Course Navigation

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- Select **Resources** top right (Reference material and downloadable resources)

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Press the Play Button below to start
Occupational Therapy’s Unique Contributions to Cancer Rehabilitation

Claudine Campbell, MOT, OTR

Jennifer Hughes, MOT, OTR

Lauro A. Munoz, MOT, OTR, C/NDT
Course Authors

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Introduction

Lessons include:

Lesson 1: Cancer Basics

Lesson 2: Medical Rehabilitation Principles in Oncology

Lesson 3: Complex Oncology Symptoms

Lesson 4: Oncology-Related Symptoms and Occupational Therapy’s Role

Case Study

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Lesson 1: Cancer Basics

After completing this lesson, the learner will:

• Identify cancer prevalence and different types of cancer.
• Identify common sites of metastasis of malignant tumors.
• Identify basic cancer treatments and common side effects.
• Identify the different goals of medical treatment for cancer.
Need for Oncology Rehabilitation

• In the United States 1,596,670 new cases of cancer were diagnosed in 2011:
  – 1 in 2 men.
  – 1 in 3 women.

• According to the National Cancer Institute (NCI), there were approximately 11.7 million survivors of cancer in the United States in January 2007.

• Approximately 78% of cancers are diagnosed in people age 55 and older.

(American Cancer Society [ACS], 2011, pp. 1, 5)
## Leading Sites of New Cancer: 2011 Estimates

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
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</thead>
<tbody>
<tr>
<td>Prostate 29%</td>
<td>Breast 30%</td>
</tr>
<tr>
<td>Lung and bronchus 14%</td>
<td>Lung and bronchus 14%</td>
</tr>
<tr>
<td>Colon and rectum 9%</td>
<td>Colon and rectum 9%</td>
</tr>
<tr>
<td>Urinary bladder 6%</td>
<td>Uterine 6%</td>
</tr>
<tr>
<td>Melanoma of skin 5%</td>
<td>Thyroid 5%</td>
</tr>
<tr>
<td>Non-Hodgkin’s lymphoma 4%</td>
<td>Non-Hodgkin’s lymphoma 4%</td>
</tr>
<tr>
<td>Oral cavity/pharynx 3%</td>
<td>Melanoma of skin 4%</td>
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<tr>
<td>Leukemia 3%</td>
<td>Kidney and renal 3%</td>
</tr>
<tr>
<td>Pancreas 3%</td>
<td>Ovary 3%</td>
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<tr>
<td></td>
<td>Pancreas 3%</td>
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</tbody>
</table>

(ACS, 2011, p. 10)
<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
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<tbody>
<tr>
<td><strong>Lung and bronchus 28%</strong></td>
<td><strong>Lung and bronchus 26%</strong></td>
</tr>
<tr>
<td><strong>Prostate 11%</strong></td>
<td><strong>Breast 15%</strong></td>
</tr>
<tr>
<td><strong>Colon and rectum 8%</strong></td>
<td><strong>Colon and rectum 9%</strong></td>
</tr>
<tr>
<td><strong>Pancreas 6%</strong></td>
<td><strong>Pancreas 7%</strong></td>
</tr>
<tr>
<td><strong>Liver and bile duct 4%</strong></td>
<td><strong>Ovary 6%</strong></td>
</tr>
<tr>
<td><strong>Leukemia 4%</strong></td>
<td><strong>Non-Hodgkin’s lymphoma 4%</strong></td>
</tr>
<tr>
<td><strong>Esophagus 4%</strong></td>
<td><strong>Leukemia 3%</strong></td>
</tr>
<tr>
<td><strong>Urinary bladder 4%</strong></td>
<td><strong>Uterine 3%</strong></td>
</tr>
<tr>
<td><strong>Non-Hodgkin’s lymphoma 3%</strong></td>
<td><strong>Liver and bile duct 2%</strong></td>
</tr>
<tr>
<td><strong>Kidney and renal 3%</strong></td>
<td><strong>Brain/nervous system 2%</strong></td>
</tr>
</tbody>
</table>
What is Cancer?

(Source. NCI, 2011b)
Behavior Classification

Benign Tumors (Neoplasms)
- Not cancer.
- Slow growing.
- Rarely life threatening.
- Grow locally, no invasion.

Malignant Tumors (Neoplasms)
- Cancer.
- Rapid growth.
- May be life threatening.
- Capable of spreading by invasion or metastasis.
Normal vs. Malignant Cell Function

- Normal cells have a specific function to perform (e.g., muscle cells contract, salivary gland cells produce saliva).
- Malignant cells lose some of their ability to function or may assume the function of different cell types (e.g., small-cell lung cancer cells can start producing antidiuretic hormone [ADH]).
Types of Cancer

- **Carcinoma**: Skin or tissues that line or cover internal organs.
- **Sarcoma**: Bone, cartilage, fat, muscle, blood vessels, connective and supportive tissues.
- **Leukemia**: Blood-forming tissues (bone marrow).
- **Lymphoma and myeloma**: Cells of the immune system.
- **Central nervous system**: Tissues of the brain, spinal cord.
Nomenclature

Benign
Cell of origin + “oma”
- Fibroma (fibroblastic cells)
- Adenoma (glandular)
- Chondroma (cartilage)
- Osteoma (osteoblasts)

Malignant
Epithelial tissue of origin + “carcinoma”
- Adenocarcinoma (glandular)
Connective tissue of origin + “sarcoma”
- Fibrosarcoma
- Chondrosarcoma
Clinical Staging of Cancer

TNM Scale:
- Primary tumor size.
- Lymph node involvement.
- Extent of metastasis.

