



The “July Effect”

Are You Using Simulation to Smooth out the New Intern Learning Curve?

As July approaches, medical students brace themselves to begin their intern residency programs. In 2016, nearly 19,000 students graduated from medical school, and nearly all were matched with positions at the more than 4,800 residency programs within the U.S.⁽¹⁾ This marks a continued annual growth in new resident positions in America. For some patient safety advocates, this raises a perennial concern about the so called “July Effect”, a potential increase in medical error during July as new interns assume their new roles as practitioners and as leaders.

The “July Effect” is not an idea that is confined to the United States. The United Kingdom has a similar equivalent in August when new residency programs begin there.

While some studies argue that the “July Effect” marks an increased risk to the care of patients, others indicate no effect at all. Conflicting data aside, introducing new team members to an established hospital workforce can create a new variable for your system. This in turn can put everyone involved on a new learning curve, especially the new intern.

“With the change of guard [each July] come new questions, new relationships, and a generation of our country’s brightest

Drawing on the experience of experts, in this article we share five insights about where and how you can use simulation to support your new resident interns as they transition to practice.

Discussed herein are:

- What some residency programs are already doing using simulation
- How hospitals are placing patient safety at the core
- What it means to make simulation part of a new resident’s daily environment
- How simulation can benefit new residents and their surrounding teams by helping improve leadership, followership, and mutual support skills
- Why it is worth preparing new residents for low frequency, high acuity events

minds quickly understanding that they are real doctors,” says Dr. John Henning Schumann, President and former Residency Program Director at University of Oklahoma School of Community Medicine.⁽²⁾

For interns, this transition means making a leap from the breadth of the information needed to graduate from medical school to practicing a narrow set of skills just to perform daily tasks. Dr. Matt McCarthy, author of *The Real Doctor Will See You Shortly: A Physician’s First Year*, reflects that if he had been asked to “recite pages from a journal article on kidney chemistry or coagulation cascades, I could’ve put on quite a show. . . . But I hadn’t learned much of the practical business of keeping people alive – skills like drawing blood or putting in a urinary catheter”.⁽³⁾

If you are involved in managing or onboarding new interns or if you are a part of hospital administration, the “July Effect” marks a potential learning curve for everyone- one that can conceivably affect daily operations, morale, and some say patient safety. One solution is to use simulation to smooth out and minimize that learning curve for greater control and efficiency.

In this article, we share some points for consideration on where and how you can use simulation to your benefit.

What Some Residency Programs are Doing

Using simulation in residency programs is not a new concept. Residency programs in emergency medicine have often led the way in using simulation to train new interns. By 2008, greater than 90% of the then 179 accredited emergency medicine programs in the U.S. reported the use of some form of simulation to train their residents, with 85% specifically using manikin-simulators.⁽⁴⁾

Emergency medicine typifies what many other specialties are facing. The last decade has placed numerous stressors on the traditional “see one, do one model of medical education,” with a subsequent influence on resident training. Residency programs have had to cope with an exponential increase in disease diagnoses and management strategies, resident duty-hour restrictions, reduced physician teaching time, and a heightened awareness about the use of patients as educational resources. Despite these changes, practicing safe medicine continues to depend on the acquisition of medical knowledge, proper judgment, and practical skill. With stricter clinical governance and a greater focus on patient safety, acquiring these skills before independent practice is challenging for residents.⁽⁵⁾

If we were to draw on the experience of nursing, the National Council of State Boards of Nursing (NCSBN) recently conducted a landmark study that concluded that simulation can be effectively substituted for up to 50% of traditional clinical experience in all pre-licensure core nursing courses under conditions comparable to those described in the study.⁽⁶⁾

While the NCSBN study did not address the world of new interns, it may still be worth considering its findings. A preliminary study conducted by Magee-Women’s Hospital of University of Pittsburgh Medical Center concluded that simulated patient exercises can be utilized in multiple arenas to teach OB/GYN residents communication skills, while simultaneously addressing their clinical knowledge deficits.⁽⁶⁾ In another study conducted by Johns Hopkins University, simulation training was used to improve critical patient hand-off by pediatric interns.⁽⁷⁾ Hospitals use simulation to train staff all the time. If you are interested in teaching new interns and you are not already involved in simulation, a great place to begin is to ask if your hospital already has a simulation program.

