D. Sandberg, RRT, J. Fleetham, MD, FRCPC

Home oxygen therapy in British Columbia

Updated eligibility requirements for the Home Oxygen Program are now in effect.

ABSTRACT: The Home Oxygen Programs in each of British Columbia's health authorities have recently changed the eligibility criteria for home oxygen following a detailed review of the current medical evidence. To qualify, patients must be referred by a physician or nurse practitioner. Applicants must supply results from a recent arterial blood gas, oximetry, and other studies to confirm comorbid disease if present. If there is hypoxemia consistent with the medical criteria, the patient will be provided with oxygen through a contracted oxygen company. The safe use of oxygen in the home is essential.

Long-term home oxygen therapy reduces mortality and improves quality of life for hypoxemic patients with respiratory disease. Four randomized controlled trials have helped establish the indications for home oxygen use in patients with chronic obstructive pulmonary disease (COPD),[1-4] and more trials are currently underway.[5] There is limited evidence concerning the efficacy of home oxygen in other respiratory diseases but it is presumed to be effective based on the COPD data for hypoxemic patients with other respiratory diseases such as pulmonary hypertension and fibrosis. There is also limited evidence concerning the efficacy of long-term home oxygen therapy for patients with intermittent hypoxemia during either exercise or sleep.[6] There is no evidence to support the use of supplemental oxygen to reduce dyspnea in patients with respiratory disease without hypoxemia. Long-term home oxygen has no adverse effects if administered correctly.

The Canadian Thoracic Society COPD guidelines currently support long-term home oxygen for stable COPD patients with a partial pressure of oxygen (PaO_2) 55 mm Hg or less, or when PaO_2 is less than 60 mm Hg in the presence of bilateral ankle edema, cor pulmonale, or a hematocrit of 56%.[7] These guidelines also state that there is no evidence for the use of nocturnal oxygen to improve survival, sleep quality, or quality of life in patients with isolated nocturnal desaturation. The majority of Canadian provinces have guidelines for home oxygen therapy.[8-10]

BC's Home Oxygen Program

Previously, the Home Oxygen Program (HOP) for all regions in British Columbia was managed by Pharmacare. Since 2002, HOP has been the responsibility of the regional health authorities. Although home oxygen therapy is managed separately by each authority, all follow the same medical criteria and similar practice standards.

Three providers, VitalAire, MedPro, and Alliance, are currently contracted by the health authorities to provide home oxygen services. MedPro and Alliance serve patients in the Vancouver Island Health Authority. VitalAire and MedPro serve patients in the Vancouver Coastal Health, Fraser Health, and Interior Health Authorities. VitalAire is the sole provider of services in the Northern Health Authority.

Mr Sandberg is coordinator and Dr Fleetham is medical consultant with the Vancouver Coastal Health Home Oxygen Program.

Home oxygen may be funded by extended health benefits, if available to the patient, and by Veterans Affairs, Non-Insured Health Benefits, and WorkSafeBC under specific circumstances. The health authority may cover the remainder of any costs not covered by these primary funders. The Palliative Care Benefits Program (PCBP) does not have its own oxygen funding program or eligibility criteria, so patients registered with PCBP must meet HOP medical criteria. Contracted oxygen providers and other companies not contracted by the health authorities are also available to serve patients who wish to pay privately.

To access home oxygen therapy through BC's HOP, patients must be referred by a physician or nurse practitioner. Applicants must submit results from a recent arterial blood gas, oximetry, and other studies to confirm comorbid disease if present. Upon receipt of the application, HOP adjudicates the information. If there is hypoxemia consistent with the medical criteria, the patient will be provided with oxygen through a contracted oxygen company. The company supplies equipment based on the criteria and guidelines established by the health authority. Approximately 1 month after setup, patients are contacted by the health authority's respiratory therapist and assessed using HOP medical criteria. Equipment may be changed following these assessments, according to the criteria and patient needs and goals. Patients who are not approved for HOP funding after they apply or who become ineligible after a reassessment may consider paying privately if they still want oxygen therapy.

Costs

For the 2011–2012 fiscal year, British Columbia health authorities spent approximately $9 million to provide oxygen to more than 5500 patients. With limited health care funds available, HOP resources need to be used by patients who will benefit the most —that is, in cases where there is clear evidence that oxygen will treat hypoxemia and reduce mortality, or improve exercise tolerance.

