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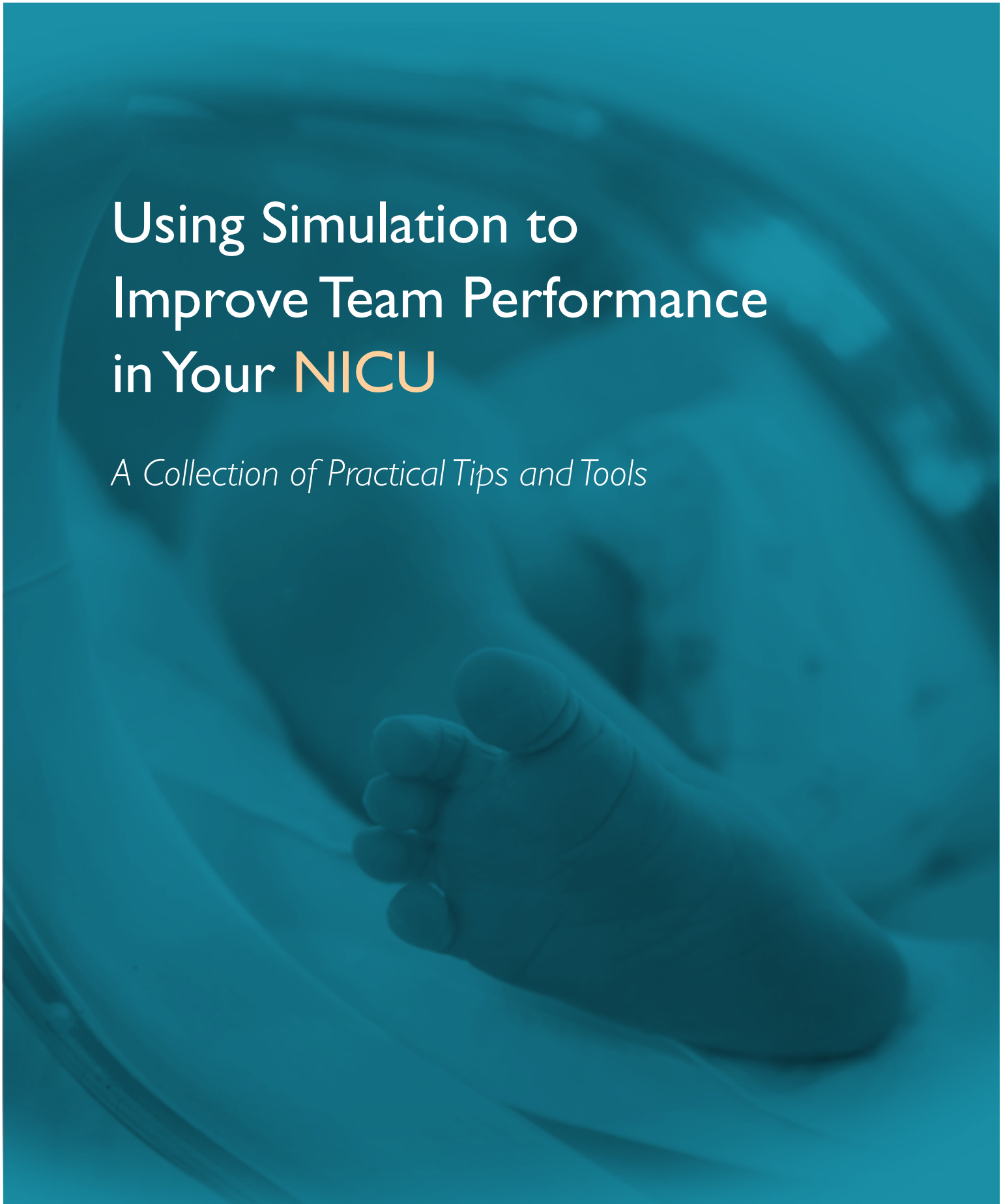

Using Simulation to Improve Team Performance in Your NICU

A Collection of Practical Tips and Tools

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Introduction

> ***Under pressure, you don't rise to the occasion–you sink to the level of your training.***
>
> Navy SEAL Training Ethic

We've published this collection of tips and tools because we want to help you train to be your very best.

