

3M/Bair Hugger Safety Study: Intentional Deception

(<https://www.youtube.com/watch?v=xPHGWsp2NGU>) or (FAWFacts.com)

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Background

3M has commissioned two scientists to attempt to refute the seven studies and many video-documented experiments that show that the waste heat from Bair Hugger patient warming:¹⁻¹⁰

- 1.) disrupts operating room airflow and
- 2.) moves contaminated air from the floor to the surgical field.

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Drs. Abraham and Wagner and 3M staged what is purported to be an “experiment” in a “real operating room” and then modeled that very experimental setup in an accompanying Computational Fluid Dynamics study.

3M and their outside consultant experts Drs. Abraham and Wagner are certainly not the first investigators to cheat or deceive in a medical research study. However, when there are more than a dozen separate infractions—cheating, deception and false analysis, all leading to false results, it cannot be by accident and it might be even be a record in the history of research fraud.

The false assurances of Bair Hugger safety based on this research fraud willfully put orthopedic implant patients at significantly increased risk for catastrophic periprosthetic joint infections (PJI). These patients are permanently disabled if they survive the infection and frequently end up with amputations. What drives a company, its employees and consultants to give false assurances of safety, when they know the catastrophic human suffering that will invariably result from clinicians listening to their false assurances and continuing to use Bair Hugger warming during joint implant surgery?

General Study Design Critique

1.) The Megasonic Fog Generator used for airflow visualization invalidates the entire study.

The biggest cause of confusion and deception in this study is 3M's decision to use a Megasonic Fog Generator for airflow visualization. The airflow visualization technique should be *inert* to the experiment. The Megasonic Fog Generator is not only ineffective for visualization, it is also the opposite of inert--it interacts with and dominates the experiment, creating its own results.

a.) This machine uses ultrasound energy to aerosolize microscopic droplets of water. The first problem with using fog for visualizing airflow is that the water droplets evaporate within 2-3 feet of travel and become *invisible* as water vapor. Therefore, it is physically impossible for this study to track airflow beyond the first 2-3 feet of travel because the tracer particles literally disappear. Any observation of contamination over the surgical site is obviously impossible because the fog has already evaporated before even reaching the surgical site.

This is similar to a previous 3M study by Dr. Sessler and the 3M R&D Department which I have previously identified and disclosed as “research fraud” and gross “academic misconduct.”^{11,12} In that study, they somehow neglected to introduce traceable particles into the air currents and (not surprisingly) they also failed to detect the non-existent particles. With remarkable similarity the current study uses “disappearing” particles and is equally deceptive.

b.) The second problem with fog as the visualization technology is that it is basically a “swamp cooler,” the highly effective evaporative cooling technique that has been in use for thousands of years. As the microscopic water droplets rapidly evaporate, they very efficiently absorb a large amount of heat from the surrounding air—approximately 600 kilocalories per liter of water evaporated (540 kcal of which is the latent heat of vaporization). The water droplet visualization technique itself, therefore, grossly alters the experiment. The technique literally sucks the heat from the warm waste air so that it is no longer warm and no longer rises. The heat absorption makes the fog visualization technique totally unsuitable for experiments relating to heated air. Certainly experts such as Drs. Abraham and Wagner would know that.

The Megasonic Fog Generator that was used for airflow visualization in this experiment can aerosolize 1.5 liters of water per hour according to the manufacturer. This volume of microscopic water particles will absorb approximately 900 kcal/hr (or 1046 watts/hr) of heat in the process of evaporation. The Bair Hugger heater produces about 1000 watts of heat per hour. Therefore, the fog used in this experiment can cool or neutralize 100% of the *total* heat output of the Bair Hugger heater. It is obviously impossible to measure and track the waste Bair Hugger heat when it has been quenched and cooled by a mist of fog.