Oxygen providers are paid a daily rate for an oxygen concentrator, a portable system, or both. A flat rate is paid for cylinders of compressed oxygen or kilograms of liquid oxygen, regardless of the quantity used. Many patients require home oxygen for only a few weeks or months while they recover from an exacerbation of their disease. Some patients remain oxygen-dependent for months or years. Although most oxygen-dependent patients have COPD, some have pulmonary fibrosis, lung cancer, or cardiac disease. Some HOP patients have hypoxemia during sleep despite maximum treatment for sleep apnea with continuous positive airway pressure (CPAP) devices. A small number of children require home oxygen therapy and are usually under the care of a pediatric respirologist.

Criteria

Since 3 July 2012, new criteria based on a recent review by BC HOP physicians and managers have been in effect (see box).

Oxygenation requirements

The oxygenation requirements remain unchanged in the new criteria. Arterial oxygen saturation (SpO_2) must still be less than 88% or the PaO_2 must be 55 mm Hg or less. Furthermore, patients with a comorbid disease still qualify for oxygen with a PaO_2 of $\leq$ 60 mm Hg. As previously required, patients must have sleep apnea ruled out and must always take safety precautions while using oxygen.

Comorbid disease requirements

The ambiguous terms "cor pulmonale" and "polycythemia" have been eliminated from the BC HOP criteria. The term "significant CHF" has been changed to "heart failure." Pulmonary hypertension is still considered a comorbid disease. It is necessary to provide documents such as a consultation note, discharge summary, spirometry report, or echocardiogram to confirm the presence of comorbid disease.

Ambulatory oxygen

To qualify for ambulatory oxygen, patients must be able to walk more than 1 minute. In accordance with the criteria in effect since 2007, outpatient testing requires an exercise oximetry study on room air versus oxygen while measuring distance walked and calculating the percentage of change. Desaturation to less than 88% *and* a distance improvement of 30 m (100 feet) and 25% change must be present to qualify for ambulatory oxygen.

Nocturnal oxygen

To qualify for nocturnal oxygen, patients must show evidence of daytime hypoxemia (resting and/or with ambulation) in addition to arterial oxygen desaturation to less than 88% for more than 30% of the night. Sleep apnea must be ruled out or treated (e.g., with CPAP, oral appliances) before oxygen is funded.

Oxygen on discharge

To qualify for oxygen to expedite discharge from hospital, studies confirming hypoxemia must be obtained within 48 to 72 hours of discharge.

Safety

Safe use of home oxygen remains a concern and continues to be an issue for some patients. For example, in

BC Home Oxygen Program criteria (in effect as of 3 July 2012)

- All Home Oxygen Program applicants are expected to obtain and be compliant with optimal medical or adjunctive treatment prior to receiving oxygen therapy.
- Oxygen flow rates titrated to achieve $SpO_2 > 90\%$ must be provided with the application.
- Short-term funding for oxygen may be provided to patients discharged from acute care to allow more time for submission of evidence of comorbid disease.
- Although excessive use of alcohol or illicit drugs (e.g., crack, heroin, cocaine) can make clients ineligible for funding, those involved with active rehabilitation may be considered.
- Smokers who do not comply with safety instructions will be at risk of having oxygen funding discontinued immediately.
- The safe use of oxygen at all times is vital.

1. Resting oxygen

- Before an arterial blood gas (ABG) sample is obtained or oximetry monitoring begins, the client must be breathing room air and seated at rest for at least 10 minutes.
- Eligibility for funding requires:
  A. $PaO_2 \leq 55$ mm Hg on room air, or $SpO_2 < 88\%$ sustained continuously for 6 minutes.
  OR
  B. $PaO_2 \leq 60$ mm Hg, with evidence of one of the following comorbid diseases:
  Heart failure
  Pulmonary hypertension
- Documents supporting comorbid disease diagnoses are required (e.g., consultation note, discharge summary, spirometry report, echocardiogram).

2. Ambulatory oxygen

- If the client is unable to walk for 1 minute or more, ambulatory oxygen will not be useful and will not be funded. Oxygen therapy for ambulation is intended to encourage activity outside of the home and to support those clients who qualify for funding by meeting section 1 criteria.
- Long-term ambulatory oxygen therapy criteria take precedence over short-term ambulatory oxygen therapy criteria.
- To be eligible for short-term ambulatory oxygen therapy funding, clients about to be discharged from acute care must show:
  $SpO_2 < 88\%$ sustained continuously for 1 minute while breathing room air.
- To be eligible for long-term ambulatory oxygen therapy funding, clients must show:
  A. $SpO_2 < 88\%$ sustained continuously for a minimum of 1 minute while breathing room air, and a measured improvement within a 6-minute walk test as tolerated on oxygen compared to room air, showing the distance traveled increases by at least 25% and at least 30 m (100 feet).
  OR
  B. $SpO_2 < 80\%$ with ambulation for a minimum of 1 minute.

