

# ***Live Germ Free with UV-C***

Ultraviolet Germicidal Irradiation (UVGI): A Remote Disinfection Solution



*For Doctors, Patients & Everyone in Between*

*[www.MSEC.co](http://www.MSEC.co)*

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# A Need for A Deeper Clean

- With the world's population exceeding 7.1 billion and physical contact among individuals from across the globe more frequent, an outbreak of a super-bug may be inevitable.

*Annually, there are over 1.7million documented cases of Hospital Acquired Infections (HAIs), with nearly 100,00 of those resulting in fatalities.*

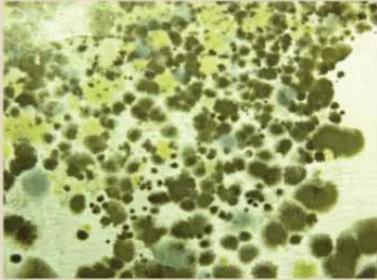
- HAIs infection may cost a hospital up to \$111,000 per case.
- *Up to 28% of pathogens are Multi Drug Resistant Organisms (MDRO) which have developed resistivity to common antibiotics and can be easily transferred from one person to the next.*



- *MDROs can survive in a health care environment for up to two months.*
- *A patient has over 200% greater risk of acquiring a MDRO if occupying a room previously used by a patient with MDRO infection, even after terminal cleaning.*
- *Hand washing, air purification and traditional cleaning methods are no longer sufficient to inhibit the spread of mutated and deadly gems.*



