

The importance of warming surgical patients during the COVID-19 pandemic

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An optimised core temperature helps support patient resistance to infection. Maintaining normal body temperature provides valuable benefits to surgical patients, including reducing the risk of surgical site infections, reduced mortality, fewer postoperative cardiac events, reduced blood loss, faster recovery times and shorter length of hospital stays for patients.¹

Hypothermia can be avoided when temperature is monitored and an active warming measure is instituted throughout the perioperative process – starting before the induction of anaesthesia.

The 3M™ Bair Hugger™ warming system provides hospitals and clinicians with an effective method of keeping patients warm before, during and after surgery. An overwhelming number of studies and medical organisations, based on proven and scientific results, support the use of a convective warming system for maintaining patient normothermia.

Many healthcare organisations around the world have published recommendations or guidelines emphasising the importance of maintaining normothermia. According to a recent communication from AORN (Association of periOperative Registered Nurses), “Forced air warmers may be used during surgical procedures in COVID-19 positive patients to decrease the risk of hypothermia.”²

You may find the following frequently asked questions helpful when creating policies and procedures involving active warming in your facility during the COVID-19 pandemic.

What filter is used in the 3M Bair Hugger™ warming units?

The filter media used in the Model 700-series warming units is classified on an industry-standard scale as Minimum Efficiency Reporting Value (MERV) 14 at 48 CFM (cubic feet per minute), under ASHRAE Standard 52.2-2012. The filter media used in the Model 600-series warming units is classified on an industry-standard scale as Minimum Efficiency Reporting Value (MERV) 14 at 44 CFM (cubic feet per minute).

The ASHRAE standard 52.2-2012 provides test methods for air intake filters to ensure standardisation in classification and efficiency. ASHRAE Standard 170-2013, Ventilation of Health Care Facilities, provides standards and guidance on the design requirements for ventilation systems utilised in health care facilities. The standard recommends that operating rooms utilise a filter that is equivalent to MERV 14 in the OR HVAC system. The use of a MERV 14 filter in the Bair Hugger™ warming unit is in addition to the OR’s general HVAC filtration.³

What size are the particles that carry viruses?

While viruses themselves are submicron in size, to travel they attach to inert carriers or particulates such as skin squames or liquid droplets which range in size from 5 microns to 100 microns.^{4,5}

What size particles can a filter with a MERV 14 efficiency capture?

A filter's capture efficiency depends in part on the overall particulate size. MERV 14 equates to 95% efficiency for filtering particles of size 3 to 10 microns from air passing through the filter.⁶ Please refer to the attached "Frequently Asked Questions on Filtration" for more information.

How should the filter in the 3M™ warming unit be maintained?

Per the recommended filter change outlined in the 3M™ Bair Hugger™ Model 600-series and Model 700-series warming units Operator's Manuals, the filter should be changed every 12 months or 500 hours of use. Do not attempt to clean the air filter as it may be contaminated from use. Discard the filter in a manner consistent with institutional protocol.

Any other filter-change practices or preferences beyond this recommendation should be dictated by your hospital's policies and procedures.

How should the 3M Bair Hugger™ warming unit be cleaned?

Per the cleaning instructions outlined in the 3M Bair Hugger Model 600-series and Model 700-series warming units Operator's Manuals:

1. Disconnect the warming unit from the power source before cleaning.
2. Cleaning should be performed in accordance with hospital practices for cleaning OR equipment. After every use; wipe the warming unit, the outside of the warming unit hose, and any other surfaces that may have been touched. Use a damp, soft cloth and a hospital approved mild detergent, germicidal disposable wipes, disinfecting towelettes, or antimicrobial spray.
3. Let air dry or dry with a separate clean soft cloth
 - Do not use cleaning solutions with greater than 80% alcohol or solvents, including acetone and thinner, to clean the warming unit or hose. Solvents may damage the labels and other plastic parts.
 - Do not immerse the Bair Hugger warming unit, warming unit parts, or accessories in any liquid or subject them to any sterilisation process.

The approved disinfectants list is heavily US based, one 1 or 2 are commercially available here.

Any other cleaning practices or preferences beyond this recommendation should be dictated by your hospital's policies and procedures.

How can I reduce the risk of cross-contamination when using 3M warming units?

Do not operate the Bair Hugger warming unit with the hose detached from the 3M warming blanket/gown. The Bair Hugger warming unit is intended to be used with the hose properly attached to its corresponding warming blanket/gown and in accordance with good practices for operating room sterile technique. Clean the warming unit and the outside of the warming unit hose after each patient use in accordance with Operator's Manual instructions.

What can I do to reduce the risk of cross-contamination when using 3M™ warming blankets?

Except for specific Bair Hugger warming blanket models, 3M warming blankets/gowns are not sterile. Each warming blanket/gown is intended for single patient use ONLY. Placing a sheet between the warming blanket/gown and the patient does not prevent contamination of the product.

How is airflow in healthcare facilities managed?

The ventilation system in the health care setting is designed to maintain environmental control for comfort, odour, and asepsis. Special ventilation systems supplying filtered air at positive pressure are required in the OR.⁷ As specified by ASHRAE, a minimum of 20 air changes/hour are necessary to dilute microorganisms generated in the operating room and to exclude ingress from surrounding areas.⁸ The CDC recommends a minimum of 15 air changes/hour for ORs.⁹

The use of air filtration in healthcare facilities aims to reduce airborne concentrations. Room air flow is governed by a combination of air movements caused by differences in temperature and humidity and by moving bodies and equipment. These complex air movements make the route and suspension time of an infectious particle very difficult to determine once it has left the infectious host.¹⁰

In the CDC's guidelines for infection control and ventilation requirements for infectious patients in healthcare facilities, it is recommended:¹¹

- Limit the number of healthcare workers in the room during an aerosol-generating procedure.
- Perform aerosol generating procedures such as intubation and extubation, in airborne infection isolation rooms (AIIRs).
- If these procedures cannot be done in airborne infection isolation rooms (AIIRs), allow adequate time for air exchanges per hour (ACH) to clean 99% of airborne particles from the air.

Should anything be done differently when using convective warming during the COVID-19 pandemic?

Healthcare providers should always deliberately assess potential risks of exposure to infectious material before engaging in activities and procedures in healthcare delivery. An interdisciplinary team should be involved in creating policies and procedures in your facility.¹²

What does the CDC recommend for medical equipment for patients on Isolation Precautions?

In the CDC's 2007 Guideline for Isolation Precautions which was recently updated in July 2019, it is stated that providing patients who are on Transmission-Based Precautions with dedicated noncritical medical equipment has been beneficial for preventing transmission.¹³

What does the CDC recommend regarding medical equipment for patients with known or suspected COVID-19?

In the recent publication, Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings, the CDC states that dedicated medical equipment should be used when caring for patients with known or suspected COVID-19.¹²

References

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Please contact your 3M sales representative if your facility requires additional warming units because you are dedicating medical equipment for use only with known or suspected COVID-19 patients.

If you have questions or comments, please feel free to contact 3M Customer Service at 363 363 in Australia, 0800 808 182 in New Zealand.



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