

Home Oxygen Therapy

Pulmonary Rehabilitation Educational Booklet



醫院管理局
Hospital Authority

Coordinating Committee-Grade in
Occupational Therapy

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Aim of Home Oxygen Therapy

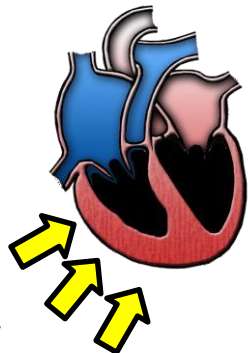
Oxygen is vital to human beings. We need to take in oxygen from air constantly through respiration. Oxygen will be taken up by blood cells in the pulmonary circulation and then circulated to the rest of the body by the heart.



Patients with diseased lungs will have problems of oxygen uptake causing hypoxemia, breathing difficulty and other related symptoms to develop. Long term hypoxemia increases the loading of the right heart and may cause right heart failure (cor-pulmonale).



Physician will assess individual need for home oxygen therapy according to the disease conditions, arterial blood gas results and severity of desaturation in daily activities. Supplementary oxygen can reduce the burden of the heart, and thus reduce the chance of developing cor-pulmonale. Proper use of home oxygen therapy can alleviate hypoxemia and other related symptoms, reduce dyspnea and improve your tolerance in performing activities of daily living. Moreover, it helps you reduce the rate of hospital admission and enhance your quality of life and life expectancy.



Home Oxygen Therapy

Home oxygen therapy is a medical prescription. The primary aim is to treat chronic hypoxemia in the body. There is **no evidence on addiction after using long term oxygen therapy**.

One of the most commonly used oxygen therapy equipment is **oxygen concentrator**. Its function is to extract oxygen particles from room air so as to generate highly concentrated oxygen.







In Hong Kong, **portable oxygen cylinders** are usually prescribed together with stationary oxygen concentrators for back up and outdoor use. Oxygen cylinders contain compressed oxygen gas at high pressure, which can be used through an external regulator or a conserving device.



Dosage and Duration of Oxygen Therapy

1. Dosage

Activity		Flow Rate
	Sleeping (includes nap)	
	<u>Resting and Light Activity:</u> such as - talking, eating, grooming (perform whilst sitting), watching TV or desk work.	
	<u>Moderate Activity:</u> such as - Dressing, toileting, walking around your own home or doing light housework, e.g. making a bed, sweeping floor, vacuuming, preparing simple meal (no-flame).	
	<u>Heavy Activity:</u> such as - Standing shower, shopping with grocery-carrying, walking upstairs/uphill or doing heavy housework, e.g. scrubbing floors, washing & hanging heavy clothes.	

2. Duration

- ☐ Continuous Use: Apply for at least 15 hours daily (including daily activities and sleep). More benefit can be achieved when it is used continuously for 24 hours a day.
- ☐ Ambulatory/ Exertional Use
- ☐ Nocturnal Use
- ☐ Palliative Use

Remarks: Oxygen therapy, just like other pharmacological intervention, should be applied properly according to the dosage and regime prescribed by your physician or medical staff. Inappropriate adjustment of the dosage may induce undesirable effects to your health.

Operation of Oxygen Concentrator



1. Plug the oxygen concentrator into an independent socket.

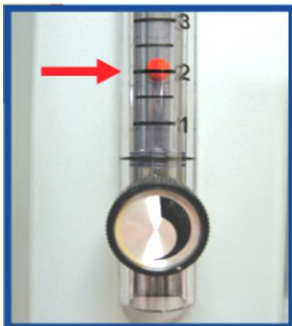


2. Attach the nasal cannula to the oxygen outlet of the oxygen concentrator.

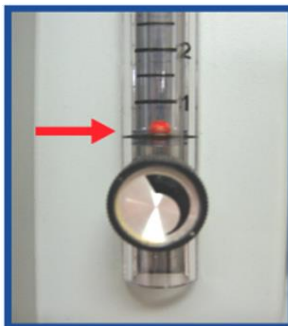


3. Switch on the oxygen concentrator.

Flow Meter Type



4. Turn the knob to adjust the meter ball to the oxygen flow rate as prescribed by your physician.

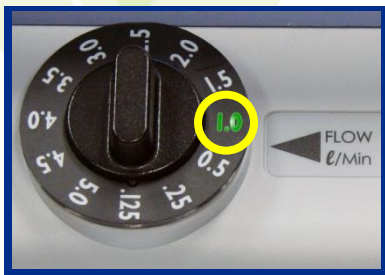


5. Adjust the oxygen flow rate back to zero before switching off the oxygen concentrator.



6. Switch off the oxygen concentrator.

Digital Panel Type



1. Turn the panel to the oxygen flow rate as prescribed by your physician.



2. Switch off the oxygen concentrator directly after use.

Remarks:

For users requiring flow rate equal to or less than 4 Liters Per Minute (LPM), there is no need to use the humidifier. The nasal cannula can be connected to the oxygen outlet directly.