# Under A Constant Attack



**mold**



**viruses**



**bacteria**



**dust mite fecal matter**



**smog**



**cooking odors**



**cigarette smoke & odors**



**lingering odors**



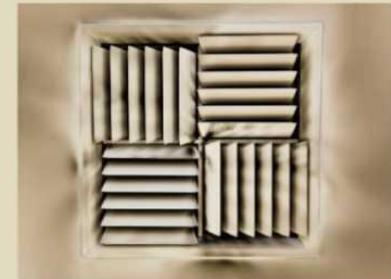
**pet odors & dander**



**VOCs & chemicals**



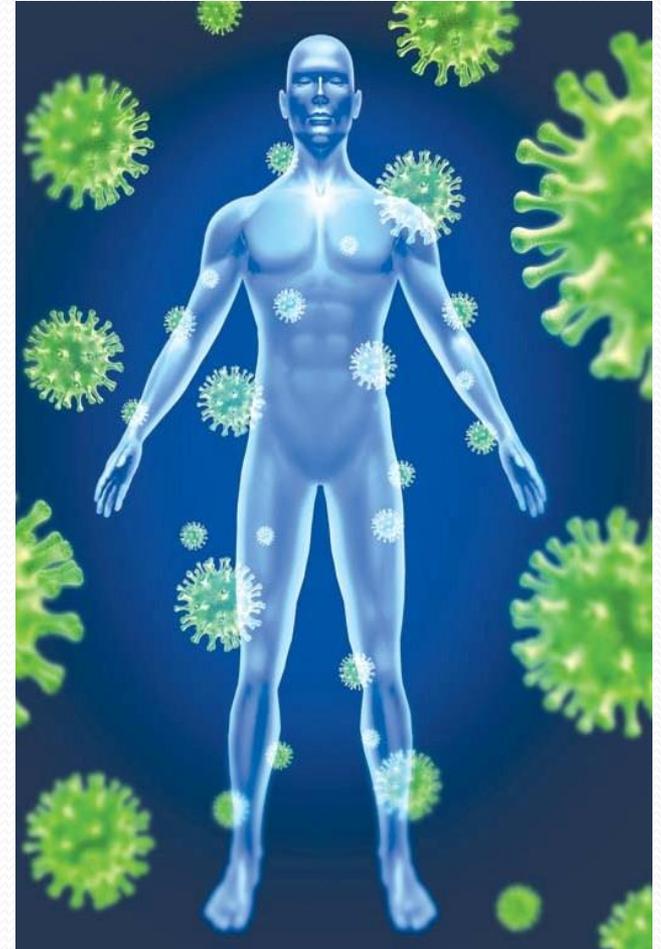
**allergy & asthma triggers**



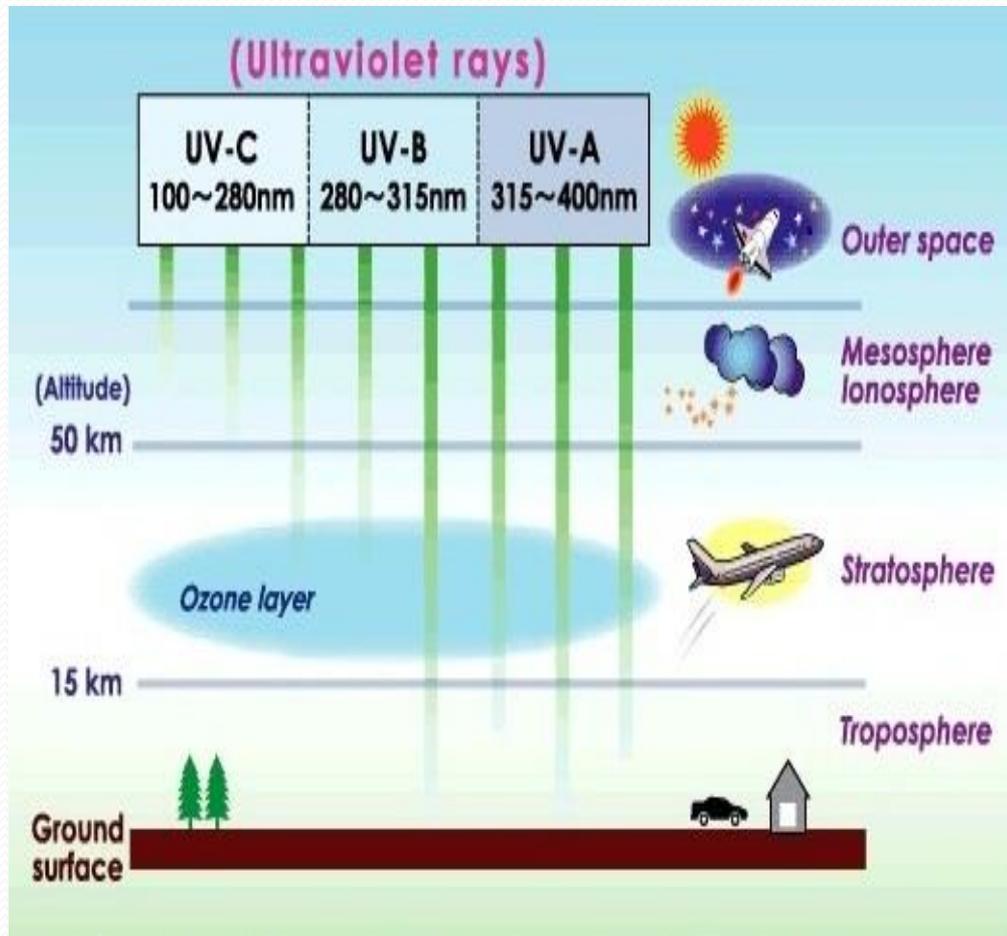
**sick building syndrome**

# The UVGI Solution

- Ultraviolet germicidal irradiation or UVGI is a process which uses a short-wave, germicidal component of natural UV light, known as UV-C, to DENATURE micro-organisms rendering them unable to REPLICATE.
- *With the reproductive systems neutralized, pathogens quickly SUCCUMB to the natural defensive mechanism of human immune system.*
- When combined with standard cleaning protocols, UVGI technology can provide up to 99.99% disinfection on surfaces.
- *UVGI is beneficial in areas where people have compromised or weakened immune systems, such as; retirement communities, long term care facilities, ORs and anywhere else people interact.*
- Pathogen free environment is an effective way to increase productivity, reduce absenteeism due to illness and enhance bottom line.