High stakes environments are "high consequence" environments. They involve situations where errors can be catastrophic, and failure is not an option. A NICU typifies a high stakes environment. Every patient case poses a potential challenge to a NICU's readiness and skills.

How do others in high-stakes environments - like even the famed Navy SEALs - improve their performance? They use simulation. And, now many hospitals do, too!

The information that follows is intended to give you ideas on how you can use simulation to achieve high-reliability status. They are based on the experience of our clients and what has been proven to work within simulation. So, let's begin!

How Does Simulation Improve Performance and Outcomes?

Historically, healthcare providers trained using the "see one, do one" apprentice model, but the paradigm has shifted in healthcare.

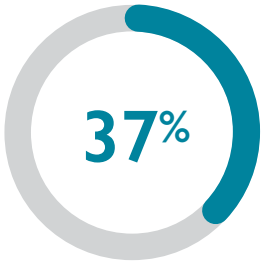
In 1999, the Institute of Medicine published its report *To Err Is Human: Building a Safer Health System*. The report highlighted the number of deaths occurring annually due to preventable medical error in the U.S. It also recommended simulation as an intervention to address human factors that put patients at risk.

Here's a look at how simulation is making a difference in the NICU today:

2.31 times as many critical actions were taken in resuscitation exercises after simulation training[1]

Participants demonstrate a higher rate of recognition to[3]:

- changes in vitals
- mis-dosing of antibiotics
- Oversedation



37% improvement in perinatal morbidity following in situ simulation training.[2]

Participants achieve a heart rate of >90 per minute at 3 minutes and a significant decrease in hazardous events.[4]

Chapter 1

Assess Your NRP skills and Cross-functional Skills

Reflect on your team's individual and joint performance. Use the checklists below to mark which skills your team has mastery of. Any boxes you don't feel confident checking off may be areas on which you should focus in your training.

How are each team member's individual skills?

Certification for the American Academy of Pediatrics (AAP) Neonatal Resuscitation Program® (NRP®) is required every 2 years. Data shows, however, that **after certification many care providers retain their skills for only 3 months.**[5,6] And, their knowledge starts to diminish not long after. This can cause performance deficiencies during an emergency to be less than optimal.

Fundamental Individual Skills

- Patient identification
- Hand washing and sterilization
- Drying, stimulation, and suctioning
- Positive pressure ventilation (PPV)
- Pulse Oximetry
- Umbilical cord palpation and heart auscultation
- Intubation, including assessing for correct tube size
- Administration of epinephrine
- Administration of fluid bolus

How do teams in your organization perform together?

There is a pervasive assumption in healthcare that if people are competent to be healthcare providers, good communications and teamwork should come naturally. That's not the reality, though. 70-80% of healthcare errors are caused by poor communications and teamwork.[7] Evidence shows that effective communication can make the difference between a team being good versus great.

Fundamental Team Skills

Team structure
Does your multi-team system organize and work together effectively to ensure patient safety?

Communication
Is your team capable of clearly and accurately exchanging information?

Leadership
Does an established leader on the team ensure team member actions are understood, changes in information are shared, and team members have the necessary resources?

Situation Monitoring
Does your team actively scan and assess situational elements to support the team's overall functioning?

Mutual support
Does your team anticipate and support other members' needs through accurate knowledge about their responsibilities and workload?

Chapter 2

Calculate Your Number of Possible Team Combinations

If you're lucky, your team members all get to train and work together on a permanently assigned basis. For most, though, rigidly assigned teams are a rarity. It's more likely that teams will be based on who's on schedule, the acuity of the patient, and potentially the case load in the hospital.

Consider how a formal team training model can help you create an expert team, regardless of which team members it's comprised of.

Start with this example:

A baby is born premature and suffers a respiratory emergency due to amniotic fluid that has entered the baby's lungs. The hospital has 258 staff members that make up the various disciplines that in their case could be called upon to respond. The chart below shows just how many team combinations could form to respond to a single obstetrics emergency. The number of unique combinations comes from multiplying each number in the unit by the next, excluding zero.

