

COVID-19

& GUIDANCE FOR OXYGEN SELF-USE DURING HOMECARE

(A pictorial guide to proning & oxygen self-care to defeat COVID-19)

Let's fight COVID-19 together



6 FEET'S
KEEP
DISTANCE



**USE
OXIMETER**



**CONSULT
YOUR
DOCTOR**



**KNOW
YOUR O₂
CYLINDER**



**WEAR
O₂ MASK
PROPERLY**

**SELF
PRONING**



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FOREWORD

Oxygen is one of the medicines which is used for patients suffering from hypoxemia. It is required for severe pneumonia diseases like COVID-19, chronic pulmonary diseases & emergency surgeries, and cardiovascular diseases.

The COVID-19 pandemic has caused some issues of procuring required oxygen. Health care systems at all levels are under pressure to deal with the supply of this vital resource. Hence, it is crucial to understand when to use oxygen and how to minimize its wastage.

The oxygen should be used only after consulting a medical professional, following their instructions. We should also avoid unnecessary hoardings of oxygen cylinders, which adds to the current oxygen scarcity. The infographic booklet 'COVID-19 and Guidance for Oxygen Self-use during Homecare' aims to explain the oxygen uses during homecare and avoid wastages.

I observed that the infographic booklet also guides about the blood oxygen level, its monitoring, including the oxygen therapy devices (e.g., oxygen cylinders, oxygen concentrators) and their uses in easy to understandable pictorials to ensure the safe delivery of oxygen to the patients. Further, as explained in the booklet, safety precautions must be followed when using an oxygen cylinder as it helps in burning.

I commend the effort of Dr. Ravindra Khaiwal, Department of Community Medicine & School of Public Health, Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh and Dr. Suman Mor, Department of Environment Studies, Panjab University (PU), Chandigarh, for bringing out the infographic booklet for caregivers and the general public to ensure patients well-beings.

I also request please do not unnecessarily hoard the oxygen cylinders as it may be helpful for someone in urgent need. Once again, I congratulate the authors, their team and both insitutions for developing this pertinent infographic, which will be a valuable tool to fight against the COVID-19. Together we will defeat the COVID-19 and its spread.


(Prof Jagat Ram)

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This booklet is based on current knowledge & may need to be updated with the emerging evidence.



ARTERIAL BLOOD GAS & ITS MEASUREMENT

BLOOD OXYGEN LEVEL



It shows the concentration of oxygen being carried by the red blood cells in the human body

TERMINOLOGY FOR BLOOD OXYGEN LEVEL

The measurement of blood oxygen concentration is also called oxygen saturation level. It is symbolized by-

→ PaO_2 : When oxygen saturation level is measured using blood gas

→ SpO_2 : When oxygen saturation level is measured using oxygen



NORMAL

Normal oxygen level measured using a pulse oximeter (SpO_2) varies between 95-100%, whereas typical arterial blood gas (ABG) oxygen levels range from 80 & 100 (mm Hg) for healthy lungs



BELOW NORMAL

A pulse oximeter (SpO_2) level below 95% or an ABG oxygen level below 80 mm Hg reflect below-normal oxygen level. This situation is termed hypoxemia & if not treated, could lead to severe complications in human body tissue & organs



MEASURING BLOOD OXYGEN LEVEL

ARTERIAL BLOOD GAS



An arterial blood gas or ABG is an invasive blood test. ABG is an accurate test & apart from blood oxygen, it also allows to measure the other gases, including the pH (acid/base level). To perform an ABG test, medical professionals draw blood from an artery

PULSE OXIMETER



A pulse oximeter allows monitoring the blood oxygen level without any invasion & pain. A pulse oximeter is normally placed at the finger's toe or earlobe. It measures the blood oxygen by sending infrared light into the capillaries of the finger & recording how much light is reflected by the gases. The pulse oximeter reading shows the oxygen saturation level, known as the SpO_2

SIX MINUTE WALK TEST



If you have COVID-19 symptoms check oxygen level by using an oximeter before taking a walk. Now, walk for 6 min without a break on an even surface with having pulse oximeter. Oxygen level may fall 1-2%, but if it falls below 3% or 93%, consult a doctor

