

REPORT OF DR. JAMIE ZEITZER

This report is being written by Jamie Zeitzer, PhD. I have a dual appointment as an assistant professor of Psychiatry and Behavioral Sciences at Stanford University and a health science specialist at the VA Palo Alto Health Care System. I am recognized world-wide as an expert in sleep and circadian rhythms. I have published more than 60 articles and lectured internationally on these topics. I have been conducting research on sleep and circadian rhythms for 20 years at Harvard University, the University of California at Los Angeles, and Stanford University. This report represents my opinion of the best evidence as supported by the totality of the scientific literature.

Chronic sleep loss is well known to cause a host of physical and psychiatric problems. There is, however, scant empirical evidence that bears upon the sleep of prisoners kept in either the general population or in isolation units, such as the Security Housing Units (SHU) of the Pelican Bay State Prison. During December 2014 through January 2015, I assisted Ms. Strickman, Staff Attorney with Legal Services for Prisoners with Children, with a retrospective and prospective examination of sleep of prisoners who had been housed in the SHU for ten years or more. We had the opportunity to examine their overall sleep using the Pittsburgh Sleep Quality Index¹, a well-validated and extensively used questionnaire that examines overall sleep quality. Scoring above 5 on this questionnaire is well-associated with having a clinically significant disruption of sleep. Of the 24 randomly selected prisoners in the SHU, 18 had scores above 5 on this questionnaire. In other words, three-quarters of the prisoners housed in the SHU would likely have been diagnosed as having clinically disrupted sleep. We also had the opportunity to prospectively examine the sleep in these inmates by having them complete a standardized sleep diary² on which they tracked their sleep patterns for 1-2 weeks. As with the retrospective examination of sleep, these diaries revealed poor sleep among them. Some were awakened on average six times per night, some spent nearly 1 ½ hours awake during the night, and some spent as little as 57% of their night actually sleeping. Many indicated that the thrice nightly checks by the guards, especially the noise associated with such checks, was highly disruptive to their sleep. Both the prospective and retrospective examinations of sleep provide empirical evidence for what is mostly self-evident - most prisoners housed in the SHU for prolonged periods have poor sleep.

On August 3, 2015, the Pelican Bay State Prison changed their patrolling routine, checking on each inmate every 30 minutes, 24-hours per day. I understand that, previously, the checks, both

¹ The Pittsburgh Sleep Quality Index was originally published in: Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Research*, 28(2), 193-213. It has been cited by more than 8,000 different published articles.

² We used the Consensus Sleep Diary - Core. This was developed as a standardized sleep diary through the partnership of several major researchers in the sleep field and was originally published in: Carney, C. E., Buysse, D. J., Ancoli-Israel, S., Edinger, J. D., Krystal, A. D., Lichstein, K. L., & Morin, C. M. (2012). The consensus sleep diary: standardizing prospective sleep self-monitoring. *Sleep*, 35(2), 287.

during the day and night, were conducted much less frequently (approximately every 3-4 hours). While this was instituted as a safety measure, including the prevention of suicides, it has created an even more disrupted sleep environment, one that will actually lead to an *increase* in suicidal ideation. We have not had the opportunity yet to formally examine the sleep of these inmates, but according to the report provided by Ms. Strickman ("Report on Prison Interviews about Guard One 30 Minute Cell Checks"), there is a further decline in the quality and amount of sleep that the inmates are receiving and this has resulted in an increase in reported headaches, fatigue, loss of concentration, loss of appetite, irritability, and depression.

These symptoms and others are consistent with an extensive literature that demonstrates the causal relationship between disrupted sleep and decrements in both physical and psychological health. An extensive literature that covers the gamut from animal studies to highly controlled studies in humans to epidemiologic studies of many different populations from around the world all come to the same conclusion - there are serious ramifications of sleep loss on both physical and mental health. Common disturbances associated with chronic sleep disruption include metabolic disruption, worsened memory, severe changes in mood (irritability, depression, anxiety), and a greater likelihood of developing diseases such as cancer and Alzheimer's. A recent series of studies in Veterans has further pointed to the strong connection between suicidality and sleep, so much so that treatment of sleep problems in Veterans is considered part of the first line of treatment in reducing the risk of suicides. The negative health consequences of inadequate sleep has been extensively documented and nowhere in the literature is there a report on as severe a disruption in sleep as is occurring in the Pelican Bay SHU.

Normal sleep consists of cycling between different stages, defined as "rapid eye movement sleep" (REM sleep) and "non-rapid eye movement sleep" (NREM sleep). NREM sleep is further defined by three different stages (N1, N2, N3), each of which have different functions and can be thought of as progressively "deeper" sleep. On average, it takes approximately 90 minutes to cycle through these different stages and such a cycle is thought to be necessary for the proper functions of sleep to be accomplished. Most studies of sleep disruption, both those occurring in the laboratory and those occurring in society at large, address chronic loss of hours per night (e.g., regularly sleeping 5 hours instead of 8 hours) or sporadic loss of a large number of hours on specific nights (e.g., an individual with insomnia who might get 3 hours on several consecutive nights and then 8 hours on several consecutive nights). There are no studies that examine the intentional disruption of the natural cycle of sleep to the extent to which inmates in the SHU have their sleep disrupted. In specific neurologic conditions (e.g., Alzheimer's and Parkinson's disease), there can be severe fragmentation of sleep, such as occurs in the inmates in the SHU. The occurrence of this fragmentation in these diseases can be associated with even more rapid progression of the disease course, psychotic features, and hallucinations. There have been no direct studies of intentionally waking an individual every thirty minutes every night for days, weeks, or months, as doing so would be considered highly unethical in a research environment.

The every 30-minute, noisy checks on the inmates in the SHU, while well intentioned, are likely to have serious physical and psychological consequences. Most of the empirical evidence for the negative effects of sleep loss are obtained from individuals in which there are at least some nights on which good sleep is obtained, on some nights where 90 minute sleep cycles are completed, on some nights in which maybe even 8 or more hours of sleep is obtained. None of this is the case in those in the SHU. Not all prisoners are affected. Some can inure themselves to the intermittent noise. While this is more typical in the non-incarcerated population when the noise is composed to single frequencies (e.g., a creaky house) or occurs at a regular time (e.g., a train whistle), some individuals are just better able to sleep through such noise. Most individuals, however, will be deeply disturbed by the type of noise reported by Ms. Strickman. The somewhat random timing, the mixed sound frequencies and types of sounds, all lead to increasing the likelihood of the brain identifying the sound as "novel" or "important" and signaling the brain into an aroused state. In the field of sleep medicine, there are various approaches that would be recommended to mitigate the effects of the type of noise to which the inmates are exposed. These countermeasures, however, are either impractical (carpeting the SHU) or likely pose security issues (using a camera to check the inmates or having loud white noise generators abate the external noise).

Conclusion. The current practice of 30 minute wellness checks of inmates housed in the SHU is likely a cause of severe sleep disruption. This type of sleep disruption is likely worse than anything that has been provocatively studied in a laboratory. The known consequences of chronic sleep loss, including disruptions to metabolism, memory, mood, and health, are likely even more severe in these individuals. The mandated purpose of these wellness checks (i.e., suicide prevention) is, in fact, likely to have the opposite effect and inadvertently increase suicidality in these individuals.

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