

Improving Perinatal Safety: Managing Risk

Simulation User Network
San Diego
Dec 1-2, 2010

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Objectives

- Discuss the medical/legal environment in the Perinatal area
- Identify issues specific to Perinatal care
- Describe the role of simulation in providing safe, reliable care
- Discuss collaboration with multidisciplinary leadership
- Describe how to plan and implement in-situ simulation

Why Simulation Training?

- In 2004, Joint Commission published specific risk reduction strategies for perinatal emergencies, noting that the majority of perinatal deaths/injuries are related to organizational culture and communication among caregivers
- Identified variations in how different healthcare providers are trained to respond and communicate during an urgent/emergent situation
- In 2010 published another sentinel alert specific to maternal mortality

Joint Commission 2004 Sentinel Event Alert

- Root cause analysis of 71 sentinel events (61 deaths, 10 with severe morbidities)
 - Communication (72%)
 - Safety culture (55%)
 - Staff competency (47%)
 - Orientation and training (40%)

Joint Commission Recommendations Sentinel Event Alert Issue #30

- Organizations should conduct:
 - Team training in perinatal areas to teach staff to work together and communicate more effectively
 - Clinical drills to help staff prepare for high-risk events
 - Debriefings to evaluate team performance

Joint Commission Recommendations

Sentinel Event Alert Issue #44

“Identify specific triggers for responding to changes in the mother’s vital signs and clinical condition and develop and use protocols and drills for responding to changes, such as hemorrhage and pre-eclampsia. Use the drills to train staff in the protocols, to refine local protocols, and to identify and fix systems problems that would prevent optimal care.”

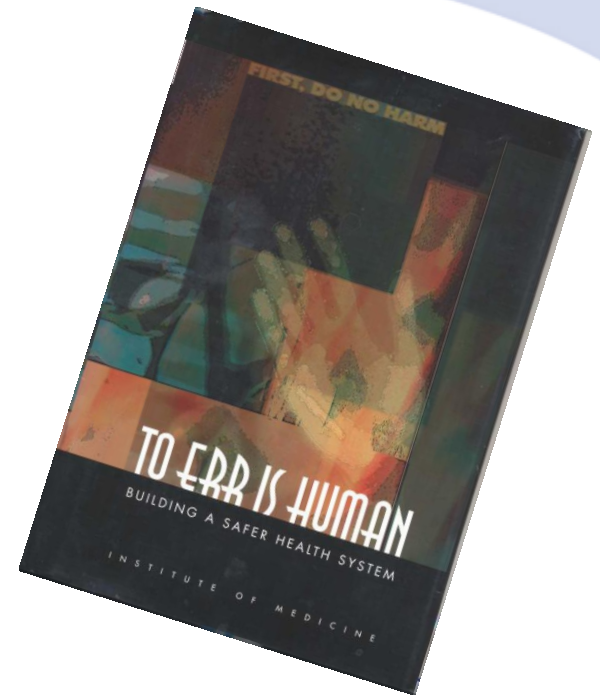
http://www.jointcommission.org/SentinelEvents/SentinelEventAlert/sea_44.htm

Maternal Mortality Rate

- National Center for Health Statistics of the Centers for Disease Control and Prevention in 2006 noted the national maternal mortality rate was 13.3 deaths per 100,000 live births
- Healthy People 2010 target of no more than 3.3 maternal deaths per 100,000 live births

Institute of Medicine's To Err Is Human

In 1999, the IOM specifically called for establishment of interdisciplinary team-training programs that incorporate efficient training methods, including simulation



National Quality Forum

“Economic toll from preventable medical errors cost anywhere from \$17-\$29 billion annually”

http://www.qualityforum.org/News_And_Resources/Press_Releases/2009/National_Quality_Forum_Endorses_Updated_Safe_Practices.aspx

Intermountain Healthcare: Perinatal Simulation Program



Intermountain Healthcare

- Not-for-profit integrated healthcare system located in the intermountain west
- Nineteen birthing facilities and one free standing Children's hospital
- Range from large tertiary centers to small rural facilities
- Over 32,000 births a year

Goal of Maternal-Child Simulation Project

- Demonstrate the benefit of creating a collaborative, interdisciplinary training program to prepare for emergent situations in Women and Newborns service line
- Utilize interdisciplinary clinical leaders from across the community to define the program components for simulation training
- Create a shared vision for developing and implementing simulation training (methodology and processes)

Neonatal Resuscitation as a Start

- Described by Joint Commission as a high risk event conducive to clinical drills and debriefings
- Defined national curriculum - Neonatal Resuscitation Program (NRP) is required in our facilities for those who care for neonates at birth
- Dependent on a coordinated interdisciplinary team response in the delivery room to achieve optimal outcomes

Initial Step-Determine our current state

- Training for dealing with urgent/emergent situations differed between facilities
 - Time allotted for training varies
 - Type of training varies
 - NRP-some facilities allowed 4 hour class to renew others did during work hours
- Disciplines did not train together

Goals of Neonatal Simulation Project

- Develop and improve the cognitive, technical and behavioral skills necessary to perform optimal neonatal resuscitation in a team environment
- Increase trainees' confidence in performing neonatal resuscitation
- Shorten the training time for novice practitioners to achieve proficiency in neonatal resuscitation
- Improve the quality of education and training, ultimately resulting in improved neonatal resuscitation outcomes
- Provide opportunity to participate in a wide variety of complex neonatal resuscitation scenarios in a safe environment

Measurable Outcomes

- Assess clinician perception of simulation training methodology compared to standard NRP training utilizing a standardized tool
- Assess staff satisfaction with simulation training compared to other methods of education

Budget Creation

- Hours for training
 - Initial cost for Stanford CAPE training program
 - Creation of our Intermountain instructor training program
 - “Train the Trainer Courses”
 - NRP courses (some already budgeted)
- Equipment needs
 - Manikins-initial budget included basic manikin
 - Cameras-hand held camera \$279
 - Supplies-varied according to site

Initial Steps

- Champions found in nursing and medical provider leadership
- A multi-disciplinary team was assembled and sent to a nationally recognized three day simulation instructor training program at Stanford Center for Advanced Pediatric Education (CAPE) in March 2007.
 - OB provider
 - Neonatologist
 - L&D nurse
 - Neonatal nurse practitioner
 - Two neonatal nurses
 - Respiratory Therapist

Other Program Development Issues

- Confidentiality
- Photo consent
- Evaluations
 - Program
 - Learner
- CME/CEU
- Equipment
 - Purchase, care, cleaning and maintenance
- Course scheduling

Roll-Out Process

Simulation “Kick-Offs” were held to introduce simulation training to facility leadership

- Brief introduction to simulation
- Participation in scenarios

Emphasized Multi-disciplinary Team Training

- Achieved buy-in for team participation
 - Met with leadership from all disciplines and identified champions right from the start
- Teams of trainees and instructors
 - Nursing both maternal and newborn, obstetric care providers, CNA or PCT, newborn care providers, respiratory therapy

Instructor Training “Train the Trainer Program”



Instructor Training Process

- With permission the information and materials received from Stanford CAPE training program used to create a two day Instructor Training Program specific to the needs at Intermountain Healthcare.
- Initial instructor training was implemented and Neonatal Resuscitation simulation classes were held at the pilot site June 2007
- Extensive two day instructor training was implemented across the Intermountain Healthcare system in the fall of 2007

