



Therapeutic Lighting Aims to Provide Faster Healing

Research project at the Psychiatric Center
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Therapeutic Lighting Aims to Provide Faster Healing

Psychiatric Center Copenhagen is taking innovative approaches to the treatment of its patients. By using specially designed light sources that replicate natural light, researchers hope to reduce the levels of depression, hospitalization time, and medication usage among patients.

Since 2014, a team of researchers from the Psychiatric Center Copenhagen (Rigshospitalet), consisting of Dr Klaus Martiny, a clinical professor, and architect Carlo Volf, have been exploring the impact of light on the healing process of psychiatric patients. In a recent study published in *Neuropsychobiology*, the researchers discovered a correlation between patients' length of stay and natural sunlight in their hospital rooms. Patients admitted to the sunny, southeast-facing rooms had significantly shorter hospital stays compared to those in the darker, northwest-facing rooms.

Now, the research team has joined forces with Chromaviso, DTU Fotonik, and Copenhagen Trial Unit for a larger and interdisciplinary research project called ROOM-LIGHT. The primary goal of this project is to develop a diagnosis-specific therapeutic light for psychiatry. Following that, a clinically controlled and randomized study will be conducted on 150 patients to measure and document the effects of the light on depression, sleep, hospitalization time, medication usage, circadian rhythm, and comfort.

The impact of natural light

This project is a natural progression from the well-known light therapy, where patients sit in front of a powerful light lamp for an hour. In this case, the light is seamlessly integrated into the room, replacing the regular lighting.

Sunshine all year round

To ensure an optimal lighting environment in psychiatric settings, the project has created innovative and experimental light fixtures with high-quality illumination and therapeutic and physiological effects.

We have developed a lighting fixture that creates a unique sensation of sunlight. The intention is for patients to experience it as if the sun is always shining in their room, even on a dark rainy day. We know that sunlight creates an instinctive reaction that promotes well-being in people. That's why we actively utilize this stimulus in the project to achieve a psychological effect, which is crucial in psychiatry, explains Carlo Volf, emphasizing the importance of creating a therapeutic and comforting environment for patients.

The project guarantees nearly double the amount of sunshine hours throughout the year. The light fixtures have been meticulously designed using innovative shapes and materials to create a more homely, less institutional expression, and to provide a pleasant light that patients enjoy being surrounded by. While the light is physiologically effective, it is also important that patients find it visually appealing and comforting, as this encourages them to keep it on.

Recreating the Natural Light

The therapeutic light in the project automatically changes over a 24-hour period. The aim is to recreate the beneficial effects of natural light, including the balance between the gentle morning, the intense daylight with its many blue tones, and the warm evening and darkness at night.

In order to replicate the intervention for clinical use, detailed measurements of the light are being collected.

"By measuring and documenting the precise composition of light, we are establishing evidence of how spectral distribution affects individuals"

Professor Paul Michael Petersen, DTU Fotonik

Addressing a societal challenge

According to Carlo Volf, the prospects of ROOM-LIGHT are significant. The lack of natural daylight has become a reality for modern individuals, not just hospitalized patients.

"We spend too much time indoors in insufficient lighting. Many hospitals have facades that face away from the sun, meaning that patients do not receive the beneficial effects of sunlight. This affects their sleep and circadian rhythm, which can be crucial in their treatment. We aim to provide evidence of the beneficial effects of light on people so that it can be implemented first in psychiatry, then in other medical fields, and possibly even in workplaces, he explains."

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We are well aware of the therapeutic benefits that natural light brings to individuals suffering from depression. Light has an immediate mood-enhancing effect, promoting alertness during the day, better sleep at night, and a more stable circadian rhythm. For patients with depression, maintaining a consistent daily rhythm is especially challenging.

Klaus Martiny, chief physician and clinical professor at the Psychiatric Center Copenhagen



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The rhythm of the light is described in a light protocol that is tailored to psychiatric diagnoses, behaviour, and the department's rhythm. The light protocol indicates the precise interaction between intensity, colour spectrum, timing, and duration depending on the time of day. This means that the light becomes a time signal for patients to be alert during the day and sleep at night. It strengthens their circadian rhythm and enhances their sense of time.

Torben Skov Hansen,
Chief Technology Officer at Chromaviso.



About ROOM-LIGHT

ROOM-LIGHT is a groundbreaking research initiative at the Psychiatric Center Copenhagen, aimed at providing evidence on the impact of light on patients with severe depression requiring hospitalization. Unique lighting fixtures and a carefully designed light composition throughout the day have been developed specifically for this research project, with the goal of recreating the beneficial effects of natural light during psychiatric stays



About the Research

ROOM-LIGHT aims to investigate the impact of therapeutic light on patients hospitalized with depression at the Psychiatric Center Copenhagen in relation to:

- Depression
- Sleep
- Length of Stay
- Medication Usage
- Circadian Rhythm
- Comfort

The study is a randomized clinical trial with an initial pilot study involving 15 patients (since May 2017), where the tolerability of the light is examined and optimized. Following this, the actual study will be conducted with an expected 150 patients, both in the intervention and control groups, with the control group receiving standard lighting. The light will be measured and documented to obtain evidence of how its composition affects individuals both physiologically and therapeutically. As an added benefit, the project aims to achieve energy savings through the use of this light.

About Chromaviso

Chromaviso is changing the standards of lighting to improve health, treatment quality, care, work environment, and efficiency within the healthcare sector. Through technological innovation and close collaboration with healthcare professionals, we create and apply integrated and highly preferred lighting solutions with proven effectiveness.

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