

trophon® EPR



Microbial efficacy

We go further
with testing



Paving the way globally in microbial efficacy, the trophon automated system has a comprehensive portfolio of efficacy testing in ultrasound probe high level disinfection to help prevent the risk of cross-infection.

Ensuring comprehensive patient protection with trophon's automated high level disinfection system

High level disinfection (HLD) is defined as the complete elimination of all microorganisms except for high numbers of bacterial spores – a small number of which are permitted to remain.

When reprocessing your probes, it's important to choose a HLD system that is proven effective against the widest range of pathogens.

Nanosonics conducts extensive laboratory testing, focused on continually validating the effectiveness of trophon, an automated HLD system for reprocessing intracavity and surface ultrasound probes. Patient safety and reducing the risk of infection is paramount to us and drives our clinical research and testing.

Going far beyond the minimum regulatory requirements, we prioritise having the broadest possible microbial efficacy program.

- trophon inactivates the mandated subset of microorganisms as required by European Standards
- trophon is proven to also eliminate an extended range of clinically relevant infectious pathogens that other HLD products do not, including:*
 - sexually transmitted infections (STIs)
 - *Clostridium difficile* spores
 - drug resistant bacteria



Sexually transmitted infections (STIs)

Ultrasound probes frequently contact body sites where STIs can occur. However, trophon is proven to completely inactivate a range of STI causing pathogens.*

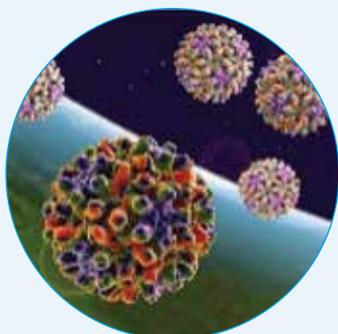


HIV

Human immunodeficiency virus (HIV) is an incurable disease that affects the immune system, impairing its ability to fight disease.

More than 100,000 people in the United Kingdom are estimated to have HIV, with 6,095 new diagnoses and 613 HIV-related deaths reported in 2015.^{2,3}

trophon has been shown to inactivate HIV.

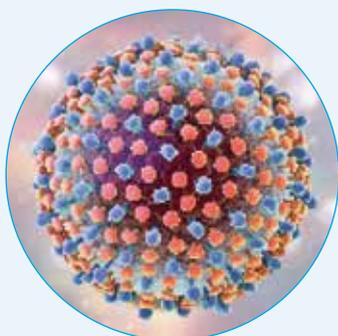


Hepatitis B

Hepatitis B (HBV) infection attacks the liver and can be transmitted through bodily fluids (e.g. during sexual contact).

About 11,708 confirmed hepatitis B cases were reported in England and Wales in 2015, of which 83% were chronic cases.⁴

trophon is effective against hepatitis B.

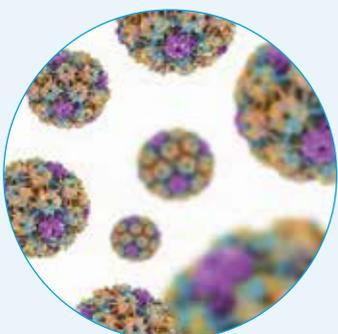


Hepatitis C

Hepatitis C virus (HCV) is a blood borne virus that can cause chronic infection and liver diseases like liver cancer.

It is estimated that more than 15 million people in Europe and 214,000 people in the United Kingdom have chronic hepatitis C infection.⁵

trophon is effective against hepatitis C.



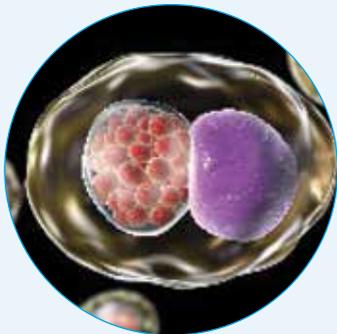
HPV

HPV is one of the most commonly transmitted STIs and can cause cancer in both sexes.^{6,7}

HPV causes 99.7% of cervical cancer cases, 88% of anal cancers, 70% of vaginal cancer cases and 50% of penile cancers.^{7,8} Genital warts (caused by HPV infection) is the second most common STI in England.⁹

trophon is effective against HPV.

Sexually transmitted infections (STIs)

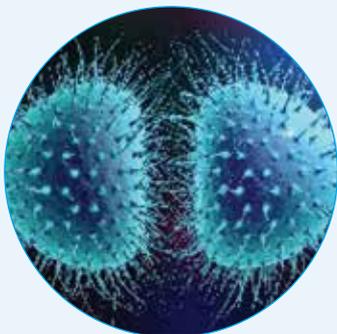


Chlamydia

Chlamydia trachomatis is the most common sexually transmitted infection in the United Kingdom¹⁰ and can result in infertility and ectopic pregnancy.

