Robust daily patterns of light and dark synchronize the human circadian clock to local sunrise and sunset. Disruption of this 24-hour rhythm of light and dark affects every one of our biological systems, from DNA repair in single cells to melatonin production by the pineal gland to our sleep quality. Circadian disruption is most obviously linked with disruption of the sleep-wake cycle—feeling sleepy during the day and experiencing sleep problems such as insomnia at night—but is also linked with increased risk for diabetes, obesity, cardiovascular disease and cancer. Beyond the many health benefits of circadian entrainment, light also has an acute alerting effect, like a cup of coffee. The constant, unvarying dim light found in many homes, offices, hospitals and schools means that humans in modern society are not experiencing the robust light-dark patterns necessary for circadian entrainment and optimal daytime alertness.

A team of researchers at the LRC comprised of Kassandra Gonzales, Russ Leslie and Mariana Figueiro have created a portfolio of lighting patterns applicable to the general population.

The project was sponsored by the Light & Health Alliance: Acuity Brands, Cree, GE Lighting, Ketra, OSRAM Sylvania, Philips Lighting and USAI Lighting. For more information, visit http://lightingpatternsforhealthybuildings.org.

Lighting patterns are based upon the 24-hour lighting scheme proposed by Figueiro, which recommends high circadian stimulation during the daytime, low circadian stimulation in the evening, good lighting for visibility, and night-lights with horizontal and vertical cues to improve postural stability.

Applying the results of the LRC’s circadian stimulus (CS) research, the new website—“Lighting Patterns for Healthy Buildings”—allows users to view lighting patterns showing the base case and new lighting design analyzed for CS. Each pattern presents lighting plans, renderings and generic luminaire information useful for providing healthy lighting throughout the 24-hour day. The project team chose two target populations that can benefit most immediately from healthy lighting: older adults in long-term care facilities and children in schools, but the basic principles are applicable to the general public. The project was sponsored by the Light & Health Alliance: Acuity Brands, Cree, GE Lighting, Ketra, OSRAM Sylvania, Philips Lighting and USAI Lighting. For more information, visit http://lightingpatternsforhealthybuildings.org.

Sleep problems are all too common among older adults, especially those in long-term care facilities, and may contribute to depression, weight gain and, according to recent research, the onset and progression of Alzheimer’s disease. Conversely, healthy, high-quality sleep improves overall health and well-being.

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