

Manitoulin-Sudbury District Services Board POLICY & PROCEDURES MANUAL	
Section: G. Emergency Medical Services	Effective Date: March 1, 2010
Topic: 8. Occupational Health and Safety	Replaces: New
Subject: 3.8. Oxygen Cylinders	
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PURPOSE

To outline safe workplace process and the safe use of Oxygen Cylinders.

APPLICATION

Paramedics, EMAs, Management

PROCEDURE

Rationale for use

The oxygen cylinder is the source of providing increased concentrations of oxygen to a patient during care and transportation to a medical facility.

Description

Oxygen is stored under high pressure in cylinders. These are painted white or green by international agreement. This helps ensure that only oxygen and no other gases will be in the cylinder. In the prehospital setting, both D and M tanks have application. D tanks are used with portable kits, while M tanks are part of the integral oxygen supply system within the ambulance.

- Oxygen cylinders are seamless and made of aluminum or steel.
- The stem valve protrudes from the top of the cylinder. A non-sparking stem valve wrench or knob should be immediately available for the associated pressure-reducing regulator.
- The certification dates must be stamped on the cylinder along with the date cylinder serial number, ICC specification number and service pressure. Inspect the cylinder to ensure that the most recent inspection date is within the inspection schedule criteria for that cylinder. Aluminum cylinders must be inspected every 5 years; steel cylinders are usually inspected every 10 years.
- The stem valve should have an attached status tag reading “full” when the cylinder contents are about 2000 psi and “in use” when the contents are over 500 psi for both D and M cylinders.

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Specifications

Size

	Diameter	Height	Weight - Empty	Weight - Full	Volume
D (Aluminum)	10 cm	42 cm	2.8 kg	3.4 kg	415 L
M (Aluminum)	20 cm	93.4 cm	19 kg	23 kg	3500 L

NOTE:

- Sizes and weights vary by manufacturer
- The oxygen, inside the cylinders, is stored under a pressure range of about 1800 to 2400 pounds per square inch (psi).

Duration of Flow

The length of time that a cylinder can be relied upon to deliver oxygen is dependent on:(1)the oxygen pressure within the cylinder (2) the flow rate being supplied This time is determined by:

- Duration of O₂ (minutes) = Gauge Pressure (psi) - Safe Residual tank Pressure (500psi) x constant / Flow Rate (L/min)

Cylinder Type	Gauge Pressure of Full Cylinder	Constant	Flow Rate L/ Min.	Duration of Available Oxygen Flow/Minute
D	2100	0.16	6	42.6
			8	32.0
			10	25.6
			12	21.3
M	2100	1.56	6	416.0 (6.8 hrs)
			8	312.0 (5.2 hrs)
			10	249.8 (4.16 hrs)
			12	208.3 (3.46 hrs)

Procedure for Use

Refer to the Procedure for Use in G.8.3.7

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Precautions

- The sudden pressurization of any regulator at the opening of a high pressure cylinder valve can generate extremely high temperatures. Thus, combustible materials such as solvents, lubricating oils, greases, tape residue and greasy hands must not be permitted to come in contact with the cylinder, regulator or hoses.
- The sudden pressurization can also result in rupture of pressure gauges and other regulator components. Always stand to one side of this cylinder and turn on cylinders slowly.
- Although oxygen does not burn, it does support combustion and will cause burning objects to flame vigorously. Smoking is not permitted near oxygen equipment and oxygen should not be used near open flame.
- Only equipment intended for use with oxygen should be used. Devices intended for use with other gases should not be modified for use with oxygen
- Ensure washers, valve seats, gauges and other components are in good condition. Never try to repair or modify oxygen equipment.
- When finished administering oxygen, always bleed remaining gas from the regulator to prevent damage from the constant pressure. Empty containers should be stored with the valve closed to prevent contamination.
- Always secure oxygen cylinders well. In transit, the cylinder must be properly and securely stowed utilizing ambulance manufacturer mounting devices or securely strapped (D-cylinder).
- Oxygen cylinders should not be subjected to temperatures greater than 50 degree Celsius. Reserve cylinders should be secured appropriately in the provided cylinder racks or retaining systems installed at each Ambulance Station.
- A minimum of two persons should be utilized when moving and/or installing M-cylinders.

Cleaning

The exterior of the cylinder may be cleaned with soap or detergent in water. Take care to ensure that the cleaner does not come in contact with the cylinder valve or oxygen outlet. If sterilization is required, disinfect according to "Disinfection of Vehicles and Patient Care Equipment", (Policy & Procedures G.6.2.).

To clean the oxygen outlet, "crack" the cylinder valve by opening it slightly and then closing it. This will blow out any loose dust or lint in the connection passage.

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The external cylinder wall should show no more than superficial corrosion. The valve and cylinders should be clean and free of oil or grease.

REFERENCE

Ministry of Health, Emergency Services Branch, 1993, *Patient Care Equipment Manual*, The Crown in Right of the Province of Ontario

Emergency Health Services, Occupational Health Services, 1991, *A Lifting Training Program for Emergency Medical Attendant*

Manitoulin-Sudbury District Services Board, *Ergonomics*, Policy & Procedures G.8.5.1.

Manitoulin-Sudbury District Services Board, *Cot Maintenance Program*, Policy and Procedure G. 4.2.

Manitoulin-Sudbury District Services Board, *Securing Equipment*, Policy and Procedure G. 8.4.3.

Manitoulin-Sudbury District Services Board, *Disinfecting of Vehicles and Patient Care Equipment*, Policy & Procedures G.6.2.