3. Nocturnal oxygen

- In the absence of comorbidities mentioned in section 1, daytime desaturation must be present at rest or with ambulation according to section 1 or 2 criteria.
- Documents supporting any comorbid disease diagnoses are required (e.g., consultation note, discharge summary, spirometry report, echocardiogram).
- Sleep apnea will only be treated with supplemental oxygen if the nocturnal criteria are met in spite of optimal CPAP treatment.
- SpO_2 must be $< 88\%$ for $> 30\%$ of a minimum 4-hour nocturnal oximetry study while breathing room air.

4. Palliative oxygen

- Clients in palliative care must have hypoxemia according to section 1, 2, or 3 criteria to be eligible for funding.

Home oxygen reduces mortality and improves quality of life in hypoxemic patients with respiratory disease.

Vancouver Coastal Health in 2011, seven safety incidents were reported, four of which resulted in facial burns. Most often safety problems occur when patients are smoking while using oxygen. The health authorities currently provide oxygen for patients who smoke and meet the medical criteria. Patients are given the opportunity to be safe, but if they are not (e.g., they smoke within 1.5 m or 5 feet of oxygen equipment or have a fire incident), they are re-educated and may be given a second chance. If during a follow-up assessment the patient continues to ignore safety requirements, the funding will usually be stopped regardless of the medical need for oxygen. Safety to the public and property takes priority in these situations. On occasion, patients may be restarted with oxygen. However, in order to ensure safety, access to oxygen may be limited or the patient may be moved to an environment where oxygen treatment can be closely monitored.

Patients may request a formal review if they disagree with any aspects of HOP services. The HOP coordinator will attempt to resolve the issue. If the issue cannot be resolved, a formal review may be undertaken involving the medical consultant. The patient can also consider alternative review processes through the Patient Care Quality Review Board or the Office of the Ombudsperson.

For more information

A mail-out to physicians was distributed by each health authority in 2012 outlining the new home oxygen eligibility criteria. If additional information concerning these criteria or the application process is required, physicians should contact their regional Home Oxygen Program.

Competing interests

None declared.

References

1. Continuous or nocturnal oxygen therapy in hypoxemic chronic obstructive lung disease: A clinical trial. Nocturnal Oxygen Therapy Trial Group. Ann Intern Med 1980;93:391.
2. Long term domiciliary oxygen therapy in chronic hypoxic cor pulmonale complicating chronic bronchitis and emphysema. Report of the Medical Research Council Working Party. Lancet 1981;1(8222): 681.
3. Eaton T, Lewis C, Young P, et al. Long-term oxygen therapy improves health-related quality of life. Respir Med 2004; 98:285.
4. Chaouat A, Weitzenblum E, Kessler R, et al. A randomized trial of nocturnal oxygen therapy in chronic obstructive pulmonary disease patients. Eur Respir J 1999; 14:1002.
5. Stoller JDK, Panos RJ, Krachman S, et al.; Long-Term Oxygen Treatment Trial Research Group. Oxygen therapy for patients with COPD: Current evidence and the long-term oxygen treatment trial. Chest 2010;138;179-187.
6. Cranston JM, Crockett A, Moss J, et al. Domiciliary oxygen for chronic obstructive pulmonary disease. Cochrane Collaboration. Wiley Library Online. Accessed 3 February 2013. onlinelibrary .wiley.com/doi/10.1002/14651858.CD0 01744.pub2/otherversions.
7. O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease - 2007 update. Can Respir J 2007;14(suppl B):5B-32B.
8. Ontario Ministry of Health and Long-Term Care Assistive Devices Program, Home Oxygen Program (HOP) administration manual. Toronto: ADP; 2010.
9. Saskatchewan Aids to Independent Living Program (SAIL) general policies. Regina: Saskatchewan Ministry of Health; 2010.
10. Alberta Aids to Independent Living respiratory policies and procedures. Edmonton: Alberta Seniors and Community Supports; 2010. BCMJ