Guides treatment.
Gives indication of prognosis.
Facilitates exchange of information and research.

(Greene et al., 2002; Sharpe & Fenton, 2008)
Tumor Classification and Staging

**TNM Classification (universal system)**
- T (T1–T4): Tumor size
- N (N0–N3): Lymph node involvement
- M (M0–M1): Absence or presence of metastasis

**Staging Groups**
- Stage I: T1 N0 M0
- Stage II: T2 N1 M0
- Stage III: T3 N2 M0
- Stage IV: T4 N3 M1

(Greene et al., 2002; Sharpe & Fenton, 2008)
Cancer Metastasis

Invasion:
- Direct migration and penetration to neighboring tissues.

Metastasis:
- Penetrate into lymphatic and blood vessels.
- Circulate through the bloodstream.
- Invade normal tissues elsewhere in the body.
- In general, certain body sites are more likely to develop metastases than other sites.

(Source. NCI, 2011a)
## Common Sites of Metastasis by Primary Tumor

<table>
<thead>
<tr>
<th>Primary Tumor</th>
<th>Common Sites of Metastasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>Bone, lung, liver, lymph nodes, brain, meninges</td>
</tr>
<tr>
<td>Prostate</td>
<td>Bone, lung, liver, lymph nodes</td>
</tr>
<tr>
<td>Lung</td>
<td>Bone, liver, lymph nodes, brain, meninges</td>
</tr>
<tr>
<td>Colorectal</td>
<td>Liver, lung, lymph nodes</td>
</tr>
<tr>
<td>Bone</td>
<td>Lung, brain</td>
</tr>
</tbody>
</table>
Goals of Medical Cancer Treatment

**Curative:**
- Use treatment to restore patient to prior health status.
- Obtain a cure using single or combined modalities.

**Palliative:**
- Optimize comfort.
- Decrease caregiver burden.
- Focus on patient-centered goals.
Forms of Cancer Treatment

- Surgery
- Radiation therapy
  - External
  - Internal (brachytherapy)
  - Systemic
- Chemotherapy
- Hormone therapy
- Bone marrow or stem cell transplantation
- Clinical trials
Surgery

• Preventative, curative, diagnostic, palliative.
• Used in addition to other cancer treatments:
  - Chemotherapy.
  - Radiation.
• Goal: Achieve clean margins.
• Debulking.

(Stubblefield & O’Dell, 2009)
Side Effects of Surgery

- Pain.
- Fatigue and limited endurance.
- Risk for infection.
- Blood clots and pulmonary embolisms.
- Altered cosmesis.
- Swelling.
- Altered weight-bearing capacity.

(Stubblefield & O’Dell, 2009)
Radiation Therapy

Local treatment uses ionizing radiation to disrupt cell DNA.

• Goals:
  - Cure or shrink early stage cancer.
  - Prophylactic.
  - Palliative.

External radiation.

Internal radiation (brachytherapy).

Systemic radiation.

(Stubblefield, 2011a; Stubblefield & O'Dell, 2009)
Side Effects of Radiation

- Fatigue.
- Headaches, nausea, vomiting.
- Skin changes, radiation fibrosis.
- Mucositis.
- Cognitive changes.
- Pulmonary fibrosis.
- Gastrointestinal disorders.
- Infertility.

(Stubblefield, 2011b)
Chemotherapy

Wide range of drugs used to kill cancer.
- Interfere with DNA replication.
- Damage DNA.
- Cytoskeletal interference.

Not specific: Affects any rapidly growing or dividing cells.
- Neoadjuvant: Shrinks cancer before it is removed.
- Adjuvant: Kills any remaining cancer cells.

Oral administration or intravenous injection.

(Stubblefield & O’Dell, 2009)
Side Effects of Chemotherapy

- Bone marrow suppression.
- Nausea and vomiting.
- Hair loss.
- Ototoxicity.
- Appetite loss and changes in taste.
- Mucositis.
- Constipation or diarrhea.

- Fatigue.
- Multiorgan damage.
- Central and cranial nervous system changes.
- Peripheral neuropathy.
- Cognitive changes ("Chemobrain"/"Chemo fog").
- Reproduction and sexual changes.

(Stubblefield & O’Dell, 2009)
Hormone Therapy

- Systemic therapy that adds, blocks, or removes hormones.
- Used often with prostate and breast cancer.
- Delivered by means of medications or surgery.
Side Effects of Hormone Therapy

- Weight gain.
- Hot flashes and night sweats.
- Nausea.
- Changes in fertility.
- Loss of libido.

(Shearsmith-Farthing, 2001)
Bone Marrow and Stem Cell Transplantation

Forms of stem cell transplants:

- In *autologous transplants*, patients receive their own stem cells.
- In *syngeneic transplants*, patients receive stem cells from their identical twin.
- In *allogeneic transplants*, patients receive stem cells from a brother, sister, or parent. An unrelated donor also may be used.

