THE 5 COMMON MYTHS OF DISINFECTION

By: Olivia Lattimore, BHSc., MDRT
Manager, Professional and Technical Services, Virox Technologies

THE 5 COMMON MYTHS OF DISINFECTION

Lightning never strikes the same place twice, chewing gum takes 7 years to digest, and cold weather causes colds. What do all of these have in common? They are all myths or widely held, yet false beliefs among society. While these myths don't have any consequences for those who believe them to be true, when it comes to myths pertaining to infection prevention, there can be adverse implications for both staff and patients, as believing in these falsehoods can lead to disinfection incompliance, increasing exposure to harmful pathogens. Facilities, such as dental practices, that require the use of chemical disinfectants as part of their infection prevention program, should be mindful of the 5 common disinfection myths to ensure the safety of patients and staff.

Myth 1: To make a disinfectant stronger, a compromise must be made to safety and compatibility

Historically, in order to make a chemical disinfectant more effective either by decreasing the contact time or increasing the germicidal efficacy, more chemical, either active or inert ingredient, is added to make it stronger. For example a quaternary ammonium based disinfectant may add alcohol to its formulation to enhance its efficacy and contact time. While a disinfectant may improve its contact time and efficacy, there is often a compromise made to the safety profile and materials compatibility. And while this holds true for many disinfectants looking to make improvements, there are newer disinfectant technologies available on the market that improve efficacy and contact time through altering the

formulation's synergy rather than adding more chemicals. Take the newest Accelerated Hydrogen Peroxide® (AHP®) based disinfectant, Optim 1, for example. Compared to Optim 33TB, this new and improved disinfectant has dramatically improved its fungicidal contact time from 10 minutes to 30 seconds, as well as its tuberculocidal contact time from 5 minutes to 1 minute. Amazingly, these improved contact times were successfully achieved all while remaining nontoxic and non-irritating[i]. These claims are reinforced by toxicity support data found in the SDS. In the example of Optim 1, the disinfectant is rated as a GHS category 5 across the board meaning it does not require any hazard or precautionary pictograms or statements. Furthermore, Optim 1 is classified as an EPA category 4 which is considered the safest category and as such does not require the use of personal protective equipment (PPE) to protect users from the disinfectant, but should always be worn as best practice.

When a new and improved disinfectant is introduced to the market, while it's not always easy to identify the changes the manufacturer made to the formulation, comparing the Safety Data Sheets of both products is a good starting point. Look for any new or increased amount of potentially hazardous ingredients and compare the precautionary pictograms and statements. The SDS will also tell you any additional PPE that may be required to protect the user from the disinfectant. Regardless if your facility is bringing in a newer generation product or a new disinfectant altogether, the SDS should always be assessed to ensure optimal safety for staff and patients.

Myth 2: If a disinfectant kills most germs, it must be toxic

Legacy disinfectants are known to require a compromise

between germicidal efficacy and user safety. However, in the past 10-15 years companies have been working to bring safer and more environmentally sustainable disinfectants to market. Today, there are a number of disinfectant alternatives based on safer chemistries that have improved safety profiles without compromising germicidal efficacy. Conversely, facilities using older disinfectant chemistries such as bleach or phenols for example, should provide training on protocols for safe use. Safety Data Sheets are the best resource to learn about the toxicity and risks associated with using chemical disinfectants. On the SDS, sections 2 and 11 should be reviewed to identify product hazards and toxicological data. Section 2 provides an overview of the disinfectants hazards identification including GHS classification, signal words, hazard pictograms and precautionary statements. Ideally, a disinfectant should not be classified by GHS and should have no hazard pictograms or hazard statements. Furthermore, section 11 will provide the toxicity results of the disinfectant. All disinfectant manufacturers must provide toxicity support data for oral, dermal, and inhalation toxicity by an EPA approved party laboratory. An ideal disinfectant will be non-toxic, non-irritating and non-sensitizing, will be VOC (volatile organic compound) free, and will not contain hormone mimicking agents that can act as endocrine disruptors in the body.

In regards to the Optim line of disinfectants, there are no physical or health hazards associated with the products. Optim has been proven by third party laboratories to be non-toxic, non-irritating, and non-sensitizing. Furthermore, the Optim line of disinfectants do not utilize any ingredients that are carcinogenic, mutagenic or have reproductive toxicity, giving user's confidence

that they won't be harmed by their disinfectant if used according to the label directions.

Myth 3: More is better

It's common for disinfectant manufacturers to include a lengthy list of pathogens on their product label in an effort to look more effective. But instead of looking for disinfectants with the greatest number of efficacy claims, look for disinfectants with the most applicable claims. There are different classes of pathogens, each with surrogate organisms that are reflective of the gold standard or more difficult to kill pathogen in that class such as:

Vegetative bacteria: *Pseudomonas aeruginosa and Staphylococcus aureus*.
Fungi: *Trichophyton mentagrophytes*
Viruses: *Poliovirus or Adenovirus*
Mycobacteria: *Mycobacterium bovis or Mycobacterium terrae*
Bacterial Spores: *Bacillus subtilis and Clostridium sporogenes*[ii]

When cleaning and disinfecting surfaces, it is important to consider what pathogens are relevant to patients and the facility and focus your attention on a disinfectant formulation that provides a balance between effectiveness and minimal toxicity to increase user compliance. Special consideration should also be made to new and emerging pathogens. In 2016, the EPA developed an emerging pathogen guidance document for viral pathogens not listed on EPA registered disinfectant labels. In order to be eligible to meet the Emerging Pathogen Guidance[iii], the disinfectant product must meet the following 2 criteria.

