

# Acute Antimicrobial Pesticide Related Illnesses Among Workers in Health Care Facilities

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As we ramp up in providing health care facilities with superior antimicrobial protection by releasing the sale of Dynacidal™ impregnated swipes, known as Dyna-Swipe™ (not approved for use at present in the United States), it is important to recognize that all antimicrobial pesticides should never be taken lightly. They are powerful tools with extraordinary chemical and biological activity. If antimicrobial pesticides are not treated with respect they have the ability to cause bodily injury and can lead to adverse health effects. By eliminating the need for using any existent active ingredients associated with current antimicrobial pesticide we have been able to reduce such risks.

Antimicrobial pesticides are chemicals used to destroy or suppress the growth of harmful microorganisms whether bacteria, viruses or fungi on inanimate objects and surfaces. They include products which are sterilizers, disinfectants and sterilizers which are formulated into sprays, liquids, concentrated powders and gases. Of note, disinfectants are able to destroy or irreversibly inactivate infectious fungi and bacteria but not necessarily their spores. There are approximately 5,000 antimicrobial pesticide products containing 275 active compounds which are registered with the Environmental Protection Agency, and nearly 2/3 of these are designed to control infections in health care settings. Annual sales volume for these products in the United States exceeds one billion dollars.

The US Environmental Agency classifies pesticide products into one of four categories based on established criteria. Category I is given for pesticides with the greatest toxicity and Category IV for pesticides with the least toxicity. The Center for Disease Control has analyzed the data from the period of 2002 to 2007 from the four states which regularly collect data on antimicrobial pesticide related illness (California, Louisiana, Michigan and Texas). An antimicrobial pesticide related illness is defined as any acute adverse health effect resulting from exposure to an antimicrobial pesticide product.

This report, published in the May 10, 2010 edition of the Morbidity and Mortality Weekly (59(18);551-556)) summarized the data from the 401 cases of work related illness associated with antimicrobial pesticide exposure in health related facilities. Health care facilities use anti-microbial pesticides to prevent pathogen transmission from contaminated environmental surfaces.

The most frequent occupations reporting illness are janitors, housekeepers, nurses and medical assistants. The most common mechanisms of injury are splashes and spills, with only 15% of health care workers reporting wearing protective eyewear.

The most common active ingredients responsible for illnesses are quaternary ammonium compounds (QACs), glutaraldehyde, and sodium hypochlorite. QACs are widely used to disinfect environmental surfaces or medical equipment designed for skin contact, such as blood pressure cuffs. Glutaraldehyde is used as an immersion chemical in disinfecting heat sensitive medical equipment such as endoscopes. Sodium hypochlorite is used in environmental sanitation.

The most common active ingredients are listed in the CDC report:

- Quaternary ammonium compounds
- Glutaraldehyde
- Sodium hypochlorite
- Isopropyl alcohol
- Peroxyacetic acid

- Phenolic disinfectants
- Hydrogen peroxide

Of note, 66% of cases occurred in persons exposed while they handled antimicrobial pesticides and 18% were in bystanders. Among workers handling antimicrobial pesticides 74% wore a form of personal protective equipment, with 60% wearing specialty work clothes or gowns, 55% wearing gloves and only 15% wearing protective eyewear including safety glasses, goggles or face shields.

The recommendation from the CDC is to educate workers about antimicrobial pesticide hazards, promote the use of personal protective equipment (PPE) and implement effective risk communication strategies for antimicrobial pesticide use to prevent bystander exposure. It is believed by the CDC staff that this is a great underreporting of injury and illness as such reporting is entirely voluntary.

Health care facilities should use less hazardous antimicrobial pesticide products when available. Dynacidal™ impregnated materials, by reducing exposure to common active ingredients may reduce antimicrobial pesticide related injuries among health care professionals.