

Managing Extreme Heat in the Operating Theatre Environment

Association for Perioperative Practice (AfPP) Member Advice Note

Managing Staff Safety and Theatre Conditions During Periods of Extreme Heat

Periods of extreme heat present significant challenges within operating departments. Theatre teams may be exposed to prolonged periods of elevated temperatures whilst wearing surgical attire and personal protective equipment (PPE), potentially affecting staff wellbeing, concentration, performance, fatigue levels and patient safety, Health and Safety at Work Act (HSWA), 1974).

Operating theatres are controlled clinical environments and must continue to meet specialised ventilation, temperature and air quality requirements. According to Health Technical Memorandum (HTM) 03-01 Part A, the supply of air to an operating theatre has four principal functions:

- To dilute airborne microbial contamination generated by surgical activity and personnel.
- To aid the removal and dilution of fumes, odours and waste anaesthetic gases.
- To control air movement and prevent contaminants entering from less clean areas.
- To control the temperature and, where necessary, the humidity of the operating room (NHS England, 2021a, section 8.36).

During periods of extreme heat, organisations should ensure that these ventilation functions continue to operate effectively and that environmental conditions are routinely monitored. Where elevated temperatures affect the ability to maintain validated operating conditions, a documented risk assessment should be undertaken and appropriate mitigation measures implemented (NHS England, 2021b; HSWA,1974; Health and Safety Executive (HSE),2026).

HTM 03-01 Part A further states that humidity within operating departments should fall within the range of **35% to 60% whilst in use**. When areas are not in use, humidity may be allowed to fall below 35% but should not be allowed to exceed 70% (NHS England, 2021a, section 8.69).

Consequently, monitoring of temperature, humidity and ventilation performance should form part of routine environmental surveillance and any local extreme weather response plan (NHS England, 2021a; Association for Perioperative Practice (AfPP), 2022).

This advice should be considered alongside local organisational policies, the Health and Safety at Work Act 1974, HTM 03-01: Specialised Ventilation for Healthcare Premises, and the AfPP Standards and Recommendations for Safe Perioperative Practice , 2022; NHS England, 2021a; NHS England, 2021b; HSWA, 1974).

Key Principles

Healthcare organisations have a duty to:

- Protect staff from foreseeable risks associated with excessive workplace temperatures (HSWA, 1974).
- Maintain a safe operating environment for patients and staff (AfPP, 2022).
- Routinely monitor temperature, humidity and ventilation performance within operating theatres (NHS England, 2021a; NHS England, 2021b).
- Ensure specialised ventilation systems continue to perform their intended functions, including the dilution of airborne contamination, control of airflow from less clean areas, removal of waste gases and maintenance of appropriate environmental conditions (NHS England, 2021a).
- Escalate concerns where environmental conditions fall outside validated operating parameters or may compromise patient safety, staff welfare or aseptic practice (NHS England, 2021b).

HTM 03-01 requires specialised ventilation systems to maintain environmental conditions appropriate to the clinical activity being undertaken (Part A: Design and Validation) and recommends routine monitoring and performance verification throughout the life of the system (Part B: Operational Management and Performance Verification) (NHS England, 2021a; NHS England, 2021b).

Extreme Heat Risk Assessment

A formal risk assessment should be undertaken when:

- Theatre temperatures exceed locally agreed operating parameters.
- Staff report symptoms of heat stress.
- Environmental monitoring systems indicate abnormal temperatures or humidity levels.
- Ventilation systems are unable to maintain validated conditions.
- There is equipment failure impacting environmental control.

This approach is consistent with employers' duties under the Health and Safety at Work Act 1974 and the operational management requirements described within HTM 03-01 Part B (HSAWA, 1974; NHS England, 2021b).

Patient Risks

Risk assessments should consider:

- Potential impact on patient normothermia.
- Increased risk of surgical site contamination if ventilation effectiveness is compromised.
- Potential equipment performance issues.
- Reduced staff performance affecting patient safety.

These risks should be managed through local workplace risk assessments and staff welfare arrangements (HSWA, 1974; HSE, 2026).

Staff Risks

- Heat stress.
- Dehydration.
- Fatigue and reduced concentration.
- Headaches and dizziness.
- Increased likelihood of errors.
- PPE-related heat burden.

These risks should be managed through local workplace risk assessments and staff welfare arrangements (HSWA, 1974).

Environmental Risks

- Theatre temperature.
- Relative humidity (target range 35-60% whilst the department is in use).
- Air change rates.
- Positive pressure relationships.
- Ventilation system functionality.
- The ability of the ventilation system to fulfil the four primary functions described in HTM 03-01 Part A Section 8.36.

