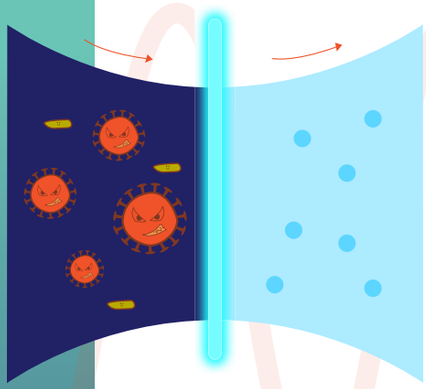

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# Considerations on the Safe use of UVC Radiation for Surface and Air Disinfection

Light waves from both the sun and man-made sources are differentiated by wavelength. Human eyes can detect light at wavelengths between about 400 nanometers (deep violet end of the visible light spectrum) to 780 nanometers (red end). **Ultraviolet (UV) waves, that also come from the sun and man-made sources, are invisible to the human eye, with wavelengths ranging from 100 to 400 nanometers.**

Although humans cannot see UV light, it is hazardous to human skin and eyes. Acute (short-term) health effects of overexposure to UV radiation include photokeratitis (snow blindness), erythema (sunburn), and skin photosensitization. Long-term health effects associated ongoing or constant UV light exposure include cataracts, skin aging, and skin cancer.[1-4]

**1900s**

UV light has been used as a germicide in industry and medicine

**2003**

UV radiation was demonstrated to have germicidal capabilities against the SARS-CoV-1 virus.[5]

UV light was first used in the early 1900s. Since then it has been used in many germicidal applications such as water treatment plants, ventilation systems, hospitals, swimming pools, and laboratories.

In 2003, UV radiation was demonstrated to behave with germicidal capabilities against the SARS-CoV-1 virus.[5] Since then, studies have indicated that **UV radiation also has the capability of killing SARS-CoV-2**.[6] As with other infectious agents, UV radiation can potentially be used to disable the coronavirus on both surfaces and in air.

Despite the effectiveness of UV radiation in killing germs, serious consideration must be given to how it can be applied safely without exposing the public or workers to harm. For any given infectious agent, the power of UV light needed to kill the germs greatly exceeds levels that would be considered "safe" to humans for an exposure of more than a few seconds. At the intensity needed to kill most infectious agents, the light is still hazardous to humans from several meters away. Generally speaking, **if a person can see the visible light that comes from most germicidal UV lightbulbs when the unit is on, they are potentially exposed to hazardous levels of radiation within just a few minutes**. Exposures to the public and workers must be kept below consensus exposure limits.[7,8]

The decision to implement a UV system to reduce germ load on surfaces or air should consider potential public and worker exposures, including installation and maintenance workers, and include a thorough evaluation of the need and potential benefits. If selected, the use of UV must be accompanied by a vigilant and thorough industrial hygiene program including:

- ❏ Evaluation or monitoring of exposures
- ❏ Engineering and administrative controls, and
- ❏ Potentially, personnel protective equipment such as UV-absorbing eye and face protection, long sleeves, and neck drapes.

Administrative controls might include prohibiting entry into spaces where germicidal UV irradiation is in progress. Engineering controls could involve interlocks to shut off a UV source if entry occurs. Programs must include:

- ❏ Worker training
- ❏ Administrative policies and procedures
- ❏ Record keeping and exposure reporting

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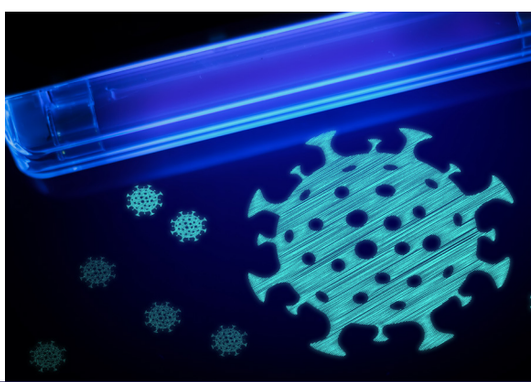


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