This may seem extreme, but these numbers come from a hospital that did a formal review of the number of delivery room teams who responded to resuscitations in a year. They recorded over 150 different team combinations just among doctors and registered nurses alone.

Position	Number in Unit
Neonatologists	20
Neonatal Nurse Practitioners	30
Respiratory Therapists	8
Clinical Nurse Specialists	25
Bedside Nurses	175
Pediatric Cardiologist	0
Total Staff	258
Total Combination of Teams Possible!	21,000,000

How Many Possible Teams Can Form in Your NICU?

Populate your unit's numbers into the chart below and then multiply them to find your organization's number of possible team combinations. All it takes is one new person added to the team to begin understanding why a formal model for teamwork and communications can help mitigate risk.

Position	Number in Unit
Neonatologists	
Neonatal Nurse Practitioners	
Respiratory Therapists	
Clinical Nurse Specialists	
Bedside Nurses	
Pediatric Cardiologist	
Total Staff	
Total Combination of Teams Possible!	

TIME OUT

Teams in Healthcare Don't Resemble Corporate Teams

Teams in healthcare are more like teams in the military, aviation, or other high reliability sectors. The staffing model is "plug and play," where members of teams are expected to be interchangeable.

Most training in the corporate world emphasizes better team cooperation and performance through shared experiences. That's not a practical expectation in healthcare.

> *"True collaboration – which means a work culture where joint communication and decision making among all members of the healthcare team becomes the norm – is not an event. It's an ongoing process that grows over time.*[8]
>
> Ramon Lavandero, RN, MA, MSN, FAAN, director of communications and strategic alliances for the American Association of Critical-Care Nurses (AACN) and Clinical Professor at Yale University School of Nursing

Chapter 3

Use Video to Record How You Perform

Video recording a team's performance can allow a team to set a baseline. Running a scenario and then reviewing the recording can lead to a sense of ownership.

To be sure, any team going through an exercise like this will need a good coach. Even for the best of teams, a recorded scenario can be an uncomfortable view into how they truly perform.

That team will need to be led though a thorough, non-judgmental debriefing and will need to know that they will have a chance to try the scenario again. Keep the team on task and re-emphasize that the exercise is about future improvement.

Two Solutions to Consider:

- Laerdal's SimCapture or an alternative video debriefing platform
- A manikin or simulator with feedback that can be integrated into your video platform

How to Choose the Right Scenario for Deliberate Practice

Here are a few questions to consider when choosing the appropriate scenario to run and video record. We recommend that you use the Neonatal Resuscitation Scenarios for SimNewB® – for NRP 7th Edition and that you run those scenarios on a Laerdal SimNewB.

Which scenario will permit you to involve the number of team members you have in mind?

- Consider what your team is ready for.

What level of complexity are you hoping to achieve?

- The more advanced the scenario, the more individuals you can engage; however, this also likely increases the need for additional technical a staff and support. Keep in mind the amount of complexity that your system can handle.

Will there be room to continue improving after your learners have mastered this scenario?

- You may wish to consider selecting one of the intermediate NRP scenarios, so that you have opportunities to continue fostering growth.

What learning objectives are you hoping to achieve?

- Why are your learners participating? To ramp up their ability to work efficiently and effectively as a team. Or something else?
- How will this help them? Give them a base line for performance that they can rely on during clinical practice.
- What you are trying to achieve? Mitigation of human factors that can put patients at risk. Or something else?

How will you pre-brief your participants?

- You will need to provide an explanation of how people will be expected to apply their scenario experience on the job later.

Chapter 4

Prioritize What You Want to Debrief

Revisit Chapter 1 and the individual and team skills you set out to improve. Stick to these learning objectives in your debrief.

Focus on Facts

Dr. Lou Halamek from Stamford University shared with us this important debriefing axiom: "there's no such thing as positive or negative feedback, only accurate or inaccurate feedback."

