The importance of high-level disinfection (HLD) of ultrasound probes in the Emergency Department (ED)

Critical Summary

- The emergency department (ED) is one of the most complex healthcare delivery environments. The trophon® device can help meet your ultrasound probe HLD needs in the Emergency Department.
- According to Australian and New Zealand Standards, the use of a protective barrier does not change the reprocessing needs of ultrasound probes, and merely acts as another mechanism to reduce infection risk.
- With increasing use of ultrasound in ED, it is important to ensure probes are properly prepared for use as infection transmission risks have been associated with the use of ultrasound probes in ED settings.

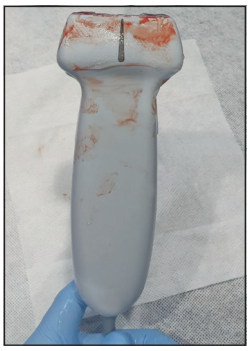
The emergency department (ED) is one of the most complex healthcare delivery environments. Procedures are often performed under time pressure, with patients of unknown infectious status and ultrasound is often used in invasive procedures.

Ultrasound has brought tremendous benefits to ED, becoming an essential diagnostic tool, and in recent years, has been increasingly used to guide a variety of interventions. This increased use corresponds to a need to properly maintain this equipment to ensure it is ready for safe use.

A study has shown that 57% of ultrasound probes in EDs are contaminated with blood and a further 46% with microoganisms.[1] The COVID-19 pandemic has more recently revealed gaps in ultrasound infection prevention education and protocols in Australian EDs, which need to be addressed to help protect patients and staff.[2]

Given probes used in ED settings may contact sterile tissue, the bloodstream, broken skin or mucous membranes, it is important to ensure they are appropriately disinfected to protect patients from infection risk.

Adequate cleaning and disinfection is necessary to prepare a probe for use. The Spaulding classification is used by the Australian Guidelines for the Prevention and Control of Infection, AS/NZS 4187 and the ACIPC-ASUM guidelines, to determine the level of disinfection required, based on the patient contact site (see Table 1).[3-5] High level disinfection (HLD) should be used when a probe contacts broken skin or mucous membranes. HLD can also be used when the probe contacts sterile tissue in conjunction with a sterile sheath, if sterilisation is not possible.[4,5]



An external ultrasound probe with visible blood contamination in an emergency department.

Table 1. The Spaulding Classification

Classification	Patient Contact Site	Disinfection Level	Efficacy Spectrum
Critical	Device enters or contacts sterile tissue or bloodstream	Sterilisation or HLD and use with a sterile sheath*	All viable microorganisms must be destroyed.
Semi-critical	Device contacts mucous membranes or non-intact skin	High Level Disinfection	All viable microorganisms must be destroyed, except bacterial spores.
Non-critical	Device only contacts intact, healthy skin	Low Level Disinfection	Most vegetative bacteria and viruses destroyed, except bacterial spores, mycobacteria, fungi, or small non-lipid viruses.

*Critical ultrasound probes can be high level disinfected and used with a sterile sheath if sterilisation is not possible.[4,5]

Use of a sheath does not replace the need for HLD

According to the AS/NZS 4187 and the ACIPC-ASUM guidelines, the use of a protective barrier does not change the reprocessing needs of ultrasound probes, and merely acts as another mechanism to reduce infection risk.[4,5]

Ultrasound procedures performed in ED

Both endocavitary ultrasound examinations and ultrasound guided procedures using external probes are performed in the ED (see Table 2). Endocavitary probes always contact mucous membranes and consequently always require high level disinfection and use with a sheath.[4,5] External probes may come into contact with a variety of patient sites and should be adequately disinfected before patient use in those applications.

Table 2. The Spaulding Classification of procedures performed in the ED.

Sample Procedure performed in ED	Potential patient contact sites	Classification	Minimum disinfection and use requirements
Transvaginal ultrasound	Mucous membranes	Semi-critical	HLD[2,3]
Ultrasound scans over non-intact skin	Rash, dermatitis, superficial wounds	Semi-critical	HLD[2]
Probes used in surgical procedures	Contact sterile tissue or the bloodstream	Critical	HLD with use of a sterile sheath*
Probes used in percutaneous interventions (e.g. biopsies, thoracentesis, CVC)	May contact sterile tissue or the bloodstream at the puncture/ incision site.	Critical^	HLD with use of a sterile sheath*

*Critical ultrasound probes can be high level disinfected and used with a sterile sheath if sterilisation is not possible.[4,5] ^ If the probe will not contact sterile tissue, the probe could be non-critical requiring low level disinfection. However if the probe is used in a sterile field, HLD and a sterile sheath may be required (AS/NZS 4187 & ACIPC/ASUM).[4,5] The CICM and ACEM can also be consulted to guide facility decision making.[6,7]

The trophon® device has been designed to meet your ultrasound probe HLD needs in the ED

Manual disinfection methods are inherently variable. Using an automated and validated disinfection process means that critical parameters (e.g., contact time, temperature, concentration or dosage) are controlled and all surfaces of the probe head and handle are disinfected. Automated methods also standardise and digitise traceability across the utrasound infection prevention workflow. Traceability documentation to each patient demonstrates a facility's committment to quality care, and is essential for managing outbreak situations.

The trophon device can transform the way HLD is performed in ED settings. Simply HLD your probe after use to ensure it is ready for the next procedure. The trophon family includes the trophon EPR and trophon2 devices, which share the same core technology of 'sonically-activated' hydrogen peroxide.

Conclusion

With increasing use of ultrasound in ED, it is important to ensure probes are properly prepared for use. Infection transmission risks have been associated with the use of ultrasound probes in ED settings. It is important to correctly apply Spaulding and follow Australian and New Zealand Standards on the reprocessing of semi-critical and critical probes to keep patients safe from infection.

Contact us today for your specific needs on point of care reprocessing, understanding when to HLD or for an educational session at your facility.

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References: **1.** Keys M, Sim BZ, Thom O, et al. Crit Care Resusc. 2015;17(1):43-6. **2.** Manivel, V et al. AJUM. 2021; https://doi.org/10.1002/ajum.12283. **3.** Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019). **4.** AS/NZS 4187:2014 Reprocessing of reusable medical devices in health service organisations. **5.** Australasian College for Infection Prevention and Control (ACIPC), Australasian Society for Ultrasound in Medicine (ASUM). Guidelines for Reprocessing Ultrasound Transducers. Australasian Journal of Ultrasound in Medicine. 2017;20(1):30-40. **6.** College of Intensive Care Medicine of Australia and New Zealand (CICM). Prevention of pathogen transmission during ultrasound use in the Intensive Care Unit: Recommendations from the College of Intensive Care Medicine Ultrasound Special Interest Group (USIG). https://onlinelibrary.wiley.com/doi/abs/10.1002/ajum.12205. **7.** Australasian College for Emergency Medicine (ACEM). Sep 21. Statement-Cleaning and Disinfecting Ultrasound Transducers.

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Nanosonics Limited 14 Mars Road, Lane Cove, NSW 2066, Australia, T: +61 2 8063 1600 E: info@nanosonics.com.au www.nanosonics.com.au

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