What is Oncology Rehab?
(And Yes, You Can Do This!)

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Who is Considered a Cancer Survivor?

“Anyone who has been diagnosed with cancer from the time of diagnosis through the balance of his or her life”

Emily S. Tonorezos, MD, MPH
Director of the Office of Cancer Survivorship, Division of Cancer Control and Population Sciences at the National Cancer Institute (NCI)

https://cancer.ucsf.edu/support/survivorship/sm_files/SurvivorshipWellness_wheel.png
Cancer Survivor Population Continues to Grow

- 2016: 15.5 million
- 2026: 20.3 million
- 2040: 26.1 million
# Cancer by the Numbers – 2020

## Estimated New Cases

<table>
<thead>
<tr>
<th>Location</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostate</td>
<td>191,930</td>
<td>21%</td>
</tr>
<tr>
<td>Lung &amp; bronchus</td>
<td>116,300</td>
<td>13%</td>
</tr>
<tr>
<td>Colon &amp; rectum</td>
<td>76,300</td>
<td>9%</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>62,100</td>
<td>7%</td>
</tr>
<tr>
<td>Melanoma of the skin</td>
<td>60,100</td>
<td>7%</td>
</tr>
<tr>
<td>Kidney &amp; renal pelvis</td>
<td>46,520</td>
<td>5%</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>42,380</td>
<td>6%</td>
</tr>
<tr>
<td>Oral cavity &amp; pharynx</td>
<td>38,380</td>
<td>4%</td>
</tr>
<tr>
<td>Leukemia</td>
<td>35,470</td>
<td>4%</td>
</tr>
<tr>
<td>Pancreas</td>
<td>30,400</td>
<td>3%</td>
</tr>
<tr>
<td><strong>All Sites</strong></td>
<td><strong>893,660</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

## Estimated Deaths

<table>
<thead>
<tr>
<th>Location</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung &amp; bronchus</td>
<td>72,500</td>
<td>23%</td>
</tr>
<tr>
<td>Prostate</td>
<td>33,330</td>
<td>10%</td>
</tr>
<tr>
<td>Colon &amp; rectum</td>
<td>28,620</td>
<td>9%</td>
</tr>
<tr>
<td>Pancreas</td>
<td>24,640</td>
<td>8%</td>
</tr>
<tr>
<td>Liver &amp; intrahepatic bile duct</td>
<td>20,020</td>
<td>6%</td>
</tr>
<tr>
<td>Leukemia</td>
<td>13,420</td>
<td>4%</td>
</tr>
<tr>
<td>Esophagus</td>
<td>13,100</td>
<td>4%</td>
</tr>
<tr>
<td>Urinary bladder</td>
<td>13,080</td>
<td>4%</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>11,460</td>
<td>4%</td>
</tr>
<tr>
<td>Brain &amp; other nervous system</td>
<td>10,190</td>
<td>3%</td>
</tr>
<tr>
<td><strong>All Sites</strong></td>
<td><strong>321,160</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

## FIGURE 1
Ten Leading Cancer Types for the Estimated New Cancer Cases and Deaths by Sex, United States, 2020. Estimates are rounded to the nearest 10 and exclude basal cell and squamous cell skin cancers and in situ carcinoma except urinary bladder. Ranking is based on modeled projections and may differ from the most recent observed data.
Chemotherapy

• Systemic administration for wide control
• Intermittent dosing allows for bone marrow recovery
• >50 agents w/ differing mechanisms/side effects
• Combine agents for greatest effect
  – Impact metabolism of cells
  – Impact the RNA
  – Impact the ability of the cell to produce energy
  – Impact blood flow to the tumor
Chemotherapy Side Effects

- Fatigue
- Neuropathy
- Cardiac
  - cardiac muscle destruction $\rightarrow$ O2/nutrient delivery
- Pulmonary
  - lung capacity $\rightarrow$ submax/max exercise O2 consumption
- Muscular
  - Muscle wasting $\rightarrow$ weakness
- Myelosuppression
  - Neupogen/Neulasta support $\rightarrow$ Bone pain
Chemotherapy Side Effects