(Stubblefield & O’Dell, 2009)
Transplant Process

- Collect patient’s bone marrow or blood.
- Process in the lab to purify and concentrate stem cells.
- Freeze to preserve stem cells.
- Thaw stem cells.
- Reinfuse stem cells into patient after patient receives high-dose therapy.
Side Effects of Bone Marrow and Stem Cell Transplant

- Low blood counts.
- Poor nutrition.
- Fatigue.
- Graft versus host disease (GVHD).
- Infections.
- Gastrointestinal infections.

(Stubblefield & O’Dell, 2009)

Cancer Basics

Lesson 2: Medical Rehabilitation Principles in Oncology

After completing this lesson, the learner will:

• Recognize the five stages in the cancer treatment continuum.
• Identify common complications and precautions relative to cancer and treatments.
• Identify cancer rehabilitation paradigms that affect occupational therapy treatment planning and goal setting.
Rehabilitation Principles

Cancer Treatment Continuum

Common Complications and Precautions of Cancer and Treatments

Cancer Rehabilitation Paradigms
Cancer Treatment Continuum

Functional Status May Fluctuate

Pretreatment:
- Newly diagnosed, no treatment initiated.

Active Care:
- Presently receiving treatment with a curative goal.

Maintenance:
- Long-term therapy to maintain remission or tight control.

Postcare:
- Treatments complete with no evidence of disease.

Palliation:
- Palliative treatment for incurable cancer.

(Stubblefield & O’Dell, 2009)
# Understanding Complications and Precautions of Cancer

<table>
<thead>
<tr>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progression of disease (i.e., advancement of the disease or recurrence)</td>
</tr>
<tr>
<td>Cancer pain</td>
</tr>
<tr>
<td>Cancer fatigue</td>
</tr>
<tr>
<td>Edema and lymphedema</td>
</tr>
<tr>
<td>Deep vein thrombosis and pulmonary embolism</td>
</tr>
<tr>
<td>Psychosocial issues</td>
</tr>
<tr>
<td>Hematological considerations</td>
</tr>
<tr>
<td>Bone metastases</td>
</tr>
<tr>
<td>Neurological changes</td>
</tr>
<tr>
<td>Sudden changes in functional or cognitive status</td>
</tr>
</tbody>
</table>
Hematological Considerations

Platelets (normal value = 200K–400K/mm³).
- Low platelet levels (thrombocytopenia) = increased risk of bleeding.

Hemoglobin (normal value = 12.0–16.0 g/dL).
- Low hemoglobin levels = anemia.

White blood cells (normal value = 4000–10,000/mm³).
- Low white blood cell count = neutropenia.
- Creates a high risk for infection.

(Paul, 2011; Stubblefield & O’Dell, 2009)
### Hematological Considerations: Exercise and Activity Precautions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemoglobin &lt;8.0 g/dL</td>
<td>Avoid high-intensity activities that require significant oxygen transport.</td>
</tr>
<tr>
<td>Platelet count &lt;20K</td>
<td>Avoid activities that may increase risk of bleeding or injury.</td>
</tr>
<tr>
<td>Fever &gt;100.4</td>
<td>May indicate systemic infection and needs to be investigated. Patients with neutropenia should avoid strenuous exercise.</td>
</tr>
</tbody>
</table>

(Paul, 2011; Salmon & Swank, 2002)
Bone Metastases

- Osteolytic vs. osteoblastic lesions.
- Shoulder girdle or pelvic girdle.
- Rehab implications:
  - Weight-bearing status.
  - Manual muscle testing and resistive exercises not recommended.
Neurological Complications

- Seizures.
- Increased intracranial pressure.
- Spinal precautions.
- Hydrocephalus.
- Change in mental status.

(Stubblefield & O’Dell, 2009)
Sudden Changes in Functional or Cognitive Status

- An abrupt change in functional status may require a consult with a physician for formal assessment.
- Impaired judgment, new onset of decreased safety awareness, or confusion may indicate progression of disease, new location of disease, or poor medication management.
Cancer Rehabilitation Paradigms

• Preventative:
  - Preoperative education and training.
  - Improve general health and function.

• Restorative:
  - Return to previous levels of function.

• Supportive:
  - Accommodation training for existing disabilities.
  - Minimize potential debilitating changes.

• Palliative:
  - Best quality of life for client and family.
  - Balance between function and comfort.

(Dietz, 1981; O’Toole & Golden, 1991; Stubblefield & O’Dell, 2009)
## Occupational Therapy Intervention Approaches for Cancer Rehabilitation Paradigms

<table>
<thead>
<tr>
<th>Cancer Rehabilitation Paradigms</th>
<th>Focus of Paradigm Intervention</th>
<th>Occupational Therapy Intervention Approaches</th>
<th>Focus of Occupational Therapy Interventions</th>
</tr>
</thead>
</table>
| • Preventative                  | • Preoperative education and training.  
  • Improve general health and function. | • Prevent (disability prevention) | • To prevent the occurrence or evolution of barriers to performance in context. |
| • Restorative                   | • Return to previous levels of function. | • Establish, restore (remediation, restoration)  
  • Prevent (see above) | • To change client variables to establish a skill or ability that has not yet developed or to restore a skill or ability that has been impaired. |
| • Supportive                    | • Accommodation training for existing disabilities.  
  • Minimize potential debilitating changes. | • Modify (compensation, adaptation)  
  • Prevent (see above)  
  • Maintain (see below) | • To find ways to revise the current context or activity demands to support performance in the natural setting. |
| • Palliative                    | • Best quality of life for client and family.  
  • Balance between function and comfort. | • Maintain  
  • Modify (see above) | • To provide the supports that will allow the client to preserve the performance capabilities that have been regained, to continue to meet the client’s occupational needs, or both. |
  • Assumption: that without continued maintenance intervention, performance would decrease, occupational needs would not be met, or both, thereby affecting health and quality of life.
Cancer Rehabilitation Paradigms: Occupational Therapy Role

