

The background of the slide features a photograph of Northwestern University buildings. On the left is the historic, Gothic-style Old Chapel building with its iconic spire. To the right is a modern, multi-story glass skyscraper. A large, dark purple diagonal shape overlaps the left side of the image, serving as a background for the text.

**M Northwestern Medicine®**  
Feinberg School of Medicine

# Survivorship: Surviving the Aftermath

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## Relevant Financial Disclosure(s)

Sheetal Kircher, MD

- I have nothing to disclose

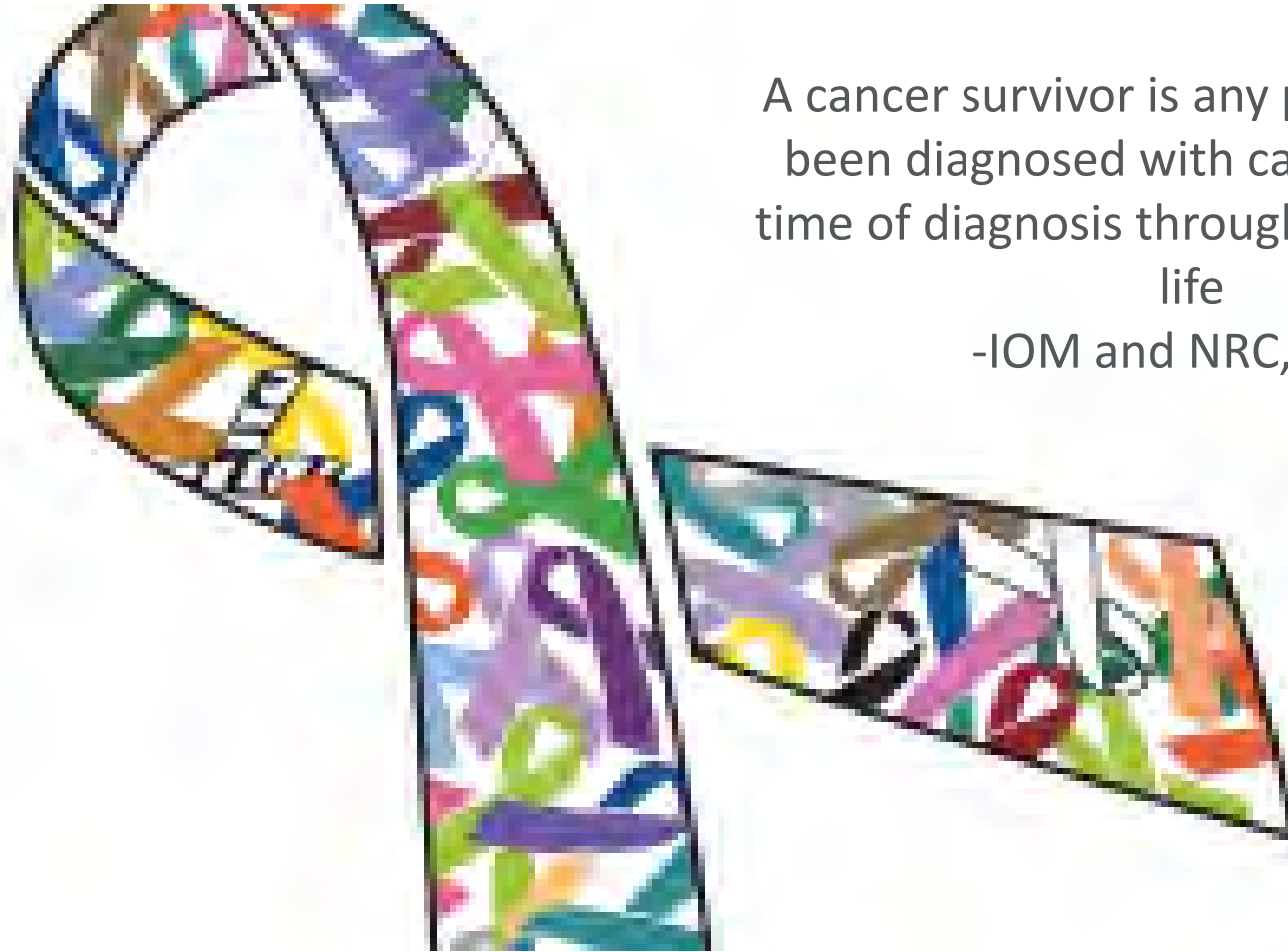
# Cancer is a major public health problem



