

## **Extended Work Duration and the Risk of Self-reported Percutaneous Injuries in Interns**

**Context** In their first year of postgraduate training, interns commonly work shifts that are longer than 24 hours. Extended-duration work shifts are associated with increased risks of automobile crash, particularly during a commute from work. Interns may be at risk for other occupation-related injuries.

**Objective** To assess the relationship between extended work duration and rates of percutaneous injuries in a diverse population of interns in the United States.

**Design, Setting, and Participants** National prospective cohort study of 2737 of the estimated 18 447 interns in US postgraduate residency programs from July 2002 through May 2003. Each month, comprehensive Web-based surveys that asked about work schedules and the occurrence of percutaneous injuries in the previous month were sent to all participants. Case-crossover within-subjects analyses were performed.

**Main Outcome Measures** Comparisons of rates of percutaneous injuries during day work (6:30 AM to 5:30 PM) after working overnight (extended work) vs day work that was not preceded by working overnight (nonextended work). We also compared injuries during the nighttime (11:30 PM to 7:30 AM) vs the daytime (7:30 AM to 3:30 PM).

**Results** From a total of 17 003 monthly surveys, 498 percutaneous injuries were reported (0.029/intern-month). In 448 injuries, at least 1 contributing factor was reported. Lapse in concentration and fatigue were the 2 most commonly reported contributing factors (64% and 31% of injuries, respectively). Percutaneous injuries were more frequent during extended work compared with nonextended work (1.31/1000 opportunities vs 0.76/1000 opportunities, respectively; odds ratio [OR], 1.61; 95% confidence interval [CI], 1.46-1.78). Extended work injuries occurred after a mean of 29.1 consecutive work hours; nonextended work injuries occurred after a mean of 6.1 consecutive work hours. Injuries were more frequent during the nighttime than during the daytime (1.48/1000 opportunities vs 0.70/1000 opportunities, respectively; OR, 2.04; 95% CI, 1.98-2.11).

**Conclusion** Extended work duration and night work were associated with an increased risk of percutaneous injuries in this study population of physicians during their first year of clinical training.

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## Extended Work Shifts and the Risk of Motor Vehicle Crashes among Interns

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### ABSTRACT

#### BACKGROUND

Long work hours and work shifts of an extended duration ( $\geq 24$  hours) remain a hallmark of medical education in the United States. Yet their effect on health and safety has not been evaluated with the use of validated measures.

#### METHODS

We conducted a prospective nationwide, Web-based survey in which 2737 residents in their first postgraduate year (interns) completed 17,003 monthly reports that provided detailed information about work hours, work shifts of an extended duration, documented motor vehicle crashes, near-miss incidents, and incidents involving involuntary sleeping.

#### RESULTS

The odds ratios for reporting a motor vehicle crash and for reporting a near-miss incident after an extended work shift, as compared with a shift that was not of extended duration, were 2.3 (95 percent confidence interval, 1.6 to 3.3) and 5.9 (95 percent confidence interval, 5.4 to 6.3), respectively. In a prospective analysis, every extended work shift that was scheduled in a month increased the monthly risk of a motor vehicle crash by 9.1 percent (95 percent confidence interval, 3.4 to 14.7 percent) and increased the monthly risk of a crash during the commute from work by 16.2 percent (95 percent confidence interval, 7.8 to 24.7 percent). In months in which interns worked five or more extended shifts, the risk that they would fall asleep while driving or while stopped in traffic was significantly increased (odds ratios, 2.39 [95 percent confidence interval, 2.31 to 2.46] and 3.69 [95 percent confidence interval, 3.60 to 3.77], respectively).

#### CONCLUSIONS

Extended-duration work shifts, which are currently sanctioned by the Accreditation Council for Graduate Medical Education, pose safety hazards for interns. These results have implications for medical residency programs, which routinely schedule physicians to work more than 24 consecutive hours.

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