One must ask the obvious question: why has 3M not developed a heat absorber for their waste Bair Hugger heat problem? They could easily use the vaporization of microscopic water droplets as the heat absorbent. They designed a study using

this cooling phenomenon, so they certainly could have designed a product utilizing the same principles. The answer is obvious: the added cost of adding another piece of equipment to the Bair Hugger system that would have to be provided at no cost to the hospital reduces profits.

c.) The third problem with using a Megasonic Fog Generator for airflow visualization is that the water droplets are propelled out of the fogger nozzle by a fan. The fog is riding its own air current, which at frame 8:45 appears to be moving at a velocity of approximately 0.5m/sec. To put this in context: the standard downward airflow velocity in an operating room is 0.3m/sec; the rising waste heat is moving at 0.1-0.2 m/sec. Therefore, the velocity of the airflow blowing from the fog generator is 2-5 times faster the velocity of the background air currents. Needless to say, the higher airflow velocity of the fog will dominate the local airflow scene. Again, the fogger is not simply a visualization technique, it is fundamentally interacting with and altering the experiment. How could experts such as Drs. Abraham and Wagner think that blowing a fan into an airflow experiment could be a good idea?

d.) The authors repeatedly identify the Megasonic Fog Generator with the description "emits visible water vapor" (2:35 and elsewhere). Calling the fog "visible water vapor" is simply a clever deception. The fog is actually an aerosol, or "a colloid of fine solid particles or liquid droplets, in air or another gas" as opposed to a vapor which is "a substance in the gas phase at a temperature lower than its critical point." Webster clumsily defines vapor as either; however, the physics, chemistry and thermodynamics disciplines do not. The crux of suspended liquid vs gas is vital to understanding the effect of a liquid-to-gas phase change on a system, or in this case *the* system being studied. In this case, the Megasonic Fog Generator emits a plume of aerosolized water droplets that are visible until vaporizing after a few feet, thereby becoming invisible gas. This phase change from liquid to gas—as evidenced by the disappearing of the fog—can theoretically absorb 100% of the Bair Hugger waste heat from the system. By erroneously calling the fog "vapor," the authors' clever use of semantics leads the audience to believe that no phase change takes place, when indeed it does. The authors designed a heat study wherein the vast majority of waste heat is intentionally drawn from the system by the visualization method. This is either utter incompetence or a clear and carefully planned act of deception.

In contrast, the prior published studies of Bair Hugger waste heat all used theater smoke particles or neutral buoyancy bubbles to track airflow. Both of these visualization technologies are thoroughly validated, operate at room temperature (thermal neutral), have no propulsion (no fan) and are stable--meaning that they can be tracked (visualized) over long distances.

Drs. Abraham and Wagner are said to be experts in this field. One must ask the obvious question: why did they choose a fog machine with rapidly disappearing particles that both massively cools the air that they are trying to track for its heat content and blows a

relatively high velocity air current directly into the measurement site? They could have easily used the well-established and validated smoke particles or neutral buoyancy bubbles for visualization of the air currents. This can only be explained one way: this “study” is actually a carefully planned deception producing willfully false results.

2.) For the past six years 3M has insisted that the waste Bair Hugger heat does not rise. It must be understood that waste heat will *always* rise in the operating room or anywhere else. It’s a law of physics and 3M’s denial of this physical law is rather laughable.

The investigative exercise is to identify where the heat is being released (the location of the warming blanket) and then track the path of least resistance to the heat rising. Straight up is easiest, especially if there is a zone of dead air, a “dead zone” that is protected from the downward airflow of the operating room ventilation airflow. These “dead zones” are created by flow obstructions in the downward airflow of the operating room ventilation airflow. For example: the dish-shaped surgical light has a huge “dead zone” that forms under the light. Along the sides of the anesthesia screen and areas surrounding the anesthetist and surgeons are upside-down cone-shaped “dead zones,” all caused by a flow-boundary phenomenon. Again—physics. If available, the rising waste heat will preferentially rise within one of these “dead zones,” protected from the downward ventilation airflow. If there is no “dead zone” available, the waste heat will form into a thermal convection current and rise directly into the downward ventilation airflow anyway. It is not a matter of *if* it going to rise but rather simply *where* is it going to rise.