# What is a cancer survivor?



# What is a cancer survivor?



A cancer survivor is any person who has been diagnosed with cancer, from the time of diagnosis through the balance of life

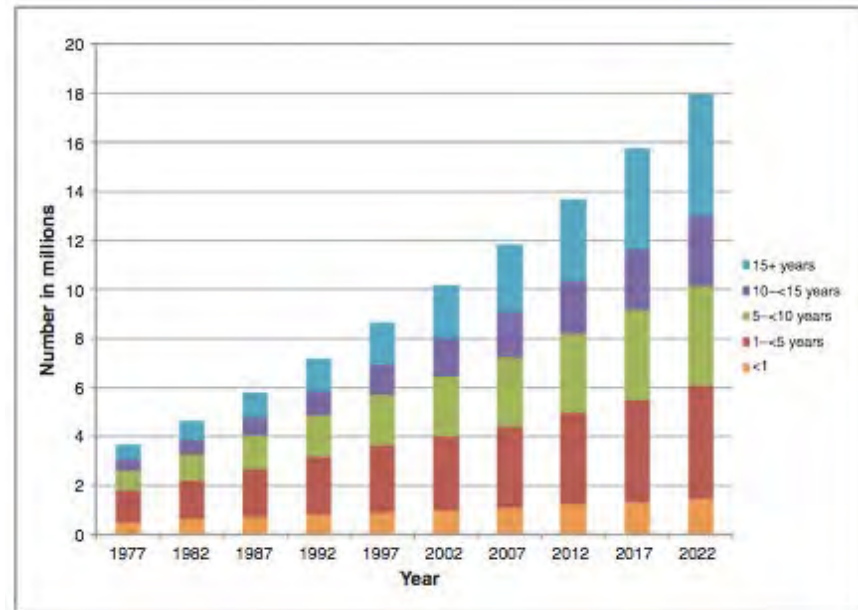
-IOM and NRC, 2005

# Increasing Number of Cancer Survivors

US population: 300 million

