Burden of Illness
Patient Burden of Cancer

- Cancer treatment is associated with long-term health effects
  - Cardiotoxicity
  - Lymphedema
  - Sexual dysfunction
  - Incontinence
  - Pain and fatigue
  - Cognitive dysfunction
  - Psychological distress

Cancer survivors also have an increased risk of secondary cancers

### Burden in Cancer Survivors*

*age-, gender-, and educational attainment-matched controls


<table>
<thead>
<tr>
<th>Burden measure*</th>
<th>Cancer survivors (N = 1817)</th>
<th>Noncancer control subjects (N = 5465)</th>
<th>P†</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Utility</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HALEx utility value, mean (95% CI)</td>
<td>0.74 (0.72 to 0.75)</td>
<td>0.80 (0.80 to 0.81)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Lost productivity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job in past 12 months, % (95% CI)</td>
<td>41.0 (38.5 to 43.4)</td>
<td>45.9 (44.3 to 47.5)</td>
<td>.001</td>
</tr>
<tr>
<td>Unable to work due to health problems, % (95% CI)</td>
<td>18.0 (16.1 to 19.9)</td>
<td>10.3 (9.3 to 11.3)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Limited in amount/kind of work because of health problems, % (95% CI)</td>
<td>27.4 (25.1 to 29.8)</td>
<td>17.6 (16.3 to 18.8)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Days lost from work, past 12 mo (as reported), mean (95% CI)</td>
<td>13.2 (9.9 to 16.5)</td>
<td>5.7 (4.5 to 7.0)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Days lost from work, past 12 mo (modified variable with assigned data), mean (95% CI)</td>
<td>50.6 (43.6 to 57.6)</td>
<td>23.6 (20.3 to 26.8)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>General health</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health status, % (95% CI)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>13.5 (11.8 to 15.1)</td>
<td>21.9 (20.5 to 23.3)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Very good</td>
<td>22.7 (20.3 to 25.1)</td>
<td>31.2 (29.8 to 32.7)</td>
<td>.001</td>
</tr>
<tr>
<td>Good</td>
<td>32.8 (30.4 to 35.3)</td>
<td>29.0 (27.5 to 30.5)</td>
<td>.001</td>
</tr>
<tr>
<td>Fair</td>
<td>20.6 (18.4 to 22.7)</td>
<td>13.4 (12.4 to 14.5)</td>
<td>.001</td>
</tr>
<tr>
<td>Poor</td>
<td>10.4 (8.8 to 12.1)</td>
<td>4.5 (3.8 to 5.2)</td>
<td>.001</td>
</tr>
<tr>
<td>Needs help with activities of daily living, % (95% CI)</td>
<td>4.9 (3.8 to 5.9)</td>
<td>3.0 (2.5 to 3.6)</td>
<td>.003</td>
</tr>
<tr>
<td>Needs help with instrumental activities of daily living, % (95% CI)</td>
<td>11.4 (9.9 to 13.0)</td>
<td>6.5 (5.7 to 7.2)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Any limitation in any way, % (95% CI)</td>
<td>36.2 (33.6 to 38.8)</td>
<td>23.8 (22.5 to 25.2)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>No. of bed days in past 12 mo, % (95% CI)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>57.1 (54.6 to 59.6)</td>
<td>66.2 (64.7 to 67.6)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>1–10</td>
<td>28.9 (26.6 to 31.2)</td>
<td>26.1 (24.7 to 27.5)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>&gt;10</td>
<td>14.0 (12.2 to 15.7)</td>
<td>7.7 (6.9 to 8.6)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

*CI = confidence interval. Activities of daily living include eating, bathing, dressing, getting in or out of bed or chairs, using the toilet, and getting around inside the home. Instrumental activities of daily living are routine needs such as everyday household chores, doing necessary business or shopping, or getting around for other purposes.

†Categoric variables were compared with chi-square statistics, and continuous variables were compared with linear regression. P values are two-sided.
# Common Causes of Pain in Cancer Patients

<table>
<thead>
<tr>
<th>Malignancy-Related</th>
<th>Antineoplastic Therapies</th>
<th>Other Comorbidities</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Bone metastases</td>
<td>• Side effects from</td>
<td>• Immobility</td>
</tr>
<tr>
<td>• Soft tissue metastases</td>
<td>• Chemotherapy</td>
<td>• Constipation</td>
</tr>
<tr>
<td>• Visceral metastases</td>
<td>• Immunotherapy</td>
<td>• Thrombophlebitis</td>
</tr>
<tr>
<td>• Leptomeningeal metastases</td>
<td>• Hormonal therapy</td>
<td>• Unaddressed</td>
</tr>
<tr>
<td>• Epidural spinal cord compression</td>
<td>• Radiation therapy</td>
<td>psychosocial and</td>
</tr>
<tr>
<td>• Malignant bowel obstruction</td>
<td>• Post-procedural pain</td>
<td>psychiatric issues</td>
</tr>
<tr>
<td>• Pathologic fracture</td>
<td>• Post-surgical pain</td>
<td></td>
</tr>
<tr>
<td>• Hemorrhage into a tumor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Tumor-related neuropathic pain</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Burden in Cancer Survivors*

- Compared with matched controls, cancer survivors have significantly poorer outcomes across multiple burden measures.

