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Product Evaluation and Purchasing: Environmental Hygiene-Related Products

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ICT invited manufacturers of environmental hygiene-related products to provide instruction on best practices relating to the evaluation of products as well as how to introduce and integrate them into the healthcare environment.

ICT: What are the primary considerations decision-makers should keep in mind when evaluating and purchasing your category of environmental hygiene-related products/services?

There has been increasing awareness of the importance of effective environmental cleaning in the prevention of healthcare acquired infections. Routine cleanliness testing of environmental surfaces in high risk areas including intensive care and operating rooms, as well as testing of patient rooms, is being done by more and more health care facilities as part of their quality improvement programs. An important consideration in the selection of a surface cleaning test is understanding what type of information the cleaning verification test can provide. There are two basic approaches to testing cleaning effectiveness on environmental surfaces. The first approach are tests that rely on placement of an artificial chemical marker on the surface, then making a subsequent assessment of the presence of the marker after cleaning. Information from these tests is subjective and qualitative, as they rely on the tester's ability to visualize the remaining marker and decide if the amount remaining constitutes a pass or fail result. The second approach are tests that measure the amount of clinical soil remaining on the surface though detection of a component of clinical soil, such as ATP. These ATP tests are typically easier to interpret than surface markers as the results are given as a numerical readout, and this quantitative data can then be used to analyze cleaning effectiveness over time. The ATP approach does not require two trips to the test area like the surface marker (one to place the marker, the second to look for residual marker) and test results are available in seconds.
-- Craig Wallace, BS, 3M senior technical specialist

When selecting a surface disinfecting product or products, decision makers should look for solutions with broad-spectrum antimicrobial efficacy that are fast acting, easy to use and available in formats that encourage compliant use. Surface compatibility and an acceptable residue profile are also important to protect environmental surfaces and medical devices from damage. Achieving balance between disinfectant efficacy and surface compatibility is possible, but requires a holistic view of facility maintenance and careful consideration of cleaning and

disinfecting products as well as the surfaces, materials and equipment on which they are used. Since surfaces are sometimes missed during the manual cleaning and disinfecting process, adding UV-C disinfection for terminal cleaning can provide an extra layer of protection against pathogens that can be spread via surfaces.
-- Laurie Rabens, associate director of marketing, Clorox Healthcare

The first consideration is hygiene. Whether laundry is being done in-house or through an outside service, laundry processes are flawed. So, what comes out of the laundry is necessarily flawed too, unable to clean and disinfect like disposable, new microfiber consistently can. Think about the last time that your healthcare facility tested and evaluated the cleanliness of your laundered textiles; it just doesn't happen consistently. The second consideration is compliance. Disposable microfiber wipes and pads are simple to use, consistently manufactured and packaged. Their new fibers grab dirt from surfaces and whisk it away. Laundries are complicated, unpredictable, and wildly variable. There's lots of risk there. Residues can interfere with disinfectant efficacy. Why introduce another potential risk into your OR or patient room through used wipes or mops that are so hard to clean effectively?
-- Warwick Spencer, critical care business manager for Contec

The most success has been in organizations which have invested in products that are effective and pleasant to use, along with the standardized procedures which are implemented and monitored for compliance, with ongoing training. Studies have shown that having the right product, procedures with ongoing training and compliance have reduced HAI rates significantly. Additionally, with the increasing need for fast turnover and products that can safely be used by staff, around patients, and on surfaces, there are new technologies, such as improved hydrogen peroxide, that are effective against a broad spectrum of pathogens, in as little as one minute. These products improve compliance by staying wet for the required label contact time, ensuring disinfection while streamlining the process. With one pass, staff can clean and disinfect surfaces and equipment, while being gentle on staff, equipment and surfaces. Also, having products that are non-irritating to eyes and skin, and require no safety warnings or personal protective equipment make them available and accessible to staff as needed. Emerging practices, such as no-touch disinfection,

have also gained traction. Examples are UVC disinfection, in conjunction with standardized processes for cleaning and disinfection, are also contributing to the positive changes. These solutions will drive improved results and improved satisfaction of patients, staff and visitors.
-- Carolyn Cooke, vice president of the North America Healthcare Sector for Diversey