In 2016, nearly 19,000 students graduated from medical school, and nearly all were matched with positions at the more than 4,800 residency programs within the U.S.⁽¹⁾

Hospitals Placing Patient Safety at the Core

Preventable medical error in U.S. hospitals accounts for as many as 250,000 patient deaths⁽⁸⁾ and over 1 million injuries annually. Medical errors can be defined as:

- Lapses in judgment, skill or coordination of care
- Mistaken diagnoses
- System failures that lead to patient deaths
- The failure to rescue dying patients
- Preventable complications of care⁽⁹⁾

In the words of Martin Makary, a Professor of Surgery at the Johns Hopkins University School of Medicine, "it boils down to people dying from the care that they receive rather than the disease for which they are seeking care".⁽¹⁰⁾

And, yet, new interns often find themselves in situations where their role is pivotal in this equation.

To address this, many facilities, including Massachusetts General Hospital and Yale-New Haven Hospital, have implemented longer and more robust training for interns. Despite questioning the legitimacy of a "July Effect", doctors and administrators there support sensible precautions which include interns completing simulations, task training, and online learning.⁽¹¹⁾

Similarly, the University of Miami-Jackson Memorial Hospital Center for Patient Safety has worked to impart a clear, uniform message for interns that system deficiencies and trainee inexperience can compromise patient outcomes. Using a blended learning approach that involves lecture, web-based learning, and small group simulation, the center developed an innovative curriculum to impart competencies related to a new intern's role in preventing medical errors. Their course runs during the first week of the intern year and specifically addresses 1) calling for help; 2) teamwork and communication; 3) hand hygiene compliance; and, 4) preventing medication and other system errors.⁽¹²⁾

If these or any other patient safety issues are your concern, even basic simulations can address these concerns and turn practice into permanence.

So, Why Not Make Simulation Part of the Tour?

At this point you might be asking what it takes to address all of this. How do I leverage simulation in a world where I can't afford to take interns away from their scheduled rounds? And, how do I avoid a long protracted training effort that could further isolate interns from the very environment they need to become accustomed to? If these are your concerns, perhaps you may wish to consider using in situ (i.e. on site) simulation in the very environment your new interns will practice in starting on day one.

Greater than
90%

By 2008, greater than 90% of the then 179 accredited emergency medicine programs in the U.S. reported the use of some form of simulation to train their residents, with 85% specifically using manikin-simulators.⁽⁴⁾

Consider the process of an intern becoming familiar with your hospital's technology and equipment for the first time. Within the confines of their orientation, interns are usually given a tour and instructions on where equipment is stored. While this can certainly be used as a starting point, interns should also feel comfortable using the equipment. Residents typically have no prior experience, yet are

expected to diagnose and treat patients in these unfamiliar settings.⁽¹³⁾ To a new intern, a quick overview may be insufficient, especially if they find themselves at the center of treating a patient emergency.

“New residents are unfamiliar with their new working environment, equipment, hospital layout, and culture, which can cause anxiety,” according to Dr. Chopra and Dr. Kondapalli of Iowa State University. A cardiac arrest, for example, is no time to be discovering functionality of your defibrillators, layout of your crash carts, or how to activate a code. It’s equally no time to be discovering your protocol, processes, and procedures.

As a solution, in situ simulation can effectively introduce interns to their new work environments. In situ simulation is simulation conducted on location in the intern’s own care setting involving the same staff, protocol, processes and equipment that the new intern and surrounding team will use every day. And, since new interns will be dependent on working with teams, in situ simulation allows everyone to review and reinforce their skills, all the while identifying hazards and deficiencies in their systems and environment.⁽¹⁴⁾ These in situ simulations can be held in any unit and can provide exposure to the real world circumstances new interns will be expected to perform in.

Used effectively, you can make in situ simulation part of each new intern’s orientation--“part of the tour” and part of a regenerative circle of learning process going forward.

Simulate for Leadership, Followership, and Mutual Support

Experts agree, the team development benefits of in situ simulation should not be underestimated. When interns are introduced to each other, they are aware that they are each other’s support system - for the year and for the length of their entire residency program. They will endure the long hours, challenges, and new intern stress together. But, these relationships do not form the basis for the teams they will be working with. The staff that interns will be expected to work with will include nurses, senior residents, physicians, paramedics, and personnel that interns may not get the chance to know on a personal level.

