

HEADS UP...

TOPIC: Management of utility systems

SETTING: Ambulatory Health Care (AHC)



Why is this important?

Heating, ventilation, and air-conditioning (HVAC) systems maintain the building environment within a desired range, providing year-round control of building temperatures, humidity, airflow (pressures) and filtration. HVAC systems are very important not only in preserving patient comfort and safety, but also in minimizing the spread of airborne contaminants. Despite the recognized importance of high-performing HVAC systems, surveyors continue to find issues with ventilation, temperature, humidity, as well as non-compliance with inspection, testing, and maintenance of HVAC systems on survey.

Scope of the Problem:

Time period: **January 1, 2019 – March 31, 2020**

Number of full surveys performed: **857**

Number of surveys which had high-risk findings related to the inspection, testing and maintenance of high-risk equipment (EC.02.05.01 EP 7): **94 (11%)**

Observations identified within a specific topic area may reveal systemic areas for improvement across the organization. These improvement opportunities might be reflected in additional standards/EPs within the EC chapter and/or other chapters/standards/EPs. *See also EC.02.05.01 (EP 4, 16), EC.02.05.03, EC.02.05.05 (EP 3), EC.02.05.07, (§416.44, §416.51(a))*

Sample survey observations [from surveyor notes] and contributing factors

- The operating room was not under positive pressure relative to the surrounding spaces.
- The correct positive to negative pressure differential between clean and dirty areas was not maintained.
- The required number of air exchanges in the OR was not met.
- Temperature and humidity were not monitored in a centralized sterile supply storage where large volumes of sterile supplies are kept.
- The relative humidity for the operating room(s) was not within the organization's identified range of 20 - 60 %. The organization has measured and recorded humidity levels as high as 75% on multiple occasions without corrective action being taken.
- The organization has not conducted a risk assessment on the impact of humidity less than 30% on supplies and equipment stored or used in critical spaces.
- There was no system in place to monitor temperatures and humidity when rooms are not occupied after hours and over the weekend.

Potential contributing factors:

- Lack of temperature/humidity monitoring systems/logs and/or no alert notifications when temperature/humidity levels fall out of range.
- Inadequate staff training and education related to monitoring, logging, correlation of HVAC systems to safety, role and plan of action if readings out of compliance.
- Leadership failure to recognize that maintaining proper temperature and humidity during non-operating hours was required and important.
- Leadership failed to ensure that regular testing of room pressures was being conducted.
- Manual manipulation of individual thermostats and alarms by staff members created HVAC inefficiencies and non-compliance.

How to identify potential problems in your organization

Review your policies and procedures

- Does the organization have a process to ensure that the HVAC system provide appropriate pressure relationships, air-exchange rates, filtration efficiencies and temperature and humidity?
- Has the organization established a minimal relative humidity range for equipment, products, sterile supplies, and minimizing infections?
- Does the organization inspect, test and maintain the utility systems (or use an external service to do so)?

Interview staff

- Can staff demonstrate an understanding of the following regarding HVAC and utility systems:
 - The requirements for pressure relationships, temperature and humidity readings and documentation thereof?
 - How are temperature and humidity levels maintained? Are they at the required levels in accordance with the hospital policy and evidence-based guidelines?
 - How do you test and monitor negative/positive pressure relationship between the sterile storage, medication rooms, and other sterile areas and the adjacent areas (and in critical areas such as the operating room and oncology)?
 - Familiarity with the technology utilized to eliminate/minimize and to assist with responding to an incident (alarms, humidity, pressure or temperatures out of range, settings for min/max).
 - Knowledge of tracking and/or documentation logs.
 - Knowledge of how technology is maintained, who is responsible for maintaining the technology, and what to do if the technology fails.
 - Knowledge of how to respond when an incident occurs (improper air pressure relationships, temperatures or humidity out of range) and process to report an incident.
- Have clinical staff received training and education on the above?
- Are staff knowledgeable about IFU requirements regarding humidity levels for existing inventory of supplies and equipment used in the OR?

Assess your environment

- Is the utility system appropriately maintained?
- Are required frequencies for maintaining, inspecting, and testing of utility system components completed in accordance with manufacturer requirements?
- If using a CMS category waiver (which allows for humidity levels to be between 20% and 60%), has the organization completed the required risk assessment to ensure that supplies and equipment can be used and stored at these humidity levels?

Evaluate implementation

- Review documentation logs of temp and humidity readings, including on weekends and holidays for sterile storage areas; ensure scheduled maintenance activities have a 100% completion rate.
- Test air-exchange rates, temperature and humidity readings in both critical and non-critical areas.

What are some resources that can assist in mitigating risks in these areas?

- The Joint Commission, physical environment resources: <https://www.jointcommission.org/en/resources/patient-safety-topics/the-physical-environment/utility-systems/>
- Guidelines for Design and Construction of Health Care Facilities: <https://fgiguideines.org/guidelines/2018-fgi-guidelines/>
- The Joint Commission. Big Book of More Tracer Questions. 2019
- American Society for Healthcare Engineering. <https://www.ashe.org/>