The major focus of selecting a healthcare surface disinfectant is often on the kill claims, whether the product kills the most prevalent healthcare pathogens or pathogens of concern, and how quickly it does so. Kill claims are a critical factor in a healthcare disinfectant's performance,1 but healthcare facilities are increasingly considering safety as another key performance factor and are often faced with making tradeoffs between safety and efficacy. The Environmental Protection Agency (EPA), which regulates surface disinfectants, evaluates the safety, efficacy and toxicity of all antimicrobial disinfectants and EPA product labels contain important information on the proper use and hazards of the product. The EPA Design for the Environment (DfE) program is part of its Safer Choice initiative and is aimed at helping consumers, businesses, and purchasers find products that perform well and are safer for human health and the environment.2 The EPA evaluates every ingredient against a stringent set of health and environmental criteria. DfE program assures that products listed are in the lowest hazard classes, unlikely to have negative health effects, have no unresolved adverse effects, or unresolved efficacy failures. Only 10 liquid products are currently listed on the DfE program.2 More chemicals are used in healthcare than in any other sector. Many product manufacturers are making efforts to incorporate green chemistry into their product portfolios. As technology in products advances and there is increased commitment to green chemistry, having to choose between safety, efficacy and sustainability will hopefully be a thing of the past.

References:
1. Rutala WA. Selection of the ideal disinfectant. http://disinfectionandsterilization.org/selection-of-the-ideal-disinfectant/ . Accessed June 27, 2017.

2. Environmental Protection Agency. Design for the environment antimicrobial pesticide pilot project: moving toward the green end of the pesticide spectrum. Available at: https://www.epa.gov/pesticide-labels/design-environment-antimicrobial-pesticide-pilot-project-moving-toward-green-end .
-- Megan DiGiorgio MSN, RN, CIC, FAPIC, clinical manager, GOJO Industries

When evaluating a whole room disinfection system, it is critical to note that not all systems are capable of fully disinfecting a room. The various UV alternatives, for example, are only capable of, at best, sanitizing a space. Many of those UV systems have reduced efficacy in rooms that contain equipment or shadowed areas. A decision-maker must consider a system's ability to achieve at least a 4-log kill in complex spaces, not just simple ones. Next, it is important to reference a system's EPA or FDA accreditations. Only vapor and fogging systems validated by the EPA or FDA can legally claim a 99.9999 percent kill rate against C. difficile spores. Advertised kill rates are meaningless unless they are validated by government agencies, particularly for foggers and electro-static spray guns. These devices often use disinfectants never certified by regulators for use with that device, meaning they can only make a supplemental efficacy claim, and never make any "kill" claims at all for that combination of device and disinfectant. If a salesman makes a claim not on the product's EPA label, that should be a red flag to decision-makers. Finally, decision-makers should be aware that all whole room disinfection systems require that a room be completely empty at the time of disinfection. Only professionals with full PPE are permitted to be in the disinfection space, no matter what a vendor says.
-- David St.Clair, chairman and CFO of Halosil International, Inc.

EVS and Infection Prevention need quick results to turn beds over faster, verify instrumentation is clean, and collect quantifiable data for meaningful analysis. Managers need reliable data collection and objective measurement techniques to truly know if a surface is clean. A simple method, like blacklight detection of fluorescent gels, is an excellent training tool, but fails to measure the actual removal of biological matter. Another technique is microbiology testing; microbiology tests give the most quantitative, specific results for pathogens or bacteria on a surface, but results are slow and tests are expensive. Other techniques, like mass spectrometry or

liquid chromatography, are effective but fall far out of the technical and financial range of most facilities. Considerations should include how easy the system is to use--from swabbing, sampling techniques, the monitoring instrument, and software that records information and provides reports. Maintenance issues and convenience of power supplies are also important considerations. Systems that run on AA batteries, which are easily replaced and less expensive, are simpler to adopt. These systems should also offer self-calibration checks, which are features that accrediting organizations like the Joint Commission look for in an audit.
-- Andrew M Porterfield, marketing communications specialist, Hygiena

It is important to stay current with CDC forecasts on the newest microorganism threats to impact patients, and help mitigate HAIs associated with the spread of these potential pathogens. Easily identifiable contact times and a ready-to-use format avoids confusion and allows for facility-wide standardization, easy access for the end user, ease of implementation, replacement and compliance, as is the case with our color-coded system.

