Your guide to

# Oxygen Therapy

## How it works

Invacare® thanks: Professor Jean-François Muir, pulmonologist, University Hospital Centre (CHU) of Rouen 1 Doctor Luc Gaucher, pulmonologist, Léonard de Vinci Health Centre at Tours for proofreading this document.

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Is your pulmonologist considering or have they already prescribed oxygen therapy for you due to severe respiratory impairment? If so, this brochure will be a great resource for you.

Invacare®, world leader in the manufacture of oxygen concentrators since 1990, has prepared this brochure with the aim of informing and advising you about the use of devices provided by your home health care service providers, as part of your long-term treatment of oxygen therapy.

This brochure does not replace the user manual for the Invacare device that your doctor has prescribed for you. We recommend you read this booklet as well as the user manual carefully.

# 1 / Symptoms of COPD[1]

COPD (chronic obstructive pulmonary disease) is, as its name indicates, a chronic and slowly progressive illness of inflammatory origin, characterised by a reduction of air flow rate that is not entirely reversible. Due to this chronic inflammation, bronchial calibre diminishes with consequences on the anatomy and the working of the respiratory device and hypersecretion.

It is estimated that COPD affects 64 million people worldwide and is an illness that can get progressively worse over several years. Initially, it is characterised by breathlessness when exercising and can continue until the lack of oxygen can be felt even when a person is resting.

# 2 / Principles of good oxygen therapy[2]

The air that we breathe is a mixture of gases: 21% of oxygen, 78% of nitrogen and less than 1% of rare gases such as argon. Oxygen treatment is generally only effective when taken continuously for at least 15 hours a day as the human body cannot store oxygen. If you stop the treatment, the quantity of oxygen in your blood will come down in just a few minutes. If you take this treatment at a different air flow rate, or only a few hours per day, the beneficial effects will be reduced, or there may simply not be any. If you smoke, the effectiveness of the treatment will be less, and you will be exposed to risks of burns; ensure that the medical prescription is properly respected.

N.B. Never increase the oxygen flow rate yourself without medical control as there is a risk of increasing carbon dioxide in the blood - hypercapnia.

**Effectiveness of oxygen therapy:**

- Significantly improves life expectancy
- Reduces the feeling of tiredness and breathlessness
- Improves tolerance to exercise, sleep and life quality
- Improves cardiac function

**Undesirable effects:**

- None or minor (e.g.: dryness of the mucous membranes of the nose and eyes, ask for a humidifier from your health care service provider) if the conditions of use are respected.

# Example of one typical day with long-term oxygen therapy

*Invacare*® ***SOLO$_2$***


*Invacare*® ***Platinum 9***

*Invacare*® ***Platinum*™ *Mobile***

*Invacare*® ***Platinum*™ *Mobile***

Oxygen therapy should not prevent you from performing outdoor activities, in fact it should do quite the opposite. It should help you to resume your normal active lifestyle with your friends and family:

- While walking, fishing or gardening, you can use your portable *Invacare* ***Platinum Mobile*** oxygen concentrator, your transportable trolley-mounted *Invacare* ***SOLO$_2$***, or your *Invacare* ***HomeFill***® oxygen filling bottle.
- You can go to the shops or admire an art exhibition with your portable *Invacare* ***Platinum Mobile*** oxygen concentrator, your transportable trolley-mounted *Invacare* ***SOLO$_2$***, or with your *Invacare* ***HomeFill*** oxygen filling bottle.
- During meals, you can use your fixed, mobile concentrator, or liquid oxygen which lasts between 1 and 2 hours.
- During leisure time at home, you can use your fixed oxygen concentrator, or your liquid oxygen which lasts between 2 and 3 hours.
- At night or during a siesta, you can use your fixed oxygen concentrator or your *Invacare* ***SOLO$_2$*** concentrator, which has up 3 LPM, lasting between 8 and 9 hours.

# 3 / What are the supplementary examinations?

Upon medical prescription

- Measuring your PFT (pulmonary function test)
- Checking gases of the blood
- Measure of the peripheral oxygen saturation in blood (pulse oximetry)
- 6-minute walk test => Indispensable in finding the best adapted adjustment in pulse mode
- Exercise test on a bicycle or treadmill
- Chest X-ray
- Chest scan
- Bronchial fibroscopy

# 4 / How is the oxygen administered?

Oxygen is administered by connecting a soft nasal cannula to the source of oxygen (concentrator or bottle). Based on your pulmonologist's prescription, the oxygen flow rate required for your treatment will be adjusted by the home medical care service provider, on your device. For the draw mode while walking, it is recommended to use a cannula of 1.2 m. Refer to the user manual to identify the manufacturer's tubing length recommendations.