The flow obstruction “dead zones” that would normally occur during surgery were conveniently omitted by the investigators in this study. For example, there was no anesthetist. The anesthesia screen normally 12-18 inches from the head end of the table was omitted. In its place, they built a tunnel-like tent that vented the waste heat all the way past the head end of the table. In this location, the surgical light over the patient was not in its usual location creating a “dead zone” immediately adjacent the anesthesia screen. All of these “dead zones” have been shown to have key interactions with the rising waste heat. Conveniently eliminating them from the experiment invalidates the entire study.

Many people erroneously believe that the rising waste heat can be blown away by simply increasing the velocity of the downward ventilation airflow. The normal ventilation flow velocity in operating rooms is 0.3 m/sec. Research has shown that increasing the velocity from 0.3 m/sec to 0.5 m/sec causes 4-7 times *more* contaminating particles from the floor to rise into the sterile surgical field. Again—the answer is physics. Heat does not “rise” strictly speaking; cool air *sinks*, pushing the warm air upward. The faster the cool air sinks (because it is being pushed by the ventilation fan), the faster the heated air is pushed upward.

3.) It is nearly impossible to prove a “negative” as Drs. Abraham and Wagner are apparently trying to do. To prove a “negative” requires that it must be shown to be “negative” in *all* circumstances, not merely in one isolated, unique circumstance.

The investigators, however, make generalized “negative” statements insisting that these experiments prove that waste heat from Bair Hugger patient warming:

- 1.) does not disrupt operating room airflow.
- 2.) does not move contaminated air from the floor to the surgical field.

Such broad generalizations are unscientific and totally absurd.

4.) To refute any of the seven studies or video experiments, the exact study design that is being refuted must be followed--and then one must find contradictory results. One cannot refute a given study by doing a totally different study. Therefore, this attempt to refute seven different studies with one study that is unlike any of them is folly. This study disproves none of the prior published studies.

5.) Drs. Abraham and Wagner are identified as experts in the fields being studied: air flow in the operating room, visualization techniques for air quality in operating rooms, fluid dynamics, heat transfer and forced-air warming systems. They worked with the experts from 3M to design and execute these experiments. With so many experts involved in this project, it can be safely assumed that every detail of this study design was meticulously planned and nothing was left to chance.

The grossly deceptive study design indicates to this author that 3M and their outside consultant experts willfully intended to mislead their clinical customers into believing that Bair Hugger warming is safe during implant surgery. This deceptive study design could not possibly refute any of the seven previously published studies showing disruption of operating room airflow and contamination of the sterile surgical field by the waste heat from Bair Hugger warming.

Specific Study Critique

In order to demonstrate the deceptive design of this 3M study, I will compare each part of this study to previously published waste heat research. There are three mechanisms by which the waste Bair Hugger heat has been shown in previous published research studies to disrupt the operating room ventilation airflow and contaminate the sterile surgical field:

1.) Waste Bair Hugger heat contamination mechanism #1: Heat rising from an upper body warming blanket.

Published research by Belani, McGovern, Reed, and Augustine has shown that heat exhausting from an upper body Bair Hugger blanket applied to the patient’s arms and head easily rises along the anesthesia side of the anesthesia screen in a protective flow-boundary dead zone--a “chimney” for the rising heat flow.^{1,2,8} In normal practice, the anesthesia screen is a vertically oriented drape rising straight up from approximately the patient’s chin to create a barrier between the anesthesia and surgical spaces.

When the rising heat reaches the top edge of the screen, it is literally sucked over the top of the screen and into the dead zone that forms under the surgical light due to the ventilation airflow. From there, it can easily be pushed by the downward flowing ventilation air into the sterile surgical field. The downward ventilation airflow is necessary to create the dead zone under the surgical light and the downward movement of air into the surgical site. Therefore ironically, the downward ventilation airflow is necessary to cause maximum contamination by the waste Bair Hugger heat.

