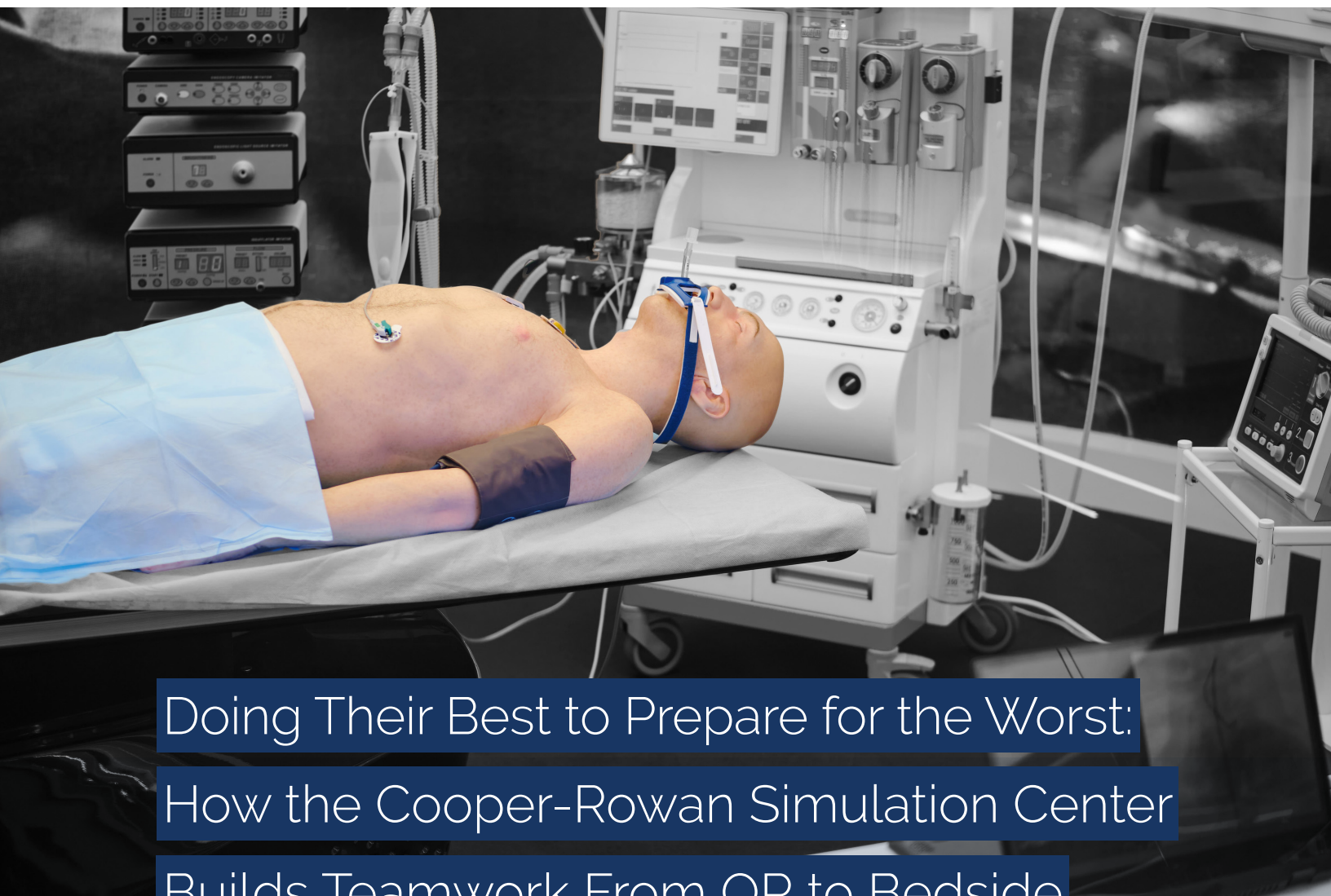




Doing Their Best to Prepare for the Worst: How the Cooper-Rowan Simulation Center Builds Teamwork From OR to Bedside

In the fast-paced, often chaotic, and ever-changing environment of medicine, we know how important it is to keep people at the heart of healthcare—but that may be easier said than done. Dr. Amanda Burden, professor of Anesthesiology and assistant dean for Clinical Skills and Simulation Education at Cooper Medical School of Rowan University, sat down with *Patient Safety* managing editor, Caitlyn Allen, to share how they put people first and collaborate to be ready for anything.

