

## Welcome!

Welcome to our Simulation Newsletter!

This is the start of the third year of our simulation newsletter. Please let us know what you'd like to see in future issues!

This month's theme is

using simulation for systems testing.

Simulation is not just for clinical education. We can also use it to test how we do patient care. We can bring a manikin into a clinical area to see how the

system will respond to a unexpected situation.

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

## What is Systems Testing?

Systems testing is where we use simulation to test how people respond to an unexpected emergency. We're not necessarily looking at how each of the participants performs clinically; we're looking at how the system performs.

We can do focused or

random testing, which we'll discuss in other articles. While we can tell people that these tests will be coming at some point, we don't announce their specific days or times.

We evaluate how the system responds and compare that with how the system is

designed to respond. For instance, how do staff respond to a possible stroke? Do they provide the correct initial interventions? Do they call the right team for help? Does the patient move quickly to the CT for emergent imaging to assist in decision-making?

## Different Types of Systems Testing

Systems testing can be focused or random.

In focused testing, we are testing a specific process. Usually, this is reserved for the "big ticket" items, such as cardiac arrest, STEMIs, strokes, and sepsis. These are areas that all organizations want to do well, that are watched closely by national regulators and accrediting agencies, and that can be difficult to do well.

It frequently happens after an event of concern occurs.

We can do focused testing before training to see how we do in our base state

and/or after training to see how well our training has been absorbed and how effective we now would be with real patients.

One theoretical example of this would have been if we had done systems testing after the blood misadministrations we had a few years ago.

We can also do random testing. This is designed to find problems that we don't know are problems yet.

We can test processes and procedures that we believe are working — there are no outstanding A3s or other concerns — to see if we're

correct. Frequently, random testing will show that we are doing things correctly. Occasionally, we'll find a new problem that we can fix before it reaches an actual patient. An example of this is the in-house adult mock codes we were running before COVID-19 arrived (see next page).

The manikin doesn't mind if the systems don't work as planned. But the manikin can help improve our care of actual patients.

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### Steps of a Simulation:

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

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A Nuclear Stress Lab mock code — the patient collapsed on a treadmill. We've helped their staff find system problems in previous sessions.



A pediatric sledding accident simulation in the Emergency Department, involving nurses, physicians, pharmacists, and Child Life Specialists. The team came up with suggestions for system improvements, such as putting a poster with trauma alert criteria on the wall.

## Example: In-house Adult Mock Codes

We've been running In-house Adult Mock Codes since 2014, though we haven't run any since April 2020 due to COVID-19. Over time, we've expanded their scope from observing the clinical care of the Adult Code Team members (though we still do this) to include systems testing.

We look for an open room on a floor that isn't too busy. We bring the manikin into that room and do a fast setup. We then bring in the charge nurse to be the first participant. She's the only person who receives a formal briefing about the simulation. We then let the code run.

The participants are encouraged to do everything they usually do, including pressing the blue Code button and actually calling 4-2012. The notification will go to the Adult Code Team as a code, not as an exercise or drill. We watch the floor's response and then add in the Adult Code Team's response. The scenario ends no more than 15 minutes from start, and the debriefing is no more than 15 minutes long. The debriefing mostly focuses on clinical topics.

We use cameras for these, but only to make a detailed timeline. The video is not used in any other way. In contrast to the debriefing, the timeline also discusses systems topics, both successes and improvement needs. The timeline doesn't use anyone's name, identifying people by their roles instead (Nurse 1, Physician 2, etc.). The timeline goes to everyone who was present. We will begin to also send it to various service line and profession leaders to highlight what we do well and what concerns we may have, if any.

These simulations have been instrumental in improving the care of the Adult Code Team. We can see how they perform in a near-real situation and then tailor our education for them in response to what we saw.

These were also instrumental several years ago in showing that the change to the silent code pager would work. Simulations can test systems, not just clinical care.

## Journal Article Spotlight

This month's journal article discusses using simulations for systems testing in a new hospital before the hospital opened. The testing found 641 unique issues that could be addressed before opening day. The article is Adler, M. D. et al. (2018). Use of simulation to test systems and prepare staff for a new hospital transition. *Journal of Patient Safety* (14)3. The following link should work from any UVa computer:

<https://oce.ovid.com/article/01209203-201809000-00004/HTML>.

## Examples of System Improvements

Additional signage and placement of patient information in Hyperbaric Medicine (the hyperbaric oxygen chamber) for patient and provider safety.

Suggestions for improvements between Emergency Department pharmacy and nursing staff during code/critical patient situations.

Suggestions for process and flow improvements in the new Emergency Department before it opened. Separately from the LSLC, the ED had its own mock-up of new ED rooms before the new building broke ground.

Suggested equipment improvements as part of Malignant Hyperthermia simulations in the Outpatient Surgery Center. These were designed for clinical care, not systems testing, but found potential system improvements as well!