PROBE **HYGIENE** SOLUTIONS

Everything you need to know about ***ultrasound probe disinfection***

E-book

INTRODUCTION

Preventing cross contamination is an important topic in the healthcare world.

When it comes to ultrasound examination, the question everyone is asking is:

"How do I effectively reprocess my ultrasound probe?"

This document tells all you need to know about disinfection and probe reprocessing: why it is needed, when it should be done, and how to do it.

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1 Why is probe disinfection needed?

SPAULDING CLASSIFICATION

The Spaulding classification is a widely used framework that specifies medical device reprocessing requirements based on the intended use. This classification scheme is used by infection control professionals, and others, when planning probe disinfection methods.

Probe classification based on expected contact site	Corresponding disinfection level	Disinfection level definition
CRITICAL Contacts sterile tissue or blood	STERILISATION	All viable microorganisms must be destroyed
SEMI-CRITICAL Contacts mucous membranes and non intact skin	HIGH LEVEL DISINFECTION	All viable microorganisms must be destroyed, except bacterial spores
	INTERMEDIATE LEVEL DISINFECTION	
NON-CRITICAL Contacts healthy, intact skin	LOW LEVEL DISINFECTION	Effective against all vegetative bacteria, but only effective against some viruses and fungi and not effective against mycobacteria or bacterial spores

1 Why is probe disinfection needed?

Up to **9 %**

of barrier sheaths and condoms leak[1]

12.9 %

of probes remain contaminated following low level disinfection[2]

Up to **7 %**

of ultrasound probes were found to be contaminated with human papillomavirus (HPV) after disinfection with low level wipes[3,4,5]

1 *Vickery K, et al. Evaluation of an automated high-level disinfection technology for ultrasound transducers, Journal of Infection and Public Health, 7(2):153-160, 2014.*

2 *Leroy SJ, Infectious Risk of endovaginal and transrectal ultrasonography, Journal of Hospital Infection, 83(2):99-106, 2012.*

3 *Casalegno JS, Le Bail Carval K, Eibach D, Valdeyron ML, Lamblin G, Jacquemoud H, et al. High risk HPV contamination of endocavity vaginal ultrasound probes: an underestimated route of nosocomial infection? PLoS ONE, 7(10):e48137, 2012.*

4 *Ma ST, Yeung AC, Chan PK, Graham CA. Transvaginal ultrasound probe contamination by the human papillomavirus in the emergency department. Emergency Medicine Journal 30(6):472-5, 2013.*

5 *M'Zali F, Bounizra C, Leroy S, Mekki Y, Quentin-Noury C, Kann M. Persistence of Microbial Contamination on Transvaginal Ultrasound Probes despite Low-Level Disinfection Procedure. PLoS ONE, 9(4):e93368, 2014.*

1 Why is probe disinfection needed?

Ultrasound probes are a potential source of HPV infection, posing a new challenge for infection control.

Studies show that common disinfection methods, including some high level disinfectants, are not effective against cancer-causing HPV.[1] The HPV virus can survive and remain infectious on surfaces, including medical equipment, for days or weeks and is not inactivated by common disinfectants.[2]

1 *Meyers J, Ryndock E, Conway MJ, Meyers C, Robison R. Susceptibility of high-risk human papillomavirus type 16 to clinical disinfectants. J Antimicrob Chemother. 2014;69(6):1546-50.*

2 *Ryndock EJ, Meyers C. A risk for non-sexual transmission of human papillomavirus? Expert review of anti-infective therapy. Expert Rev Anti Infect Ther. 2014;12(10):1165-70.*

1 Why is probe disinfection needed?

EU LANDSCAPE

The probe disinfection landscape in Europe is changing.

A 2016 European Society of Radiology (ESR) study found varying infection prevention practices across Europe, with a need to raise awareness among practitioners of the importance of infection prevention and control measures.

Based on that, the ESR issued a best practice recommendation[1] in November 2017:

- High level disinfection of probes after each exam is mandatory for endocavitary ultrasound and all interventions.
- Automated systems offer standardised and reproducible decontamination processes, helping to avoid operator-associated errors or variations.
- Dedicated transducer covers should be used for endocavitary ultrasound and all interventions.
- Sterile gel should be used for endocavitary ultrasound and all interventions.

Some countries have already started to develop their own regulations further.