- Cisplatin/Carboplatin → acoustic nerve damage (and nephrotoxicity)
- Vincristine → peripheral neuropathy
- Bleomycin, Busulfan → pulmonary fibrosis
- Doxorubicin → cardiotoxicity
- Trastuzumab → cardiotoxicity
- Cisplatin/Carboplatin → nephrotoxic (and acoustic nerve damage)
- CYclophosphamide → hemorrhagic cystitis
- 5-FU → myelosuppression
- 6-MP → myelosuppression
- Methotrexate → myelosuppression
Radiation Therapy

• Destroys local cancer cells by inhibiting cell growth and division
• Neo adjuvant -- to shrink tumors
• Adjuvant
  – to kill remaining cells at primary site to prevent recurrent disease
  – Importance of surgical margins
  – Prevent residual cancer cells from metastasizing
• Palliative
  – shrinks metastatic lesions
  – Preserve bone integrity
  – Pain management
  – Prevention/alleviation of nerve entrapment
Radiation Therapy

• External Beam
  – Simulation: Positioning and Tattooing

• Image guided radiation therapy (IGRT)
  – Delivered in tangential fragmented beams
  – Full daily dosage is broken down and delivered in tangents with full dose culminating at the site of the tumor
  – 5-10 minutes
  – Daily over 4-6 weeks

• Can also do Bradytherapy (radioactive seeds implanted in tumor)
Radiation Fibrosis

- Occurs in the radiated zone
- Normal tissue is replaced over time by disorganized, sclerotic collagen → chronic, progressive tissue scarring
- Absent, mild, moderate, severe
- Painful → chronic pain
- Inflammation/scarring → lymphatic stagnation → lymphedema
- Risk for any patient w/ hx of radiation
Radiation Fibrosis Syndrome
Why PT in the Oncology Setting

**Chemotherapy**
- Early Menopause
- Sexual dysfunction and vaginal dryness
- Heart dysfunction
- Numbness/tingling/pain in extremities
- Bone marrow changes
- Leukemia
- Cognitive issues
- Bone Loss

**Radiation**
- Lymphedema
- Radiation fibrosis / scar tissue buildup
- Cardiac risks
- Secondary cancers

**Surgery**
- Post-surgical pain syndrome
- Restricted ROM
- Lymphedema
- Cosmetic Defects

**Fatigue**
- Pain
- Fear of Cancer Recurrence
- Balance Concerns
- Weight Changes
- Scar tissue/GVHD-ROM
- Deconditioning and Debilitation
- Pelvic Health Concerns
- Insomnia
Oncology Rehab through the Cancer Continuum

- Preventative (Prehab)
- Supportive (During Tx)
- Restorative (post-tx, Survivorship)
- Palliative
Preventative/Prehabilitation

• The goal of Physical Therapy: Increase functional capacity by ramping up physical activity prior to surgery/chemo/radiation therapy

• Benefits
  – Preoperative Optimization
  – Increase tolerance to treatment
  – Enhancement of treatment efficacy
  – Decreased Hospital length of stay
  – Potentially decreases rate of mortality
  – *Patient empowerment*
Restorative/During Active Tx

- Maximum recovery of function and ability – little to no residual dysfunction
- Assessing
  - Mobility
  - Pain management
  - Strength
  - Flexibility
  - Balance
  - HEP
  - Lymphedema
Restorative/Short & Long Term Survivorship

- Increase self care and mobility, prevention of functional loss, management of late and long-term side effects

- Screening/assessing for
  - CV disease risk
  - Fatigue
  - Hormone related symptoms
  - Pain
  - Sexual Dysfunction
  - Cognitive function
  - Anxiety, Depression
  - Return to work/leisure activities $\rightarrow$ QOL
In the Turbulent Sea that is the Cancer Experience...Be Someone’s Anchor
How To Engage Patients (and Clinicians)

