

UTMB RESPIRATORY CARE SERVICES GUIDELINES – Respiratory Care Services Medical Gas Cylinder Storage, Use and Transport	Policy 7.4.15 Page 1 of 4
Guidelines for Respiratory Care Services Storage, Use and Transport of Medical Gas Cylinders.	Effective: 07/10/2018 Revised: 06/26/2019 Reviewed: 08/21/2023

I. Title

Medical Gas Cylinder Storage, Use and Transport.

II. Policy

This policy applies to all departments and areas where medical gases are used stored or transported for patient care activities. Respiratory Care supplies oxygen for the transport of patients who require continuous oxygen therapy.

III. Scope

Nurses, Respiratory Care Practitioners, Patient Care Technicians, and Radiology/Transportation personnel trained to transport patients requiring continuous oxygen.

IV. Definitions

Combustible-anything capable of undergoing combustion.

Nonflammable Gas-a gas that does not support combustion. Examples include nitrogen, carbon dioxide, compressed air, and helium.

Oxidizing Gas-a gas that supports combustion. Examples include oxygen and nitrous oxide.

Medical Gas- specialized gas or gas mixtures used for patient care. Medical gas includes oxygen, medical air, nitrous oxide, nitrogen, carbon dioxide and other mixtures.

Full Cylinder-cylinders that are unused and full on the pressure gauge (1800-2200 psig).

Empty Cylinder-cylinders found in empty rack that are red on the pressure gauge (0 psig-500psig).

E Size Cylinder-smaller cylinders containing 23 cubic feet of gas.

H Cylinder-larger cylinders containing 337 cubic feet of gas.

Partial Cylinder-a cylinder that has been used but is not in the red zone on the gauge (500-1800 psig).

V. Relevant Federal and State Statutes

2015 NFPA 99 Health Care Facilities Code

2016 NFPA 55 Compressed Gases and Cryogenic Fluids

Joint Commission Environment of Care Standards, EC.02.01.01 and EC.02.06.01

VI. Requirements

Compressed gas cylinders have the potential to create a hazardous work environment if not handled, stored and used properly. Improper handling of compressed gas cylinders can potentially turn a cylinder into a lethal projectile. Improperly segregated cylinders can put patients at risk if a cylinder is accidentally used that does not contain an adequate supply of medical gas.

A. Medical Gas Cylinder Storage

When storing medical gases, in all cases the following applies:

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- 1) Cylinders ‘in use’ are not counted in the aggregate volume calculation.
- 2) If Valve Protection Caps are provided, they must be in place and secured when cylinder is no longer in use. These are typically found on the H size cylinders.
- 3) Cylinders shall be physically supported by being secured in a rack, on a cart or in an enclosure designed for such cylinders at all times. Unsecured cylinders could fall, break the valve and become a projectile.
- 4) Freestanding cylinders should be properly chained or supported in a proper cylinder stand or cart.
- 5) Cylinders must be segregated and separated by Full/Partial and Empty so that staff select the proper cylinder during emergency situations.
- 6) Smoking, open flame, electric heating elements and other sources of ignition are prohibited within medical gas storage locations.
- 7) Cylinders must be kept away from heat and flammable materials. Temperatures cannot exceed 125°F.
- 8) Nitrous oxide and carbon dioxide cylinders shall not reach temperatures lower than manufacture recommendations or -20°F.
- 9) Oxygen cylinders, containers, and associated equipment are protected from contamination, damage, and contact with oil and grease.

Less than 12 E size cylinders (less than 300 cubic feet) of nonflammable gas:

- 1) Cylinders will not be required to be stored in enclosures.
- 2) Individual E size cylinders available for immediate use in patient care areas shall not be considered in storage.

Storing more than 12, but less than 120, E size cylinders (300 but less than 3,000 cubic feet) of nonflammable gas:

- 1) The storage locations should be outdoors in an enclosure or within an enclosed interior space constructed of non- or limited-combustible material.
- 2) Enclosure must have door (or gates outdoors) that can be secured. Room is not required to have a self-closing device and is not considered ‘hazardous’.
- 3) Oxidizing gases are not to be stored with flammables and are separated from combustibles by 20 feet (5 feet if building is sprinklered) or enclosed in a cabinet of noncombustible construction having a minimum 1/2-hour fire protection rating.
- 4) In rooms used to store oxygen or medical air, doors shall be labelled:
CAUTION:
OXIDIZING GAS(ES) STORED WITHIN
NO SMOKING
- 5) Signs shall be located on storage room doors/fence and be visible from a distance of 5 ft .

Storing more than 120 E size cylinders (more than 3,000 cubic feet) of nonflammable gas:

- 1) The storage locations should be outdoors in an enclosure or within an enclosed interior space constructed of non- or limited-combustible material.

