

A woman with blonde hair is lying in a hospital bed, smiling and looking towards the right. She is wearing a grey long-sleeved shirt. The background is a bright, clean hospital room with a window. In the top left corner, there is a white and teal logo for Philips HealWell.

PHILIPS

HealWell

Supporting outcomes
through light

Enhancing environments in healthcare facilities

The natural power of light

The body clock and the circadian rhythm are strongly regulated through environmental signals, with light being one of the most prominent factors. Limited or no access to natural daylight in settings like hospital rooms — even for short periods of time — can greatly affect the ability of the body to maintain a healthy biorhythm. Using light effectively in healthcare facilities can support sleep cycles of patients as well as improve patient and staff satisfaction.

As humans, light influences our health and well-being much more than we realize. Independent research has shown that there is a clear and positive relation between exposing patients to sufficient light during the day and their health and well-being.¹

The effect of light on our biological clock is also important as it influences many aspects of our physical and emotional well-being. This biological clock is regulated by light and darkness, by the daily cycles of night and day, and the time we spend asleep and awake.

In the morning, when the sun comes up and light levels increase, we wake up and become active and alert. In the evening, when the sun goes down, we unwind, relax, and prepare for sleep. Our body's hormone levels rise and fall with these light cycles. The production of cortisol, a life sustaining adrenal hormone also called the "stress hormone," naturally

increases with morning light and decreases throughout the course of the day. The levels of melatonin, a hormone that regulates the sleep-wake cycle, increase before bedtime when darkness sets in and decrease as morning approaches.

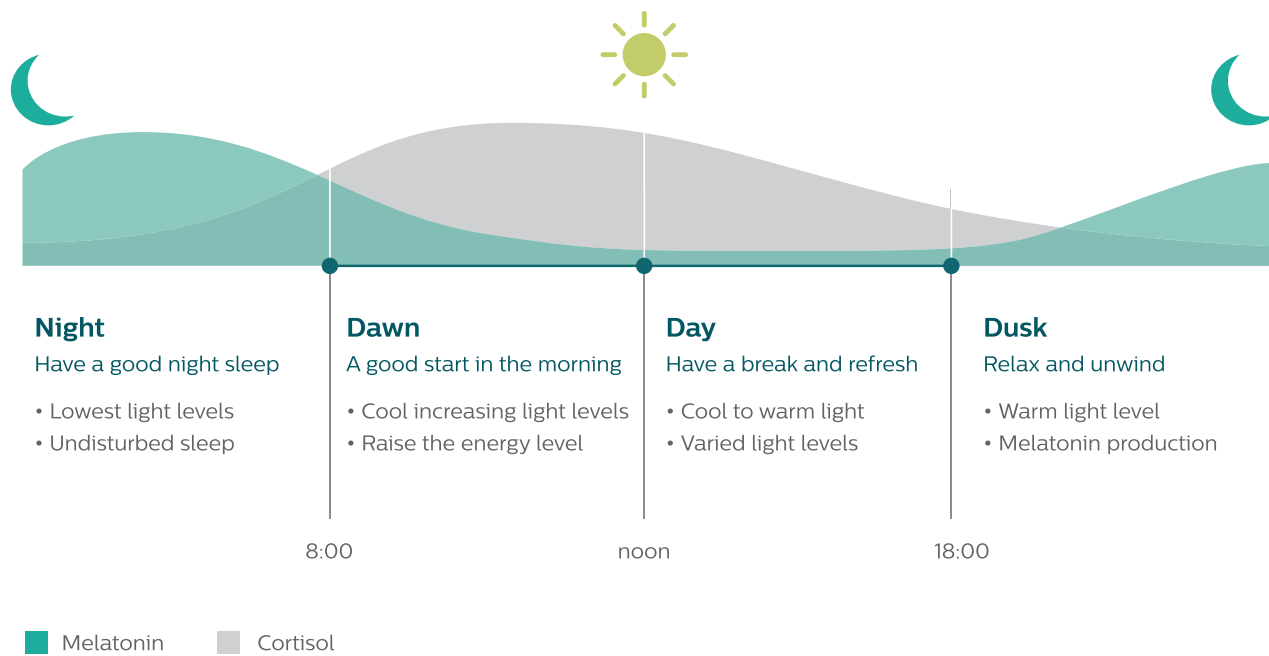
In our modern society, we spend much of our time indoors — at home, in a school, office, shop, or hospital. Those who have to stay indoors for significant parts of their time, like hospital patients, can be particularly at risk of getting insufficient light during the day to set their biological clock properly.