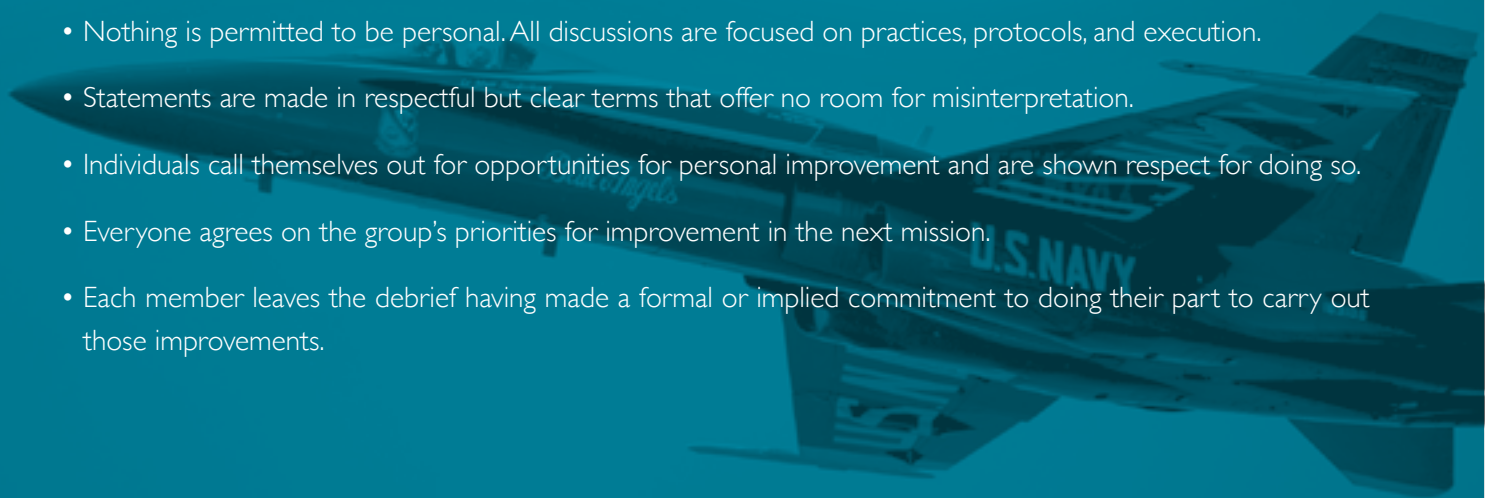
Experts like Dr. Halamek have stated that the objective of debriefing should not be to make people "feel good" about their experience. The central question should always be, "What can you do better?"

TIME OUT

The United State's Navy's Blue Angels is iconic in how they approach debriefing. What's particularly notable is that at any given time half of their pilots are new to the team due to duty rotations.

Here's how they do it and you can, too:

- They review their own video recording and audio during each debrief.
- Rank is left at the door. There is no hierarchy during the debriefing.
- Nothing is permitted to be personal. All discussions are focused on practices, protocols, and execution.
- Statements are made in respectful but clear terms that offer no room for misinterpretation.
- Individuals call themselves out for opportunities for personal improvement and are shown respect for doing so.
- Everyone agrees on the group's priorities for improvement in the next mission.
- Each member leaves the debrief having made a formal or implied commitment to doing their part to carry out those improvements.



A Guide to Your NRP Debrief

For some, it may be difficult to know which questions will resonate with learners and lead to the most impactful team learning. Use this brief guide to help you navigate an effective debriefing session.

First, keep the following in mind:

- The debrief is not intended to be feedback from the instructor. Keep the discussion team-oriented.
- Self-discovery is key. Team members should do most of the talking.
- Use active listening and think constructively.
- Maintain confidentiality within the present group.
- A complex debriefing can last up to 30 minutes, but you might only have 5-10 minutes. Choose the most important objectives to discuss!

Sample Debriefing Questions:

- ✔ Tell me in a few sentences what happened to this baby.
- ✔ What were your objectives and how were they met/not met?
- ✔ Who was the leader and how did you know?
- ✔ What was your thought process when [a particular event occurred]?
- ✔ What did the group do well? How did those behaviors help the team?
- ✔ What would you do differently next time?
- ✔ How can you help when a team member's performance needs improvement?
- ✔ What did you learn?
- ✔ Any additional comments?

