DISINFECTION DIGEST
...FOCUSED ON SCIENCE

Assessment of Accelerated Hydrogen Peroxide® disinfectant wipes in removal of chemotherapeutic agents from hard non-porous environmental surfaces

Abstract

Chemotherapy agents (also known as cytotoxic agents) are used in chemotherapy treatment to stop or slow the growth of cancer cells. However, these agents can also affect healthy cells and are known to have high toxicity which can be harmful to individuals that are not under chemotherapy treatment. In addition, chemotherapy molecules are known to be highly resistant to inactivation by chemical disinfectants. In order to protect personnel preparing chemotherapy drugs, choosing a disinfectant with the ability to cleanse or degrade chemotherapy agents is an essential aspect of the pharmacy's/laboratory's infection control and biosecurity program. In this investigation, Accelerated Hydrogen Peroxide® (AHP®) exhibited complete removal of all chemotherapy agents tested.

Background

There is limited information available regarding disinfectant efficacy against chemotherapy agents. Bleach used at higher concentrations is often used as a standard agent for cleaning and disinfecting surfaces where chemotherapy drugs have been prepared. However, bleach is often accompanied with health and safety hazards. As such, a safer disinfectant alternative is often sought after. A number of studies have evaluated the use of hydrogen peroxide as an agent to degrade chemotherapy agents and found the oxidizing properties of hydrogen peroxide to be effective in degrading chemotherapy drugs. Another study looked at the effect that pH had on degradation of the chemotherapy drugs and found that a low (acidic) pH was very effective. As AHP® based disinfectants utilize low levels of hydrogen peroxide and works optimally at a lower pH, the aim of this investigation was to determine if AHP® disinfectant wipes were capable of cleansing hard non-porous surfaces that may have come into contact with therapeutic agents.

Study

In this investigation a clean and sterile stainless steel surface was portioned into eight equal clean areas of which 7 of the areas were soiled using a mixture of 10 different chemotherapy agents. The 8th space was used as the control surface. Using Bureau Veritas' ChemoAlert Surface Contamination 10-pack kit, one recovery swab was dipped into the recovery solution and was used to swab the soiled area. The same was done to the control area. These two swabs were used to provide scoring points for a "100% soiled" and "0% soiled" area. Next, each of the remaining areas were wiped using AHP® disinfectant wipes. The wiping action used in this test was the same standard method that is used in conducting antimicrobial tests done on disinfectants for US EPA registration. The disinfected surfaces were allowed to dry at room temperature for 10 minutes. The same method of surface swabbing was done on the disinfected surfaces, using the kit's provided recovery solution and swabs. Each recovery swab was sent back to Bureau Veritas for quantitative analysis of each of the recovery swabs.

Results

Concentration readings from swabs sampled from each surface area were analyzed for all ten chemotherapy agents. Treatment of the soiled surfaces using AHP® disinfectant wipes resulted in complete removal of all ten deposited chemotherapeutic agents. In comparison to the blank surface that was used as the control, the disinfected areas showed to be as clean as the blank area.

Conclusions

Based on studies that have demonstrated the ability of hydrogen peroxide and products with a low pH to deactivate chemotherapy agents, as well as the results from this investigation, highlight that AHP® would be an excellent choice for the use in pharmacy and laboratory settings that deal with the preparation and use of chemotherapy agents. Furthermore, AHP® meets the USP 800's disinfectant criteria for the decontamination of hazardous drugs as AHP® is a non-toxic, volatile, corrosive or otherwise harmful disinfectant technology.

Implications for AHP®

AHP®'s unique synergy makes is an ideal product to be used for the removal of chemotherapy agents.

AHP® Disinfectants are One-Step Disinfectant Cleaners

•AHP® has proven cleaning efficiency as it utilizes both anionic and non-ionic surfactants within its formulation. Anionic surfactants have superior cleaning abilities allowing for easier removal of soils and non-ionic surfactants help in preventing redeposition of soils that have been lifted off the surface.

AHP® Disinfectants provide the perfect balance between safety and efficacy

•AHP's® non-toxic, non-irritating to eyes and skin and non-skin sensitizing formula is designed to be easier on employees and occupants resulting in protocol compliance.
•AHP® is VOC free

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AHP® Disinfectants are compatible

•AHP formulations are tested to ensure compatibility that preserves your investments in equipment, furniture, and building surfaces by reducing corrosion and wear.

AHP® Disinfectants have realistic contact times

•Short contact times ensure surfaces remain wet for the required contact time, providing comfort and confidence that disinfection has occurred.

AHP® Disinfectants are environmentally sustainable

•AHP's® active ingredient, hydrogen peroxide, breaks down into water and oxygen leaving no active residues and will not negatively impact indoor air quality.

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