- Cancer diagnosis and rehabilitation paradigm.
- Occupational therapy evaluation and treatment plan.
- Meaningful and realistic client-centered goals.
Lesson 3: Complex Oncology Symptoms

After completing this lesson, the learner will:

• Recognize how complex oncology symptoms affect occupational performance and engagement.

• Distinguish between the objective and subjective components of cancer symptoms.

• Identify attributes of occupational therapy intervention that are relevant in treating the objective and subjective components of cancer symptoms.
Effect on Occupational Performance

• A national survey found that 87% of oncology patients had rehabilitation needs, including deconditioning, impaired mobility, restricted range of motion, and impaired activities of daily living (Movsas et al., 2003).

• A study by Cusick, Lawler, & Swain (1987) found that 41% of clients reported engagement in more sedentary activity and 36% reported less involvement in work and school.
12 Common Symptoms

1. Weakness 82%
2. Dry mouth 68%
3. Anorexia 58%
4. Depression 52%
5. Pain 46%
6. Insomnia 46%
7. Swollen legs 46%
8. Nausea 42%
9. Constipation 36%
10. Vomiting 32%
11. Confusion 30%
12. Dyspnea 30%

(Dunlop, 1989)
Subjective Component of Symptoms

- Emotional and psychological.
- Impact unique to each individual.
- Affected by perception and experiences.
- May have increased impact on clients with cancer.
- Assessments: typically self-report.
- Common intervention attributes: dynamic, holistic, and individualized.

(Butler & Moseley, 2003)
Objective Component of Symptoms

- Physical in nature.
- Observable.
- Measurable.

Assessments:
- Standardized.
- Objective.

Interventions:
- Protocol driven.

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Objective and Subjective Components of Symptoms

- Client treated with radiation and surgery for breast cancer.
- Had goal of donning shirt.
- Completed restorative techniques to regain range of motion and strength.
- Showed increased range of motion and strength.
- Still could not don shirt because of fear of reinjuring arm.
- Able to don shirt while using breathing techniques to calm anxieties.
Oncology-Related Subjective and Objective Symptoms: Occupational Therapy Role

- Engagement in occupation as the focus of occupational therapy intervention involves addressing both the subjective (emotional and psychological) and objective (physically observable) aspects of performance. (AOTA, 2008, p. 628)

- Occupational performance is the accomplishment of the selected occupation resulting from the dynamic transaction among the client, the context and environment, and the activity. (AOTA, 2008, p. 650)
Oncology-Related Subjective and Objective Symptoms: Occupational Therapy Role

• A 31-year old father with a 1-year-old daughter was referred to occupational therapy 6 months postsurgery for radial sarcoma.

• He was having difficulty completing ADLs, but his doctor felt he should be healed and achieving full function.

• The occupational therapist discovered that client’s pain was 9 out of 10 on the visual analog scale which limited all occupations.

• The client was feeling stress and anxiety related to his arm because he thought he would never return to his job.

• He wasn’t able to sleep and suffered from depression.

• The occupational therapist addressed the subjective symptoms of his cancer so he could engage in occupations again.
Lesson 4: Oncology-Related Symptoms and Occupational Therapy’s Role

After completing this lesson, the learner will:

• Identify five symptoms common to many cancer diagnoses and treatments.
• Recognize the attributes for each one of the five symptoms.
• Identify assessments used in determining occupational therapy interventions for the five symptoms.
• Identify occupational therapy interventions that may improve occupational performance affected by the five symptoms.
Commonly Treated Oncology Symptoms

- Pain
- Chemotherapy-induced peripheral neuropathy (CIPN)
- Psychosocial challenges related to oncology
- Cancer-related fatigue (CRF)
- Chemobrain
Commonly Treated Oncology Symptoms: Example

- An 80-year-old man with advanced metastatic renal cell carcinoma had been on chemotherapy for 10 years.
- The client was experiencing the five symptoms: pain, CIPN, psychosocial challenges, CRF, and chemobrain.
- His participation in all meaningful occupations had been impeded.
- The occupational therapist adapted the client’s environment, habits, and routines.
- He served as a mentor to his grandsons in a sitting position, decreasing his depression and anxiety.
Cancer Pain

A nociceptive mosaic composed of acute pain, chronic pain, tumor-specific pain, and treatment-related pain that is cemented together by ongoing psychological responses of distress and suffering.