ASTHMATIC PATIENT **X**

> 60 YEARS **3 MINUTES**



PRONING TO ENHANCE BLOOD OXYGEN LEVEL

WHAT HAPPENS IF YOUR OXYGEN LEVEL IS TOO LOW

SHORTNESS OF BREATH



CHEST PAIN



CONFUSION



HEADACHE



RAPID HEARTBEAT



PRONING FOR SELF-CARE

PRONING is a medically accepted process to improve the distribution & exchange of oxygen in the lungs. A patient is safely placed from their back onto their abdomen (stomach), i.e., having face down to improve breathing & oxygenation. It has been shown beneficial for COVID-19 patients with compromised breathing comfort, especially during home isolation



PRECAUTION

Avoid proning for an hour after meals



Maintain proning for only as much times as easily tolerable



One may prone for up to 16 hours a day, in multiple cycles, as felt comfortable



Proning is required only when the patient feels difficulty in breathing & the SpO₂ decreases below 94 (less than 94)

PRONING POSITIONS

LAYING ON YOUR BELLY
(30 Min – 2 Hrs)



LAYING ON YOUR RIGHT SIDE
(30 Min – 2 Hrs)



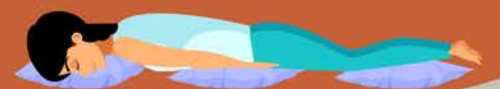
SITTING UP
(30 Min – 2 Hrs)



LAYING ON YOUR LEFT BELLY
(30 Min – 2 Hrs)



LAYING ON YOUR BELLY
(30 Min – 2 Hrs)



OXYGEN THERAPY DEVICES & THEIR USES

WHEN TO USE OXYGEN? USE ONLY UNDER MEDICAL CONSULTATION

Only mild to moderately ill patients, who have an oxygen saturation level between 90-94, can use an oxygen concentrator at home



In case of need of oxygen, one can use it upto an oxygen level of 85



The oxygen saturation level below 80-85 requires a higher flow of oxygen & hence one should switch to a cylinder or liquid medical oxygen supply



Oxygen is a medicine. Please consult a medical professional before using an oxygen device

THE BEST CHOICE FOR AN OXYGEN THERAPY DEVICE?

IT DEPENDS ON HOW MUCH OXYGEN ONE NEED AS PER MEDICAL CONSULTATION



Standard Oxygen Concentrator: It is a device that extracts oxygen from ambient air & filters out other gases such as nitrogen. Oxygen concentrators are commonly based on either pressure swing adsorption or membrane gas separation technology. Oxygen concentrators are considered to be a cost-effective source of oxygen despite requiring electricity to operate. It weighs around 20 kg & has wheels to make it easily portable

Liquid Oxygen Tank: Oxygen is a gas, but it converts into a liquid at lower temperatures. Liquid oxygen takes up less space; hence it can be stored in thermos-like tanks. When the liquid oxygen comes out from the tank, it converts into a gas. A liquid oxygen tank can weigh around 40 kg



Compressed Oxygen Gas Tank: Oxygen cylinders or tanks contain compressed oxygen under high pressure inside a metal cylinder or tank. Compressed oxygen cylinders are generally not preferred due to heavyweight & safety issues. These cylinders come in various sizes but typically come only in small sizes; their uses last only for a short duration, depending on the flow rate

Portable Oxygen Concentrator: These medical devices are used by people having breathing disorders or lung diseases. Portable Oxygen Concentrator weighs only 1-8 kg & can run both on electricity & batteries. These devices also come with adaptors, which enhance the mobility of patients



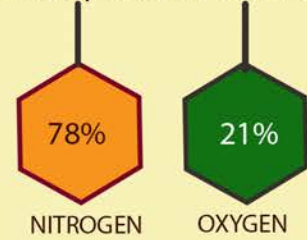
OXYGEN CONCENTRATORS & CYLINDERS

WORKING OF OXYGEN CONCENTRATORS

Oxygen concentrators are simple devices that take in ambient air & increase its oxygen concentration by filtering away the nitrogen



Atmospheric air contains



They function similarly as oxygen tanks or cylinders, supplying oxygen to the patients using a cannula, oxygen masks, or nasal tubes. While cylinders & canisters need to be refilled, oxygen concentrators can be used continuously

Oxygen concentrators can provide around 5-10 liters of oxygen per minute & are suitable for patients having moderate symptoms of COVID-19. Critical patients often require up to 40-50 liters of oxygen per minute & hence they can not be supported by the oxygen concentrators