According to the Ventilation Standards for operating rooms, the head end of the operating table should be at least 12 inches *inside* the ventilation airflow field. The anesthesia screen is typically located at the patient's chin and is, therefore, 12-18 inches from the head end of the table. This places the screen a minimum of 24 inches *inside* the ventilation airflow field.

This waste Bair Hugger heat contamination mechanism #1 (The heat rising from an upper body warming blanket) represents the vast majority of actual surgical cases using upper body forced-air warming. This is the mechanism that Demonstrations #1-3 of the 3M study are apparently trying to refute.

- Demonstration #1 at frame 4:08 clearly shows that the horizontal fog at the head end of the table has no downward movement. Compare this to frame 9:38 where the fog is released in the center of the ventilation flow field. At 9:38 the fog is quickly blown downward. In Demonstration #2 at frame 5:25, the fog hose is oriented vertically and easily rise--in contrast to frame 10:34, where the fog within the ventilation flow field is forced downward. This indicates that the head end of the surgical table in this experiment is located *outside* of the operating room ventilation flow field where there is no downward air movement. As previously noted, Ventilation Standards require that the head of the surgical table should be at least 12 inches *inside* the ventilation airflow field. The investigators cleverly moved the head of the table outside the ventilation flow field in this experiment so that heat escaping from the head end of the table would be *outside* the experimental space. Then they pretended to look for waste heat airflow *inside* the ventilation airflow field, knowing that the heat was being diverted *outside* the experiment.

- Demonstration #1 at frame 4:08 also shows the “slight of hand” that is pervasive throughout these “experiments.” The waste Bair Hugger heat has to be escaping from under the tent-like anesthesia screen which is at least 2 feet *above* the level of the fogger and then rising (as heated air does) from there. There is no mystery as to why the heated air did not affect the fog located 2 feet below—the heat was rising from the top of the anesthesia screen, not sinking. The investigators make it sound as if this is some sort of discovery, when it is actually just a slight of hand. This is pure deception: the fact that the fog is not altered by the rising heat means absolutely nothing.

It is interesting to notice the rapid updraft of fog that occurs when the fog is briefly pushed into the updraft of waste heat by the operator while he is turning the blower off at frame 4:35.

- The anesthesia screen in this study forms a tunnel-like tent structure with a 45° sloping angle facing the surgical field. The opening to the tunnel-like anesthesia screen in this experiment extends *past* the head end of the surgical table as shown at frame 5:15. This is not a normal anesthesia screen location or shape. A normal anesthesia screen is simply a vertical sheet located approximately at the patient's chin, which is at least 12 inches from the head end of the table.

The abnormal 45° sloping angle of the tunnel-like anesthesia screen in this demonstration is perfectly designed to vent the waste heat of the upper body Bair Hugger warming blanket away from the head end of the surgical table. The waste heat will rise along the underside of the slope until it reaches the free edge at the head end. From there it will escape and rise straight up. Note also that the top edge of the anesthesia screen in this experiment is at least 12 inches higher than usual, apparently so that the sloped tunnel-like tent will reach past the head end of the table. Again, this is not a normal anesthesia screen shape or location.

To summarize the anesthesia screen deception: a “normal” anesthesia screen would be a substantially vertical sheet located at least 24 inches *inside* the ventilation airflow field, and thus any rising waste heat would clearly cause a ventilation disruption of some sort. Drs. Abraham and Wagner's clever design in this demonstration produced an abnormal tunnel-like tent that extended *beyond* the head end of the table. Moreover, the head end of the table was placed *outside* of the ventilation airflow field. With this unrealistic arrangement, all of the waste heat of the upper body Bair Hugger warming blanket was effectively vented outside of the ventilation airflow field and thus outside the experiment. This is totally unrealistic and very deceptive; it is not an accurate demonstration of current patient-warming practice.