Chlamydia infections accounted for 46% of all STIs in 2015, with the highest of incidence in young people aged 15-24.¹¹

trophon is effective against *Chlamydia trachomatis*.

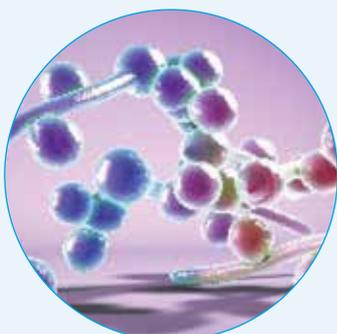


Gonorrhoea

Neisseria gonorrhoea is a sexually transmitted disease that infects both women and men and, if left untreated, can lead to infertility.

Gonorrhoea diagnoses in England decreased between 2015 and 2016 (after a 175% increase from 2008-2015). However sustained transmission is of concern with the recent emergence of antimicrobial resistant strains of *Neisseria gonorrhoea*.¹¹

trophon is effective against *Neisseria gonorrhoea*.



Candida

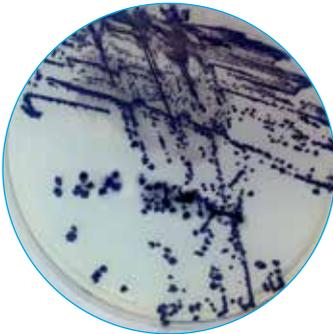
Candida albicans can cause fungal infection in the throat and vagina as well as causing bloodstream infections resulting in high rates of morbidity and mortality.

Candida spp. accounted for 5.5% of ICU-acquired pneumonia and 8.6% of ICU-acquired bloodstream infections in the United Kingdom in 2012.¹²

trophon is effective against Candida infection.

Bacterial spore testing

Bacterial spores are extremely resistant to disinfectants. In addition to achieving HLD, trophon is effective against bacterial endospores including *Clostridium difficile* spores in accordance with European Standards.



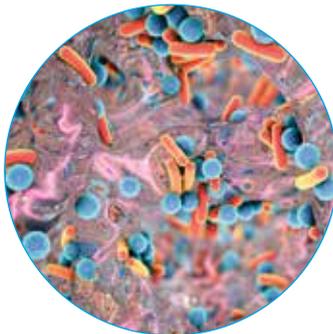
Clostridium difficile

Clostridium difficile is a common hospital acquired infection (HAI), characterised by severe diarrhoea. It is a leading contributor to the HAI burden in our healthcare systems.

In the United Kingdom there were 12,985 reports of *C. difficile* in 2014, with the majority of cases (74.1%) occurring in age groups 65 years and over.¹³

Drug resistant bacteria

Drug resistant bacteria outbreaks in healthcare facilities are a real threat and antibiotics are ineffective against these strains. trophon inactivates these drug resistant bacteria.*

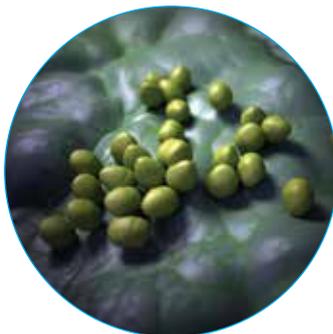


MRSA

Methicillin-resistant *Staphylococcus aureus* (MRSA) is antibiotic resistant and a common cause of many HAIs.

MRSA can cause skin infections and lead to more severe diseases including sepsis, pneumonia and bloodstream infections.

trophon is effective against MRSA.



VRE

Vancomycin-resistant *Enterococci* (VRE) have resistance to one of the last resort antibiotics available.¹⁴

Enterococci reside in the gut and symptoms can be severe. Infection can occur from contaminated healthcare settings.

trophon is effective against VRE.



CRE

Infection with Carbapenem-resistant enterobacteriaceae (CRE) can cause severe morbidity and death.

A wave of CRE outbreaks were associated with duodenoscopes in the USA and Europe between 2013 and 2015 resulting in hundreds of patient deaths.^{15,16}

trophon is effective against CRE.

European Standard testing requirements

trophon is shown to inactivate all the mandated microorganisms with its seven-minute cycle time when tested according to European Standards. trophon exceeds the minimum requirements for HLD.

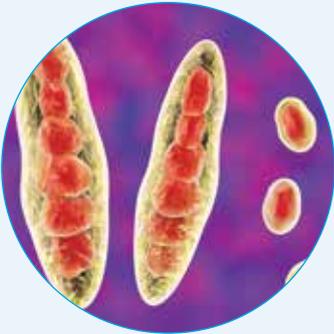


Mycobactericidal

Mycobacteria can cause serious diseases like tuberculosis. HLD should eliminate mycobacteria within contact time.