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- 2) Enclosure must have door (or gates outdoors) that can be secured. Storage room doors must be self-closing.
- 3) Interior rooms used to store compressed gases shall be separated from the rest of the building by walls and floors having a one hour fire resistance rating with ¾ hour rated doors.
- 4) Oxidizing gases are not to be stored with flammables and are separated from combustibles by 20 feet (5 feet if building is sprinklered) or enclosed in a cabinet of noncombustible construction having a minimum 1/2-hour fire protection rating.
- 5) In rooms used to store oxygen or medical air, doors shall be labelled:
**CAUTION:
OXIDIZING GAS(ES) STORED WITHIN
NO SMOKING**
- 6) In rooms used to store positive pressure gases other than oxygen or medical air, doors shall be labelled:
**Positive Pressure Gases
NO Smoking or Open Flame
Room May Have Insufficient Oxygen
Open Door and Allow Room to Ventilate Before Entering**
- 7) Signs shall be located on storage room doors and be visible from a distance of 5 ft .
- 8) Indoor rooms used for compressed gas storage shall have mechanical exhaust ventilation or natural ventilation. Exhaust must not be recirculated.
- 9) Mechanical exhaust ventilation should be continuous and provide negative pressurization of enclosure. Ventilation must comply with the 2012 version of NFPA 99, section 9.3.7.
- 10) Enclosures housing oxygen cylinders at this quantity may not be used for any other purpose.
- 11) Electrical devices must be physically protected, either by the use of a protective barrier around the device or by locating the electrical devices at or above 5 feet above the finished floor, to prevent the possibility of the cylinders or container from coming in contact with the electrical device so as to avoid damaging cylinders or containers.

B. Medical Gas Cylinder Handling and Transport

1. Cylinders must be secured during transport in a rack, cart or in an enclosure designed for such cylinders, at all times.
2. Cylinders may not be placed on a bed with a patient during transport. Cylinders must be secured in an appropriate cylinder holder on or under the bed.
3. Cylinders and associated equipment are protected from contamination, damage and contact with oil and grease.
4. Cylinders should not be draped with any materials such as hospital gowns, masks or caps.
5. Personnel handling cylinders should be trained on the hazards of compressed gas cylinders and proper handling techniques.

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C. Medical Gas Cylinder Use

1. For emergency transport, use cylinders from ‘Full/Partial’ racks and ensure the gauge is full and following the UTMB Respiratory Care Services Procedure 7.3.35: Portable Oxygen Transport.
2. Use of the cylinders should be arranged so that they are used in the order received from the supplier.
3. Cylinders are considered in use if they are: being used by a patient, secured to equipment or located in a patient room ready for immediate use.
4. Adaptors or conversion fittings are prohibited.
5. Compressed gas cylinders, as well as any assemblies included with cylinders, shall not be present in the same room with MRIs unless it is proven to be non-magnetic or suitable for use in an MRI.
6. Cylinder labels shall not be defaced, altered, or removed and connecting fittings shall not be modified.
7. For each transport request, staff will use charts posted in storage locations to determine the length of time the cylinder will support the liter flow required for that case. Cylinders reading below 500 psi will not be used. Additional information can be found in UTMB Respiratory Care Services Procedure 7.3.35: Portable Oxygen Transport.
8. UTMB no longer uses liquid oxygen. Liquid Oxygen transfilling is prohibited in patient care areas.

VII. Roles and Responsibilities

A. Nursing:

1. Ensure no orphaned/ unsecured cylinders exist.
2. If an orphaned/unsecured cylinder is found, it must be immediately placed in a rack or transported to one of the appropriate storage rooms. Locations of storage rooms can be found in Appendix.

B. Respiratory Care

1. Manage the cylinder program.
2. Pick up cylinders from storage locations and replenish stocks of full cylinders.

C. Transportation

1. When transporting patients with gas cylinders, the used cylinders must be left with patient in appropriate holder, returned to the original location or secured in a rack in any location.
2. Comply with this policy and UTMB Respiratory Care Services Procedure 7.3.35: Portable Oxygen Transport.

D. Environmental Health and Safety

1. Maintain Medical Gas Cylinder Policy.
2. Evaluate policy compliance during Environmental of Care Tours and other safety inspections and evaluations.

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3. Report instances of noncompliance to appropriate individuals.

VIII. Related UTMB Policies and Procedures

UTMB Respiratory Care Services Procedure 7.3.35: Portable Oxygen Transport

IX. Appendix

Gas Cylinder Storage Room Locations

Galveston Main Campus

John Sealy 2nd floor Burn unit clean storage 2.544
 John Sealy 4th floor O2 storage room next to the elevators 4.106
 John Sealy 4th floor Cath Lab clean storage 4.224
 John Sealy 9D PICU clean storage 9D8
 Emergency Department 2.914
 TDCJ O2 storage on 4th floor 4C52
 TDCJ Sally port 1st floor GA08
 CSW Transportation 2nd floor 2.504
 CSW Respiratory Care 5th floor tank room 5.300B
 Jennie Sealy 8, 9, 10 and 11th floor racks in staff elevator lobby's
 Jennie Sealy 8th floor Jennie ABG lab 8.128
 Jennie Sealy 8D tank storage 8.722
 Jennie Sealy 4th OR 4.412
 McCullough 2nd floor Radiology 2.332
 Clinical Sciences Building 4th floor Endoscopy 4.224

League City Campus

Emergency Department 1.424
 Respiratory Care Services 1.604
 PACU 1.312K
 Medical Surgery Unit 2.420
 ICU 2.830A

Angleton Danbury Campus

PACU Recovery Room
 Operating Room Area
 Emergency Department 1.150
 ICU 2.131
 Respiratory Care Storage 2.116
 Med Surg South 2.246
 Labor and Delivery Nursery 2.320
 Radiology

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Clear Lake Campus

- Emergency Department : 1.142
- Radiology Interventional : 1.325
- Cath Lab : 2149
- Or (Pre/Op) : 3.018
- PACU : 3.434
- ICU : 4.311
- Med/Surg : 4.118
- L&D : 5.218
- Med/Surg : 6.203
- ICU : 7.304
- Med/Surg : 7.202
- Med/Surg : 8.203

X. Dates Approved or Amended

Include origination date, dates of major or minor revisions and dates reviewed without changes.

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