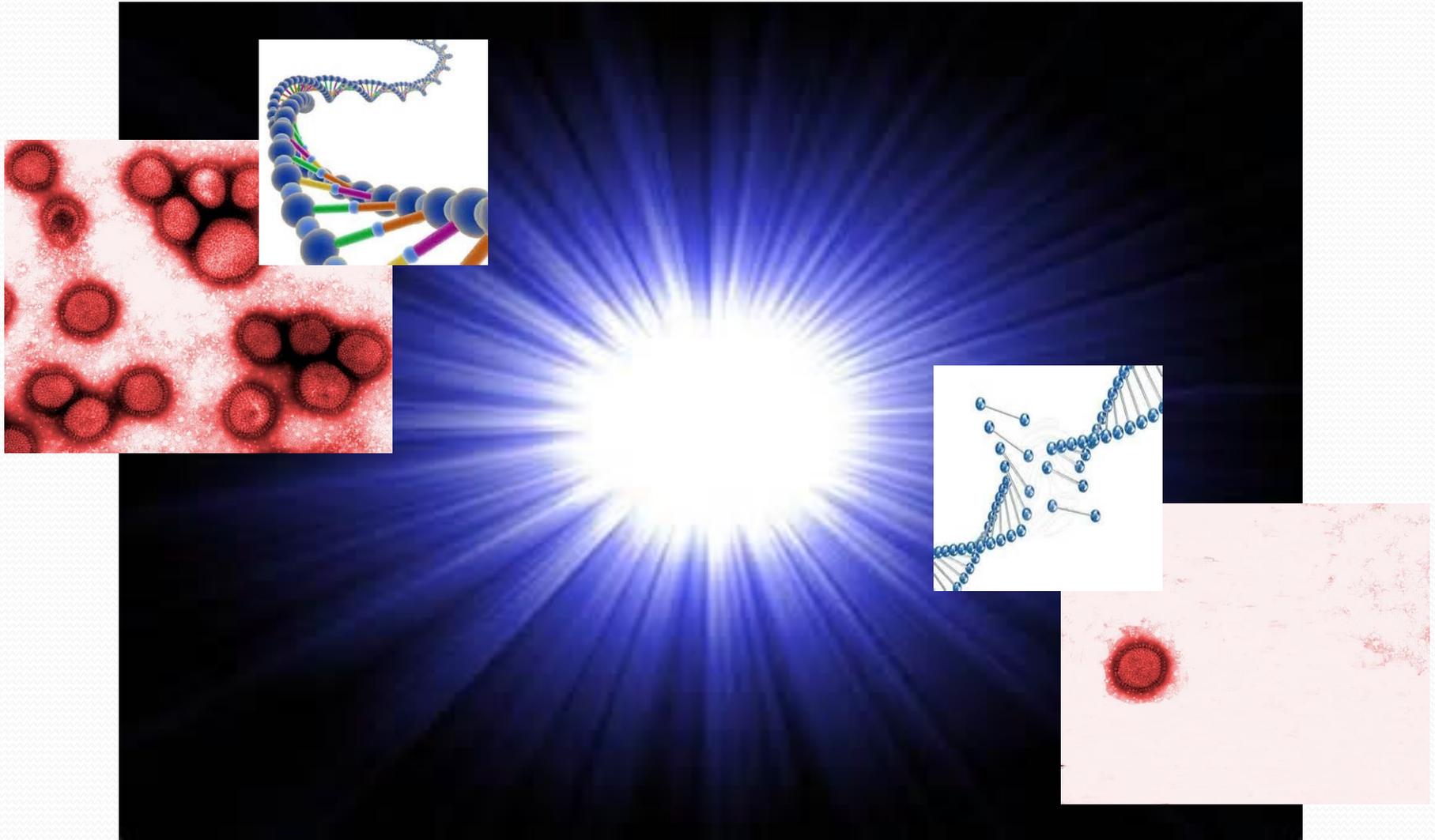


# UVGI Origins



- A germicidal component of natural solar light is UV-C which is stopped by Earth's atmosphere.
- *UV-A and UV-B do reach the surface and are responsible for sun tan, skin rashes and skin cancer.*
- UV has been a known mutagen at the cellular level for more than one-hundred years. A mutagen is a chemical or physical agent which changes the genetic properties of an organism usually at a DNA level.
- *Niels Finsen was awarded Nobel Prize in Medicine in 1903 for his use of UV against lupus vulgaris, TB of the skin.*
- UV light application for drinking water disinfection dates back to the year 1910 in Marseille, France.