-- Frances K. Canty, MA, BSN, RN, VA-BC™, clinical science liaison for PDI

In the UV disinfection category, there are limitations that must be considered. Four main factors are important for UV disinfection: Shadows, Distance, Labor, and Validation. Shadows are self-explanatory, UV requires direct line of sight for maximum effectiveness. Distance is less appreciated but as a surface gets farther from a UV emitter the energy delivery decreases significantly, energy delivery is correlated to effective microorganism kill. Labor is often forgotten however any UV system that isn't easy to use simply won't be used. Moving an emitter from place to place and running multiple cycles within a single disinfection space is not an efficient use of staff. Validation is key, many systems simply advertise short cycle durations but given the considerations above each room is unique and the disinfection times will vary. Look for a system that calculates or measures the appropriate UV dose and eliminates the guess work. Finally, when evaluating any technology be critical of manufacturer claims. Devices that claim to reduce infections by 100% but prevent you from conducting independent testing or

presenting your results, good or bad, should raise doubts. Be sure to understand both the benefits and limitations.
-- Adam Buchaklian PhD, director of clinical research for Surfacide, LLC

Most importantly, investigate the efficacy behind a company's marketing claims. Study disclosures demonstrating conflict of interest from authors with company affiliation must be discounted. Large-scale randomized clinical trials are the gold standard for evidence-based conclusions for any environmental hygiene-related product or service. Labor cost to operate no-touch disinfection technologies have a major impact on total cost of ownership. Determine if the devices you are evaluating require an FTE to monitor usage or movement of the device every few minutes. Some technologies have demonstrated effectiveness from single placement in the room. Single placement allows operators to perform other important tasks during the disinfection cycle. Units that require multiple positionings within the room tether the operator to the device and dramatically increase labor costs. The literature is clear that manual disinfection often misses 50 percent of environmental surfaces and that all room surfaces are contaminated and must be disinfected. Be certain the technology you choose is capable of disinfecting the total room. Many technologies have distance limitations or the inability to claim disinfection in shadowed surfaces. Choose a technology capable of disinfecting the entire room and providing maximum risk reduction to patients admitted to your facility.
-- Chuck Dunn, president and CEO of Tru-D SmartUVC

When facilities are looking to choose a disinfectant, they are often focused on the efficacy and contact time as the key parameters. However, when it comes to selecting disinfectants there are many other attributes to contemplate. Consider reframing the reason of why we are looking for a disinfectant from "I need a product that kills X, in Y minutes" to "I need a product that will improve our disinfection compliance and prevent the transmission of pathogens". By illuminating the importance of compliance we force ourselves to ask why our staff are not using our existing disinfectant correctly. Certainly, contact time is one aspect, however, staff will be more likely to use products correctly if they do not perceive them to be harmful, irritating to work with or have an objectionable odor. If we add attributes

such as non-toxic, non-irritating, and non-sensitizing and easy to use to our need for a rapid contact time and broad-spectrum efficacy we have a much more comprehensive list to evaluate a product against. The 2014 paper from Rutala and Weber, "Selection of the Ideal Disinfectant," illustrates the concept very well.

