

trophon: maximizing safety by minimizing chemical exposure

- Chemistry supplied sealed and ready to use
- Minimal vapour emitted
- Minimal residuals on probe
- No requirement for eye wash stations
- Environmentally neutral waste products

Risk of chemical exposure from bulk liquid disinfection

trophon: the POC solution for ultrasound



trophon®: minimizing chemical exposure for safety at point of care (POC)

trophon® is a state of the art point of care (POC) high level disinfection (HLD) device for ultrasound probes. Ultrasound probes are often high level disinfected in a centralized location in the hospital setting outside of the patient examination room. This is partly attributed to the chemical exposure risks associated with disinfection using bulk liquid disinfectants, such as glutaraldehyde (GTA) and *ortho*-phthalaldehyde (OPA).

Risk of chemical exposure from bulk liquid disinfection

Disinfection with bulk liquid chemicals such as aldehydes are toxic and reprocessing rooms require installation of ventilation, eye wash stations and sinks limiting their POC use.

Toxicity is possible from both direct contact with the chemical and vapour inhalation. There have been several reports of anaphylaxis in patients following cystoscopy where the medical device was reprocessed using OPA.^{1,2} Bronchial asthma and dermatitis can also be triggered by occupational OPA exposure.³ OPA exposure has been shown to have detrimental effects on embryo development during toxicity testing for *in vitro* fertilization programs.⁴

One study found a 39% increased risk of spontaneous abortion with occupational exposure to sterilizing agents like GTA and formaldehyde.⁵ The CDC guidelines recognize and discuss the risks of anaphylaxis from OPA exposure.⁶

The risk of chemical exposure during bulk liquid disinfection is high from preparation of the chemical, to reprocessing of the probe through to waste disposal once the chemistry expires. The manual nature of this workflow increases the likelihood of direct contact and vapour inhalation by reprocessing staff.

trophon: maximizing safety by minimizing chemical exposure

trophon is a POC alternative to centralized ultrasound probe

**USA & Canada
Nanosonics, Inc.**

7205 E 87th Street, Indianapolis,
IN 46256 USA T: 1-844-TROPHON
1-844-876-7466
E: info@trophon.com



disinfection with bulk liquid disinfectants. trophon has been tested and validated with safety and design features to ensure patients and staff are at minimal risk of chemical exposure.

- **Chemistry supplied sealed and ready to use**

trophon does not require mixing or dilution of disinfectant chemicals. The 35% hydrogen peroxide is ready for use and sealed inside a chemically resistant cartridge (Sonex). The cartridge is punctured only when correctly inserted and sealed inside trophon. There is no user interaction with the cartridge until the bottle is empty and needs to be replaced.

- **Minimal vapour emitted**

trophon is a closed disinfection system and there is minimal risk of hazardous exposure to hydrogen peroxide vapour during or after the disinfection cycle. Extensive leak testing has been performed in various conditions as well as risk assessments to demonstrate the operator and patient are at minimal risk of unsafe hydrogen peroxide vapour exposures defined by the Occupational Safety and Health Administration (OSHA).^{7,8}

- **Minimal residuals on probe**

A large range of both surface and intracavity probes have been tested for hydrogen peroxide

residuals after the trophon disinfection cycle using an internally validated test methodology.⁹ This testing is conducted to ensure the probe is safe for use on patients without putting them at risk of chemical exposure during an examination. For an extra margin of safety, the trophon IFU specifies wiping the probe with a low lint cloth after each cycle.

trophon is designed to ensure the patient and sonographer are not at risk of chemical exposure. The sealed Sonex cartridge and overall closed disinfection design ensures there is minimal risk of chemical splashing. System checkpoints ensure the disinfection cycle does not commence until the Sonex is inserted correctly and the chamber is sealed. In its letter of interpretation OSHA states that *"If hazardous materials are present at a worksite in such a way that exposure could not occur (for example, in sealed containers that will not be opened, or caustic materials in building piping), then an eyewash or emergency shower would not be necessary."*¹⁰



- **No requirement for eye wash stations**

Eye wash stations are not required for trophon at POC. Institutional policy may however require that eye wash stations be installed.

- **Environmentally neutral waste products**

trophon produces water and oxygen gas as by-products and the liquid waste is collected in the waste drawer located inside the device. The operator

is notified when the waste drawer needs to be emptied. This is easily done by donning gloves, removing the drawer and emptying the contents into any sink. The waste drawer has minimal volume and the operator is not at risk of injury or chemical exposure commonly associated with disposal of large volumes of bulk liquid disinfectants.

trophon: the POC solution for ultrasound

trophon has been engineered with POC use in mind to provide a workflow solution for sonographers managing the time and resource constraints of centralized reprocessing with bulk liquid disinfectants. The ability of trophon to minimize the risk of chemical exposure forms an integral part of its engineering to ensure compatibility with and safety at POC.



References: 1. Sokol WN. Nine episodes of anaphylaxis following cystoscopy caused by Cidex OPA (*ortho*-phthalaldehyde) high-level disinfectant in 4 patients after cystoscopy. *The Journal of Allergy and Clinical Immunology*. 2004;114(2):392-7. 2. Cooper DE, White AA, Werkema AN, Auge BK. Anaphylaxis following cystoscopy with equipment sterilized with Cidex OPA (*ortho*-phthalaldehyde): a review of two cases. *Journal of Endourology / Endourological Society*. 2008;22(9):2181-4. 3. Fujita H, Ogawa M, Endo Y. A case of occupational bronchial asthma and contact dermatitis caused by *ortho*-phthalaldehyde exposure in a medical worker. *Journal of Occupational Health*. 2006;48(6):413-6. 4. Ackerman SB, Stokes GL, Swanson RJ, Taylor SP, Fenwick L. Toxicity testing for human *in vitro* fertilization programs. *Journal of In Vitro Fertilization and Embryo Transfer: IVF*. 1985;2(3):132-7. 5. Lawson CC, Rocheleau CM, Whelan EA, Lividoti Hibert EN, Grajewski B, Spiegelman D, et al. Occupational exposures among nurses and risk of spontaneous abortion. *American Journal of Obstetrics & Gynecology*. 2012;206(4):327 e1-8. 6. Centers for Disease Control (CDC). Guideline for Disinfection and Sterilization in Healthcare Facilities. CDC; 2008. 7. United States Department of Labour Occupational Safety and Health Administration (OSHA). Hydrogen Peroxide: https://www.osha.gov/dts/chemicalsampling/data/CH_246600.html (Accessed February 2017). 8. Internal leak test reports. 9. Internal hydrogen peroxide residual reports. 10. United States Department of Labour Occupational Safety and Health Administration (OSHA). Response to letter June 1, 2009 regarding standard numbers 1910.151 and 1910.151(c): https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=27089. (Accessed February 2017).