Aging and Cancer: Live and Let Die, or a Cancer-Free Methuselah?

Moderator:

- *Mike Rice, MS, MBA,* Principal, Defined Health

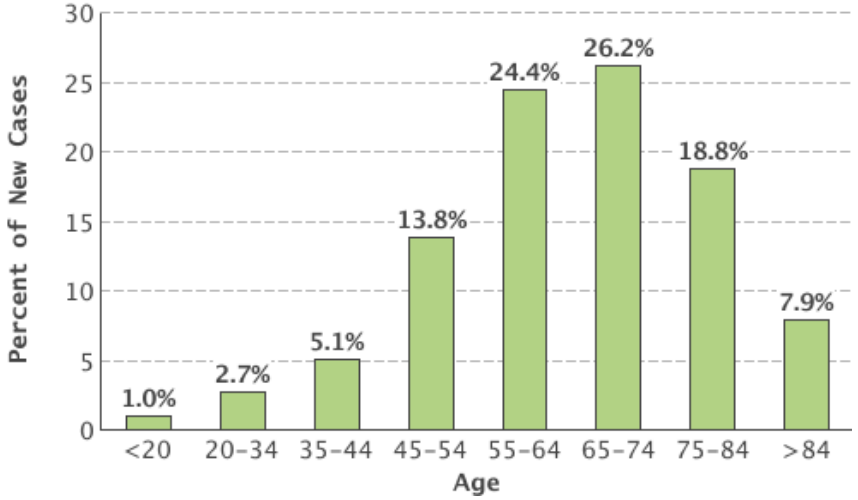
Panelists:

- *Judith Campisi, PhD,* Professor, Buck Institute for Research on Aging
- *James DeGregori, PhD,* Professor, Dept. of Biochemistry and Molecular Genetics; Courtenay C. and Lucy Patten Davis Endowed Chair in Lung Cancer Research; Deputy Director for Basic Science, University of Colorado Cancer Center

Age is the Greatest Cancer Risk Factor

- The population is growing older:
  - Advanced medicine, reduced smoking, improved diet and exercise
  - Lifespan increased by 25 yrs this century (F=85 yrs; M=77 yrs)
  - >65 US population increased 10X in a decade (25% of population by 2030)
- After 50, cancer risk increases significantly
  - Most frequently diagnosed between 65-74

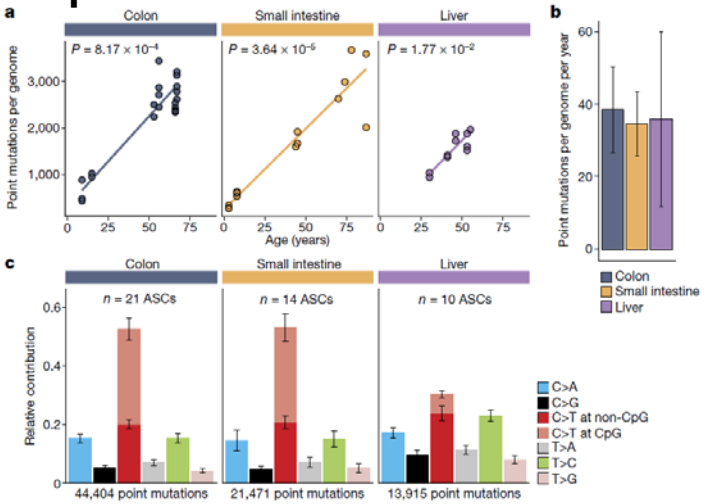
New Cancer Cases by Age (%, Any site)



Cancer Progress by Defined Health
New York, NY | March 7 - 8, 2017

- Many reasons why cancer occurs more frequently in older persons.
  - less resistance and longer exposure to carcinogens,
  - differences in homeostasis
  - decreased DNA repair capacity
  - decline in immune competence,
  - Increased mutational burden and defects in tumor-suppressors,