Program Creation

- Online resources for instructors
 - Course content for instructor and trainee programs
 - Debriefing guide
 - Ten basic simulation scenarios
 - Hints for simulation

Recruiting Instructors

- Shared vision for simulation with instructors
- Recommended teams of instructors from different disciplines
- Determined not all current NRP instructors would be trained for simulation
 - Expertise in content
 - Comfort level with teaching modality
 - Communication Skills
 - Organizational skills

Instructor Training

DAY ONE: Instructors participate as learners in order to better understand the student experience in a simulation environment which includes:

- Introduction including a brief lecture describing simulation-based training, videotape review of examples of participants performing in simulated environments
- Detailed hands-on orientation to the simulation environment
- Participation in scenarios designed to simulate real neonatal medical situations
- All scenarios and events are captured on time-coded videotape for playback during a formal debriefing session that immediately follows each scenario
- Evaluation of the course

Instructor Training

- DAY TWO: Training is focused on preparing instructors to teach simulation courses:
 - Review of Simulation Course content including discussion of scenario design, debriefing, building a successful simulation program, qualities of instructors and adult learning principles
 - The second half of day two is spent with participants acting as instructors involved in running the scenarios, filming and debriefing
 - Care of equipment
 - Evaluation of the course

Challenges with instructor training

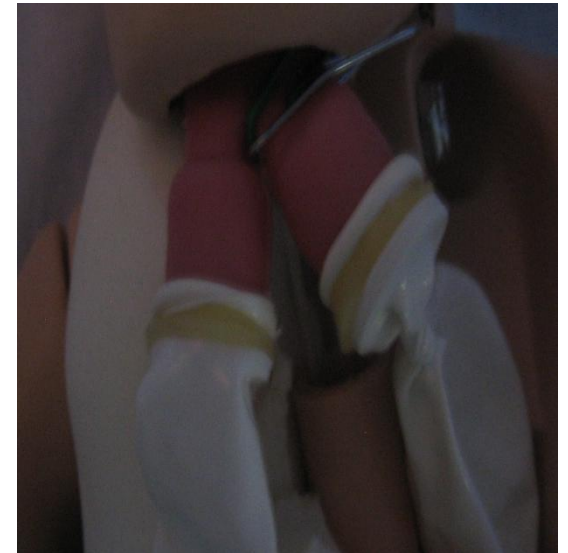
- Debriefing skill competency
 - Initial competency
 - Maintaining competency
- Instructor as content expert
 - Knowledge deficient in newborn physiology

Finding space to hold courses

- Different solutions for each Intermountain region
 - Empty patient rooms for scenario then conference room or patient room to debrief
 - Conference rooms with portable oxygen/suction
 - Rooms on closed units
 - Simulation Center pilot in one region

Equipment

- Hand held cameras-capability to focus on specific issues during scenario
- Utilized mid fidelity “altered” manikins at all sites
 - Meconium-instilled in trachea and lungs
 - Pneumothorax
 - Cyanotic newborn
 - Diaphragmatic hernia
- Supplies “scavenged” from units
 - Resealed after use
 - Label as simulation supplies



Scenario Content Example

- Learning Objectives
- Personnel needed
- Equipment set-up
- Expected interventions
- Debriefing points
- Suggestions to change scenario from simple to complex

Program Roll-Out

- January 2008 initiated teaching NRP using only neonatal simulation classes throughout Intermountain Healthcare birthing facilities
- Multi-disciplinary training emphasized sometimes not achievable

NRP Provider/Renewal Training

- Upon registration participants receive a letter providing an overview of the course and instructions for participation.
- Participants are required read and study the Textbook of Neonatal Resuscitation before attending course.

NRP Course Overview

- Introduction including a brief lecture describing simulation-based training, videotape review of examples of participants performing in simulated environments
- Detailed hands–on orientation to the simulation environment
- Participation in scenarios designed to simulate real neonatal medical situations
- Scenarios and events are captured on time-coded videotape for playback during a formal debriefing session that immediately follows each scenario
- As many as five scenarios and debriefings are conducted in a single program
- Evaluation of the course

Our Typical Simulation Program

- Welcome and introduction to simulation-based training
 - Confidentiality
- Curriculum overview utilizing brief video clips
- Review of skills
 - Cognitive-required to study prior to attendance
 - Technical-practice time provided with equipment
 - Behavioral-discussion of Crisis Resource Management (CRM) principles

