July Effect? Maybe not

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In the UK they call it The Killing Season; in North America it's called The July Effect.

It's the time of year when newly minted physicians traditionally begin their residency training, other medical trainees advance to the next year of training, and senior residents graduate to begin their professional careers. Interest in the potential effect on patient care during this large changeover has produced a body of research. Media has been quick to pick up on some of that research indicating a possible adverse effect.

Is The July Effect something to be concerned about?

"I think it is a topic that is complex and over sensationalized," says Dr. Salvatore Spadafora, who oversees all residency programs, fellowships and continuing professional education at the University of Toronto. "Whenever you've got a complex topic or problem you usually never have a simple answer … it's probably better to take a breath, step back, and say, 'Ok, what are the actual facts? What are the variables in the complexity?'"

The most rigorous publication on the topic to date is a systematic review published in 2011 in the *Annals of Internal Medicine* which found that increased mortality is associated with year-end physician changeovers. However, this finding came with the limitation that, "heterogeneity in the existing literature does not permit firm conclusions about the degree of risk posed, how changeover affects morbidity and rates of medical errors, or whether particular models are more or less problematic."

A 2016 analysis in the *Journal of Patient Safety* pooled data collected between 2011 and 2015 from nearly 120 academic medical centres and more than 333 affiliated hospitals from all geographic regions in the United States. It concluded that there was no evidence to support a July effect on survival outcomes at US academic medical centres. Studies focused on specific specialties and patient populations have indicated mixed results.

Patients should feel safe seeking care at teaching hospitals all months of the year.

Despite this lack of strong supporting evidence, a national survey of US academic leaders in internal medicine, published in 2016 in *The American Journal of Medicine*, revealed that most internal medicine residency program leaders believe in the potential for a July effect.

As a result, many programs have enacted changes to minimize risk. For example, in response to errors identified for first-year residents, programs have instituted additional electronic medical record training and education on handoffs and discharge processes. For new senior residents, teaching sessions on how to lead a team have been implemented.

Dr. Vineet Chopra, corresponding author on the 2016 survey of academic leaders, notes that the big issue is ensuring consistency of institutional know-how, which is difficult to measure. However, he says, "we are mindful of [this] in Michigan — we have an overlap with our interns and residents, a robust boot camp and onboarding process, and attending [physicians] that often come on during July to oversee care — and I think all of these factors have helped us along the way."

Dr. Kathryn Levy, lead author on the same survey, says, "I can tell you having made it through the first half of July as a chief medical resident here, we've had a

smooth transition without any concerns for patient safety."

Recent studies have compared mortality at teaching versus nonteaching hospitals, year round. A 2017 study in *JAMA* concluded that teaching hospitals are safer. In the study, teaching hospital status was associated with lower mortality rates for common conditions than nonteaching hospitals. "Since they [teaching hospitals] are more prone to a potential July effect, I would say this is reassuring," says Chopra.

In contrast, Levy cites a 2017 study that found discrepancies in mortality between teaching and nonteaching hospitals. Although a July effect was not observed, overall mortality rates at teaching hospitals were higher than at nonteaching hospitals for high-risk patients admitted with septic shock. Levy does note, "it [the study] had a much lower sample size (~120 000 v. > 1 million for sepsis) than the *JAMA* article."

Both Chopra and Levy emphasize that patients should feel safe seeking care at teaching hospitals in July or at any other time of year. Chopra says, "I think patients should hear the following — that care at teaching hospitals is always supervised and performed in a manner to ensure that not only are doctors learning the right thing, but also doing it."

It is important to note that the vast majority of research on The July Effect has been conducted in the US, which may not be generalizable to the Canadian context, says Spadafora. "I think that maybe we need to study it. … We like to think of ourselves as being a North American system, but we all know that health care in Canada is very different than health care in the US."

Spadafora notes that Canadian institutions have also introduced measures to mitigate any potential harms associated with new medical trainees in the workplace — at all times of year. He says "there's a heightened awareness beyond The July Effect on the appropriate need for onboarding and orientation, appropriate supervision in a graded manner from novice to competent expert, and the primacy of the patient's safety."

The bottom line: Should patients be concerned about seeking medical care at a teaching hospital in Canada in July?

"I would say no," concludes Spadafora. "I would have a heightened awareness; you should know who you're talking to [in terms of level of training of medical staff]. It's really important for patients to not be afraid, but to feel empowered to ask who's treating them. If I were in an emergency situation I would not hesitate to come in in July, or any other month of the year. At the end of the day, all of the people who are on the team have one prime directive — to serve the needs of the patients."

Emily Hughes, *CMAJ*