



भारत सरकार  
स्वास्थ्य एवं परिवार कल्याण मंत्रालय  
निर्माण भवन, नई दिल्ली - 110011  
Government of India  
Ministry of Health & Family Welfare  
Nirman Bhavan, New Delhi - 110011

वन्दना गुरनानी, भा.प्र.से.  
**Vandana Gurnani, I.A.S.**

अपर सचिव एवं मिशन निदेशक (रा.स्वा.मि.)  
Additional Secretary & Mission Director (NHM)

D.O. No. Z-33014/45/2020 -RCH

Dated 4<sup>th</sup> April 2020

Dear AU,

As you all are aware that the COVID-19 pandemic is throwing up unique challenges for our health systems. It is also leading to particular challenges of not only ensuring the adequate supply of oxygen but also protocols related with handling the major sources of supplies.

Keeping above facts in mind, guidelines have been prepared by incorporating the major sources for supply of oxygen, oxygen system component, normative requirement of quantity of oxygen and precautions required for handling the oxygen cylinder including disinfecting cylinders right from filling point to transportation, loading, unloading, use, exchange, carriage in the hospitals and in critical care facilities. All concerned hospitals and staff must be informed to ensure timely requisitions and payments so that there is no disruption in oxygen supplies.

I am enclosing the control room emergency contact numbers of All India Industrial Gases Manufacturers' Association and States / UTs can contact this control room directly in case of any difficulty or clarification.

I am sure that State/UT Government will find this brief and relevant guideline useful and disseminate this to all the health facilities handling COVID-19 patients.

*with warm regards*

Enclosure: as above

Yours sincerely,

  
(Vandana Gurnani)

1. Additional Chief Secretary / Principal Secretary / Secretary – Health, All States /UTs
2. Mission Directors, National Health Mission , All States / UTs





**All India Industrial Gases Manufacturers' Association**  
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Regd. No. SI/7716 of 1975

1<sup>st</sup> April 2020

**CONTROL ROOM - EMERGENCY CONTACT NUMBERS**

**HELPLINE NUMBERS: 9354899158/9899136618 (MRS VEENA PETER, SECRETARY – AIIGMA)**

**MEDICAL OXYGEN GAS MANUFACTURERS/REFILLERS/SUPPLIERS**

Sl. No.	Name of Person	Company Name	Contact Number	Remarks
1.	Surender Singh	Linde India Ltd	8279626987	Northern Region
2.	Dheeresh Manrai	Linde India Limited	8291004431	All over India
3.	Anirban Sen	Linde India Limited	9831798987	All over India
4.	R C Kaushik	Praxair	9324548432	All over India
5.	Vinod Singh	Inox Air Products Pvt Ltd	9999162672	North India Only
6.	Rajeev Gupta	Vinayak Air Products Pvt Ltd	9350109650	North India Only
7.	Mukesh Gupta	Goyal MG Gases Pvt Ltd	9643311915	North India Only
8.	Salim Rakhani	Phoenix Gases Pvt Ltd	9930403747	Western Region
9.	Sunil Gupta	Raigad Carbides	9325025132	Western Region
10.	Sanjay Agrawal	Essem Gases Pvt Ltd	9823088573	Western Region
11.	Subasish Guha Roy	Universal Air Products	9845063119	Southern Region – Karnataka
12.	Sadanand Pai	Southern Gases	9845543677	Southern Region - Karnataka
13.	R Srikrishnan	Popular Carbonic	9387201533	Southern Region - Kerala
14.	Anthony Joseph	Manorama Gases	9895030269	Southern Region - Kerala
15.	J L Manohar Rao	Siddhivinayak	9849021331	Southern Region – Andhra Pradesh
16.	R S Sachdeva	Hitech Industries	9815022200	Northern Region - Punjab
17.	R Kannan	Tamilnadu Air Products Pvt Ltd	9094001166	Southern Region – Tamil Nadu

**CYLINDERS MANUFACTURERS (MEDICAL OXYGEN)**

Sl. No.	Name of Person	Company Name	Contact Number	Remarks
1.	Puneet Khurana	Everest Kanto Cylinders Ltd	9821029299	Steel Cylinder
2.	Sarang Gandhe	Everest Kanto Cylinders Ltd	9167200361	Steel Cylinder
3.	Pravin Nandu	Euro India Pvt Ltd	9821042582	Steel Cylinder
4.	Vijay Parikh	AI Can Exports	9769111333	Aluminum Cylinder
5.	Ravi Kaul	Luxfer Uttam India	8860917244	Aluminum Cylinder
6.	Sandeep Bhasin	Luxfer Uttam India	9971344511	Aluminum Cylinder
7.	Amit Ramsinghani	Rama Cylinders Pvt Ltd	9820055111	Steel Cylinder

**CRYOGENIC VESSELS MANUFACTURERS (LIQUID OXYGEN)**

Sl. No.	Name of Person	Company Name	Contact Number	Remarks
1.	Savir Julka	Inox India Limited	9824063920	
2.	Santhosh Radhakrishnan	Chart VRV	9160710000	
3.	Munjal Mehta	Shell-n-Tube Pvt Ltd	9822033325	
4.	Babu	Cryolor Asia Pacific	8220053223	

