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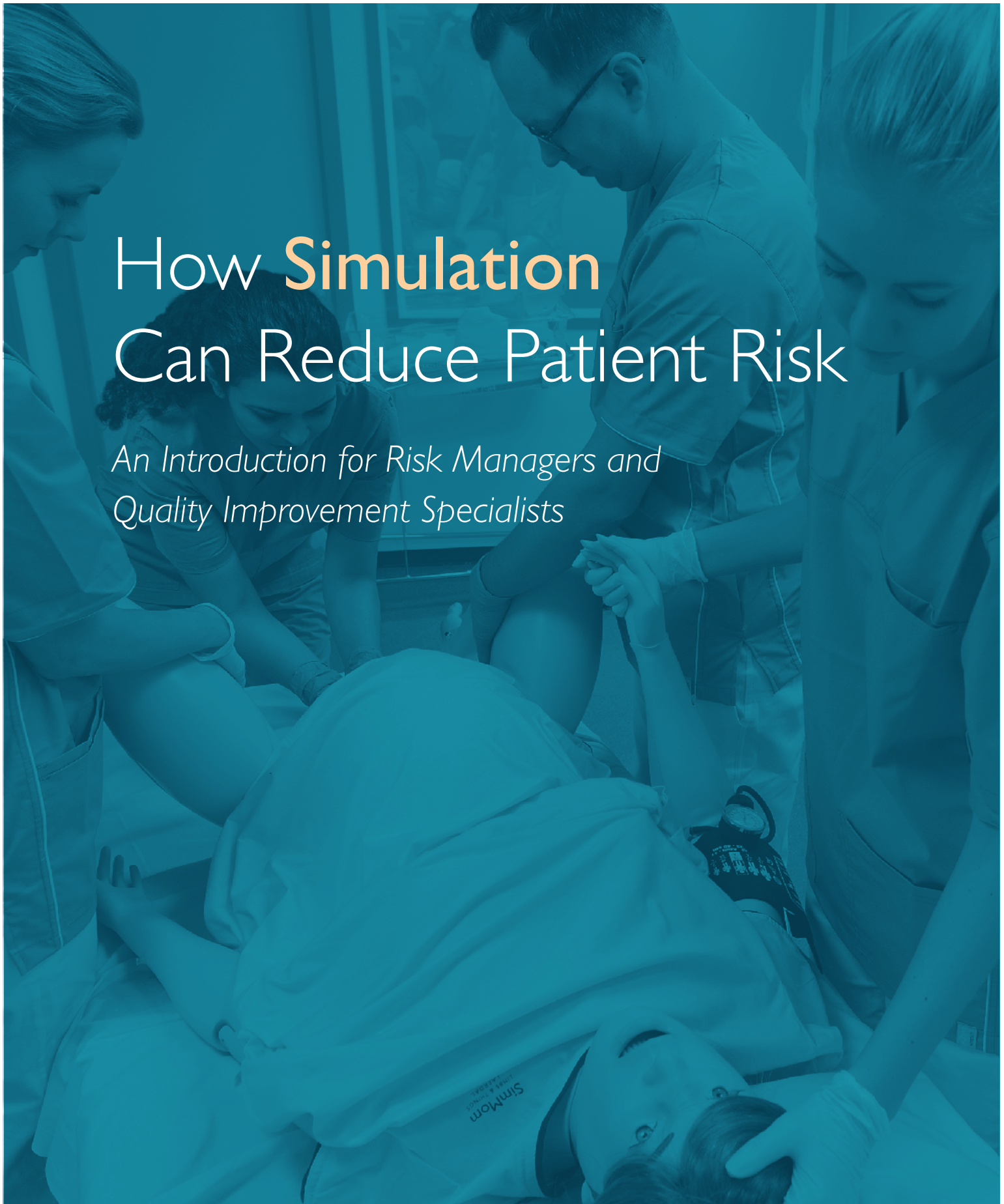

How Simulation Can Reduce Patient Risk

An Introduction for Risk Managers and Quality Improvement Specialists

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Introduction

> ***"Risk management is a more realistic term than safety. It implies that hazards are ever-present, that they must be identified, analyzed, evaluated and controlled or rationally accepted."***
>
> Jerome F. Lederer - Director of the Office of Manned Space Flight Safety for the Apollo Program

Thank you for downloading this eBook and for exploring how you can use simulation to reduce patient risk and improve the quality of care.