For users requiring flow rate more than 4 LPM, you should seek advice with your occupational therapist in determining the need of using the humidifier. The humidifier should be filled with sterilized water in case when it is used. The humidifier should be disinfected regularly and the sterilized water inside should be replaced daily.

Cautions in Using Oxygen Concentrator

- Use an independent standardized three - flat pin socket for the oxygen concentrator.
- Keep the vent of oxygen concentrator **1 foot** away from wall for better cooling and ventilation effect.
- Place or store the oxygen equipment in dry, clean and well-ventilated area.
- Keep away from direct sunlight exposure.
- Stay away from open flame during cooking.
- Recommend flameless cooking with rice cooker or induction cooker.



- Switch off the oxygen concentrator and turn off the portable oxygen cylinder whenever they are not in use.

Cautions in Using Oxygen Concentrator

- If the alarm (usually red light with “beep” sound) remains on even after the oxygen concentrator is switched on for a while, please check whether the oxygen concentrator is properly plugged in. Contact your corresponding oxygen supplier for checking immediately if the alarm persists.



- If the meter ball sinks below the set level, please check whether the nasal cannula is broken/ disconnected or the oxygen flow is obstructed.



- If the switch-on sound level is weak, please contact your corresponding oxygen supplier for replacing the internal battery. The name and telephone numbers of the corresponding oxygen supplier can be found on the display label on the machine.



- Oxygen supplier will provide free preventive maintenance service for your rental oxygen concentrator every 2 to 3 months. Please contact your corresponding oxygen supplier if regular checking is missed.



Operation of Oxygen Cylinder



1. Turn the switch in anti-clockwise direction for about 180 degree. (use the key if needed)



2. The gas pressure indicator of the regulator will move from the red zone towards the green zone.



3. Adjust the oxygen flow rate to the setting as recommended by the medical professionals.



4. In switching off the cylinder, turn the switch in clockwise direction till it is firmly tight.



5. Wait for the gas pressure indicator moves back to zero position.



6. Adjust the oxygen flow rate back to "0" or "off".

Usage of Oxygen Cylinder – Duration of the Oxygen supply

If you plan to have outdoor activities e.g. medical follow-up, going to a restaurant etc., you can use oxygen cylinder, but you should plan and estimate the time of travel and check whether there is sufficient amount of oxygen supply from the cylinder.

Duration of Oxygen Cylinder Supply (Hour: min)		Flow Rate (L/Min)				
Size of Oxygen Cylinder	Capacity (Liter)	1	2	3	4	5
B	170	2:50	1:25	0:56	0:42	0:34
C	230	3:50	1:55	1:16	0:57	0:46
D	406	6:46	3:23	2:15	1:41	1:21

(Different supplier will have cylinders of different capacity. The above information is for reference only)

Remarks:

When you turn on an oxygen cylinder with full capacity, the gas pressure indicator should move the green zone, e.g. at “2000” or “4/4”. If the gas pressure indicator drops to red zone, you should contact your corresponding supplier for oxygen refill as soon as possible.



If you need a larger size of oxygen cylinder (e.g. D-size cylinder), you can purchase a trolley from the supplier to ease carrying. You may ask your supplier to arrange an extra oxygen cylinder if needed. Please observe the corresponding regulation on storage of compressed oxygen cylinders under Fire Service Ordinance.

Cautions in using Portable Oxygen Cylinder

- For safety reason, oxygen cylinder is suggested to be carried in a **bag or a trolley**.



- The gas valve at the top of the cylinder may get damaged easily, the cylinder should be stored at a **secure place** to avoid impact and knocking over.

- Avoid any oil grease on your hands** when handling the oxygen cylinder.