Recommended Control Measures

Environmental Controls

Where excessive temperatures are identified, organisations should:

- Verify theatre temperature and humidity readings using calibrated monitoring equipment.
- Confirm ventilation systems are functioning correctly.
- Escalate any ventilation faults immediately to Estates and Facilities teams.
- Increase monitoring frequency during periods of hot weather.

- Consider postponement of non-urgent cases if environmental conditions cannot be maintained safely.
- Limit unnecessary traffic through theatre doors to preserve ventilation effectiveness.
- Ensure any portable cooling solutions do not compromise positive pressure ventilation or clean airflow patterns.
- Document environmental monitoring results, ventilation alarms, equipment faults and mitigation measures in accordance with local governance procedures.

These control measures align principally with HTM 03-01 Part B: Operational Management and Performance Verification (NHS England, 2021b).

AfPP guidance (2022) recognises the importance of monitoring ambient temperature and ventilation as part of maintaining a safe operating theatre environment.

Workforce Controls

Organisations should:

- Schedule additional staff rest breaks where required.
- Rotate staff undertaking lengthy procedures.
- Consider workload adjustments for staff wearing extensive PPE.
- Encourage early reporting of symptoms of heat-related illness.
- Ensure managers undertake dynamic risk assessments throughout the day.

These measures support employers' duties under the HSAWA (1974) to protect the health, safety and welfare of employees.

Staff should immediately report:

- Dizziness
- Light-headedness
- Excessive sweating
- Headache
- Visual disturbances
- Nausea
- Difficulty concentrating

Hydration Guidance

Maintaining hydration is one of the most effective controls against heat-related illness and should form part of local staff welfare arrangements HSAWA (1974).

Staff should be encouraged to:

- Begin shifts adequately hydrated.
- Drink fluids regularly throughout the day.
- Increase fluid intake during hot weather.
- Avoid relying solely on caffeinated drinks.
- Replace fluids lost through excessive sweating.

Drinks Within Operating Departments

Food and drink should not be brought into clinical areas and should only be consumed in designated staff rest areas in accordance with AfPP Standards and Recommendation for Safe Perioperative Practice (2022).

However, organisations should ensure:

- Easily accessible hydration stations are available within designated staff rest areas.
- Staff have regular opportunities to hydrate between procedures.
- Cold drinking water is readily available.
- Break arrangements support adequate fluid intake throughout the working day.

Where hydration facilities are not readily accessible within the perioperative environment. Organisations may wish to consider permitting staff to have a clearly identifiable personal water bottle with a secure leak-proof lid. Any such arrangement should be subject to a local risk assessment and incorporated within a written local policy. Water bottles should be stored away from patients, medicines preparation areas, workstations and sterile fields and should not compromise infection prevention, medicines management or patient safety requirements.

Suitable hydration options include:

- Water.
- Low-sugar electrolyte drinks.
- Milk.
- Diluted squash.

Staff should avoid excessive consumption of:

- Energy drinks.
- Highly caffeinated beverages.
- Sugar-rich drinks.

Escalation Criteria

Immediate escalation should occur where:

- Theatre ventilation systems fail.

- Positive pressure relationships cannot be maintained.
- Humidity falls outside validated operating parameters.
- Multiple staff members develop heat-related symptoms.
- Environmental conditions are considered likely to impact patient safety or aseptic practice.

These escalation requirements align with the operational monitoring and fault management principles described within HTM 03-01 Part B (NHS England, 2021b).

The decision to continue operating lists should be based upon:

- Risk assessment findings.
- Ventilation system performance.
- Clinical urgency.
- Staff wellbeing.
- Patient safety considerations.

This decision-making process should be informed by local risk assessment, governance arrangements and professional judgement (NHS England, 2021b; AfPP, 2022).

References

Association for Perioperative Practice (AfPP) (2022) *Standards and Recommendations for Safe Perioperative Practice*. Harrogate: AfPP.

Health and Safety Executive (HSE) (2026) *Health and Safety at Work etc. Act 1974*. Available at: [HSE Health and Safety at Work Act](#) [Accessed: 10 July 2026].

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NHS England (2021) *Health Technical Memorandum 03-01: Specialised Ventilation for Healthcare Premises Part A: Design and Validation*. London: NHS England. Available at: <https://www.england.nhs.uk/publication/specialised-ventilation-for-healthcare-buildings/> [Accessed 10 July 2026]

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