

Experience with the Introduction of a Homefill™ Oxygen System for Provision of Ambulatory Oxygen.

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Aim

To evaluate the experience and attitudes of patients' supplied with a HomeFill™ Oxygen System (HFOS) and determine what if any cost savings that have resulted.

Background

Since 2002 our regional oxygen service has provided ambulatory oxygen therapy predominantly to patients with COPD. The aim is to enable patients to improve and maintain their exercise tolerance and participate in community activities. Patients must have completed pulmonary rehabilitation and be able to achieve a walking distance of 200 meters in six minutes (6MWT). To establish a benefit, a double blinded 6MWT is performed.

Patients were supplied with 2 (3 if working) light weight cylinders, a conserving device and back pack (ambulatory set). This provided 9h per week of portable oxygen at 3 L min⁻¹.

A number of patients on long term oxygen therapy (LTOT) who did not fulfil the ambulatory criteria were supplied with standard cylinders for various reasons.

From 2006 we progressively introduced HFOS to reduce the costs of frequent portable cylinder refills. This was also aimed at increasing supply and flexibility for this group of patients.

Methods

Adult patient with HFOS for more than a month were sent a questionnaire, followed up by a phone call. The questionnaire asked the patient to quantify their expectations in regard to ease and frequency of use and its impact on their independence, breathlessness and anxiety. Hour meter readings were recorded. Cost comparisons were made calculating the difference between cylinder and HFOS supply. All operating costs and depreciation over 5 years were included.

Patient Characteristics

Thirty-seven adult patients were identified with HFOS (Table 1). Thirty-five questionnaires were returned. One patient died within 5 days of the mail out and 1 patient declined.

Results

The majority of patients expected and subsequently found that the HFOS was easy to use. The HFOS met their expectations for reduced breathlessness, anxiety, fatigue and increased independence (Table 2). Eighty-six percent had previously used an ambulatory set.

Sixty percent of patients used more than the equivalent of 2 cylinders per week and 26% used more than 3 cylinders per week (Table 3). Sixty two percent of patients reported going out of the home more than 6 times in a 2 week period and 45% more than 10 times in a 2 week period (Table 4).

Cost Comparison

The HFOS was cost effective for those using 1 or more cylinders per week (Table 5). After 5 years savings are estimated to exceed 80%. Initial capital set up costs of supplying a HFOS is approximately 4 times more than a concentrator and ambulatory set.

Conclusions

Notwithstanding the higher initial capital outlay for the HFOS, our experience with their use has proven to be cost effective. Patient feedback has been positive and the introduction of the HFOS has been widely accepted and meets patient expectations.



Table 1: Patient population demographics

| Age (Years) | 65±13 | Mean ± SD |
|---|---------|-----------|
| Age Range (Years) | 35-87 | |
| Gender | 20 Male | 17 Female |
| Equipment supplied prior to HFOS | | |
| Concentrator and Ambulatory set | 26 | |
| Concentrator and standard cylinders | 7 | |
| Ambulatory set only | 4 | |
| Ethnicity | | |
| European New Zealanders | 29 | |
| Pacific Island People | 4 | |
| Maori | 3 | |
| Other | 1 | |
| Primary Diagnosis | | |
| COPD | 23 | |
| Bronchiectasis | 5 | |
| Interstitial Lung Disease | 6 | |
| Other diagnoses | 3 | |

Table 2: Expectations of the HFOS

| Expectations of the HFOS | Before HFOS n = 35 | | | After HFOS n = 35 | | |
|---|------------------------|------------------------------|------------|------------------------|------------------------------|------------|
| | Strongly agree / agree | Strongly disagree / disagree | Don't know | Strongly agree / agree | Strongly disagree / disagree | Don't know |
| Time consuming and complicated | 17% | 66% | 17% | 6% | 94% | 0% |
| Cylinders easy to operate and manage | 71% | 20% | 9% | 97% | 3% | 0% |
| Improved breathlessness / fatigue on exertion | 77% | 23% | 0% | 77% | 20% | 3% |
| Achieve the things I want to do | 83% | 9% | 9% | 80% | 17% | 3% |
| More independence | 94% | 6% | 0% | 88% | 11% | 0% |
| Less anxious | 74% | 17% | 9% | 77% | 17% | 6% |
| Worry about breathlessness less | 71% | 20% | 9% | 74% | 17% | 9% |
| Go out more often | 89% | 11% | 0% | 86% | 11% | 3% |

Table 3: Number of cylinders used per week¹*

| Hours per week | Number of Fills Per Week | % Patients |
|----------------|--------------------------|------------|
| <7.4 | 1 | 11% |
| 7.4 -14.9 | 1-2 | 29% |
| 15 - 22 | 2-3 | 34% |
| > 22 | >3 | 26% |

* Calculated by hour meter. Calculations based on 3 L min⁻¹ at 20 bpm and fill time from empty of ~140min.

Table 4: Reported number of times used outside of the home in the previous 2 weeks.

| Times Used | % Patients |
|------------|------------|
| 0-2 | 6% |
| 2-6 | 31% |
| 6-10 | 17% |
| 10-20 | 34% |
| >20 | 11% |

Table 5: Cost Savings for patients on HFOS

| Equipment supplied | Cylinders per week | | |
|--|--------------------|--------------|--------------|
| | 1 | 2 | 3 |
| 247L ambulatory oxygen set** | 33% | 44% | 51% |
| 247L ambulatory oxygen set | 21% | 34% | 43% |
| 400L (A) cylinder + flow regulator ** | 28% | 40% | not supplied |
| 1600L (D) cylinder + flow regulator ** | 34% | not supplied | not supplied |

** Patients on LTOT with an existing concentrator