Epidemiology
## Ten Leading Cancer Types for Estimated New Cancer Cases and Deaths, by Sex, US, 2013

### Estimated New Cases*

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>232,340</td>
<td>26%</td>
</tr>
<tr>
<td>Lung &amp; bronchus</td>
<td>110,110</td>
<td>14%</td>
</tr>
<tr>
<td>Colorectum</td>
<td>69,140</td>
<td>9%</td>
</tr>
<tr>
<td>Uterine corpus</td>
<td>49,560</td>
<td>6%</td>
</tr>
<tr>
<td>Thyroid</td>
<td>45,310</td>
<td>6%</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>32,140</td>
<td>4%</td>
</tr>
<tr>
<td>Melanoma of the skin</td>
<td>31,830</td>
<td>4%</td>
</tr>
<tr>
<td>Kidney &amp; renal pelvis</td>
<td>24,720</td>
<td>3%</td>
</tr>
<tr>
<td>Pancreas</td>
<td>22,480</td>
<td>3%</td>
</tr>
<tr>
<td>Ovary</td>
<td>22,240</td>
<td>3%</td>
</tr>
<tr>
<td><strong>All Sites</strong></td>
<td>865,500</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Estimated Deaths

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung &amp; bronchus</td>
<td>72,220</td>
<td>26%</td>
</tr>
<tr>
<td>Breast</td>
<td>39,520</td>
<td>14%</td>
</tr>
<tr>
<td>Colorectum</td>
<td>24,530</td>
<td>9%</td>
</tr>
<tr>
<td>Pancreas</td>
<td>18,980</td>
<td>7%</td>
</tr>
<tr>
<td>Ovary</td>
<td>14,030</td>
<td>5%</td>
</tr>
<tr>
<td>Leukemia</td>
<td>10,060</td>
<td>4%</td>
</tr>
<tr>
<td>Non-Hodgkin lymphoma</td>
<td>8,430</td>
<td>3%</td>
</tr>
<tr>
<td>Uterine corpus</td>
<td>8,190</td>
<td>3%</td>
</tr>
<tr>
<td>Liver &amp; intrahepatic bile duct</td>
<td>6,760</td>
<td>2%</td>
</tr>
<tr>
<td>Brain &amp; other nervous system</td>
<td>6,150</td>
<td>2%</td>
</tr>
<tr>
<td><strong>All Sites</strong></td>
<td>273,430</td>
<td>100%</td>
</tr>
</tbody>
</table>
Annual Age-adjusted Cancer Incidence Rates among Males and Females for Selected Cancers, US 1975-2009

Annual Age-adjusted Cancer Death Rates* among Females for Selected Cancers, United States, 1930-2009
FIGURE 5 Annual Age-adjusted Cancer Death Rates* among Females for Selected Cancers, United States, 1930-2005

U.S. BC Mortality Rates Over Time

Smith B D et al. JCO 2011;29:4647-4653
U.S. Estimated Life Expectancy

Year

Age

1900
1904
1908
1912
1916
1920
1924
1928
1932
1936
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976
1980
1984
1988
1992
1996
2000

2009

All ~78 years
Women: 81
Men: 76
Why is Geriatric Oncology Important?

- US Population 65 and older

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td>9.5</td>
</tr>
<tr>
<td>1985</td>
<td>12</td>
</tr>
<tr>
<td>1990</td>
<td>12.6</td>
</tr>
<tr>
<td>2005</td>
<td>13.1</td>
</tr>
<tr>
<td>2030</td>
<td>20</td>
</tr>
</tbody>
</table>
U.S. BC Incidence and Mortality Rates: SEER 2005-09

Median Age ~ 61

Incidence and Mortality rates per 100,000 women.

Per 100,000 women

Projected cases of all invasive cancers in the United States by age and sex

![Graph showing projected cases of all invasive cancers in the United States by age and sex.](image)

Prevalence of overall comorbidity by severity across the age spectrum.

Workforce Implications

The Present:
1 Geriatrician: 2620

The Future:
1 Geriatrician: 3798

Projected future need for geriatricians in 2030: 30,623

AGS: Geriatric Workforce Policy Study Center
I asked Chad Boult, the geriatrics professor now at Johns Hopkins what can be done to insure that there are enough geriatricians for our surging elderly population, “Nothing,” he said. “It’s too late.”

Atul Gawande, The New Yorker
April 30, 2007
The Challenge

- We are living longer
- The population is aging
- Breast cancers is diseases of aging
- Age is associated with other illness
- Other illness competes with cancer for life
- We are short of geriatricians
- Health care costs are out of control
Screening

After carefully studying the available research on whether you should have a mammogram, I have just one question... 

...Heads or Tails?
Life expectancy and Screening

- RCTs in women aged 50-69 years

Benefits of Screening

• Early detection of breast cancer
• Mammography is more sensitive/specific in older women
• Screening benefit increases with age in RCTs
  – NNS=1339 for 50-59 years
  – NNS=377 for 60-69 years
Consequences of screening mammography in a cohort of 216 frail elderly women. Text in bold denotes patients who experienced burden from screening mammography.

Walter LC. J Gen Intern Med 2001:779-784
Individualized Approach to Screening

Screen

Likelihood of benefit

Patient’s Preference (Fulcrum)

Don’t Screen

Likelihood of harm
Evaluation and Assessment
The Heterogeneity of Aging

A Life Expectancy for Women

B Life Expectancy for Men

The Heterogeneity of Aging

Your Child’s Early Development is a Journey
Check off the milestones your child has reached and share your child’s progress with the doctor at every visit.

