A Randomized Trial of a 3-hour Protected Nap Period in a Medicine Training Program: Sleep, Alertness and Patient Outcomes

Judy A. Shea PhD, David F. Dinges PhD, Dylan S. Small PhD, Mathias Basner MD, PhD, Jingsan Zhu MBA, Laurie Norton MA, Adrian Ecker, Cristina Novak MA, Lisa M. Bellini MD, C. Jessica Dine MD, MS, Daniel Mollicone PhD, Kevin G. Volpp MD, PhD

Abstract

Purpose: A recent study found five hour protected sleep periods for internal medicine interns resulted in increased amount slept and improved cognitive alertness but required supplemental personnel. We evaluate intern and patient outcomes associated with protected nocturnal nap periods of 3 hours that are personnel neutral.

Method. Randomized trial at Philadelphia VA Medical Center (PVAMC) Medical Service and Hospital of the University of Pennsylvania (HUP) Oncology Unit. During 2010-2011 AY, 4-week blocks were randomly assigned to a standard intern schedule (extended duty overnight shifts of up to 30 hours), or sequential protected sleep periods (phone sign out 00:00-03:00 [early shift] intern 1, 03:00-06:00[late shift] intern 2). Participants wore wrist actiwatches, completed sleep diaries, and performed daily assessments of behavioral alertness.

Results: HUP interns had significantly longer nap sleep durations during both the early (2.40 hours) and late (2.44 hours) protected periods compared to controls (1.55 hours, p’s < 0.0001). At PVAMC sleep duration was longer only for the late shift group (2.40 vs.
1.90 hours, p < 0.036). Interns assigned to either protected period were significantly less likely to have call nights with no sleep and had fewer attentional lapses on the Psychomotor Vigilance Test; response speed was significantly faster in the intervention group at the PVAMC. Patient outcomes between standard schedule months vs. intervention months were not observed.

Conclusions: A protected nap sleep period of 3 hours resulted in more sleep during call and reductions in periods of prolonged wakefulness and could be a plausible alternative to 16-hour shifts.