

Effectiveness of Sterilisation Techniques



Steam sterilisation proved to be the most effective and had the largest margin of safety when compared to low-temperature sterilisation technologies, increasingly required for plastic tools, a recent study [published](#) in *Infection Control & Hospital Epidemiology* shows.

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Researchers at the University of North Carolina at Chapel Hill set out to compare the microbicidal activity of steam sterilisation to three low-temperature sterilisation technologies, namely vaporised hydrogen peroxide (VHP), ethylene oxide (ETO) and hydrogen peroxide gas plasma (HPGP).

Stainless steel test carriers, which simulated surgical tools, were soiled with salts and serum and inoculated with common bacteria found in healthcare settings, such as *Pseudomonas aeruginosa*, *Escherichia coli*, *Staphylococcus aureus*, vancomycin-resistant *Enterococcus*, *Mycobacterium terrae*, *Bacillus atrophaeus* spores, *Geobacillus stearothermophilus* spores, or *Clostridioides difficile* spores. The carriers then were subjected to four sterilisation technologies: steam, VHP, ETO and HPGP.

The results showed that VHP had the highest failure rate of 76.3% (206 of 270), and salt was the main interfering component. Sterilisation with steam, ETO and HPGP inactivated the test organisms on the carriers much more efficiently. Steam sterilisation, which is most common technique applied for heat-resistant instruments, had no failures (0 of 220). For both ETO and HPGP, the failure rate was 1.9% (6 of 310 and 5 of 270 cases respectively).

The authors underscore the importance of proper precleaning of surgical instruments in cases when sterilisation relies on low temperature processes, such as VHP, to ensure that tools are thoroughly and optimally sterilised.

References

Rutala W et al. (n.d.). Comparative evaluation of the microbicidal activity of low-temperature sterilization technologies to steam sterilization. *Infection Control & Hospital Epidemiology*, 1–5.

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