The Role of Rehabilitation in a Comprehensive Cancer Center

Michael D. Stubblefield, M.D.
Memorial Sloan-Kettering Cancer Center
Assistant Attending, Rehabilitation Medicine Service
Assistant Professor of Rehabilitation Medicine, Weill Cornell Medical College

American Board of Physical Medicine & Rehabilitation
American Board of Electrodiagnostic Medicine
American Board of Internal Medicine
Cancer Rehabilitation
Learning Objectives

• Define the role of the Rehabilitation Medicine Specialist in the evaluation and treatment of cancer patients and survivors at a Comprehensive Cancer Center.

• Understand the basic principles and practice of safe and effective Cancer Rehabilitation.

• Discuss the select disorders that benefit from Comprehensive Rehabilitative Care.
Cancer Rehabilitation
Job Description

A specialist in the identification, evaluation, and rehabilitation of neuromuscular, musculoskeletal, and functional disorders associated with cancer and it’s treatment emphasizing the restoration and maintenance of function and quality of life.
Cancer Rehabilitation
Contemporary Perspective

• 11 million persons in the United States who are living with a previously diagnosed cancer in 2008 (compared with 3 million in 1971).\textsuperscript{1,2}

• There are less than 3 hundred thousand survivors of spinal cord injury.\textsuperscript{3}

• Approximately 65% of persons diagnosed with cancer today can expect to live at least 5 years after diagnosis compared with only 35% in the 1950’s.\textsuperscript{4}

• Patients are increasingly described as “cancer survivors” as opposed to “cancer victims”.\textsuperscript{2}

Cancer Rehabilitation
Survivorship

Surveillance, Epidemiology, and End Results Program of the National Cancer Institute (http://seer.cancer.gov)
Cancer Rehabilitation
Treatment Objectives

• Preventive – to improve function and reduce morbidity and disability

• Restorative – for patients with potential cure of cancer whose residual disability can be appropriately controlled, circumvented, or eliminated

• Supportive – for patients who must continue with cancer but can expect relative control or remission of appreciable time, and whose disability, handicap, emotional stress, or discomfort can be lessened by rehabilitative care

• Palliative – for patients whose disease is advanced and relentlessly progressive, but whose disability, discomfort, and stress can be mitigated by rehabilitation

Cancer Rehabilitation
Success Requires and Understanding of:

- Cancer
- Cancer treatment
  - Surgery
  - Chemotherapy
  - Radiation Therapy
- Pre-existing disorders
- The interrelationship between all of the above
Cancer Rehabilitation
Phases of Cancer

Diagnosis

Treatment
• Surgery
• Chemotherapy
• Radiation Therapy

Cure & Survivorship
Recurrence
Cancer Rehabilitation
“The Dirty Little Secret”

The principles and practice of cancer rehabilitation are generally similar to those of general rehabilitation...
Practice of Cancer Rehabilitation
Cancer Rehabilitation
The Core Rehabilitation Team

• Rehabilitation Medicine (a.k.a PM&R, Physiatry)
• Physical Therapy
• Occupational Therapy
• Lymphedema Therapy
• Recreational Therapy
• Speech & Language Pathology
• Prosthetics & Orthotics
Cancer Rehabilitation
The Medical Team

- Medical Oncology
- Surgical Oncology
- Radiation Oncology
- Anesthesia Pain
- Pain & Palliative Care
- Rehabilitation Medicine
- Psychiatry

- Primary Care
- Internal Medicine
  - Cardiology
  - Endocrinology
  - Gerontology
  - Nephrology
  - Pulmonology
  - Rheumatology
Cancer Rehabilitation
The Support Team

- Chaplaincy
- Nursing
- Nutrition
- Psychology
- Social Work
- Vocational Councilors
Cancer Rehabilitation

WHO Analgesic Ladder

Upper Extremity Pain in Breast Cancer:
Upper Extremity Pain Cycle

- C-5 or C-6 Radiculopathy
- Upper Trunk Brachial Plexopathy
- Shoulder Pain
- Rotator Cuff Weakness
- Decreased Shoulder Movement
- RTC Tendonitis
- Adhesive Capsulitis

Surgery
Chemotherapy
Radiotherapy
Old Age
Recurrence

Cancer Rehabilitation
Select Neuromuscular and Musculoskeletal Disorders

- Neuromuscular
  - Cerebropathy
  - Myelopathy
  - Radiculopathy
  - Plexopathy
  - Neuropathy
    - Polyneuropathy
    - Mononeuropathy
    - Mononeuropathy Multiplex
    - Ganglionopathy
    - Small Fiber
  - Myopathy
  - Disorders NMT
    - Myasthenia Gravis
    - LEMS

- Musculoskeletal
  - Rotator Cuff Tendinitis
  - Adhesive Capsulitis
  - Epicondylitis
  - De Quervain's Tenosynovitis
  - Spondylosis
  - Spinal Instability
  - Fracture/Impending Fracture
  - Arthritis
  - Enthesopathy
  - Osteoporosis
Cancer Rehabilitation
Other Select Disorders