- Evidence indicates that the Bair Hugger airflow was at least partially obstructed during Demonstration #2 and perhaps all of the Demonstrations. Observe carefully at frame 5:18. The Bair Hugger blower can clearly be seen mounted at the head end of the surgical table. The air inlet to a Bair Hugger blower is on the bottom of the unit. The nozzle of the fog hose is positioned below the blower. Notice how the fog gently rises and drifts generally *away* from the head of the table and the blower. The problem with this picture is that a normally operating Bair Hugger blower delivers 40 cubic feet of air per minute (CFM) to the blanket. That means that it must suck in 40 CFM of air into its inlet. That is a large volume of air. The fog near the blower should be sucked *into* the inlet but instead it just casually drifts away. The fog drifting away from the blower rather than being sucked into the blower strongly suggests that the Bair Hugger airflow was at least partially obstructed.

Also notice the Bair Hugger hose collapse when the blower is turned off at frame 6:00. A normally operating Bair Hugger system develops very little pressure in the blanket to avoid the lofting and “fly-away” nature of these blankets. The normal low pressure could never cause the hose to distend and become self-supporting at the visible bend as it is at frame 5:18. The obvious distention of the hose indicates that there was an abnormally

high pressure in the system and that either the hose was partially occluded at the outlet or that the blanket was folded and/or tucked to restrict the airflow. The hose can be seen collapsing when the blower is turned off. Obviously, reducing the airflow by occluding the hose or tucking the blanket proportionally reduces the waste heat, invalidating the entire experiment.

Demonstration #2 (5:25): In this demonstration, the fog hose is blowing vertically and is slowly lifted from the floor to near the top of the anesthesia screen. The investigators claim that there is no difference between the conditions of Bair Hugger “on” and Bair Hugger “off.” This is simply a false statement. Because of the high density of water particles and the relatively large airflow at the fogger nozzle compared to the background, one must avoid looking at the nozzle for subtle differences. Near the nozzle all of the conditions look alike because the mass of fog from the fog generator dominates everything else. Instead, watch the area around the fog plume during the side-by-side comparison at frame 6:53. It is easy to see that the height of the fog plume is much higher in the presence of the vented waste heat from the Bair Hugger “on” condition. Additionally, with the Bair Hugger “on” condition, there is no cool fog falling at the sides of the plume. Also note that the rising fog plume quickly evaporates due to the heat. In contrast, with the Bair Hugger “off,” the plume height is much shorter and a large amount of fog can be seen falling at the sides of the plume, due to its cooler and heavier than air nature.

Clearly there is a visible difference between the Bair Hugger “on” and “off” conditions in this experiment. Nonetheless, the investigators attempt to mislead the viewer to believe otherwise.

Demonstration #3 (frame 8:08): In this demonstration the investigators hold the fog nozzle near the patients face, aiming upward. The fog is blown into the waste heat venting from under the upper edge of the anesthesia screen, which is located outside the ventilation flow field.

The investigators claim that there is no difference between the conditions of Bair Hugger “on” and Bair Hugger “off.” This is simply a false statement. It is easy to see that the height of the fog plume is much higher in the presence of the vented waste heat from the Bair Hugger “on” condition. Additionally, with the Bair Hugger “on” condition, there is no cool fog falling at the sides of the plume. The rising fog plume quickly evaporates. In contrast, with the Bair Hugger “off,” the plume height is much shorter and a large amount of fog can be seen falling at the sides of the plume, due to its cooler and heavier than air nature.

This demonstration is apparently supposed to refute the studies by Belani, McGovern, Reed and Augustine, all of which show significant movement of contaminants from the anesthesia side of the screen, over the top and into the sterile surgical field.^{2,4-6} Unfortunately, the current study design makes refuting these previous studies impossible. The current experiment was done outside of the ventilation airflow field, with an evanescent fog that disappears within about 2 feet of travel making it impossible to track

it across the screen *and* it cools the air being studied with microscopic water droplets. The investigators also conveniently omitted the following: the vertical anesthesia screen that creates flow-boundary zones, the anesthetist standing by the anesthesia screen and the surgical light located over the patient's chest and the screen. Therefore, the results of this demonstration have absolutely no bearing on the cited prior research and certainly do nothing to negate the previous findings.

