HAlS and ICUcare
The prevalence and costliness of hospital-acquired infections has not gone unnoticed by Medicare. Two Medicare fraud alerts have been put in place to increase reimbursement for the selection of HAlS to reduce HAI through preventive measures.

The first was established in 2009 with the Deficit Reduction Act (DRA) that contained language that became effective October 1, 2008. Hospitals will not be reimbursed for infections that the selected condition was not present on admission. (NCSL 2008). This trend, in collaboration with the CDC, to establish tracking and assessment of selected HAIs. The program was developed to increase efficiency over time.

The second was established in 2013 when the Centers for Medicare & Medicaid Services (CMS) instituted the Hospital Value-Based Purchasing Program, which pays more to hospitals with performance indicators above a threshold considered “good” and less to hospitals below the threshold (CMS 2014). In 2013, the CMS published “element achievement criteria” which included the following conditions, some of which are selected hospital-acquired infections. In 2014, 1,451 hospitals reported their performance data for selected HAI conditions.

In October 1, 2014, Bosnia in 2,131 hospitals will also occur during the same time frame (HHS 2014). Increasing efficiency over time also is expected in the program.

HAC surfaces-cleaning was recently documented in a significant intensive care unit (NICU) case study at the University of buffalo researches that children’s Hospital. (Ryan 2014). The study found substantial reductions in micro- biological loading on NICU surfaces to near 0 cfu per IperIod (rAu 2014). IncreAsIng sTrIngency over TIMe Also Is expecTed In THe progrAM. THAT AfTer “ocTober 1, 2008, HospITAls wIll noT receIve AddITIonAl pAyMenT for cAses In wHIcH one of THe fIrsT wAs esTAblIsHed In 2006 wITH THe defIcIT reducTIon AcT (drA) THAT conTAIned lAnguAge sucH as “pAtient AcquIred infecTIons,” soMe of wHIcH Are selecTed HospITAl-AcquIred InfecTIons. In 2014, 1,451 HospITAls coMMitted to THe study wITH 30 hospITAls wITH 1,000 bedS or greateR. oNce oNce oN October 1, 2014. HospITAls in 2,131 hospITAls wIll also receIve dUrINg THe sAMe TIMe.

This basic knowledge provides a foundation to compass all of the information and/or proven interventions are shown to work best for which pathogens. It helps to know pathogen types and how they spread, their resistance to medicines and healthcare facilities plays a pivotal role in fighting this battle. Guidelines exist, such as those produced by the CDC and the Joint Commission, that specify which interventions are shown to work best for which pathogens. These are often based on clinical experience, but also on what the CDC and other experts recommend. There is, essentially, a war being fought on three fronts of infection control: HAIs, antibiotic-resistant microorganisms (ARMs) and emerging diseases.

There is, essentially, a war being fought on three fronts of infection control: HAIs, antibiotic-resistant microorganisms (ARMs) and emerging diseases.

Shorcuts to Infection Information:

As seen in: UV-C Infection Control Products
UV-C energy can fortify hospital defenses against infectious diseases by reducing their resistance with increasing their resistance to medicines.

E ach year, more than two million people contract a hospital-acquired infection (HAI) that can also be antibiotic-resistant. In 2014, these infections resulted in at least 23,000 deaths! In fact, HAIs, kill more people than AIDS, breast cancer and auto accidents combined.

Emerging diseases—such as Sudden Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS)—by healthcare facilities to protect work- ers, patients, and visitors from the spread of these pathogens.

There is, essentially, a war being fought on three fronts of infection control: HAIs, antibiotic-resistant microorganisms (ARMs) and emerging diseases.

Engineering for infection-control systems in healthcare facilities play a pivotal role in fighting these emerging infections. Guidelines exist, such as the ASHRAE/ASHRAE/ASHRAE Guidelines for Ventilation of Health Care Facilities (Enterovirus D68), SARS, MERS and colds and other enteroviruses (Enterovirus D68), SARS, MERS and colds.

Transmission
This basic knowledge provides a foundation to design interventions that interrupt or inter- rupt and therefore reduce the spread of infectious agents. There are many forms of transmission. Some are not even listed below.

Steps to Fight Infection:
1. Viruses: keep away from sick people, wash your hand, cover your sneeze.
2. Bacteria: be aware of pathogen types and how they spread, their resistance to medicines and healthcare facilities plays a pivotal role in fighting this battle. Guidelines exist, such as those produced by the CDC and the Joint Commission, that specify which interventions are shown to work best for which pathogens. These are often based on clinical experience, but also on what the CDC and other experts recommend. There is, essentially, a war being fought on three fronts of infection control: HAIs, antibiotic-resistant microorganisms (ARMs) and emerging diseases.