This can have an impact on a person's sleep and state of mind as well as on behavior, recovery, and the immune system. In addition, light can improve patient satisfaction, comfort, and quality of sleep.

¹Harrison, Y. The relationship between daytime exposure to light and night-time sleep in 6-12-week-old infants. *J. Sleep Res* 13, 345-352 (2004). Tuunainen, A., Kripke, D. F. & Endo, T. Light therapy for non-seasonal depression. *Cochrane Database Syst Rev*, Cd004050, doi:10.1002/14651858.Cd004050.pub2 (2004).



How light regulates our circadian rhythm²



² Dijk, D. J. et al. Light treatment for sleep disorders: consensus report. II. Basic properties of circadian physiology and sleep regulation. *J. Biol Rhythms* 10, 113-125 (1995). Viola, A. U. et al. Dawn simulation light: a potential cardiac events protector. *Sleep Med* 16, 457-461, doi:S1389-9457(15)00090-8 [pii];10.1016/j.sleep.2014.12.016 [doi] (2015). Santhi, N. et al. The spectral composition of evening light and individual differences in the suppression of melatonin and delay of sleep in humans. *J. Pineal Res* 53, 47-59, doi:10.1111/j.1600-079X.2011.00970.x [doi] (2011).

HealWell: A complete lighting system that **improves patient and staff experience**

HealWell is a proven lighting system developed to better the patient and staff experience in healthcare facilities. Its unique system design and dynamic lighting recipe has been proven to support patient outcomes and lead to improved satisfaction for both patients and staff.

At Philips Lighting, we take people's needs as the starting point for new lighting solutions and we understand the business challenges that hospital management face. By combining state-of-the-art technology, scientific knowledge, and end-user insights, we can transform the experience for everyone in your hospital by supporting its healing environment.

HealWell is a complete lighting system developed specifically to address people's natural responses to light. Dynamic shades of warm and cool light support patients' biorhythms during the day. Colored light and accent lights change a sterile setting to a more personalized, pleasant, and comfortable atmosphere. High levels of functional light for staff create a better

working environment for tending to patients and performing tasks.

HealWell is a scalable networked control system that automatically manages a rhythm of dynamic daylight. It also allows patients and staff to control individual settings. Pre-set lighting options are available and can be customized to suit your hospital's specific needs, while maintaining the system's key benefits.

HealWell can be delivered as a part of an overall hospital lighting system with energy monitoring and reporting and can be integrated into a building management system or other sub-systems in healthcare facilities.



Ambient and orientation light

- Color-changing LED cove lighting and LED spots opposite the bed provide lighting scenes to change the ambience in the room, and offer orientation lighting when dimmed

Dynamic-natural/examination light

- Tunable white LED ceiling modules above each patient bed provide specific daylight settings to support biorhythms, and static examination lighting when required

Reading light

- LED spot at each patient bed provides dimmable reading light



Staff control

- Single examination lightswitch provides a manual override to switch the room light on at any time
- Room lighting control panel allows staff to monitor and manage the daylight rhythm for each bed, switch the room mode, or turn off all lighting
- Switch on nurse bed panel provides control of individual bed examination light