COMPARISON

SYSTEM	OXYGEN CYLINDER	OXYGEN CONCENTRATOR
Source of Power	No power source required	Continuous electricity is required depending on the model
Transport Requirement	It is heavy & costly to move, as regularly needs to be changed	Lightweight & use of adaptor help to increase the mobility
Exhaustible Supply	The supply is limited, which depends on the cylinder size	Can provide continuous oxygen supply
User Care	Leakages need to be checked routinely to minimize fire hazards	The filters & device exterior should be cleaned to minimize fire hazards
Maintenance	Need to be checked for pressure leaks with the help of a gauge	An analyzer can be used in case of low oxygen requirement



WHAT YOU WILL NEED TO BREATHE IN THE OXYGEN



OXYGEN MASK

It covers the patient's nose & mouth to supply breathing oxygen safely from a source, e.g., cylinder. Medical masks are made up of plastics considering cost-effectiveness & safe disposal. Masks design help to improve the accuracy of the oxygen delivery even at high pressure



NASAL CANNULA

A nasal cannula is a soft plastic tube with two small prongs, which help to supplement the oxygen requirements. This device can support the oxygen flow rate of up to 5 liters per minute. High flow rate results in drying of nasal passages, including nose bleeding



KNOW YOUR OXYGEN CYLINDER

OXYGEN CYLINDER



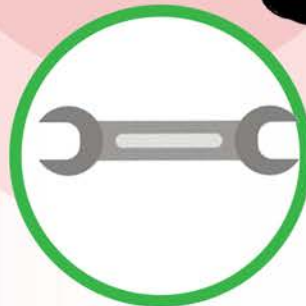
Flow Adjustment Regulator



Outlet



Humidifier Bottle



Special Wrench
(Important tool to turn the knob valves)