- There was no surgical light in its standard location over the anesthesia screen at the patient's chest in any of these experiments. Surgical lights shield the area over the chest and anesthesia screen from the ventilation airflow, creating a dead space with no airflow. The dead space under the light creates a situation that acts like a vacuum, sucking the rising waste heat over the top of the anesthesia screen and into the surgical field.
- There was no anesthetist to create a flow-boundary layer "dead zone" on the anesthesia side of the anesthesia screen, into which the waste heat can easily rise.
- The investigators chose to do this study in a turbulent conventional ventilation system rather than in the more rigorous laminar flow ventilation system used in previous experiments. With turbulent conventional ventilation systems the flow pattern is unpredictable at any given location within the flow field, in contrast to the uniform flow offered by a laminar ventilation system. Risk of contamination of the surgical field and periprosthetic joint infections exists for both conventional and laminar flow systems. However, research is less confusing in the more rigorous laminar flow field.

In summary, the degree of surgical site contamination caused by the waste heated air escaping from a forced-air blanket located over the patient's arms and head (contamination mechanism #1) is affected by several contributing factors:

- 1.) The anesthesia screen located *within* the downward ventilation airflow: In these experiments they located the anesthesia screen *outside* the downward ventilation airflow so the escaping heat was never even in the ventilation airflow field.
- 2.) The *surgical light* located in its normal position over the patient's chest creating a dead zone at the anesthesia screen: In these experiments the anesthesia screen was moved to the head end of the table.
- 3.) The *anesthetist* standing near the anesthesia screen creating a flow-boundary dead zone: In these experiments they omitted the anesthetist all together.
- 4.) The *more heat, the more contamination*: In these experiments they restricted the Bair Hugger airflow and thus reduced the amount of waste heat that could affect the experiment.

Drs. Abraham and Wagner give the illusion of re-creating the previously studied waste Bair Hugger heat contamination caused by heat rising from an upper body warming blanket. However, they changed many key elements in their clever design making it totally unrealistic and, in this author's opinion, purposefully deceptive. Demonstrations #1-3 do nothing to negate the validity of the prior published research documenting the waste Bair Hugger heat contamination mechanism #1: Heat rising from an upper body warming blanket.

2.) Waste Bair Hugger heat contamination mechanism #2: Heat radiating through the surgical drape from an upper body warming blanket.

The second mechanism of contamination from the waste forced-air warming heat is caused by heat radiating and conducting through the surgical drape from an upper body warming blanket at the anesthesia screen. As shown by Legg, McGovern, Reed, Augustine and Dasari, the radiant and conductive heat warms the air on the surgical side of the screen causing it to form into a tornado-like vortex in the presence of a downward ventilation airflow and an anesthesia screen.^{2-4,9} This vortex has been shown to literally vacuum contaminants off of the floor, sucking them upward and depositing them in the sterile surgical field, identical to a tornado. Legg reported that this contamination mechanism resulted in 2000 times (200,000%) more contaminating particles in the sterile field with Bair Hugger warming than with air-free HotDog conductive warming.³

Drs. Abraham and Wagner made no attempt to recreate or negate this mechanism of contamination.

3.) Waste Bair Hugger heat contamination mechanism #3: Heat from lower body warming of the legs escaping from under the surgical drape, under the surgical table near the floor.

The third mechanism of contamination from the waste forced-air warming heat is caused by lower body warming of the legs. Published research by Belani, Legg, McGovern, Reed, and Augustine has shown that heat exhausting from a lower body blanket applied to the patients legs eventually escapes from under the foot end of the surgical drape by venting under the surgical table.^{1,2,5,10} From that location it has been shown to underflow the lower edge of the surgical drape hanging down by the floor, heating the contaminated air near the floor and forming into convection currents that rise with the contaminants up and into the sterile field.