# How Does UVGI Works?



# UVGI Studies

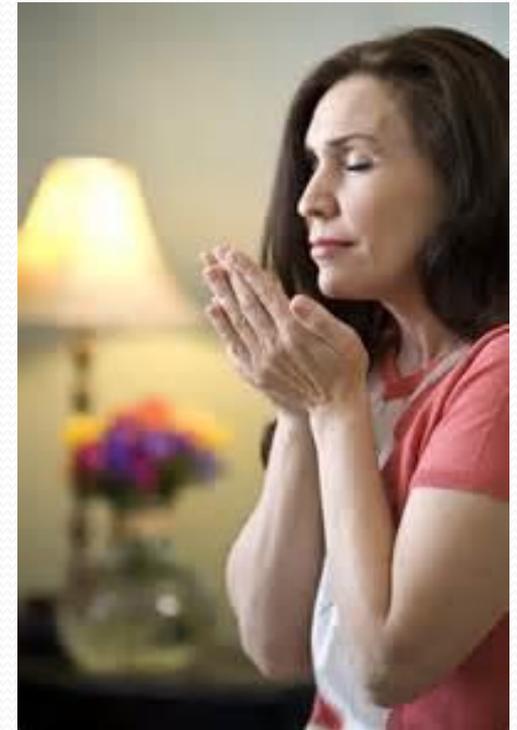
- In a hospital based study published in the Journal of Infection Control and Hospital Epidemiology, May 20, 2012 it was found that using a 10% bleach disinfectant, along with routine environmental cleaning, failed to eliminate a heavy *Clostridium difficile* infection (CDI) when tested 5 hours after cleaning. However, with a single cycle run using a UVGI device at 22,000mWs/cm<sup>2</sup> for ~90 minutes there was only one colony detected on a bedrail. Even up to 5 weeks after treatment patient samples were negative for *C. difficile*.
- *In a 2011 study reported in the same journal Boyce et al. found that there was a significant reduction in MRSA, VRE, Acinetobacter baumannii and C. difficile on 5 high touch surfaces when cycle times of 34.2 to 100.1 minutes were used.*
- In 2009 at the acute care hospital in Chapel Hill, North Carolina a 9 month study on the use of UV-C light treatment in patient rooms was completed. The results indicated that with 15 minutes of UV-C irradiation the vegetative bacteria on surfaces was reduced by 99.9% and *C. difficile* spores were reduced by 99.8% with 50 minutes of exposure.
- *In the same Chapel Hill study plates of MRSA colonies located in specific areas of the rooms that employed UV irradiation decontamination found that only 2 of 400 showed a positive test for the presence of MRSA as compared to 81 without exposure to UV-C.*

# UVGI Studies *cont...*

- In a 2007 study from the Journal of Military Medicine researchers found that *Acinetobacter baumannii*, a multi-drug resistant isolate, was completely killed on all metal surfaces tested at a fluence of 90J/m<sup>2</sup>. In the same test spraying with ethanol on metal surfaces was found to be ineffective.
- *A study of the use of automated ultraviolet radiation device published in BMC Infection Diseases in 2010 found that the device was able to reduce C. difficile cultures by 80% and MSRA and VRE positive cultures were reduced by 93%. When compared to traditional cleaning of difficult to reach surfaces such as the underside of bedside tables, the UVGI system was 100% effective while the manually cleaned rooms with standard disinfectant were 18% positive for the contaminants.*
- In a test at Highland Hospital, a 260 bed teaching facility, the rate of infection with nosocomial CDI was 2.2 per 1000 patients with a morbidity of 42 and a mortality of 2 in the first quarter of 2009. After using a total room, automated, handheld remote control UV device the next quarter reported a drop of infection to 1.6 per 1000 patients and by the second quarter after implementation of UV room cleaning the rates were down to 0.8, the lowest rate recorded in the prior 10 quarters.

# Benefits of UVGI

- UVGI is an effective method of eradicating harmful pathogens.
- *It is an affordable technology with broad commercial applications.*
- Use of UVGI systems does not require any special training.
- *UVGI equipment is easy to operate and require minimum maintenance.*
- Mobile and hand held UV-C units allow for quick and easy response to contaminated areas.
- *Replacement components are limited to UV light bulbs and should be replaced based on manufacturer's guidelines.*

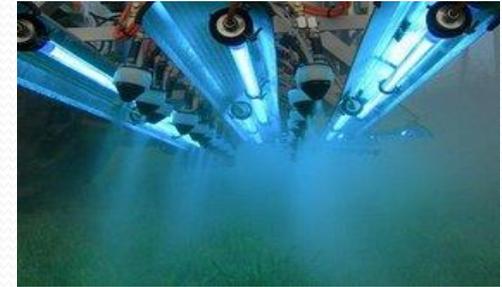


# Drawbacks of UVGI

- UV-C are not a stand alone devices and should be used in conjunction with existing infection control protocols.
- *UVGI technology can not remove stains or soil.*
- Disinfection area should be vacated when unit is in operation.
- *Protective clothing and eyewear must be worn when unit is in use.*
- Operating cycles vary based on the treatment area and on the type of pathogen being disinfected against.



