Risks of Improper Ultrasound Probe Reprocessing

Background and Facts

Effective high level disinfection (HLD) should eliminate fungi, bacteria, and viruses on an ultrasound probe. Traditional disinfection involves manual methods such as soaking in toxic chemicals, spraying or wiping, which can be ineffective, inefficient and environmentally unsound. Clinical evidence highlights the various cross contamination risks when ultrasound reprocessing is not performed properly.

Manual Disinfection Risks

As well as being potentially inconsistent, manual processes can also be arduous for the operator, leading to a risk of error and a lack of compliance. Additionally, there is the risk of exposure to dangerous chemicals.

Clinical research confirms the drawbacks of traditional disinfection processes:

- A study that evaluated endoscopy reprocessing practices, including employee perceptions and occupational health issues, found there was “extensive non-adherence with reprocessing guidelines when manual methods were used.” Further, “automation resulted in better compliance with guidelines and reduced [health problems] associated with reprocessing.” Employee compliance to HLD recommendations was observed as only 1.4 percent for manual methods versus 75.4 percent for an automated process.[1]
- Manual disinfection of medical devices has been shown to lead to an increased risk of operator error if protocols are not followed correctly and poor protocol compliance can lead to an increased risk of infection transmission for patients.[1,2]
- A non-fatal case of hepatitis C and a fatal case of hepatitis B have been linked to improper ultrasound transducer disinfection.[3,4]

Probe Handle Risk

Some ultrasound probes cannot be immersed in bulk liquids due to potential probe damage, so users avoid disinfecting the handle. Additionally, manual wipe-based disinfection systems may not specify disinfection of the probe handle and practice can vary between users.

While there is no specific guidance for ultrasound probe handle disinfection, a number of experts have noted it is imperative for the reprocessing guidelines to be updated.[5,7]

Clinical research confirms the necessity of proper handle disinfection:

- Residual bacteria, including pathogens such as methicillin resistant Staphylococcus aureus (MRSA), persist on more than 80 percent of handles that are not immersed during liquid soak disinfection.[5]

- The frequency of handle contamination was also confirmed in another study showing that over 80% of handles had residual contamination (after probe reprocessing) where handles were not disinfected.[6]
- Experts have discussed the potential for ultrasound probe handles to act as a reservoir for nosocomial pathogens, which could be transferred to the probe head, sheath or to a patient. This highlights the imperative need for guidelines and healthcare policies to be updated to ensure that the handle and probe are adequately disinfected after every patient use.[7]

Health Risks Using Traditional Bulk Liquid High Level Disinfectants

Glutaraldehyde (GTA) and ortho-phthalaldehyde (OPA) are both used as high level disinfectants. GTA, and particularly OPA, can pose severe health and safety risks for patients and clinical staff who are exposed to them.

- In 2012 a study found that nurses with regular daily exposure to sterilizing agents (including glutaraldehyde) during pregnancy, are more than twice as likely to undergo late spontaneous abortion compared to nurses who are not exposed to these chemicals.[8]
- A study showed detrimental effects upon embryo development when culture media were exposed to surgical instruments sterilised with Cidex.[9]
- There is a body of published case reports showing that workers and patients have experienced respiratory problems, anaphylaxis, skin reactivity, and systemic antibody production with use of OPA.[10-15]

In addition to these health risks, both OPA and GTA have been shown ineffective against high-risk Human Papillomaviruses (HPVs) that can contaminate ultrasound probes.[16,17]

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