Chapter 5

Run the Simulation Until You See Improvement

So, you've run a simulation and your team has debriefed. There's no better time to perform another simulation than right now. The team needs to know what success feels like and that their time is being used with a valuable purpose in mind. ***Use this second-run of the scenario to demonstrate the value of your training.***

Make Sure Everyone is Clear on the Goal and Intent

During the debrief after completing the first scenario, the team should have identified some key areas for improvement. Before beginning a second scenario, make sure everyone is clear about the goal and intent of running the scenario again. *Maintain focus so that you can improve one performance factor at a time.*

Debrief and Acknowledge Success

During the second debrief, it should be clear whether the goal and intent were accomplished. If they were, a quick congratulations to everyone is appropriate, but be sure to debrief with the same strict discipline as before. If no improvement was made, this is a good time to teach the "five whys."

What is "The 5 Whys" Model?

The "5 Whys" model helps individuals and teams reach the root cause of a problem so that they can better resolve it. Use this model to drill deeper into a situation, asking why something occurred the way it did, until you reach the real reason beneath it all.

Use this chart to get started:

What is the problem?	*Why did this happen?*	*What are possible solutions & countermeasures?*
	Is this your root cause? If not, continue asking the same question until you reach the catalyst to the problem.	

Chapter 6

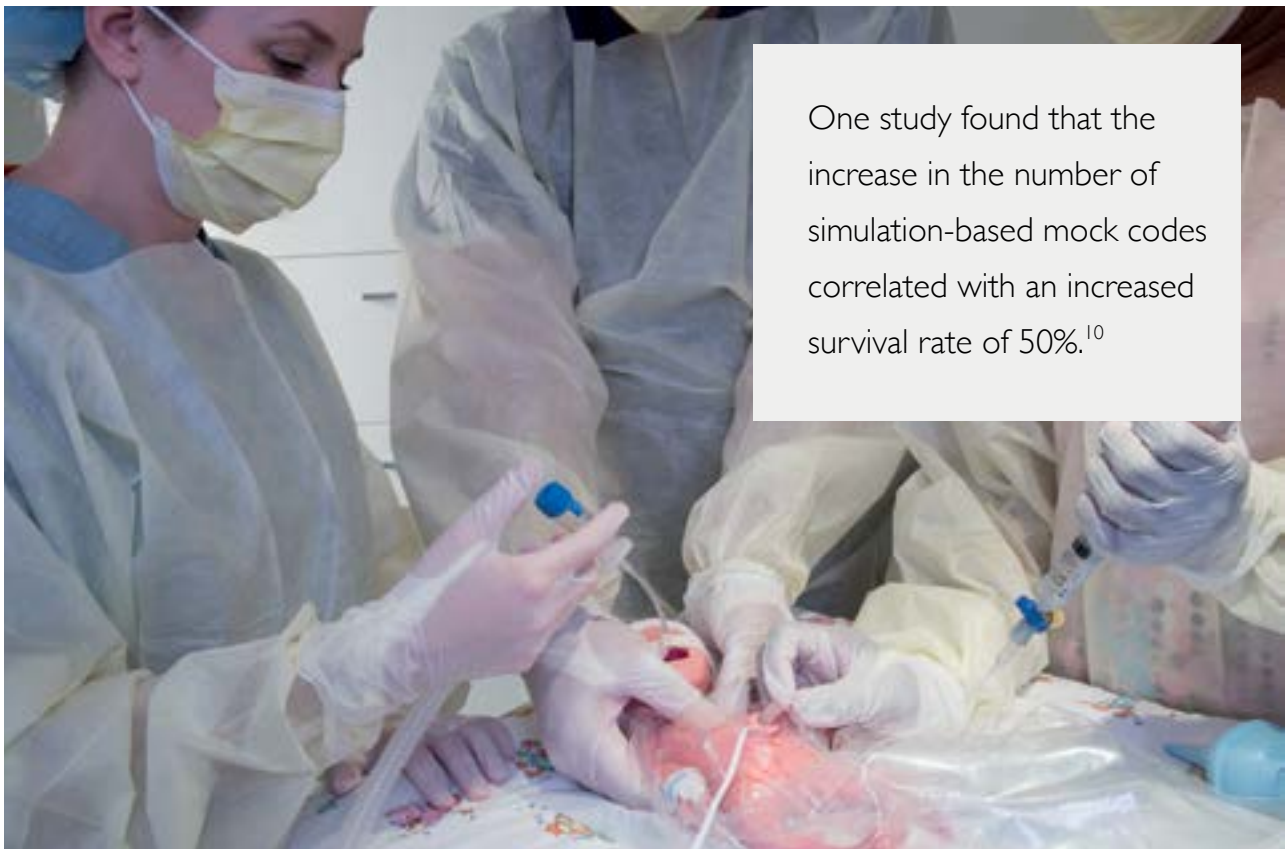
Increase Your Training Frequency

How many people do you know who look forward to recertification or compliance training?

