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The Importance of Contact Time and Visible Wetness to Ensure Effective Disinfection

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THE IMPORTANCE OF EFFECTIVE DISINFECTION

Effective cleaning and disinfection is important in healthcare to reduce the risks of infection. To ensure that a U.S. Environmental Protection Agency (EPA)-approved hard surface disinfectant kills the microorganisms that it claims to, correct use according to manufacturer instructions is required. A user needs to know that after applying a disinfectant, it will be as effective as the manufacturer intended.

HOW CAN EFFECTIVE DISINFECTION BE ENSURED?

Ensuring effective disinfection in healthcare is subject to some unique challenges. In particular, hospital rooms are full of surfaces of varying shapes and sizes, and knowing where a disinfectant has been applied can often be challenging. To help, users need an indicator to know that they have correctly applied a disinfectant to a surface and that they can be assured that the disinfectant has worked as intended.

The most common industry practice is to ensure that the surface is kept visibly wet for the full contact time indicated on the product label. The contact time, also known as the wet time, is the time that the disinfectant needs to stay wet on a surface in order to ensure efficacy. It is determined by the manufacturer and based on the results of microbiological testing using EPA-approved methods. Contact times for disinfectants range from 15 seconds to ten minutes, the maximum time allowed by the EPA. Disinfecting products usually include directions that instruct users to ensure that the surface is visibly wet for the contact time.

This practice does have its challenges though. Keeping a surface visibly wet can be difficult for disinfectants that require a long contact time, such as ten minutes. Under some conditions, such as high temperatures and low humidity, it can also be difficult even for disinfectants with contact times as short as three or four minutes to stay wet. It is particularly challenging for disinfectants with high alcohol content, which evaporate quickly. If the disinfectant does dry on the surface before the contact time is reached, label instructions usually require reapplication to ensure that the contact or wet time is met.

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If visible wetness for the contact time is not used as a measure of efficacy or as a way to help with compliance, then how would end users know that product application was sufficient to achieve disinfection? Would the alternative approach be based on the surface area a wipe can cover and still effectively disinfect? This approach would require product labels to include instructions for how much surface area the product can cover and still effectively disinfect and would require users to measure the surface area being wiped to ensure proper use. If the wipe is used on too large an area, then insufficient disinfectant may be applied, resulting in a failure to effectively decontaminate the surface. This approach presents a more challenging situation than using visible wetness as an indicator. First, while measuring surface area may be relatively easy on large flat surfaces, hospital room surfaces and equipment are rarely flat and consistent, making it difficult and highly impractical to calculate surface area. Second, wipe sizes and the amount of disinfectant on each wipe varies between products and differences in wipe sizes and surface coverage could create confusion for users trying to monitor areas covered for specific wipes. For these reasons, requiring the disinfectant to remain visibly wet on the surface is a useful and relatively simple practice to follow to ensure compliance and proper disinfection.

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WHAT ARE THE EPA'S REQUIREMENTS FOR DISINFECTANT TESTING?

EPA regulations require data to support disinfecting claims. Data requirements are not specific or consistent around the requirement to keep the surface visibly wet for the full contact time and are also dependent on the microorganism against which a claim is obtained. For example:

- The EPA Standard Operating Procedure for germicidal (disinfectant) sprays does not specify whether the carrier containing the microorganism under testing must remain wet for the duration of the contact time.[1] In our experience using this method, carriers are typically sprayed with an excess of disinfectant and stay visibly wet over contact times up to ten minutes. The method even instructs the third-party laboratory to drain excess disinfectant from the carrier once the contact time is reached. It is also common practice for third-party testing laboratories to cover the carriers after application of the disinfectant to create a closed environment that reduces drying and prevents contamination.
- The EPA Standard Operating Procedure for towelettes or wipes requires that wiped carriers are left in *covered* petri dishes for the duration of the contact time.[2] Although it does not specify whether the carrier surface should remain visibly wet for the duration of the contact time, the closed environment created by covering the petri dish reduces drying. In this closed environment, disinfectants are likely to stay visibly wet on the carrier surface for the full contact time.
- For testing towelettes against *Clostridium difficile* (*C. difficile*) and *Candida auris* (*C. auris*), the EPA Standard Operating Procedure requires that the carrier surface remain

visibly wet for the full contact time, with the EPA stating that *"The data must show the presence of free-liquid on the treated surface by weight and physical observations (presence of wetness)."*[3,4] Additionally, the EPA requires manufacturers to include language on the product label specifying that if the disinfectant is being used against *C. difficile*, the surface must remain visibly wet for the full contact time.

In the interests of providing simple and consistent instructions for users, it is reasonable to suggest that if wetness for the full contact time is required for *C. difficile* and *C. auris*, then the same should apply for all microorganisms. Label directions for disinfectants usually instruct the user to apply the disinfectant to a hard surface and allow it to stay visibly wet for the full contact time. As required by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), product labels also state that *"it is a violation of Federal law to use this product in a manner inconsistent with its labeling."*[5]

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OUR RECOMMENDATION: ENSURE SURFACES ARE VISIBLY WET FOR THE LABELED CONTACT TIME

Clorox Healthcare's current opinion is that users should follow the common practice of requiring surfaces to remain visibly wet for the contact time, a practice that is supported by microefficacy testing requirements and the need for a practical indicator of disinfectant surface coverage and contact time. Despite facing some challenges with keeping a disinfectant wet on the surface, it remains a simple method of providing users with an indicator that the disinfectant has been used correctly and will be effective as the manufacturer intended. All Clorox Healthcare products include these directions for use and Clorox Healthcare will continue to recommend that users ensure disinfectants remain visibly wet on surfaces for the full contact time.

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[1] United States Environmental Protection Agency. Office of Pesticide Programs. Standard Operating Procedures. Germicidal Spray Products as Disinfectant. MB-06-09. September 29, 2017. https://www.epa.gov/sites/production/files/2018-01/documents/mb-06-09.pdf Accessed January 22, 2018.
[2] Standard Operating Procedure for Disinfectant Towelette Test. MB-06-09. February 11, 2016. https://www.epa.gov/sites/production/files/2016-05/documents/mb-09-06.pdf Accessed February 11, 2018.
[3] United States Environmental Protection Agency. Interim Guidance for the Efficacy Evaluation of Products for Claims against Candida auris. https://www.epa.gov/pesticide-registration/interim-guidance-efficacy-evaluation-products-claims-against-candida-auris-0. Accessed January 22, 2018.
[4] United States Environmental Protection Agency. EPA MLB SOP-MB-31: Procedure for the OECD Quantitative Method for Testing Antimicrobial Products against Spores of *Clostridium difficile* (ATCC 43598) on Inanimate, Hard, Non-porous Surfaces. December 2017. https://www.epa.gov/sites/production/files/2017-12/documents/mb-31_december_2017.pdf Accessed January 22, 2018
[5] United States Government. Federal Insecticide, Fungicide, and Rodenticide Act. 7 U.S.C. §136 et seq. (1996)