

From: "Valerie Barnes" <vbarnes@psha-inc.com>
To: "David Desaulniers" <DRD@nrc.gov>
Date: 3/28/05 9:38AM
Subject: Conversation with Dr. David Dinges

Dr. Desaulniers:

As we discussed, I attempted to contact the authors of the Van Dongen, et al (2003) "Cumulative cost of additional wakefulness" study to ask for information about the performance of the subjects in that study on the recovery days. Dr. David Dinges, who, as you know, is a Professor of Psychology in Psychiatry, Chief of the Division of Sleep and Chronobiology, and Director of the Unit for Experimental Psychiatry at the University of Pennsylvania School of Medicine, returned my call. The remainder of this message documents the conversation, which occurred on the afternoon of March 22, 2005.

Dr. Dinges said that they have analyzed the recovery data from the Van Dongen study, but that it is not yet ready to be released. He referred me to the Belenky, et al (2003) study for recovery data, which we have already reviewed.

However, he stated that they are currently conducting two large-scale research projects for NIH and NASA to study the recovery process after 7 and 14 consecutive days of sleep restriction, respectively. He expects that their first publications from these studies will be available in the Nov. 2005 timeframe. He said that his preliminary impression of the results suggests that the sleep-restricted subjects are not recovering completely (i.e., not achieving baseline levels on the various performance measures), even after 3 nights of 12-14 hour time-in-bed periods and are reporting that they are still experiencing fatigue after they have gone home from the sleep lab.

Dr. Dinges indicated the sleep "research community" has come to a consensus that 2 nights' of sleep is the essential minimum to recover from chronic sleep restriction. Further, he stated that the recovery sleep periods have to be at night, because otherwise the individual's sleep will be disrupted by circadian processes. He also pointed out that one recovery night is insufficient because people are unable sleep for the 12-14 hours that appear to be necessary to recover from even mild sleep restriction, also due to circadian interruption.

He also referred me to the studies of medical interns and residents that have been recently published in the New England Journal of Medicine, with which we are already familiar. He thought that these studies are particularly relevant to the NRC's concerns about the effects of consecutive days of extended work hours on performance. He also mentioned one study that found a substantial increase in traffic accidents for doctors driving home from their shifts after 80-hr workweeks. This research would be relevant because of the long commutes faced by many nuclear plant personnel and recent litigation that has awarded damages to individuals involved in traffic accidents whose employers required them to work excessive hours.

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2887
4192

Date & Time

03/28/05 09:38AM

Options

Expiration Date: None
Priority: Standard
Reply Requested: No
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Concealed Subject: No
Security: Standard