- In 2017, Ireland and Scotland made high level disinfection mandatory between examinations.[2]
- In 2019 the French Ministry of Health published data sheets about endocavity probe reprocessing for healthcare professionals.[3]
- Others countries recommend strongly the same practices.[4]

1 *Nyhsen CM, Humphreys H, Koerner RJ, Grenier N, Brady A, Sidhu P, et al. Infection prevention and control in ultrasound – best practice recommendations from the European Society of Radiology Ultrasound Working Group. Insights into imaging. 2017.*

2 *https://hpspubsrepo.blob.core.windows.net/hps-website/nss/1937/documents/1_RES-183-1-v1.pdf (IIrish HSE Guidance for Decontamination of Semi-critical Ultrasound Probes QPSD-GL-028-1- 2017) Health Service Executive (HSE) Quality Improvement Division (2017). HSE Guidance for Decontamination of Semi-critical Ultrasound Probes; Semi-invasive and Non-invasive Ultrasound Probes. Document: QPSD-GL-028-1.*

3 *https://solidarites-sante.gouv.fr/soins-et-maladies/qualite-des-soins-et-pratiques/securite/article/prevention-des-risques-d-infection-associes-a-l-utilisation-des-sondes-d*

4 *Werkgroep Infectie Preventie (2017). Reiniging, desinfectie en sterilisatie van medische hulpmiddelen voor hergebruik niet-kritisch, semi-kritisch of kritisch gebruik: 56.*

Direzione Sanitaria AUSL Pescara (2009). Linee Guida per la "Corretta gestione di Procedure Assistenziali e Igienico-Sanitarie in Setting di Cura Ospedalieri e Territoriali": 88.

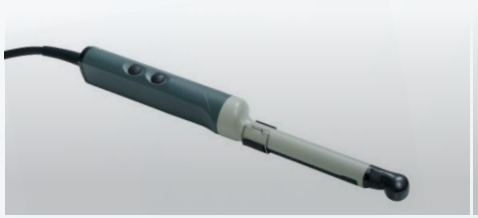
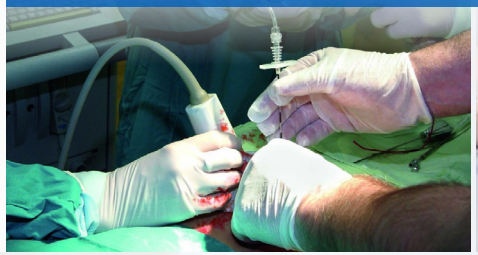
Kommission für Krankenhaushygiene und Infektionsprävention (KRINKO), and Bundesinstitut für Arzneimittel und Medizinprodukte (BfArM), (2012). Anforderungen an die Hygiene bei der Aufbereitung von Medizinprodukten. Bundesgesundheitsblatt - Gesundheitsforschung - Gesundheitsschutz: 66.

Society and College of Radiographers and British Medical Ultrasound Society (2017). «Guidelines For Professional Ultrasound Practice.» 127.

Welsh Health Technical Memorandum (WHTM) (2014). WHTM 01-06 - Decontamination of flexible endoscopes Part C: Operational management, NHS Wales Shared Services Partnership – Specialist Estates Services: 74.

2 When should a probe be disinfected?

Semi-critical ultrasound probes contact mucous membranes and non-intact skin. They need to be high level disinfected.

ENDOCAVITARY PROCEDURES	Transvaginal procedures	Transrectal procedures	Transesophageal procedures
			
SURFACE PROBE PROCEDURES	Intra-operative ultrasound procedures	Ultrasound guided interventional procedures (eg biopsies)	Ultrasound use on broken skin (wound scans)
			

Based on the Spaulding classification.

2 When should a probe be disinfected?

What procedure will your probe be used for?

PROCEDURE	Probe may contact sterile tissue or blood	Probe may contact mucous membranes & non intact skin	Probe will only contact healthy, intact skin
SPAULDING CLASSIFICATION	**CRITICAL** • intraoperative procedures • drainages • biopsies • needle guidance • transvaginal oocyte retrieval • venous catheter placement • vascular ablation	**SEMI-CRITICAL** **Intracavitary** • transvaginal scans • transrectal scans **Surface ultrasound** (broken skin) • wound scanning burn evaluation	**NON-CRITICAL** • surface ultrasound (intact skin)
			
DISINFECTION / STERILISATION REQUIREMENTS	**Sterilise[1] or HLD**	**HLD**	**LLD or HLD**

1 *Critical probes should be sterilised, or can also be high level disinfected and used a sterile sheath.*

3 How do you disinfect a probe?

Ultrasound disinfection is based on infection risk associated with intended use. When applying the Spaulding classification to ultrasound probes, the following disinfection methods may be considered:

NON CRITICAL ULTRASOUND PROBES
for contact with intact skin only

- Low level disinfection wipes

SEMI-CRITICAL AND CRITICAL ULTRASOUND PROBES
for contact with mucous membranes or non-intact skin

- High level disinfection wipes
- High level disinfection soaking
- Automated high level disinfection solution

Most guidelines recommend automated, validated HLD of semi-critical and critical ultrasound probes.

