

Selection of the Ideal Disinfectant (from Infection Control Report, SPICE, 2/21/14)

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Healthcare-associated infections (HAIs) remain an important source of morbidity and mortality with an estimated 1.7 million infections and 99,000 deaths annually. A major source of nosocomial pathogens is thought to be the patient's endogenous flora, but an estimated 20-40% of healthcare-associated infections have been attributed to cross-infection via the hands of healthcare personnel. Contamination of the hands of healthcare personnel could in turn result from either direct patient contact or indirectly from touching contaminated environmental surfaces. Healthcare personnel have frequent contact with the environmental surfaces in patients' rooms providing ample opportunity for contamination of gloves and/or hands. Two recent studies demonstrated that contact with the environment was just as likely to contaminate the hands of healthcare workers as was direct contact with the patient. Donskey has reviewed the scientific literature and found that improving surface cleaning and disinfection reduces healthcare-associated infections (Am J Infect Control 2013; 41:S12-S19). Another recent paper showed that daily disinfection of surfaces (versus standard cleaning surfaces when visibly soiled) with a sporicidal disinfectant in rooms of patients with *Clostridium difficile* and methicillin-resistant *Staphylococcus aureus* (MRSA) reduced acquisition of pathogens on gloved hands after contact with room surfaces. While disinfectants are used to prevent transmission of pathogens from both noncritical and semicritical items, the purpose of this brief article is to assist the user in the selection of the optimal disinfectant for use with environmental surfaces and noncritical patient care items (devices that contact only intact skin such as stethoscopes). The same characteristics for an ideal low-level disinfectant would be used for high-level disinfectants; however, the contact time would be longer and antimicrobial spectrum would be broader (e.g., may include *C. difficile* spores). To date, the perfect product for healthcare disinfection has not been introduced; however, there is a wide array of disinfectants that offer a range of characteristics.

While the process of selecting an optimal healthcare disinfectant used for low-level disinfection of noncritical items is commonplace in healthcare facilities there are no papers in the peer-reviewed literature on this topic. Disinfectant selection, or the product, is one of the two components essential for effective disinfection. The other component, the practice, is the thorough application such that the disinfectant contacts all surfaces, as well as proper training of hospital staff (especially environmental services and nursing) and adherence to the manufacturer's label instructions (except in the cases where an institution may prepare a formal risk assessment to follow alternate contact times such as ≥ 1 minute for vegetative bacteria). The combination of product and practice results in effective surface disinfection, or the reduction of patient risk, and improved patient outcomes. The five key considerations when selecting a disinfectant are summarized below. When determining the optimal disinfecting product for surface disinfection in your facility, consider the five components below (Table), give each product a score (e.g., 1 is worst to 10 is best) in each of the five categories and select the product with the highest score as the optimal product choice (maximum score is 50).

Table. Key Considerations for Selecting the Optimal Disinfectant for Your Facility.

Consideration	Questions to Ask	Score (1-10)
Kill Claims	<p>Does the product kill the most prevalent healthcare pathogens, including those that:</p> <ul style="list-style-type: none"> • Cause most HAIs? • Cause most outbreaks? • Are of concern in your facility? 	
Kill Times and Wet-Contact Times	<ul style="list-style-type: none"> • How quickly does the product kill the prevalent healthcare pathogens? • Does the product keep surfaces visibly wet for the kill times listed on its label? 	
Safety	<ul style="list-style-type: none"> • Does the product have an acceptable toxicity rating? • Does the product have an acceptable flammability rating? • Is a minimum level of Personal Protective Equipment (PPE) required? • Is the product compatible with the common surfaces in your facility? 	
Ease-of-Use	<ul style="list-style-type: none"> • Is the product odor considered acceptable? • Does the product have an acceptable shelf-life? • Does the product come in convenient forms to meet your facility's needs (e.g. liquids, sprays, refills, and multiple wipe sizes, etc.)? • Does the product work in the presence of organic matter? • Is the product water soluble? • Does the product clean and disinfect in a single step? • Are the directions for use simple and clear? 	
Other factors	<ul style="list-style-type: none"> • Does the supplier offer comprehensive training and ongoing education, both in-person and virtual? • Does the supplier offer 24-7 customer support? • Is the overall cost of the product acceptable (considering product capabilities, costs of infections that may be prevented and costs per compliant use)? • Can the product help standardize disinfectants used in your facility? 	