AAOS Patient Safety Committee Considers Ways to Avoid Harm Through Innovations in Quality and Safety

Recently, members of the AAOS Patient Safety Committee—David C. Ring, MD, PhD, chair; Michael R. Marks, MD, MBA; Dwight W. Burney III, MD; Ramon L. Jimenez, MD; Alan M. Reznik, MD, MBA; Michael S. Pinzur, MD; and Nina R. Lightdale-Miric, MD—participated in a roundtable discussion about innovation in quality and safety.

Dr. Ring: An evolution in the definition of harm was the catalyst for a discussion of innovation in quality and safety. The Institute for Health Innovation definition of harm includes both acts of commission or omission (e.g., forgetting to do a test or check a laboratory result). It expands the diagnosis of harm to include psychological and physical or financial harm. For example, a misdiagnosis sometimes causes no physical harm, but a misdiagnosis of HIV or cancer could result in psychological and financial harm. Do we agree with that expansion of the definition of harm?

Dr. Burney: Ineffective communication can cause both psychological (shame or stigmatization) and physical harm (delay in diagnosis or treatment). An example might be fat shaming: It's both inappropriate and ineffectual.

Dr. Jimenez: Another way of saying it might be active versus passive harm.

Dr. Ring: One example of the benefits of expanding the definition of harm is the progress made on central line infections. For a long time, we said, "This happens. There's no way to avoid this. It's just part of the risk of using central lines." Then a five-step checklist tested in Michigan showed that the infection rate could be reduced to near zero just by having somebody watch technicians when they place lines and calling them out if they violated one of the checklist's principles. It changed the way we thought about whether a central line infection was harm or a known, acceptable risk. The perception used to be that even the actions of skilled technicians could result in central line infections. In reality, infections happen when the technicians have lapses or slips. The five-step checklist went a long way toward recognizing potential paths to patient harm and reducing those risks.

Dr. Pinzur: Another example of innovation in quality and safety is simulation. Historically, we taught surgical technique to residents via the "see one, do one, teach one" method. Now we're adding simulation, where they can practice on a model and inflict less harm when they perform the technique on a human.

Dr. Ring: In the past, we might have accepted that episodes of harm were inevitable when learning how to perform a certain surgical procedure. Now with simulation and teaming with experts until our skills are established, that notion is not as readily accepted. We're moving more toward the concepts and culture of aviation and manufacturing. In those fields, simulation of the many situations when "harm" can occur helps people train away the risks of impending harm before they occur.

Dr. Pinzur: As medical students, we used to run to codes, so that if a person was pronounced dead, a couple of medical students would get to intubate them and bolster their skills. Perhaps one could question that practice, but that was our simulator. Now we use manikin simulators, and the anesthesia residents are better at emergency intubation at an earlier stage in their training.

Dr. Ring: Examples of quality and safety innovation in surgery include how radical mastectomy was the accepted treatment for breast cancer based largely on eminence rather than evidence. Radical mastectomy is the removal of the entire breast, the underlying muscle, and all of the axillary lymph nodes. Even though the procedure results in extensive scarring, disfigurement, and lymphedema with no improvement in outcome compared to less extensive mastectomy, it took a while for surgeons to transition because of the inertia of tradition and the authority of William Halsted, MD. Now radical mastectomy is rarely performed.

Another example of innovation in medical quality and safety is sedation in the intensive care unit (ICU). Patients who were intubated and uncomfortable with all the lines used to be sedated. Now, patients sit up in bed and participate in their recovery as much as they can (including deep breathing, coughing, changing positions in bed, etc.), an approach that has led to better outcomes. What you accept and what you consider harm versus the price of doing business are changing.

Dr. Pinzur: We looked at venous thromboembolism (VTE) rates, and we found that mobilization was much more effective in reducing those rates than anything else we do. We decreased the rate of VTE in the ICU by placing comatose patients in a sitting position.

Dr. Ring: In the vein of quality and safety innovation, there's something that I've been wondering about and trying to put in the right context. As hand surgeons, we diagnose illnesses that lead to surgery; however, some surgeons disagree whether the diagnoses even exist. If we evolve to the point where, looking back, we say that those diagnoses were the "whiplash" or "hysteria" of our day, would we consider all those prior "well-meaning" surgeries as harm and stop their use?

> "Another example of innovation in quality and safety is simulation. Historically, we taught surgical technique to residents via the 'see one, do one, teach one' method. Now we're adding simulation, where they can practice on a model and inflict less harm when they perform the technique on a human."
>
> *Michael S. Pinzur, MD*

Dr. Reznik: That's a little scary. Another orthopaedic example: We were at an interesting crossroads when people thought thermal capsulorrhaphy was a good idea. People were shrinking the lining of the capsule in the shoulder. Some were even "tightening" loose anterior cruciate ligament grafts by thermal "shrinking" them. It all looked beautiful at the time of arthroscopic visualization. The videos made great presentations. Yet, I remember very distinctly that the microscopic pictures were what I learned in pathology would be classically denatured proteins. I was thinking, "They're denaturing all the proteins; this approach can't be good. I'm not going to do it." Over a three-year period, surgeons kept modifying the rehabilitation, and even changed the technique in an effort to try to make the operation work. At the end of the day, eventually, the reports of good, long-term results were retracted, and the technique was abandoned.

Dr. Ring: That's an example where innovation turned out to be a form of harm, but in the midst of it, we were thinking, "This is a great advance." We were seduced by the concepts, by the way it appeared to be a good idea and a notable advance, and how it seemed to get a significant result.

Dr. Lightdale-Miric: Blood transfusions in total joint replacement are another example. We thought transfusion was unquestionably good (like the attitude toward blood doping in cycling). We thought that they'd go home faster and that they'd feel more energetic after they got their blood. Now that we have more evidence about hemodynamic requirements in spine and total joints, people are going home faster, and there are fewer adverse outcomes from blood transfusions.

Dr. Ring: This was a useful tour of some quality and safety innovations. It seems that, both collectively and individually, not expecting to improve, not expecting to grow, or thinking you have things down perfectly represent latent (potential) error and harm. The problems caused by attractive and rushed innovations teach us that lack of humility, curiosity, and a growth mindset may increase the potential for error and harm. The contrary attitudes of hubris, single-mindedness, and stagnation also might cause team psychological harm. So, we continue to improve the field of orthopaedics, continuing education, a healthy review of one's own outcomes, self-review, vigilance, and honesty to reduce potential "harm" to patients.