

How Do Hospital Lights Affect Patients' Quality of Sleep?

Rationale:

Hospital lights could be detrimental to the health of patients. Many hospital room doors stay open all night, allowing the bright, artificial light reach the patients. There are also lights on equipment and monitors, which also affect patients. Sleep is critical for hospital patients for them to recover. When a person's brain sees light, it immediately sends misinformation about the dark-light cycle. The person's brain interprets the light as day. The person's biological clock then instructs the pineal gland of the brain to cease the production of the hormone melatonin.

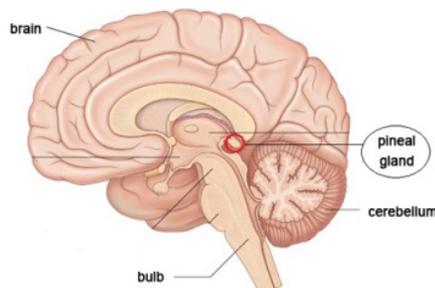
Melatonin sets a person's internal "clock", which plays a critical role in when to fall asleep and when to wake up. When it is dark, the body produces more melatonin. The production of melatonin has a number of health benefits in terms of the immune system. The ceased production of melatonin could significantly lower the health of someone, especially of a hospital patient. Melatonin helps patients fall asleep and gives an overall feeling of well-being and comfort to patients. It also has proven to have an impressive array of anti-cancer benefits. The production of melatonin is so important to the immune system, that the cease of its production could cause the thymus gland, a key component of the immune system, to atrophy (decrease in size). Suppressing this essential hormone is the last thing hospital patients need. Overall, hospital lights could be detrimental to the health of patients at night, and we need to change it. Hospital patients are already not in good health conditions, and they need all the rest and help they can get for their recovery. (Dr.Mercola)

According to a study done by scientists at Brown University, teens undergoing or in the earlier stages of puberty are more sensitive to light at night compared to adults or teenagers that have already undergone puberty. Teenagers undergoing puberty had much more suppression of melatonin in their bodies at the sight of light at night. Children and teens were exposed to 3 types of lights. When children were exposed to very dim light (15 lux), about 9.2% of the production of melatonin was suppressed. When children were exposed to normal room light (150 lux), about 26% of melatonin

production was suppressed. When children were exposed to very bright light (500 lux), 36.9% of melatonin production was suppressed. Hospital lighting is also very bright. This also suppresses melatonin levels drastically. Overall, hospital lights are dangerous to children and teens, especially teens undergoing puberty (ages 11 to 16).(David Orenstein)

" Use Your Pineal Gland to Get a Better Night's Sleep." <i>

The Hearty Soul</i>. Outmatch, 25 Apr. 2015. Web. 27 Jan. 2016.



Methodology:

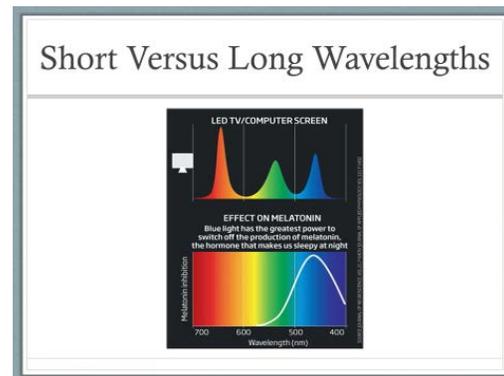
The latest animal study, done by US neuroscientists at Ohio State University, builds on a growing body of research on the health hazards of light at night, and suggests that the color of the light makes a big difference. Red light at night doesn't cause much damage to the brain, compared to other colors. Although complete darkness is always the best for sleep, red light is the best out of all lights. Lighting characteristics affecting melatonin suppression are different than those affecting visibility. It is now known that low levels of light affect vision, but to affect melatonin levels the light must be brighter.

Though the color blue is believed to have a calming effect, it actually does the opposite. A study involving hamsters found that blue light had the worst effect on mood-related measures, followed closely by white light. Hamsters exposed to red light at night had significantly less evidence of depressive-like symptoms and changes in the brain linked to depression, compared to those that experienced blue or white light at night. Total darkness is still best for sleep. "Our findings suggest that if we could use red light when appropriate for night-shift workers, it may not have some of the negative effects on their health that white light does," said Randy Nelson, co-author of the study and professor of neuroscience and psychology at The Ohio State University. We believe that red light

would be the best to use in hospital rooms, and the patients as well as night-shift workers would benefit from the red-lights in hospital rooms.

Peper, Erik. "Do Night Lights Cause Cancer?" *The Peper Perspective*. N.p., 13 Feb. 2012. Web. 27 Jan. 2016.

Next Steps:



We have learned how bright light could negatively affect hospital patients, especially children our age at night. It ceases the production of melatonin, creating a chain of negative effects on children's bodies. We also learned how important the hormone melatonin is. Melatonin is essential for the body's immune system. It helps people fall asleep and bestows a feeling of comfort and well-being, and it has anti-cancer benefits. With more time and resources, we would conduct an experiment. We would test the quality of sleep among hospital patients (particularly children) under white light and under red light at night. We believe that the patients under the red light at night will sleep well, and will have a better recovery.

Luthera, Shefali. "Why Won't Hospitals Let Patients Sleep?" *PBS*. PBS, 17 Aug. 2015. Web. 27 Jan. 2016.



Bibliography

"Light Therapy for Better Sleep." The Sleep Review. Sleep Review, n.d. Web

-Figueiro, Mariana G. "Light Therapy for Better Sleep - Sleep Review." *Sleep Review*. N.p., 4 May 2015. Web. 22 Dec. 2015.

- Sboros, Marika. "Red Light at Night - Sleeper's Delight." *Business Day Live*. N.p., 8 Aug. 2013. Web. 22 Dec. 2015

- Dr.Mercola. "Hospital Room Lighting May Affect Your Mood and Pain." *Mercola.com*. N.p., 26 Dec. 2013. Web. 22 Dec. 2015.

- Orenstein, David. "Bright Screens at Night Imperil Sleep of Young Teens." *Brown University*. Brown University, 26 Aug. 2015. Web.