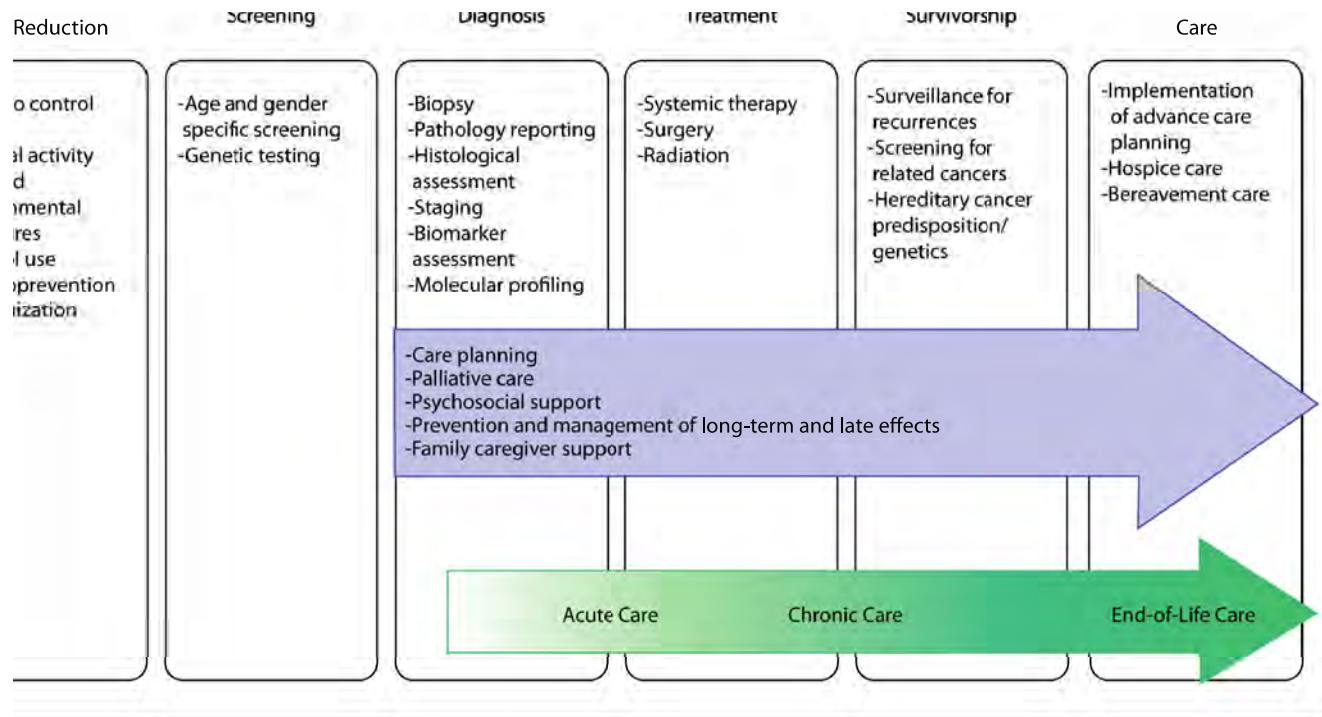
2012: 14 million cancer survivors

2022: 18 million cancer survivors



# What is survivorship care?

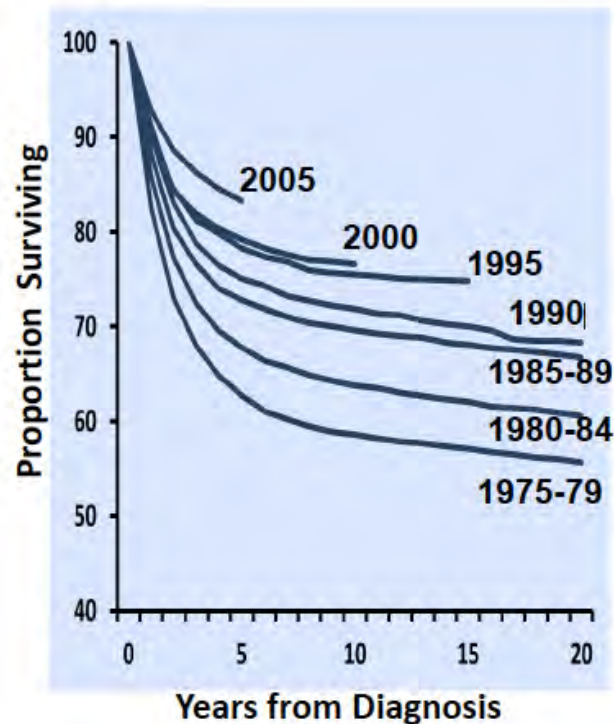
## Cancer care continuum



1-1 Domains of the cancer care continuum with examples of activities in each domain. The blue arrow identifies com-