Given the nature of different staff schedules, each time a new intern finds him or herself working with a team, the mix will likely be different. Understanding how to manage team dynamics despite who is on the team becomes an important asset. Great teams know this and that’s where they focus – not just on refining individual skills but on instilling the skills necessary to excel within teams.⁽¹⁵⁾

The To Err is Human report recommends that simulation training be used to prevent errors in a clinical setting. According to the report, “...health care organizations and teaching institutions should participate in the development and use of simulation for training novice practitioners, problem solving, and crisis management, especially when new and potentially hazardous procedures and equipment are introduced”.



The above is especially true if you find yourself struggling to teach Crew Resource Management Principles or TeamSTEPPS®. In this arena, simulation offers teams benefits that outpace didactic learning. One benefit is the opportunity for deliberate practice, with a focus on quality of the experience – not quantity. Another is the chance to debrief and truly understand the strengths and weaknesses in a team's behavior. Incorporating standardized scenarios into a simulation allows you to focus on instilling good leadership and followership skills, polishing closed loop verbal communications skills, and maintaining situational awareness as the team coordinates efforts. Furnished with this kind of practice, interns and others can leave the simulation better equipped to care for patients and function as part of an ever-changing team.

Transition to practice is real enough. The patient doesn't have to be

In their paper, "Emergency Medicine Simulation: A Resident's Perspective", Drs. Meguerdichian, Heiner, and Younggren describe a new resident stepping into an emergency department (ED), immediately confronted by the commotion of a team trying to save a patient who has begun to code. The new resident quickly determines that the patient needs to be intubated. The airway proves to be difficult, and with every step the new intern takes, first using a Macintosh blade, then a video laryngoscope, the patient deteriorates one step ahead. Alarms blaring, and sweat building up on his brow, the new intern prepares to perform a cricothyroidotomy. With that decision, the alarms halt, and the new intern is commended for his efforts. The case was a simulation, part of what all three doctors encourage as part of an onboarding process for new residents.⁽¹⁶⁾

This type of situation, a low frequency, high acuity event, can be especially problematic for a new intern given the infrequency of true hands-on practice.⁽¹⁷⁾



70%

of sentinel events reported to the Joint Commission have been found traceable to communication failure as the primary root cause.⁽²⁰⁾ Additionally, 80% of patient harm is traceable to a breakdown in teamwork and communication during patient hand-offs.⁽²¹⁾ Simulation can help.

Three leading indicators of good patient-centered performance are staff confidence, competence, and compliance. And, yet, interns can reportedly feel paralyzed in the first year of their residency program as they adjust to the change in their environment and an awareness of how much there is to learn. "I spent much of [my first year] in a state of crisis and doubt," says Dr. Sandeep Jahuar, author of the memoir *Intern*.⁽¹⁸⁾ Allowing interns to build their skills through simulation can go a long way in addressing these issues before they manifest themselves in the form of a preventable medical error. By incorporating simulation in your program you can provide new interns with an opportunity to perform procedures in action. And, you can give attending physicians a chance to gauge resident confidence, competency and compliance with hospital regulations, their new environment, and their new teams – all while protecting the patient.

According to Dr. Catherine Skae, vice president for graduate medical education at Montefiore Medical Center, "it's truly our responsibility to be hyper-vigilant throughout the year"⁽¹⁹⁾. Preventable medical error and patient safety are clearly not issues isolated to the month of July. If you'd like to further develop your new intern program, however, July may be the place to start. Please let us know how we can help.