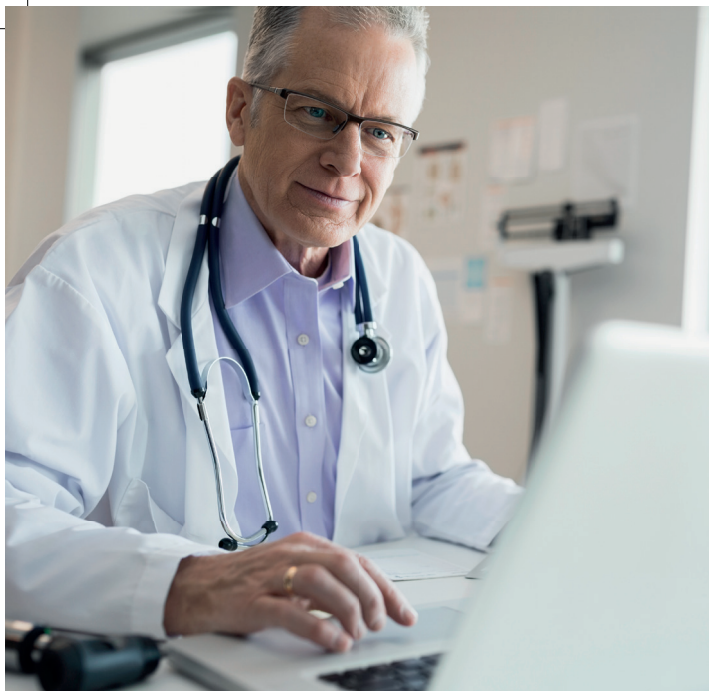
Patient remote control

- Remote control installed at each bed allows the patient to switch and dim the reading light and to choose different ambient light settings



Why Philips Lighting

- Global trusted partner with a proven track record in healthcare applications
- Complete portfolio of lighting systems — for both indoor and outdoor applications — to address the full range of lighting needs for a single site up to an entire healthcare campus
- Customized systems and services to meet your requirements and to support integration into other sub-systems
- Full line of professional services including auditing and consulting, as well as lifecycle services — from installation and commissioning, to operations and maintenance — to fit your business needs
- Know-how and experience to help you create people centric environments while meeting operational goals



“

HealWell creates a pleasant atmosphere for patients and staff, supports the physiological processes in the body and can be individually adapted at any time.”

Dr Karl-Heinz Frosch, Senior Consultant of Orthopaedics, Asklepios Clinic St. Georg

HealWell: Proven positive impact of light

Impaired sleep is a known hospital stressor and hospitalized patients struggle to get sufficient sleep at night due to factors like discomfort, worries, noise, inappropriate light exposure, and pain. In a recent field study, HealWell was shown to have a beneficial impact on patients as well as staff.

In the past, scientific research has proven that light can improve parameters like sleep, mood, depression, and length of stay in a hospital environment.³

As part of the Philips Lighting initiative to develop and validate the HealWell lighting solution for patient rooms, a field study was carried out at the Maastricht University Medical Centre (MUMC) in the Netherlands. This study was performed in co-operation with the Clinical Trial Centre Maastricht and Maastricht University as research partners.

The study took place at the cardiology department of MUMC, where various outcome parameters of patients

were monitored during their stay in hospital. In the study, the results of patients in control rooms (with existing lighting) were compared with those of patients in intervention rooms (with HealWell).

The results were striking:

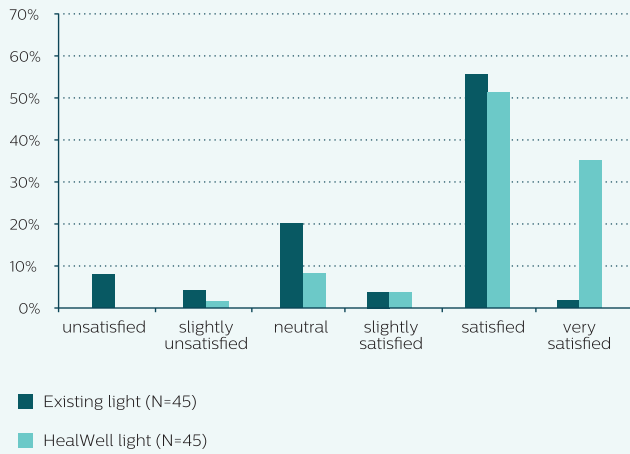
HealWell was shown to have beneficial effects for both patients and staff, thus confirming the positive impact that light can have. The HealWell lighting solution resulted in:

- Longer sleep duration for patients
- Shorter time to fall asleep for patients
- Improved patient and staff satisfaction