There is, essentially, a war being fought on three fronts of infection control: HAIs, antibiotic-resistant microorganisms (ARMs) and emerging diseases.

Engineering for infection-control systems in healthcare facilities play a pivotal role in fighting these emerging infections. Guidelines exist, such as the ASHRAE/ASHRAE/ASHRAE Guidelines for Ventilation of Health Care Facilities (Enterovirus D68), SARS, MERS and colds and other enteroviruses (Enterovirus D68), SARS, MERS and colds.
**Direct contact:** Physical contact or transfer of microorganisms through touching, coughing, sneezing or talking, and directly touching through sneeze or cough droplets, nose or mouth. Droplets can also be generated during times of healthcare work, surgery, autopsy, and other medical procedures (Mt. Sinai 2014).

**Fecal-oral transmission:** The term “reproduction number” (R0) is used to numerically rate the infectiousness of treat ment. This higher the R0, the more contagious the disease. Transmissibility is an informal term that means the difficulty to treat an infection with vac cinations or medicines. Viruses are difficult to treat because they can infect any cell that contains the essential cellular machinery. A known disease is passes on to another person or species through direct or indirect contact with a contaminated surface, such as door knobs, bed rails or medical instruments, etc. (Mt. Sinai 2014).

**Fecal-oral transmission:** Infections can occur outside of an intensive care unit (Magill 2014).

**Fecal-oral transmission:** Infections are being waged on three fronts – hospital-acquired infections, patients acquired infections, engineers have one major issue to address: answering the question of how to reduce the number of patients who develop healthcare-acquired infections; anti-microbial resistance (WHO 2014). The situation elicited a warning from the World Health Organization: “If we don’t take urgent action we are heading for a post-antibiotic era.” (WHO 2014-2). Notable applications include the Pentagon for protection against bio-terror agents, the CDC for protection against catastrophic spills of infectious agents and the isolation units at Emory University hospital, where Dr. Kent Brantly and Nancy Writebol, who both were infected with Ebola, were taken to recover.

**Fecal-oral transmission:** ABSHAE (2011-2015) finds that more than 240 healthcare workers have died from such infections; some of whom were their close friends and prominent doctors (WHO 2014-2).

**Fecal-oral transmission:** UV-C and Infection Control

**Fecal-oral transmission:** Infections of the upper respiratory tract have been associated with multiple nosocomial infections (Sandford 1998).

**Fecal-oral transmission:** UV-C waveform is a supplemental and adsorption technique that has been demonstrated to be highly effective against a wide range of pathogen species. The UV-C waveform is a supplemental and adsorption technique that has been demonstrated to be highly effective against a wide range of pathogen species.
UV-C and Infection Control

Direct contact: Physical contact and transfer of microorganisms through touch, coughing, sneezing or talking, and directly reaching a wound, incision, abrasion or nose or mouth. Droplets can also be generated during coughing, sneezing, vomiting, or other medical procedures (Mi. Sinai 2014).

Fecal-oral transmission: Occurs via the fecal-oral route, in which bacteria are excreted in feces and enter the host through ingestion, contact with soiled hands, etc. It happens from person to person; having direct contact with a patient’s faeces or vomit is the mode of transmission.

Fecal-oral transmission. However, several studies have found that it can become airborne during room evacuation or through forced air systems. And areas of HVAC systems can serve as reservoirs for pathogen growth and subsequent transmission. UV-C installations are positioned in key spaces to protect against bio-terror agents, the CDC recommends. Notable applications include the Pentagon for protection against bioterror agents, the CDC for protection against catastrophic spills of infectious agents and the isolation units at Emory University hospital, where Dr. Kent Brantly and Nancy Writebol, who both were infected with Ebola, were taken to recover.

The impact of emerging diseases is not always understood. As previously mentioned, the war against diseases, which often considers emerging diseases as a new pathogen or disease, may be more virulent and/or resistant to existing or emerging treatments. The difficulty to treat an infection with vaccines, the patient’s access to health care.

The term “reproduction number” (R0) is used to numerically rate the infectiveness of treatments for emerging diseases. The higher the R0, the more contagious a disease is. The reproduction number is the average number of people who catch an infection from one infected person, and the reproduction number is the average number of people who catch an infection from one infected person. Furthermore, the reproduction number is the average number of people who catch an infection from one infected person. In the 2013-2014 outbreak of Ebola in West Africa, the reproduction number was estimated to be between 1.9 and 3.3. However, this estimate is based on early data and may not be accurate.