This eBook speaks primarily to healthcare risk managers and quality improvement specialists but can be useful to simulationists as well. This eBook is not intended to cover every detail for how simulation can be used to identify and mitigate risk. Rather it is intended to be an introduction to a growing area of patient simulation in healthcare where risk managers and quality improvement specialists have begun using simulation in the same way that other high risk, high acuity fields have.

You are likely familiar with the "Swiss Cheese Model" of accident causation. This popular risk model likens human systems to slices of Swiss Cheese stacked side by side in which the risk of a threat turning into a reality is mitigated by the differing layers. The goal in any human system is to ensure that the holes in the layers never line up so that threats can never penetrate to the next layer.[1,2]

Risk managers and quality improvement specialists must often sort through huge amounts of patient data to identify where threats can penetrate the layers in the cheese. Patient simulation helps by permitting you to run scenarios repeatedly while testing people, processes, equipment, and/or your care environment until you have discovered your organization's risks and put in place a training program to address them.[3]

In this eBook you will find references to healthcare but also to aviation, the military, and even NASCAR. All of these sectors can impart lessons for how simulation can be used as a modeling tool to continuously improve performance—Six Sigma level performance where threats cannot break through the layers in the cheese.

Our mission at Laerdal is Helping Save Lives. We pursue that mission by bringing to our clients resources like this eBook. And we back it by our commitment to help you create a simulation program at your facility that will meet your specific goals. We appreciate your learning about how simulation can make a difference in your world. And we will be privileged to support you in any of your lifesaving efforts.

Chapter 1

A Cyberattack: A Worst-Case Scenario in Your Healthcare Facility That Might Be Keeping You Up at Night

The threat of a cyberattack is on the minds of many hospital risk managers today. Quality improvement managers are keeping an eye on it, too. You no doubt have considered the risks associated with hackers accessing your patients' personal health information (PHI) and other sensitive data. **But what about a catastrophic system failure?**

In a recent webinar hosted by the American Society for Health Care Risk Management (ASHRM), Dr. Aaron C. Hamilton, Chief Medical Officer at Cleveland Clinic Hillcrest, spoke about a breach in cybersecurity as a top threat to patient safety. Something as simple as a malicious email containing spy or ransomware, he shared, can cause a loss in internal communications, a failure in equipment, the appearance of bogus medical records, and more. A team caring for a patient can be left without all the high-tech resources it normally depends on – and patient safety can hang in the balance.[4]

John Riggi, a 30-year veteran of the FBI and now the American Hospital Association's (AHA's) senior advisor for cybersecurity and risk, is equally concerned. He writes that during a cyberattack, "…patient safety and care delivery may also be jeopardized. Losing access to medical records and lifesaving medical devices, such as when a ransomware virus holds them hostage, will deter your ability to effectively care for your patients. Hackers' access to private patient data not only opens the door for them to steal the information, but also to either intentionally or unintentionally alter the data, which could lead to serious effects on patient health and outcomes."[5]

How well would your clinical teams perform after a cyberattack? How will they deliver optimized care if they are suddenly isolated from every technology they normally depend on, from electronic medical records, to communications with other departments, to a failure in medical devices?

Consider running a simulation. Film it as you do it and follow it up with a thorough debrief. Study how people perform and learn where your risks are. If you are worried about a cyberattack, running a simulation can help you present your concerns to hospital senior leadership. And it can help you justify an investment in simulation as part of your risk management and quality improvement efforts. We are confident that this one exercise will make you a simulation believer. Invite us in and we'll be delighted to set up an exercise for you.

Chapter 2

What Is Patient Simulation?

If you have ever flown, you have put your life in the hands of someone who routinely uses simulation to identify and mitigate risk. Today, virtually every U.S. airline pilot gets FAA-certified in a full flight simulator – NOT an actual airplane. If you board a regional airline flight, it is entirely possible that your pilot could be flying the type of aircraft you are in for the very first time. This is possible because all training up to their first live flight can legally be done in a simulator.[6]

The same approach can apply in healthcare. According to the recommendations by the National Council on State Boards of Nursing (NCSBN), up to 50% of a new nurse's prelicensure training can be achieved through simulation. [7]

So, what is simulation? The Society for Simulation in Healthcare defines simulation as an artificial representation of a real-world process to achieve educational goals through experiential learning. Let's break that down. [8]

Artificial representation

This means a re-creation of real experiences using a variety of training aids that might include manikins, task trainers, standardized patients, along with real-world equipment, patient monitors, and even the sights, sounds, and smells of a real care environment. [9]

Real-world process

The closer to reality, the better. We will comment later about the concept of fidelity – the degree of realism in a simulation. But this is about the process itself. Especially if you intend to use simulation to identify risk, the simulation must adhere to processes as you use them. [10]

Educational goals

From a risk management and quality improvement perspective, educational goals can mean discovery goals, training goals, and even "proof of concept" goals. Think of simulation in this area as a form of intervention that has a continuous improvement component. [11]

Experiental learning

This is where the real power is in simulation. Experiential learning is about disciplined, deliberate practice. This allows for not only the acquisition of skills, but the correction, modeling, and continuous improvement of skills. [12]

Chapter 3

Why Use Patient Simulation in Your Risk Management Strategy?

