

Supplementary Appendix 1

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: Barger LK, Cade BE, Ayas NT, et al. Extended work shifts and the risk of motor vehicle crashes among interns. *N Engl J Med* 2005;352: 125-34.

Online Supplemental Material

Methods

We tried to reach as many of the 18,447 individuals who matched to residencies via the NRMP in 2002. Potential participants were verified as PGY1 residents and directed to a secure website, hosted by Pearson NCS, Inc. (Eagen, MN), for electronic informed consent. Volunteers received password-coded links in June 2002 to a baseline survey for gathering prospective information regarding scheduled PGY1 work hours. That is, participants were asked to provide prospectively the average monthly number of extended work shifts to which they were scheduled in the upcoming year. Thereafter, surveys were distributed monthly through May 2003.

On monthly surveys, participants reported the number of extended duration shifts worked and the number of days off per month, allowing derivation of the number of non-extended duration shifts worked per month. Person-months during which time the reported number of extended duration shifts and the reported number of hours worked in the hospital were incongruent were excluded from analysis (~5% of person-months). Months with <150 work hours reported were excluded from the analysis of secondary outcome variables (fall-asleep incidents while driving and while stopped in traffic) in order to limit this analysis to interns working full time and thereby reduce variability of exposure time within the group.

We then performed two analyses to assess whether the extended duration work shifts were associated with an increased risk of motor vehicle crashes (MVC). First, we analyzed a subset of 131 MVCs [37% consequential; 82% documented (4 by photograph, 2 by insurance claim, 12 by repair bills or estimates, 10 by police report and 80 by written description)] and 3,127 near-miss crashes that occurred on the commute from

work as reported on the monthly surveys. The risks of an MVC or near-miss crash occurring after an extended versus a non-extended duration work shift was calculated.

We then determined whether the number of mean monthly number of scheduled extended shifts collected prospectively was associated with the monthly rate of MVC (using Poisson regression). We performed this analysis to address potential reporting bias because both MVCs and work shifts were reported on the same monthly survey in the first analysis.