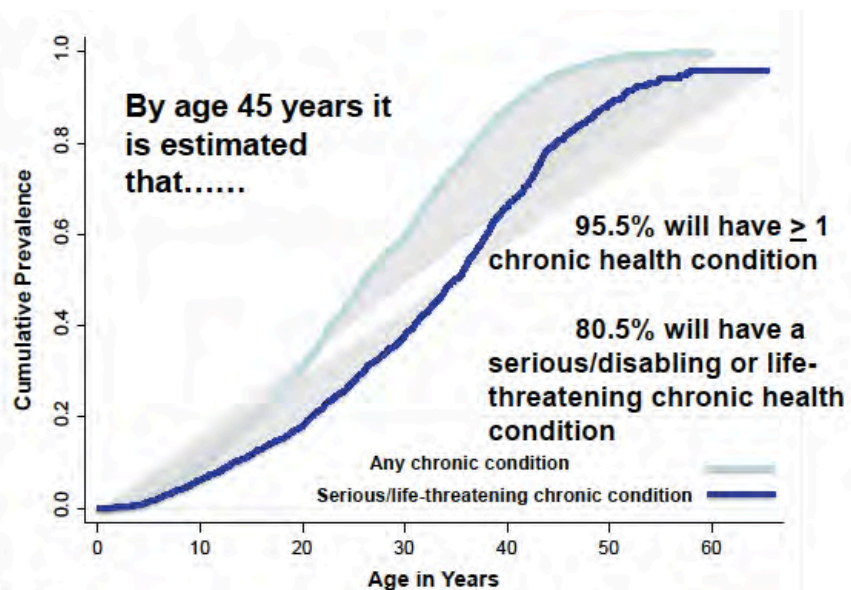
# Progress in Cancer Survival



- 5-year survival rate exceeds 80% in pediatric cancers
- One in every 750 individuals in the US is a survivor of childhood or adolescent cancer
- Lung, breast, colorectal in adults death rate decreasing about 1.5%/year