Many professionals regard compliance training with a certain disdain. That's because compliance training is not about getting better. It's about meeting a minimum standard. Compare this with any high performing team or organization – they choose to look at minimum standards as merely a starting point to becoming better.

Individuals and teams that train more often are more confident, have higher morale, and are associated with higher esprit de corps.[9]

Studies among pediatric residents show that their skills performance in key areas like intubation and immediate resuscitation dropped off dramatically after training. And, there's every indication that these statistics hold true for all functions that attend to neonates. ***Experts recommend that if you've gone past 90 days since your last training, it's time for a refresh!***



One study found that the increase in the number of simulation-based mock codes correlated with an increased survival rate of 50%.[10]

Chapter 7

Consider a Formal Team Communications Model

Most formal models for teamwork and communications fall under the category of Crew Resource Management (CRM). ***If you're not practicing some form of CRM, you may want to speak to your medical or nursing directorate to get a formal program going.***

The active patterns and discipline necessary for good teamwork and communications aren't easily learned through PowerPoint or by reading a manual. The patterns must be practiced and practiced under gradually increasing pressure.

Where a formal CRM model is involved, use of the protocols must be second nature. Simulation-based training is ideal for this because of the opportunity for deliberate practice and debriefing.

Do You Use TeamSTEPPS?

TeamSTEPPS is an evidence-based program aimed at optimizing performance among healthcare teams, enabling them to respond quickly and effectively to whatever situations arise.

If you've ever used an SBAR (Situation, Background, Assessment, Recommendation) to report on a patient case, you've used a TeamSTEPPS tool! There are many more, and they are all designed to expedite patient care and take risk out of the care equation.

> *"Many of our patient care issues are related to failure to escalate or ineffective communication, and TeamStepps is an interdisciplinary program [to improve that]."*[11]
>
> Stephen Marrone, EdD, RN-BC, CTN-A, Deputy Nursing Director at the Institute of Continuous Learning at SUNY Downstate

TeamSTEPPs Glossary

Review each category of tools and strategies used in the TeamSTEPPS program. For any that you may be less familiar with, we've included a short description.

Communication

- ✔ ***SBAR***
  Facilitates prompt and appropriate communication (Acronym for Situation, Background, Assessment, Recommendation)
- ✔ ***Call-Out***
  Used to communicate important or critical information to all team members simultaneously during emergent situations.
- ✔ ***Check-Back***
  Using closed-loop communication to ensure information conveyed by the sender is understood by the receiver as intended.
- ✔ ***Handoff***
  The transfer of information, authority, and responsibility during transitions in care. It should always include an opportunity to ask questions, clarify, and confirm details. Some may use "I PASS THE BATON" acronym.

Leading Teams

- ✔ ***Brief***
  Short session prior to start. Includes: sharing the plan; discussing team formation; establishing expectations and climate; anticipating outcomes.
- ✔ ***Huddle***
  Ad hoc meeting to re-establish situational awareness.
- ✔ ***Debrief***
  Informal information exchange to share lessons learned and reinforce positive behaviors.

