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ORIGINAL ARTICLE

Disinfected So It Is Safe AND Works

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Abstract

There has been an upsurge in interest in monitoring the cleanliness of the health care environment as it relates to disease transmission. Cleaning and disinfecting practices are nothing new in health care facilities. However, continued development of analytical medical products such as point-of-care devices or, as in this review, glucose meters, has created potential risks to patients on a number of levels. Examples are (1) inappropriate disinfection of glucose meters so that the risk of disease transmission is increased and (2) cleaning agents potentially affecting glucose reading accuracy. Cleaning and disinfection recommendations have become available to address these issues. In this issue of *Journal of Diabetes Science and Technology*, Sarmaga and colleagues discuss the impact of a disinfecting agent on results generated from a particular device, which suggests that not all equipment are created equal and not all practices/products used to clean and disinfect are the same. It appears that more interaction must take place between vendors of these technologies as well as vendors of cleaning/disinfecting agents and the end users who will be performing all the requisite tasks to ensure a high quality product as well as care.

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In March 2011, the Centers for Disease Control and Prevention reported that since 2000, there have been at least 15 outbreaks of hepatitis B infection associated with providers failing to follow basic principles of infection control when involved with blood glucose monitoring.[1] The outbreaks were associated with breakdowns in practices and products—inappropriate use of device as well as poor cleaning/disinfection.[2,3] It is also likely that underreporting and lack of recognition of acute infections has led to an underestimation of the extent of the problem.[4]

There has also been a great increase in interest in monitoring the cleaning practices of patient rooms and high touch areas as a result of a high incidence of multi-drug resistant organisms such as vancomycin-resistant enterococci and *Clostridium difficile*. These high touch areas include monitors and various types of instrumentation. Qualitative and quantitative analyses have been undertaken to determine the value of various practices to clean and disinfect these inanimate objects [e.g. use of microfiber cloths, types of chemicals, cleaning technique, mobile disinfection units (UV robots)]![5–7]

In an article entitled "Evaluation of Different Disinfectants on the Performance of an On-Meter Dosed Amperometric Glucose Oxidase Based Glucose Meter," Sarmaga and colleagues[8] discuss an interesting implication of the use of a disinfectant on the results of a commonly used device. As discussed earlier, inappropriate use of the device among patients has contributed to disease transmission. A Food and Drug Administration (FDA) notice from September 2010 updated the infection prevention methods

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necessary to ensure patient safety[4]. Similarly, Klonoff and colleagues[9] made recommendations that, if blood glucose meters must be shared, then the device should be cleaned and disinfected after every use, per manufacturer's instructions, to prevent carry-over of blood and infectious agents. If the manufacturer does not specify how the device should be cleaned and disinfected, then it should not be shared.

Improved cleaning and disinfection practices have been developed to address this issue. Vendors of cleaning products such as Professional Disposables International, Inc., have provided updated guidance in selecting disinfectants and wipes.[10] As also discussed by Sarmaga and colleagues,[8] previous publications have documented interference of some disinfectants with particular glucometers. It is interesting to note that the FDA document, while focusing on proper cleaning and disinfection, is somewhat vague on the issue of accuracy of the equipment after disinfection. Companies such as Virox issued guidance on the use of their products with glucometers stating there are procedures that can be implemented to prevent this reaction including stringent compliance with changing of gloves, hand hygiene, and rinsing of the glucometer.[11]

What we are seeing here is an outgrowth of a statement made by Thompson and colleagues in 2009, "The diabetes technology community should be cognizant of the risk for bloodborne pathogen transmission when designing devices. Through the development and marketing of safety-engineered equipment, the diabetes technology community can play a significant part in eliminating unnecessary risks and reducing the disease burden from hepatitis viruses."[12]

Sarmaga and colleagues[8] as well as other researchers are addressing a gap in knowledge related to the impact of disinfectants when used on glucose meters. The limitations of their study are clearly stated: one concentration of hydrogen peroxide tested, one application. Another aspect that may have not been considered is the amount of pressure applied to the wipe when being applied and its potential to leave a residue. The article states "External disinfection of the on-meter dosed glucose meter was accomplished by thoroughly wiping all external areas including the test strip port with the prescribed disinfectant wipe". What actually is "thoroughly"? Was the cleaning undertaken by the same individual or by a group? It has been demonstrated that there is variability during the routine cleaning of patient care areas by environmental service staff.[6] The potential for variability exists as well when disinfecting these devices.

The message is clear—more interaction must take place between vendors of these technologies as well as vendors of cleaning/disinfecting agents to match the appropriate cleaning and disinfection agent/ method to the technology. Additionally, the end users who will be performing all the requisite tasks with these glucose meters need to understand the importance of not deviating from the manufacturer's recommended disinfection practices. Appropriately disinfected so it is safe...and it works!

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