- Do not drag or roll the cylinder on the ground. When holding up the cylinder, support well from the bottom. **Do not grab on the top part (the switch / regulator) alone.**



- Do not apply any wax cleaner, cleansing spray or lubricants on the cylinder.

- Regularly check the cylinder. Contact oxygen supplier if dents, cracks, fading of colors, or leakage are noted.

- Oxygen users must use licensed oxygen cylinders supplied by the supplier. Cylinders must be labeled with standards guaranteed safe for use by the supplier. Do not damage the labels on the cylinder.



Cleansing

- For oxygen concentrators with filters, **clean the filter with soapy water once a week** or whenever necessary. After rinsing it with running water, dry the filter with towel thoroughly. Allow it to dry before placing it back to the oxygen concentrator.



- Use soapy water to clean the nasal part of the cannula to remove any attached stains. Rinse it with cool boiled water thoroughly and then allow it to dry in room air.

- Disinfect the nasal cannula at least once a week.**

Disinfection

- Prepare sterilizing agents in a clean container. The sterilizing agent is **a blend of bleach and water in 1:49 parts.**



- Soak the nasal part of the cannula in the sterilizing agent, while the oxygen outlet should be pointing downwards.

- Recommended soaking time **is 10 to 30 minutes for diluted bleach water.**

- Rinse it thoroughly with cool boiled water. Allow it to dry in room air.

Usage of Conserving Devices

You may consider using an oxygen conserving device to increase the duration of oxygen supply from a cylinder. Some devices can **increase the usage duration by 2-3 folds**.



1. Electronic conserving device



1. Connect the conserving device to the oxygen cylinder and then plug in the nasal cannula.



2. Turn the switch of the cylinder in anticlockwise direction for around 180 degree (Use the key if needed).

1. Electronic conserving device (Cont'd)



3. Check if the remaining amount of oxygen is sufficient for your activity



4. Switch to the "conserving mode".



5. Adjust the flow rate.



6. After use, close the on/off valve of the cylinder by turning it in clockwise direction. Then switch to the "continuous mode"



7. When the gas pressure indicator points to zero, switch back to the "conserving mode"

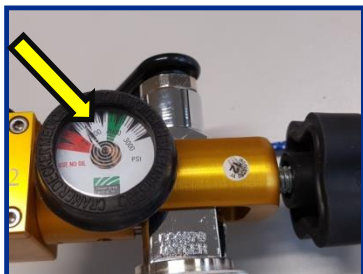
2. Pneumatic Conserving Device



1. Connect the conserving device to the oxygen cylinder and plug in the nasal cannula.



2. Switch on the cylinder by turning it in anti-clockwise direction (You can use a key if needed).



3. Check if the remaining amount of oxygen is sufficient for your activity.



4. Switch to "conserving" mode". Then adjust the flow rate.



5. After using, turn the main switch off by turning it in clockwise direction and switch the knob back to the mode of continuous flow.



6. When the gas pressure indicator drops back to zero position, then adjust the flow rate back to [0].

Cautions in using Conserving Device



1. When using the electronic conserving device, **the green light will flash when the user inhales**. If it does not, adjust your breathing pattern and check if there is any connection problem with the nasal cannula/tubing.

2. If the conserving device fails to release oxygen, switch it from pulse mode (conserving mode) to continuous mode.

3. For electronic conserving device, when the light indicating low battery is on, replace the battery immediately.



(If there is any problem with the conserving device, contact the supplier for checking.)

Remarks: There are differences in functions among models of oxygen conserving devices. Please consult your health care provider for further information.

Other Oxygen Devices and Equipment

Oxymizer

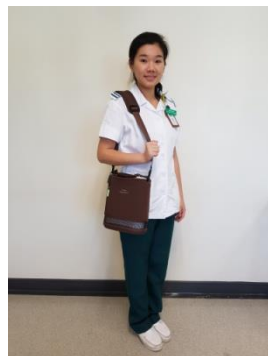
- The reservoir should be kept dry to maintain proper performance. You should renew it when water is trapped inside.
- Regular replacement is required, approximately every one month.
- Oxymizer cannot be used together with any conserving devices (Neither the electronic nor the pneumatic type).



Portable Oxygen Concentrator



- Portable Oxygen Concentrator is more compact and handy. Common models are operated with rechargeable batteries allowing the users to go outdoor for longer hours and enjoy travelling for short trips.
- The operation and function are different with different models. Some models can generate oxygen flow rate from 1LPM to 6LPM in pulse-dose or continuous modes.
- Duration of oxygen supply varies depending on flow rates generated (approximately around 50 minutes to 10 hours).
- Contact your health care provider for enquiry or assessment.