Results

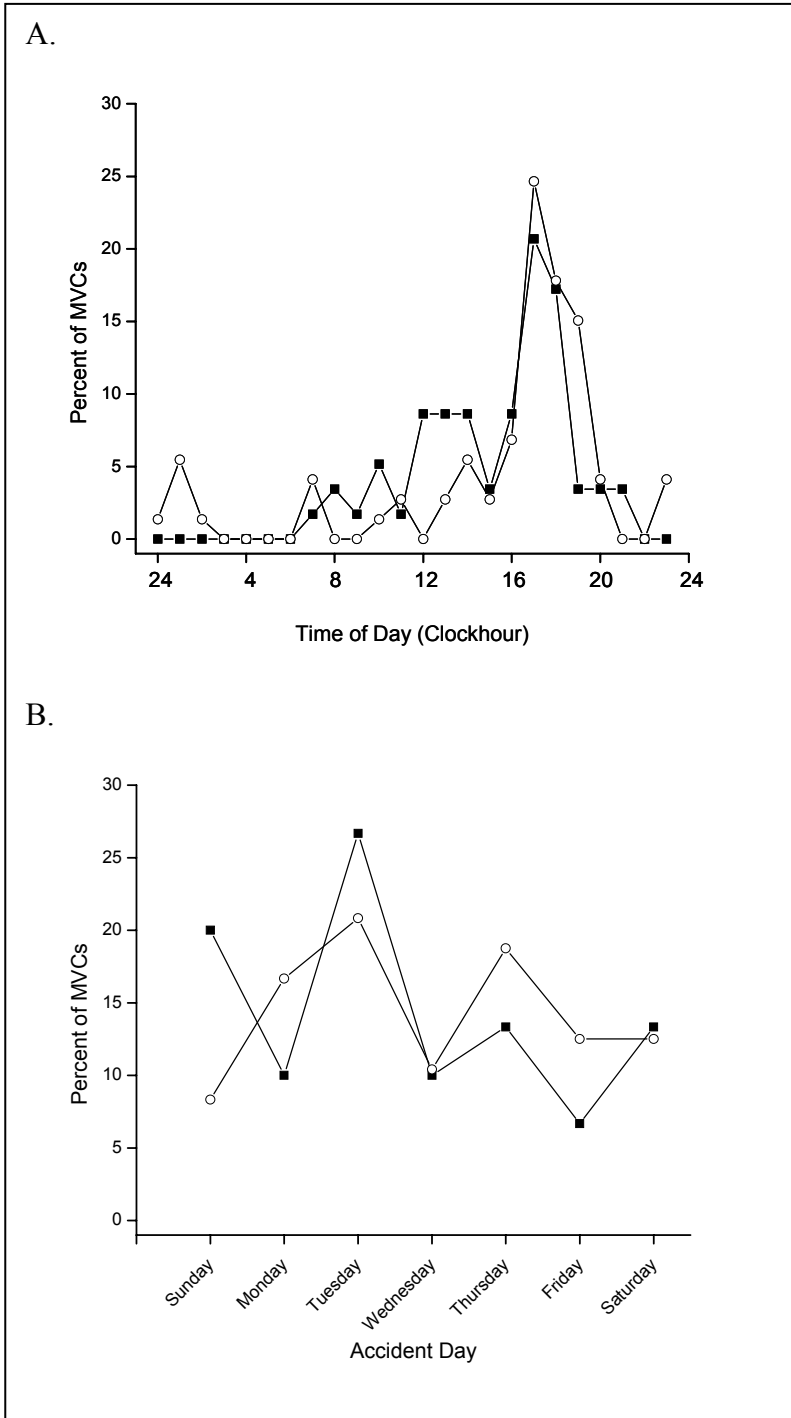


Figure 1. The number of crashes following extended duration (≥ 24 hours) work shifts (closed square) and following non-extended duration (< 24 hours) work shifts (open circle) is illustrated across time of day (A) and day of week (B). The longest extended

duration work shifts averaged 33.7 ± 4.8 hours. In months without extended duration shifts, the longest non-extended duration work shift averaged 12.8 ± 3.6 hours.

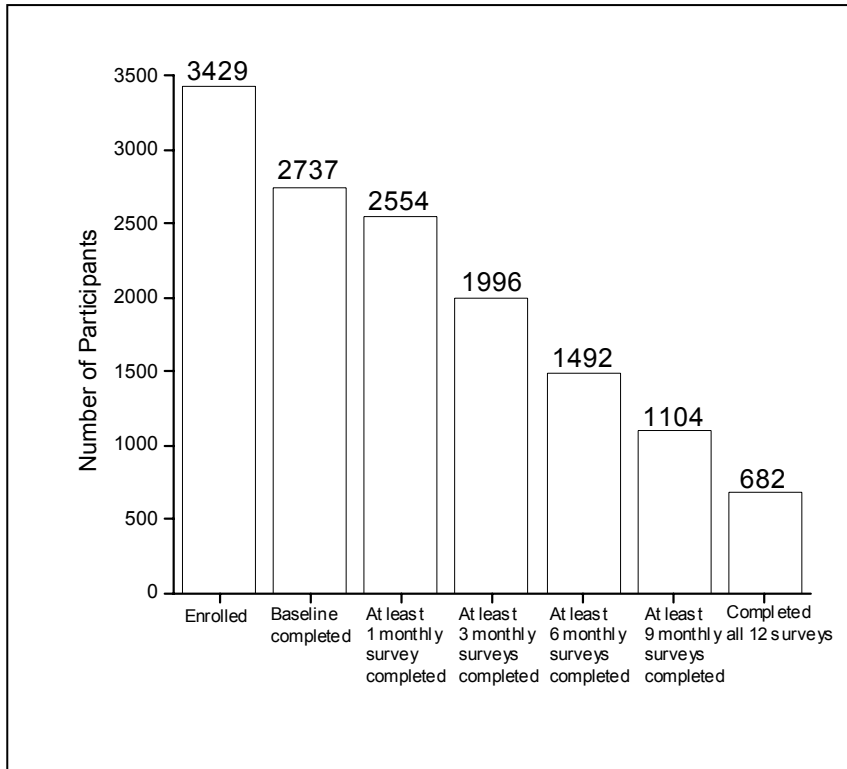


Figure 2. Detailed participation of interns enrolled in survey.

Appendix A – Study Advertisement

Dear Colleague,

We would like to invite you to participate in an exciting study of work hours and health. This is a national survey designed to examine the work schedules of students, dentists, and physicians, and see how these impact health and safety. The study has been sponsored by the National Institutes for Occupational Safety and Health (NIOSH) and the Agency for Healthcare Research and Quality (AHRQ). Data from this study may have an important impact on future policy guidelines concerning work hours of health professionals. Your information is vital for us to complete our project. If you are interested in hearing more about this study, please click on the following link.

<https://www.workhoursandhealth.org/maincontact/default.asp?ID=XXXXXX>

Personal Incentive:

We realize that you are very busy and appreciate your willingness to consider participation in this study. Therefore, those of you in the study cohort who complete all the surveys throughout the year will be eligible for a cash prize in a random drawing. The following cash prizes will be awarded at the end of the year:

ONE \$1,000.00 AWARD; TWO \$750.00 AWARDS; THREE \$500.00 AWARDS; AND FIFTY \$100.00 AWARDS.

Thank you again for considering this invitation.

Sincerely yours,

Charles A. Czeisler, Ph.D. M.D.
Professor of Medicine

Najib Ayas, M.D.
Instructor in Medicine

Laura K. Barger, Ph.D.
Research Fellow in Medicine