Age-associated accumulation of somatic point mutations in human ASCs

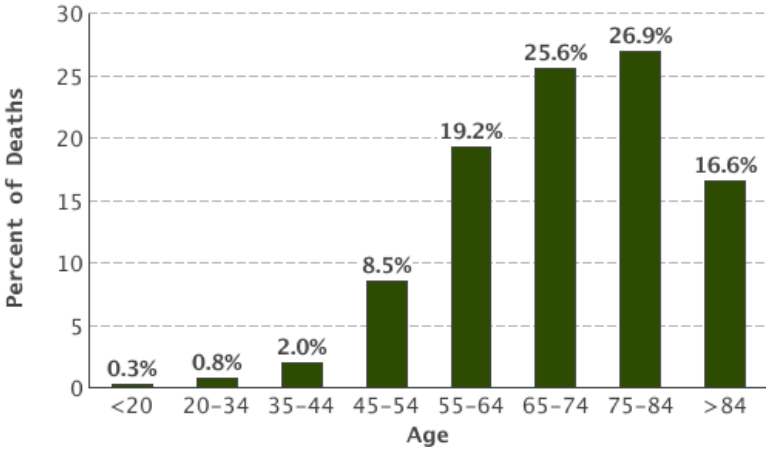


SEER Cancer Stat Facts: Cancer of Any Site. National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/statfacts/html/all.html; **doi:10.1038/nature19768**

Age is a Poor Prognosticator, Median Diagnosis at 65 and Death by 72

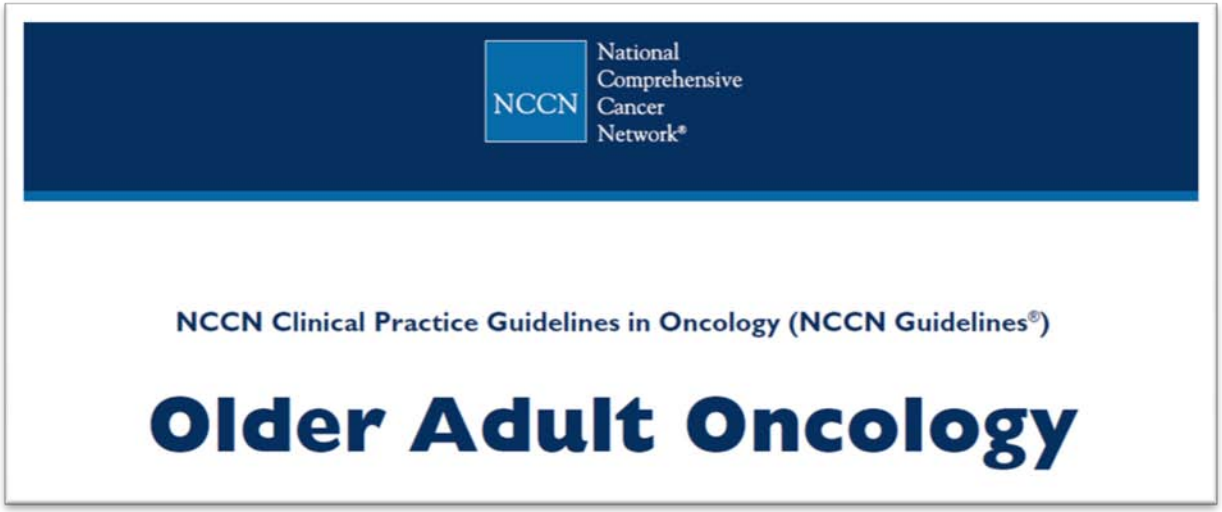
- Poor outcomes for older cancer patients contributed by both patient and disease characteristics:
  - Lower cancer screening and diagnosis rates for older adults.
  - More advanced stage and higher grade disease diagnosed
  - Increased high risk features (cytogenetics, mutations, resistance)

Cancer Deaths by Age (%, Any site)



  - Comorbidities influence determining a treatment course
  - Performance status: Organ function impaired by 50% compared to age 30.
    - decreased hepatic clearance, renal clearance, lung function, immune competence, and marrow cellularity.
  - Less aggressive therapy or palliation:
    - tolerance of cancer treatments involving surgery, radiation therapy, or chemotherapy.
    - conservative treatments rather than curative major surgical procedures
    - less aggressive radiotherapy or chemotherapy regimens may be planned for older patients.
  - Logistic considerations, such as transportation or social support, also contribute to undertreatment.

