Consequences of Cancer Treatment

Nancy Houlihan, RN, MA, AOCN®
Clinical Program Manager
Cancer Survivorship
Program Goal

• To increase knowledge of nurses caring for patients completing cancer therapies and cancer survivors about managing consequences of a cancer diagnosis and treatment
Overview and Objectives

- Describe the potential long term impact of cancer treatment
- Discuss management strategies to address long term and late physical, psychological and spiritual effects of cancer and treatment
What we know about treatment consequences

- Potential wide range of effects
- Described largely in convenience samples
- Limited information about incidence and prevalence
- Few research-based guidelines for assessment, prevention and management
Survivors’ Needs

LIVESTRONG™ Poll

- Secondary Health Problems
  - 53% - secondary health problems
    - 54% - deal with chronic pain
    - 33% - infertility
- Non-Medical Support
  - 49% - non-medical cancer needs were unmet
  - 53% - practical and emotional consequences of cancer are often harder than medical issues
- Emotional Support
  - 70% - dealt with depression
  - 78% - did not seek professional services
- Relationships
  - 58% - dealt with loss of sexual desire and/or sexual function
Survivors’ Needs

LIVESTRONG™ Poll

• Financial Problems
  – 43% - decreased income as a result of cancer
  – 25% - in debt as a result of treatment
  – 12% - turned down a treatment option because of cost

• Job Issues
  – 32% - lack of advancement, demotion or job loss
  – 34% - trapped in job to preserve insurance coverage
Survivorship
Domains of Concern

- Physical/medical
- Psychological
- Social
- Existential and spiritual
Quality of Life Model Applied to Cancer Survivors

**Physical Well Being**
- Functional Activities
- Strength/Fatigue
- Sleep and Rest
- Overall Physical Health
- Fertility
- Pain

**Social Well Being**
- Family Distress
- Roles and Relationships
- Affection/Sexual Function
- Appearance
- Enjoyment
- Isolation
- Finances
- Work

**Psychological Well Being**
- Control
- Anxiety
- Depression
- Enjoyment/Leisure
- Fear of Recurrence
- Cognition/Attention
- Distress of Diagnosis and Control of Treatment

**Spiritual Well Being**
- Meaning of Illness
- Religiosity
- Transcendence
- Hope
- Uncertainty
- Inner Strength

Ferrell, BR and Grant, M.
City of Hope Beckman Research Institute (2004)
Possible Consequences of Cancer and Treatment

- Related to the disease
- Dependent on treatment modalities
  - Surgery
  - Chemotherapy
  - Radiation Therapy
  - Immunotherapy/biotherapy
- Physiological or medical
  - Long-term effects
  - Late effects
- Psychosocial and Spiritual
Clinical Assessment of Effects

- Clinically Obvious Effects
  - Visible, and/or have direct effects on function
  - Functional disturbances that interfere with activities of daily living

- Clinically Subtle Effects
  - Apparent only to the trained observer

- Subclinical effects
  - Detectable only by laboratory screening or radiographic imaging techniques
Long-term Effects

- Any side effects or complications of treatment for which a patient must compensate
- Also known as persistent effects
- Begin during treatment and continue beyond the end of treatment
- Fatigue, pain, weight gain, early menopause, anxiety

Late Effects

Unrecognized toxicities:

- Absent or subclinical at the end of therapy
- Manifest months to years after treatment related to any of the following:
  - Developmental processes
  - Failure of compensatory mechanisms
  - Organ senescence
- Influencing factors

Causes of Late Effects

- Lack of nourishment to healthy cells
- Chronic cell injury
- Death of cells
  - Subsequent loss of normal tissue
- Scar tissue formation
Factors Influencing Late Effects

• Age
• Pre-existing co-morbidities
  – Physiological
  – Psychological
• Developmental stages
  – Survivor
  – Family
Expression of Late Effects

• Children
  – Rapidly dividing cells
    • Cell turnover
  – Interference with normal growth and development

• Adults
  – Loss of normal cells
    • Loss of homeostatic reserve
  – Pre-existing diseases
  – Environmental exposures
  – Modifiable risk factors
Expression of Late Effects

- Premature development of a normal age-related change
- Atypical presentation of a common problem
- Increased risk of developing certain common diseases
- Increased risk of developing rare diseases
- Poor response to treatment that is usually effective
Medical Late Effects