Reference: Rutala WA and Weber DJ. Selection of the Ideal Disinfectant. Journal of Infection Control and Hospital Epidemiology. Vol. 35, No. 7. 2014.
-- Nicole Kenny, HBSc, vice president of professional and technical services, Virox

Making decisions about new technologies to prevent hospital-acquired infections can be challenging, especially given the barrage of conflicting information that may cross your desk. Best-practice guidelines are based on peer-reviewed evidence, not anecdotes. You need to ask tough questions when it comes to evaluating room disinfection technologies. The gold standard for assessing new technologies is evaluating the peer-reviewed literature. Ask the vendor to show you peer-reviewed studies from hospitals that saw reductions in infection rates. If they don't have peer-reviewed and published infection rate reduction studies, then the technology has not met the standard for evidence-based decision-making. There are a lot of manufacturers in the UV disinfection space but not all UV technologies are the same.
-- Sarah Simmons, DrPH, CIC, FAPIC, science director for Xenex Disinfection Services

University research is beneficial to decision-makers. The University of Chicago found that bacteria move unceasingly through a healthcare facility. A three-year University of Arizona study concluded that cluster ion technology will kill 99 percent of this bacteria. Bacteria move through childcare centers, hospitals and long-term care facilities on every person and object. Chemical cleaning and UV exposure provide just a few minutes of protection before bacteria resume growing. Most technological solutions cover only a small area and provide only brief amount of protection. Infection control experts protect people in their care. They seek solutions that best prevent the spread of bacteria that can sicken or kill those they protect. The technology in the University of Arizona study is the standard by which experts should evaluate environmental hygiene-related products and services: How well, and for how long will they prevent the spread of bacteria, and at what cost? Preventing avoidable illness and death is the ultimate measure of infection control.
-- Jim Masterson, CEO of XSTREAM Infection Control, LLC

ICT: What are some suggestions for how to effectively introduce and educate on environmental hygiene-related products/services to healthcare workers?

Open communication is the key to success here, as it is for many situations. Responsibility for cleaning environmental surfaces in the health care facility typically falls to the EVS (Environmental Services) team. The first step of the education process is to clarify and then reinforce the importance of the EVS job in helping protect patients from healthcare acquired infections. Once this point is established, it is more straightforward to describe the value of using testing tools like ATP tests to help the EVS team members see exactly how they are doing, identify areas for improvement, and provide proof they are effectively cleaning the environment. The quantitative data from ATP tests can be incorporated into a hosted database which generates dashboards and reports providing both a snapshot and detailed analysis of test results from different locations or team members over any period of time. This information can be easily shared with facility management and the EVS team, and provides a great tool for the EVS staff to share their cleaning performance with other areas of the organization.
-- Craig Wallace, BS, 3M senior technical specialist

When implementing a new product, it is important to first review the product's safety information and directions for use. Your manufacturer or vendor should be able to provide comprehensive education and training on the correct use of the product as well as resources to help support implementation. For example, Clorox Healthcare actively partners with customers to train their staff and implement new products and protocols and provide ongoing technical support. We also help customers identify which disinfectant products are compatible with common environmental surfaces and equipment in their facilities, and provide free educational resources, available in English and Spanish, to help with staff training and step by step implementation. For the best results, education surrounding the implementation of a new product should also be supplemented with ongoing training and monitoring to promote compliance.
-- Laurie Rabens, associate director of marketing, Clorox Healthcare

Train, train and then train some more. EVS employees whom we work with want to better understand why their role is so important. Help them connect the dots, and they'll be infection control's greatest advocates. Their cleaning and disinfection process can be the single most important link between a hospital stay and a good patient outcome. If the tools simplify the cleaning process, then better results will necessarily follow.
-- Warwick Spencer, critical care business manager for Contec

We have found that a very strong in-service program is critical to the success of a product introduction. Key components include a comprehensive introduction package, including product overview, key implementation points, and information, claims, and dwell time training. This often includes target disinfection areas, strategic workflow, roles and responsibilities checklists and customized procedure chart and schedule for each area, using best practices, tailored for the facility. Training is then conducted, and compliance is measured, along with staff feedback to improve over time. There is no shortage of communication possible to ensure success and improvement. Support and education by the supplier is critical to a successful introduction and education.
-- Carolyn Cooke, vice president, North America Healthcare Sector, Diversey

