OCN Review
Symptom Management:
Alterations in Respiratory Function
Alterations in Circulatory Function
Alterations in Neurologic Function

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Objectives
* Definition
* Risk Factors
* Prevention
* Education
* Management
* Palliative Care

Alterations in Respiratory Function

Definition

"A term used to characterize a subjective experience of breathing discomfort that consists of qualitatively distinct sensations that vary in intensity. The experience derives from interactions among multiple physiological, psychological, social and environmental factors and may induce secondary physiological and behavioral responses."

The American Thoracic Society 1999

Causes of Dyspnea

- Pneumonitis
- Pulmonary fibrosis
- Pulmonary Edema
- Pulmonary Effusion
- Pulmonary Emboli
- Pulmonary Obstruction
- Phrenic Nerve paralysis
- Pericardial Effusion
- Pneumothorax
- Electrolyte abnormalities
- Lymphangitic carcinomatosis
- Superior Vena Cava Syndrome
- Pneumonia
- Cachexia
- Anemia
- Anxiety
- COPD/ Asthma
- Obesity
- Hepatomegaly
- Ascites
- Nonproductive cough
- Low-grade fever
- Tachycardia
- Dyspnea, tachypnea
- Pleuritic chest pain
- Shortness of breath
- Blood-tinged sputum
*Can occur up to one year after treatment

- Consolidation specifically in area treated by radiation or throughout
- Crackles
- Fatigue
- Restlessness
- Hypoxia

**Pneumonitis: Inflammation of the lung**

**Pulmonary Fibrosis**
- Later effect: 6–12 months after treatment
- Symptoms
  - Can be asymptomatic depending on extent
  - Signs and symptoms can be the same as pneumonitis.
  - Can lead to a chronic cor pulmonale

**Risk Factors for Dyspnea**

- Advanced age (older than 65 years)
- History of cardiac or pulmonary disease (CHF, COPD, Asthma)
- Nicotine use
- Hepatic or renal dysfunction
- Combination therapy
- Lung Cancer
- Radiation to the chest
- Cumulative dose of chemotherapy
- Longer duration of survival
- Low performance score
- Environmental exposure

**Antineoplastic Agents Causing Pulmonary Toxicity**

- Alkylating Agents
- Antimetabolites
- Antitumor antibiotics
- Nitrosureas
- Plant Alkaloids
- Anti-angiogenesis agents
- Monoclonal Antibodies
- Interleukins
- Targeted therapies
• Know pretreatment status and who is at higher risk.
• Provide monitoring of pulmonary function and nursing assessment.
• Educate patients on symptoms to report.
• Limit radiation dose to the lungs; chemotherapy dose can be reduced or drugs can be changed, if necessary.

* Prevention

* Educate Patient and caregivers

* Recommended for Practice
  * Immediate-release oral or parenteral opioids

* Evidence Based Interventions for Dyspnea

* Likely to be effective
  * Temporary ventilator support
  * Oxygen therapy
  * Benzodiazepines for anxiety
  * Increasing ambient airflow directed at the face or nose
  * Providing cooler temperatures
  * Promoting relaxation and stress reduction
  * Providing educational, emotional and psychosocial support to patient and family caregivers and referring to other disciplines as appropriate

* Evidence Based Interventions for Dyspnea
Effectiveness not established
- Extended release morphine
- Midazolam plus morphine
- Nebulized or oral transmucosal fentanyl
- Nebulized furosemide, lignocaine, opioids
- Palliative oxygen
- Acupuncture
- Cognitive behavioral approaches

Corticosteroids: Reduce inflammation, relieve symptoms, and prevent progression to fibrosis.
- Symptom management
  - Bronchodilators
  - Expectorants, humidifier, hydration, antitussives
  - Oxygen, elevate head of bed
  - Rest
  - Antibiotics may be necessary
  - Diuretics
- Education for patient and family on what to expect

Employ the same symptom management as for pneumonitis.
- Educate patients and families that this is a chronic condition and not to expect a drastic improvement.
- Support patients and families in coping with this sometimes disabling side effect of treatment.
- Provide continued follow-up and monitoring of pulmonary status.