Critical thinking skills are one of the most important factors in the success of individual healthcare providers and combined teams. Simulation works because it creates a real-life experience from which a person can gain context. That person may be someone participating in a simulation. Or, it might be you as the risk manager observing the simulation. Either way, when simulation is done right, it creates a safe, repeatable, controllable "experience" that people can learn from and apply later to real-world circumstances. [13]

Here are five things you'll want to know about using simulation to reduce risk or for continuous improvement:

1. It's low risk!

Minimal risk is why simulation is an aviation favorite. A pilot and flight crew can fly a simulator with no risk to themselves or their passengers. The same can be said for healthcare professionals and teams. In a real-life patient situation, the patient is always at risk. In patient simulation, of course, the patient never is. [14]

2. It allows for isolation and repetition

One of the key benefits of using simulation is that it allows for isolation and repetition. [15] By using a patient simulator, pre-programmed scenarios, and a video capture system, simulation allows for complex situations to be repeated as many times as necessary to achieve your goals.

3. It feels real

For those participating, simulation done right can feel like real life.[16] That's important because while you may be observing or studying the simulation to identify risk, your participants will have the benefit of feeling like they are in a real event.

4. It works well with other initiatives

Perhaps you are introducing a safety effort like TeamSTEPPS®. Perhaps you are introducing a new medication or care protocol. Or perhaps you are seeking to augment training following a sentinel event. Simulation creates a low pressure, low risk, high engagement environment in which to learn any of these. [17]

5. You can keep it simple

All that matters is that people be active participants. Simulation is not about the simulator but about the simulation. A lot can be done with a good pre-brief, a task trainer, and patient history. People will get in the moment, and you will get great results that you can use in shaping your future strategy. [18]

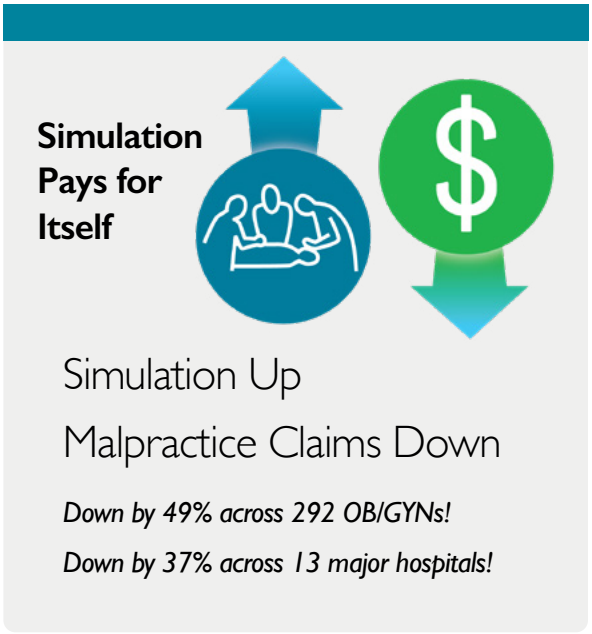
Chapter 4

ROI That Speaks: A Landmark Study That Will Change How You Look at Simulation

Simulation can be used as an intervention to address risk across virtually every area of care in a hospital – the ED, the ICU, the NICU, Med Surg, and even across the entire patient experience. Few areas are more obvious, though, than labor and delivery. *And a landmark study recently showed how simulation can produce a high return on investment.*

Doctors and staff affiliated with the Center for Medical Simulation and the CRICO/Risk Management Foundation of the Harvard Medical Institutions performed a study examining the relationship between simulation training and medical malpractice claims. They looked at the performance of 292 OB/GYNs, all of whom were covered by the same insurer and all of whom undertook simulation training to prepare for emergency deliveries. Each OB/GYN had attended at least one or more simulation training sessions from 2002 to 2019. [19]

The results? Malpractice claims went down! **"Very few patient safety programs have been associated with a decrease in malpractice claims rates," explains Dr. Adam Schaffer, lead author of the study. "So it was really encouraging that our data suggested that simulation training was able to 'move the needle."** [20]