By **Amanda Burden, MD^{1,2}, Caitlyn Allen, MPH^{*3} & Eugene Myers, BA³**

Caitlyn Allen: How does anesthesia work?

Dr. Amanda Burden: Anesthetic medications work by blocking signals from nerves to the brain to prevent the feeling of pain. They also act on different centers in the brain to change our level of consciousness to allow people to undergo significant surgeries and procedures that would otherwise be very painful and stressful in a safe, manageable way. Anesthesiology involves more than just helping patients be asleep or not feel pain. It also involves keeping people safe throughout whatever procedure or surgery they are having.

Patients have reported waking up during surgery. Is there any way to predict when this might happen?

Unintentional awareness is a very rare event in modern day anesthesia care. We monitor our patients and their physiological responses continuously throughout the procedure or surgery. We also monitor a patient's brain activity in real time so we can identify that they are unconscious.

There are many procedures, even surgeries, that can be performed comfortably and safely under deep sedation instead of general anesthesia. This is like being in a deep sleep but is not fully a general anesthetic. Many colonoscopies are performed in this manner, for example. What is most important is to make sure that the patient understands the planned anesthesia technique and that they are not surprised. Also, patients who are undergoing general anesthesia are not fully unconscious in the operating or procedure room right before and after the procedure and may remember this period. This is very different than intra-operative "awareness."

If you've never had surgery and have only seen it on TV, you'd expect to be completely asleep. But that's not always what is best for the patient for the situation.

Being completely asleep with general anesthesia is not always the best or safest option for a particular operation or procedure. It may expose the patients to the risks associated with

general anesthesia when the procedure could be accomplished safely and comfortably under light or deep sedation instead. There are many different approaches that can be employed: We can use sedation with a local anesthetic or use a peripheral nerve block or something like a spinal or epidural. What the anesthesiologist will do is determine what is safest and most appropriate for each patient in light of their preexisting medical conditions and the type of procedure that is planned.

You're board certified in anesthesiology and pediatric anesthesiology. How does working with kids differ from adults?

Kids are always a little trickier. Their bodies and brains are still developing; there are significant differences between children and adults in terms of their anatomy and physiology—as well as their ability to understand what is happening. All these factors have a considerable impact on anesthetic management. Their heart and lungs may be working harder than an adult's. They need and use more oxygen and are different from adults in how they navigate oxygen supply and demand. Obviously, nobody wants their child to need surgery, and this is very stressful for the parents and family. Even if the kids don't fully understand what's happening to them, they do usually sense that everyone around them is terrified, especially their parents. That makes taking care of kids an especially anxiety-provoking circumstance for everyone involved. It can also be harder to communicate with children. So, we need to be mindful of those points when we're working with kids.

I had no idea just how nuanced and complex anesthesia is.

It's an amazing gift to be able to render people unconscious to the point where they really don't feel something that is incredibly painful, because it's obviously not normal sleep. If someone decided to take out your gallbladder while you were napping, you would wake up and have a big discussion with them. This is a significant change in your consciousness and in how your body reacts to pain.

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It's truly amazing that we're able to do that. It's also a tremendous responsibility. Our field has come a long way in understanding that responsibility, both of improved outcomes and of helping patients to better comprehend what's happening.

What is one of your most unusual patient experiences?

I feel fortunate to have been a part of each of my patients' care. They have all been very interesting. I participated in one of the very early living unrelated lung donor transplants. I took care of the donor patient. She and the recipient patient were church members, and this woman decided to give part of one of her lungs to her close friend. I still get chills thinking about it.

The recipient needed this lung, or they wouldn't live. The donor subjected herself to very significant risk to give this amazing gift to somebody with friendship as the only benefit, and everyone in the room felt it, everyone who took care of her felt it. And I still can't believe that I was part of it. Thankfully, everyone did well. It was an amazing experience.

How can you create a team environment in the operating suite when working with new colleagues?

The World Health Organization created a great tool: a preop checklist that gets everyone on the same page. At the beginning of the procedure, before the patient is asleep, the full team reviews key points: What's the patient's name, medical record number, date of birth? What procedure are we doing? Who's here? What is some of the basic equipment we have? Do we think this procedure is likely to cause blood loss? Will that be significant? What else is going on with the patient?

The checklist process includes gathering the team together at the beginning to introduce ourselves, even if we all know each other. The overall process has proven to be very helpful. We all introduce ourselves: "Hi, I'm Amanda. I'm the anesthesiologist." Everyone says their names and their roles. It reminds us that we're all there together for the patient. My institutions, Cooper University Health Care and Cooper Medical School of Rowan University, have made this a priority. There is tremendous support for this at every level, from leadership through to every person working in the health system.

