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**EFFECT OF TRIAZOLAM ON RECOVERY SLEEP STAGING**

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# ABSTRACT REPRODUCTION FORM

## Effect of Triazolam on Recovery Sleep Staging

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The recuperative value of sleep is determined primarily by two sleep parameters: sleep duration and sleep continuity. Sleep staging may also be a factor in determining recuperative value of sleep--though research has thus far failed to conclusively assign differential functions or recuperative values to the various sleep stages. Both sleep deprivation and triazolam (a short-acting benzodiazepine) cause increased sleepiness, increased sleep duration, and improved sleep continuity, but they have some opposite effects on sleep staging. Sleep deprivation causes increases, and triazolam causes decreases, in the amount of stage 3-4 and REM sleep. The purpose of the present study was to determine the potential usefulness of administering triazolam to sleep-deprived subjects before recovery sleep, and to determine the effects of triazolam on recovery sleep staging, when that recovery sleep takes place in a non-sleep-conductive environment.

Subjects were 45 healthy males, age 18-39. They reported to the laboratory at 0800 on Day 1 at which time electrodes were attached for continuous monitoring of EEG, EMG, EOG, and EKG; and training on various performance measures was administered. Subjects were then kept awake until 0800 on Day 2, when they were administered 0.5, 0.25, 0.125 mg triazolam or placebo, using a double blind random assignment procedure. They were instructed to try to sleep from 0800-1400 under non-sleep-conductive conditions (while sitting upright in a well-lit chamber, during a period when blood was being collected from indwelling catheters at specific intervals. Multivariate analysis of variance of the six-hour sleep period immediately following drug administration revealed no significant effects of drug group on total sleep time (TST) or number of minutes of wake time after sleep onset (WAKES--a measure of sleep continuity). However, planned comparisons showed that WAKES was greater in the placebo group (mean = 78.8 min) than in the 0.5 mg triazolam group (mean = 37.6 min). Analysis also revealed a main effect of Drug on minutes of stage 3-4,  $F(3,39) = 4.51$ ,  $p = .0087$ . Post hoc Duncan's multiple range tests revealed that the placebo group obtained less stage 3-4 (mean = 38.7 min) than the triazolam groups ( $p < .05$ ; means = 67.4, 63.3, and 80.3 min, respectively). It was concluded that increased stage 3-4 amounts following triazolam administration were most likely due to a triazolam-mediated increase in arousal threshold. Thus, triazolam was found to improve recovery sleep under non-sleep-conductive conditions.

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