Case Study: Achieving Perfect Depth Illumination with Integrated Wireless Vision — Enabled by LumiDepth™ in Celesta OT Light

Problem Statement

Dr. Gupte, a leading neurosurgeon from Pune, performs advanced cervical spine surgeries where deep-cavity illumination is absolutely critical. Despite using several global and Indian OT light systems, he was unable to achieve uniform illumination within the deep surgical cavity. Light intensity would fall sharply with depth, compromising visibility and slowing surgical flow.

Upon adopting EPMD's Celesta OT Light, equipped with LumiDepth™ technology, Dr. Gupte experienced a complete transformation — achieving near isometric luminance, where illumination within the deep surgical cavity matched surface brightness. The shadowless optical design of Celesta's light head enabled him to perform long, intricate procedures with greater precision and comfort.

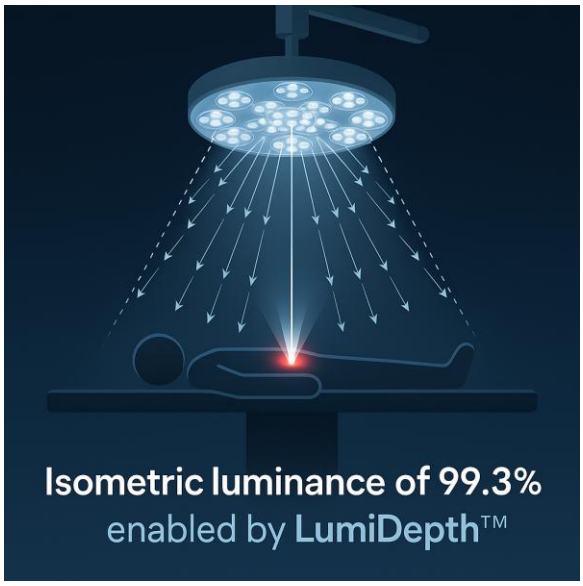
As his clinical and educational work expanded, Dr. Gupte requested an additional capability — a wireless camera integrated directly into the same light head, allowing live surgical transmission for documentation and training.

Our Solution

EPMD's design and engineering team developed a customized Celesta OT Light with a fully integrated wireless camera system mounted at the center of the light head. To house the transmitters and control circuitry, certain optical components had to be repositioned. While the solution delivered excellent wireless video streaming, Dr. Gupte soon noticed that deep-cavity illumination performance had reduced — the LumiDepth™ effect was not at its original strength.

Recognizing this feedback, EPMD's optical engineers worked closely with the surgeon to analyze the issue. Through iterative optical redesign, precise re-clustering of LED beam paths, and intelligent component repositioning, the team successfully retained LumiDepth™ performance while maintaining full wireless camera integration.

The result: a surgical luminaire capable of providing 99% illuminance retention at depth, with a built-in wireless imaging system — an industry-first combination.



Impact

With the reengineered Celesta OT Light, Dr. Gupte now benefits from both deep-cavity brilliance and seamless wireless visualization. The system enhances procedural clarity, reduces visual strain, and allows live case documentation without external camera attachments.

“This is truly next level,” said Dr. Gupte. “The deep illumination I rely on is back — and now, with the wireless camera, I can teach and record without compromise. It’s the perfect balance.”

Beyond the Product

This collaboration reflects EPMD’s core philosophy — not just to build devices, but to engineer solutions that respond to real surgical needs. By working hand-in-hand with surgeons, understanding their workflow, and iterating through design challenges, EPMD demonstrated what it means to be a dynamic medtech company.

Unlike conventional off-the-shelf suppliers, EPMD combines clinical empathy, in-house design capability, and technological innovation to deliver customized solutions that elevate surgical performance. This project stands as a testament to EPMD’s commitment to innovation, agility, and partnership — redefining what “made for surgery” truly means.