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Owner:	*LORI SNYDER-SLOAN: RN-INFECTION CONTROL COORD*
Policy Area:	*Infection Prevention - Equipment and Environment*
References:	
Applicability:	*All CHI Health excluding Clinic & Physician Network*

Airhandling in Controlled Areas

PURPOSE

To define heating, ventilation, and air conditioning (HVAC) system requirements needed to 1) remove contaminated air, 2) protect susceptible staff and patients from airborne health care associated pathogens, and 3) minimize the risk for transmission of airborne pathogens from infected patients.

POLICY STATEMENT

A. Background

1. Elements of air-handling systems relevant to the prevention of infection include:
    a. Temperature
    b. Ventilation rate, e.g., minimum total air exchanges/hour
    c. Recirculation of air
    d. Pressure relationships to adjoining areas
    e. Filtration
    f. Humidity (in storage situations)
2. Numerous authorities having jurisdiction, governmental agencies, professional organizations, and accrediting agencies have input on HVAC requirements include:
    a. Department of Health and Human Services (DHHS).
    b. Department of Labor (DOL).
    c. Occupational Safety and Health Administration (OSHA).
    d. American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE).
    e. American Society for health care Engineering (ASHE).
    f. The Joint Commission on Accreditation of Healthcare Organizations.
    g. The American Institute of Architects (AIA) Guidelines represent a consensus document that incorporates or adopts by reference, the guidelines of others.

B. Definitions

1. Operative Procedure - An operative procedure is a procedure that takes place during an operation (defined as a single trip to the Operating Room (OR) where a surgeon makes at least one incision through the skin or mucous membrane, including laparoscopic approach, and closes the incision before the patient leaves the OR. (CDC / National Healthcare Safety Network [NHSN])

PROCEDURE

A. CHI Health hospitals comply with special air-handling requirements for the following areas:
    1. ORs.
    2. Critical Care rooms.
    3. Patient rooms used for Airborne Isolation rooms (aka Negative Pressure rooms).
    4. Procedure Rooms for bronchoscopy, gastrointestinal, invasive radiology, and cardiac procedures.
    5. Central Sterile Processing Decontamination/Clean side.
B. CHI Health hospitals follow relevant state regulations for hospitals as they relate to air pressure, air exchange rate and filtration supply:
    1. Nebraska Title 175, Chapter 9 (Guidelines for Design and Construction of Hospitals and Health Care Facilities, 2001 edition, published by the American Institute of Architects)
    2. Iowa regulations
C. Rooms requiring special ventilations are monitored with devices which will alert staff (Clinical and/or Maintenance) in the event of a sustained failure of any parameter.
    1. For sustained deviations, Facilities and Clinical staff collaborate on the formation of an action plan.
D. Preventative maintenance inspections verify operation of these engineering systems, including at least:
    1. Final filters are monitored and changed as needed.
    2. Pre-filters are inspected on a regular basis and changed as needed.
    3. Positive airflow and increased air exchanges; including all ORs, is verified by an independent contractor annually and as needed.
        a. When verification demonstrates a problem, corrective action is taken immediately, **and**
        b. Department leadership, Maintenance, and Infection Prevention are notified.
E. Records of inspections and maintenance are maintained.
F. Surgical areas must have heating and cooling systems that are capable of producing room temperatures at a range between 68°F and 73°F and relative humidity at a range between 30% and 60% relative humidity.
    1. The relative humidity parameter must meet the requirements shown below unless a waiver has been filed and approved by the Authority Having Jurisdiction.
    2. Temperature variations are allowed in order to meet the clinical needs of the patient. (for example: intentional maintenance of hypothermia conditions for selected cardiac surgery patients, warming of the room for trauma surgery patients)
    3. Any sustained deviation from the established parameter requires an action plan for resolution.
        a. This action plan is a collaborative effort between the affected department and Maintenance.

b. When a prolonged deviation is anticipated, the Infection Preventionist and committee are included.

c. *Ranges accommodate regulations into which hospitals are grandfathered.

Area	Temp*	Humidity %*	Minimum Total Air Exchanges/ Hour (ACH)	Recirculation by Room Unit (fans)	Pressure Relation to Adjacent Area	Minimum Outdoor Air Exchanges/ Hour (N/R = No Requirement)
Instrument Processing Area (soiled)	60 to 65	<71	6 to10		Negative	2
OR or Delivery Room (grandfathered)	68 to 73	30 to 60	15	No	Positive	3
OR or Delivery Room (new construction)	68 to 75	30 to 60	20	No	Positive	4
Patient Care Rooms (non-isolation)	70 to 75	70 to 75	6	Yes	N/R	2
Patient Care Rooms Used for Negative Pressure / Airborne Isolation	70 to 75	<60	12	No	Negative	2
Perioperative, Pre/Post Op Areas	70 to 75	20 to 60	6	No	NA	2
Procedure Room (GI, Endoscopy, Cardiac)	60 to 72	20 to 60	15	No	Positive	3
Storage Areas for Sterile Supplies		<70	4		Positive	N/R
Storage Areas for Medical / Anesthesia Gas	N/R	N/R	8	N/R	Negative	N/R

G. In the event of a failure of the HVAC system in the OR or Procedure Rooms.

1. Surgeries already in progress are completed.
2. ORs supplies that are open at the time of failure are considered contaminated and should be torn down.
3. Procedures not already underway will be redirected to areas of the surgical suite where the air-handling system is functioning or postponed until the problem has been corrected.
    a. Anesthesia and the OR Director, or designee, will triage all surgical cases for order of completion based on a risk assessment, and will identify specific OR/Procedural areas for use.
    b. In some hospitals, alternative areas are available which meet the requirements for acceptable temperature and humidity control as stated above.
    c. In situations where patient risk outweighs infection control risks, procedures which do **not** meet the definition of an "Operative Procedure" (above) may be performed in the Procedure Rooms with the approval of the surgeon, after making him/her aware of the room standards.
    d. The option to reschedule or move case to another facility is offered to patients whenever possible.
    e. ENT and OBGYN or clean contaminated cases (only) may be performed under the surgeon's direction after being informed that the air-handling system is down.

H. Appropriate notification occurs when air-handling parameters are not met in the OR or Procedure Rooms.
    1. Incident Report (IRIS) if the variation occurs while the room was in use.
    2. The surgeon if the variation occurs while a case is in progress.
        a. OR nurse will document in record: air-handling conditions, and time surgeon notified.
    3. Hospital leadership.
        a. A decision may be made to divert incoming patients if no estimated down time for air handlers being operational can be formed.

I. Upon restoration of airflow, proper function is verified before starting cases.
    1. After Maintenance has determined the air-handling system is operational, the OR will have 30 minutes of complete air exchanges prior to inspection for condensation.
    2. In the absence of visible condensation, all flat surfaces of the OR are wiped down and procedures are allowed to resume.

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Attachments:

No Attachments

Approval Signatures

Approver	Date
AMY ANDREASEN: COORDINATOR-HUMAN RESOURCES	08/2018
CATHERINE JESUS: DIV VP-QUALITY	08/2018
LORI SNYDER-SLOAN: RN-INFECTION CONTROL COORD	08/2018

Applicability

CHI Health Laboratory, CUMC-Bergan Mercy, Good Samaritan, Immanuel, Lakeside, Mercy Corning, Mercy Council Bluffs, Midlands, Missouri Valley, Nebraska Heart, Plainview, Schuyler, St. Elizabeth, St. Francis, St. Mary's