This is not unusual. In 2012, the Premier Hospital network published a similar study based on 14 hospitals that participated in the Premier Perinatal Safety Initiative designed to train OB/GYNs and assist staff in response procedures to perinatal emergencies. The 14 hospitals used simulation as a training method. The results were that OB claims per delivery at the 13 hospitals decreased by 37%. [21,22]

In these cases and others across healthcare, **simulation has made a major difference in mitigating risk and improving care quality.** As a risk manager or someone involved in continuous improvement, you can use simulation for most of your focus areas:

- Root cause analysis
- Process redesign
- Equipment testing
- Protocol proof of concept
- Improved teamwork and communications
- Training to new regulatory requirements and standards

Simulation is not only a powerful quality improvement tool, but it can also form the basis of a risk mitigation strategy like no other.

Chapter 5

Factors in Patient Care That Create Real Risk

As a risk manager or someone in quality circles, you've no doubt heard of the study from Johns Hopkins that suggests that **there are 250,000 deaths annually in the U.S. due to medical error.** [23] This would make medical errors the third leading cause of death in the United States.

Simulation can be used to identify when and where those errors are most likely to occur, to learn how to prevent them, and to assess and monitor performance according to approved standards.

The Eight Common Root Causes of Medical Errors

According to the Agency for Healthcare Research and Quality, there are eight common causes of medical errors. Simulation can be used to address each of these. [24]

1. Communication breakdowns

Communication breakdowns are the most common causes of medical errors. Whether verbal or written, communication failures can occur among physicians, nurses, healthcare team members, and even with the patient. [25]

2. Insufficient information flow

Information flow is critical in any healthcare setting, especially between departments and during patient handoffs. Poor information flow can lead to risks ranging from medication errors to wrong site surgeries. [26]

3. Human failures

Human failures occur when standards of care, policies, processes, or procedures are not followed correctly or efficiently. A subcomponent of this can be knowledge-based errors when individuals do not have adequate knowledge to provide the care that is required at the time it is needed. [27]

4. Patient-related issues

These may include inappropriate patient identification, inadequate patient assessment, failure to obtain consent, and insufficient patient education. [28]

5. Organizational transfer of knowledge

This refers to insufficiencies in training and inconsistent or inadequate education for those providing care. Transfer of knowledge is critical, especially where new employees or temporary help are used. [29]

6. Staffing patterns and workflow

Inadequate staffing alone does not lead to medical errors, but can put healthcare workers in situations where they are more likely to make a mistake unless they are trained to manage the situation. [30]

7. Technical failures

Technical failures can include complications or failures with medical equipment, computers, medical devices, implants, grafts, etc. [31]

8. Inadequate policies

Often, failures in the process of care can be traced to poor documentation and non-existent or inadequate procedures. [32]

Chapter 6

Teamwork and Communication: Low Bearing Fruit

The Joint Commission and the scientific community are unanimous in their agreement that a **breakdown in communication and teamwork is a root cause of most patient harm.** [33,34] And this is a key area where you can not only use simulation to study and demonstrate the impact of team performance within your organization, but also use it to correct shortfalls. [35]

If you're lucky, your team members all get to train and work together on a permanently assigned basis. For many hospitals, 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 case, and potentially the case load in your hospital. Nursing staff shortages are only adding to this problem.

You might be using a formal team training model like TeamSTEPPS® or crew resource management. Or perhaps you have just borrowed some tools from these approaches. These methods can be tested and introduced into simulations to show you fast results.

Consider this real example from a NICU. 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 could be called upon to respond. The chart here 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 the hospital in this case performed a formal review of the number of delivery room teams who responded to resuscitations in a year. They recorded over 150 different team combinations among doctors and registered nurses alone.

How Many Possible Teams Can Form in Your NICU? Populate your unit's numbers into the chart on the right 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 communication practiced during simulation can help mitigate risk.** And this is just in the NICU. You can apply this method to any department in your hospital.

Example of possible team combinations

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

Fill out to determine your possible team combinations.