- Cardiovascular
- Pulmonary
- Endocrine
- Central Nervous System (CNS)
- Neurocognitive
- Neurological

- Renal
- Genitourinary
- Gastrointestinal
- Musculoskeletal
- Integumentary
- Lymphatic

## Review the Evidence:
### Prominent Issues by Cancer and Domain

<table>
<thead>
<tr>
<th>Cancer</th>
<th>Physical Sequelae</th>
<th>Psychosocial Sequelae</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>Menopausal symptoms, Osteoporosis, Lymphedema, Weight gain, Cognitive loss</td>
<td>Anxiety, Sexuality, Body image</td>
</tr>
<tr>
<td>Colon and rectal</td>
<td>Colostomy, Anal incontinence, Radiation proctitis, Sexual dysfunction</td>
<td>2nd to physical sequelae</td>
</tr>
<tr>
<td>Prostate</td>
<td>Sexual dysfunction, Urinary incontinence, Radiation proctitis</td>
<td>Anxiety, Depression, Others 2nd to physiologic alterations</td>
</tr>
<tr>
<td>Lung</td>
<td>Reduced lung function, Renal impairment, Neuropathy, Pain, Cognitive loss</td>
<td>Dependence on others due to dyspnea and cognitive loss, Anxiety, fear of recurrence</td>
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<td>Hodgkin’s Disease</td>
<td>Fatigue, Hypothyroidism</td>
<td>Marital difficulties</td>
</tr>
<tr>
<td></td>
<td>Heart failure</td>
<td>Sexual problems</td>
</tr>
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<td></td>
<td>Reduced lung function</td>
<td></td>
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<td>Infertility, Weight gain</td>
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<tr>
<td></td>
<td>Sexual dysfunction</td>
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<td>Leukemias, NHL</td>
<td>Fatigue</td>
<td>Marital difficulties</td>
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<td></td>
<td>Heart failure</td>
<td>Sexual and Vocational problems</td>
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<td></td>
<td>Hepatitis</td>
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<td>Infertility, Sexual dysfunction</td>
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<td>GYN cancers</td>
<td>Menopausal symptoms</td>
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<td></td>
<td>Urinary frequency</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vaginal stenosis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neuropathy</td>
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Kattlove & Winn *CA Cancer J Clin* 2003; 54:172-196
## Physical Late Effects of Cancer Treatment: Chemotherapy

<table>
<thead>
<tr>
<th>Organ/System</th>
<th>Drug</th>
<th>Late Effect</th>
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<tbody>
<tr>
<td>Bone</td>
<td>Steroids</td>
<td>Avascular necrosis</td>
</tr>
<tr>
<td>Cardiopulmonary</td>
<td>Anthracyclines</td>
<td>Cardiomyopathy, CHF</td>
</tr>
<tr>
<td></td>
<td>HD Cyclophosphamide</td>
<td>CHF</td>
</tr>
<tr>
<td></td>
<td>Bleomycin</td>
<td>Pulmonary fibrosis</td>
</tr>
<tr>
<td></td>
<td>Methotrexate</td>
<td>Interstitial pneumonitis</td>
</tr>
<tr>
<td></td>
<td>BCNU</td>
<td>Pulmonary fibrosis</td>
</tr>
<tr>
<td></td>
<td>Actinomycin/doxorub</td>
<td>Radiation recall</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>Steroids</td>
<td>Cataracts</td>
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<tr>
<td>Neurologic</td>
<td>Methotrexate</td>
<td>Structural/ neuropsych changes</td>
</tr>
<tr>
<td></td>
<td>Cisplatin</td>
<td>Peripheral neuropathy, hearing</td>
</tr>
<tr>
<td></td>
<td>Vinca alkaloids</td>
<td>Peripheral neuropathy</td>
</tr>
<tr>
<td>Hematologic</td>
<td>Alkylating agents</td>
<td>MDS</td>
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<tr>
<td>GI</td>
<td>Methotrexate</td>
<td>↓ liver fx, hepatic fibrosis, ↓ liver fx; hepatic failure cirrhosis</td>
</tr>
<tr>
<td></td>
<td>BCNU</td>
<td></td>
</tr>
<tr>
<td>Gonadal</td>
<td>Alkylating agents</td>
<td>Men: sterility</td>
</tr>
<tr>
<td></td>
<td>Procarbazine</td>
<td>Women: sterility; premature menopause</td>
</tr>
<tr>
<td>GU/Renal</td>
<td>Cyclophosphamide</td>
<td>Hemorrhagic cystitis; fibrosis</td>
</tr>
<tr>
<td></td>
<td>Cisplatin</td>
<td>↓ Creatinine clearance; Mg waste</td>
</tr>
<tr>
<td></td>
<td>Methotrexate</td>
<td>↑ Creatinine; renal failure</td>
</tr>
<tr>
<td></td>
<td>Nitrosureas</td>
<td>Delayed onset fibrosis</td>
</tr>
</tbody>
</table>