Orientation to Simulation Environment

- Equipment
- Drugs, fluids
- Manikins
- Colleagues/roles



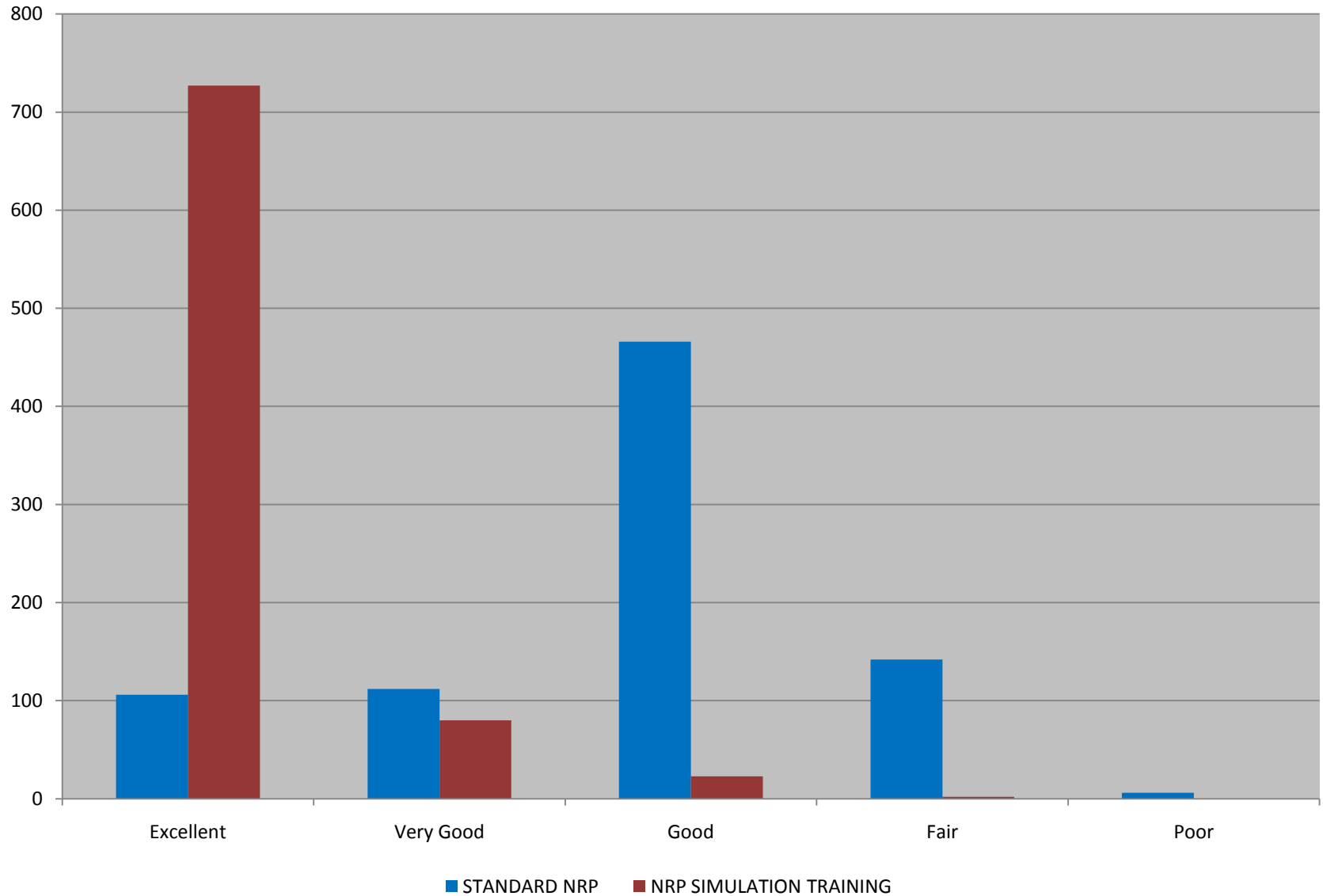
Our Typical Program-Debriefings

- Move to another room to allow participants to separate from simulation experience and reflect on performance
- Allow participants time to initially “debrief themselves”
- Review videotape-stopping at critical points
