



A Brief Review: Microbiology

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Objectives:

- Define microbiology and discuss what role it plays in central sterile processing.
- Discuss the various organisms associated with microbiology.
- Discuss preventative measure to reduce exposure to harmful microorganisms.
- Discuss pathogens common to the sterile processing environment.

Let's face it! When you initially took a position into the sensational world of central sterile processing; could you have ever imagined that microbiology would be a pertinent source of information critical to your safety as a technician? Maybe you assumed that you would only be delivering clean, "safe" items to various departments. You may have thought that potentially hazardous organisms were only restricted to the operating room professionals. It could very well be that you didn't know what microbiology was until you entered the healthcare field.



What is microbiology? A simple definition for microbiology would be the study of microorganisms. When we discuss microbiology, we are describing tiny, microscopic organisms that usually can only be viewed underneath a microscope. There are various types of microorganisms that include bacteria, viruses, prions, and funguses, to name a few. It is critical that central processing professionals understand the various types of organisms as they relate to sterile processing and how to protect themselves from these potentially hazardous organisms. Not all microorganisms are dangerous. Before we discuss how you can protect yourself against the dangerous microorganisms, we will first discuss the various types in detail.

Bacteria

Bacteria are unicellular organisms and reproduce by a method referred to as binary fission. Binary fission can be described as "a single cell splitting into two cells" (Zundell, 2015). Bacteria come in various shapes such as rods (bacilli), round (cocci), and spiral (spirochetes). They contain flagella (hair-like structures) that help them to migrate through liquids. There are bacteria that need oxygen to survive (aerobic) and bacteria that cannot survive with oxygen (anaerobic). Spores are specialized structures of bacteria that consist of a hardened shell that make them resistant to sterilization. The appropriate method of sterilization must be utilized to destroy spores. Biological indicators contain about one million spores that verify that items have been effectively sterilized during the sterilization process.

Viruses

Viruses are even smaller than bacteria. They cannot survive without a living host. They do not contain cells. Some common viruses associated in the healthcare environment include the influenza (flu) virus, Human Immunodeficiency virus (HIV), and the Hepatitis virus. HIV and Hep b are the two most common bloodborne pathogens that central processing professionals have to be aware of. Most hospi-

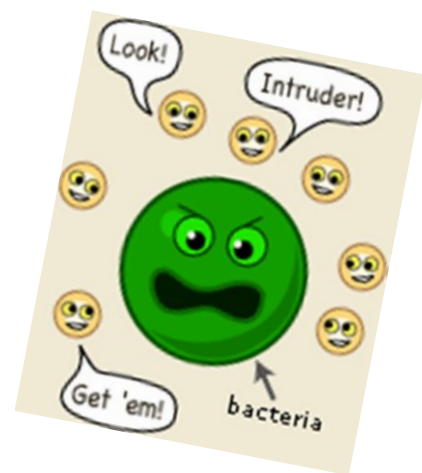




tals offer the Hepatitis B vaccination to protect their staff from this dangerous virus that attacks the liver. It is best practice to treat everything as potentially hazardous to provide extra measures of protection against these blood borne pathogens.



Prions: A prion can be a very fatal disease. Prions are extremely difficult to kill under regular sterilization procedures. This tough organism causes the disease CJD. “Creutzfeldt-Jakob disease (CJD) is a rapidly progressive, degenerative, neurologic disorder of humans with an incidence in the United States of approximately 1 person/million population/year” (Centers for Disease Control and Prevention, 2009). It is critical that central processing technicians understand the correct protocols within their department when potential exposure to prions is of concern. It can mean the life and death of a patient not already infected. Instrumentation exposed to prions should be carefully monitored and/or quarantined. Appropriate sterilization procedures must be followed. If disposable instruments are utilized for potential cases of patients with CJD, those trays must be clearly marked and set aside specifically for those patients. It is important to review all guidelines available within your department regarding exposure to prions.





Common organisms in CS

Look at the chart below to view some of the most common organisms that cause disease within the central processing department and ways in which they are transmitted.

Microorganism	Transmission
Staphylococci/ Bacteria	Direct contact, Airborne
Escherichia coli/ Bacteria	Feces, Urine Direct contact
Streptococci/Bacteria	Airborne, Direct contact
Tubercle bacillus/ Bacteria (Mycobacterium tuberculosis)	Airborne, Droplet, Direct Contact
Fungi/ Fungus	Airborne, Direct contact
Spongiform encephalopathies (TSEs)/ Prions	Airborne, Droplet, Direct Contact
Hepatitis virus/ Virus	Blood borne, Direct Contact

Handwashing

There are several necessary steps a central processing technician must take in order to protect themselves from dangerous microorganism exposure. Exposures to these microorganisms are most prevalent in the decontamination area. Other hazardous areas include dirty closets or patient care rooms in which microorganism can be numerous. Handwashing is the single, most important method used to protect you from dangerous microorganisms. Each time gloves are removed, the technician must thoroughly wash their hands for a minimum of 15 seconds with lukewarm water and soap. Heavily soiled hands must also be washed with soap and water, rather than just sanitized with alcohol-based, waterless scrubs. Hands that are not heavily soiled can be cleaned, however with alcohol-based sanitizers. When working in decontamination, technicians must remember to don the appropriate PPE (Personal Protective Equipment). This includes a mask, impervious gown, shoe covers, thick gloves (non-examine), a disposable cap, and eye shield. If the appropriate PPE is used and handwashing techniques are implemented, it can decrease the potential of harmful microorganism exposure that can cause both the technician and patient disease.

References

Centers for Disease Control and Prevention. (2009). Healthcare Infection Control Practices Advisory Committee (HICPAC). Retrieved from http://www.cdc.gov/hicpac/2007IP/2007ip_part1.html.

Chobin, N. (2013). The Basic of Sterile Processing, 5th Edition. Lebanon, New Jersey: Sterile Processing University

Zundel, J. (2015). Binary Fission: Steps, Definitions, and Examples. Retrieved from <http://study.com/academy/lesson/binary-fission-definition-steps-examples.html>.





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- 1 Microorganisms are very large.
TRUE FALSE

- 2 Round bacteria are also referred to as cocci.
TRUE FALSE

- 3 Viruses do not contain cells.
TRUE FALSE

- 4 Hepatitis can be prevented if exposed to a medical device contaminated with hepatitis b if the healthcare worker becomes vaccinated with the hepatitis b vaccination prior to employment.
TRUE FALSE

- 5 Prions are easy to kill under normal sterilization procedures used to sterilize implants.
TRUE FALSE

- 6 E Coli cannot be transmitted by dealing with instruments contaminated with feces.
TRUE FALSE

- 7 Hepatitis is a not considered to be a blood borne pathogen.
TRUE FALSE

- 8 Viruses are larger than bacteria.
TRUE FALSE

- 9 Heavily soiled hands should be cleaned with alcohol-based sanitizers.
TRUE FALSE

- 10 Handwashing can help prevent the spread of microorganisms.
TRUE FALSE

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