**NOTE:** In case the end user has any difficulty in contacting any of the above person, they may kindly contact the following:

**Saket Tiku, President - AIIGMA at 9322668367**

*Peter*

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cretary

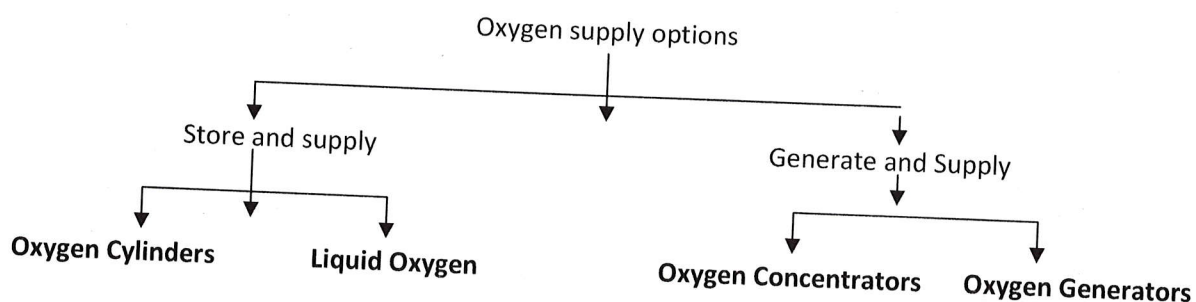


## NOTE ON SUPPLY OF OXYGEN TO HOSPITALS AND INDIVIDUAL PATIENTS IN A CORONA INFESTED ENVIRONMENT

Corona virus pandemic has presented such challenges to the norms of medical care in the world that responding and countering this challenge will demand a major functional and behavioral change to our working environment. This note intends to present a method of supplying oxygen to medical facilities and individual patients in the current environment.

### **I. Major Source for Supply of Oxygen**

Oxygen to medical facilities is supplied and fed through four primary methods:



**1. Oxygen Cylinders** - These are primarily used in hospitals where Medical Gas Pipeline (MGPS) has not been laid, however many hospitals use cylinders connected in series to supply oxygen to the wards through a manifold. The Jumbo cylinders are used in critical areas like Operation Theatres, ICUs, HDUs, etc. Smaller cylinders (B Type) are used for stretchers, ambulances, general wards, etc. The use of oxygen cylinders requires three times the inventory of cylinders consumed in a hospital in a day (one set of cylinders in use, one set as backup and one set in refilling station). It is labour intensive, logistically challenging, unsafe, unhygienic (chances of carrying infection from hospital) and expensive method. However this is the most easily adaptable method in short term and emergency situations.

**2. Liquid Medical Oxygen (LMO)** - This demands a MGPS, a safe, open, unhindered space upto 9M x15M in a hospital premise. It also demands installation of a storage tank which needs a PESO license and a third party supply dependence. It also demands one day of oxygen supply through cylinders as a backup. But this is a far better, cheaper, safer method than supply through cylinders, however this is again a supplier dependent method.

**3. Oxygen Concentrators** - An oxygen concentrator is a self-contained, electrically powered medical device designed to concentrate oxygen from ambient air. This is used on the bedside without MGPS and caters to 1-2 patients at a time. This oxygen cannot be used with ventilator, because the pressure generated is very low.

**4. Oxygen Generators (Plant)** - This demands a MGPS and an assured cylinder backup. It allows ownership of oxygen with the user with no third party dependence. It is safe, efficient, cheapest, least polluting, non human dependent for operations and most contemporary form of oxygen supply.

*Signature*  
3/4/2020

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## II. Oxygen System components

Oxygen distribution, conditioning, delivery, patient monitoring, power supply and maintenance support are some of the critical components of oxygen systems. Consumables and ancillary devices such as regulators, breathing circuit, mask, nasal prongs, cannula, filters, flowmeter, air oxygen blender, etc. are crucial for operational use of oxygen therapy equipment. Please refer the below figure for details of the same.

The accessories that are downstream of the oxygen source should be single use/disposable. These include the tubing and facemask/nasal cannula/nasal prongs. They should be changed for every patient and should be disposed of as per Ministry of Health & Family Welfare, Government of India guidelines.

