



Welcome!

Welcome to our Simulation Newsletter!

This month, we are coming back to systems simulations. We'll spend the next few months moving back and forth between preparation sims and systems sims.

We're going to focus this month's issue on simulations run at the new Orthopedic Center Ivy Road (OCIR). We ran two malignant hyperthermia simulations there. While we do look at clinical care in simulations, these were designed

to see how the system responded to a malignant hyperthermia situation.

Please send us your feedback! *Our contact information is in the top left corner of the second page.*

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OCIR Simulations

OCIR is similar to the Outpatient Surgery Center in the Battle Building in that it's not in the same building as the main hospital. However, it is much farther away. They are also smaller. They know that in an emergency they will not have a lot of staff available.

The team there wanted to analyze what would happen if a malignant hyperthermia case (a life-threatening reaction to certain anesthesia medications) occurred at OCIR. When those cases

occur, many things need to happen simultaneously ([see here](#) for national recommendations). They wanted to see how they could get all of it done.

Usually, during an emergency, the LIP in the room is the Team Lead. At OCIR, that LIP is a CRNA. Since the emergency is caused by anesthesia, the CRNA has multiple things they must do in addition to being the Team Lead.

Would that be possible?

What could other team

members do that would help the situation, and could those be organized without adding to the CRNA's workload or even help reduce it?

A patient in malignant hyperthermia can't stay at OCIR — they need to be in an ICU. How could that be arranged?

These were the goals of the simulations. Remember that in simulations it always comes back to the goals.

How the Simulations Ran

We ran the same simulation twice. Since we were looking at a system response, it didn't matter as much that they already knew what the simulation was. What was important was that they did everything as they would in real life — they had to call people in, get the right equipment into the room, and then use it properly.

The CRNA had to make several changes to the anesthesia delivery, both in medications used and in the equipment.

The team members had to get cooling materials — actually go out of the room, find the premade ice packs that OCIR has for this, and place them on the patient.

The dantrolene had to be made up. The team prac-

ticed preparing both standard dantrolene as well as Ryanodex, a more concentrated and faster-dissolving version.

However, we did not have the team actually call 4-2012 to request Medic V.

As much as possible, this was hands-on and do all the things they would usually do for this.

Steps of a Simulation:

- Goals
- Creation
- Preparation
- Running the Simulation
 - Briefing
 - Run
 - Debriefing
- Reset
- Assessment

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We create simulation-based experiences for current staff and students to maintain and improve their clinical judgment and teamwork skills during medical emergencies.

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Our newsletter repository:

<https://www.medicalcenter.virginia.edu/medsa/simulation-newsletters>

Journal Article Spotlight

Our article this month describes simple tracheostomy emergency simulations for pediatric residents. It's another example of system simulations. It is Binder, C et al. (2023). Interprofessional In Situ Simulation to Identify Latent Safety Threats for Quality Improvement: A Single-Center Protocol Report. *Journal of Emergency Nursing* 49(1), 50-56.

The following link should work from any UVa computer: <https://www.sciencedirect.com.proxy1.library.virginia.edu/science/article/pii/S0099176722002343>



From the OCIR simulations. Notice the patient covered with premade blue ice packs. The code cart is in the room in case of deterioration. Behind it, barely visible, is the group mixing up the dantrolene. Behind the patient's head is the CRNA who is also the Team Lead.

Debriefing

The debriefing is usually the core of a simulation. In this case, it was even more so. While we discussed clinical care briefly, the goal for these simulations was to assess the system. As a result, every team member there was able to point out positive items and opportunities for improvement.

On the clinical side, we spent a little time discussing how the patient would present and also how to quickly rule out other possible confounding problems such as an anesthesia machine problem. The CRNA has multiple things they must do (switch anesthesia meds, change the circuit, add charcoal filters, flush the circuit with 100% oxygen, and continue monitoring the patient). Then we moved into the team response.

We discussed pulling more people into the room and who those people might be. Multiple ORs are operating simultaneously and the team can't just abandon a patient mid-operation. How many anesthesiology providers can come into the room and how fast?

Also, who else can come into the room? Some of the actions needed require nurses or pharmacists, such as mixing and administering dantrolene. In most OR cases, the CRNA/anesthesiologist is the one giving medications, but as we've discussed, the CRNA is busy.

Some of the other tasks do not require a nurse, such as bringing ice packs and other cooling equipment into the room. Could they pull in more OR techs/PCTs or people from pre-op/PACU? If so, do those team members know where the equipment is and can they get it quickly?

There will need to be a lot of people doing a lot of things. Who will assign all of those roles? This point was one of the best parts of the debriefing. Everyone was involved in deciding who would do what. This is one of the great uses of simulation: people coming together to decide how they will respond to an emergency in their area. They've just had this (simulated) emergency — how can they do better with a real one?

Hear from OCIR

This is from Christa Mazur, one of the NECs at OCIR:

At the Orthopedic Center Ivy Road, we are an island since we started performing surgeries in the fall of 2022. The full strength and support of the UVA Health System is behind us, but we know that we need to be prepared to react initially to crises with a small staff. Malignant hyperthermia is a rare but serious occurrence. If it were to happen here, we would need all available hands to respond to the initial crisis. It is crucial that all of the perioperative crew (pre-op, post-op, and OR) are prepared to respond. Working with the Life Support Learning Center to bring a realistic simulation to our facility helped our team to understand the challenge of dealing with such a crisis on our island. The simulation showed the strength of our teamwork and revealed areas to improve our processes and resources. We plan to work with the LSLC to do further simulations to sharpen skills, increase knowledge, test processes, and make further improvements.

You Can Do This, Too!

You can also do this!

Real-life experience is important. Simulations allow us to have some degree of that experience with the added benefit of a thoughtful, deliberate discussion afterwards.

Send us an email. See what we can do to help you.