(Goudas et al., 2001)
Cancer Pain Prevalence

• Pain occurs in as many as 50% of patients undergoing treatment. (Yarbro, Wujcik, & Holmes Gobel, 2011)

• More than 70% of patients experience pain toward the end of life. (Yarbro et al., 2011)

• In one study, at least 40% of patients with cancer reported more than one pain site. (Davis & Walsh, 2004, as cited in Yarbro et al., 2011)
Assessment of Cancer Pain

Pain assessments fall into two categories:

1. Those that assess the client’s subjective experience with pain and limitations (e.g., the McGill Pain short form questionnaire [MPQ-SF; Melzack, 1987], Disability of the Arm, Shoulder, and Hand [DASH] Questionnaire [Solway, Beaton, McConnell, & Bombardier, 2002], Shoulder Pain and Disability Index [SPADI; Williams, 1995], and the Manual Ability Measure [MAM; Chen, 2011]).

2. Those that quantify physical signs during a physical examination and biomechanical changes during activity.
Physical Interventions for Pain

- Therapeutic exercise.
- Graded and purposeful activity.
- Postural reeducation.
- Massage and soft-tissue mobilization.
- Transcutaneous electrical nerve stimulation (TENS).
- Heat and cold.

(Bracciano, 2007)
Psychosocial and Other Interventions for Pain

- Distraction.
- Anxiety management.
- Lifestyle adjustment, such as task adaptation, goal setting, work simplification.
- Environmental adaptation, such as posture, seating, positioning, and pressure care.
- Educational approaches.
- Identifying triggers and pain awareness.
Chemotherapy-Induced Peripheral Neuropathy (CIPN)

- CIPN is peripheral neuron damage secondary to neurotoxic chemotherapy agents. (Postma & Heimans, 2000)
- Incidence of severe CIPN is estimated at 3%–7% in people treated with single agents and upward of 38% in those treated with multiple chemotherapeutic agents. (Cavaletti et al., 2003)
- The chemotherapeutic agents most often associated with CIPN are platinum compounds, taxanes, vinca alkaloids, thalidomide, and bortezomib. (Argyriou, Bruna, Marmiroli, & Cavaletti, 2011)
- Recovery takes anywhere from months to years. (Kautio, Haanpää, Kautiainen, Kalso, & Saarto, 2011)
CIPN Distribution

- Primarily polyneuropathic.
- Symmetric stocking-glove distribution.
- Earliest symptoms developing at the fingertips and toes.

(Stubblefield et al., 2009)
CIPN Sensory Symptoms

- Paresthesia, hyper- or hypothesia, or dysethesia.
- Pain.
- Numbness and tingling.
- Hyporeflexia or areflexia.
- Impaired proprioception.
- Diminished or absent vibratory and cutaneous sensation.
- Impaired sense of discrimination.

CIPN Motor Symptoms

- Weakness.
- Gait disturbance.
- Balance disturbance.
- Difficulty with fine motor skills: buttoning clothing, writing, typing.

(Stubblefield et al., 2009)
Occational Therapy's Role for CIPN

- Maintain current level of function.
- Prevent secondary deficits.
- Modify activity demands or environments and contexts.
- Provide interventions to improve performance skills and client factors.
- Establish performance patterns that improve the process of engaging in occupations.
Occupational Therapy Assessments for CIPN

- **Standard Sensory Testing** (Dellon, 1988)
  - Moving two-point discrimination or temperature awareness

- **Balance**
  - Berg Balance Test (Berg, Wood-Dauphinee, Williams, & Gayton, 1989)
  - Activities-Specific Balance Confidence Scale (Powell & Myers, 1995)

- **Outcome Measurements**
  - Moberg Pick-Up Test (Dellon, 1988)
  - DASH

- **Functional Timed Test**
  - Typing speed and error rate, etc.
CIPN Education

• Signs and symptoms of peripheral neuropathy.
• Compensation strategies for safety.
• Foot care and proper shoes.
• Risk of ischemic and thermal injuries.
• Manage symptoms of autonomic dysfunction.
• Falls prevention.

(Stubblefield et al., 2009)
CIPN Safety Education

Kitchen Safety

✓ Cut with adaptive equipment.
✓ Wear oven mitts or use potholders when handling hot objects or cooking.
✓ Use rubber gloves when washing dishes.
✓ Ensure that dish water is not too hot.
CIPN Safety Education

Additional Safety Tips

✓ Use gloves when gardening.
✓ Protect areas of the body where sensation is decreased.
✓ Wear thick socks and soft-soled shoes.
✓ Avoid or protect against extreme temperatures.
✓ Wear warm clothing in cold weather.
✓ Use care when bathing.
✓ Establish well-lit rooms without glare.
✓ Clear walkways and avoid the use of throw rugs.
✓ Create nonslip showers by installing tub mats, grab bars, or shower chairs.
CIPN Falls Prevention

• Balance.
• Lighting.
• Vision for compensation.
• Prevention: proactive vs. reactive.
• Progressive task training.

(Wampler et al., 2006)
Assistive Devices for CIPN

- Button hooks
- Zipper pulls
- Fingertip moisteners
- Finger thimbles
- Built-up handles
- Pencil grips
- Nonslip matting
- Jar openers
- Elastic laces
- Ambulatory devices
Strengthening for CIPN

• Exercise can be used as a preparatory method for participation in desired occupations.

• Exercise can increase the strength of involved and accessory muscles, improve coordination and sensory integration, maintain muscle and ligament length, and prevent deformity.