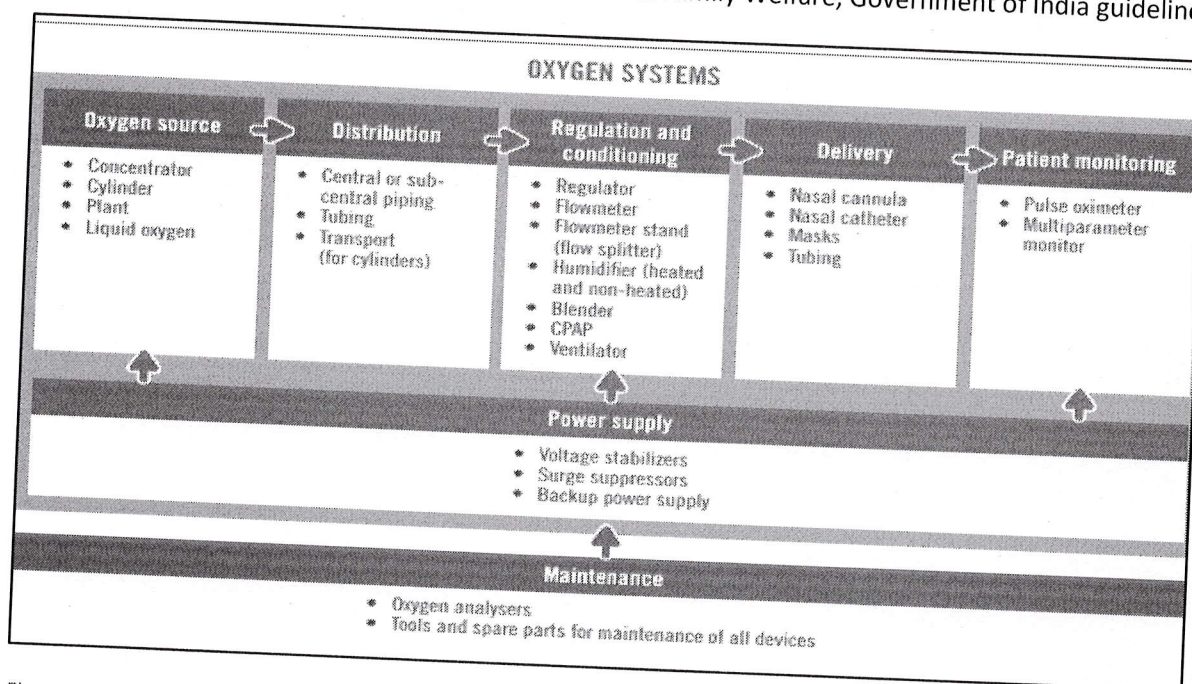


Figure 1- Oxygen System components (Source WHO)

## III. Normative requirement of quantity of oxygen for a 200 bedded(with oxygen) hospital is as below:

Source of Oxygen	Volume of oxygen generated/required	Back up
Oxygen Generated in House using PSA Generator	475 Litre per minute – with required Power load (40 KW) and space of 4 x 5 m	90 'D type Jumbo cylinders'
Liquid Oxygen through a Supplier	20,400 cubic meter/month.	90 'D type Jumbo cylinders'
Oxygen Cylinders	7.25 cubic meter per cylinder (D type) * 90 cylinders per day	90 'D type Jumbo cylinders'

It is pertinent to note that cleaning/disinfection of oxygen cylinders is crucial and if not done by the hospital, before sending back to the oxygen supplier for refilling, could become a major source of infection.

*Signature*  
3/4/2020

*Mohammed Khan*  
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#### IV. Precautions needed in using any of the methods of oxygen supply in corona virus infested environment

Liquid Medical Oxygen, Oxygen generators and in some cases cylinders are methods which use a MGPS to supply oxygen to a hospital facility. These equipment will need exactly the same disinfection as is been given to any other machinery and surfaces in the hospital. All parts which are regularly and frequently touched or operated should be sanitized before and after use. Only relevant operators should handle the equipment.

Use of cylinders brings a need for a major change in procedure of handling them. Right from filling point to transportation, loading, unloading, use, exchange, carriage in the hospitals and in critical care facilities, cylinders see handling by various people, usage by patients and being very close to actual infected patients. The safe handling of cylinders is a major challenge which needs a very focused and concentrated effort by all involved.

**The following guidelines should be adopted for handling Oxygen cylinders (and related accessories):**

- The cleaning & disinfection procedure should be performed at the hospital in a designated area.
- For initial cleaning, hot potable water with detergents, not exceeding 50 degrees Celsius (50 °C) should be used for cleaning cylinders, wheeled cylinder trolley, spanner, keys, regulators and wrench. Valves & inlets should be closed & covered so that the water doesn't get inside the cylinders/containers. Under no circumstances medical gas cylinder/container should be immersed in water.
- After cleaning the cylinder/accessories with water and soap, the cylinder/container should be cleaned with 1% sodium hypochlorite solution. Fogging is a suitable alternative.
- While cleaning the cylinder/container, avoid cleaning agents that contain ammonia, amine based compounds or chlorine based compounds as they can cause corrosion of steel or aluminium alloy components or stress cracking of brass, including copper alloy components.
- In case the used cylinders have not been disinfected, then the cylinders should be kept in an isolated area, with a tag clearly mentioning that the cylinder is infected. The cylinders should be sent to the supplier only after these steps are followed.
- It is important to note that even hospitals having central supply systems/MGPS may need to rotate cylinders in new areas created for patient care. Therefore special precautions mentioned as above to be observed when exchanging the cylinders.
- Personnel involved in filling, storing, handling & transporting of Medical Gas Cylinder/container should be trained in this procedure and should be wearing protective gear at all times as per MoHFW guidelines

These steps and methods highlighted above is not the last word on precautions which can be taken while handling oxygen supply related equipment during the outbreak of COVID – 19. These guidelines would be updated as and when required.

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