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

Chapter 7

NASCAR: If You're Having Trouble Understanding Simulation, Look No Further

We invite you to look at any video of a NASCAR pit crew in action. It may change your whole perspective on how to use simulation to reduce risk and improve quality. NASCAR pit crews simulate all the time—and with good reason. The seconds that they save and the quality of their work they can win a race and reduce risk in the process. [36]

To be competitive in NASCAR means getting a car serviced and back in the race in 12 seconds or less. NASCAR races require incredible precision for marathon stretches of time. NASCAR isn't about peak performance. It's about identifying bottlenecks and weaknesses and eliminating mistakes to shave tenths of a second off a lap time. Minor mistakes can ruin entire races and they can kill, whether on the first lap or the 400th. Nowhere is all of this more evident than during a pit stop. [37]

Six mechanics are expected to enter the track, raise the car, change tires, fuel the vehicle, lower the vehicle, and then be out of the way, all in no more than 12 seconds. To achieve this level of skill, every process needs to be refined to Six Sigma perfection. No waste in effort is allowed; no shortcoming in quality at the source permissible.

The great people at Seattle Fire Department Medic One in King County, Washington have used this same approach in what is known as **Pit Crew CPR** – an approach specifically based on NASCAR pit crews. Just as NASCAR pit crews use simulation to practice, study, and improve their performance, Medic One continually simulates Advanced Cardiac Life Support (ACLS) scenarios to identify processes that can be improved. They focus on seconds and anything that might rob a patient of life saving compression time. [38]

The results? Since Medic One has adopted this approach, **they have achieved a 56% chance of survival, neurologically intact, from sudden cardiac arrest – compared to an 8% chance of survival nationally.** [39]

Medic One's approach has been adopted by EMS systems and hospitals throughout the U.S. and in other countries – always with similar results.

A Pit Crew Approach to Resuscitation Developed Through Simulation: How Would Your Organization Fare?

Immediate compressions once no heartbeat is confirmed
Two-inch hover above chest during defibrillation
Immediate compressions following defibrillation
No stoppage during intubation or IV administration
Ensure 360° access to the patient
Clear, concise communications always
Predefined positions at patient bedside
Predefined roles and responsibilities
Predefined movement around patient
Simulation used to test and train for ANY changes in approach
Mindset that the patient must live and be neurologically intact

Chapter 8

The INACSL Healthcare Simulation Standards of Best Practice™

You may not envision yourself becoming a simulation expert. But you may wonder what goes into making a good simulation. Thankfully, the International Nursing Association for Clinical Simulation and Learning (INACSL) is there to help. Just recently they updated their **Healthcare Simulation Standards of Best Practice™** [40] which is considered a gold standard—practical, tried, and tested.

Your hospital may have a simulation lab or center with which you can partner to ensure that your facility meets the INACSL standards. If not, we can help you directly. What's important is that you be able to communicate your needs and goals. We've summarized the INACSL best practices below. This summary will help you understand if you are missing anything in the simulations you might choose to create.

Rely on someone who has experience as a simulationist

A simulationist is someone who will understand the scenario you are trying to create and will appreciate what goals you need to achieve. This person is accustomed to using simulation to achieve a learning experience for participants. [41] But at the same time, a simulationist can create high-quality simulation experiences to help meet your risk management and quality needs.

Conduct a pre-briefing

Pre-briefing involves preparation and briefing. Pre-briefing ensures that simulation participants are prepared for the experience and are aware of the ground rules.[42] If your intent is to test for risk in your organization, pre-briefing should include or exclude information that might interfere with discovery. If you're seeking to recreate a sentinel event looking for a root cause, your pre-briefing should consider any information that might skew results. If your intent is to train staff for the sake of continuous improvement, you should share what the training task and purpose is.

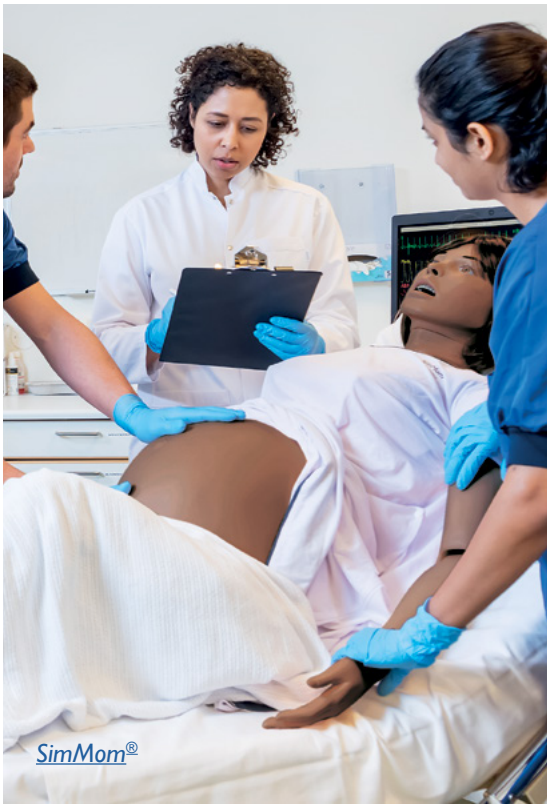
Design an accurate simulation

Good simulation-based experiences are purposefully designed to meet identified objectives and optimize expected outcomes. [43] The INACSL Healthcare Simulation Standards of Best Practice have a lot to say about accurate simulation design. We advise that you consult their standards if you are approaching simulation for the first time. Accuracy means keeping the simulation true to its task and purpose. It also means connecting it to measurable objectives, appropriate level of fidelity, thorough facilitation, and above all, active debriefing!

