of achieving objectives
  o Reveal systems-based problems when done in patient care areas

• Simulation & debriefing as a training tool
  o Improves patient care through staff attainment of cognitive, technical and behavioral skills
  o Builds teams and collaboration when staff participation is interprofessional and interdisciplinary
Communication during Deliveries

• **Objective of 1st PDSA cycle**
  o To identify areas for improvement within the domains of teamwork and communication between OB and NICU teams during high-risk deliveries through a needs assessment

• **Process to achieve the objective**
  o Noted teamwork-related concerns from root cause analyses
  o Reviewed results of Safety Attitudes Questionnaires
  o Observed deliveries and pilot simulations
  o Reviewed perinatal literature

• **Main result of needs assessment**
  o Need to improve communication of vital information among OB and NICU providers
Communication during Deliveries

- Developed simulation-based training program
  - Annual curriculum for OB and NICU providers
  - Standardized delivery room scenarios, followed by debriefings

- Developed assessment tools
  - Survey
    - Asks providers about communication during deliveries
    - Combines Likert scale ratings and open questions
  - Communication Checklist
    - Validated tool to rate team communication during deliveries

- Used assessment tools to rate communication
  - During actual and simulated deliveries each year
Program Overview

• Ongoing team training program since 2007
  o Fall and winter months
  o 20-25 sessions per year, 90 minutes long

• Participation from OB and NICU teams:
  o Attendings, fellows, residents, nurse practitioners, nurses
  o 75 - 100% participation

BRIEFING
Staff oriented to goals of training

SIMULATION
Staff participates in simulated high-risk delivery

DEBRIEFING
Staff discusses teamwork and communication
Survey Statements

<table>
<thead>
<tr>
<th>Communication between OB and NICU teams</th>
<th>P ≤ 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. OB and Peds are well-coordinated during emergencies.</td>
<td>#</td>
</tr>
<tr>
<td>2. I know the roles of each person on the OB and Peds teams.</td>
<td>*, #</td>
</tr>
<tr>
<td>3. OB collaborates and communicates well with Peds.</td>
<td>#</td>
</tr>
<tr>
<td>4. OB provides adequate maternal information to Peds.</td>
<td>*, #</td>
</tr>
<tr>
<td>5. Peds collaborates and communicates well with OB.</td>
<td>*, #</td>
</tr>
<tr>
<td>6. Peds relays back to OB the infant’s status after stabilization.</td>
<td>*, #</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Communication with the family</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Peds speaks to the mother and family in a patient-friendly manner.</td>
<td>*</td>
</tr>
</tbody>
</table>

Responses by OB (*) and NICU (†). Analysis by Kruskal-Wallis test comparing ratings across project period.
Staff Ratings of Communication

Communication between OB & NICU

Communication with the Family

Likert Scale Rating

Y1 Y2 Y3

Y1 Y2 Y3

OB Peds

Delivery Communication Checklist

**Information shared BEFORE delivery**

- **OB → Peds team**
  What OB tells Peds when they ask Peds to attend a delivery

- **OB → Peds team**
  What OB tells Peds when Peds arrives at the delivery

**Information shared DURING and AFTER delivery**

- **Peds → OB team**
  What Peds tells OB during & after newborn stabilization

- **Peds → Family**
  What Peds tells the family during & after newborn stabilization

Communication before Delivery

Information exchanged between OB and Peds, when OB calls and asks Peds to attend a delivery
- Brief reason why Peds is needed
- Gestational age
- Maternal risk factors (If none, it should be stated.)

Information exchanged between OB and Peds, when Peds arrives at the 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.)
- Time of birth or minutes of life during handoff (if applicable)
Communication during/after Delivery

Information exchanged between OB and Peds, after Peds stabilizes the infant
- Resuscitative efforts on infant
- Infant’s current clinical status
- Where the infant will be admitted
- Apgar scores

Peds’ communication to OB and family after infant stabilization
- Introduction of Peds to the family
- Infant’s current clinical status
- Measures done to help the infant transition
- Why NICU care is required (if applicable)
- Offer to answer any questions
- Offer to let the family see, touch and hold the infant

Dadiz R et al. Simul Healthc 2013.
Team Communication Scores

Scores during simulations (* P < 0.001) and actual deliveries (** P = 0.005) over time.

