

## **Effect of Heated-Air Blanket on the Dispersion of Squames in an Operating Room**

Expert Report of Said Elghobashi

Professor Elghobashi used a high fidelity, large eddy simulation (LES) to study the interaction of the operating room ultra-clean ventilation air flow and the flow created by Bair Hugger® forced air warming and its impact on the dispersion of squames particles.

### ***Key Findings:***

- “Drastic differences in the trajectories of the squames are observed between the blower-off and blower-on cases. With the blower-off, the majority of the squames are dispersed by the ventilation air flow towards the outlet grilles. None of the squames actually rise to the level of the side tables or the [Operating Table] (OT). In contrast, with the blower-on, a large number of squames are lifted upwards by the rising thermal plumes. Some of the squames are lifted above the surgeons heads and are blown towards the OT by the downward moving ventilation air. Large number of squames are seen to be above the OT, several are surrounding the surgeons hands, above the side tables, and some are very close to the patient’s knee and the surgical site.” (Pg. 63)
- “[T]he hot air from the blower and the resultant thermal plumes are capable of lifting the particles and transporting them to the side tables, above the operating table, and the surgical site.” (Pg. 63)
- “[I]f we also include the repetitive motion of the surgeons, the motion of medical assistants to fetch the surgical instruments placed on the side tables, and the resulting suspended squames shed by all staff in the OR, then the probability of dispersing the squames to the surgical site will be increased even further.” (Pg. 63)

Filed: *In re Bair Hugger Forced Air Warming Products Liability Litigation*. MDL No. 15-2666 (JNE/FLN)

Professor Elghobashi is an expert in highly sophisticated Computational Flow Dynamics (CFD) computer modeling. He is a distinguished professor of Mechanical and Aerospace Engineering at the University of California, Irvine.