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Ultraviolet Irradiation

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Three modalities for routine disinfection of hard surfaces in patient rooms:

- Chemical disinfectants
- Self-disinfecting surfaces
- No-touch technologies:
  - **-Ultraviolet Light**
  - **-Hydrogen Peroxide-Producing Systems**

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What is Ultraviolet (UV) Light?

- Ultraviolet (UV) light is a form of light that is invisible to the human eye
- It occupies the portion of the electromagnetic spectrum between X-rays and visible light.
- The sun emits ultraviolet light; however, much of it is absorbed by the earth's ozone layer.

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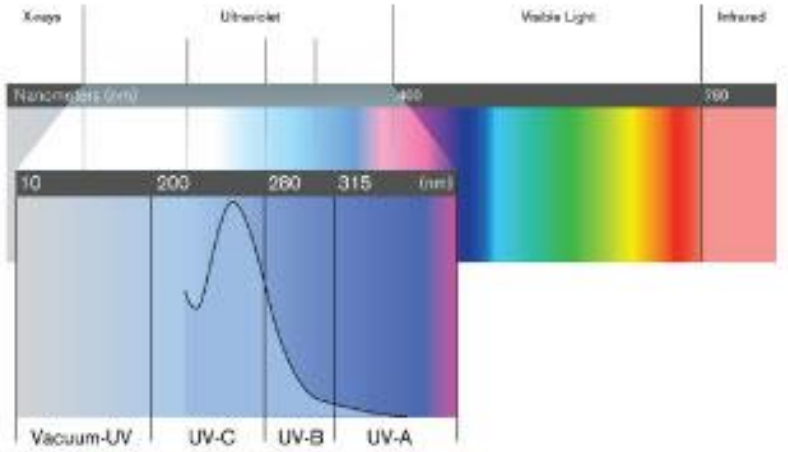
What is Ultraviolet (UV) Light?

Ultraviolet light is invisible to the human eye but can be used to disinfect microorganisms including chlorine-resistant protozoa.



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Ultraviolet Germicidal Irradiation (UVGI)

- Disinfection method that uses short-wavelength ultraviolet (UV-C) light to kill or inactivate microorganisms.
- Works by destroying nucleic acids and disrupting their DNA, leaving them unable to perform vital cellular functions.
- UVGI is used in a variety of applications, such as food, air, and water purification.

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Large Randomized Trial Led by Duke Health

Enhanced terminal room disinfection and acquisition and infection caused by multidrug-resistant organisms and Clostridium difficile (the Benefits of Enhanced Terminal Room Disinfection study): a cluster-randomised, multicentre, crossover study. *The Lancet*, 2017; DOI: 10.1016/S0140-6736(16)31588-4

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What might this be used for?

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Effectively disinfects cell phones in 10 minutes…

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Far ultraviolet C (far-UVC) light

- Can kill airborne flu viruses without harming human tissues.
- Overhead *far*-UVC light in hospitals, doctors' offices, schools, airports, airplanes, and other public spaces could provide a powerful check on seasonal influenza epidemics, as well as influenza pandemics. (According to study at the Center for Radiological Research Far-UVC light: A new tool to control the spread of airborne-mediated microbial diseases." Feb 2018)

Far-UV Light in an Airport

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To give you an idea…

Ultraviolet A	UVA	315–400	3.10–3.94, 0.497–0.631	Long-wave, black light, not absorbed by the ozone layer
Ultraviolet B	UVB	280–315	3.94–4.43, 0.631–0.710	Medium-wave, mostly absorbed by the ozone layer
Far ultraviolet	FUV	122–200	6.20–12.4, 0.993–1.987	
Short-wavelength UVC (Germicidal UV)		260-270		

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Closer to home – Vancouver Coastal Health

- There was a study conducted in BC that compared the decontamination of UVC light vs chemical measures.

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M20 UVC Disinfection Device

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MoonbeamTM3

- https://1source.diversey.com/see3/61141-LIT-Moonbeam3_brochure-LDG-en-HRNC_20170612212535.pdf

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Xenex Disinfection UV Robot

https://www.xenex.com/our-science

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Disadvantages

- Requires room to be vacated & disinfected
- Used only in terminal cleaning
- Positioning of equipment & furniture
- Turnaround time
- Cost

Adjunct to Current RP

- Stringent hand-washing.
- Precautions for staff contact with infected patients.
- Prudent use of antibiotics in patients.

Cost-Benefit Ratio

- Expense of UV Units
- Expense of treating nosocomial infections

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Any Questions or Comments?

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Thank-you! ☺

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