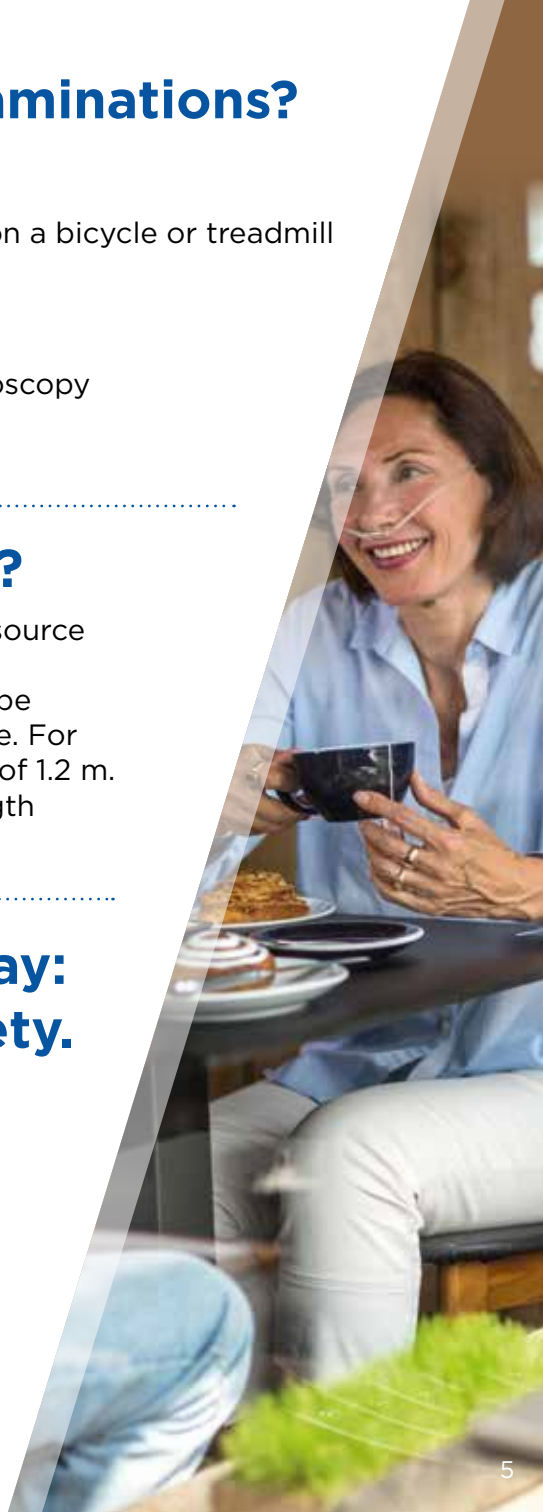
# 5 / Sources of oxygen available today: advantages, disadvantages and safety.

Below are the sources of oxygen available at home:

**The oxygen extractor or concentrator**
Fixed, portable or transportable

**The liquid oxygen tank**
Portable

**The gas bottled oxygen**
Essentially used in first-aid



# Liquid oxygen

Oxygen can be stored in very large quantities in liquid form, provided it is maintained in special cryogenic tanks at -183°.

**Advantages of liquid oxygen:**

- Independence
- Quiet system

**Disadvantages of liquid oxygen:**

- Dedicated one part for the tank
- Incompatibility with heating with pan, insert, model, floor, linoleum carpet or net curtains
- Feeling of cold
- Risks of burns connected to the cold tank (-183°C)
- The constraint of filling
- The frequency of deliveries (based on speed)
- Evaporation of the non-operational oxygen
- The loss of oxygen while filling the portable equipment
- Filling may appear difficult for some people
- The cost for the Health Insurance Fund
- Increase in home insurance
- The weight of the portable equipment may be compensated by its transport on a trolley or backpack

# Gas bottled oxygen[5]

This is mainly used today in the first-aid station or while strolling with a fixed concentrator. The system of filling bottles of oxygen at home or in institutions replaces these pre-filled bottles of gas oxygen.

