

## **Determining optimized roles of different types of light delivery sources**

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The potential for germicidal light based solutions in healthcare delivery facilities has been gaining momentum. Effectiveness of use, pathogen reduction efficacy, and non-touch convenience for adjunct environmental sanitation of unoccupied hospital rooms and operating theaters has been increasingly demonstrated. It has become more established in recent years, showing very promising results.

However, the deployment of the assortment of low pressure lamp based ultraviolet disinfection systems on the market do have acknowledged operational limits. For example, they can only be operated episodically in unoccupied space due to human safety requirements and are only validated for use on hard surfaces. As a result, high traffic areas, fast turnaround places, hard to reach surfaces, and unforeseen use of equipment due to unanticipated procedures, and accidental spillages or emergency re-tasking pose a particular challenge to fully taking advantage of the benefits of such high powered germicidal light surface disinfection delivery systems perhaps limiting their wider deployment. In response to this utilization gap, the possibility of using germicidal light emitting diodes, G-LEDs, for sanitation of select environmental surfaces during room occupancy, has arisen.

Each independent approach, use of LP lamp mercury based emitters, xenon tubes, or G-LED based emitters has their time and place, benefits and tradeoffs, entrenched supporters and detractors, and not surprisingly, there is little coordination or crossover of implementation, with eye towards exploiting complementary capabilities, even though there should be, to the benefit of patients and hospital environmental services workers, infection control professionals, and as a cost containment strategy. To the detriment of all such stakeholders, no technology deployment bridge has yet to be spanned.

However, innovative hybrid approaches, which holds great promise, are starting to couple and optimize the established benefits lamp or tube based sources with burgeoning capabilities of G-LEDs. The objective being to more fully maximize germicidal light utilization acceptance and greatly reduce pathogen loads on critical surfaces to the benefit of patients and hospital administrators alike. Such dual source implementations will be presented highlighting with the ability to switch between emitters determined by design, by a need for planned scheduling, driven by placement and mobility limitations, use opportunities, or workflow considerations. Thoughtful utilization offers the highest potential for enhanced efficacy and convenience, and would certainly result in higher degree of surface sanitation on demand or selectively 24 / 7 than currently achieved, leading to more patient and worker protection and greater cost savings for hospitals.