I fully believe that every person who went into healthcare did so because they want to use their skills to take care of people, they want to make things better. Every single person shows up every day hoping to make things better. So, I try to meet people in that place and assume that the whole team is working to do their best.

That's always helpful for me. If we're in a rough patient situation just saying, "Hey, I'm concerned about this. Here are the vital signs I see. Here's what I think's going on, and here's what I think we should do. I'm going to start doing this. Please tell me what different ideas you have. Is there something I'm not seeing?" We refer to those sorts of things as human factors issues, and they are very helpful. Anesthesiology has borrowed this approach to patient safety from other high-hazard fields. They've been super helpful in those fields and they're super helpful for us as well.

What are some of the things that you borrowed in anesthesiology?

From aviation, probably the biggest thing is "crew resource management," which we call crisis management in anesthesiology. David Gaba, MD, an anesthesiologist, engineer, and pilot, first identified the similarities between challenges in aviation and anesthesiology and created this approach [crisis management in anesthesia (CMA)] to thinking about a crisis and to organizing and leading the team. It's a system that uses these advances from aviation in anesthesiology practice and has been adopted by other healthcare domains as well. CMA provides a guide for how to organize the team. It's an understanding that there needs to be a leader. That leader obviously needs to have excellent medical knowledge and skills; they also need to have humility about the potential scope of the situation and to be open to information and ideas that they have not considered.

The other people on the team have a responsibility to help the leader. That includes telling the leader if they think the leader is wrong, obviously in a reasonable, respectful way. "Hey, did you happen to see this is going on? I'm confused about this point; I'm concerned about that." Assuming that everyone is there to make patients feel more comfortable and to do what is best as a starting point is very helpful for this.

The Closed Claims Program: Reviewing Malpractice Insurance Cases to Improve Anesthesia Safety

Sharing and studying stories about what went wrong in patient safety is an effective way of preventing errors from happening again. Recognizing this powerful opportunity to identify safety concerns and trends relating to anesthesia, in 1984 the American Society of Anesthesiologists (ASA) and the University of Washington at Seattle turned to an unusual source of information on safety events: insurance malpractice cases.

The **Closed Claims Program in Anesthesiology**—which began in 1984 and moved under the auspices of the Anesthesia Quality Institute in 2019—studies closed malpractice claims to identify anesthesia-related major safety concerns, patterns of injury, and prevention strategies in areas where anesthesiologists provide care. Board-certified anesthesiologists collect and analyze quantitative and qualitative data from participating malpractice insurance organizations and derive a narrative summary of care, which is reviewed by legal experts associated with the cases. These analyses of rare and serious events are available for use in publications, presentations, and research studies.

For more than 35 years, the work of the Closed Claims Program has helped advance understanding of the hazards of anesthesia and support for standards of practice, such as the use of pulse oximetry for all anesthetics and in the post-anesthesia care unit (PACU), as well as encouraged further research to improve patient safety.

Learn more at asahq.org/aqi/registries/closed-claims.

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I fully believe that every person who went into healthcare did so because they want to use their skills to take care of people. Every single person shows up every day hoping to make things better.

It's also an understanding of the importance of assessing what resources we have, of the importance of calling for help early, and of the different roles that people have: who can help and how. There's more involved in crisis management, but those are some key elements that are very useful. They are useful for anything you do that involves other people. Literally anything. Does not have to be a crisis, does not have to be a medical situation. Those elements are incredibly helpful anytime you're trying to get other people to do something together.

It's hard to have a successful encounter when everybody's a captain or nobody's a captain.

Right. Often, it's a nobody's a captain situation, but either one is a problem. Studies show that teams that work together often have a rhythm and do better. Most of those studies are from the other high-hazard fields. It's a little harder to study that kind of thing in healthcare.

Cooper-Rowan^a has one of the most impressive simulation training labs in the region, if not the country, of which you are the director. Tell me about your approach to educating your fellow clinicians.

Thank you for your kind words! We are very fortunate at Cooper-Rowan to have a wonderful team and faculty of people who recognize the importance of education in healthcare—for all levels of experience in our SimLab. Cooper-Rowan was one of the first in this area to understand how simulation could help teach people how to provide better care for patients.

