TABLE 4

Ventilation, Medical Gas, and Air Flow Requirements in Health Care Facilities[1]

Area Designation	Air Movement Relationship To Adjacent Area	Minimum Air Changes Outside Air Per Hour[3]	Minimum Total Air Changes Per Hour[4,5]	Air Recirculated By Means of Room Unit[7]	All Air Exhausted Directly Outdoor[6]
SURGERY AND CRITICAL CARE AREAS					
Operating/Surgical Cystoscopic Rooms [8,9]	Out	3	15	No	Optional
Delivery Room [8]	Out	3	15	No	Optional
Recovery Room[8]	-	2	6	No	Optional
Critical Care and Intensive Care	-	2	6	No	Optional
Newborn intensive care	-	2	6	No	Optional
Treatment Room[10]	-	-	6	Optional	Optional
Trauma Room[10]	Out	3	15	No	Optional
Anesthesia gas storage	In	-	8	Optional	Yes
Endoscopy	In	2	6	No	Optional
Bronchoscopy [9]	In	2	12	No	Yes
ER Waiting Room	In	2	12	No	Yes [11,12]
Triage	In	-	12	No	Yes[11]
Radiology waiting rooms	In	2	12	Optional	Yes[11, 12]
Procedure room	Out	3	15	No	Optional
NURSING AREAS					
Patient Room	-	2	6[13]	Optional	Optional
Toilet Room	In	-	10	Optional	Yes
Newborn Nursery Suite	-	2	6	No	Optional
Protective environment room [9,14]	Out	2	12	No	Optional
Airborne Infectious Isolation, Bronchoscopy Room[9, 15]	In	2	12	No	Yes
Isolation alcove or anteroom[14,15]	In/Out	-	10	No	Yes
Labor/Delivery/Recovery (LDR)	-	2	6[13]	Optional	Optional
Labor/Delivery/ Recovery/ Post Partum (LDRP) -	-	2	6[13]	Optional	Optional
Patient Corridor	-	-	2	Optional	Optional
ANCILLARY AREAS					
Radiology X-ray (Surgical/Critical Care & Catheterization)[16]	Out	3	15	No	Optional
Radiology X-ray (Diagnostic & Treatment)[16]	-	-	6	Optional	Optional
Radiology Darkroom	In	-	10	No	Yes
Lab General[16]	-	-	6	Optional	Optional
Lab Biochemistry[16]	Out	-	6	No	Optional
Lab Cytology	In	-	6	No	Yes
Lab Glass Washing	In	-	10	Optional	Yes
Lab Histology	In	-	6	No	Yes
Lab Microbiology [16]	In	-	6	No	Yes
Lab Nuclear Med	In	-	6	No	Yes
Lab Pathology	In	-	6	No	Yes
Lab Serology	Out	-	6	No	Optional
Lab Sterilizing	In	-	10	Optional	Yes
Autopsy[9]	In	-	[17]12	No	Yes
Nonrefrigerated body holding room	In	-	10	Optional	Yes
Pharmacy	Out	-	4	Optional	Optional

Area Designation	Air Movement Relationship To Adjacent Area	Minimum Air Changes Outside Air Per Hour[3]	Minimum Total Air Changes Per Hour[4,5]	Air Recirculated By Means of Room Unit[7]	All Air Exhausted Directly Outdoor[6]
DIAGNOSTIC AND TREATMENT AREAS					
Examination Room	-	-	6	Optional	Optional
Medication Room	Out	-	4	Optional	Optional
Treatment Room	-	-	6	Optional	Optional
Physical Therapy and Hydrotherapy	In	-	6	Optional	Optional
Soiled Workroom or Soiled Holding	In	-	10	No	Yes
Clean Workroom or Clean Holding	Out	-	4	Optional	Optional
STERILIZING AND SUPPLY AREAS					
ETO Sterilizer Room	In	-	10	No	Yes
Sterilizer Equipment Room	In	-	10	Optional	Yes
Central Supply Soiled or Decontamination Room	In	-	6	No	Yes
Central Supply Clean Workroom[17]	Out	-	4	No	Optional
Sterile Storage	Out	-	4	Optional	Optional
SERVICE AREAS					
Food Preparation Centers[17]	-	-	10	No	Optional
Warewashing	In	-	10	No	Yes
Dietary Day Storage	In	-	2	Optional	Optional
Laundry, General	-	-	10	Optional	Yes
Soiled Linen Sorting and Storage	In	-	10	No	Yes
Clean Linen Storage	**Out**	-	2	Optional	Optional
Soiled Linen and Trash Chute Room	**In**	-	10	No	Yes
Bedpan Room	**In**	-	10	Optional	Yes
Bathroom	**In**	-	10	Optional	Optional
Janitor's Closet	**In**	-	10	No	Yes

Notes for Table 4

1. The ventilation rates in this table cover ventilation for comfort, as well as for asepsis and odor control in areas of acute care hospitals that directly affect patient care and are determined based on healthcare facilities being predominantly "No Smoking" facilities per Ark. Code Ann. §20-27-704 et seq. . Where smoking may be allowed, ventilation rates will need adjustment. Areas where specific ventilation rates are not given in the table shall be ventilated in accordance with ASHRAE Standard 62, Ventilation for Acceptable Indoor Air Quality; and ASHRAE Handbook-HVAC Applications. Specialized patient care areas, including organ transplant units, burn units, specialty procedure rooms, etc., shall have additional ventilation provisions for air quality control as may be appropriate. OSHA standards and/or NI0SH criteria require special ventilation requirements for employee health and safety within healthcare facilities.