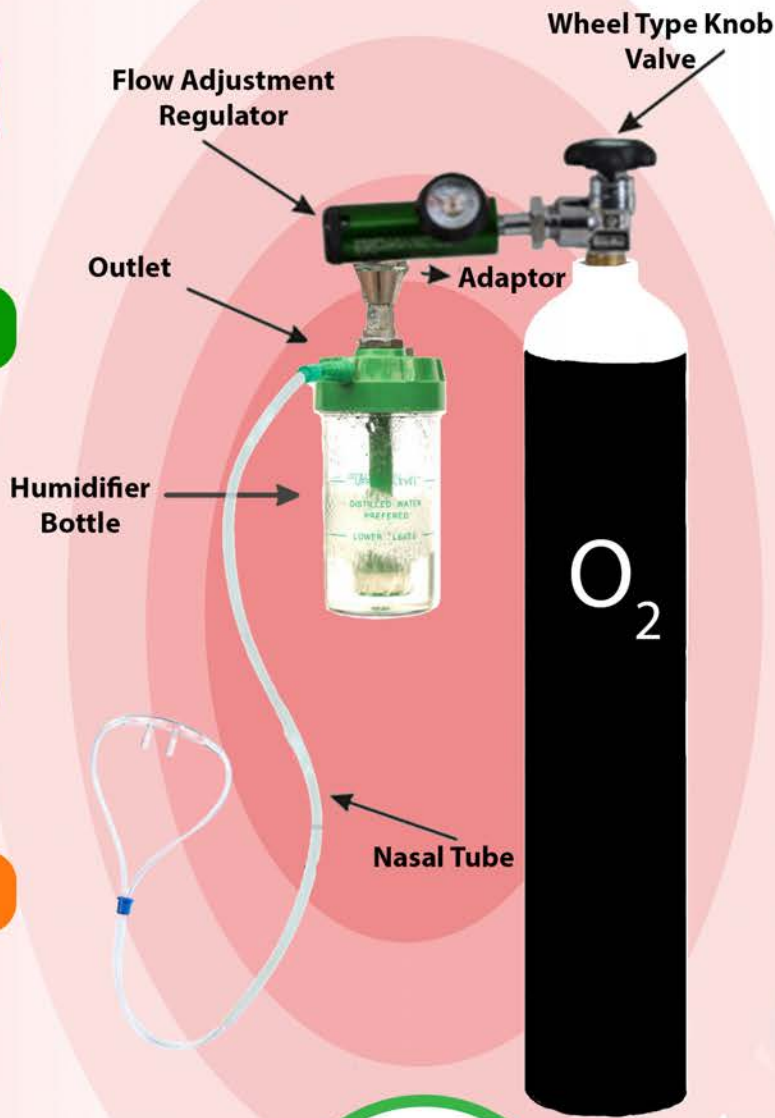
Wheel Type Knob Valve



Nasal Tube



Adaptor



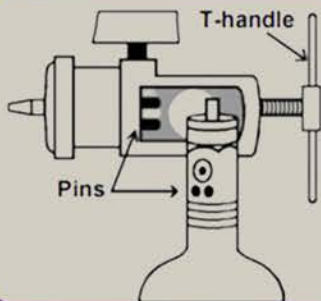
EFFICIENT USE OF OXYGEN CYLINDERS

HOW TO USE OXYGEN CYLINDER

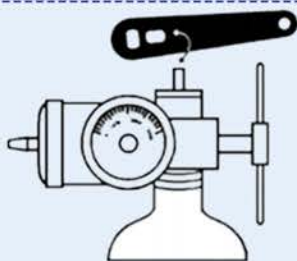


First, remove the tape or cover on the stem of the oxygen cylinder. After this, you will see a plastic washer. Always replace the old washer with a new washer whenever you change a cylinder

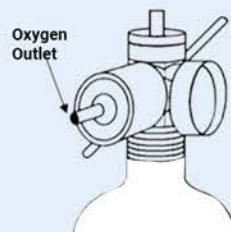
NOTE: In case you're using permanent metal & rubber ring washer for the regulator, the plastic washer from the oxygen tank should be removed & discarded



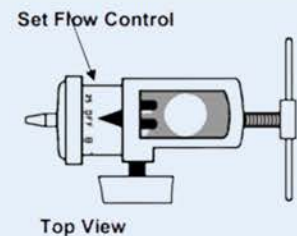
The regulator needs to be placed on the stem of the cylinder, & align the regulator's pins with the matching holes on the cylinder stem. Afterward, ensure that the pointed end of the T-handle fits into a small round depression on the opposite side of the stem. Tighten the T-handle with your hands



Now, turn the valve on the top of the stem of the cylinder, slowly & carefully using a wrench in a counter-clockwise direction until you see the needle movement in the pressure gauge



Oxygen tubing & cannula should be connected to the oxygen outlet on this regulator

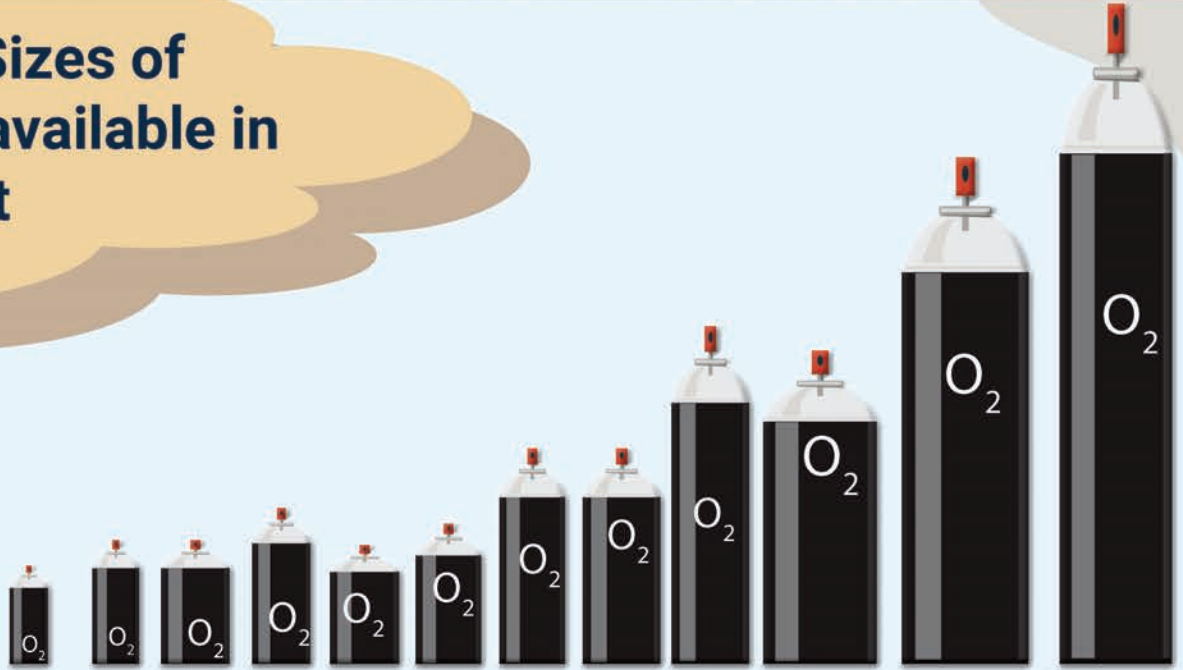


Finally, the prescribed flow of oxygen should be set using the flow control knob. Ensure cannula or face mask are properly placed