Around 2004, Cooper purchased a simulation mannequin and began developing a curriculum. I was fortunate to be part

of that early process to help shape some of the earliest education that we accomplished here and then just move forward with it. When Cooper Medical School of Rowan University [CMSRU] was started in 2012, the medical school leadership immediately identified simulation education as an essential element for medical student education. Working with learners at every level of the healthcare and medical education continuum has allowed our simulation center to study and develop more robust and meaningful educational programs.

How do you progress from a single mannequin to becoming one of the premier sim centers?

We have a very dedicated group of people in the sim center and leadership at Cooper and CMSRU who understood how simulation can help with medical education and patient safety. We have been able to work with many different departments, along with Risk Management, to best identify what's going on and the different areas of concern in healthcare across the country. Two early projects for us were managing a difficult airway and helping more-novice workers to recognize when a patient is in distress. We were able to meet with stakeholders to involve them in addressing those concerns. We identified different challenges and created a program around those.

It was a success in a lot of different ways. People really enjoyed it. They felt that the simulation training helped them overcome their anxiety of working through these stressful situations and better understand how to marshal resources when you're new in a new place, in a new setting with new people. And they felt that it helped them make the transition from student to healthcare professional.

We were also able to demonstrate during some subsequent encounters that things improved after taking our course. That set us off on a good path. The people who took the course liked it, the patients they took care of did better, and we were off to the races after that.

How do you come up with realistic scenarios on which people can train?

Whenever we can, we use actual encounters, because one of the first things people will say is, "This could never happen." But we are able to counter with, "I wish you were right, but it did." Typically, we'll use cases we have read about in the literature, particularly those that present meaningful opportunities for us to learn and discuss what happened. We often use cases from the Closed Claims Program in Anesthesiology for scenarios so we can learn as much as possible from these issues. (See sidebar on [page 3](#).)

Some studies have looked at how to make simulation feel more realistic, and the best thing is to create a realistic sense of the emotion involved in the situation, to replicate the sights and smells and sounds and people in the real setting for the simulated event to make the learners feel as though they are in a real situation.

Everyone in healthcare has stories. Everyone in healthcare knows how incredible the work is and that taking care of patients requires the effort of so many people working together, of so many different interacting procedures and equipment, and circumstances. So, it doesn't take much to get people back into the setting. It doesn't require an expensive piece of equipment, mainly just bringing in some people to play the different roles and bringing in some of the real feel of the people and the actual setting.

If a facility wants to implement simulation training, but lacks access to something like Cooper-Rowan SimLab, where would you recommend they start?

The most important thing and the most expensive thing are the people: the clinical educators who make the sessions work. The simulators are really tools to get the learners and the clinical educators together around something that's important to both groups, something relevant to their practice. Good sim training also recognizes

^aCooper University Health Care and Cooper Medical School of Rowan University

how adults learn. That it's much more of an opportunity for people to reflect on what they do and how they might do it differently instead of me saying, "Hi, here's how you need to do it, and here's the best way to do it, and here's what you're doing wrong. Just stop doing all that." Studies have repeatedly shown that approach doesn't work.

It's best to present circumstances where people can reflect about what happened and discuss it. And that's the real power of what simulation education can do. It does not take much equipment. It takes people to investigate where there is a need for more education who can create a scenario that captures those points and that provides an opportunity to think through what happened that worked and where there's room for improvement.

What type of scenarios do you use?

We use many different sorts of scenarios. We use some scenarios to teach people a new technique or procedure and some to teach people how to recognize and manage a crisis. We'll turn off the power in a hospital room and the hallways and call people to take care of a patient. Suddenly, they must navigate where they're going and how they're getting there. Our goal is for people to say, "You know what? I need to go look at our disaster preparedness plan. Where exactly would I go and how would I get the patient wherever I need them to go?"

It's to make people think about things like, "Hey, where is a flashlight? Oh, I have a phone that has a flashlight. Yes, that is helpful." We do run scenarios around surgical fires. Unfortunately, it can happen, and people often don't think about it. But it's absolutely one of those things that you have to anticipate and plan to address, or you just will not be ready. You will waste precious time and too many people will be harmed. So that's something we run through in a sim center in an effort to prevent it from happening, and to make sure people are prepared.

We provide education for every possible learner in healthcare, from prehospital through board-certified attending physicians. We cover everything from introducing a very novice learner to how to talk to a patient all the way up through really complex and dynamic scenarios for long-standing professionals to figure out how to manage those better.

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I certainly appreciate innovation and new technology, but people talking to each other, people trusting each other, people working well together is still such an essential part of healthcare.