• Start with 1 patient
  – Never forget the power of the patient voice
• Start with one email
  – ‘Thank for your referral’ goes a long way
• Start with one in-service
  – Educate fellow rehab staff + oncology providers
Spell Out How To Place a Referral
Measurements from the EDGE Task Force

• Fatigue
  – Brief Fatigue Inventory – 4
    • Score of 4-6 = moderate fatigue
    • Score of >7 = significant fatigue

• Functional Mobility
  – 6MWT – 4
  – Timed Up and Go – 4

• Strength
  – Hand Grip Dynamometer – 3
    • Normative values by age

• Balance
  – Fullerton Advanced Balance (FAB) Scale – 3
    • Cut-off for risk of falls: <25/40
  – Timed Up and Go – 3
    • Cut-off for risk of falls: >13.5 seconds
Measurements from the EDGE Task Force

• CIPN
  – Functional Assessment of Cancer Therapy, Gynecologic Oncology Group- Neurotoxicity Scale (FACT/GOG- Ntx) – 4

• Lymphedema (QOL + Functional outcome)
  – Functional Assessment of Cancer Therapy – Breast (FACT-B) – 4
  – Disability of Arm Shoulder and Hand (DASH) – 4

• Pain
  – Visual Analog Scale – 4
  – Numeric Rating Scale – 4
Furthering Oncology Rehab

- APTA – Academy of Oncologic Physical Therapy
  - EDGE Task Force
  - Oncology Residencies
  - Board Certification in Oncology
  - Mentor List/mentor-mentee pairing program (…)
- APTA CT – Oncology Special Interest Group (SIG)
- American Society of Clinical Oncology + National Cancer Coalition Network
- American College of Surgeon’s Commission on Cancer (CoC)
  - Rehabilitation Care Services (4.6)
  - Survivorship Guidelines (4.8)

Oncology Rehab on SM

• Twitter
  – Nicole Stout: @NicoleStoutPT
  – Kathryn Schmitz: @fitaftercancer
  – David Mizrahi: @davemiz_EP
  – Dan Steventon (peds): @TheKidsCancerPT

• Instagram
  – Kelly Reed (lymphedema): @CancerRehabPT
  – Alexandra (Alex) Hill (pelvic health): @oncopelvicpt
  – Brianna DeWitt (PT/breast cancer survivor): @bri.d.pt

• Podcasts
  – TheOncoPT (@theoncopt)
  – PTPintCast (@PTPintCast)
Case Study

- Emily
- Mother of 2 boys 18 and 21
- Divorced, currently with supportive boyfriend
- Works as special education paraprofessional in elementary school
- Irregular findings on mammogram → B breast US
Case Study

• Dx’d w/ stage IIB (pT2N1a G3) ER 95%, PR -, HER2 - RIGHT breast IDC

• Bilateral skin sparing mastectomy, R sentinel lymph node dissection $\rightarrow$ R axillary dissection (1/18 LN), and bilateral breast reconstruction with tissue expanders

• Adjuvant AC-T
  – Developed Cording $\rightarrow$ PT IE after C1 AC
    • R UE Shoulder Flexion = 130d, Abduction = 95d
    • QuickDash = 56

• Adjuvant XRT 50Gy in 25 fractions to right CW/SCV
Case Study

• Manual therapy to break up cording
• Scheduled PT around chemo cycles
• Initiated balance training/sensory strategies prior to Taxol
• Continue to progress R UE AROM and strength prior to and during radiation therapy
• Continually update and enforce HEP/walking
• Caught early signs of lymphedema → seen by PT CLT → fitted with sleeve
• D/C’d to continue w/ HEP
  – R UE Shoulder Flexion = 170d, Abduction = 155d
  – QuickDash = 20
The Intangibles of Oncology Rehab

- Educate
- Validate
Questions?

Thank You