Situation Monitoring

- ✔ ***STEP***
  Used to assess the healthcare situation (Acronym for Status of the patient, Team members, Environment, Progress toward goal)
- ✔ ***I'M SAFE***
  Used by individual team members to assess his or her own safety status (Acronym for Illness, Medication, Stress, Alcohol and drugs, Fatigue, Eating and elimination)

Mutual Support

- ✔ ***Task Assistance***
  Team members foster a climate where it is expected that assistance will be actively sought and offered.
- ✔ ***Feedback***
  Information provided to team members for the purpose of improving team performance. It should be timely, respectful, specific, directed toward improvement, and considerate.
- ✔ ***Assertive Statement***
  Assert a corrective action in a firm and respectful manner.
- ✔ ***Two-Challenge Rule***
  It is each team member's responsibility to assertively voice a safety concern at least two times to ensure it has been heard.
- ✔ ***CUS***
  "I am concerned", "I am uncomfortable", "This is a safety issue"
- ✔ ***DESC Script***
  A constructive approach for managing and resolving conflict. (Acronym for Describe the specific situation, Express how the situation makes you feel, Suggest alternatives, Consequences should be stated in terms of impact on established team goals)

Chapter 8

Add Leadership and Followership Skills Into the Equation

Given the interdisciplinary nature of the NICU, managing teams according to a strict hierarchy is not always practical. Leadership and followership roles need to be fluid.

Run Leadership/Followership Drills

If you're satisfied with how your team is working together, mix things up. Modify a scenario to create a situation where only a follower on the team can solve the problem—i.e., the follower must step in to be the leader.

Simple situation ideas:
- The team leader gets ill.
- Someone performing an intubation makes an unnoticed error.
- A medication dose is incorrectly calculated and goes unnoticed.
- A team leader loses situational awareness.

Any of these circumstances can present an opportunity for a follower on the team to step into a leadership role to protect the outcome of the patient.

TIME OUT

Leadership Is Not Command

Leadership is the process of influencing others to accomplish the task at hand by providing purpose, clarity, direction, and motivation. Command is the authority someone exercises over subordinates by virtue of his/her rank or position.

There will always be a command structure in the NICU. But, the responsibility for leadership can – and almost certainly will – be shared because leadership is situational.

Followership Is Not Passive

A follower focuses on his/her own subject matter expertise, taking guidance from the leader to ensure optimal care for the patient.

An effective follower, however, is not a passive participant. They are part of the team and should be encouraged to take the lead as circumstances require.

Chapter 9

Use In Situ Simulation to Test Your Procedures and Environment

In situ simulation means that you perform simulation on location, where you provide patient care. The purpose is to test your own environment, equipment, protocols, and staff.

Some latent threats you may identify include:

- Malfunctioning equipment
- Knowledge gaps in responsibility
- Issues regarding room layout or storage

There's an abundance of evidence that in situ simulation works well in the hospital environment. It can improve teamwork, communication skills, and patient outcomes.

Based on our experience and the experience of our clients, we've compiled **7 Tips for Effective In Situ Sim.**

Begin with the end in mind

Once you've determined the knowledge, practice, or behavior you want your learners to acquire and transfer to the bedside, you can make informed decisions about simulation technology and curriculum options.

Use your own equipment

If you use it in the real clinical world, try to use it in simulation. Learners will appreciate the hands-on practice with devices they will use in their real clinical environment.

Brief everyone in the nearby environment

Because of the nature of in situ simulation, providers, patients, and their families are likely to be nearby. Be mindful and forewarn them that a simulation will be taking place.

Make labels your best friend

Label simulated medications "for simulation only" or "not for patient use". This will prevent any future harm to real-patients if it is picked up in error.

Minimize influence on the learner

One of the primary objectives of in situ simulation is identifying system threats. Avoid giving participants an indication of what you are testing. Let them pursue the simulation as they would handle it.

Encourage mindful self-reflection

Debriefing is one of the most important components within a simulation experience. Analyzing what went right, what went wrong, and how to improve before dealing with a real patient case.

Give people time to decompress

In situ simulation gives learners a chance to experience real world clinical scenarios in action. With real world experience comes real world stress and emotion. Remember to give learners a moment to regroup after each scenario.

Chapter 10

Integrate Stress Management Into Your Simulations

During an emergency, it's estimated that **stress can reduce human performance by up to 25%**.[12] Simulation can help train team members to recognize how stress influences their performance and which coping mechanisms can help.

Keep in mind that your learners won't benefit from situations that are so unrealistic that they create stress for the sake of stress. As you design scenarios to help teach stress-coping mechanisms, look for situations where stress has reduced performance in your own NICU or the NICUs of others.