- Usually 2-3 times the length of the scenario
- Constructive feedback
 - Instructors
 - Colleagues

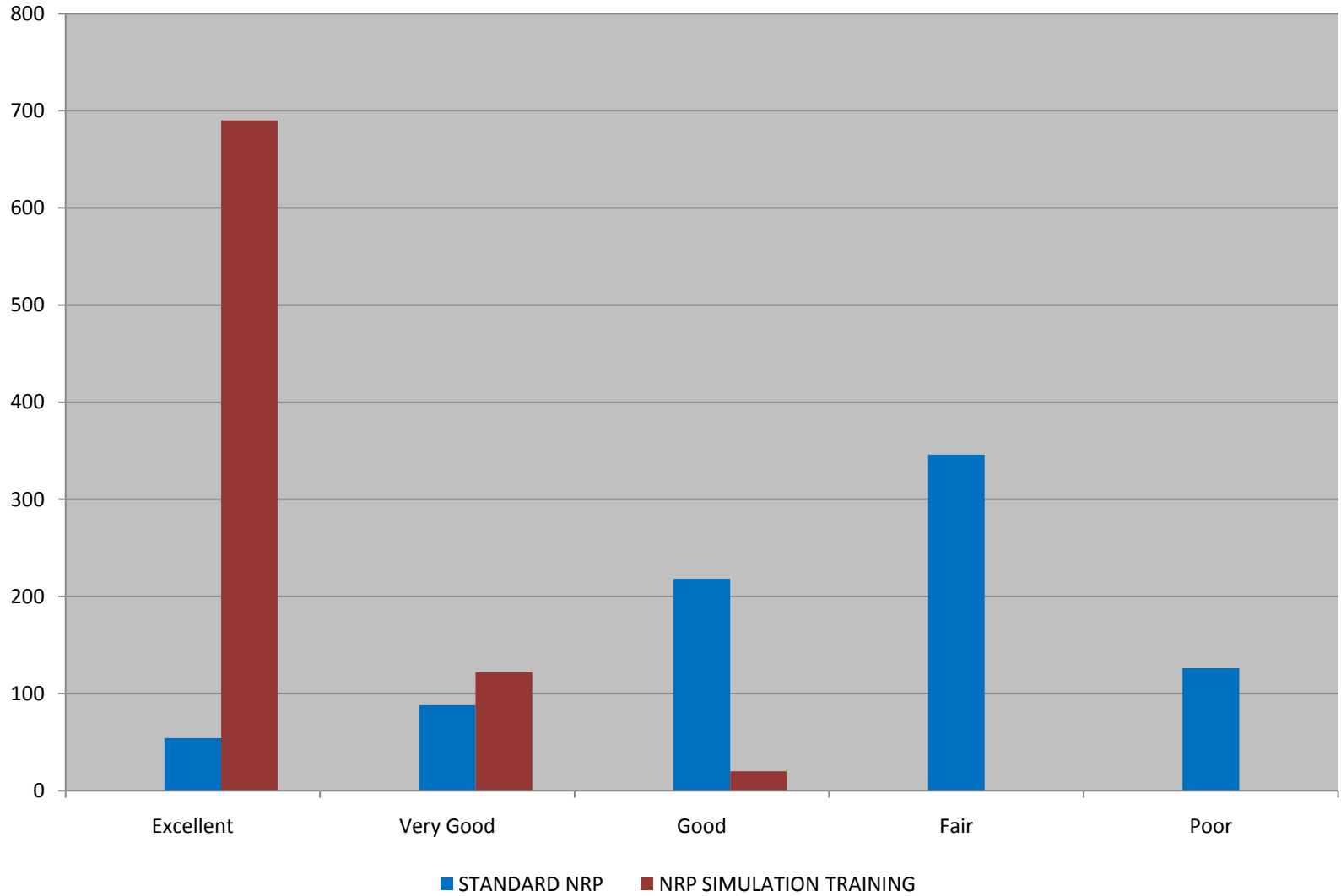
Evaluations

- This project included evaluations which compared the traditional Neonatal Resuscitation training program with simulation based training
- Based on Stanford CAPE evaluation-used with permission

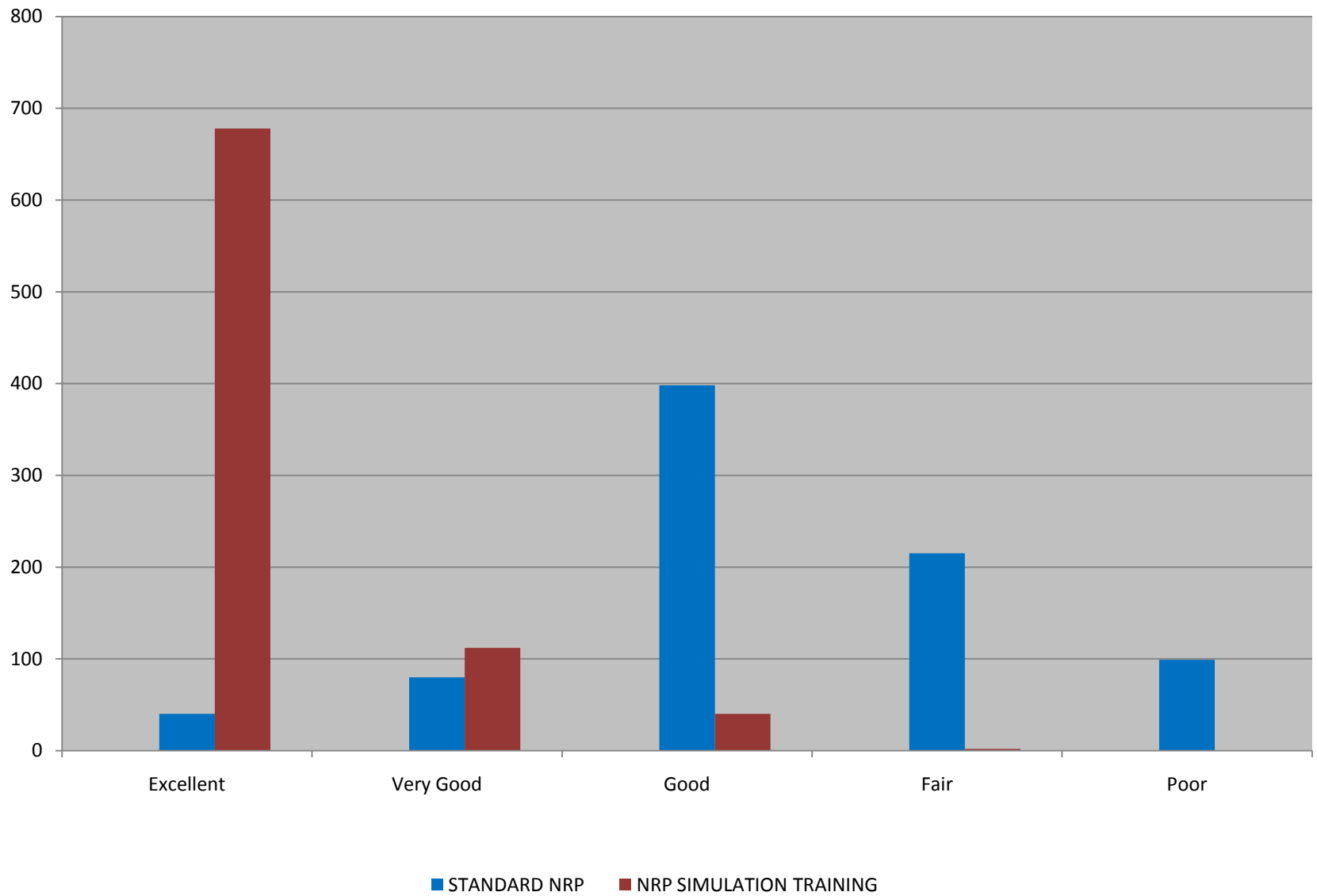
Relevance to my practice in the hospital



