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Study Confirms Forced-Air Warming Safety

Authors conclude patient warming's "gold standard" does not disrupt laminar flow in ORs

The use of forced-air warming to maintain patient normothermia and help prevent surgical site infections (SSIs) and other complications does not disturb laminar air flow in operating rooms or compromise the protection of the surgical site, a newly published study has concluded.¹

“The addition of this research to the significant body of existing science should leave no doubts regarding the safety of forced-air warming when used in laminar flow conditions,” said Bob Buehler, Vice President of 3M’s Patient Warming business. “While makers of competing technologies continue their efforts to deceive health care practitioners and disrupt our business, we will rely on the evidence and our 24-year history of safe, effective care to speak on our behalf.”

This is excellent news for orthopedic surgeons, a group especially vigilant about contaminants entering the surgical site. They often perform surgery in suites equipped with laminar air flow ventilation systems. Laminar air flow is designed to reduce airborne bacteria that may cause SSIs by dispensing highly filtered air over the surgical field.

At least six independent, peer-reviewed studies have demonstrated that forced-air warming does not increase bacteria dispersion near the patient.²⁻⁷ In fact, independent randomized control studies have shown that perioperative temperature management with forced-air warming actually decreases SSI risk^{8,9} in patients.

A peer-reviewed study published online ahead of print by *Anesthesia & Analgesia* extends those results by showing that forced-air warming systems do not impair operating room air quality, with or without laminar flow ventilation.¹

The authors evaluated the effect of forced-air warming on laminar air flow performance in class 1a operating rooms at two hospitals in the Netherlands. The testing methodology met a rigorous European standard, DIN 1946-4:2008-12, that includes quantitative testing of particle counts and was conducted by an independent organization.

Two forced-air warming blankets were tested: a 3M™ Bair Hugger™ model 522 upper-body blanket and a 3M Bair Hugger model 635 underbody blanket. At the same time, the concentration of particles at the surgical site was assessed at a test point just above the volunteer’s abdomen. Use of the 3M Bair Hugger blankets caused no statistically significant difference in particle counts, regardless of whether the forced-air warming unit was set to off, ambient air or high heat settings.

In all cases, the particle concentration at the test point was reduced 3-log to 5-log (1,000x to 100,000x) compared to background particulate levels in the room. This far surpassed the 2-log reduction required by the European performance standard.

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The authors also deployed a vapor generator to assess airflow patterns above the patient with the forced-air blower set to high and the laminar flow system activated. Neither the forced-air warming blanket nor the forced-air blower generated upward air that interfered with the normal unidirectional stream of the laminar air flow system.

The study's conclusions align with published computational fluid dynamic models that show the downward stream of laminar air flow effectively reduces particle concentrations around the operative site.¹⁰

The authors conclude by confirming that, "activation of forced-air warming does not reduce operating room air quality, even during laminar flow ventilation."¹¹

About Arizant Healthcare Inc., a 3M company

Arizant Healthcare Inc., headquartered in Eden Prairie, Minn., is the maker of surgical patient temperature management systems including 3M™ Bair Hugger™ therapy, the 3M™ Bair Paws™ patient adjustable warming system, and the 3M™ Ranger™ blood and fluid warming systems. Arizant created the category of forced-air warming, which is the preferred method of warming surgical patients in the U.S.

About 3M Infection Prevention Division

The 3M Infection Prevention Division is on a mission to provide health care professionals solutions to minimize the risks of health care-associated infections. Combining science and technology, 3M has introduced more than 40 distinct technology platforms and a comprehensive portfolio of quality products that help the healthcare industry define and address current infection prevention best practices. With its system of people, products and process, 3M Infection Prevention remains a trusted partner committed to helping customers lead the way in controlling the risk of infection. For more information, please visit www.mmm.com/infectionprevention.

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