

AB059. SOH21AS247. Powered air purifying respirator (PAPR) use during surgical interventions: a clinical trial

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Background: Healthcare team safety has been spotlighted by the COVID-19 pandemic with increased awareness of perioperative aerosolisation hazards. Powered air purifying respirators (PAPR) provide increased protection over other masks/respirators and have been used empirically in healthcare settings. However, there is a lack of independent evaluation of their appropriateness for surgery. Following satisfactory preclinical, graded user assessment, a clinical study (IRB: AEROSOLVE 1/378/2172) was performed for this purpose using a PAPR system (VersaflowTR-300)

Methods: Microbiological safety assessment (settling-plate testing) was performed during simulation surgery prior to clinical use. Subsequently 25 users (anaesthesiologists, nurses, and surgeons) wore PAPR perioperatively during 5 general surgery operations, of ~1-hour duration, on COVID-screened patients. Usability was evaluated both subjectively, by validated and previously used questionnaires assessing thermal sensation, comfort, effort of breathing, effort of listening and communication, and objectively, through independent observation.

Results: Microbiological assessment confirmed PAPR usage compatibility within the acceptable limits for safe surgery. All procedures were performed satisfactorily without PAPR rejection or sterility breach. Mean usability scores were

acceptable with only listening effort significantly differing by group (surgeons suffered most impact, $P=0.024$, Kruskal-Wallis, $P=0.017$ and $P=0.022$, Mann Whitney U, *vs.* anaesthetists and nurses respectively). Narrative feedback provided insights re visual (loss of peripheral vision with episodic obstruction of the assistants view by the primary operator) and au

Conclusions: PAPR are usable, with care and some compromise, during surgery although scope exists for further technical optimisation, especially to aid communication and accommodate specific tasks (e.g., stethoscopy).

Keywords: Aerosols; COVID-19; laparoscopic surgery; powered air purifying respirators

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Footnote

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Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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