DOs & DON'Ts: Using Simulation to Teach Stress Coping Techniques

Do

- Tell participants what the purpose is of each scenario and what the desired application will be on the job.
- Provide stress management strategies in advance and let them practice prior to a simulation.
- Encourage participants to be honest with themselves about stress triggers.
- Introduce stress triggers slowly in simulations. Let team members walk before they run.
- Allow appropriate time for debriefing.
- Use video recording so that learners can see the impact of stress on patient care.

Don't

- Create levels of stress beyond a learner's tools and capacity for using those tools.
- Throw people into situations designed to be "shock therapy."
- Create scenarios intended to scare learners with the idea of "toughening them up."
- Create scenarios that are unrealistic with no possible future application to the job.

Stress Management Tools

Stress inoculation training (SIT) enables learners to maintain performance during stressful situations by preparing them to effectively handle stress well in advance. SIT has been adopted by athletes, the military, and now some areas of healthcare as a means for teaching people how to cope with their anxiety wherever and whenever it occurs.

Experts agree that SIT training should be introduced using a low-dose, high frequency approach:

1. Introduce participants to the concept and tools associated with stress inoculation.
2. Allow time for skills acquisition and rehearsal.
3. Allow for adequate application and follow-through.

These are some stress management tools you may want to share with your team:

✔ **Breath control**

Box Breathing is a common stress control technique.

- Breathe in for four seconds
- Hold your breath for four seconds
- Exhale for four seconds
- Hold your lungs empty for four seconds

✔ **Self-talk**

Remind yourself that you've trained for this, others have done the same job, and you're going to do the job as good or better than them!

✔ **Tapping into your "why"**

Everyone has a why. Honor yours. Keep your promises to yourself about why you wanted to care for neonates versus any other kind of patient.

✔ **Adopt an aggressive attitude**

Passive performance can undermine you. Own your performance.

✔ **Visualizing success**

Take a "tactical pause". Visualize what you are about to do, THEN do it.

✔ **Use your training decisively**

Show grit. The effects of stress can surprise you. Acknowledge it, rely on your training and protocol, and move forward.

> *"Pilots don't prepare for emergencies in real jets. They train on simulators. This allows us to do the same thing, so when an infant is in distress, we are prepared.*[13]

Dr. Renate Savich, Professor of Pediatrics and Chief of the Division of Newborn Medicine, The University of Mississippi Medical Center

Chapter 11

Invite Risk Management to Participate

In many cases, hospital risk management will not know about simulation-based training and its value in taking risk out of the patient care equation. **For a hospital risk manager to see a simulation—and even potentially participate—can have an incredible impact on the support you can garner from hospital administration.**

You may want to show them a scenario that addresses one of the following:

Common medication errors
- Weight-based dosages
- Off-label drug usage
- Out of stock medications
- Misidentification of infants
- Misidentification of medications

Improper resuscitation

Improper ventilation or overventilation

Failure to diagnose and treat dangerous birth injuries and neonatal conditions

Respiratory problems
- Hypoxic ischemic encephalopathy (HIE)
- Jaundice
- Neonatal hypoglycemia
- Sepsis
- Brain bleeds
- Neonatal Encephalopathy
- Seizures

Communications errors and handoffs

Resident physician fatigue and failure of the team to help

July Effect (when new residents come on board) or Weekend Effect (where staffing may be an issue)

Did You Know?

The Archives of Disease in Childhood (ADC) has reported **that medication errors are eight times more common in the NICU than any other unit in the hospital.**[14]

Celebrate Your Team's Success

It's been estimated that only 60% of learning gets transferred to people's jobs. The rest gets discarded as "learning scrap" – 45% of it![15]

The easiest way to avoid learning scrap is to ensure that your team members understand how the exercises they are participating in are associated with a defined outcome. And, once they've achieved those outcomes, let them know by celebrating their success (big or small). Reinforcement of a job well done paves the way for future success.

Acknowledge your team members when you notice them using the tools in this guide and show your appreciation for their commitment to better patient care.

We wish you great success! Let us know how we can help.

For more information about how to use simulation in your NICU, visit **Laerdal.com/NICU**

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