Chapter 8

Be a good facilitator

Ideally, facilitation should be conducted by someone trained in facilitating simulations.[44] If you were to facilitate a simulation personally, keep in mind your discovery needs (if using simulation for root cause analysis, for example) and your learners' needs (if using simulation to train to improve future performance).



SimMom®

Debrief like a pro

Many would say that debriefing is the most important element in the simulation process. All simulation-based educational (SBE) activities must include some form of planned debriefing process.[45] Debriefing aims to identify and resolve gaps in knowledge, skills, attitudes, and communication. This applies to individuals, teams, and/or your system. The goal of the debriefing process is to assist in the development of insights, improve future performance, and promote the transfer of learning to actual practice.

Be mindful of operations

Given that you may be trying to solve an immediate specific problem in your hospital, you may wish to reach out to an outside resource like our Managed Services program. Our Managed Services program can provide you with turnkey help before you develop your own operations expertise.

Maintain professional integrity

Professional integrity refers to the ethical behaviors and conduct that are expected of all involved throughout SBEs: facilitators, learners, and participants.[47]

Simulation-Enhanced Interprofessional Education

Simulation-enhanced interprofessional education (Sim-IPE) enables learners from different healthcare professions to engage in a simulation-based experience to achieve linked or shared objectives and outcomes.[48]

Evaluate your overall performance

Identify opportunities for improvement, plan for future changes, implement those changes, and review how they are working. This is a standard continuous improvement cycle that will not let you down.[49]

Chapter 9

Debriefing: Be Prepared to DASH©

Central to simulation is debriefing. Just like in other high-risk industries, debriefing after a clinical simulation is a crucial step in clarifying and consolidating insights and lessons learned. You as the auditor of the simulation – and quite possibly the facilitator – are afforded the ability to both observe and interact with the participants. What better way to identify and create a plan to mitigate risk?

DASH© is a debriefing guideline developed by the Center for Medical Simulation. DASH (Debriefing Assessment for Simulation in Healthcare) can guide you in evaluating and developing debriefing skills.[50] Debriefing is a conversation between you and the participants that will allow everyone to examine their actions, critical thinking skills, emotions, and other factors necessary to improve performance.

We've adopted the DASH approach here to give you a general guideline of how to debrief. If you are interested in learning more about debriefing, consider reaching out to us or to a qualified organization to enroll in a course on debriefing fundamentals.

Plan ahead to create an engaging learning environment [51]

1. Ensure a comfortable physical atmosphere that's free from distraction.
2. Share with participants why you are using simulation as a means for discovery or training.
3. Review your objectives, the simulation setting, roles, and expectations.
4. Convey a commitment to respecting participants and understanding their perspectives.

Maintain an engaging atmosphere during the debriefing [52]

1. Convey respect for the participants.
2. Clarify debriefing objectives, roles and expectations.
3. Establish realism by treating scenarios as actual clinical cases.

Structure the debrief [53]

1. Begin: allow participants to express emotional reactions and go directly to participant concerns.
2. Proceed: shift to a focus on the simulation objectives and involve participants in a discussion about why events occurred.
3. End: review important points of discovery and allow participants to summarize their conclusions.

Elicit interesting and engaging discussions and foster a reflective mindset [54]

1. Ensure that observable actions and outcomes are used as a basis for discussion.
2. Own the reasoning and judgments shared.
3. Use nonverbal cues to avoid interrupting.
4. Use video replay if available. (See our Pro Tip on next page)
5. Recognize and manage any difficult participant behavior.
6. Keep the discussion practical and focused on identifying risk, root cause, and solutions.

Identify Performance Gaps [55]

1. Encourage participants to verbalize positive and negative aspects of their performance.
2. Provide feedback on performance and clearly describe performance gaps.
3. Explore the basis for any performance gaps and why.

Help Close the Performance Gaps [56]

1. Elicit input and techniques from participants to identify risk, root cause and solutions.
2. Demonstrate knowledge of the subject.
3. Ensure that you have met the objectives of the simulated case.

