

How to prevent 440,000 yearly deaths due to medical errors

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Teaching a "Martian" how to make a peanut butter and jelly sandwich is part of new curriculum at Northwestern Medicine that aims to eliminate medical errors. Credit: Northwestern University

Why do physicians accidentally jab themselves in the hand with an EpiPen (epinephrine injection) when they are trying to give another person an injection while holding their breath?



How does directing a "Martian" to make a peanut butter and jelly sandwich improve <u>health care</u> communications?

The answers are part of the curriculum for the first Ph.D. in <u>health care</u> <u>quality</u> and <u>patient safety</u> program in the country—at Northwestern Medicine — which aims to prevent the annual 440,000 deaths from medical errors in the United States.

"You can't stress enough how crazy it is that the third-leading cause of death is medical errors," said Donna Woods, director of the graduate programs in health care quality and patient safety at Northwestern University Feinberg School of Medicine. "How will this ever get fixed if we don't train a work force to do it? We need an army of experts who need to know how to address this. The medical field does not have the skills to do it."

The first Ph.D. student in health care quality and patient safety graduated this fall with others in the pipeline.

Senior and mid-career clinicians (physicians, nurses, pharmacists) and <u>health care professionals</u> are trained by engineers, cognitive psychologists and risk assessment and change management specialists, who bring a critical fresh eye to the medical world. The "outsiders" teach students how to spot the vulnerable chinks in the system and figure out how to fix them. The students learn to do research, so they can design fixes based on scientific evidence.

To build a national health care safety army, Northwestern has provided a template from its master's level health care quality and patient safety program—also the first in the country—to other medical schools to launch their own master's programs. These include George Washington University, Thomas Jefferson University's College of Population Health, University of Illinois and Cornell University.



Doctors, nurses and pharmacists are working in a system that has not been designed for safety, and they never got the skills or perspective to help them redesign health care to make it safer. Thus, the problem can't be fixed by insiders without training in health care quality and patient safety, Woods said.

"Under the current model, when medical students and residents walk into an Emergency Department, their challenge is to survive and adapt to a crazy system, not figure out how to fix it," Woods said. "When they become attending physicians, they are inured to the problems and no longer see the risks. We have to reintroduce them to these risks. If they don't see them, they won't ever do anything to fix them."

The Ph.D. students learn about physical and cognitive ergonomics, which is the study of predictable errors your mind can make and how to consider these in health care design to make the delivery of health care more reliable.

In one class session for Ph.D. and graduate students, a faculty member who is a physician and an engineer, brought EpiPen trainers to class. He asked students—most of whom had medical degrees—to hold their breath (to create a sense of urgency) while reading the directions and give another person the injection. In the scenario, the person was having a life-threatening anaphylactic reaction. Every time this session is held, at least one student accidentally sticks himself or herself in the hand with the injector, wasting the life-saving medicine. Students had to figure out why the device's design led to that problem.

The lesson learned: it's hard to make your eyes focus when you are in a crisis situation.

The faculty member who taught the EpiPen class subsequently worked with the manufacturer to develop a new design in which the injector



gives spoken instructions.

In another class, students are instructed to write a protocol for a "Martian," who has no earthly cultural knowledge, to make a peanut butter and jelly sandwich. When the instructor attempts to literally follow students' directions, sandwich-making chaos ensues. It illustrates when a person writes a protocol for a health care procedure, they make a lot of cultural assumptions that not everyone shares or understands across medical departments, services and professions. That can lead to errors.

Students also learn one of the riskiest moves for a patient is from an intensive care unit (ICU) to the regular-care hospital floor. In the ICU, each nurse cares for two patients and checks them constantly. On the regular floor, a nurse may have seven or eight patients and visits them every four to six hours.

"In four hours, a patient just transferred from the ICU can quickly deteriorate to the point of death," Woods said. "One opportunity for change is not just recognizing this to be a potentially risky transition but to develop a system of additional monitoring and checking on these patients. Many hospitals have a rapid response system after a patient has deteriorated. Possibly, a system of rapid-response rounding can provide a system so a nurse comes around more frequently. This is the type of intervention our students will develop."

Woods has a personal interest in this solution; several years ago her mother died within a day after being moved from the ICU to a regular floor.

The curriculum also targets how to improve teamwork and communication in health care—often disjointed and risky—as a patient moves through the system. A patient's primary care doctor and



specialists don't always communicate or know about changes in drugs, which could lead to dangerous interactions or overdoses. Students are tasked with making electronic health records more reliable, including more accurate processes for including all of a patient's current medications. Unreliable information is frequently the cause of medical errors.

The first Ph.D. student who graduated in September, Cindy Barnard, is non-traditional in that she is already an executive in the health care world as vice president of quality for Northwestern Memorial Healthcare. In her research, she asks patients how they define quality health care.

"As surprising as it may seem, nobody has asked them," Barnard said. "We discovered patients have thoughtful and distinctive views of what health care quality should be, and what they want us to improve. Now we need to figure out how we can use their perspective to change what we measure in order to provide what's important to them."

The medical field thinks patients care most about emotional support and the hotel aspects of the hospital (food quality, cleanliness and parking). But what they really value is a timely, accurate diagnosis and evidence-based care, Barnard said. They also are concerned about <u>medical errors</u> and recognize the most vulnerable time in their care is when they are transitioning from one nurse or doctor to another. Many said they want to make sure all of their doctors are on the same computer system.

"We've learned the health care industry needs to do a better job of creating quality measures to determine if the patient received a prompt and accurate diagnosis," Barnard said. "There's no way to say this hospital or doctor did or did not do a great job."

Gayle Kricke, a geriatric social worker who will get her Ph.D. next year, is researching quality end-of-life care for older adults with multiple chronic conditions. They account for two-thirds of the older adult



population more than 65 years old, a number on the rise.

"These patients tend to be on a roller coaster of sickness and relative health, so you don't really know when they are approaching the end of their lives," Kricke said. She's investigating how to improve care for them, moving them into palliative care sooner and hospice at the appropriate time. Many spend only a few days in hospice care, which means they aren't getting the full benefit, including a focus on comfort and holistic care to meet the spiritual and emotional needs of the patient and family.

"These students are the future of safer and higher <u>quality medical care</u>," said Neil Jordan, director of Northwestern's Health Sciences Integrated Ph.D. Program, which includes the Ph.D. degree in health care quality and patient safety.

Provided by Northwestern University

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