2. Design of the ventilation system shall provide air movement which is generally from clean to less clean areas. If any form of variable air volume or load shedding system is used for energy conservation, it shall not compromise the corridor-to-room pressure balancing relationships or the minimum air changes required by the table. Where the air movement relationship is "In " (negative) or "Out" (positive), the air movement relationship shall not be reversible. Rooms with reversible airflow provision for the purpose of switching between "In" and "Out" are not acceptable.

3. To satisfy exhaust needs, replacement air from the outside is necessary. Table 4 does not attempt to describe specific amounts of outside air to be supplied to individual spaces except for certain areas such as those listed. Distribution of the outside air, added to the system to balance required exhaust, shall be as required by good engineering practice. Minimum outside air quantities shall remain constant while the system is in operation.

4. Number of air changes may be reduced when the room is unoccupied if provisions are made to

ensure that the number of air changes indicated is reestablished any time the space is being utilized. Adjustments shall include provisions so that the direction of air movement shall remain the same when the number of air changes is reduced. Areas not indicated as having continuous directional control may have ventilation systems shut down when space is unoccupied and ventilation is not otherwise needed, if the maximum infiltration or exfiltration permitted in Note 2 is not exceeded and if adjacent pressure balancing relationships are not compromised. Air quantity calculations shall account for filter loading such that the indicated air change rates are provided up until the time of filter change-out.

5. Air change requirements indicated are minimum values. Higher values should be used when required to maintain indicated room conditions (temperature and humidity), based on the cooling load of the space (lights, equipment, people, exterior walls and windows, etc.).

6. Air from areas with contamination and/or odor problems shall be exhausted to the outside and not recirculated to other areas. Note that individual circumstances may require special consideration for air exhaust to the outside, e.g., in intensive care units in which patients with pulmonary infection are treated, and rooms for burn patients.

7. Recirculating room HVAC units refers to those local units that are used primarily for heating and cooling of air, and not disinfection of air. Because of cleaning difficulty and potential for buildup of contamination, recirculating room units shall not be used in areas marked "No." However, for airborne infection prevention and control, air may be recirculated within Individual isolation rooms if HEPA filters are used. Isolation and intensive care unit rooms may be ventilated by reheat induction units in which only the primary air supplied from a central system passes through the reheat unit. Gravity-type heating or cooling units such as radiators or convectors shall not be used m operating rooms and other special care areas.

8. National Institute for Occupational Safety and Health (NIOSH) Criteria Documents regarding Occupational Exposure to Waste Anesthetic Gases and Vapors, and Control of Occupational Exposure to Nitrous Oxide indicate a need for both local exhaust (scavenging) systems and general ventilation of the areas in which the respective gases are utilized.

9. Differential pressure shall be a minimum of 0.01" water gauge (2.5 Pa). If alarms are installed, allowances shall be made to prevent nuisance alarms of monitoring devices.

10. The term trauma room as used here is the operating room space in the emergency department or other trauma reception area that is used for emergency surgery. The first aid room and/or "emergency room" used for initial treatment of accident victims may be ventilated as noted for the "treatment room." Treatment rooms used for Bronchoscopy shall be treated as Bronchoscopy rooms. Treatment rooms used for cryosurgery procedures with nitrous oxide shall contain provisions for exhausting waste gases.

11. In a ventilation system that recirculates air, HEPA filters can be used in lieu of exhausting the air from these spaces to the outside. In this application, the return air shall be passed through the HEPA filters before it is introduced into any other spaces.

12. If it is not practical to exhaust the air from the airborne infection isolation room to the outside, the air may be returned through HEPA filters to the air-handling system exclusively serving the isolation room.

13. Total air changes per room for patient rooms, labor/delivery/recovery rooms, and labor/delivery/recovery/postpartum rooms may be reduced to 4 when supplemental heating and/or cooling systems (radiant heating and cooling, baseboard heating, etc.) are used.

14. The protective environment airflow design specifications protect the patient from common environmental airborne infectious microbes (i.e., Aspergillus spores). These special ventilation areas shall be designed to provide directed airflow from the cleanest patient care area to less clean areas. These rooms shall be protected with HEPA filters at 99.97 percent efficiency for a 0.3 micron sized particle in the supply airstream. These Interrupting filters protect patient rooms from maintenance-derived release of environmental microbes from the ventilation system components. Recirculation HEPA filters can be used to increase the equivalent room air exchanges. Constant volume airflow is required for consistent ventilation for the protected environment. It the facility determines that airborne infection isolation is necessary for protective environment patients, an anteroom shall be provided. Rooms with reversible airflow provisions for the purpose of switching between protective environment and airborne infection isolation

functions are not acceptable.

15. The infectious disease isolation room described in these guidelines is to be used for isolating the airborne spread of infectious diseases, such as measles, varicella, or tuberculosis. The design of airborne infection isolation (AII) rooms should include the provision for normal patient care during periods not requiring Isolation precautions. Supplemental recirculating devices may be used in the patient room, to increase the equivalent room air exchanges; however, such recirculating devices do not provide the outside air requirements. Air may be recirculated within individual isolation rooms if HEPA filters are used. Rooms with reversible airflow provisions for the purpose of switching between protective environment and All functions are not acceptable.

16. When required, appropriate hoods and exhaust devices for the removal of noxious gases or chemical vapors shall be provided per NFPA 99.

17. Food preparation centers shall have ventilation systems whose air supply mechanisms arc interfaced appropriately with exhaust hood controls or relief vents so that exfiltration or infiltration to or from exit corridors does not compromise the exit corridor restrictions of NFPA 90A, the pressure requirements of NFPA 96, or the maximum defined in the table. The number of air changes may be reduced or varied to any extent required for odor control when the space is not in use.