DIFFERENT SIZES OF OXYGEN CYLINDERS

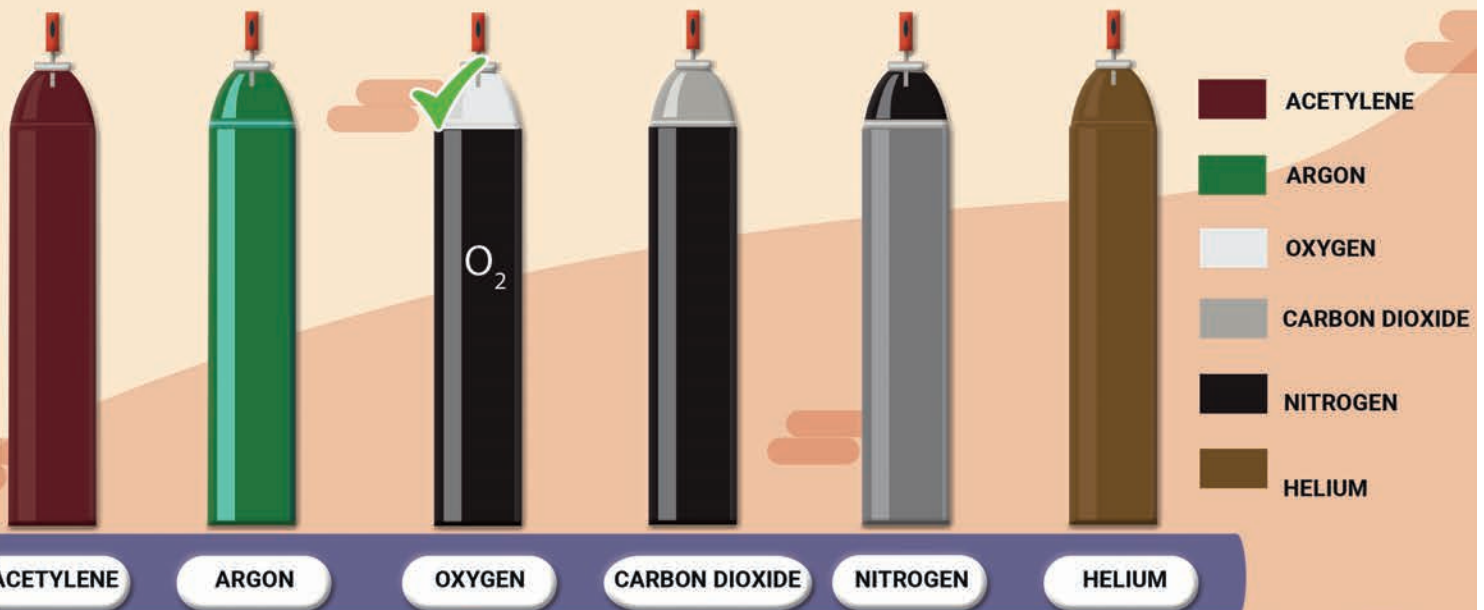
Different Sizes of cylinders available in the market



Older Name		A		B		C	D	JD	E			H
Newer Name	M-2	M-4	M-6	M-6	M-7	M-9	M-15	M-22	M-24	M-60	M/MM/M122	M-250
Empty Weight (Kg)	0.32	0.73	1.27	1.00	1.50	1.68	2.40	3.63	3.58	10.12	17.92	51.71
Capacity (l@2200 psi)	42	113	165	164	198	255	425	640	680	1738	3455	7080
Approximately Supply Time (hrs @ 2 lpm)	0.35	0.94	1.37	1.35	1.65	2	2	4.5	4	14.48	29.5	48

HOW TO DIFFERENTIATE O₂ FROM OTHER CYLINDERS

Always check the neck of cylinder to match your color coding

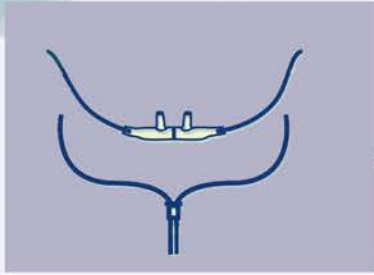


This is your O₂ cylinder



OXYGEN SAFETY & MAINTENANCE OF ACCESSORIES

HOW DO I MAINTAIN MY EQUIPMENT?