VIRUS, INFECTIVITY AND TREATABILITY

Virus is the potential to infect a person’s health, including mortality rate or, when a virus is not present, the number of people who are infected. Apart from pathogens specific, virus exposure does not depend on many factors, including air temperature, vaccinations, and the patient’s access to healthcare.

Infectious is a disease’s ability to spread. The term “reproduction number” (R0) is used to numerically rate the infectiveness of treatments for emerging diseases. The higher the R0, the more contagious a disease is. The reproduction number is the average number of people who catch an infection from one infected person, and the reproduction number is the average number of people who catch an infection from one infected person. In the 2013-2014 outbreak of Ebola in West Africa, the reproduction number was estimated to be between 1.9 and 3.3. However, this estimate is based on early data and may not be accurate.
Infectiveness is a disease’s ability to spread. Apart from pathogen specifics, virulence determines how many people die after becoming infected.

Virulence, infectiveness and treatability

Virulence is the potential to impact an infected person’s health, including mortality rate or, in other words, the impact on the patient’s access to healthcare. Treatability is an informal term that means the ability to treat an infection with vaccines or medicines.
UV-C and Infection Control

UV-C Infection Control Products

GLO® Upper Air UV-C Fixture: Provides increased levels of ultraviolet peracetic acid irradiation (UVGI) protection through its exclusive, computer designed, high spectral amber aluminum reflector that helps to significantly reduce indoor UV energy use. The GLO exceeds the performance guidelines established by the U.S. Department of Health and Human Services and the Center for Disease Control and Prevention (CDC) for hospital and healthcare applications.

RLM® X-treme UV-Lamp System: Delivers high output ultraviolet energy to air-stream or cooling coils to destroy mold, bacteria, and viruses in demand. High-volume HVAC (heating, ventilation, and air-conditioning) environments. This modern UV system is designed to help improve air-quality, while creating a more energy-efficient HVAC system that does not need to waste-energy to distribute properly conditioned air to facilities.

As seen in:

UV-C energy can fortify hospital defenses against infectious diseases by reducing their concentrations without increasing their resistance to medicines.

Basics

It helps to know pathogen types and how they are manifested as diseases (etiologies), which includes virulence (how it affects people); its transmission (how they spread), and which interventions are shown to work best for which diseases.

Types

Most focus on two types of pathogens that are of concern – bacteria and viruses.

Bacteria

Bacteria are single-celled microorganisms that replicate in living cells of other organisms such as in humans, animals and plants. They are typically smaller than viruses and are difficult to treat with drugs. Viruses include Bacteria and other microscopic microorganisms such as the Enterovirus (D68), SARS and MERs and ebola and flu.

Transmission

This basic knowledge provides a foundation to design intervention that can be maintained, that can be sustained, and that can reduce the risk and spread of infectious diseases. Transmission of these diseases can be classified as:

• Direct contact: Those who share close contact with infected individuals (e.g., sexual and blood contact, household contact).
• Indirect contact: Those who are exposed to infectious agents that can be transmitted through contaminated food or water, or aerosols, and are responsible for spread through hands.
• Airborne: Infections that can easily be transmitted (e.g., by sneezing and coughing to infect others).
• Vector: Those who can transmit infections (e.g., insects or animals transmitters).
UVC and Infection Control Products

GLO® Upper Air UVC Fixtures: Provides increased levels of ultraviolet pericellular irradiation protection through its exclusive, computer designed, high spectral aluminum reflector that helps to significantly reduce indoor UVC energy use. The GLO exceeds the performance guidelines established by the U.S. Department of Health and Human Services and the Center for Disease Control and Prevention (CDC) for hospital and healthcare applications.

As seen in:

UV-C and Infection Control

UVC energy can fortify hospital defenses against infectious diseases by reducing their concentrations without increasing their resistance to medicines.

Basics

It helps to know pathogen types and how they are manifested as diseases (etiologies), which is not always obvious. For instance, a pathogen can cause several diseases such as meningitis from the meningococcus (Neisseria meningitidis) and sepsis from the same organism. Other pathogens attach to surfaces in hospital facilities and are difficult to treat with drugs. Viruses are also known to be resistant microorganisms (ARMs), such as MERS (Middle East Respiratory Syndrome) and EBOV (Ebola virus), and some are highly resistant to antibiotics and other antimicrobials.

Types

Types of concern – bacteria and viruses.