If you're going to invest so much time and energy into creating scenarios, it makes sense that you'd want them to be things that people are likely to encounter. Something as simple as the power going out could very well happen, especially with all the fierce storms that we're increasingly getting. It would be better if the first time someone has to deal with a disaster scenario is in the sim center.

Absolutely. I've been at places where the power has gone out. When the weather is extreme, or there are outside physical events that are catastrophic, it is important to have a framework to think about how to manage that crisis. In the case of the power going out, a generator will typically turn on quickly, but it's not perfect. You still need to think about it.

Are there particular topics that don't lend themselves as well to sim training?

I used to think that, but increasingly less so. There are many different tools for simulation. There are people who pretend to be patients, we call those people "standardized patients" (SPs). They are useful for pretty much any field. Those SPs allow students or learners of any level to examine them, to talk to them, to better learn how to take care of someone.

They also are instrumental for issues of professionalism and communication, including between colleagues. It's helpful to teach people about breaking bad news or error disclosure, God forbid, or any adverse event disclosure. Any conversation that is challenging presents an opportunity to learn what it feels like to be the patient or their family who's hearing that sort of information and to better understand how to present difficult information to patients.

We use sim to teach many elements around adverse events: how to avoid errors and how to have tough conversations, because unfortunately, that is part of medicine. Even if everything goes perfectly, sometimes you have tough information to give people that you'd obviously much rather not. And you have to learn how to do that in a way that's most helpful for the patient.

We also want to be mindful of the emotional well-being of healthcare workers, because it is a rough place to work sometimes. There is so much emotion in addition to the complex illnesses or procedures involved. We want to help physicians, nurses, and all healthcare workers develop the skills they need to do the best job they can for their patients.

Absolutely. As you said, you go into healthcare because you want to help people. So, when things go wrong, it can be devastating: You woke up this morning hoping to make things better, but sometimes things just don't go that way.

It is brutal for people. There have been many studies of healthcare workers who have committed errors and how they've coped with it. It's obviously most brutal for the patient and the patient's family. But it is also very brutal for the people in the healthcare system.

What do you see as the next generation of sim training?

There's obviously a lot of work in virtual reality and artificial intelligence [AI], I'm sure that will create many opportunities to help people better understand anatomy, physiology, and how to accomplish certain procedures. As long as we are going to be taking care of patients and working with other people, we are going to need to keep improving how we do that. We

need to best understand how we create a great team that works well together, that feels comfortable questioning each other, making decisions, and then accepting new information and changing those decisions based on new information.

There may be a role for virtual reality and artificial intelligence in that, but we'll still need to get people together and talking to each other.

Absolutely. And at the end of the day, if you or a loved one is sick or needs a procedure, you want to talk to a human, you don't want to talk to a robot.

I agree. I'm hoping that it can help us learn how to work better together. I certainly appreciate innovation and new technology, but people talking to each other, people trusting each other, people working well together is still such an essential part of healthcare.

We've done a few programs for students to work with standardized patients who are demonstrating different challenges, whether it's vision loss or hearing loss or memory loss. And it's very powerful. It's helpful for them to train in a setting where it's not an actual patient. Students can see what they know, but more importantly, what they don't know. Where they've misunderstood something, where they've been just guessing about something, but they really don't have it solidified in their head.

Nobody can know everything. Let's figure out how we can work together to fill in the gaps, whatever the gaps are. That's tremendously powerful.

About the Authors

Amanda Burden is vice chair of Faculty Affairs, professor of Anesthesiology, and assistant dean for Clinical Skills and Simulation Education at Cooper Medical School of Rowan University and Cooper University Healthcare in Camden, New Jersey. She is an active member of the medical education research and patient safety communities. Her research and publications address the use of simulation to explore a range of physician education and patient safety issues, particularly involving critical thinking and decision-making during crises. Dr. Burden is a recipient of an Anesthesia Patient Safety Foundation Safety Scientist Career Development Award and funding from the Agency for Healthcare Research and Quality. She has been an invited speaker at national and international anesthesiology, surgery, and simulation meetings, as well as at the United States Department of Education and the White House Office of Science and Technology Policy, to discuss the use of simulation education to improve patient safety.

Working with a diverse team, Dr. Burden built and directs a successful multidisciplinary interprofessional simulation program that is nationally recognized. She serves as vice chair for the Closed Claims Committee for the American Society of Anesthesiologists (ASA) and Anesthesia Quality Institute, editor-in-chief of the ASA Simulation-Based Education Editorial Board, and as an associate editor of the ASA Editorial Board for Interactive Computer-Based Education.

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