- Productivity costs due to morbidity and intangible burden of illness associated with cancer are substantial, even among patients 5 years after diagnosis.

- Long-term cancer survivors (≥11 years post-diagnosis) have a significantly higher burden than matched controls across multiple measures.

*age-, gender-, and educational attainment-matched controls
Economic Burden of Cancer Survivorship

• Economic impact is considerable
• Costs continue to be high in the years after a cancer diagnosis
• Cancer survivorship has increased substantially and is expected to increase further with treatment advances, increased life expectancy, and aging population
• Survivorship is associated with substantial medical expenditures and lost productivity
  • Employment disability
  • Fewer hours worked
  • More missed work days

Economic Burden of Cancer – Direct Medical Costs

• Contributors:
  – Hospitalizations
  – Surgery
  – Physician visits
  – Radiation therapy
  – Chemotherapy
  – Immunotherapy

• Costs vary with each phase of care
• Costs vary significantly by cancer site

Economic Burden of Cancer

- Must consider direct and indirect costs
- Costs are highest in initial period following diagnosis and at end of life
- Width and height of U-shaped cost curve varies by cancer site, stage at diagnosis, and patient age

Economic Burden of Cancer – Direct Medical Costs

Economic Burden of Cancer – Direct Medical Costs

MEPS = Medical Expenditure Panel Survey
Economic Burden of Cancer – Indirect Costs

MEPS = Medical Expenditure Panel Survey
Cancer Comorbidities

- Natural history of cancer may affect the severity and outcomes of other chronic illnesses
- Comorbidity, when compared with functional status, has an independent effect on survival
- Measurement of comorbidities has a profound effect on their correlation with prognosis
- Comorbidities can profoundly impact cancer care:
  - Prevention
  - Screening
  - Diagnosis
  - Prognosis
  - Cancer treatment
  - Health service needs

Prevalence of Comorbidities in Cancer Patients

Overall Prevalence of Pre-existing Chronic Diseases

- No chronic disease: 31.3%
- 1 chronic disease: 36.1%
- 2 chronic diseases: 22.1%
- ≥3 chronic diseases: 10.5%

Common Comorbidities in Cancer Patients

- Hypertension
- Diabetes
- Cardiovascular diseases
- Respiratory diseases
- Cerebrovascular diseases
- Arthritis

Cancer, Anxiety, and Depression

- Anxiety and depression are common among cancer patients.
- Anxiety and depression in cancer patients:
  - Reduces patient quality of life
  - Negatively impacts compliance with medical treatment
  - Increases risk of mortality
- Levels of anxiety and depression vary with cancer type, gender, and age

Cancer and Anxiety

Prevalence of anxiety differs by cancer site and gender

Cancer and Depression

Prevalence of depression differs by cancer site and gender

Cancer and Sleep/Fatigue

- Fatigue is one of the most common and debilitating symptoms of cancer
  - Up to 90% of patients treated with radiation and 80% of those treated with chemotherapy experience fatigue
- CRF is characterized by tiredness, weakness, and lack of energy
  - Not the same as normal drowsiness experienced by healthy individuals because it is not relieved by rest or sleep
- Occurs due to cancer and as a side effect of cancer treatment
- May be an early cancer symptom; reported by 40% of patients at diagnosis
- Significant negative impact on patient’s quality of life
  - Can also negatively impact patient’s caregivers and family members, who may have to reduce their own work capacity to help the patient

CRF = cancer-related fatigue
Cancer and Sleep/Fatigue

• Sleep disorders:
  – Difficulty falling asleep
  – Problems maintaining sleep
  – Poor sleep efficiency
  – Early awakening
  – Excessive daytime sleepiness

• Problem becomes chronic in some patients
  – Cancer-related fatigue continues for months or years following completion of treatment in about one-third of patients

• Negative impact on emotional health

• Associated with depression, pain, and anxiety

Cancer-Related Fatigue Negatively Impacts Emotional Health

<table>
<thead>
<tr>
<th>Aspect reported in ≥50% of patients*</th>
<th>Patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having to push yourself to do things</td>
<td>77</td>
</tr>
<tr>
<td>Decreased motivation or interest in usual activities</td>
<td>62</td>
</tr>
<tr>
<td>Sadness, frustration, or irritability because of fatigue</td>
<td>53</td>
</tr>
<tr>
<td>Diminished interest in normal activities</td>
<td>51</td>
</tr>
<tr>
<td>Mental exhaustion</td>
<td>51</td>
</tr>
</tbody>
</table>

*In 301 patients undergoing treatment for cancer
Cancer and the Family

- Diagnosis of cancer is a “family affair”
- Family members experience similar, if not greater, negative psychologic responses to a cancer diagnosis
- Patients, partners, and other family members can suffer from depression, anxiety, and stress
- Affects the functioning of the entire family unit
- Diagnosis of cancer in the family means changes in and disruptions to normal daily life for the family as well as the patient
- Relatives/caregivers need to make role adjustments and lifestyle adaptations to meet demands created by the illness
- Burden has increased with more outpatient treatment of cancer and more home care

Literature Cited