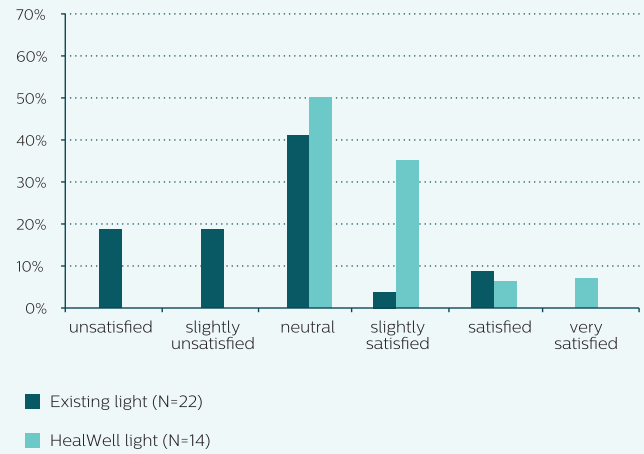
³ Walch, J. M. et al. The effect of sunlight on postoperative analgesic medication use: a prospective study of patients undergoing spinal surgery. *Psychosom. Med* 67, 156-163 (2005). Bernhofer, E. I., Higgins, P. A., Daly, B. J., Burant, C. J. & Hornick, T. R. Hospital lighting and its association with sleep, mood and pain in medical inpatients. *J. Adv. Nurs*, doi:10.1111/jan.12282 [doi] (2013).

The proven benefits of HealWell⁴

Increased **patient** satisfaction:

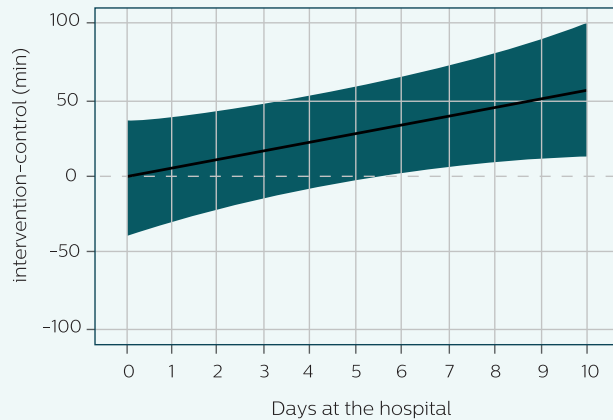


Increased **staff** satisfaction:



Increased sleep duration

Light x time*: +5.9 minutes / night (*p=0.03)
Total Sleep Duration (TSD) – 20 day analysis

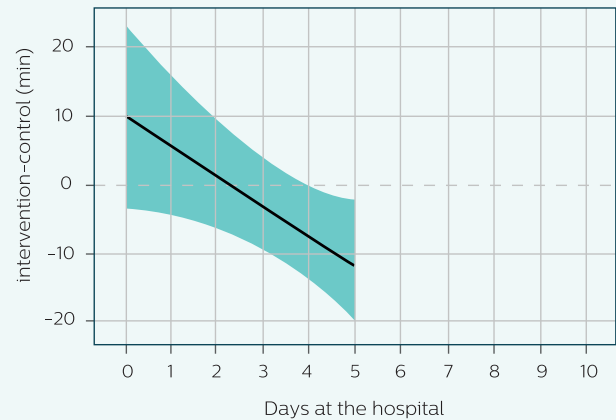


“Actigraphic sleep duration of patients improved by 5.9 min per hospitalization day with interventional lighting instead of standard control lighting.”

(Baseline sleeping time in control rooms is 402.3min)

Reduced time to fall asleep:

Light x time*: -4.3 minutes / night (*p=0.02)
Sleep Onset Latency* (SOL) – 5 day analysis



“The time to fall asleep was reduced by 4.3 minutes per hospitalization day with interventional lighting instead of standard control lighting.”

(Baseline time to fall asleep in control rooms is 12.4 min)

⁴ Giménez, M. C. et al. Patient room lighting influences on sleep, appraisal and mood in hospitalized people. Journal of Sleep Research, (2016).



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www.philips.com/healwell