New ECRI Guidance Expresses "Concern" About Forced-Air Warming in Implant Surgery

In the latest issue of Health Devices, ECRI Institute analyzed the safety of forced-air patient warming, concluding that thermal currents are "particularly worrisome" in implant surgery. Dr. Scott Augustine, inventor of both Bair Hugger and (air-free) HotDog patient warming and CEO of Augustine Temperature Management, comments.

Minneapolis, MN (PRWEB) April 17, 2013 -- After reviewing multiple published, peer-review articles addressing the consequences of the convection currents created by the waste heat produced by forced-air devices, ECRI stated:

- "The disruption of air-flow patterns is particularly worrisome in laminar-flow and ultraclean ORs, in which a wide variety of implant surgeries are performed."

- "This is especially concerning during orthopedic surgeries because contamination of the surgical site may present a greater risk of developing a PJI, which is harder to treat and resolve than would be the case with SSIs in general."

ECRI declined to advise hospitals to discontinue using forced-air warming during all surgery, stating the "currently available evidence" is insufficient to require such action. ECRI specifically noted that it chose not to consider a study by U.K. orthopedic surgeon P.K. McGovern published in the Journal of Bone & Joint Surgery, that showed a 74% reduction in joint-implant infections after forced-air warming was discontinued because, among other reasons, the study was retrospective and performed at a single institution. The McGovern study, ECRI stated, was "not conclusive." ECRI assured its subscribers that it would continue to monitor published literature and update its recommendation as warranted.

"Given ECRI's decision not to consider the McGovern study," said Dr. Scott Augustine, inventor of market-leading Bair Hugger forced-air warming as well as air-free HotDog patient warming, "I believe that they gave their subscribers as much of a warning as they could."

ECRI reviewed more than 180 studies in its analysis. Among those reviewed are studies that established the following:

- Forced-air warming creates convection currents that capture particles below the surgical table, lifting them into the sterile surgical field. 2,000 times more contaminant particles were found in the air over the wound with Bair Hugger warming than with air-free HotDog conductive warming. With HotDog warming, only 1,000 particles per cubic meter of air were present. With Bair Hugger warming, the particle count was 2,174,000 per cubic meter, an increase of 217,300% (Legg, B&JJ 2013)
- Forced-air warming generates convection current activity in the vicinity of the surgical site. "The clinical concern is that these currents may disrupt ventilation airflows intended to clear airborne contaminants from the surgical site" (Desari, Anaesthesia 2012).
- Excess heat from forced-air warming escaped near the floor and generated convection currents that mobilized floor air, causing it to rise between the surgeon's body and the operating table, transporting contaminated floor-level air upwards and into the surgical site (McGovern, JBJSb 2011)
- "The direct mass-flow exhaust from forced-air warming generated hot-air convection currents that

mobilized [particles] over the anesthesia drape and into the surgical site." (Belani A&A 2012)

ECRI also alerted its subscribers to product liability litigation that has been filed against 3M and Arizant Healthcare, manufacturers of Bair Hugger patient warming. Although ECRI concluded that the complaint contained no new information, it provided its subscribers with a link to the plaintiff's attorney's website.

"ECRI has done orthopedic implant patients a great service, " said Dr. Augustine. "Every joint infection is a disaster—both for the patient and the system. The process is horrific: ex-plant the joint, prolonged hospitalization, 6-8 weeks of IV antibiotics and then—assuming no amputation—re-implant the joint. The average cost is around $100,000."

More than 12,000 of these infections occur each year in the US, a rate that some see as a significant public health problem.

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ECRI subscribers may access this article at https://www.ecri.org

Citations to studies regarding the safety of forced-air warming:

Albrecht M, Leaper D et al. Forced-air warming blowers: An evaluation of filtration adequacy and airborne contamination emissions in the operating room. Am J Infect Control 2011;39:321-8.

Belani et al. Patient warming excess heat: The effects on orthopedic operating room ventilation performance. Anesthesia & Analgesia 2012;X:X (prepublished online).

Dasari et al. Effect of forced air warming on the performance of operating theatre laminar flow ventilation. Anaesthesia 2012;67:244-249.

Leaper D et al. Forced-air warming: a source of airborne contamination in the operating room? Orthopedic Rev. 2009;1(2):e28.

Legg, A.J. and Hamer, A.J. Forced-air patient warming blankets disrupt unidirectional airflow. Bone and Joint Journal, March 2013 vol. 95-B no. 3 407-410

McGovern et al. Forced-air warming and ultra-clean ventilation do not mix. J Bone and Joint Surg-Br. 2011;93(11):1537-1544.

About ECRI Institute
For 45 years, ECRI Institute, a nonprofit organization, has been dedicated to bringing the discipline of applied scientific research to discover which medical procedures, devices, drugs, and processes are best, all to enable subscribers to improve patient care. As pioneers in this science, ECRI prides itself in having the unique ability to marry practical experience and uncompromising independence with the thoroughness and objectivity of evidence-based research.

ECRI has been designated an Evidence-Based Practice Center by the U.S. Agency for Healthcare Research and Quality and listed as a federal Patient Safety Organization by the U.S. Department of Health and Human

Services. Its more than 5,000 member and client list includes hospitals, health systems, public and private payers, U.S. federal and state government agencies, ministries of health, associations, and accrediting agencies worldwide.

About HotDog® Patient Warming
The HotDog patient warming system is a state-of-the-art, conductive fabric temperature management solution that prevents and treats perioperative hypothermia. Used in some of the most prestigious hospitals in the world, HotDog patient warming is an air-free system that is effective and safe even in ultra-clean surgeries.

Dr. Scott Augustine invented the patient warming field, when he pioneered forced-air warming 25 years ago. Since then, hundreds of millions of patients have received the benefits of normothermia during surgery. Due to concerns with patient safety in ultra-clean surgeries, Dr. Augustine and his team of engineers sought created an alternative warming solution to meet the needs of the healthcare community. HotDog is produced by Augustine Temperature Management.

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