References

1. Press Release: Results of 2016 NRMP Main Residency Match Largest on Record as Match Continues to Grow. (2016, March 18). Retrieved June 15, 2017, from <http://www.nrmp.org/press-release-results-of-2016-nrmp-main-residency-match-largest-on-record-as-match-continues-to-grow/>
2. Schumann, J.H. (2012, July 28). *A year inside a medical residency: Part 1*. Retrieved from <https://www.theatlantic.com/health/archive/2012/07/a-year-inside-a-medical-residency-part-1/260457/>
3. McCarthy, M. (2016). *The real doctor will see you shortly: a physicians first year*. New York: Broadway Books.
4. Okuda, Y., Bond, W., Bonfante, G., Mclaughlin, S., Spillane, L., Wang, E., . . . Gordon, J. A. (2008). National Growth in Simulation Training within Emergency Medicine Residency Programs, 2003-2008. *Academic Emergency Medicine*, 15(11), 1113-1116. doi:10.1111/j.1553-2712.2008.00195.x
5. Meguerdichian, D. A., Heiner, J. D., & Younggren, B. N. (2012). Emergency Medicine Simulation: A Residents Perspective. *Annals of Emergency Medicine*, 60(1), 121-126. doi:10.1016/j.annemergmed.2011.08.011
6. The NCSBN National Simulation Study: A Longitudinal, Randomized, Controlled Study Replacing Clinical Hours with Simulation in Prelicensure Nursing Education. (2014). *Journal of Nursing Regulation*, 5(2). doi:10.1016/s2155-8256(15)30062-4
7. Young, O., & Parviainen, K. (2014). Training obstetrics and gynecology residents to be effective communicators in the era of the 80-hour workweek: a pilot study. *BMC Research Notes*, 7(1), 455. doi:10.1186/1756-0500-7-455
8. Mccrory, M. C., Aboumatar, H., Custer, J. W., Yang, C. P., & Hunt, E. A. (2012). "ABC-SBAR" Training Improves Simulated Critical Patient Hand-Off by Pediatric Interns. *Pediatric Emergency Care*, 28(6), 538-543. doi:10.1097/pec.0b013e3182587f6e
9. Collins, S. (2016). BMJ analysis calls medical errors third leading cause of death, shines new light on ongoing problem. *Pharmacy Today*, 22(7), 36-37. doi:10.1016/j.ptdy.2016.06.022
10. Sternberg, S. (2016, May 3). *Medical errors are third leading cause of death in the U.S.* Retrieved from <https://www.usnews.com/news/articles/2016-05-03/medical-errors-are-third-leading-cause-of-death-in-the-us>
11. Eunjung Cha, A. (2016, May 3). *Researchers: Medical errors now third leading cause of death in United States*. Retrieved from https://www.washingtonpost.com/news/to-your-health/wp/2016/05/03/researchers-medical-errors-now-third-leading-cause-of-death-in-united-states/?utm_term=.cca23f2f1f18
12. Shekhter, I., Nevo, I., Fitzpatrick, M., Everett-Thomas, R., Sanko, J. S., & Birnbach, D. J. (2009). Creating a Common Patient Safety Denominator: The Interns Course. *Journal of Graduate Medical Education*, 1(2), 269-272. doi:10.4300/jgme-d-09-00028.1
13. Chopra, S., & Kondapalli, M. (2015). Applying lean principles to mitigate the "July Effect": Addressing challenges associated with cohort turnover in teaching hospitals. *Journal of Technology, Management and Applied Engineering*, 31(4). Retrieved from http://lib.driastate.edu/abe_eng_pubs/714
14. Patterson, M.D., Blike, G.T., & Nadkarni, V.M. (2008). In situ simulation: Challenges and results. *Advances in Patient Safety: New Directions and Alternative Approaches*, 3. Rockville, MD: Broadview.
15. Wachter, B. (2011, February 15). *Teamwork helps doctors with patient safety*. Retrieved from <http://www.kevinmd.com/blog/2011/02/teamwork-helps-doctors-patient-safety.html>

16. Meguerdichian, D. A., Heiner, J. D., & Younggren, B. N. (2012). (See reference #5)
17. ibd
18. Hester, J. L. (2015, October 1). *The misery of a doctor's first days*. Retrieved from <https://www.theatlantic.com/health/archive/2015/10/the-misery-of-a-doctors-first-days/408004/>
19. Whitman, E. (2016, July 25). *How hospitals see the so-called 'July effect'*. Retrieved from <http://www.modernhealthcare.com/article/20160725/NEWS/160729958?template=print>
20. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1765783/pdf/v013p00i85.pdf>
21. Joint Commission on Accreditation of Healthcare Organizations (Vol 32, Issue 8) (2012). *Joint Commission center for transforming healthcare releases targeted solutions tool for hand-off communications*. Retrieved from http://www.jointcommission.org/assets/1/6/TST_HOC_Persp_08_12.pdf