Please check the probe manufacturer's specifications to ensure the probe and disinfectant are compatible.

4 Automated probe disinfection with trophon®2

trophon®2, an automated high level disinfection system, offers a standardised and reproducible process.

AUTOMATED AND COMPACT

- Easy to use
- 7 minute cycle that eliminates all microorganisms
- Small footprint to fit into the examination room

PROBE COMPATIBILITY

- Validated by ultrasound manufacturers[1]
- Compatible with more than 1,000 models of standard, endocavitary and intraoperative probes

HELPS TO PROTECT PATIENTS, STAFF AND THE ENVIRONMENT[2]

- **Patients** benefit from the reduced risk of cross-contamination during ultrasound exams
- Protects **staff and the environment** by breaking down the disinfectant into water and oxygen, avoiding exposure to chemicals

1 *https://www.nanosonics.us/trophon/probe-compatibility/*
2 *https://www.nanosonics.us/trophon/safe-versatile-simple/*

4 Automated probe disinfection with trophon®2

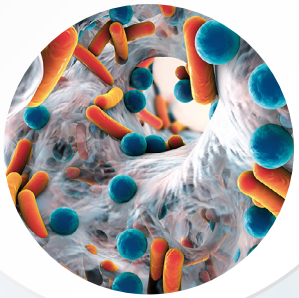
trophon®2, an automated high level disinfection system, offers a standardised and reproducible process.

> LEARN MORE:
https://www.gehealthcare.co.uk/en-GB/services/trophon2

EFFECTIVE ON MICROORGANISMS

• The efficiency and superiority[1] of the trophon®2 hydrogen peroxide vaporisation technique have been demonstrated on microorganisms such as the human papilloma virus[2]

• trophon®2 is effective against the widest range of pathogenic microorganisms, including HIV, hepatitis B, hepatitis C and chlamydia[3] ...



AcuTrace™

TRACEABILITY SOLUTION

• AcuTrace™ simplifies the creation and preservation of accurate and auditable digital records

• AcuTrace™ PLUS makes it possible to integrate trophon®2 into the Hospital Information System, with records centrally stored and accessible.[4]

1 *Nyhsen CM, Humphreys H, Koerner RJ, Grenier N, Brady A, Sidhu P, et al. Infection prevention and control in ultrasound - best practice recommendations from the European Society of Radiology Ultrasound Working Group. Insights into imaging. 2017.*

2 *C. Meyers, Inactivation des papillomavirus humains au niveau des sondes échographiques : synthèse des travaux récents. Hygiènes, Volume XXIV n° 4 – 2016*

3 *https://www.nanosonics.co.uk/clinical/microbial-efficacy/*

4 *https://www.nanosonics.co.uk/trophon2-traceability-and-it-integration/*

CONCLUSION

We hope you enjoyed reading this E-Book. Would you like to know more about the high level disinfection of ultrasound probes?

As a trusted partner for ultrasound technologies, we know how important it is to take great care of probes – and how challenging the high level disinfection process can be.

GE Healthcare can help you automate and standardise probe disinfection – and in more ways than you might expect. We offer complete systems and support for disinfecting your ultrasound transducers and keeping them protected – from the end of one exam to the start of the next.

> LEARN MORE ABOUT TROPHON®2 OR REQUEST A DEMO:
https://www.gehealthcare.co.uk/en-GB/services/trophon2

gehealthcare.com

GE Healthcare provides transformational medical technologies and services to meet the demand for increased access, enhanced quality and more affordable healthcare around the world.
GE works on things that matter - great people and technologies taking on tough challenges. From medical imaging, software & IT, patient monitoring and diagnostics to drug discovery, biopharmaceutical manufacturing technologies and performance improvement solutions, GE Healthcare helps medical professionals deliver great healthcare to their patients.

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nanosonics
Infection Prevention. For Life.

GE imagination at work