(Stubblefield et al., 2009)
Activity Pacing and Grading for CIPN

• Practice and simulate challenging occupations.
• Take breaks or grade time spent on an activity to assist with pain related to neuropathy.
• Use energy conservation techniques to manage muscle fatigue.

(Trombly, 2002)
Desensitization and Distraction for CIPN

• Desensitization programs or graded exposure to different surfaces during functional tasks often reduces anxiety. (Trombly, 2002)

• TENS, vibration, and movement during task provide relief for some clients, allowing improved occupational performance.
Psychosocial Challenges Related to Oncology

The awareness of mortality and resultant uncertainty can create tension in the lives of those with cancer. (Lyons, 2006, p. 3)

Sixty percent of cancer clients suffer psychological distress. (Zabora, BrintzenhofeSzoc, Curbow, Hooker, & Piantadosi, 2001)
Catalysts for Psychosocial Challenges

- Disruption in roles, routines, and habits.
- Altered social context. (Lyons, 2006)
- Loss of control.
- Occupational disturbance.
- Facing mortality and uncertainty. (Lyons, 2006)
- Decline in quality of life.

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Assessments for Psychosocial Challenges

Model of Human Occupation Screening Tool (MOHOST) (Parkinson, Forsyth, & Kielhofner, 2004)

Role Checklist (Oakley, Kielhofner, Barris, & Reichler, 1986)

Impact of Event Scale (Weiss & Marmar, 1996)

Quality of Life Measurements

Anxiety Management Assessment (Curt et al., 2000)
Therapeutic Use of Occupations for Psychosocial Challenges

- Demonstration of abilities.
- Recognition of assets.
- Understanding of continuing challenges. (AOTA, 2010)

Occupational engagements that allow:

- Fostering social relationships through occupation. (Lyons, 2006)
- Facing mortality through occupation. (Lyons, 2006)
- Renegotiating identity through occupation. (Lyons, 2006)
- Provision of occupations that assist with future goal setting. (AOTA, 2010)
Interventions for Psychosocial Challenges

- Adaptations to the physical and social environment to promote occupations. (AOTA, 2010)

- Counteract response to regain control:
  - Awareness.
  - Stress management.
  - Coping strategies.
  - Relaxation.
  - Guided imagery.
  - Breathing techniques.
  - Creating a personal plan for anxiety management.
  - Challenging negative thinking. (AOTA, 2010; Cooper, 2006a)

- Lifestyle management and redesign. (Cooper, 2006a)

- Cognitive behavioral techniques.
Cancer-Related Fatigue (CRF)

Cancer-related fatigue (CRF) can be defined as a:

*Distressing persistent, subjective sense of physical, emotional, and/or cognitive tiredness or exhaustion related to cancer or cancer treatment that is not proportional to recent activity and interferes with usual function.*

(National Comprehensive Cancer Network [NCCN], 2011, p. FT-1)
CRF Subcomponents

- General fatigue.
- Emotional fatigue.
- Physical fatigue.
- Mental fatigue.

(Hann et al., 1998)
CRF Multifactorial Etiology

Cancer-Related Fatigue

(Mustian et al., 2007)
Assessing CRF

The CRF experience is unique to each patient. (McColl, 2004)

No accurate objective report exists.

The most effective measure is self-report.

| Revised Piper Fatigue Scale (Piper, Lindsey, & Dodd, 1987) | Multidimensional Fatigue Inventory (Smets, Gaerssen, Bonke, & De Haes, 1995) | Fatigue Symptom Inventory (Hann et al., 1998) | Multidimensional Fatigue Symptom Inventory—Short Form (Stein, Jacobsen, Blanchard, & Thors, 2004) | Brief Fatigue Inventory (Mendoza et al., 1999) |
Management of CRF

- Pharmacological approaches.
- Complementary and alternative therapies.
- Exercise and graded activity.
- Psychosocial and educational approaches. (Kirshbaum, 2010)
- Lifestyle Redesign® (Mandel, Jackson, Zemke, Nelson, & Clark, 1999)
Occupational Therapy in the Management of CRF

Client-centered and holistic approach.

Interactive instead of didactic.
Occupational Therapy in the Management of CRF

Timing of intervention.

Restorative versus compensatory strategies.
CRF Exercise and Activity

Increase activity and independence level.

Exercise for muscle atrophy and decreased stamina.

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Intensity Pyramid Based on Fatigue Visual Analog Scale (VAS)

High Intensity
- Running
- Cycling
- Body building
- High-impact aerobics
- High-intensity IADLs

Moderate Intensity
- Swimming
- Climbing stairs
- Sweeping
- Vacuuming
- Fast-paced walking
- Preparing meals
- Gardening
- Walking the dog
- Taking a shower (standing)

Mild Intensity
- Walking (slow pace)
- Yoga
- Stretching
- Light Housekeeping
- Tai Chi

Low Intensity
- Light grooming seated at edge of bed
- Eating
- Education seated edge of bed
- Handwriting or typing
- Diaphragmatic breathing techniques
- Reading
- Standing

(Ainsworth et al., 2011; NCCN, 2011)
Psychosocial Interventions for CRF

- Decrease symptom distress.
- Increase adherence to treatment and the ability to manage symptoms.
- Increase the ability to marshal social support.
- Improve quality of life.