Mycobacteria have a tough cell wall and are highly resistant to disinfectants.

trophon is effective against mycobacteria.



Fungicidal

Fungi and yeast are opportunistic pathogens and can be highly resistant to disinfection.

They can take advantage of a change in a patient's health (e.g. immunocompromised status). HLD should be effective against fungi.

trophon is effective against fungi and yeast.



Bactericidal

Vegetative bacteria such as *E. Coli* cause a wide variety of infectious diseases in healthcare facilities and in the community.

All HLDs should demonstrate activity against vegetative bacteria for bactericidal efficacy.

trophon is effective against vegetative bacteria.



Virucidal

Viruses (unlike bacteria) require a host for replication. HLD should inactivate enveloped and non-enveloped viruses.

Viruses can survive in the environment or on surfaces for periods of time. They can be transmitted via air, droplets, body fluids and contact with surfaces.

trophon is effective against viruses.

Proven effective against a wide range of microorganisms, you can have confidence in trophon

Full range of organisms trophon has been tested against	
Vegetative bacteria	Fungi
<i>Carbapenam-resistant Escherichia coli</i>	<i>Candida albicans</i>
<i>Enterococcus hirae</i>	<i>Aspergillus niger</i>
Methicillin-resistant <i>Staphylococcus aureus</i>	Viruses
<i>Neisseria gonorrhoea</i>	Adenovirus
<i>Pseudomonas aeruginosa</i>	Hepatitis C virus surrogate (Bovine viral diarrhoea virus)
<i>Staphylococcus aureus</i>	Human hepatitis B virus surrogate (duck hepatitis B virus)
Vancomycin-resistant <i>Enterococcus</i>	Human immunodeficiency virus type 1
Mycobacteria	Human Papillomavirus HPV (HPV16 and HPV18)
<i>Mycobacterium terrae</i>	Polio virus
<i>Mycobacterium avium</i>	Chlamydia
Bacterial endospores	<i>Chlamydia trachomatis</i>
<i>Bacillus cereus</i>	
<i>Bacillus subtilis</i>	
<i>Geobacillus stearothermophilus</i>	
<i>Clostridium difficile</i>	

Surface probes

It's not only intracavity probes which can potentially become contaminated by any of these wide ranging infectious organisms.

Surface probes may come into contact with a patient's broken skin and bodily fluids, and can also become contaminated with blood and microorganisms.



Surface probes are frequently used in semi-critical procedures but often inadequately disinfected^{17,18}

Semi-critical surface probes must undergo HLD. Semi-critical surface probes are used in procedures involving non-intact, broken skin (e.g. dermatitis, wound scanning) and other procedures where the patient defences are compromised.

Surface probes used in emergency and critical care settings are often contaminated with blood and microorganisms.¹⁷ One study found that of the surface probes contaminated with blood, only half the cases were visibly soiled.¹⁷ This may reflect a common assumption that since surface probes will be used only on skin (unlike intracavity probes which will contact mucous membranes), the risk of infection transmission will be low.

