**Don’t Statement:** *Don’t administer supplemental oxygen to relieve dyspnea in patients with cancer who do not have hypoxia*

**Statement of Rationale:**

Dyspnea is the sensation of inability to catch one’s breath or subjective breathing discomfort. Dyspnea is one of the most distressing and frightening experiences for patients (Thomas & vonGunten, 2003). More than 50% of advanced cancer patients have reported dyspnea at some point throughout their illness (Bruera, Schmitz, Pither, Neumann, & Hanson, 2000; Solano, Gomes, & Higginson, 2006). Reports of the prevalence of dyspnea range from 21 to 90% overall, and the prevalence and severity of dyspnea increase in the last 6 months of life, regardless of cancer diagnosis (Currow et al., 2010).

Supplemental oxygen therapy is commonly prescribed to relieve dyspnea in people with advanced illness despite arterial oxygen levels within normal limits, and has been seen as standard care (Abernathy et al., 2010; Kvale, Selecky, & Prakash, 2007; Simoff et al., 2013). Abernathy cited evidence that over 70% of physicians reported prescribing palliative oxygen, and that, in Canada, compassionate use of oxygen in non-hypoxic patients accounts for about 1/3 of the total oxygen therapy budget. A DHHS report from the office of the inspector general in 2006 noted that the average purchase price for an oxygen concentrator was $587 (Levinson, 2006) and a home oxygen cost analysis showed that supplemental oxygen use costs $201.20 per patient per month (Morrison Informatics, 2006). In the past it was estimated that about 800,000 patients in the United States receive home oxygen therapy and total cost likely exceeds $1.1 billion (O’Donohue & Plummer, 1995). The proportion of use for palliation in non-hypoxic individuals in the United States is not clear; however, if practice is similar to that seen in other countries, the cost is substantial.

Supplemental oxygen is costly and is not a benign intervention. There are multiple safety risks associated with use of oxygen equipment. People also experience functional restriction and may have some distress from being attached to a device.

Palliative oxygen (administration in nonhypoxic patients) has consistently been shown not to improve dyspnea in individual studies and systematic reviews. Rather than use of a costly and ineffective intervention for dyspnea, care should be focused on those interventions which have demonstrated efficacy.

**Background:**

In situations where individuals are experiencing breathlessness, the automatic tendency has been to administer oxygen. Patients and their families expect that oxygen will be available, and clinicians likewise respond by providing home oxygen irrespective of the measured partial pressure of oxygen
(PaO2). In palliative care, despite evidence that breathlessness may not be due to hypoxemia, oxygen is still provided by ambulance personnel, emergency department, and hospital staff (Nonoyama, Brooks, Guyatt, & Goldstein, 2007; Uronis, Currow, MCCrory, Samsa, & Abernathy, 2008; Wiese, Barrels, Graf, & Hanekop, 2009). Oxygen is widely used for palliation of breathlessness in cancer patients (Thomas, Bausewein, Higginson, & Booth, 2011).

Supplemental oxygen is frequently requested by patients and implemented by practitioners to relieve dyspnea (Kamal, Maguire, Wheeler, Currow, & Abernethy, 2012). Uronis and Abernathy (2008) pointed out that surveys of physicians in Australia showed that palliative medicine and respiratory physicians surveyed believed that palliative oxygen is beneficial and that dyspnea was the most common reason for prescription.

Palliative oxygen continues to be recommended in some consensus guidelines. Multiple consensus guidelines state the aim of oxygen therapy as provision of symptomatic relief of breathlessness and recommend use of palliative oxygen for symptom relief. Supplemental oxygen is often given out of compassion in end-of-life care or because of patient or family request. It has been suggested that the medical symbolism of supplemental oxygen may create a placebo effect (Berger, Shuster, & von Roenn, 2013).

Evidence:

- While there is evidence to support the use of oxygen to prolong survival in hypoxic people with COPD and symptom relief in hypoxic patients with cancer, evidence regarding the use of oxygen to relieve the sensation of dyspnea in non-hypoxic individuals with cancer does not support its use. In early systematic reviews of interventions to improve palliation at the end of life, it was concluded that evidence regarding effects of palliative oxygen was equivocal (Cranston, Crockett, & Currow, 2009; Qaseem et al., 2008).
- Clemens, Quednau, and Klaschik (2009) compared effects of oxygen and opioid treatment on ventilation and dyspnea in 46 hypoxic and nonhypoxic palliative care patients and found no correlation between severity of dyspnea and oxygen saturation and that use of opioids for dyspnea was more effective than oxygen administration, even in those patients who were hypoxic (Clemens et al., 2009).
- Currow, Agar, Smith, and Abernathy (2009) reviewed findings of 230 patients who were prescribed home oxygen for symptoms of breathlessness. They found no significant improvement in symptoms after 1 and 2 weeks of home oxygen.
- Several small, randomized, prospective studies showed no difference in dyspnea severity between patients who were given supplemental oxygen versus air (Booth, Kelly, Cox, Adams, & Guz, 1996; Bruera, de Stoutz, Velasco-Leiva, Schoeller, & Hanson, 1993; Bruera et al., 2003; Campbell, Yarandi, & Dove-Medows, 2013; Philip et al., 2006) or heliox (Ahmedzai, Laude, Robertson, Troy, & Vora, 2004).
- In 2010 a large, multicenter, double blind, randomized trial among patients who did not meet eligibility guidelines for long term oxygen therapy, patients showed no difference in breathlessness, functional status, or quality of life between patients with various diagnoses who received oxygen versus medical air (Abernathy et al., 2010).
- In a systematic review of various interventions to relieve dyspnea, the conclusion from 8 studies of oxygen use was that oxygen was no better than medical air in relieving dyspnea, except for
patients with hypoxia (Ben-Aharon, Gafter-Gvili, Paul, Leibovici, & Stemmer, 2008). A later meta-analysis showed lack of benefit from oxygen administration (SMD =-0.3, 95% CI =1.06, 0.47). (Ben-Aharon, Gafter-Gvili, Leibovici, & Stemmer, 2012).

- Uronis et al. (2008) also concluded that oxygen therapy in mildly or non-hypoxemic patients with cancer was not effective for relief of dyspnea. The 2012 update of the American Thoracic Society systematic review of evidence and consensus statement on dyspnea from any etiology concluded there was limited evidence to support the use of oxygen therapy for patients who are not hypoxic (Parshall et al., 2012).

References


