

## AHRQ Grantee Profiles



### **Grant Title: Effects of Sleep Loss and Night Work on Patient Safety**

**Principal Investigator:** Christopher P. Landrigan, M.D., M.P.H.  
Associate Professor of Pediatrics and Medicine

**Institution:** Boston Children's Hospital and Brigham and Women's Hospital,  
Harvard Medical School

**Grantee Since:** 2002

**Type of Grant:** Multiple

Experiences early in his career sparked a focus on the connections between sleep deprivation, communication and teamwork, and patient safety, says Chris Landrigan, M.D., M.P.H., associate professor of pediatrics and medicine at Harvard Medical School. "I was sleep deprived, and knew that I was not operating at my best in the middle of the night when a crisis would come up or the following day when I had to take care of critical activities," Dr. Landrigan says.

"That personal feeling of vulnerability under those circumstances coincided with the beginning of the national patient safety movement, and with AHRQ's push to try to better understand some of the drivers of human performance failure," he says. In the early 2000s, Dr. Landrigan decided to devote his career to patient safety research.

It was an AHRQ career development (K) award that initially helped Dr. Landrigan advance his training in sleep medicine, patient safety, and the effects of sleep deprivation on safety and performance. With this expertise, he conducted a randomized controlled trial in two ICUs that found that eliminating shifts exceeding 16 hours for first-year physicians-in-training (interns) reduced rates of serious medical errors significantly. Based in part on this research, the Accreditation Council for Graduate Medical Education revised its guidelines to limit interns' consecutive work hours. The ICU [study](#), which was published in the *New England Journal of Medicine*, "was really a launching point for my career thinking about sleep deprivation as well as a lot of other factors in our microsystems that affect the safety of care that doctors and nurses provide," Dr. Landrigan says.

Identifying sleep deprivation as a contributing factor to medical errors allowed Dr. Landrigan and his colleagues to begin developing interventions designed to reduce

physician work hours. However, shorter shifts mean more frequent handoffs of patient care between clinicians, and these handoffs were soon identified as yet another source of adverse events.

Dr. Landrigan is now mentoring a new generation of patient safety investigators to design safer ways for physicians to hand off patient care responsibilities. They've developed I-PASS, a series of educational materials that present an evidence-based, standardized approach to teaching, evaluating, and improving handoffs. The program won the 2011 Ray E. Helfer Award for Innovation in Pediatric Education and the 2014 Harvard Business School-Harvard Medical School Health Acceleration Cox Award. In an initial nine-center [study](#), rates of preventable adverse events fell 30 percent following implementation of I-PASS in nine hospitals (*New Engl J Med*, 2014). With additional AHRQ funding, Dr. Landrigan is now leading dissemination of the I-PASS program to 32 hospitals nationwide.

Dr. Landrigan has also conducted work to evaluate and develop tools to track hospital performance. In a 2007 [study](#), he determined that the Institute of Healthcare Improvement's Global Trigger Tool (GTT) was effective for tracking rates of adverse events due to medical care. Furthermore, Dr. Landrigan worked on an AHRQ-funded pilot study to develop a Schedule Performance Index (SPI) based on mathematical modeling and the principles of sleep medicine. This index aims to give managers and researchers a tool for measuring the risk of medical errors associated with health care providers' work schedules. Most recently, Dr. Landrigan developed and tested a new trigger tool to identify adverse events in pediatric patients. An AHRQ-funded study on [the Global Assessment of Pediatric Patient Safety \(GAPPS\) trigger tool](#) was published in the May 2016 issue of *Pediatrics*.

In addition to his position at Harvard Medical School, Dr. Landrigan is the Research and Fellowship Director of Inpatient Pediatrics Service at Boston Children's Hospital, and Director of the Sleep and Patient Safety Program at Brigham and Women's Hospital. His research on patient safety has been published in numerous leading journals, including the *New England Journal of Medicine*, *Pediatrics*, and the *Journal of the American Medical Association*.

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