# UVGI Uses in Industry



- Medical
- Food Processing
- Hospitality
- Laboratory
- Pharmaceutical
- Transportation
- Water Treatment
- HVAC/ Air Quality

# Using UV-C Equipment

- Surface to be disinfected should be in direct line of sight.
- *Position units to maximize area to be cleaned, but as close to the object to minimize treatment time.*
- Reference “Kill Chart” for required treatment doses/ times.
- *Exit the area during the cleaning process.*
- Use protective UV glasses and attire if re-entering treatment area while UV-C is in use.
- *Use warning signs on all entry/ exit points.*

*Note: UV-C is not a stand alone system and should be used in conjunction with established infection control protocols.*



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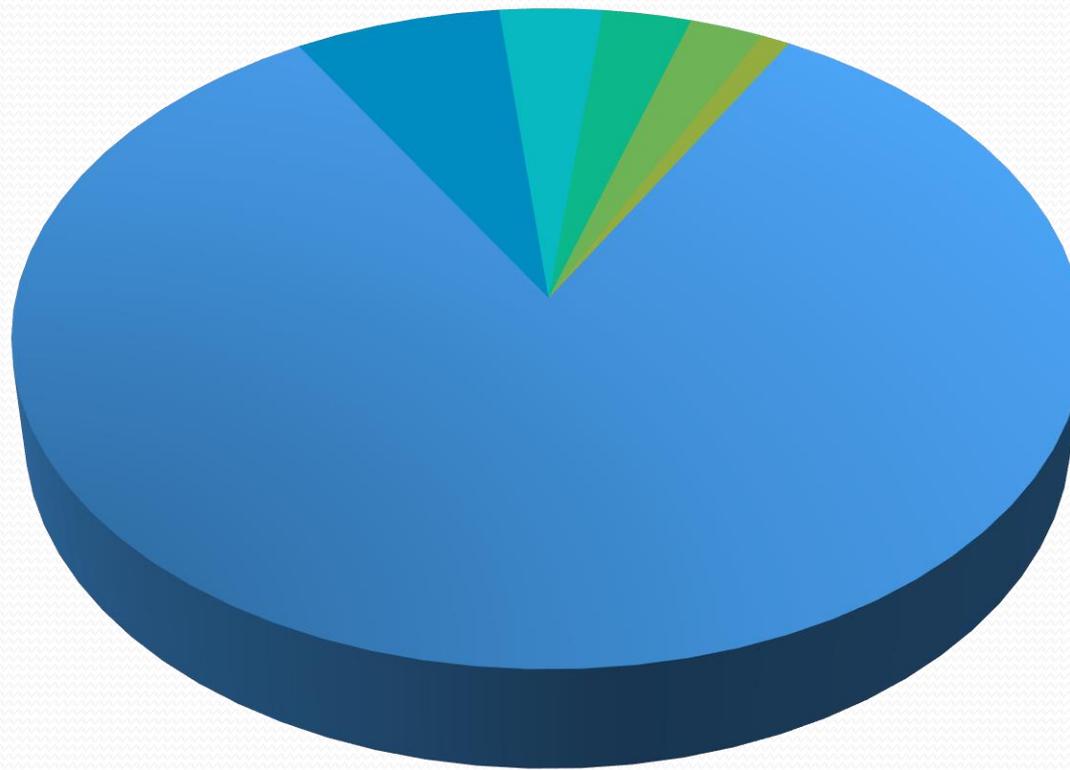
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Foundation

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This portable UVC disinfection device designed to deactivate bacteria, vru ...

**IN STOCK** Unit: single  
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*“The most important single central fact about a free market is that no exchange takes place unless both parties benefit.”*

*Milton Friedman  
Nobel Prize Laureate in Economics*



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