

Summary: Efficacy of trophon® EPR against high-risk human papilloma virus

Ryndock E, Robison R, Meyers C. 2015. Susceptibility of HPV16 and 18 to high level disinfectants indicated for semi-critical ultrasound probes. *J Med Virol. Publi  en ligne.*

Human papillomavirus (HPV) is the causative agent of cervical cancer and plays an important role in anogenital and oropharyngeal cancers. Strains HPV16 and HPV18 are associated with the majority of HPV induced tumours. Residual HPV virus has been found on intracavity ultrasound probes following routine use in hospitals.¹⁻³ It is paramount that high level disinfectants used to reprocess these probes and other semicritical items eradicate all residual HPV virus along with other disease causing pathogens.

Glutaraldehyde (GTA) and ortho-phthalaldehyde (OPA) are ineffective against HPV

Professor Craig Meyers from Pennsylvania State University and Professor Richard Robison from Brigham Young University developed a novel method to produce natural, infectious HPV. In 2014, the researchers were the first to show that glutaraldehyde (GTA) and ortho-phthalaldehyde (OPA), two common high level disinfectants, were unable to inactivate HPV in a 45 min liquid suspension test.

Nanosonics' trophon® EPR shown to be only HLD system that inactivates HPV

In this latest study, the researchers used a surface carrier test according to FDA testing requirements, to confirm the OPA finding and additionally demonstrate that the automated trophon EPR system using sonically activated 35% hydrogen peroxide was able to fully inactivate HPV. Both disinfectants were used according to manufacturer instructions for high level disinfection.

Test method

The FDA approved carrier test methodology involves drying over 10,000 infective units in 5% serum onto a 50 x 3 mm circular disc made of a plastic typically used in ultrasound transducer construction. Spreading the virus over the carrier surface models contamination of an ultrasound probe. For liquid disinfection, the disinfectant was added to the surface of the virus-coated carrier and incubated at room temperature according to manufacturer instructions. For the automated device, carriers were transferred to a rack, which was suspended in the disinfection chamber and the disinfection cycle run according to manufacturer instructions (35% hydrogen peroxide) and at a reduced 31.5% hydrogen peroxide concentration. After disinfection, carriers were washed to collect remaining HPV virus which was tested for infectivity.

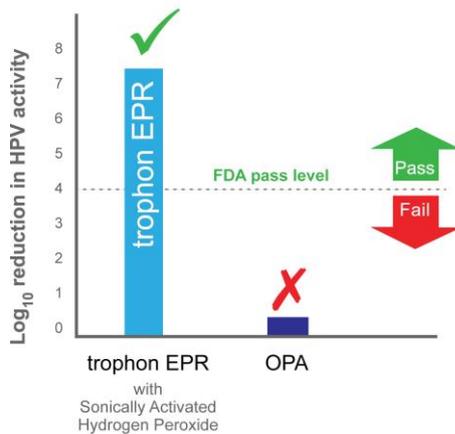
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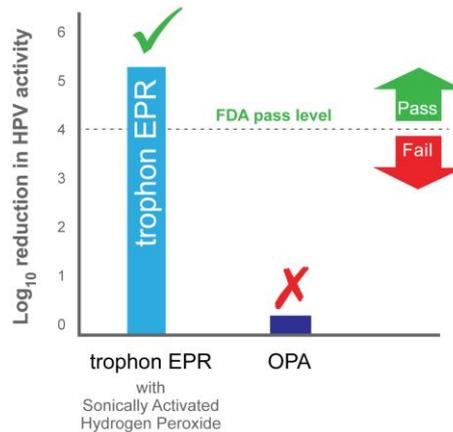
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Efficacy against HPV16



Efficacy against HPV18



Adapted from Susceptibility of high-risk human papilloma virus type 16 and 18 to high level disinfectants indicated for semi-critical ultrasound probes⁵

The trophon EPR achieved >4 log₁₀ reduction and complete inactivation of both HPV16 and HPV18 when used with 35% hydrogen peroxide (see above graphs). OPA only achieved a <1 log₁₀ reduction of HPV and therefore did not pass the FDA criteria. This is of concern as OPA is currently widely accepted as a high level disinfectant and is used to reprocess semi-critical items including intracavity ultrasound probes.

The trophon EPR is the only high level disinfection system that is shown to destroy natural, infectious HPV using FDA approved testing. The findings suggest that a review of probe reprocessing methods and disinfection standards as related to HLD may be warranted

Results are specific to the trophon device

Caution. These results should not be generalized to other disinfection chemistries, contact times and concentrations. The sonicated hydrogen peroxide used in the trophon device is delivered as nebulized hydrogen peroxide mist, so is not directly comparable to liquid or vapor phase hydrogen peroxide.

References

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