Safety Precautions

General safety guideline

- Since oxygen aids combustion, oxygen concentrators and cylinders should be kept away, **preferably 6 feet or more**, from fire, all heat sources, grease and flammable items.



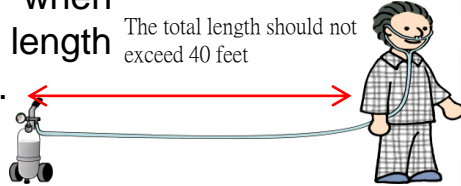
- **Smoking is prohibited** in a room with oxygen equipment in use as it greatly enhances fire hazard.
- Oxygen therapy is not recommended for those who refuse to quit smoking.
- Besides, smoking largely **offsets treatment benefit** of oxygen therapy. Therefore oxygen users should quit smoking as soon as possible.



Cautions in using Nasal Cannula/ Extension Tubing

- Nasal cannula with optimal length is preferred. Use an extension tubing when necessary and the total length should not exceed 40 feet.

The total length should not exceed 40 feet



- The nasal cannula should be placed properly to avoid tripping over.

- Avoid bending or twisting of oxygen tubing to ensure normal oxygen flow.



- Keep the unused nasal cannula and extension tubing in a clean plastic bag.

- The nasal cannula is recommended for replacement once every 2 to 3 months.

- Renew the nasal cannula as soon as possible if it turns hard, soiled or cracked.

Year 201X

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Safety guideline of using Portable Oxygen Cylinder on Public Transport

- In Hong Kong, compressed oxygen is one of the controlled items under the Dangerous Goods Ordinance (Cap 295). The main public transport service providers have issued regulations controlling the transportation of compressed oxygen cylinder (Category 2 Dangerous Goods). Therefore, passengers using oxygen cylinder should comply with corresponding regulations when they travel by public transportation.

- Portable oxygen users should aware the limitations under the corresponding ordinances, regulations and safety guidelines.

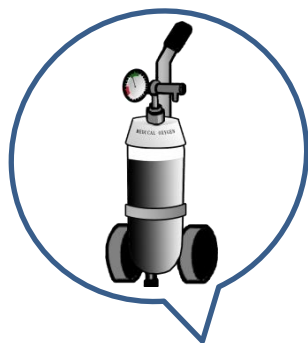
- When using oxygen cylinder in public transport or private cars, both the user and the driver should take appropriate safety measures to prevent accidents to happen.

- In case of air flight or long trips, you should seek medical advice from your physician or other medical professionals, and contact your airline and oxygen supplier in advance for related arrangement.



Emergency Handling in case of Fire

- Evacuate from the scene as soon as possible.
- If you are in motor vehicle, ask the driver to stop driving and turn off the engine immediately.
- Follow the fire escape signs or the guidance of the on-site instructor to evacuate from the scene/vehicle.
- In safe situation, try to remove the oxygen cylinder from the danger zone
- If the oxygen cylinder cannot be removed from the danger zone, inform the police, fire officers and/or on-site instructor.



Emergency Handling in case of Machine Failure/ Electricity Supply Suspension

- Stay calm, minimize physical exertion and take more rest.
- Call the 24-hour hotline of the oxygen concentrator supplier for repair or replacement immediately.
- When electricity supply is suspended, ascertain its duration so as to take appropriate contingency measures accordingly.
- Always make sure that there is a portable oxygen cylinder for contingency use.
- Seek help at the Accident and Emergency Department in case of severe dyspnea and hypoxemia.

Conclusion

Home Oxygen Therapy aims at providing supplementary oxygen to reduce hypoxemia and its associated pathophysiological changes in the body. Proper use of home oxygen therapy can improve your engagement in usual daily activities such as self-care, work and leisure, reduce dyspnea on exertion, increase your confidence in coping with daily activities, maintain quality of life and enhance life expectancy.



For enquiry, please contact your health care provider

Mr./Ms. _____ at _____.



Disclaimer:

The information provided in this brochure is intended primarily for the reader's knowledge on application of home oxygen therapy. As patients' condition may vary, please adhere to the dosage prescribed by your physician in order to achieve the best therapeutic effect. If you notice any changes in patient's condition, please consult relevant health care provider as soon as possible.

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