

# **The Lighting Project**

## **How to improve artificial lighting and daylight in an eye hospital.**

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### **Purpose**

To create a better work environment for ophthalmologists and other eye care professionals regarding light and daylight.

### **Methods**

Current light conditions at St. Erik Eye Hospital were assessed including questionnaires to employees and patients, and measurements of illuminance, luminance, space analyses, activity analyses and energy consumption. Visits to other prominent eye hospitals and a literature review were performed.

### **Results**

The questionnaires revealed that eyestrain problems were common in eye care professionals, especially in women. Working in dark rooms increased the subjective feeling of fatigue. Many, but not all, lacked daylight. The general lighting system was often insufficient with poor light distribution, shadows, and a colour temperature that in general was too low.

Improvements included possibilities to regulate inflow of daylight, installation of remote controls, and timing and level of adaptation to different light levels. These improvements have been tested in a test room, a full scale installation, that used the latest technology in terms of artificial lighting, a lighting control systems and a novel solution to control daylight. Five different light scenarios were preinstalled and evaluated by professionals and patients. A majority reported an improvement compared with traditional solutions. Current and actual energy consumption was monitored. Simulations of future consumption point to a possible energy reduction by 50 %, using new lighting technology, daylight and optimal room design. With improved logistics, new buildings and new work organization, energy savings can be even higher, around 70 %.

### **Conclusion**

Lighting, access to daylight and visual ergonomics are important for creating a positive work environment for eye care professionals and should be prioritized in planning new eye hospitals or renovation of old eye departments or eye hospitals.