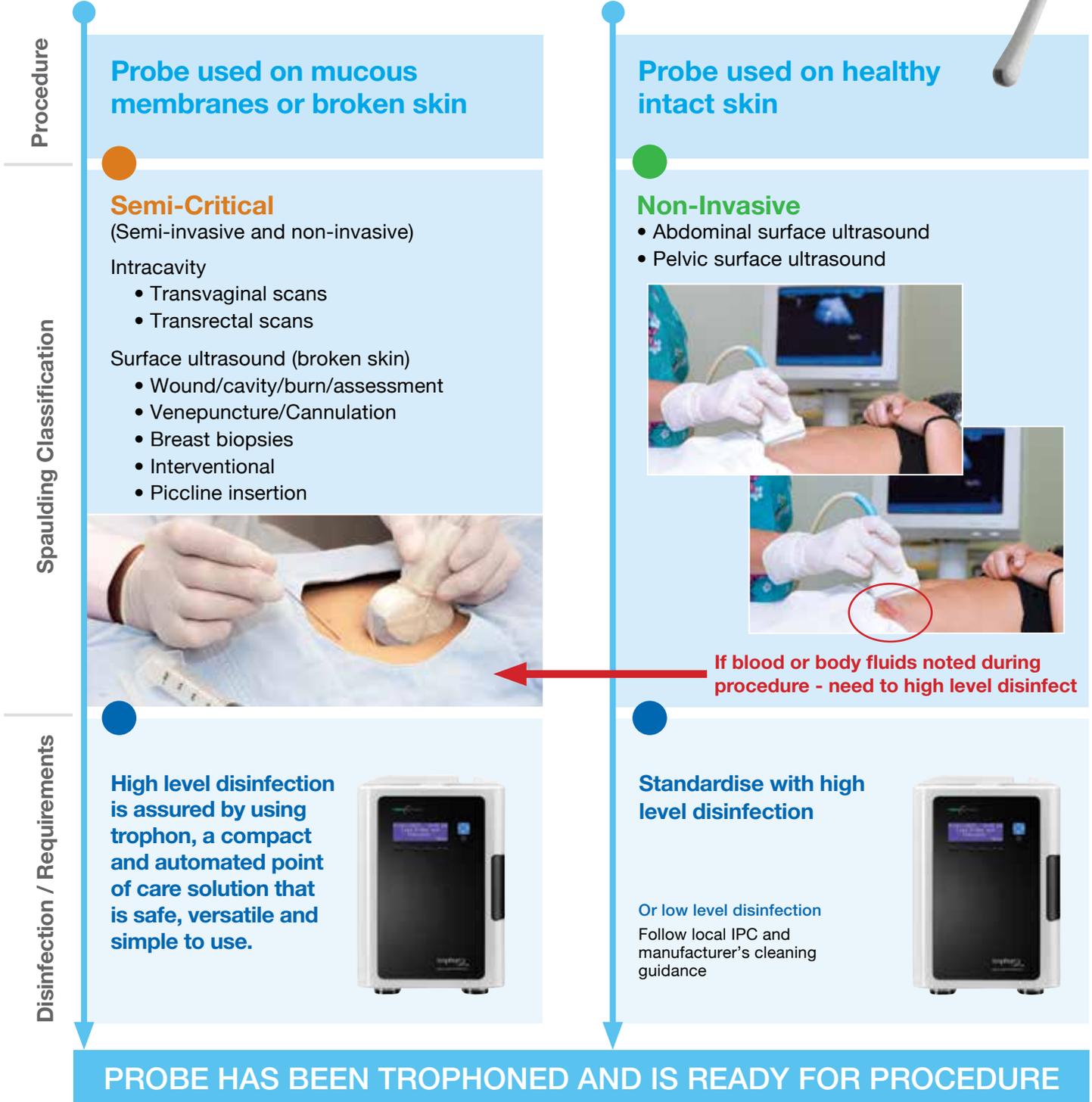
All of these factors can lead to the contamination of probes in clinical practice, resulting in cross infection between patients and even staff.

That's why it's essential to HLD every probe before it is used on the next patient.

When to high level disinfect with trophon® EPR



WHAT PROCEDURE WILL YOUR PROBE BE USED FOR?



If blood or body fluids noted during procedure - need to high level disinfect

trophon complies with all UK guidelines and audit requirements

The importance of high level disinfection

Effective HLD of ultrasound probes is a crucial factor in the fight against the spread of healthcare acquired infections (HAIs).

There can be serious consequences if proper procedures are not followed. Patients have been put at risk of infection due to inadequate cleaning or disinfecting of reusable medical devices – and even death has been associated with improperly reprocessed ultrasound probes.^{19,20}

Local and international guidelines recommend HLD

HLD is advised in Irish, Scottish and Welsh guidelines as the minimum standard in ultrasound probe reprocessing for intracavity probes that contact mucous membranes.²¹⁻²³

Additionally, the Irish and Scottish guidelines advise HLD for non-invasive probes that are used on broken skin.

Furthermore, these guidelines state that HLD using a manual multi-wipe system is the least preferred option for decontaminating semi-invasive ultrasound probes.

In the United States, the Food and Drug Administration (FDA) requires that a reusable medical device be properly reprocessed between patients to prevent the risk of infection. The Center for Disease Control (CDC) recommend HLD as the minimum standard in ultrasound probe reprocessing for semi-critical procedures.

Furthermore, the American Institute of Ultrasound Medicine (AIUM) and the Association for the Advancement of Medical Instrumentation (AAMI) Standards now recommend HLD between patients to reduce the risk of cross contamination.

Financing options to suit all budgets

Whatever your budget, you can experience first-hand the ease of using trophon's automated high level disinfection system in your health facility as Nanosonics has different financing options to suit all budgets. In no time at all, your health facility and patients could be enjoying the benefits of trophon which is setting new standards of care and reassurance in global ultrasound probe disinfection and efficacy.

Contact Nanosonics for a free demonstration

01484 860581

Discover more about trophon by visiting
www.nanosonics.co.uk

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Nanosonics is a global innovator in infection prevention. Our unique, automated trophon high level disinfection device is setting a new global standard of care in ultrasound probe disinfection practices. trophon effectively addresses a range of issues associated with traditional methods and offers a breakthrough solution across three core areas: Safety, Versatility, and Simplicity. Nanosonics is headquartered in Sydney, Australia with a highly experienced team of professionals dedicated to providing the best in infection prevention technology.

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Protect your patients with trophon, the automated high level disinfection system for ultrasound reprocessing.



Nanosonics prioritises having the broadest possible microbial efficacy program.

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