

SLEEPLESS IN SEATTLE

by John Salyer RRT-NPS, MBA, FAARC



A long time ago, when the earth was young, I used to work nights in the NICU. I worked 4-8 hour night shifts a week from 2300 to 0700. Along about 0300 things would often start getting a little fuzzy in the noodle, so I would sit down in the nice big wooden rocking chair they had in the unit and "rest", which of course resulted in me falling asleep. My esteemed colleagues and friends would sometimes drop stuff into my open mouth since my head would kind of lull backwards and my mouth would drop open. If I was lucky I could nap for about 15 to 20 minutes, which seemed to help a lot. Some nights it was so busy you never really had time to realize how desperately tired you were. But many nights it was a real struggle to stay awake and stay focused. I would try to sleep during the day, but usually about 5-6 hours was all I got. I just couldn't sleep during the day very well. I would then often take about a one hour nap from 2100 to 2200 before I went to work. Somehow I survived.

There is plenty of evidence around that Americans don't get enough sleep. Now days I personally am habitually short of sleep, but that is generally nobodies fault but mine and is not related to working nights. I tend to take a short mid-day nap when I can, which helps me a lot. About 20 minutes and I am refreshed and ready to go.

I am convinced that no one is more sleep deprived than night shift employees. Periodically staying up all night disrupts


normal circadian sleep cycles. Circadian refers to the daily cycle that almost all animal life exhibits. Each person has a natural circadian cycle of wakefulness and sleeping. The exact times of the parts of the cycle are different for different people. It is well known that when your circadian cycle is disrupted, e.g. through something almost entirely unnatural like staying awake all night, your health, your cognitive function and your ability to do complex tasks can be adversely affected. This is probably more pronounced in the 12 hour shift employee since they typically work only three shifts per week. No one that I ever knew who worked nights ever managed to stay on a cycle of sleeping during the day and staying up all night on their days off. So night shift employees usually cycle between sleeping during the night and then trying to sleep during the day. This of course, contributes even more to the disruption of the sleep cycle. I know some RT's who seem to manage it, and have been working nights for decades. But for the most part it is very hard physically and emotionally to work nights. Nearly 6 million Americans work at night either regularly or on a rotating basis. Both sleep and waking are both disrupted by working night shift because of disruption of the circadian rhythms.

Consider the neonatal intensive care unit. We have units being staffed at night by folks who are almost certainly chronically sleep deprived. One wonders how much this well known diminution in cognitive function affects the quality of care. We really don't have very good systems for measuring the quality of clinical care. Thus the influence of night shift sleep disruption has almost certainly never been carefully studied in a clinical environment like the NICU. I know anecdotally I have seen some pretty serious mistakes made in the NICU on nights. Of course I have seen some on days too. This is just my own jaundiced view, but it seems that more mistakes related to judgment and higher reasoning skills seem to happen on nights, but I have no data (yet) to prove this.

Here is what I do know. Those folks who seem to do best on night shift have developed a system. They are disciplined about trying to get to bed each morning after work at about the same time. They nap before coming to work. They use techniques for darkening their bedrooms during the day, which is reported to improve sleep quality. I used to cover my windows with tin foil, which ain't very ascetically pleasing, but it makes the room nice and dark.

Sleep specialists that I have talked to have given me a couple of recommendations to pass along to night shift staff to minimize the effects of sleep disruption. First, avoid exposure to sun light on your way home. The sun light has an effect on the retina that translates into a biochemical effect on the brain that stimulates wakefulness and thus will diminish the quality of your sleep during the day when you go home after a night shift. They further recommend that on your day off, you try to take a nap during the same period of time when you would normally be sleeping after a night shift. As an example, if, after a night

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Other recent research indicates that the orexin system may have a major role integrating metabolic, circadian and sleep debt influences in determining whether people and other mammals should be asleep or awake, alert and active. Experiments involving central administration of orexin 1 strongly promoted wakefulness, increased body temperature and provoked an increase in energy expenditure. What's more, orexin 1 seems to be increased by sleep deprivation. Some researchers feel that the orexin/hypocretin system may be even more important in the regulation of energy expenditure than food. And according to some researchers, individuals with narcolepsy, who are deficient in orexins, have increased obesity rather than the reverse (decreased BMI) than if orexin was primarily just an appetite stimulator.

While this research is starting to warm up, the use of orexin inhibitors has been postulated for years for the treatment of addictions and overeating. Expect also to see a possible role for orexin blockers in the treatment of alcoholism. Alcoholic lab rats given drugs targeting the orexin system lost interest in imbibing alcohol even though it was freely available to them and readily consumed before the orexin antagonists were administered.

The February, 2007 issue of the Pharmaceutical Journal Online published the following item:

"An antagonist of the orexin OX1/OX2 receptor — ACT-078573 — being developed by Actelion may prove useful for people suffering from sleep disorders. The company reports that a study involving 39 patients with primary insomnia indicates that the compound improves sleep efficiency as measured by polysomnography. The study follows research published in Nature Medicine this month that shows an increase in sleep in animals and healthy volunteers (2007;13:150). Actelion says that ACT-078573 is the first oral orexin receptor antagonist that penetrates the blood-brain barrier and is capable of inducing transient and reversible blockade of the OX1 and OX2 receptors." Actelion is a Swiss based company.

And at the JP Morgan Healthcare Conference held January 10, 2007 in San Francisco Human Genome Sciences of Maryland issued the following as part of a press release regarding an orexin antagonist being developed by GlaxoSmithKline (GSK) in which it has an interest:


"In the third quarter of 2006, GSK initiated clinical development of GSK 649868, an orexin antagonist, for the treatment of sleep disorders. These small-molecule drugs, as well as darapladib for atherosclerosis and relacatib for bone disease, were discovered by GSK based on HGS technology."

Turning the undesirable symptom(s) of one disease, in this case sleepiness in narcolepsy, into a weapon to fight another problem, wakefulness in insomnia, is an example of what one phase of modern pharmacological research can achieve.




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shift you would normally go home and sleep from 0900 to 1500, then on your day off, try to take a nap sometime during this period. This will help to minimize the disruption to your circadian rhythm caused by working nights.

It also turns out that my old 20 minute napping practice way back when in the NICU was a pretty good idea. Short naps have been shown to improve function and measurably reduce sleepiness among night shift workers. I heartily recommend a short nap as a very civilized thing for folks to do. If employees want to use their meal and break times to nap on night shift, I think hospitals ought to be very tolerant of this. In fact, maybe hospitals ought to rethink the whole way we staff night shift. As the science of sleep disruption grows, and as our ability to carefully measure the quality of clinical care improves, it may be that we find a strong link between night shift related sleep disruption and poor quality clinical care. If this turns out to be true then maybe we ought to rethink long night shifts. Perhaps sleeping rooms should be built and night shift staff should have the option or even be required to sleep two hours for every four or six hours worked on night shift.

No one yet knows the scope and magnitude of this issue, but I suspect the way we staff and managing hospitals after hours will change very much in the next 20-30 years.

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