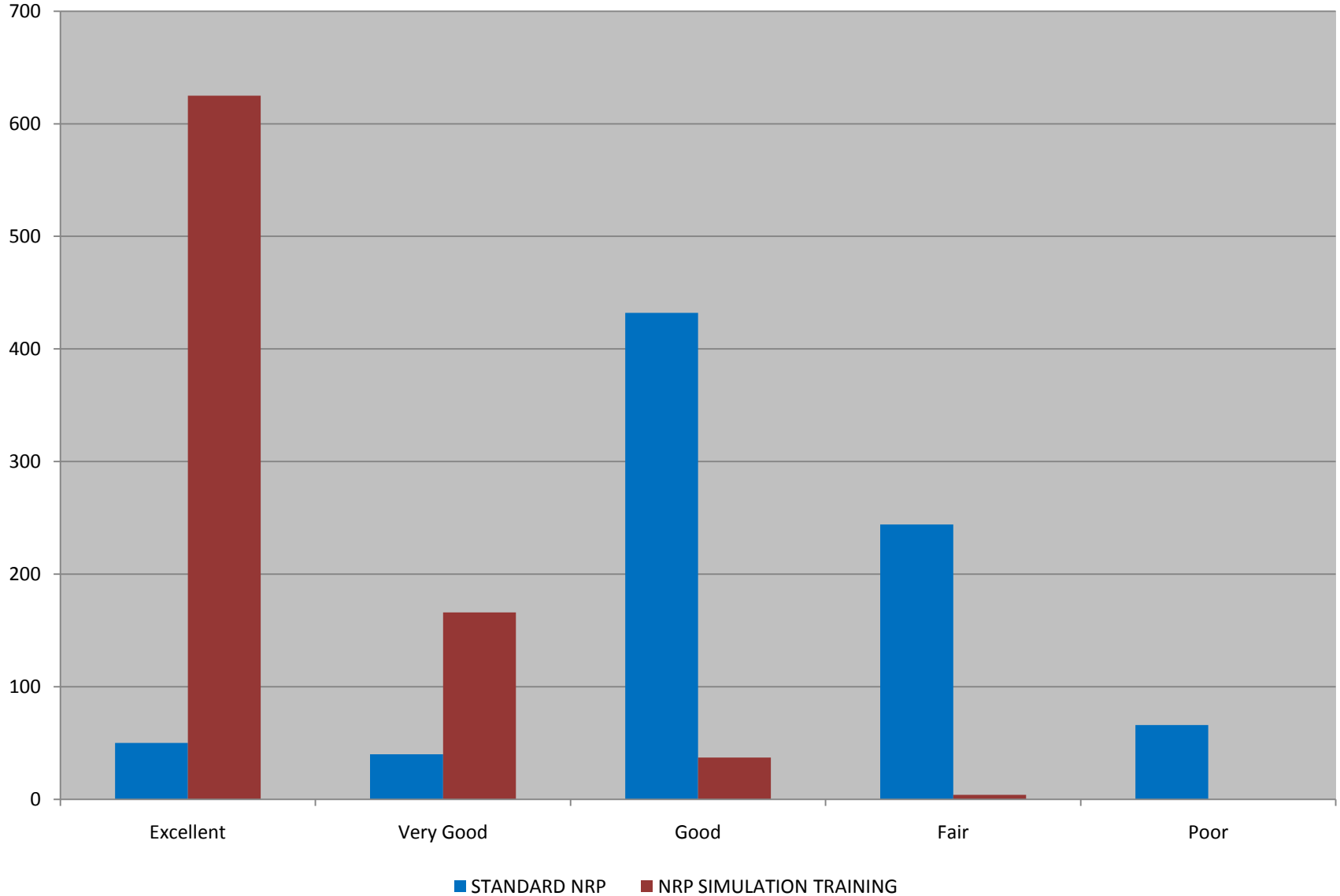
Ability to engage my intellect



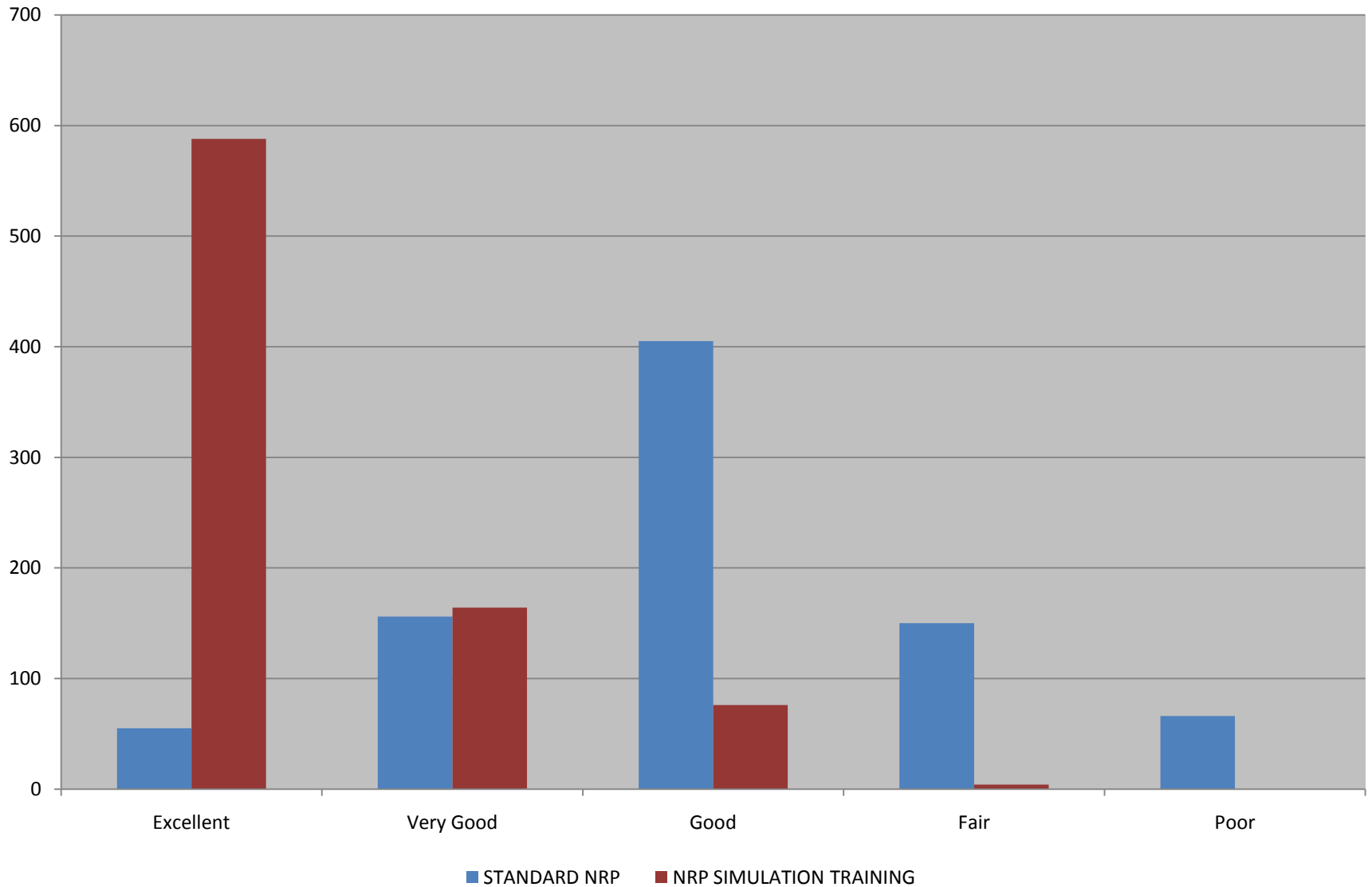
Ability to develop my behavioral skills (e.g. leadership, communication, etc.)



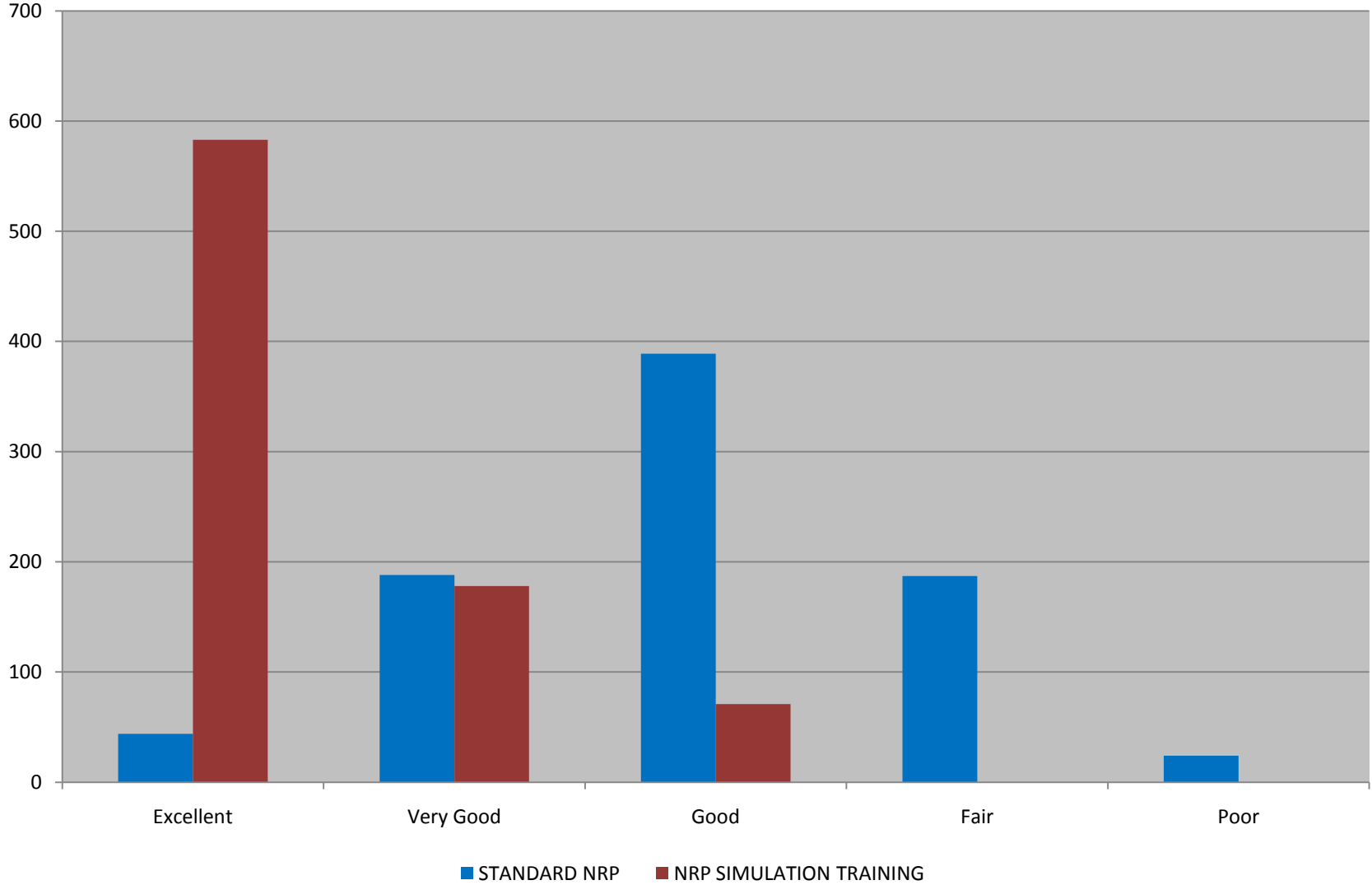
Ability to transfer behavioral skills to the real environment