(Badger, 2008)
Five Ps of Energy Conservation

Energy conservation: the deliberate planned management of one’s personal energy resources in order to prevent their depletion.

(Barsevick, Whitmer, Sweeney, & Nail, 2002)

Five Ps of energy conservation:

- Planning and organizing.
- Prioritizing.
- Pacing.
- Positioning.
- Permission.

(Packer, Brink, & Sauriol, 1995)
Chemobrain

Cognitive disturbance, commonly labeled “chemobrain,” is common among cancer survivors. (Ahles & Saykin, 2002)

It is described by patients as a mental “fogginess” after receiving chemotherapy.

Symptoms include

- Memory lapses.
- Difficulty concentrating or staying focused.
- Difficulty performing more than one task at a time.
- Slower processing speed.
- Difficulty with word retrieval.

Symptoms may resolve 6 to 9 months after chemotherapy ends. (Ahles & Saykin, 2002)
Causes of Chemobrain

**Neurotoxicity from Chemotherapy**
- Approximately 17% to 34% of cancer survivors experience cognitive dysfunction as a result of systemic chemotherapy.
- Methotrexate and 5-fluorouracil have been shown to cause diffuse white-matter changes.

**Oxidative Damage**

**Immune Dysregulation**
- Increase in cytokines has been linked to cognitive decline.
- Stress activates inflammatory cytokines.

**Microemboli**

**Genetic predisposition**

(Ferguson et al., 2007)
Assessment for Chemobrain Dysfunction

Cognitive assessments for chemobrain may not quantify the impairment with traditional paper-and-pencil testing.

The use of top-down assessments may reproduce the cognitive breakdown because these assessments are performed in everyday environments.

The use of bottom-up assessments may also be of benefit to allow the occupational therapist to focus on a very specific area of dysfunction, such as attention or memory.
Chemobrain Dysfunction Assessments

<table>
<thead>
<tr>
<th>Top-Down Assessments</th>
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<tbody>
<tr>
<td>• Executive Function Performance Test (Baum et al., 2008)</td>
</tr>
<tr>
<td>• Multiple Errands Test (Shallice &amp; Burgess, 1991)</td>
</tr>
<tr>
<td>• Kettle Test (Hartman-Maier, Harel, &amp; Katz, 2009)</td>
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<table>
<thead>
<tr>
<th>Bottom-Up Assessments</th>
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<tbody>
<tr>
<td>• Test of Everyday Attention (Robertson, Ward, Ridgeway, &amp; Nimmo-Smith, 1994; Ward &amp; Ridgeway, 1994)</td>
</tr>
<tr>
<td>• Rivermead Behavioral Memory Test–Extended (3rd ed.) (Wilson et al., 2007)</td>
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<tr>
<th>Neurobehavioral Assessment</th>
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<tr>
<td>• ADL–ONE (A–ONE; Arnadottir, 1990)</td>
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</table>
Treatment for Effects of Chemobrain

Cognitive Compensatory Strategies:

• Social skills training.
• Self-instructional training.
• Reading material.
• Applied relaxation. (Ferguson et al., 2007, p. 292)

Cognitive Orientation to Daily Occupational Performance (CO–OP):

• Client-centered strategies.
• Client develops own strategies. (Polatajko, Mandich, & McEwen, 2011)
Treatment for Effects of Chemobrain

Cognitive Rehabilitation Strategies:

- Computer-based attention training.
- Remediation activities to improve deficit areas.
- Compensatory skills training based on the pattern of impairment.

(Gillen, 2009)
Five Oncology Symptoms: Occupational Therapy Role

- Pain
- Chemotherapy-induced peripheral neuropathy (CIPN)
- Psychosocial challenges related to oncology
- Cancer-related fatigue (CRF)
- Chemobrain
Occupational Therapy Across Cancer Rehabilitation Paradigms: A Case Study
Client-Centered Approach

- Occupational therapy uses a client-centered approach that synthesizes the occupational profile and analysis of occupational performance.
- The decision-making involved in establishing the client’s plan of care and goals includes all facets of a client’s life.
- The optimal approach should consider the subjective and objective nature of the client’s symptoms. (Clipp & George, 1992)
- Need to determine the underlying problems in terms of occupational therapy’s identified domains and impact on occupational performance.
- This approach facilitates a client-based treatment plan; “recipes” for managing the symptoms will not work. (Cooper, 2006b)
- Use client-driven assessments, along with objective measures, to allow for better therapist-client collaboration in establishing a treatment plan with achievable goals.
Case Study: Mary

- Mary was initially diagnosed with left breast cancer in 1997. She was treated with surgery and chemotherapy.

- Social history: At the time of diagnosis, Mary was living with her husband and two children and worked part-time as a secretary in an insurance office.

- In 2000 Mary was diagnosed with metastases to her left ribs. She did not require occupational therapy intervention at the time.