Delivery Communication Checklist

Information shared BEFORE delivery

OB \(\rightarrow\) NICU team
What OB tells NICU when they ask NICU to attend a delivery

Information shared DURING and AFTER delivery

NICU \(\rightarrow\) OB team
What NICU tells OB during & after newborn stabilization

NICU \(\rightarrow\) Family
What NICU tells the family during & after newborn stabilization

OB \(\rightarrow\) NICU team
What OB tells Peds when NICU arrives at the delivery

QI Example 2
Transformation of Care and Learning

PARENT PROJECT

SUB-PROJECTS:
- OB call to NICU to attend delivery
- NICU communication with OB about infant
- NICU communication with family
## FAMILY COMMUNICATION TOOL

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduce yourself and state your role.</td>
<td>• “My name is _____, and I am the [doctor, nurse, nurse practitioner] taking care of your baby.”</td>
</tr>
<tr>
<td>Communicate with warmth and smile.</td>
<td>• “Congratulations!”</td>
</tr>
<tr>
<td></td>
<td>• “Do you have a name for your baby?”</td>
</tr>
<tr>
<td></td>
<td>• “Happy birthday!”</td>
</tr>
<tr>
<td></td>
<td>• “You have a beautiful baby.”</td>
</tr>
<tr>
<td></td>
<td>• “Do you have family in the waiting room? Is it okay for them to see your baby?”</td>
</tr>
<tr>
<td>Share initial plans and expectations.</td>
<td>• Initial plan of care.</td>
</tr>
<tr>
<td></td>
<td>• Invite dad / support person to NICU.</td>
</tr>
<tr>
<td></td>
<td>• Talk about NICU visitation policy.</td>
</tr>
<tr>
<td>Ask parents for questions.</td>
<td>• “Do you have any questions?”</td>
</tr>
<tr>
<td></td>
<td>• “Is there anything else I can do for you right now?”</td>
</tr>
</tbody>
</table>

What Peds tells the family during & after newborn stabilization

**Communication Behavior**

- Introduce yourself & state your role
- Communicate with warmth & smile
- Share initial plans & expectations
- Ask parents for questions

**# of Teams Who Performed Behaviors**

- **Actual Deliveries (n=11)**
- **Simulated Deliveries (n=11)**

Take Away Points

• Simulation & debriefing as a QI tool
  o Guide future direction of QI initiative by revealing areas for improvement
    – Sub-projects can target a specific area of need
  o High-fidelity simulation can mimic the “real world” environment to track progress over time
  o Visual aids (e.g., graphs, run charts, etc.) help trend improvements over time

• Simulation & debriefing as a training tool
  o Builds teams and collaboration when staff participation is interprofessional and interdisciplinary
Impact of an Obstetric Initiative

• Across consortium of 5 major academic institutions
  o Pre-initiative, 2000-2004
  o Post-initiative, 2005-2009

• Huge impact on patient care, cost-benefit savings and staff outlook on safety climate
  ➢ 34% reduction in average annual claim frequency
  ➢ 45% reduction in claim rate per 10,000 births
  ➢ Millions of dollars in annual savings
  ➢ 94% improvement in safety scores
    o As reported by OB staff on annual surveys

MCIC Vermont, Inc., data as of 6/30/2011
Simulations and debriefings are valuable QI tools for patient safety to identify areas for improvement in:

- **Clinical care**
- **Systems performance**
- **Provider knowledge**

Providers can conduct simulations to track attainment of clinical, technical and behavioral skills for QI.

Simulation-based learning provides the added benefit of staff training and team building across professions and disciplines.
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Thank You!

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