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**Research-In-Progress**

# Automated Overhead Operating Room Lights for Increased Surgical Safety and Efficiency

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**Introduction:** Proper lighting in the surgical theater is critical to performing surgery. Overhead lighting is the main source of light for the surgical field, however, these lighting systems come with inherent limitations. Literature states that OR lights are adjusted, on average, every 7.5 minutes during procedures. Furthermore, in 97% of the cases studied, the surgeon paused the task at hand to perform a lighting adjustment. Additionally, sterile light handles have been shown to foster bacterial growth, increasing the risk of infection to the patient. Overhead lighting adjustments are correlated to loss of focus for the surgeon, increased OR time, and decreased patient safety. A need exists to provide automatic overhead light movement in the OR to improve patient outcomes.

**Methods:** The concept is an attachable motorized hinge system coupled with visual feedback to augment pre-existing OR light systems. After attaching the device to each overhead light hinge, instead of looking away from the surgical field and adjusting the light manually, surgeons can depress a pedal, and the overhead lights will shift to the optimal placement. Back-end software will allow for coordinated movements between multiple light arms improving upon current standards that are difficult to position. Many lighting systems have built-in cameras that can be leveraged to provide optimal placement based on surgeon/OR staff and patient positioning.

**Preliminary Results:** Preliminary results feature multiple CAD design iterations of the device. Stakeholder analysis was also conducted with general feedback from surgeons surrounding the device's ease of use and automation to refine both the physical design and overall concept.

**Next Steps:** Next steps include completing an initial prototype design for testing, including a physical prototype of the hinge design hardware and coding software elements to interface with the motors. Further stakeholder analysis will also be conducted to validate the design elements and implementation.