As with most products, a surface disinfectant is only as good as the person who is using it. When instructions for use are not followed, product performance will likely be suboptimal. Proper environmental cleaning relies on good education. The challenge is that environmental services (EVS) personnel are not always exclusively the ones performing the cleaning. Healthcare workers (HCWs) are expected to periodically clean equipment or surfaces for various reasons; therefore, education must extend beyond EVS. Before a product is even introduced into a healthcare facility, it should be assessed for ease-of-use.1 Directions should be simple and clear and the product should clean and disinfect in a single step. The more complicated the process, the more complicated the education will be, and the less likely busy HCWs will be to follow all steps. It's important to keep in mind that a hospital surveyor (e.g., Joint Commission) can stop anyone they see using a surface disinfectant and ask them questions about how to properly and safely use the

product. For example, they could ask what personal protective equipment HCWs should wear while using the product or what is the manufacturer's recommended contact time for the product. HCWs will be expected to answer these questions. As with any type of education, a "one and done" approach is not sufficient. HCWs should be educated when they initially begin using products and receive ongoing education and reminders. In addition, visual observation of cleaning practices and on-the-spot training is useful.

Reference:
1. Rutala WA. Selection of the ideal disinfectant.
http://disinfectionandsterilization.org/selection-of-the-ideal-disinfectant/
-- Megan DiGiorgio MSN, RN, CIC, FAPIC, clinical manager, GOJO Industries

Successfully educating healthcare and facilities staff about a new disinfection system is essential to make a long-term positive impact. First, an organization should consider integration from the very beginning of its search. Certain systems are easy to use and require little operator training. Selecting one of these systems will minimize the negative effect of staff turnover on success and cost over time. In addition, we suggest highlighting the importance of a disinfection system to staff in a highly personalized way. For example, Cancer Treatment Centers of America has what it refers to as its "Mother Standard." The organization raises the bar for quality and safety by encouraging staff members to envision their own mothers lying in each hospital bed. Cues like this one go a long way in facilitating a culture of disinfection. It is also essential to set up a dependable system of coordination between the nursing staff and hospital environmental services (EVS). Nurses must notify EVS of a pending need for total disinfection. In return, EVS must respond and document the whole-room disinfection of each critical space. This entire process must be monitored and motivated by infection prevention in order to avert HAI spikes during busy periods.
-- David St. Clair, chairman and CFO of Halosil International, Inc.

It's important to keep healthcare workers motivated on hygiene, from paying diligent attention to hand-washing and surface cleaning to making sure instruments

and equipment are thoroughly sterilized. One powerful way to keep this motivation high is through data-rich feedback. Systems like ATP monitoring can not only instantly report the success of cleaning, they can also supply enough data to generate reports. These reports can show overall success in cleanliness, but also can be detailed enough to compare the work of specific workers, rooms, or surfaces, and follow those patterns over time. These kinds of engagements do not have to be punitive. They can take the form of a contest or friendly competition, to determine the cleanest surface or most effective worker. They also can create challenges, looking at how to resolve some of the thorniest hygiene problems in a facility, and see who comes up with the most effective solution. Monitoring software can also help educate new employees and even veterans on the impact of hygiene, as well as the possibility of hygiene failures, which probably occur more often than workers want to admit.
-- Andrew M Porterfield, marketing communications specialist, Hygiena

PDI works with each of its respective customers to outline an individual plan for introducing our products, including considerations around staff education and support. It's important to address each unique situation and educate as needed. This may include train the trainer programs, unit-to-unit in-servicing, attendance at facility committees, as well as providing signage, videos, presentations and compliance tool assessments to help attain the mutual goal of effective environmental hygiene and ultimately reducing HAIs. PDI also offers facility-wide environmental assessments, utilizing the latest guideline recommendations to help identify gaps in environmental hygiene, while making recommendations for improvements. This type of integrated program, working in collaboration with the customer, is the roadmap to success.
-- Frances K. Canty, MA, BSN, RN, VA-BC™, clinical science liaison for PDI