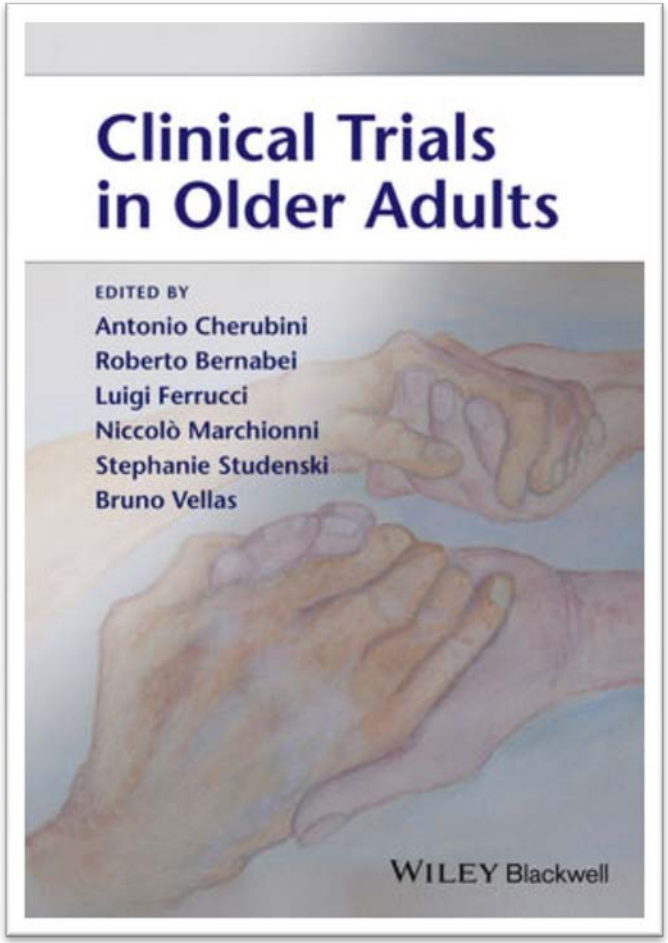
SEER Cancer Stat Facts: Cancer of Any Site. National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/statfacts/html/all.html



- **Approach and Decision Making in the Older Adult**
  - Comprehensive geriatric assessment
    - Assessment of Risk Factors
    - Assessment of gait and treatment recommendations
    - Assessment of cognitive function
    - Insomnia
  - Disease specific issues by age
  - Special considerations for patients able to tolerate treatment
    - Adherence to therapy
  - Special concerns for supportive care agents used in older adults
  - Life expectancy and treatment expectations
- ***Guidelines are largely empiric and centered on the host rather than the disease.***

Older Adults Are Underrepresented in Oncology Clinical Trials

- lack of trials designed for older adult cancer patents
  - age exclusion criteria for eligibility in a trial
  - exclusion due to presence of comorbidity,
- use of aggressive therapy that produces toxicity unacceptable to older persons,
- limited therapeutic expectations by physicians, relatives, and patients,
  - failure to refer patients to centers where trials are available
  - Patients and families don't seek experimental protocols
- lack of financial, social, and logistic support required for participation in trials.



Key Issues

- Can we envision a future without cancer? Can we live to 120 cancer free?
- What interventions can be implemented to lead to a cancer free life?
  - Lifestyle, environment, chemoprevention
- What can we learn from animal models that rarely get cancer? (Naked Mole Rat vs. African Elephant TP53 copy number, etc.)
- Can we envision a future without chemotherapy?
  - More tolerable targeted therapies, immunotherapies.
  - How long until chemotherapy is displaced?
- How will age specific therapies be translated in the clinic if there is such low trial participation for older adults?

Aging and Cancer: Live and Let Die or a Cancer-Free Methuselah?

Moderator:

- *Mike Rice, MS, MBA,* Principal, Defined Health

Panelists:

- *Judith Campisi, PhD,* Professor, Buck Institute for Research on Aging
- *James DeGregori, PhD,* Professor, Dept. of Biochemistry and Molecular Genetics; Courtenay C. and Lucy Patten Davis Endowed Chair in Lung Cancer Research; Deputy Director for Basic Science, University of Colorado Cancer Center