

## A Rational Approach to Choosing Cleaning and Disinfection Products

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Cross-contamination is an important issue. Transmission of pathogens is well documented. Protection from cross-contamination for both patients and personnel is paramount.

Disinfectants used for the cleaning and disinfection of medical devices (stretchers, mattresses, backboards, monitors, respirators, etc.) must be registered and approved by the US EPA and as well as each state's department of pesticide (disinfectant) registration. Products that are approved for this use will list an EPA Registration Number on each container label. (Example: EPA Reg. No. 70144-1). In addition, examples of the types of devices the product is intended to be used on should be listed on each container label. Disinfectant manufacturers should be prepared to present a current annual certificate attesting to the state's approval upon request of the provider. This certificate should be kept on file and be available for regulatory inspections. Obtain the certificate from your disinfectant producer.

### Surfaces

Surfaces are made of hard, non-porous surfaces that are produced from a number of materials including aluminum, stainless steel, plastics (including clear plastics) as well as soft materials such as vinyl and other soft materials. For this reason, cleaner / disinfectants should be approved for use on both soft and hard surfaces and labeled as such on each container.

### Efficacy

It is important to use a disinfectant that is effective against a broad range of microorganisms. There are many hundreds of cataloged bacteria, viruses, mycobacteria and pathogenic fungi of concern that are transmitted via inanimate surfaces. (Cross-contamination). It is impossible to test efficacy against each one microorganism individually. For that reason five major families of concern are generally represented by a member of each family. It is prudent to use a product that has known efficacy against the representative of these various families (Table 1). Generally accepted representatives (aka: benchmarks or surrogates) should be listed on the container label along with the necessary contact times. Using a disinfectant contrary to its labeled instructions can result in its inability to perform as expected and may cause deleterious effects to the device causing it to fail during use.

Table 1.

Family	Representative	Examples of family members
Gram-positive bacteria	Staphylococcus aureus	MRSA, C. difficile bacteria,
Gram-negative bacteria	Pseudomonas aeruginosa	E. coli, Salmonella enterica, KPC
Mycobacteria	Mycobacteria tuberculosis BCG ( var. bovis)	M. avium, M. chelonae
Enveloped viruses	Herpes Simplex Virus	Hepatitis B & C viruses , Ebola viruses
Non-enveloped viruses	Rotavirus	Norovirus, Adenovirus
Pathogenic fungi	Trichophyton mentagrophytes	Candida albicans, Aspergillus niger

Source: Brock- Biology of Microorganisms

### **Mixing of Concentrates**

It is important to note that the use of concentrated products may not always be appropriate due to the various qualities of available water, including particulates found in tap water. Water contaminants and other chemicals found in tap water such as chlorine, fluoride, calcium and other particulates are known to have an influence on a disinfectant's ability to perform. Ready-to use chemicals provide the best option for the cleaning and disinfection of surfaces under these circumstances.

### **Homemade Mixtures**

Using "homemade concoctions" except in extraordinary circumstances ( i.e., bleach for C. difficile outbreak) is discouraged due to water quality, stringent mixing instructions, disposal requirements, container labeling requirements and the absence of efficacy data related to each particular batch of product.

### **Transferring from a Larger Container to a Smaller Container**

It is important to thoroughly read and understand the labeled instructions for use, storage and handling requirements. Not all disinfectants may be transferred to other containers. Those with specific expiration dates should not be transferred into other containers (such as spray bottles) unless the expiration dates are identical. There are commercially available disinfectants that are not required to display an expiration date due to their tested stability and their ability to withstand cross- contamination during the transferring process. The EPA allows transfer of these products from larger containers to spray bottles as long as the bottle is approved and appropriately labeled. The "Storage and Disposal" section found on each container label will indicate whether the spray bottle may be refilled or must be disposed after use.

Keep in mind that cleaning of blood and other soil is the most important pre-requisite to disinfection. Federal and State law require that a product be used according to its labeled instructions. Each approved product label displays the following statement; ***"It is a violation of federal law to use this product in a manner inconsistent with its label"***.

Last, it cannot be over-emphasized that the selection and proper use of a disinfectant is necessary to protect the patients you serve, your personnel and to keep from taking an infectious agent home from work to family members.