ONS PEP Resource Area
http://www.ons.org/research/PEP/
**Alterations in circulatory function**

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**Cardiac Toxicities**

- Pericarditis
- Pericardial effusion
- Cardiac tamponade
- Cardiomyopathy
- Congestive heart failure
- Arrhythmias
- Fluid retention
- Hypertension
- Hypotension
- Endocardial fibrosis
- Myocardial Ischemia
- Pericardial disease

**Symptoms of Cardiac Toxicity**

- Shortness of breath (SOB)
- Chest pain
- Fatigue
- Edema
- Syncope
- Arrhythmias
- Quality-of-life changes
  - “I can’t do what I used to do.”
  - Depression

**Assessment**

- Heart sounds and rhythm
  - Murmurs, rubs, irregular or extra sounds, distant sounds
- Signs of congestive heart failure
  - Fluid overload—Edema, vein distention, weight gain, breath sounds
  - Tachycardia, SOB, cough, cardiomegaly
- Electrolyte status
- Potassium and calcium levels can affect heart function
- Electrocardiogram (EKG)
  - Assess heart rhythms.
- Echocardiogram or multiple-gated acquisition (MUGA) scan
  - Assess function of heart and valves, and look for fluid around the heart.
- Blood level of troponin
  - Assess for heart muscle tissue damage.
*Anthracycline
*Antitumor Antibiotics
*Alkylating agents
*Antimetabolites
*Plant alkaloids
*Hormonal agents
*Taxanes

*Chemotherapy
  • Direct damage to the muscle fibers from drug
  • Arrhythmias or spasms caused by high doses
  • Damage to the lining of the blood vessels

*Radiation therapy
  • Radiation directly to the heart tissues can cause inflammation that can lead to fibrosis.
  • Damage to the lining of the blood vessels and collagen deposits can cause cardiomyopathy, coronary artery disease, or dysfunction of the valves.

**Limit doses of chemotherapy and radiation.**
**Know pretreatment/baseline cardiac status.**
**Perform ongoing assessment and treatment of any signs of cardiac dysfunction.**
**Educate patients and families about signs and symptoms to report.**

**Prevention**

**Management of Cardiac Toxicities**

-Dexrazoxane (Zinecard) can be given with some chemotherapy to protect the heart.
-Chemotherapy dose reduction may be necessary.
-Diuretics for fluid overload
-Oxygen
-Beta-blockers, vasodilators, and other cardiac medications to support heart function
-Cardiology consult
-Provide rehabilitation.
-Avoid tobacco, caffeine, and alcohol; these stimulate heart muscle and can cause dehydration.
-Avoid salt if fluid overload is a problem.
-Provide ongoing monitoring of EKG and MUGA scan for cardiac status.
-Provide psychosocial support; as cardiac dysfunction can be disabling.
-Educate patients and family members on how to manage the condition and what to report to the physician.
Lymphedema

- Occurs when the flow of fluid in the lymphatic system is obstructed
- Primary Lymphedema
  - Develops when lymphatic structures are damaged.
  - Acute: Occur days after surgery, 6-8 weeks after surgery or radiation or 18-24 months after surgery may turn into chronic
  - Chronic: Occurs when lymphatic system is unable to handle the demands of lymphatic fluid flow

Signs and Symptoms of Lymphedema

- Swollen limb
- Swollen axilla or groin area
- Edema may extend to face, neck, or genitals
- Signs of infection or inflammation may be present

Risk Factors for Lymphedema

- Obesity
- Lack of exercise
- Overuse of an affected extremity
- Hematomas
- Seromas
- Cellulitis
- Wounds
- Tight or constrictive clothes
- Airplane travel
- Long distance travel
- Infection in or trauma to an affected extremity
- Prolonged standing
- Diabetes

Assessment

- Measure affected limb using anatomic landmarks for follow-up assessment & accuracy
- Assess for signs & symptoms of infection
- Pulses & ROM
- Strength of affected limb
- Affected areas for presence of suspicious masses or tumor recurrence
**Prevention of Lymphedema**

- Maintain ideal body weight
- Avoid smoking and alcohol
- Use an electric razor when shaving axilla
- Wear lightweight breast prostheses
- Wear a compression sleeve when flying
- Rest arm if it begins to ache
- No blood pressure
- No blood draws

- Do not over exercise
- Do not cut cuticles
- Avoid cuts or abrasions
- Avoid extreme temperature changes
- No tight jewelry or elastic bands
- No lifting heavy objects
- Avoid vigorous repetitive movement against resistance

**Grading Scale of Lymphedema**

- None (Grade 0):
  - Edema not evident
- Mild (Grade 1):
  - < 3 cm difference between extremities
- Moderate (Grade 2):
  - 3-5 cm difference between extremities
- Severe (Grade 3):
  - > 5 cm difference between extremities