Drs. Abraham and Wagner give the illusion of re-creating this previously studied condition with all of the fog that they blow near the floor and over the surgical site in demonstrations #4-7. However, by failing to put the warming blanket on the patient's legs, all of the fog was just for show. There is no reason to expect heat applied to the arms to have any effect on air flow and thus fog under the table or over the surgical site. Remember also that a lack of visible air flow alteration over the surgical site does not mean a lack of detectable contaminates. Heat applied to the upper body and vented outside the downward ventilation airflow field simply disappears. This is similar to the old trick of "look over there while I pick your pocket." Demonstrations #4-7 are pure deception. They do nothing to negate the validity of the prior published research.

Demonstration #4 (8:36): In this demonstration, the investigators hold the fog nozzle horizontally near the floor, under the table. This demonstration is a complete deception. In this demonstration Drs. Abraham and Wagner were apparently trying to negate the findings of Belani, McGovern, Legg, Reed and Augustine which document a third

mechanism of contamination.^{1,2,5,10} All of these prior studies used *lower body* Bair Hugger blankets to deliver heat to the legs.

Drs. Abraham and Wagner make a big issue of no airflow being detected near the floor under the table in this demonstration. However, they fail to mention is that they are using a warming blanket on the arms of the patient, which by their deceptive study design is preferentially venting the waste heat *away* from the head end of the table. There is no reason that heat applied to the arms of the patient would ever end up under the table. To find waste heat under the table one must heat the legs, not the arms. Drs. Abraham and Wagner certainly knew this to be true when they designed this demonstration. This demonstration is pure deception, proving (or more accurately disproving) nothing.

Demonstration #5 (9:30): In this demonstration the fog nozzle is over the surgical site and aimed at the patient's feet.

Demonstration #6 (10:30): In this demonstration the fog nozzle is over the surgical site and aimed upward.

Demonstration #7 (11:43): In this demonstration the fog nozzle is over the surgical site and aimed at the surgical site.

These three demonstrations are deceptive for the same reason as demonstration #4. Rising waste heat from lower body warming has been shown in many experiments to grossly contaminate the sterile surgical field and disrupt the ventilation airflow. Drs. Abraham and Wagner obviously know this since they are experts—so they avoided that condition. They instead chose to apply the heat to the arms and direct the waste heat away from the head end of the table and out of the ventilation airflow, where the heat could not possibly disrupt the ventilation over the surgical site. These are another three meaningless demonstrations simply designed to deceive the viewer.

Drs. Abraham and Wagner and 3M very cleverly and deceptively designed these studies so that they could not possibly show the Bair Hugger waste heat having any effect on anything. They also deceptively omitted several key ventilation flow obstructions that have been shown in prior research to have significant effects on the waste Bair Hugger heat. Finally, they repeatedly make irrelevant measurements, implying that there is a causal relationship between their measurements and the waste heat--when in fact there is no possible relationship between the two. The resulting “negative” observation is for show only. Their experimental design choices are deceptive at best and flagrant cheating (fraud) at worst.

Conclusions

Since Drs. Abraham and Wagner failed to re-create any of the three previously published mechanisms of contamination, their study axiomatically fails to refute or negate the previously published research.

The only logical purpose of this deceptive research is to give false assurances of safety to the clinicians using Bair Hugger warming—assuring them of the products’ safety during orthopedic implant surgery. Since these are knowingly false assurances of safety, 3M and Drs. Abraham and Wagner certainly also know that they are willfully putting orthopedic implant patients at a significantly higher risk of contracting catastrophic periprosthetic joint infections (PJI)--one of the most serious and devastating surgical complications.

In summary, this is an overtly fraudulent study design and test method carefully manipulated to mislead 3M’s clinical customers and thus willfully put patients at increased risk of devastating periprosthetic joint infections. This study cannot be dismissed as mere corporate chicanery. Rather, this study should be recognized for what it is—a purposefully orchestrated plot to sacrifice the health of tens of thousands of patients in order to protect 3M’s profits.

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