Bacteria include Staphylococcus aureus (MRSA), drug-resistant microorganisms (ARMs), such as methicillin-resistant Staphylococcus aureus (MRSA), which is resistant to all beta-lactams, and vancomycin, which is resistant to vancomycin (VRA)

Viruses:

Bacteria include Staphylococcus aureus (MRSA), which is resistant to all beta-lactams, and vancomycin, which is resistant to vancomycin (VRA)

Vigilance: We focus on two types of pathogens that are of concern – bacteria and viruses.

Bacteria: Bacteria, such as MRSA (Methicillin-resistant Staphylococcus aureus) and VRA (Vancomycin-Resistant Enterococci), are manifested as diseases (etiologies), which is not always obvious. There is, essentially, a war being fought on three fronts of infection control: UVC, antibiotic-resistant microorganisms (ARMs), and emerging diseases.

Engineering for infection control systems in healthcare facilities plays a pivotal role in fighting this battle. Guidelines exist, such as the ANSI / ASHRAE / ASHE Standard 170-2013, Universal Design for Healthcare Facilities (ASHRAE 2013); however, no single guide encompasses all the suggestions engineers will need.

Because Ultraviolet Germicidal Irradiation (UV-C) kills all known microorganisms, this article outlines some basics of infectious diseases and cases to empower engineers with suggestions engineers will need.

UVC systems are cost-effective, proven, and a readily available means to address all three fronts of the war on infectious diseases. The variety of ways that UVC can be applied enables engineers and operators to tailor UVC technologies to most desired outcomes, and doing so is more cost-effective than adding time and energy to air-streams or cooling coils to destroy mold, bacteria, and viruses.

Shortcuts to Infection Information:

• Autonomic-resistance microorganisms: http://www.cdc.gov/autonomicroorganisms/
• Emerging diseases: http://www.cdc.gov/ncidod/eid/
• Middle East Respiratory Syndrome (MERS): http://www.cdc.gov/mers/
• Non-pulsed Ultraviolet: http://www.cdc.gov/niosh-non-ultraviolet/index.html
• Morbidity and Mortality Weekly Summary Report: http://www.cdc.gov/mmwr/
• Coronavirus (including SARS and MERS): http://www.cdc.gov/coronavirus/about/index.html

As an article outline, this article provides some basics of infectious diseases and prevention using UVC technology. Although every infection is different, some commonalities can be applied to the design and implementation of UVC systems to prevent the spread of these pathogens.

There is, essentially, a war being fought on three fronts of infection control: UVC, antibiotic-resistant microorganisms (ARMs), and emerging diseases.

Engineering for infection control systems in healthcare facilities plays a pivotal role in fighting this battle. Guidelines exist, such as the ANSI / ASHRAE / ASHE Standard 170-2013, Universal Design for Healthcare Facilities (ASHRAE 2013); however, no single guide encompasses all the suggestions engineers will need.

Because Ultraviolet Germicidal Irradiation (UV-C) kills all known microorganisms, this article outlines some basics of infectious diseases and prevention using UVC technology. Although every infection is different, some commonalities can be applied to the design and implementation of UVC systems to prevent the spread of these pathogens.

The basic knowledge provides a foundation to engineer suggestions engineers will need.

Infections are typically acquired from the environment, and therefore reduce the risk and spread of these pathogens.

There is, essentially, a war being fought on three fronts of infection control: UVC, antibiotic-resistant microorganisms (ARMs), and emerging diseases.

Engineering for infection control systems in healthcare facilities plays a pivotal role in fighting this battle. Guidelines exist, such as the ANSI / ASHRAE / ASHE Standard 170-2013, Universal Design for Healthcare Facilities (ASHRAE 2013); however, no single guide encompasses all the suggestions engineers will need.

Because Ultraviolet Germicidal Irradiation (UV-C) kills all known microorganisms, this article outlines some basics of infectious diseases and prevention using UVC technology. Although every infection is different, some commonalities can be applied to the design and implementation of UVC systems to prevent the spread of these pathogens.

Vigilance: We focus on two types of pathogens that are of concern – bacteria and viruses.

Bacteria include Staphylococcus aureus (MRSA), which is resistant to all beta-lactams, and vancomycin, which is resistant to vancomycin (VRA)

Viruses:

Bacteria include Staphylococcus aureus (MRSA), which is resistant to all beta-lactams, and vancomycin, which is resistant to vancomycin (VRA)

Vigilance: We focus on two types of pathogens that are of concern – bacteria and viruses.