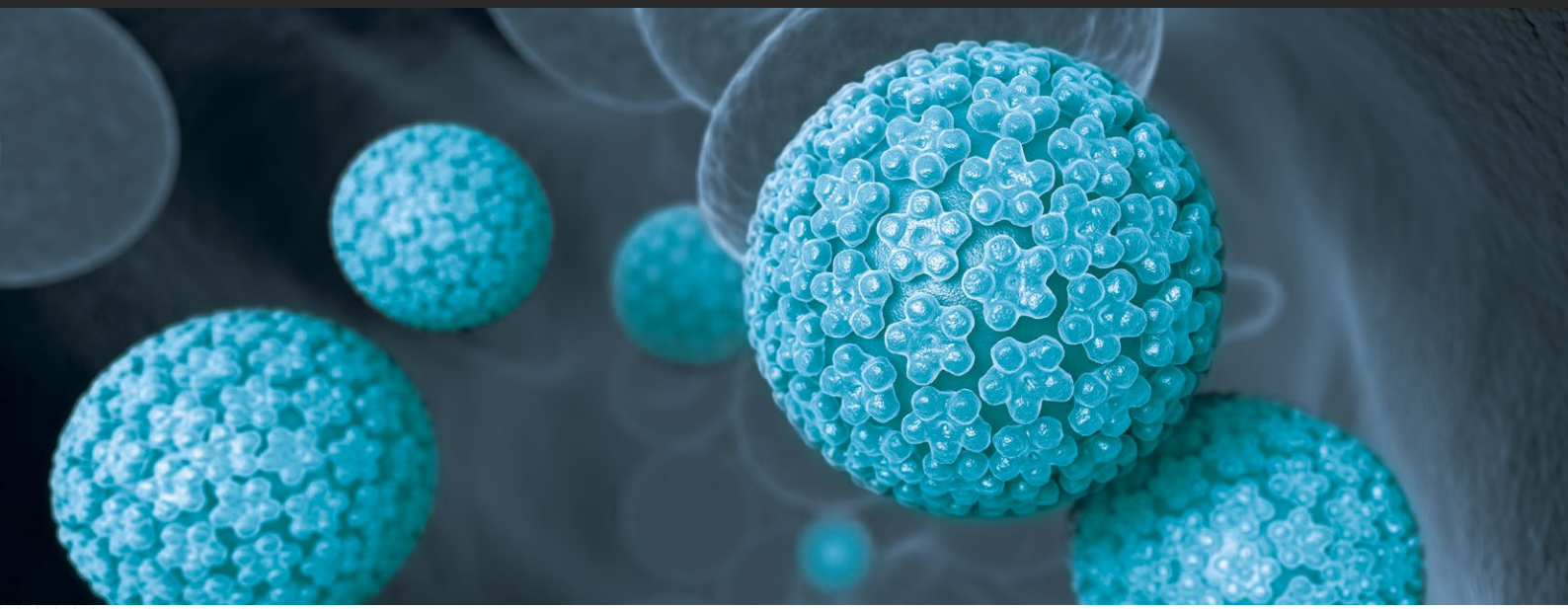
Human Papillomavirus (HPV) risk and challenges

Germitec

HPV RESEARCH IN A CLINICAL USE TEST



The aim of this study was to determine if UV-C disinfection is efficient in routine clinical conditions, especially against HPV.[1]

The study also aimed to compare two protocols usually found in infection prevention practice of endocavity ultrasound probes. The simple protocol consisted of performing LLD with a chemically impregnated wipe on a probe used with a disposable cover. The more rigorous protocol consisted of performing HLD on a visibly clean probe.

The three-step study evaluated ultraviolet-C (UV-C) efficacy against human papillomavirus (HPV) found on vaginal ultrasound probes.

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1ST PHASE:
The probe (n = 100) was sampled after a complete cleaning and disinfection protocol, i.e., cleaning with chemically impregnated wipes, followed by UV-C.

2ND PHASE:
The probe (n = 47) was sampled after cleaning and UV-C.

3RD PHASE:
The final step consisted of applying HPV positive clinical samples on a covered probe (n = 15) then sampling the cover, the probe after removal of the cover, after cleaning, and after UV-C.

Results showed the following outcomes:

1ST PHASE:
No probe (n = 100) was found positive for HPV or human cellular DNA after UV-C HLD (AS1)

2ND PHASE:
All 47 probes covers were intact (no visible damage) and positive for human and HPV DNA. After probe cover removal and wipe-based cleaning, eight probes were positive for human or viral DNA (seven probes with human DNA and one with a high-grade HPV-51). After UV-C disinfection, all probes were found to be negative. The HLD procedure was found to be statistically more efficient than LLD (seven contaminated probes versus no contaminated probe, $p < 0.05$).

3RD PHASE:
All 15 probe covers were intact and found positive for human DNA and HPV DNA. After probe cover removal, one probe was positive for high-risk HPV 16. This HPV contamination remained after LLD but was eliminated with AS1 disinfection applying HPV positive clinical samples on a covered probe (n = 15) then sampling the cover, the probe after removal of the cover, after cleaning, and after UV-C.

Nature of remaining DNA	Chemical Disinfection	Ultra-Violet Disinfection	p-Value
Human DNA	**7/47 (14.9%)**	**0/47 (0%)**	**0.0123**
HPV DNA	**1/47 (2.1%)**	**0/47 (0%)**	**NS**

Overview

- The study took place in a high-turnover gynaecological practice (12,000 emergency consultations with 8,000 vaginal ultrasound examinations annually) in a specialized university hospital.
- It was the first to evaluate UV-C disinfection efficacy against HPV in real conditions when the UV-C system is run within a short time cycle (90 seconds).
- The results of this study indicated that UV-C can be used to ensure patient safety during ultrasound examinations
- The second and third parts confirmed that the LLD procedure alone is unsafe but when using a HLD method such as UV-C that can reliably inactivate HPV. This method is strongly recommended to ensure patient safety.
- The benefit of using the UV-C system, as this system is easy to use, effective, safe to the user, and faster than other decontamination systems.
- The study highlighted the need for standardised solutions that include HPV.

Conclusion

UV-C has been confirmed as a relevant and easily adaptable solution to the healthcare environment.[1]

Reference: 1. Maxime Pichon, Karine Lebail-Carval, Geneviève Billaud, Bruno Lina, Pascal Gaucherand and Yahia Mekki (2019) Decontamination of Intravaginal Probes Infected by Human Papillomavirus (HPV) Using UV-C Decontamination System. J. Clin. Med, 8, 1776; doi:10.3390/jcm8111776.

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