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Much has been written about the transition of OR lighting away from traditional incandescent technology to LED technology. By now, some of the advantages of LED roll off the tongue; less heat, longer life, better energy efficiency. But these advantages are just the beginning.

If the point of new technology is to provide better patient outcomes, only one of these often stated advantages, less heat, directly applies. LEDs radiate much less heat than incandescent bulbs, so the surgeon and staff are more comfortable (important during long cases). And cooler light means less heat in the surgical field, reducing the risk of drying out exposed tissue. There are several other advantages of LED lighting, beyond reducing heat, that have direct clinical benefits.

Pure white color

One of the most notable features of a high quality LED surgical light is how white the color of the spot is. Traditional halogen bulbs are inherently yellow, with typical color temperatures around 3200 Kelvin (K).

Manufacturers attempt to correct this yellowness by using expensive coatings and filters to remove some of the yellow light, which raises the color temperature to a more desirable level (around 4400K). This filtering makes the light whiter but the color is still less than ideal. Also, the coatings and filters used are very difficult to apply consistently, so lighthead-to-lighthead color variability is very high.

If you take two or three halogen lights in your OR and put the spots next to each other, a discerning eye can see the differences in color and intensity between the spots; these differences can become distracting for surgeons.

On the other hand, LED's can be engineered to produce white light at the preferred color temperature of 4400K, so no filters or reflective coatings are needed to "correct" it. Also, since there are many LEDs per lighthead, any variations among LEDs tend to cancel each other out, so the color match among LED lightheads is much more consistent than in halogen lightheads.

Improved shadow control

Not only are LED lightheads whiter and more consistent, they provide much better shadow control than halogen lights. A halogen system typically consists of a single bulb and a multifaceted reflector. Unfortunately, each facet is a different shape and is located a different distance from the bulb. These differences can create unwanted "hot" and "cold" spots within the light pattern.

In a typical LED lighthead, each LED makes the entire spot. These individual spots are then precisely overlapped, so no matter how many LEDs you block, the spot remains round and consistent. As obstructions (e.g. surgeons' heads) move around in the light field, the pattern does not change.

The consistency of LED light means surgeons are not distracted by shadows moving across the pattern. In fact, some surgeons have commented that when using the LED lights, they no longer feel the need to wear their headlamps!

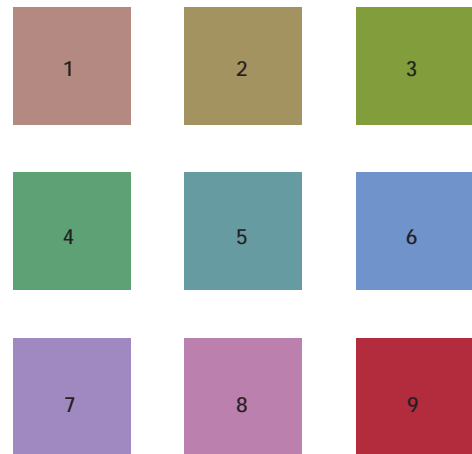


Figure 1. Each LED lens creates the entire pattern, so no matter how many you block, the spot remains clear and consistent.

More accurate color rendition

LED technology provides, which should lead to better patient outcomes.

If cost is a major concern, ask your current surgical light manufacturer about the ability to upgrade to LEDs without replacing the entire suspension. For some manufacturers, upgrading to LED technology can be as easy as swapping the lightheads and updating the control center. This approach saves money and time since these upgrades can be performed in 1-2 hours instead of 1-2 days.



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