It's important that a team and individuals participating in a simulation receive some form of post-debrief follow-up, preferably face-to-face. Reach out to participants explaining what changes in procedure, protocol, equipment, and training will be used to close performance gaps.

Debrief Pro Tip!

Use what many high-risk enterprises use: video! The United States Navy's Blue Angels is iconic in how they incorporate video into their debriefing. You can, too. And through our SimCapture system, we can help.

Here's how the Blue Angels conduct debriefing with video at the core: [57]

- 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.

Our SimCapture system is the leader in this area and can help you shape your debrief not just around events, but around data that can indicate cause and effect. You will be able to see a team's and individual's performance in motion, along with a record of the simulated patient's physiologic response.

Chapter 10

Simulate Local: The Benefits of In Situ Simulation

In situ simulation means that you perform simulation on location, where you provide patient care. [58] 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
- Failures in current protocols
- Breakdowns in communication and teamwork pattern

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. [59]

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

Begin with the end in mind

Once you've determined the practice or behavior you want to observe or the lessons you want participants/learners to acquire and transfer to the bedside, you can make informed decisions about how you want to construct the simulation.

Use your own equipment

If you use it in the real clinical world, use it in simulation. Keeping it real will allow you to uncover and mitigate risks that might otherwise go unnoticed. Ask us how your equipment can be used with our manikins.

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. Brief them about the simulation, but let them pursue the simulation as they would handle it.

Consider debriefing on location

While there may be cases where simulation should be conducted in a more comfortable or removed location, it may be to your benefit and the benefit of your participants/learners to conduct your debrief on location. This will afford everyone real-world context during debriefing.

Give people time to decompress

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

Chapter 11

Follow a Patient: A System-Wide View of Risk

We began this eBook sharing a worst-case risk scenario: the case of a cyberattack. But what about the everyday routine risk that exists as patients are brought into a hospital system, transferred between departments, and then eventually discharged from a hospital system?

Poor communication and teamwork are associated with over 70% of patient harm.[60] The Joint Commission[61] has identified communication gaps during patient handoffs as one of the fundamental root causes of patient risk. It's estimated that a typical teaching hospital may experience more than 4,000 handoffs every day. And poor communication and teamwork during these handoffs are associated with adverse events, most notably wrong-site surgery, delay in treatment, falls, and medication errors. [62]

SimMan® 3G PLUS

Poor communications means malpractice claims!

A study released in 2016 estimated that communication failures in U.S. hospitals and medical practices were responsible at least in part for 30% of all malpractice claims, resulting in 1,744 deaths and $1.7 billion in malpractice costs over five years. [63]

Below are the results of two simulation scenario exercises you can try at your own facility. These exercises first appeared in a study published in the *Journal of the American Medical Informatics Association* in 2011. [64] The study involved simulating patient transfer scenarios to explore the range of potential trajectories a routine process might take if deviated from prescribed procedures.

In the first scenario, a patient required transfer from a ward to radiology, but was given an incorrect identification band at the outset. This indicated that the initial risk of misidentification to the patient was 100%, because the patient's record information did not match the patient. Multiple identification checks reduced the risk during some of the patient handoffs in the simulations.

The purpose of the scenario was to see if the process halted or increased the risk of misidentification, which in turn could lead to an adverse event. In the end, **out of 500 simulations, 8% of the transfers were completed without detection.**[65] (See fig. 1)

The purpose of the second scenario was to test infection control during transfers. The initial risk to the patient was 0% and accumulated because of poor written or verbal communication, plus the porter's violations relating to adequate infection control precautions. **Out of 345 simulations, 23.2% showed inadequate infection control.**[66] (See fig. 2)

