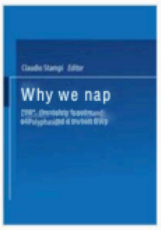

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Sustained-Operations Studies: From the Field to the Laboratory

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Abstract

Advances in military technology (including improved night-vision devices, high-performance vehicles, advanced communications systems, and increased firepower) and resultant changes in doctrine (emphasizing around-the-clock capabilities) have resulted in military forces training for sustained operations. Soldiers are expected to work with minimal sleep during missions lasting from days to weeks. Rest is dictated by the nature of the operation and will be fragmentary at best. When allowed to sleep, participants might be required to awaken quickly and resume operational duties immediately. Many experimental studies have shown that during one or more nights without sleep, as well as over longer periods of reduced or fragmented sleep, decrements occur in mood and cognitive performance (for reviews, see Wilkinson, 1965; Naitoh and Townsend, 1970; Naitoh, 1976; Kjellberg, 1977; Johnson, 1982). The operational consequences of sleep deprivation have also been recognized (Marshall, 1962). Naitoh (1983) has argued that adequate planning for sleep is as important as logistics for transportation, equipment, ammunition, and food. Sleep logistics planning is difficult, however. Work-rest schedules based on orderly civilian patterns are not appropriate for sustained operations, especially in the absence of replacement personnel.

Keywords

Sleep Deprivation Sleep Loss Battery Package Continuous Work Work Session

These keywords were added by machine and not by the authors. This process is experimental and the keywords may be updated as the learning algorithm improves.

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R. G. Angus, R. A. Pigeau, and R. J. Heslegrave

Advances in military technology (including improved night-vision devices, high-performance vehicles, advanced communications systems, and increased firepower) and resultant changes in doctrine (emphasizing around-the-clock capabilities) have resulted in military forces training for sustained operations. Soldiers are expected to work with minimal sleep during missions lasting from days to weeks. Rest is dictated by the nature of the operation and will be fragmentary at best. When allowed to sleep, participants might be required to awaken quickly and resume operational duties immediately. Many experimental studies have shown that during one or more nights without sleep, as well as over longer periods of reduced or fragmented sleep, decrements occur in mood and cognitive performance (for reviews, see Wilkinson, 1965; Naitoh and Townsend, 1970; Naitoh, 1976; Kjellberg, 1977; Johnson, 1982). The operational consequences of sleep deprivation have also been recognized (Marshall, 1962). Naitoh (1983) has argued that adequate planning for sleep is as important as logistics for transportation, equipment, ammunition, and food. Sleep logistics planning is difficult, however. Work-rest schedules based on orderly civilian patterns are not appropriate for sustained operations, especially in the absence of replacement personnel.

The research program to be described here was designed to predict and modify the effects of operational stressors on mental performance. Our approach has been twofold. First, we attempted to understand cognitive capabilities on the basis of behavioral and physiological data collected during field studies. Second, a laboratory facility to simulate sustained-operations command-post activities was developed. In this facility experimental subjects assume the role of operations officers handling message traffic and related duties during long, intense work periods while undergoing sleep loss.