The nasal Cannula should be changed every week



Oxygen concentrator filters must be cleaned weekly with warm soapy water. This prolonged the efficiency & life of the oxygen concentrator



Replaced or cleaned oxygen face mask with warm soapy water after 3 days of use

The nasal tubing should be replaced after 4 weeks. However, do not wash tubing from stationary equipment or cylinder & they should be only replaced with a new one



The humidifier must be emptied at least once a day. Wash the bottle with soap & warm water, & ensure that soap is rinsed out thoroughly. Refill the humidifier bottle only with distilled water. The minerals present in tap water can damage your equipment



OXYGEN SAFETY

Oxygen is a safe gas but always follow safety tips as it helps in burning



Never smoke while using oxygen devices & also do not allow others. Keep away these devices from open fires



While using oxygen devices, avoid using oil, grease, or petroleum products as they may block the opening of the nasal tubings



Always keep the oxygen bottles/ cylinders upright. It is advised to attach them with a fixed object to avoid fall



Stay 5 feet away from heat sources such as candles, gas stoves, etc.



Always keep a fire extinguisher in the room. If you use or store oxygen routinely at home, please ensure to inform the nearest fire safety department in your locality



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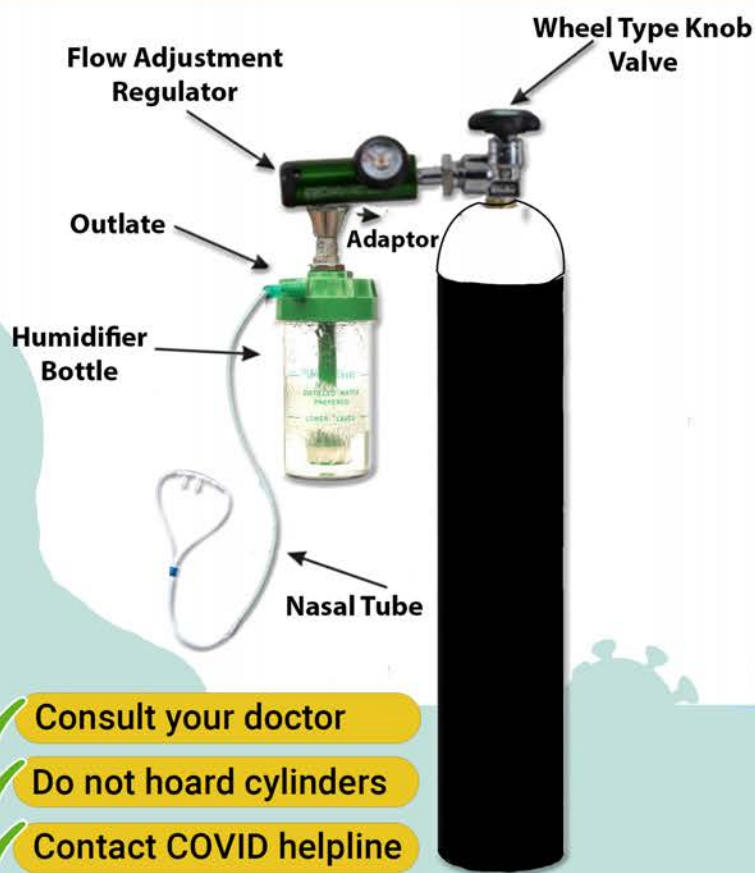
Hand Hygiene



Avoid Crowded Places



Use Steamer



Wear Double Mask



Get Vaccine



Stay 6 Feet Apart

Oxygen during homecare should be used under the guidance of medical professionals. This pictorial booklet is designed to guide the caregivers & general public about the basics of oxygen self-use & safety during homecare. Let's ensure the safe delivery of oxygen to the patients in need to improve their well-being.

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