It is important to engage a multidisciplinary team early in the process so that they truly take an interest and ownership of any new product or service. Hygiene related devices often involve multiple specialties such as infection prevention and control, EVS, nursing, ICU and OR personnel, and having all parties involved is key to a successful roll out. This also helps convince healthcare workers that they are truly

the first line of defense against hospital-acquired infections. Knowing the importance of their role in infection prevention is invaluable and often gets lost in the day-to-day operations of healthcare facilities. Training is another valuable tool, confirm that any device includes onsite training with both frontline staff and leadership on proper implementation, integration into workflows, and tracking and validation.
-- Adam Buchaklian PhD, director of clinical research for Surfacide, LLC

Chose a technology with the understanding and resources to building a comprehensive communication strategy for the implementation and successful management of an Enhanced UVC Disinfection Program. A program modeled around a successful randomized clinical trial will best ensure that your hospital will achieve HAI reduction goals and resulting cost savings. A robust UV implementation strategy must provide a framework for the key stakeholders to work together to optimize utilization of targeted highest risk rooms for HAI transmission. Through pre-planning, leadership forums, education and training, staff and operators realize the important role that the environment plays in the transmission of infections and that a strategic, comprehensive disinfection program can help reduce the spread of these pathogens.
-- Chuck Dunn, president and CEO of Tru-D SmartUVC

One of the key things we must keep in mind is that people do not like change. Introducing a new disinfectant product and educating about its proper use is not as simple as just giving the product name and telling staff what the contact time is. To effectively manage change an approach using “the five Ws” works well. What is the product and Why we want to implement it. This is one area where we can lose the battle of a getting everyone on board. It is important to share not just the benefits the new product will bring to the facility such as reduction in HAIs but to clearly communicate the benefits to the user such as the product being safer for them or improving or simplifying the work they do. Next, introduce When and Where the product will be used. Is this a product that will be used every day, everywhere or is this a task oriented product? Lastly, talk to the 'What Ifs.' These are questions that often come up after introduction such as odor profile, streaking because of residue

on the surface from your previous product. Managing expectations up front when the product is first introduced sets everyone up for success. Education provides the power to overcome any fear or anxiety we are feeling allowing for a smooth implementation regardless of the type of product.
-- Nicole Kenny, HBSc, vice president of professional and technical services

The key factors for the successful implementation of a new healthcare product, especially one that will play a key role in infection prevention, include effective training techniques, facility-wide communication and involvement, and efficient workflow integration. When working with hospitals to incorporate pulsed xenon UV disinfection into their cleaning protocol, Xenex customizes an evidence-based strategy in order to achieve maximum infection reductions. Xenex partners with the hospital during the planning phase to understand hospital goals and current processes, and uses this information to design a comprehensive, sustainable robot operating plan that can be easily integrated into a hospital's current workflow. Post-implementation review and continuous monitoring ensure program success and longevity.

-- Irene Hahn, vice president of client relations for Xenex Disinfection Services

Education must start where all healthcare workers begin, with a commitment to preserving and enhancing the health of patients. Environmental contamination stands in the way of this commitment. What can healthcare workers do every day to reduce its spread? At the personal level, this means an ongoing commitment to behaviors such as handwashing, proper handling of sterile items, etc. At the facility or unit level, this means understanding the abilities and the limitations of the chosen products or services that provide environmental hygiene. The best scenario is one in which a low- or no-maintenance solution can provide bacteria-killing benefits without any additional need for training or daily attention to cleaning protocols. In facilities or units without such a solution, healthcare workers must know the capabilities and limitations of the chosen solution – how often cleaning is necessary to provide effective protection, coverage, etc. A standard protocol with accountability mechanisms should be in place to ensure effective cleaning is

happening on the appropriate schedule. The best solutions require little education and allow healthcare workers to focus on patients. Where such solutions aren't in place, regular training and daily diligence to cleaning procedures are required.
-- Jim Masterson, CEO of XSTREAM Infection Control, LLC