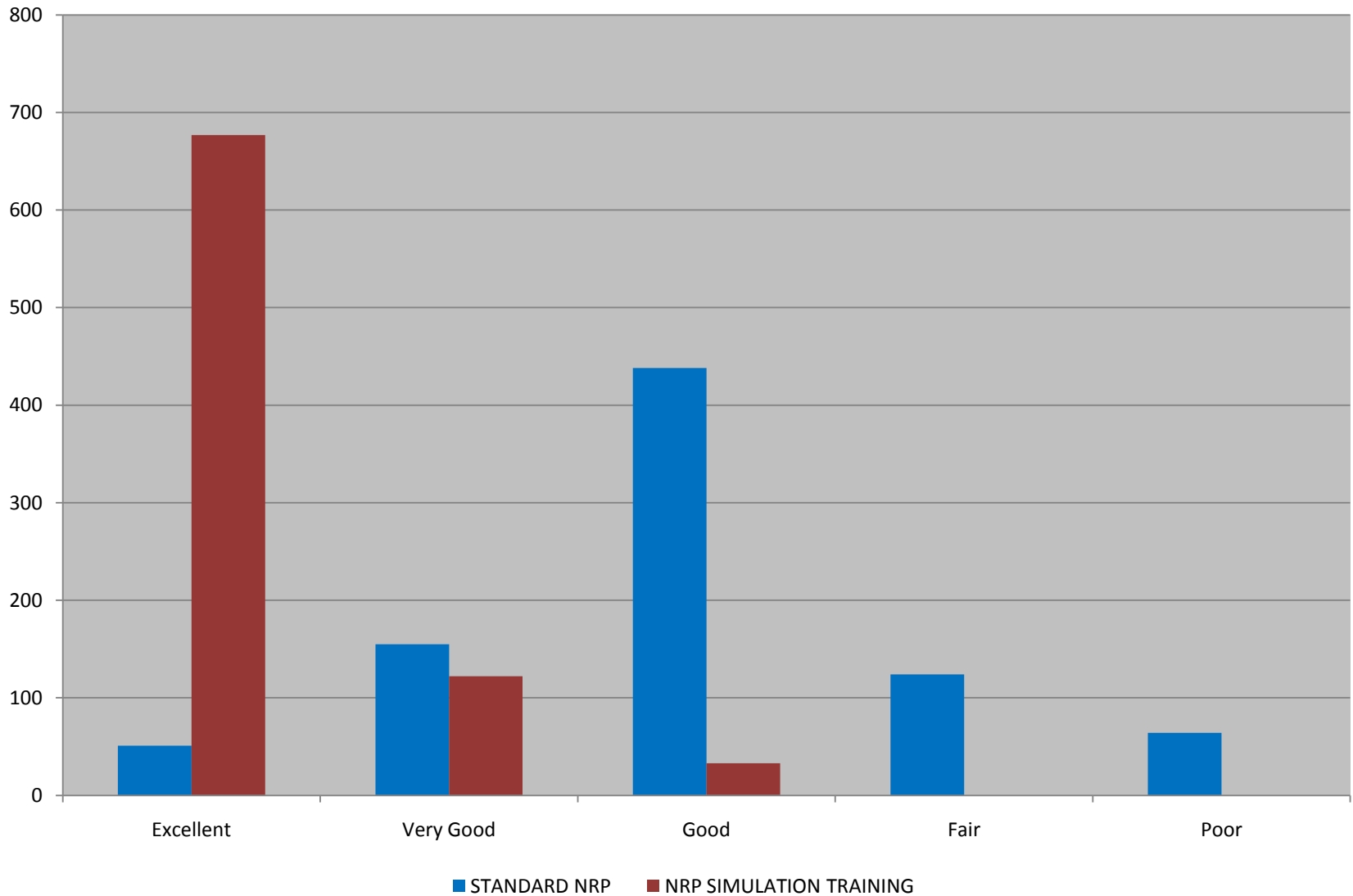
Ability to develop my technical skills (e.g. drug administration, bag/mask ventilation, etc.)



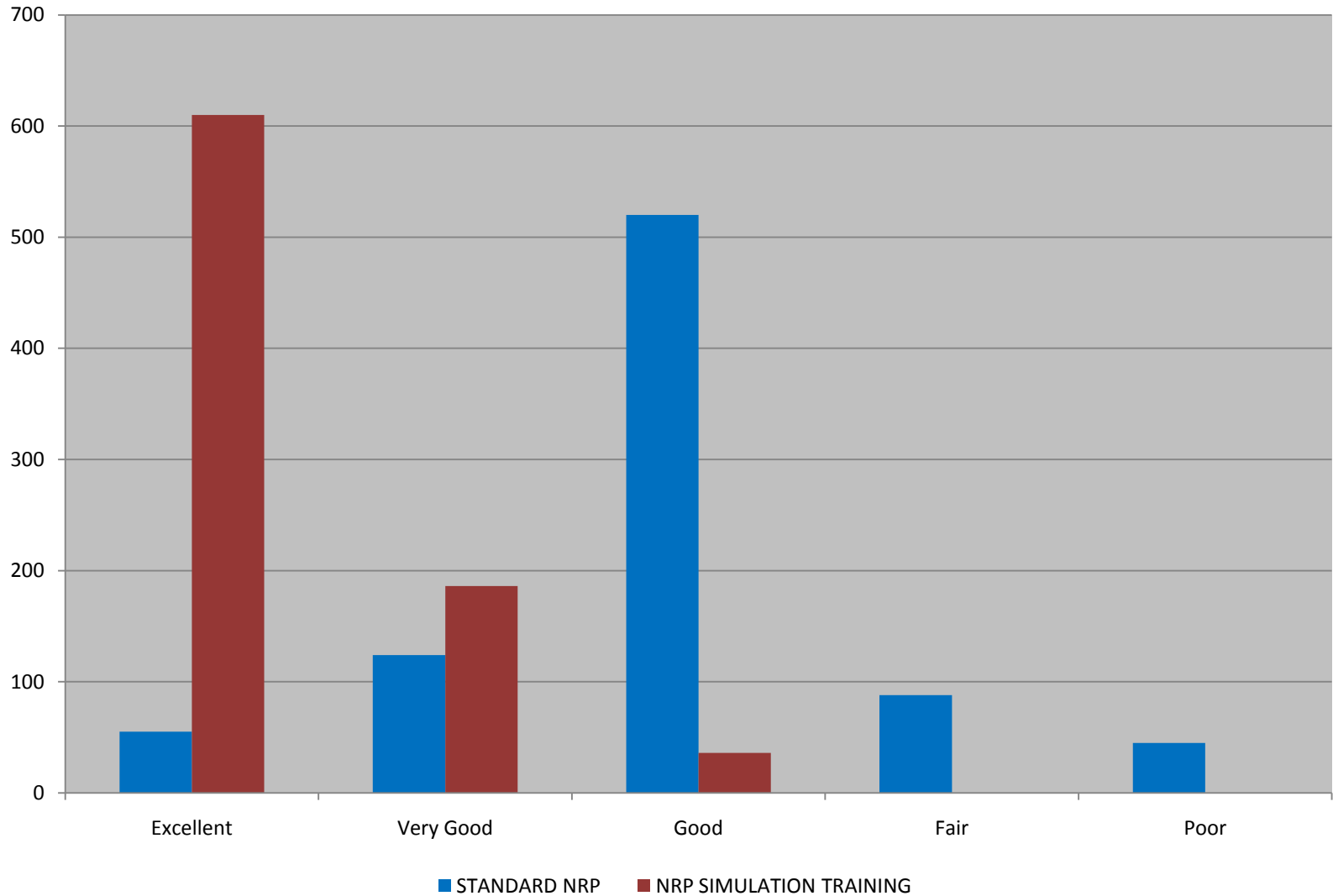
Ability to transfer technical skill to the real environment



