

Patient warming systems may affect ventilation in OR, study suggests

July 24 2013

Forced-air systems used to keep patients warm during surgery may affect the performance of operating room (OR) ventilation systems—potentially increasing exposure to airborne contaminants, reports a study in the August issue of *Anesthesia & Analgesia*, official journal of the International Anesthesia Research Society (IARS).

By comparison, conductive [warming](#) systems don't disrupt [ventilation](#) airflows over the surgical site, according to the report by Dr Kumar G. Belani of University of Minnesota and colleagues. But an accompanying editorial notes that there's not yet enough evidence to change current practice with regard to patient warming in the OR.

Patient Warming Affects OR Ventilation Airflow The researchers compared the effects of two different types of patient warming systems on airflow in the OR. Modern ORs use "sophisticated ventilation systems to create localized zones of highly filtered air over the surgical site," according to Dr Belani and coauthors.

For the experimental study, the researchers set up an OR as for knee replacement surgery, using a mannequin. They then assessed the performance of the OR ventilation system using "neutrally buoyant detergent bubbles," which made it possible to visualize airflow patterns under different conditions.

Airflow was compared using a forced-air warming system, which distributes heated air under the surgical drapes and over the patient; and

a conductive warming system (such as heated water blankets), which applies direct heat to the patient's skin.

Forced-air warming "generated hot air convection currents that mobilized bubbles over the anesthesia site and into the surgical site," Dr Belani and colleagues write. The average "bubble count" in the simulated surgical field was more than 100 with the forced-air warmer, compared to about 0.50 with a conductive warming system.

The convection currents created by the forced-air system drew air from under the surgical drapes and into the surgical site. The concern is that this could mobilize bacteria or other contaminants from nonsterile areas, or interfere with the ventilation system's ability to clear contaminants from the [surgical site](#).

Too Early to Assume Increased Infection Risk? The use of "downward displacement" OR ventilation systems had previously been shown to reduce exposure to microbes and infection rates during certain types of surgery. But more recent studies have found no reduction in infection rates. The new study was designed to test whether forced-air warming systems—a relatively recent introduction to ORs—could be affecting ventilation performance.

The results suggest that forced-air patient warming systems may indeed affect airflows in the OR, potentially increasing exposure to bacteria and other contaminants during surgery. Dr Belani and coauthors conclude, "These findings warrant future research into the effects of forced air warming excess heat on clinical outcomes during contamination-sensitive surgery."

In the editorial, Drs Charles Weissman and W. Bosseau Murray note that the findings provide only indirect evidence of potential infection risk, in a simulated setting. That's in contrast to the known benefits of

preventing drops in body temperature during surgery. Pending further research, Drs Weissman and Murray write, "The prudent course...might be to continue with the presently proven successful warming therapies, but keep an open mind about the possible future need to change practice."

More information: www.anesthesia-analgesia.org/content/117/2/406.full

Provided by Wolters Kluwer Health

Citation: Patient warming systems may affect ventilation in OR, study suggests (2013, July 24) retrieved 8 April 2024 from <https://medicalxpress.com/news/2013-07-patient-affect-ventilation.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--