# The oxygen concentrator (fixed and mobile)

Fixed concentrators are present on rollers and weigh about 20 kg. They are connected to the traditional electrical network. For ambulatory patient, a fixed concentrator can be connected to a refilling oxygen compressor *Invacare® **HomeFill® II***, to refill oxygen cylinder (between 1.6 and 2.6 kg). The mobile concentrators are either portable on a rucksack or backpack, or transportable on a trolley, and weigh between 2.22 kg (*Invacare **Platinum™ Mobile***) and 9 kg (*Invacare **SOLO$_2$***). They work on the mains supply, batteries or your car's electrical socket. These devices are also fitted with a valve in draw mode (release of a volume of oxygen upon breathing in), which gives the same therapeutic benefit as the continuous flow. In fact, a study[4] has shown that the clinical effectiveness of a portable valve concentrator upon request was identical to that of a system of liquid oxygen. This gives you greater independence while using the oxygen concentrator with batteries.

## CONTINUOUS FLOW VS FLOW UPON REQUEST (PULSED): THE DIFFERENCE

Position 2 in draw mode is not always equal to 2 l/m in continuous flow, since several elements may modify the quantity of oxygen actually reaching the lung with respect to the continuous mode. Moreover, the different positions are not equivalent from one device to another.

It is appropriate to always perform a walking test with the device (titration) in order for your doctor to determine your optimal adjustment of 02 while exercising and resting. Continuous oxygen flow remains the preferred therapy during sleep. **Please always follow your pulmonologist's recommendations carefully.**

**The advantages of the oxygen concentrator[5] :**

- It is a permanent source of oxygen at home and while walking
- It is easy to use and lightweight
- The overall dimensions are smaller than those of oxygen bottles or a tank of liquid oxygen
- The concentrator does away with the constraints of delivering the bottles or refilling the tank

**The disadvantages of the oxygen concentrator:**

- The noise level varies from one device to another: however, you can move the concentrator to keep it in a neighbouring room (refer to the manufacturer's user manual)
- These fixed devices are connected to the power grid, whereby there is a possibility of stoppage following blackouts

These three sources supply oxygen, all giving the same treatment. Your doctor will decide which one is the most appropriate for you based on your lifestyle. The service provider will explain the safety rules to be followed during installation, which include[5] :

- no smoking
- installing the source in a well-ventilated room
- not using grease, Vaseline, cream, oil, etc.
- think about using a physiological serum (a humidifier) to limit nasal dryness

## 6 / How is the installation done?

A trained health professional specialised in providing home services to patients carries out the installation of the oxygen source. They will help you choose the most suitable position, while showing you the rules of usage and safety to be followed meticulously.

# 7 / Therapeutic follow-up[5]

You have a chronic ailment so it is important to follow the treatment prescribed by your pulmonologist.

**Contact the doctor treating you if you experience:**

- Unusual difficulty in breathing
- Abnormal weight loss and fatigue
- Bluish discoloration of lips
- Palpitations
- Swelling of ankles (edema)
- Wet cough with fever and purulent sputum
- Headaches
- Unusual drowsiness
- Depressive tendency
- Chest pains - get immediate attention

# 8 / Nutrition and diet[6]

Being excessively overweight may aggravate breathlessness and further reduce lung capacity. It is thus appropriate to review your diet.

Conversely, there is the problem of malnutrition during advanced stages of the ailment: indeed, 50% to 60% of the people afflicted by advanced COPD are in a state of undernourishment. The patient should be careful about any weight and muscle loss. Once they are detected, sufficient calorie intake is advised to allow muscular reconstruction. You should remain vigilant to this risk throughout the development of COPD.

Re-education in exercise is one of the basic elements of care, especially by increasing one's 'walking distance' (distance that the patient is able to cover).

With this in mind, nutritional tracking may prove helpful.[7]

*Invacare* ***Platinum™ Mobile***

# 9 / Physiotherapy[8]

Respiratory physiotherapy reduces bronchial congestion by making expectoration easier, improves the respiratory function, maintains the musculoskeletal system and detects early signs of any aggravation. It is prescribed by the doctor treating you and carried out by a physiotherapist. The latter will show you what you can do by yourself to achieve the highest degree of independence possible.

