THE SLEEPY SURGEON:
A tired surgeon is not necessarily an unsafe surgeon

Many find it difficult to conceive of the idea of a surgeon flawlessly executing a trauma procedure at 4:30 a.m. But the truth is, it happens – and it happens often.

Surgeon fatigue is a topic that has been widely debated for years. Many publications conclude that fatigue impairs surgeons, inducing errors and endangering patients. Others claim, however, that fatigue doesn’t adversely impact surgeons’ abilities in the operating room. So which one is it?

In January 2015, the American Journal of Surgery published a study entitled, “The Sleepy Surgeon: does night-time surgery for trauma affect mortality outcomes?” They set out to determine the association between the time of day and the outcome of trauma surgery with regards to patient mortality.

The analysis used data from the National Trauma Bank between 2007 and 2010. It included just over 16,000 exploratory laparotomies that started between midnight and 6:00 a.m., and 15,000 that started between 7:00 a.m. and 5:00 a.m.
In looking at the outcomes for about 30,000 patients across both time periods, no significant difference was found in the risk-adjusted mortality rate.

In an interview with Dr. Richard Reznick, who practiced as a general surgeon for 30 years, he disclosed that the study’s conclusions aligned with his own ideas about the relationship between procedure time and patient mortality.

"Surgeons have taught themselves through years of training to get ‘hyped-up’ for an operation; you get adrenalized. So even though you might be exhausted when you're done, while you're doing it, you're trained to maintain that concentration - it really is a period of intense concentration," he said. "Surgeons know that the most important hours of their day are those hours in the operating room."

Dr. Reznick is now a Professor in the Department of Surgery and is the Dean of the Faculty of Health Sciences at Queen's University. He also wrote his Master’s thesis on this topic in 1986, in which he carried out a randomized trial of sleep deprived vs. non-sleep deprived residents.

"There's almost a movement of fatigue scientists that have [the notion] that overworked doctors are unsafe doctors," said Dr. Reznick, "but the reality is that there is just no evidence to that."

Surgeons aren’t the only ones subject to this scrutiny; the number of hours that residents work is a subject of great debate. The National Steering Committee on Resident Duty Hours put out a report in 2013 called “Fatigue, Risk & Excellence: Towards a Pan-Canadian Consensus on Resident Duty Hours”. It states, "Resident duty hours and the issues surrounding the regulation of those hours have the potential to impact various domains such as the delivery of health care, excellence in medical education and the provision of safe care."

Simply put, sleep deprivation is one of the many factors associated with fatigue, and fatigue is one of the many factors that inadvertently impacts performance. While it is claimed that lethargy can cause substantial impairments with regards to cognitive and behavioural performance, the correlation between fatigue, medical errors, and patient safety is unclear.
"If you put [a tired surgeon] in a psychomotor test and look at their saccadic eye movements, or have them try to perform fine motor skills, they might not be as good as they are when they're not tired [...] but it doesn't necessarily mean that they're not safe," said Reznick.

Fatigue Science also published a follow-up editorial on the study done by the AJS, in February of 2015, commenting that the conclusions drawn may be valid, since the data was from a common and relatively straightforward procedure – low-complexity, low-risk. But what about the longer and more complicated procedures?

Dr. Andres Lozano, a professor in the Department of Surgery at the University of Toronto, and the Dan Family Chairman of Neurosurgery, provided his insight from a neurosurgeon’s perspective:

"For emergency surgery, yes. [It's a] different issue for longer and more complex, elective procedures where you want everyone to be at the top of their game," he said. "Neurosurgeons often have the option of staging procedures - doing a partial procedure and coming back to finish on another day."

The post by Fatigue Science contained a quote from Dr. Carlos Pellegrini from the University of Washington, in which he added that experienced and tenured surgeons have devised techniques to compensate for sleep deprivation.

"You do develop heuristics and strategies to keep yourself concentrated during the time of surgery," Dr. Reznick added. "You're not the only person in the operating room; you have at least 2-4 assistants. If you were so tired that you were cutting the wrong thing, it is not very likely that all of the people in the room wouldn't notice."

There is vast agreement within sleep science literature that both sleep deprivation and fatigue have significant impacts on cognitive and behavioural performance. However, the impact on performance varies, and is dependent on many factors, including the individuals themselves, their level of fatigue, and their experience.
“A tired surgeon is not necessarily an unsafe surgeon,” concluded Dr. Reznick.

There are sundry and contrasting studies and expert opinions, and the absence of a general consensus on the role of fatigue in diminished surgical performance may initiate further studies, resulting in a more definitive answer.