- In 2002 Mary was found to have an adrenal mass. She underwent exploratory laparotomy that led to a right hemicolectomy. After this procedure she developed leg weakness and numbness, and her left shoulder active range of motion and strength were noted to be limited. She was referred for outpatient occupational therapy and physical therapy services.
Goals of Restorative Rehabilitation Paradigm

Restore optimal physical, emotional, and social function and decrease impairments that have resulted from cancer diagnosis and treatment. Restorative goals may include:

• Exercises following surgery to improve range-of-motion.
• Purposeful, occupation-based activities to improve strength.
• Functional activities to improve endurance and aerobic capacity.
• Occupation-based activities to decrease pain.
• Improve participation in ADLs and IADLs for resumption of life roles.

(Dietz, 1981)
Mary's Outpatient Occupational Therapy Treatment Plan: Restorative Rehabilitation Paradigm

Client's Goals and Values

- To improve L arm function in order to complete home management tasks (laundry and meal preparation) and care for her children.
- To have more strength and energy in order to use her L arm for functional and work-related tasks (computer use, typing, filing charts).

Health and Well-Being of the Client

- Medically cleared to receive occupational therapy services.
- Followed closely by her oncologist and a physiatrist.

Performance Skills and Patterns Addressed

- Motor skills: Impaired posture, strength, range of motion, energy.
- Routines: Daily household tasks related to kitchen and laundry activities were addressed through modifying the activity demands of these activities as well as making related environmental modifications.
New Heart Condition

In 2007 Mary, who had been cancer free for 5 years, developed chest pain and had an emergency cardiac catheterization. With further workup, Mary was also found to have multiple metastatic lung nodules. Upon discharge from the hospital, Mary was referred for a home occupational therapy evaluation to assess her home environment and for a formal home safety evaluation because of her general weakness and deconditioning. Her condition affected her safety in completing ADLs and IADLs.
Goals of Supportive Rehabilitation Paradigm

1. Provide accommodation training for existing impairments.
2. Minimize debilitating changes.
3. Minimize further safety risks (e.g., prevent falls).
4. Ensure a strong caregiver education component.
5. Educate in safety awareness (e.g., cardiac precautions, peripheral neuropathy).

(Dietz, 1981)
Mary’s Home Occupational Therapy Treatment Plan: Supportive Rehabilitation Paradigm

Client’s Goals and Values
- To be able to access her home environment and complete routine chores, get in/out of tub/shower, and make simple meals for her family.

Performance Skills and Patterns Addressed
- **Routines**: Provide instruction on work simplification, energy conservation, and activity pacing related to daily chores and routines.
- **Motor skills**: Prevent poor posture and promote improved posture when sitting for prolonged periods of time by making recommendations for proper chair and table alignment with proper back support.

Environment and Activity Demand Modifications Addressed
- Modify home setup and bathroom equipment to support client functioning and independence with bathing.
- Modify home computer workstation to support performance skill abilities when checking work e-mails.
Recurrence

- In 2010 Mary was treated with chemotherapy on a biweekly basis for a 6-month period due to a recurrence of her breast cancer in her left breast. She did not require occupational therapy services.
- In January 2011, Mary was found to have a pathological fracture in her right hip and degenerative disease in her left hip as a result of a progression of her disease.
Mary’s Acute Care Occupational Therapy Treatment Plan: Supportive Rehabilitation Paradigm Continues

**Client’s Goals and Values**
- To be able to get into the bathroom to wash up at the sink.
- To tolerate sitting in a chair for the majority of the day.

**Performance Skills Addressed**
- *Motor skills*: Prevent poor posture and promote improved posture when sitting for prolonged periods of time by making adaptations to chair.

**Environment and Activity Demand Modifications Addressed**
- Modification of equipment and environment to improve completion of morning self-care routine.
- Simplification of task sequence from bed to chair to improve ease with transfers and adapt chair to improve sitting posture and tolerance.
Mary’s Inpatient (Acute) Occupational Therapy Treatment Plan: Supportive Rehabilitation Paradigm Continues

<table>
<thead>
<tr>
<th>Client’s Goals and Values</th>
<th>Performance Skills Addressed</th>
<th>Environment and Activity Demand Modifications Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>• To be able to get dressed independently every day.</td>
<td>• Motor skills: Increase or maintain the ability to dress upper and lower body with modified techniques and adaptive equipment as needed.</td>
<td>• Simplify task sequence for meal preparation and use energy conservation techniques for completion of simple breakfast or lunch meal preparation.</td>
</tr>
<tr>
<td>• To be able to make a simple meal for her family.</td>
<td>• Motor skills: Increase standing tolerance and posture with support in order to complete functional tasks.</td>
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</table>
Goals of Palliative Rehabilitation Paradigm

- Provide opportunities to optimize best quality of life for client and family.
- Create optimal balance between function and comfort.
- Provide client-centered care: Focus on client-centered goals and what is meaningful to the client.
Mary’s Goals During the Palliative Rehabilitation Paradigm

- To spend time with children and husband.
- To be able to get out of bed and sit in a chair comfortably.
- To write letters to friends and family members.
Conclusion

- To maintain a client-centered approach across cancer rehabilitation paradigms, must consider the stage of the cancer.

- As well as the client’s goals and the performance skills and patterns necessary to address impairments.

- Cancer rehabilitation paradigms are dynamic.

- Mary moved through the different paradigms as her cancer diagnosis evolved.

- Clients with cancer can receive occupational therapy across multiple cancer rehabilitation paradigms. (Dietz, 1981)

When you are ready to take the exam for the course, go to http://learn.aota.org/ to access the exam.