

Appropriate Selection of Disinfection Product for Patient Care Devices And Equipment Can be Key to Infection Prevention

Why is infection prevention important in the health care setting? Quite simply, in the era an informed health care consumer, appropriate infection prevention and control practices are expected. It is essential to protect the patient and medical staff from infectious agents likely to be encountered during care.

Outbreaks from a variety of infectious agents have occurred in health care facilities. The literature describes the major means of transmission of infectious agents is caused by person-to-person contact via unwashed or inadequately washed hands of healthcare providers and inappropriately disinfected medical devices. Most outbreaks are bacterial or viral in etiology and many times occur in conjunction with community epidemics that spread to health care facilities.

Some causative agents are extremely hardy when deposited onto surfaces. These agents can remain viable for several weeks on surfaces, which accounts for the fact that items and equipment can play a significant role in transmission. The consistent application of procedures for processing patient care devices, disinfection and cleaning of equipment and hand washing continue to be the cornerstone practices in safely protecting patients and staff.

Infection control experts generally agree that all reusable medical devices and equipment be reprocessed according to a designated disinfection classification. An assessment of each device should be performed and a disinfection classification determination be made based upon on the intended use of the device. Ideally all medical devices in a facility would then be categorized either as critical, semi-critical or non-critical. Such designation will provide the guidance as to which reprocessing method or germicidal activity is appropriate for a particular device according to its intended use.

Classification scheme

The late E.H. Spaulding, Ph.D. a renowned microbiologist, proposed three categories of medical devices based on the degree of risk of infection to the patient in their use. These categories have since been adopted by the Centers for Disease Control and Prevention (CDC) in their guideline for hand washing and hospital environmental control and in the Association for Professionals in Infection Control and Epidemiology guideline for the selection and use of disinfectants. The classification indicates the level of sterilization or disinfection required for various items based on their intended use.

In the Spaulding scheme, patient care items are identified as being *critical*, *semi-critical* or *non-critical*:

- *Critical* devices require sterilization. Such devices enter the bloodstream or normally sterile areas of the body. Needles, syringes, scalpels, invasive/ surgical instruments are examples of critical devices.
- *Semi-critical* devices generally require high-level disinfection (HLD). HLD is a unique process that utilizes a liquid sterilant with a shortened exposure time. Such devices are intended to make direct contact with mucous membranes. Gastro endoscopes, vaginal and rectal speculums and other similar devices are examples of semi-critical devices.
- *Non-critical* devices are instruments and medical equipment that generally make contact with intact skin or epithelial tissue. These devices do not necessarily need to make direct patient contact, but may themselves become a carrier or reservoir for infectious agents. Simple hand contact by medical personnel with these devices may lead to cross contamination between patients. A wide variety of devices including respiratory therapy and anesthesia equipment surfaces, infant incubators, operating room tables and lights, ER and OR instrument stands, portable heart monitors, slit lamps and other similar devices fall into this category.

In addition to the devices described in Spaulding's scheme, environmental surfaces in patient care areas have also

been implicated in transmission of infectious agents. An example is *Clostridium difficile* bacteria which has been isolated on the surfaces of bed rails, patient room doorknobs and other similar surfaces. Outbreaks have resulted from inadequate and infrequent disinfection procedures.

The use of hospital level disinfectants, such as Opti-Cide³ disinfectant cleaner, should be used according to product label instructions. Opti-Cide³ is an example of a broad-spectrum disinfectant specifically formulated for use on medical devices. The use of homemade concoctions is strongly discouraged. Although inexpensive at first glance, the mixing of bleach and water or other similar mixtures has turned into a nightmare in regards to equipment incompatibility. The end result is a higher cost in regards to equipment damage and the failure of some devices during subsequent use.

Reprocessing Medical Devices and Equipment

Confusion exists regarding the terms “sterilization” and “disinfection”. They do not have the same meaning.

Sterilization is an absolute state. It is defined as the complete and absolute absence of any living thing, including microbes. Sterilization of medical instruments and devices is normally accomplished in the health care facility by subjecting the item to be sterilized to steam autoclaving, ethylene oxide gas or to a liquid chemical sterilant.

Disinfection on the other hand is a process that eliminates or reduces the numbers of living microorganisms to a level that is appropriate for the use of that particular device. The basic rules of thumb when selecting a disinfectant for use on patient care equipment includes the following:

- The product must be EPA approved as a cleaner as well as a disinfectant.
- It must effectively kill, at a minimum, TB, staphylococcus, pseudomonas, salmonella, hepatitis b and c viruses, HIV and poliovirus. If any one is missing from the product label the product fails the rule for use in health care facilities.
- It should list on its label instructions a single contact time for all listed microorganisms inclusive. Products that list different contact times for various microbes are too confusing. The longest kill time listed on a label for any particular microorganism is the required contact time required for complete kill.
- It should be approved for use on all hard surfaces including plastics and stainless steel.
- It should leave no residual on surfaces. Patients have contracted dermatitis as well as other untoward effects from disinfectants left to dry on surfaces.
- It must be able to remain thoroughly wet on surfaces for the entire required contact time at room temperature. If the contact time listed is 10 minutes, the surface must remain wet for the full 10 minutes before being wiped off to be effective. Naturally, the shorter contact time required the more efficient and safer the product is.
- Its label must display an EPA registration number to comply with federal regulations.

Any thing less than following these rules can put patients, healthcare professionals (and their family members) at home at risk of exposure to infectious agents.

References:

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