**Patient Education**

- Maintain lifelong preventive measures
- Exercise regularly and maintain a proper weight
- Avoid injury to the affected extremity
- Avoid tight clothing, jewelry, elastic bands on the affected extremity
- Report signs of redness, warmth, pain, swelling
- Report feelings of heaviness or aching in the affected extremity
- Wear compression garment as directed by healthcare provider trained in lymphedema management
- Lymphedema of the lower extremity, avoid standing or sitting for long periods and do not cross your legs
- Use electric razor to shave an affected area

**Recommended for Practice**

- Complete decongestive therapy
- Compressive bandaging
- Treatment of infections

- Likely to be effective
- Maintain Optimal body weight
- Manual lymph drainage
- Skin care

**Evidence Based Interventions for Lymphedema**
**Benefits Balanced With Harms**
- Exercise
- Prophylactic antibiotics for recurrent infections

**Effectiveness Not Established**
- Compression garments
- Hyperbaric oxygen
- Low-level laser therapy
- Nanocrystalline silver dressing on lymphatic ulcers
- Pneumatic compression pump
- Simple lymph drainage
- Surgical intervention

**Not Recommended For Practice**
- Diuretics
- Benzopyrenes

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**Evidence Based Interventions for Lymphedema**

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**Evidence Based Interventions for Lymphedema**

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**Resources**

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**Alterations in Neurological Function**

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**ONs PEP Resource Area** [http://www.ons.org/research/PEP/](http://www.ons.org/research/PEP/)


Impairment in perception, memory and/or thinking

Cognitive Impairment

Disease related
- CNS disease either primary or metastatic

Treatment related
- Chemotherapy
  - 5FU, Methotrexate, vinca alkaloids, taxanes
- Radiation to the brain
- Hormone therapy
- Drugs (pain medications)

Situational related
- Depression
- Anxiety
- Hopelessness

Risk Factors for Cognitive Impairment

Treat pre-existing conditions
- Depression
- Anxiety
- Hopelessness

Prevention of Cognitive Impairment

Effectiveness Not Established
- Medications (Methylphenidate, Donepezil, Modafinil)
- Complementary and alternative medicine (exercise, vitamin E)
- Cognitive training program interventions

Evidence Based Interventions for Cognitive Impairment

- Erythropoiesis-stimulating agents and epoetin alfa
Sleep-wake disturbances are perceived or actual alterations in night sleep with resultant day time impairment.

Sleep-wake disturbances are reported in 30-70% of people with cancer and have negative impact on other symptoms and quality of life.

Likely to Be Effective

Cognitive behavioral interventions/ Approach

Cognitive behavioral interventions/ Approach

Evidence based Interventions for sleep-wake disturbances

Evidence based Interventions for sleep-wake disturbances

Peripheral Neuropathy is a group of neurologic dysfunctions that occur outside the spine and brain.

Refers to any part of the body affected by peripheral nerves
Comorbidities:
- Diabetes
- Alcohol overuse
- Metabolic imbalances
- Vitamin B12 deficiency
- Cachexia
- HIV
- Other paraneoplastic syndrome
- Cancer
- Age
- Medications

*Risk Factors for neuropathy

*Platinums
- Cisplatin
- Oxaliplatin

*Taxanes
- Paclitaxel

*Vinca Alkaloids
- Vincristine
- Vindesine
- Vinblastine
- Proteasome Inhibitors
- Bortezomib

*Treat pre-existing conditions (b12 deficiency, diabetes)
*Toxic synergy
*Frequent Assessments
*Medications ??
*Amifostine
*Glutamine

*Chemotherapies that cause neuropathy

*Benefits Balanced With Harms
*Assistive devices

*Prevention of Neuropathy

*Evidence Based Interventions for Peripheral Neuropathy
Effectiveness Not Established

Treatment Interventions
- Carbamazepine
- Lamotrigine
- Acupuncture
- Pulsed infrared light therapy
- Transcutaneous electrical nerve stimulation and high frequency external muscle stimulation

Prevention Interventions
- Acetyl-L-carnitine
- Alpha-lipoic acid
- Amifostine
- Calcium and magnesium
- Gabapentin
- Recombinant human leukemia inhibitory factor
- Glutamine
- Glutathione
- Nortriptyline
- Vitamin E

Evidence Based Interventions for Peripheral Neuropathy

Leptomeningeal Disease

5% of patients with cancer will develop
Most common with breast, small cell lung, leukemia, NHL lymphoma, leukemia, melanoma
Sx: altered mental status, cranial nerve involvement esp. optic neuropathy, headaches, ataxia, seizures, radicular pain, weakness, incontinence or retention
Tx: palliative, symptom management-chemo, radiation

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Resources