# 10 / Respiratory re-education[9]

Respiratory re-education is a collection of methods to optimise your breathing, improve your tolerance to exercise and reduce your time in hospital for respiratory decompensation.

**Upon medical prescription, this rehabilitation may be done:**

In a specialised centre (some weeks), as an outpatient (daytime in a specialised centre) or at your residence (health professionals of the rehabilitation program come to you). A customised program is made on site during the program, following an assessment of ventilatory capacities when at rest and exercising. It combines physiotherapic re-education, re-training in exercise, adapted physical activities, nutritional re-balancing, psychological and social care, and therapeutic education.

**This dynamic and positive programme allows you to be involved in your own development and find new quality of life.**

# 11 / Trips and travelling

You can travel by plane with your portable or transportable concentrator and also use it during the flight. The device is FAA certified**.

**For this, you need to:**

- Discuss it with your pulmonologist
- Inform your Health Care Service Provider of your planned trip so they can help you through the process
- Make sure you have a MEDIF form filled out by your pulmonologist or the doctor treating you (to be submitted during your reservation)
- Have a product brochure, the medical prescription for oxygen with concentrator of brand *Invacare®* ***SOLO$_2$*** or the portable model < 2,22kg (with one battery pack, without bag) *Invacare* ***Platinum™ Mobile*** (signed medical prescription), a medical certificate from your doctor and the FAA certificate** with you
- Make sure you have a sufficient number of charged batteries for the complete flight time (maximum 2 additional batteries)
- Foresee delays, make sure you have an additional cannula. It is recommended to request being taken care of in a wheelchair (WCHS) to make your trip easier

*Invacare* ***SOLO$_2$***

*Invacare* ***Platinum Mobile***

# SOURCES


1 www.lesouffle.org

2 COPD logbook produced by the COPD group of SPLF and Imothep MS editions February 2013

3 Spiral Group of the University of Lyon 1

4 Study of ambulatory oxygen therapy by portable concentrator with valve upon request: study randomized and checked for its clinical efficiency in COPD patients. Rev mal respir 2010 NOV; 27 (9): 1030-8

5 http://www3.churouen.fr/Internet/test/ventiweb/patients/guide/oxygene/ CHU of Rouen Department of Pulmonology, Prof. J-F. Muir

6 http://www.lesouffle.org/vos-poumons/lesmaladies/bpco_bronchopneumopathie_chronique_obstructive/traitement_preventif_hygiene_et_conditions_de_vie_bpco

7 AFDN French Association of Dieticians-Nutritionists, Day of study 2011

8 http://pneumocourlancy.fr/page_kinesitherapie.html Polyclinic of Courlancy at Reims by Dr. G. Bonnaud

9 http://www.pslv.fr/53-Readaptation-respiratoire.html Respiratory rehabilitation center of the Health Centre Léonard de Vinci at Tours, Dr. L. Gaucher


## *Breathe and Move*

Please contact your pulmonologist or ask your Home Health Care Service Provider for advice for any information on the oxygen bottle filling system.

**The FAA certificate (Federal Aviation Administration) of *Invacare*® ***SOLO$_2$*** and *Invacare* ***Platinum***™ ***Mobile*** medical systems are available on our website **http://oxygen-therapy.net/en/**

Stamp of the pulmonologist

*Invacare* ***Platinum Mobile***: Portable oxygen concentrator for treating patients eligible for long-term ambulatory oxygen therapy in pulse mode. Class IIa - Body notified CE SGS 0120 - This medical system is a regulated health product which bears EC marking as a result of this regulation. Invacare SOLO2: Transportable oxygen concentrator for treating patients eligible for long-term ambulatory oxygen therapy with continuous flow and in pulse mode - Class IIa - Body notified CE SGS US03/3024 - This medical system is a regulated health product which bears EC marking as a result of this regulation.

*Invacare* ***Platinum9***: High-flow oxygen concentrator up to 9 l/m for treating patients eligible for long-term oxygen therapy with fixed devices between 5 and 9 l/m or with ambulatory devices connected with a system of refilling bottles up to 5 l/m - Class IIa - Body notified DNV 83877-2010 - This medical system is a regulated health product which bears EC marking as a result of this regulation.

Distributed by Invacare. NOTE: Please refer to the product manual to get complete instructions and become aware of indications, contra-indications, warnings, precautions and information indispensable for its correct usage.



Scan here to access the website
**http://oxygen-therapy.net/en/**

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