Managing Dyspnea in End of Life Care

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Dyspnea- derives from Greek “dys”- abnormal/difficult and “pnoia” meaning breath
Defined as “uncomfortable sensation or awareness of breathing:
- Air Hunger ~ Suffocation ~ Shortness of Breath
Dyspnea one of the most common symptoms reported in end of life care
A subjective symptom – similar to pain
- Dyspnea ≠ Tachypnea
Effects of Dyspnea³

**Physical**
- Fatigue and tiredness
- Decrease in functional status (low Karnofsky performance score)

**Emotional**
- Distressing to family and patient
- More likely to be anxious and depressed
- Associated with anger, helplessness, loneliness

**Social**
- Dyspnea (rather than lung function) correlates highly with disability
- Prevents patient involvement with any activities, including talking in severe cases

**Spiritual**
- Positive correlation with spiritual distress
Dyspnea and Life Expectancy\textsuperscript{4,5}

- Dyspnea may predict shortened survival in cancer patients
- Patients with cancer presenting to ED with dyspnea had median overall survival of 12 weeks
  - Lung cancer - 4 weeks
  - Breast cancer - 22 weeks
- Elevated pulse and respiratory rate along with cancer-related dyspnea correlated with a predicted mean survival of < 2 weeks
Etiology

- Increase in respiratory effort needed to overcome obstruction/restrictive disease; more respiratory muscles required to maintain adequate breathing; increase in ventilatory need
- Terminally illnesses commonly reporting dyspnea
  - Advanced malignant disease
  - COPD
  - Heart Failure
  - Deconditioning
  - Pneumonia
  - AIDS
Regulation of Normal Breathing\textsuperscript{2,7}
Cognitive/Emotional Factors

Cerebral Cortex

Sensory Receptors
Respiratory Center (Medulla/Pons)
Respiratory Muscles

Main Abnormalities in Dyspnea\textsuperscript{6,8}

- **Mechanical Impairment**
  - Increased resistance requiring increased workload
  - COPD, Bronchial Obstruction

- **Workload**
  - Increase in the proportion of respiratory muscles needed to sustain workload
  - Weakened respiratory muscles (cachexia, neuromuscular weakness)

- **Ventilator Demand**
  - Increase in ventilatory demand
  - Hypoxia, hypercapnia, metabolic acidosis, anemia
Goal Standard: Patient self-report

Objective signs include
- Areas of pulmonary dullness or crackles
- Inability to clear secretions
- Stridor
- Bronchospasm (wheezing)
- Central or peripheral cyanosis
- Intercostal retractions
- Tachypnea
Goals of Therapy

- Identify and treat underlying cause of dyspnea if applicable
- Fully address all other concomitant symptoms, stressors, and spiritual distress
Biopsychosocial Model of Dyspnea Management⁹
The City of Hope QOL Model

**Physical**
- Functional Ability
- Strength/Fatigue
- Sleep & Rest
- Nausea
- Appetite
- Constipation
- Pain
- Dyspnea

**Psychological**
- Anxiety
- Depression
- Enjoyment/Leisure
- Pain/Dyspnea Distress
- Happiness
- Fear
- Cognition
- Attention

**Social**
- Financial Burden
- Caregiver Burden
- Roles and Relationships
- Affection/Sexual Function
- Appearance

**Spiritual**
- Hope
- Suffering
- Meaning of Pain/Dyspnea
- Religiosity
- Transcendence

Adapted from Ferrell et al., 1991
Bronchoconstriction = Albuterol/ipratropium nebulizers

Hypoxia = Oxygen

Nicotine cravings = Nicotine patch/clonidine patch

Cough = Antitussives/opioids

Fluid overload/CHF = Diuretics

COPD exacerbation; superior vena cava obstruction; lymphangitic carcinomatosis = Steroids

Pneumonia/infectious process (not terminal pneumonia) = antibiotics

Treat Underlying Cause

3,9,10
Symptom Palliation$^9,^{11}$

Dyspnea

Non-pharmacologic Options

- Fan
- Elevating head of bed
- Reducing environmental irritants

Opioids
Dyspnea

Anxiety

- Opioids should remain first line when anxiety is a component
- Benzodiazepines should not be used first line as mono-therapy for dyspnea.
- Benzodiazepines may be used as adjunct therapy when opioids are not fully successful
  - Lorazepam: initial- 0.5-2.0 mg PO, SL, buccal, or SC q 1 h PRN and titrate to effect. Once the TDD established, provide 1/3 q 8 h routinely.
MOA of Opioids in Dyspnea

- Mechanism not completely understood- multiple theories exist
- May reduce the sensitivity and responsiveness of the medullary respiratory centers to hypoxia and hypercapnia
  - Addition of 100% oxygen can induce apnea
- May inhibit stimulus-evoked release of ACh
  - Mu and delta opioid receptors
- Opioid receptors are located throughout the respiratory tract and must abundantly in the aveolar walls
  - May active opioid receptors associated with pulmonary afferents on vagal C-fibers believed to be within the aveolar wall
Much lower doses are needed to relieve dyspnea than that which can cause respiratory depression.

Opioid naïve patient
- Morphine 10 to 15mg po q1h PRN and titrate to effect
- Possible alternative: hydromorphone 2.5mg orally q6h

On baseline opioids
- Increase opioid dose by 25% and titrate to effect

Chronic dyspnea
- ER formulation for baseline control w/ 10% of TDD for breakthrough dyspnea
Inhaled opioids have shown mixed results in improving dyspnea with most showing minimal effect.

Rapid administration of morphine can produce pulmonary vasoconstriction secondary to histamine release.

Studies have shown that the opioid lung receptor density is altered in ‘sensitized’ airways and may contain a non-conventional opioid receptor.

- Decrease in delta receptors with sensitized tissues
- Mucus secretions not inhibited by kappa agonists
# Summary of Treatment Options for Dypsnea

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Agent</th>
<th>Conclusions</th>
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<tbody>
<tr>
<td>Medical Gas</td>
<td>Oxygen – Hypoxemic</td>
<td>↑</td>
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<td>Oxygen – Normoxemic</td>
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<td>Medical air – Normoxemic</td>
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<tr>
<td>Pharmacologic</td>
<td>Opioids – oral/IV</td>
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<td>Opioids - inhaled</td>
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<td>Inhaled furosemide</td>
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<td></td>
<td>Anxiolytics</td>
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<td></td>
<td>Heliox</td>
<td>↔</td>
</tr>
<tr>
<td>Non-pharmacologic</td>
<td>Fan</td>
<td>↑</td>
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<td></td>
<td>Pulmonary rehabilitation (in select patients)</td>
<td>↑</td>
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<tr>
<td>Surgical</td>
<td>Pleural catheter</td>
<td>↑</td>
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<td>LVRS (in select patients)</td>
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<td></td>
<td>Bronchial stenting (in select patients)</td>
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<tr>
<td>Complementary</td>
<td>Acupuncture</td>
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↑ Evidence generally supports use of intervention
↓ Current evidence does not support use
 ↔ Further investigation required
 ↔ or ↑ Further investigation is required, but emerging data are compelling to support use
References


2. Dyspnea. Self study module 3j. Education in Palliative and End-of-life Care for Oncology (EPIC™-O). 