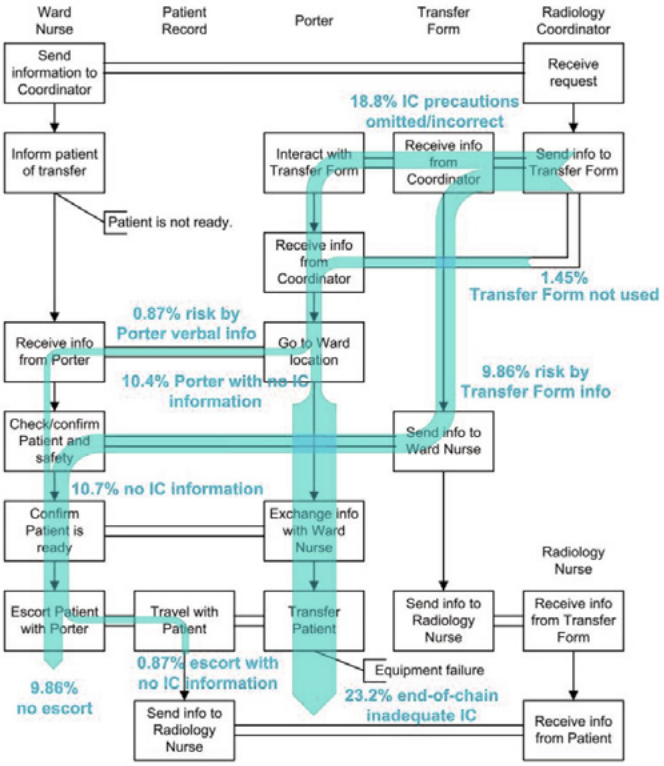


Figure 1. Patient Misidentification

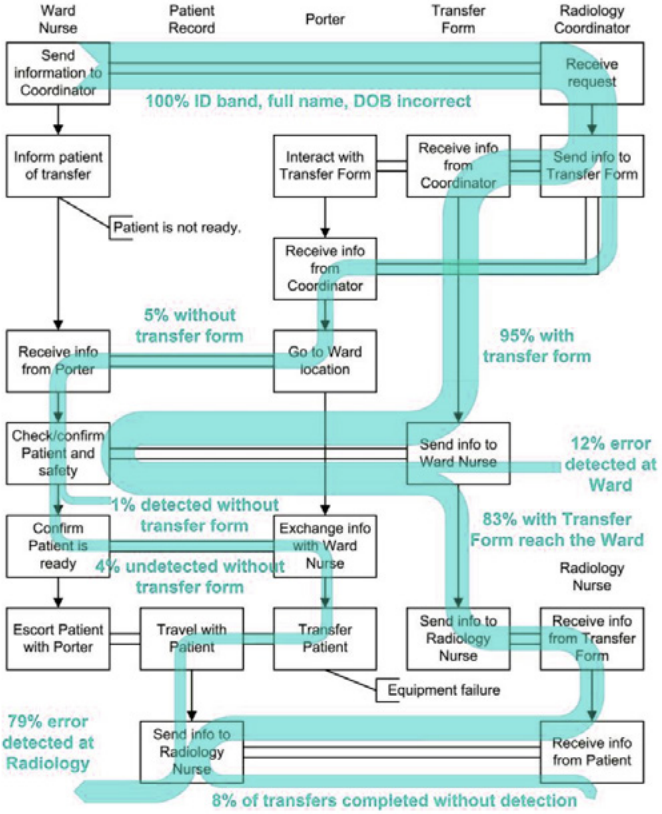


Figure 2. Infection Control

Among the determinations made during these simulations is that **the presence of violations in the form of workarounds, unintended violations, and communications errors created unique circumstances for which policy based on prescribed work practices couldn't account!** [67]

If you are just begining to consider using simulation to mitigate risk in your facility, following a patient through a particular handoff flow in your institution might be a great place to begin.

Conclusion: 1 Million Lives

Laerdal Medical's goal is to use our simulation-based solutions to help save 1 million more lives annually by 2030. The information that we've shared in this eBook is a part of that effort. Risk management and quality improvement are truly the vanguards in our healthcare system, leading an important way in the journey to reduce risk, increase patient safety, and improve patient outcomes. That all has the added benefit of reducing costs – not for your hospital institution, but for society. That is the type of impact we want to achieve by supporting you.

Helping Save Lives and Our Zero Harm Goal

Laerdal's mission is helping save lives. Our vision is that no one should die or be disabled unnecessarily during birth or from sudden illness, trauma or medical errors. We pursue our mission and vision by enabling our clients to pursue the best education, training, risk mitigation, and quality improvement strategies possible. We provide patient simulation solutions that will enable your strategies to stick. We measure our results through yours, keeping a keen eye on your key performance indicators and your desired outcomes.

By giving you the tools necessary to incorporate simulation into your risk management and quality improvement efforts, our intent is to help you save more lives and achieve a zero-harm goal.

We want to support your efforts

Let us know how we can help. Your local Laerdal representative will work with you to give you and your staff a broader introduction to simulation and to our products and services. We can arrange for both on-site and virtual demonstrations. We can even help run sample scenarios for you. All we need to do is begin the discussion. Let us turn your vision into reality.

Learn more at Laerdal.com - Thank you.

For more information about how to use simulation visit **Laerdal.com**

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