Physical Late Effects of Treatment: Radiation Therapy

- All tissue: Second cancers
- Bone and soft tissue: Atrophy, deformity, fibrosis
- Cardiovascular: Scarring or inflammation of the heart, coronary artery disease; scarring of the pericardium
- Dental/oral health: Dental caries, dry mouth
- Endocrine-pituitary: Various hormone deficiencies

Physical Late Effects of Treatment: Radiation Therapy

- Endocrine-thyroid: Low thyroid function, thyroid nodule
- Gastrointestinal: Malabsorption, intestinal stricture
- Genitourinary: Bladder scarring, small bladder
- Hematology: Low blood counts, preleukemic syndromes
- Hepatic - Abnormal liver function, liver failure
- Immune system: Impaired immune function, immune suppression
- Lymphatic: Lymphedema

## Physical Late Effects of Treatment: Surgery

<table>
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<tr>
<th>Procedure</th>
<th>Late Effects</th>
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<tbody>
<tr>
<td>Amputation</td>
<td>Functional changes, deformity, psychosocial impact</td>
</tr>
<tr>
<td>Abdominal surgery</td>
<td>Risk of intestinal obstruction, adhesions</td>
</tr>
<tr>
<td>Lymphadenectomy</td>
<td>Lymphedema</td>
</tr>
<tr>
<td>Splenectomy</td>
<td>Impaired immune function, ↑ risk of sepsis</td>
</tr>
<tr>
<td>Pelvic surgery</td>
<td>Impotence, incontinence</td>
</tr>
</tbody>
</table>
Second Malignancies
Predisposing Factors

- Genetic Conditions
  - Genetic retinoblastoma, neurofibromatosis, Li-Fraumeni Syndrome
  - BRCA-1, BRCA-2

- Treatment
  - Radiation
  - Site-specific cancers
    - Sarcoma
    - Rectal CA with prostate radiation
    - Breast cancer with chest radiation age <30yo (15 year latency)
  - Chemotherapy
    - Alkylating agents
    - Epipodophyllotoxins (etoposide ®, teniposide ®)

Psychosocial Sequelae

- Psychological
  - Transition from “Sick Role” to “Well Role”
  - Uncertainty about future; fear of recurrence
  - Diminished Sense of Control and Predictability
  - Social Isolation/Loneliness
  - Coping with Stigma
  - Anxiety/depression/PTSD

- Social
  - Changes in relationships
  - Economics
  - Career
  - Insurability

- Spiritual
Personal Growth/Positive Change

“The truth is that cancer was the best thing that ever happened to me. I don’t know why I got the illness, but it did wonders for me and I wouldn’t walk away from it. Why would I want to change, even for a day, the most important and shaping event in my life?”

Lance Armstrong (2000)
It’s Not About the Bike
Guidelines for Follow up Care

• American Society of Clinical Oncology (ASCO)

• National Comprehensive Cancer Network (NCCN)

• Children’s Oncology Group (COG)
Caring for Cancer Survivors: Managing Late Effects of Cancer Treatment

- Cardiac Effects
  Richard Steingart, MD
- Pulmonary Effects
  Marc Feinstein, MD
- Cognitive changes
  Timothy Ahles, PhD
- Osteoporosis
  Azeez Farooki, MD
- Thyroid insufficiency, hormonal changes
  Monica Girotra, MD
- Psychosocial and Spiritual Effects
  Penny Damaskos, MSW
- Reducing Health Risks in Cancer
  Kathleen Wesa, MD
- Sexuality
  Jeanne Carter PhD & Joe Narus NP
- Fertility
  Joanne Kelvin CNS
- Second Malignancies
  Matthew Matasar, MD