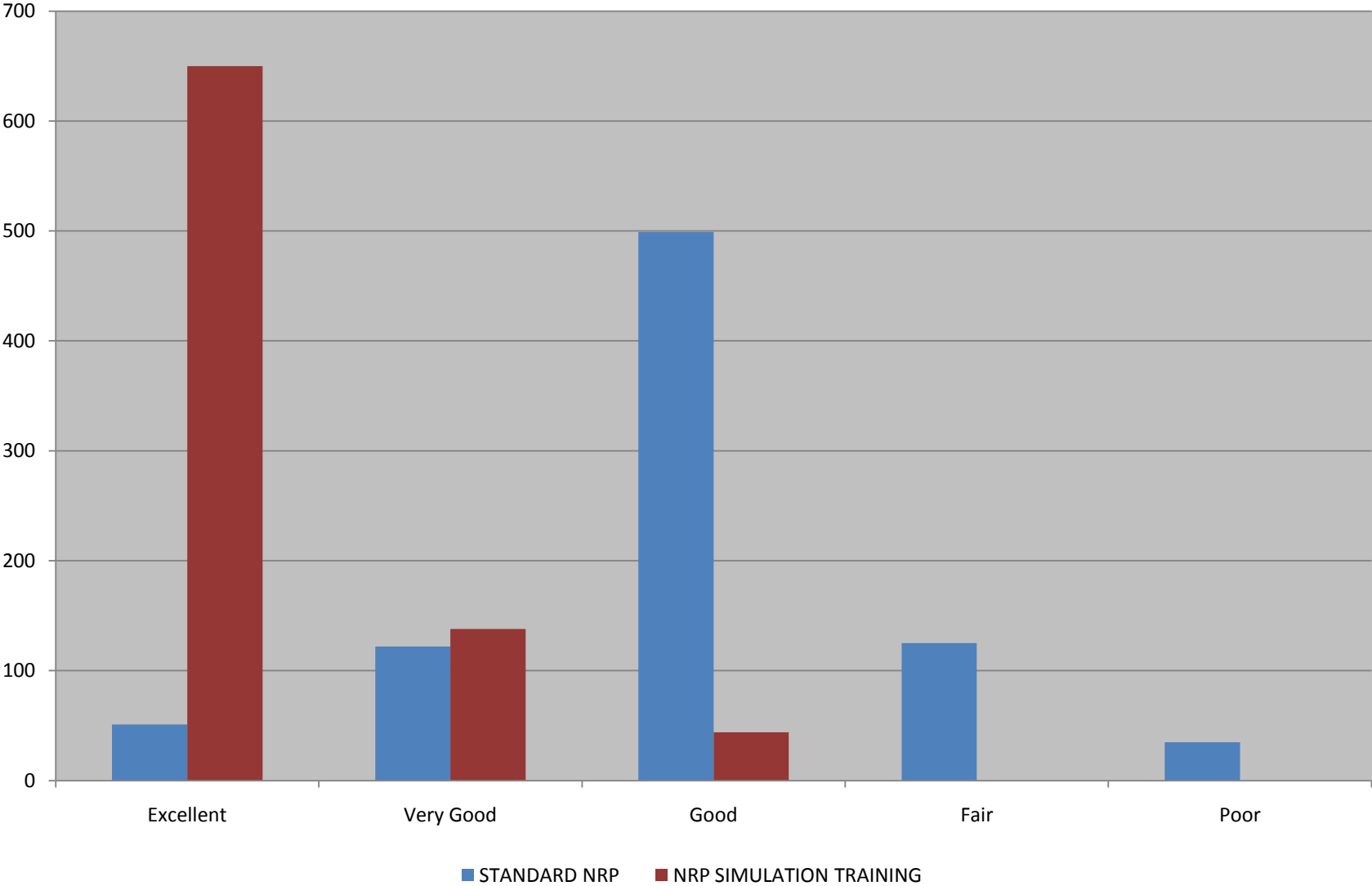
Ability to develop my critical thinking skills



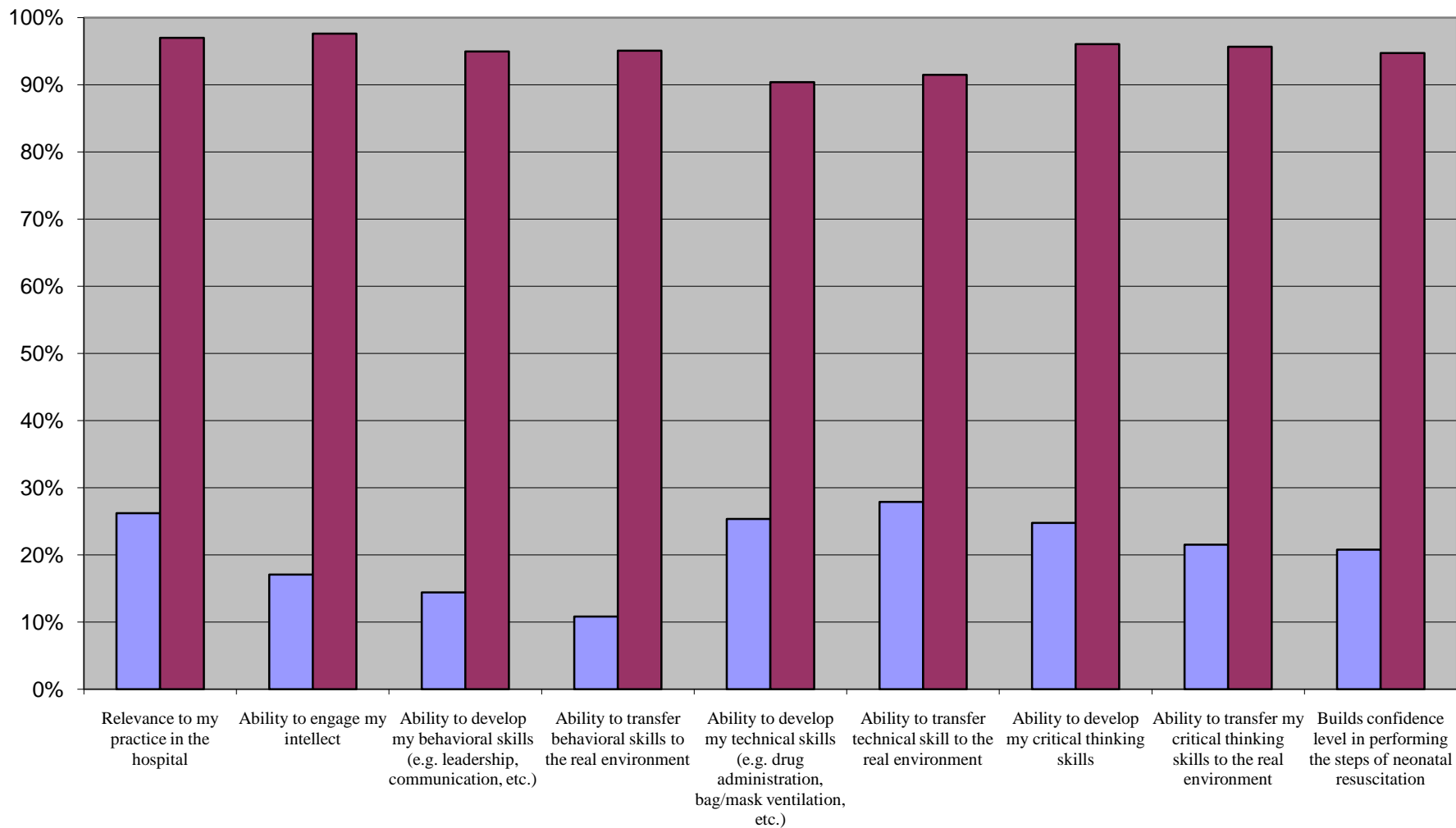
Ability to transfer my critical thinking skills to the real environment



