

Effective, Novel, Handheld, UV Technology for Surface Disinfection While Patients or Staff are Nearby

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BACKGROUND: The battle against nosocomial infections is ongoing, and the role the environment plays in these infections has been well established. Because only 50% of the items in a patient's room are adequately cleaned at the time of discharge, many hospitals are turning to "no-touch" systems to supplement their manual cleaning and disinfection protocols. Lumagenics introduces a safe, novel, handheld, low heat generating Cool UVTM technology that can be used on a daily basis, while the patient is in the room.

METHODS: Templates were drawn on Formica surfaces and inoculated with known amounts of epidemiologically important pathogens (EIP's) (i.e., MRSA, VRE, CRE *Klebsiella pneumoniae*, multidrug-resistant *Acinetobacter baumannii*, and *Clostridioides difficile* spores). After drying, each surface was exposed to the Cool UVTM at varying times and distances. After exposure, each surface was cultured with a Rodac plate and incubated according to standard microbiological procedures. Following incubation, all growth was quantitated and log₁₀ reductions were calculated.

RESULTS:). *C. difficile* spores were reduced an average of 1.84-3.18 log₁₀ in 10–60 secs from a distance of 1 inch, and an average of 1.21–2.58 log₁₀ at 5 inches (**Table 1**). Without an organic load, vegetative EIP's were reduced by an average of 3.63-5.08 log₁₀ for 1 and 5 sec., respectively, at 1 inch and by an average of 2.10-4.08 log₁₀ for 1 and 5 sec., respectively, at 5 inches (**Table 2**). With an organic load (10% fetal calf serum), the log₁₀ reduction for *C. difficile* spores was reduced ~0.94 log₁₀, but the reduction achieved for the vegetative EIP's remained relatively unaffected.

Table 1			
Log ₁₀ Reduction of <i>Clostridioides difficile</i> Spores Exposed to Cool UV TM Technology			
Distance	Log ₁₀ Reduction in Seconds		
	10	30	60
0% Fetal Calf Serum			
1 Inch	1.84	3.18	
5 Inches	1.21	1.34	2.58
10% Fetal Calf Serum			
1 Inch	2.11	3.48	2.44
5 Inches	*UTD	1.22	1.64

*Unable to Determine

Table 2 Log₁₀ Reduction of Epidemiologically Important Pathogens Exposed to Cool UV™ Technology				
Pathogen	Log ₁₀ Reduction			
	1 Inch		5 Inch	
	1 Second	5 Seconds	1 Second	5 Seconds
	0% Fetal Calf Serum			
MRSA	4.83	5.17	2.57	4.50
VRE	3.31	4.61	2.01	4.06
<i>K. pneumoniae</i> (CRE)	3.81	6.08	2.77	4.55
<i>A. baumannii</i> MDRO	2.56	4.44	1.03	3.21
10% Fetal Calf Serum				
MRSA	4.40	5.32	3.26	4.02
VRE	4.14	4.98	2.18	3.74
<i>K. pneumoniae</i> (CRE)	3.95	6.17	2.54	4.72
<i>A. baumannii</i> MDRO	3.08	4.11	1.44	3.06

CONCLUSIONS: Lumagenics' Cool UV™ technology, with short exposure times, reduced EIP's by levels like "no touch" room disinfection UV devices and may be a useful adjunct to daily cleaning and chemical disinfection.