• Lymphedema
• Fatigue
• Myalgia
• Fibromyalgia
• Cardiac insufficiency
• Pulmonary insufficiency
• Bowel and bladder dysfunction
• Autonomic dysfunction
Radiation Fibrosis Syndrome
Radiation Fibrosis Syndrome

Vascular and Tissue Sclerosis

Radiation Fibrosis Syndrome

Neuromuscular and Musculoskeletal Complications

- Skeletal growth arrest
- Scoliosis
- Osteoporosis
- Osteoradionecrosis
- Dysphagia
- Dysarthria
- Cerebropathy
  - Cerebral necrosis
  - Leukoencephalopathy
  - Neuropsychologic dysfunction
- Myelopathy
- Radiculopathy
- Plexopathy
- Mononeuropathy
- Myopathy
- Shoulder dysfunction
  - Rotator cuff tendonitis
  - Adhesive capsulitis
Radiation Fibrosis Syndrome
Selected Common Clinical Sequelae

- Myelo-radiculo-plexo-neuro-myopathy
- Cervical dystonia
- Trigeminal/cervical plexus neuralgia
- Trismus
- RTC tendonitis/Adhesive capsulitis
Radiation Fibrosis Syndrome
Malignancies Commonly Complicated by RFS

- Hodgkin’s Lymphoma
- Head and Neck Cancer
- Extremity Sarcomas
- Breast Cancer
- Spinal Metastases
Radiation Fibrosis Syndrome
Radiation Fields for Hodgkin’s Lymphoma

Radiation Fibrosis Syndrome
Myelo-radiculo-plexo-neuro-myopathy from Mantle Field Radiation for Hodgkin’s Lymphoma
Radiation Fibrosis Syndrome
Myelopathy

• Subacute myelopathy is estimated to occur in as many as 15% of patients treated with MF irradiation for HD.¹

• Clinical manifestations include:
  – Spasticity
  – Paraplegia / Quadriplegia
  – Spinal ataxia
  – Funicular pain
  – Detrusor sphincter dyssynergia (DSD)
  – Dystonia

Radiation Fibrosis Syndrome
Radiculopathy

• Incidence?

• Clinical manifestations include:
  – Mono or poly-dermatomal pain or sensory deficits
  – Mono or poly-myotomal weakness, cramping, or spasm
  – Dystonia, myokymia
  – Often keeps company with other PNS deficits
  – Upper cervical (C-5, C-6) nerve roots commonly and severely affected
Radiation Fibrosis Syndrome
Plexopathy

• Incidence up to 1% of Cancer Patients

• Clinical manifestations include:
  – Pain or sensory deficits in distribution of affected plexus structure
  – Weakness, cramping, or spasm in distribution of affected plexus structure
  – Dystonia, myokymia
  – Often keeps company with other PNS deficits
  – Upper brachial plexus most commonly and severely affected
Radiation Fibrosis Syndrome
Causes of Plexopathy in Cancer

Patient with Breast Cancer
MRI T1 Post Contrast

Patient with H&N Cancer
MRI T1 Post Contrast

Radiation Fibrosis Syndrome
Neuropathy

• Incidence ?

• Clinical manifestations include:
  – Mono or poly-neuronal pain or sensory deficits
  – Mono or poly-neuronal weakness, cramping, or spasm
  – Dystonia, myokymia
  – Often keeps company with other PNS deficits
  – Only affects nerves that are in or traverse the radiation field
Radiation Fibrosis Syndrome
Myopathy

• Incidence?

• Clinical manifestations include:
  – Pain, weakness, cramping, or spasm
  – Dystonia, myokymia
  – Often keeps company with other PNS deficits
Radiation Fibrosis Syndrome

Nemaline Rod Myopathy


Treatment of RFS
# Radiation Fibrosis Syndrome

Commonly Seen Disorders in Hodgkin’s Survivors

<table>
<thead>
<tr>
<th>Pain</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neck</td>
<td>Dropped head syndrome</td>
</tr>
<tr>
<td>Axial spine</td>
<td>Paraplegia / quadriplegia</td>
</tr>
<tr>
<td>Extremity</td>
<td>Extremity weakness</td>
</tr>
<tr>
<td>Myofascial</td>
<td>Spasticity</td>
</tr>
<tr>
<td>Shoulder</td>
<td>Impaired ADL’s</td>
</tr>
<tr>
<td>TMJ</td>
<td>Impaired gait</td>
</tr>
<tr>
<td></td>
<td>Impaired cardiac function</td>
</tr>
<tr>
<td></td>
<td>Impaired pulmonary function</td>
</tr>
<tr>
<td></td>
<td>Impaired bowel and bladder function</td>
</tr>
</tbody>
</table>
Dropped Head Syndrome
Radiation Fibrosis Syndrome
Treatment of Radiation-induced Dropped Head Syndrome

- Physical Therapy
- Nerve Stabilizing Agents
  - Pregabalin/Gabapentin
  - Duloxetine
- Analgesics
- Orthotics
Radiation Fibrosis Syndrome
Head Master Cervical Collar

Thank You