Builds confidence level in performing the steps of neonatal resuscitation



Percentage of attendees who rated Neonatal Resuscitation Program training excellent or very good



Participant Comments

- “Good experience not only for skills confidence but for team dynamics and communication skills.”
- “I had less anxiety completing this NRP than the standard program because I was actually challenged and instructed in strengths and weaknesses.”
- “I have taken NRP classes over the years and have always hated the process, but now with simulations I will look forward to class. I actually learned new behaviors and improved communication skills with team members.”
- “This was a very eye-opening, but positive experience and I feel like I learned a great deal about where I am with my skills and I was able to see my weaknesses and strengths more clearly.”
- “Although the scenarios scared me, I feel they were very valuable. I feel more confident with this type of pass-off.”
- “I think the videos were both my favorite and least favorite thing about the training. I hated to see myself make mistakes but also appreciated seeing how I really responded in a crisis situation.”

Shoulder Dystocia Program

- Defined risk area -shoulder dystocia was a rare yet potentially catastrophic event
 - Litigation lawsuits related to shoulder dystocia deliveries result in the second largest category of indemnity payments in obstetrics (exceeded only by birth asphyxia)
- Literature review on effectiveness of simulation training
 - Training can improve outcomes
 - Simulation training is a very effective training method with good skills retention up to one year later
- No current multi-disciplinary training for shoulder dystocia within corporation

Defined Ownership for Program Creation

- No current curriculum that met our needs
- OB providers-creation of care process model for shoulder dystocia
- Labor and Delivery nursing practice team leadership-creation of simulation training curriculum
- Utilized applicable materials from NRP simulation program for shoulder dystocia instructor training

Intermountain Care Process Model: Shoulder Dystocia

- Goals
 - To increase awareness of:
 - Risk factors
 - Implications
 - To improve management by orderly sequence of interventions
 - To improve documentation

Initiation of Shoulder Dystocia Care Process Model

- Delivering provider “calls” shoulder dystocia
- Primary care RN notes time of delivery of head
- Second RN calls for additional help and functions as an assistant and recorder
- Proceed in an organized series of interventions

Care Process Model

Used as a reference and documentation tool during training and actual events

MANAGEMENT OF Shoulder Dystocia

Shoulder dystocia is a birth complication in which the anterior fetal shoulder impacts the maternal pelvic symphysis after the delivery of the fetal head. (Less often, the posterior shoulder gets caught on the maternal sacrum.) Some definitions include a time factor: a head-to-body time of 10 seconds or more is considered abnormal.¹

Goals:

- To increase awareness of the risk factors and importance of shoulder dystocia.
- To improve management of this dystocia by offering an orderly sequence of steps to effect a timely delivery that can reduce injuries.
- To improve documentation of shoulder dystocia.

Why focus on shoulder dystocia?

Although the overall incidence of this obstetric emergency is not high (see table 1), shoulder dystocia warrants increased attention due to three factors:

- **Potential for serious injury:** Although most cases can be resolved without permanent injury, shoulder and dystocia does present serious fetal and maternal risks. Risks to the fetus include brachial plexus injuries, humeral fractures of the clavicle and humerus, hypoxia, and even death. Maternal risks are an increased risk for brachial plexus injury, uterine rupture or laceration, vaginal tearing or laceration, and uterine inversion.²
- **Proven opportunity to improve care:** A well-rehearsed sequence of maneuvers to manage shoulder dystocia—such as that outlined in this CPM—can minimize fetal trauma.³

Table 1: Incidence of shoulder dystocia

Birth weight	Incidence (%)	Incidence (%)
1,000-1,499 g	0.1-1%	0.0-0.7%
1,500-1,999 g	1.1-10.0%	0.8-23.1%
≥2,000 g	6.1-27.6%	20.0-60.0%

Table 2: Risk factors for shoulder dystocia

Risk factors for shoulder dystocia include the presence of fetal risk factors, the presence of maternal risk factors, and the presence of obstetric risk factors.

Estimated fetal weight (EFW): Diagnosis of fetal macrosomia is subjective. Estimated fetal weight (EFW) can be used to predict macrosomia, but neither diagnosis nor prediction is perfect. Planned cesarean section is not recommended unless macrosomia is suspected. Planned cesarean delivery may be considered when:

- EFW is greater than 4,500 grams in women without diabetes.
- EFW is greater than 4,000 grams in women with diabetes.

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- EFW is greater than 4,500 grams in women without diabetes.
- EFW is greater than 4,000 grams in women with diabetes.

If shoulder dystocia occurs, ACT QUICKLY AND CALMLY

1 Time initiated

2 Time attempted

3 Time attempted

4 Time attempted

5 Time attempted

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Program Roll-Out

- Demonstration of PROMPT force monitoring manikin at OB Development team meeting to promote buy-in
- Curriculum approved by OB leadership
- Instructors trained by core team during 3rd & 4th quarter 2009
- Pilot training held to refine program
- Regional roll-out with shared PROMPT manikin 2010

Shoulder Dystocia Course

- Overview of shoulder dystocia including causes, incidence and risk factors
- Review of care process model
 - Maneuvers
 - Roles
 - Documentation
 - Follow-up
- Scenarios and debriefing
- Evaluation of course

Current Perinatal State at Intermountain

- Several sites have purchased high-fidelity neonatal simulators-used in conjunction with mid-fidelity manikins
- Pilot project videotaping of mock codes on units with debrief
- Purchased PROMPT manikins for all regions
- Simulation center in one region

Next Steps

- More Neonatal scenarios
 - Simulation stabilization beyond NRP
- Develop simulation program for additional maternal emergencies
 - Post-Partum hemorrhage
 - Abruptio
 - Prolapsed Cord
- Practice as a team with both maternal and infant emergencies occurring in one session

Starting an In-Situ Simulation Program

We bought a manikin now what do we do?

- What are your learning objectives?
- What is the best modality to achieve those objectives
 - Team training-simulation
 - Task training-skill centers
 - Cognitive-self study

How do I decide where to start

- Neonatal resuscitation –simulation required as of 2012 easy win as curriculum is defined and resources are available for training
- Newborn stabilization
- Shoulder Dystocia-good data on outcomes and retention of skills
- OB Hemorrhage
- Uterine rupture-L&D room to OR
- Maternal seizure
- Maternal respiratory or cardiac arrest
- Anaphylaxis

What kind of space do I need?

- Utilize open room on units
- Office space or conference room
- Unused space in facility-closed units
- Simulation center
- Contact local nursing schools develop shared space agreement

Curriculums

- Neonatal Resuscitation Program
- Curriculum with purchased manikins
- MOSES: Multidisciplinary Obstetric Simulated emergency scenarios
- ALSO: Advanced life support in Obstetrics
- Create own program with internal resources

Challenges-Funding

- Risk Management
- Educational Grants
- Research grants both external and internal
- Education departments for nursing and providers

Consider starting small to prove concept

Your learning objectives
should be at the foundation
of everything.

To build a successful program
you do not need a simulation
center or expensive equipment
you need a **VISION**

Questions?