THE 5 COMMON MYTHS OF DISINFECTION

1. The product is an EPA-registered, hospital/healthcare or broad-spectrum disinfectant with directions for use on hard, porous or non-porous surfaces.
2. The currently accepted product label (from an EPA registered product as described above) should have disinfectant efficacy claims against at least one of the following viral pathogen groupings:
    a. A product should be approved by EPA to inactivate at least one large or one small non-enveloped virus (such as Poliovirus, Norovirus or Adenovirus) to be eligible for use against an enveloped emerging viral pathogen.
    b. A product should be approved by EPA to inactivate at least one small, non-enveloped virus to be eligible for use against a large, non-enveloped emerging viral pathogen.
    c. A product should be approved by EPA to inactivate at least two small, non-enveloped viruses to be eligible for use against a small, non-enveloped emerging viral pathogen.

Optim provides broad-spectrum efficacy protecting your facility against pathogens you are most concerned with. Optim has proven efficacy claims against bacteria such as *Pseudomonas aeruginosa* and *Staphylococcus aureus*, fungi such as *Trichophyton mentagrophytes,* non-enveloped viruses including Poliovirus, Adenovirus, Norovirus, bloodborne pathogens such as HIV and Hepatitis B and finally Mycobacterium bovis. In fact, the AHP® technology utilized in the Optim line of disinfectants has been proven to reduce hospital associated infections such MRSA, VRE, and *Clostridium difficile* by ≥20%[iv]!

Myth 4: Cleaning and disinfecting are the same thing

Cleaning uses detergents and surfactants to break up soils (visible or not) on surfaces whereas disinfectants kill or inactivate microorganisms and pathogens in various ways, depending upon the disinfectant used. It's also a common misconception that disinfectants labelled as a one-step cleaner disinfectant make good cleaners. When a disinfectant is labelled as a one-step disinfectant cleaner, this means that the disinfectant has been tested and remained effective in the presence of a soil challenge. In reality, the disinfectant may not have good cleaning capabilities. Disinfectants that utilize superior surfactants such as anionic and non-ionic surfactants, aid in easier removal of soils and debris allowing the disinfectant to work more efficiently. The Optim line of disinfectants are not only one-step cleaner disinfectants, but they utilize both anionic and non-ionic surfactants. In fact, the AHP® technology has been proven to prevent cross contamination to secondary surfaces[v].

Myth 5: All disinfectants are created equal and can be used in the same way

We generally accept the fact that medication comes with potential side-effects and willingly abide by the instructions for use in order to prevent side-effects. However, disinfectants are typically not thought about in the same way and are often perceived as one in the same. In the United States there are thousands of registered disinfectant products for sale, each with several variations between them. Among the most common chemistries used for disinfection (including hydrogen peroxide, quaternary ammonium compounds, bleach and alcohol), you'll find vast differences in spectrum of efficacy, contact times, concentrations, label language, and personal protection needed for proper usage.

In addition, many disinfectants require pre-cleaning of the surface or device with a product containing detergents before disinfection can occur. Reading the product label and instructions for use is essential to ensure that the product is used correctly and safely, both of which help to increase disinfection compliance.

Through uncovering these common disinfection myths, the importance of making educated and informed decisions when choosing a disinfectant is evident. Making an informed decision is imperative to ensure the correct use of chemical disinfectants and to ensure the safety to both staff and patients. ■

ABOUT THE AUTHOR:

OLIVIA LATTIMORE *is the Manager of Professional and Technical Services for the Human Health division at Virox Technologies Inc.*

REFERENCES:

i Optim 1 Wipes (US) Safety Data Sheet (2016). http://www.scicanusa.com/site/scicanusa/assets/pdf/optim_1_wipes_usa.pdf

ii Environmental Protection Agency (2012). Series 810 – Product Performance Test Guidelines. https://www.epa.gov/test-guidelines-pesticides-and-toxic-substances/series-810-product-performance-test-guidelines

Environmental Protection Agency (2016). Efficacy Requirements for Antimicrobial Pesticides. https://www.epa.gov/pesticide-registration/efficacy-requirements-antimicrobial-pesticides

iii Environmental Protection Agency (2016). Guidance to Registrants: Process for Making Claims Against Emerging Viral Pathogens not on EPA-Registered Disinfectant Labels. https://www.epa.gov/pesticide-registration/guidanceregistrants-process-making-claims-against-emerging-viral-pathogens

iv Alfa, M. et al. (2015). Use of a daily disinfectant cleaner instead of a daily cleaner reduced hospital-acquired infection rate. AJIC 43 (2015) 141-6 Boyce. J. et al/ (2017). Prospective cluster controlled crossover trial to compare the impact of an improved hydrogen peroxide disinfectant and a quaternary ammonium-based disinfectant on surface contamination and health care outcomes. AJIC 2017.

v Sattar et al. (2015). Disinfectant wipes are appropriate to control microbial bioburden from surfaces: use of a new ASTM standard test protocol to demonstrate efficacy. J Hosp Infect. 2015 Dec;91(4):319-25. doi: 10.1016/j.jhin.2015.08.026. Epub 2015 Oct 9.

OTHER REFERENCES:

Centers for Disease Control and Prevention (2016). Summary of Infection Prevention Practices in Dental Settings. https://www.cdc.gov/oralhealth/infectioncontrol/pdf/safe-care2.pdf

Rutala & Weber (2014). Selection of the Ideal Disinfectant. Journal of Infection Control and Hospital Epidemiology. Vol. 35, No. 7.

Pyrek, K. (2012). Occupational Health: Protecting Workers Against Chemical Exposures. Infection Control Today. http://www.infectioncontroltoday.com/articles/2012/10/occupational-health-protecting-workers-againstchemical-exposures.aspx