6 MONTHS
- Copies sounds
- Begins to sit without support
- Likes to play with others, especially parents
- Responds to own name
- Strings vowels together when babbling (‘ah,’ ‘eh,’ ‘eh’)
- Uses simple gestures such as shaking head for “no” or waving “bye bye”
- Copies gestures

12 MONTHS (1 YEAR)
- Responds to simple spoken requests
- Says “mama” and “dada”
- Pulls up to stand

18 MONTHS (1 1/2 YEARS)
- Says sentences with 2 to 4 words
- Says several single words
- Walks alone
- Knows what ordinary things are for; for example, telephone, brush, spoon
- Plays simple pretend, such as feeding a doll
- Points to show others something interesting

2 YEARS
- Follows simple instructions
- Kicks a ball
- Gets excited when with other children
- Points to things or pictures when they’re named

3 YEARS
- Copies adults and friends (like running when other children run)
- Carries on a conversation using 2 to 3 sentences
- Climbs well
- Plays make-believe with dolls, animals and people
- Shows affection for friends without prompting

4 YEARS
- Hops and stands on one foot for up to 2 seconds
- Would rather play with other children than alone
- Tells stories
- Draws a person with 2 to 4 body parts
- Plays cooperatively

These are just a few of many important milestones to look for. For more complete checklists by age visit [www.odo.gov/AotEarly](http://www.odo.gov/AotEarly) or call 1-800-CDC-INFO.
Important Questions

• Is the patient going to die of, or with cancer?
• Is the patient going to live long enough to suffer the consequences of cancer?
• Is the patient able to tolerate treatment?
• Are there complications of treatment that are more common in older individuals?
• Is the social network of the patient adequate to support him/her during treatment?
The Heterogeneity of Aging

- Age related changes in physiology
- Vulnerable to toxicity
- Dependent in daily activities
- Concerns regarding long-term effects of therapy

Pediatrics

Geriatrics
Chronological Age ≠ Functional Age
The Geriatric Oncology Iceberg
Geriatric Assessment

• Definition
  – Consensus Conference 1989
  – A multi-dimensional inter-disciplinary patient evaluation that leads to the identification of patient problems.

• Benefits
  – Uncover problems not detected by a routine H&P
  – Predicts chemotherapy toxicity, morbidity and survival
  – Leads to interventions to that improves function, nutrition, mental health, social support
  – A growing body of evidence suggest this improves outcomes including early re-hospitalizations and survival

• Challenges
  – Requires time, specialized personnel and expertise
  – Insufficient numbers of geriatricians to do it
How Are We Doing?

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>N=70 (100%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falls Documented</td>
<td>2 (3%)</td>
<td>0-10%</td>
</tr>
<tr>
<td>Gait Assessment</td>
<td>19 (13%)</td>
<td>10-30%</td>
</tr>
<tr>
<td>Referrals</td>
<td>2 (3%)</td>
<td>0-10%</td>
</tr>
<tr>
<td>Vitamin D Level</td>
<td>19 (13%)</td>
<td>10-30%</td>
</tr>
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</table>

- 24% of the patients in the registry reported 1 or more fall in the past 6 months
- 54% had one fall and 47% had two or more falls
- No more than 10% of patients who experience falls have appropriate medical record documentation or referrals.
- Older adults who fall were not adequately evaluated by medical oncologists.
Assess First, Then Treat

- **Good shape**: Same treatment as younger patients
- **Vulnerable**: Intervention then standard treatment
- **Frail**: Intervention then adapted treatment or palliation
- “Too sick”
Treatment
What is the Goal of Therapy?

**Young adults**
- Single serious condition
- Dominates the clinical picture
- Tolerates acute, severe side effects relatively well
- Goal: survival/cure

**Older adults**
- Coexists w/ multiple illnesses and significant disability
- Competing causes of mortality
- Variable tolerability of specific Tx, requiring tailoring
- Goal: survival vs. QOL
What is the Goal of Therapy?

- Cure
- Prolongation of active life expectancy
- Effective symptom management
- Comfort
- “Do no harm”
What’s the goal of treatment?

- All Elders: First maintain QOL and function
- Early stage breast cancer
  - Adjuvant therapy to increase cure
  - Treatment should not be as bad as disease
- Metastatic disease
  - Improve symptoms when present
  - “You can’t improve on being asymptomatic.”
  - Provide “structured” palliative care
UNC Geriatric Oncology Specialty Clinic

Your trusted partner in Geriatric Oncology

Increasing age is the major risk factor for developing cancer. Cancer treatment in the elderly population is complicated by factors related to other comorbidity, polypharmacy, functional and cognitive loss, and psychosocial support.

The Geriatric Oncology Program brings together expertise from across UNC to ensure the highest quality cancer care for older patients and to conduct research that furthers understanding of the factors affecting cancer treatment in the elderly. Older patients with cancer can be seen by both an expert in their type of cancer as well as a geriatric oncologist to maximize the quality of care for each individual. Program faculty members also educate medical students, residents, fellows, and faculty on issues related to geriatric oncology.

Scheduler: Inetha Cousin
Phone: 919-843-8442
Fax: 919-966-0393
"If your time hasn’t come yet, not even a doctor can kill you."

Leigh Stoecker
Thank You!