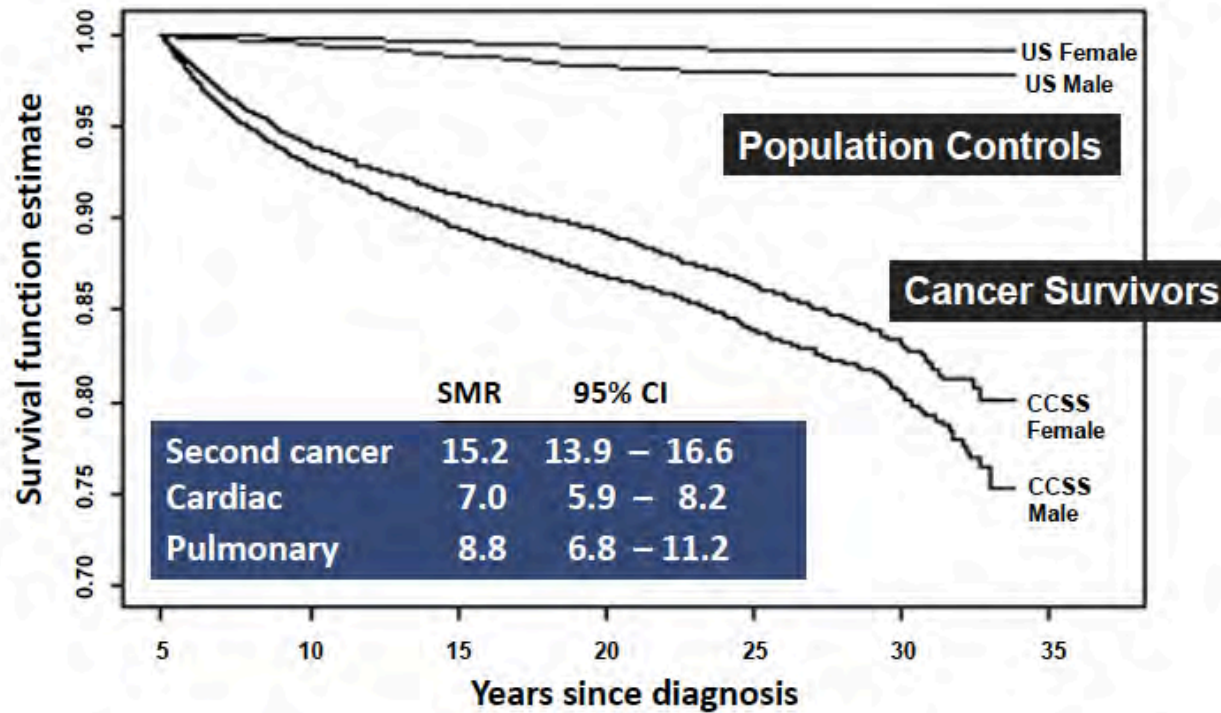


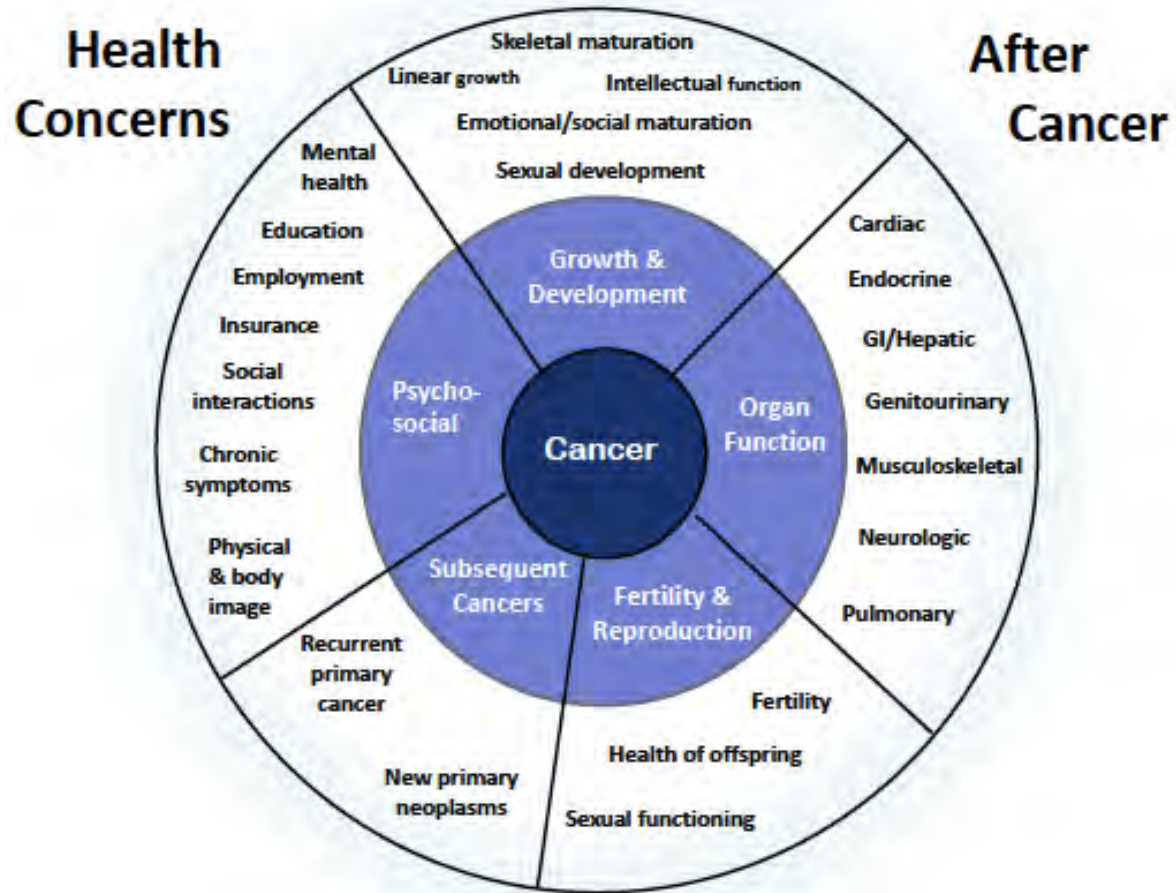
# Prevalence of health condition in childhood cancer survivors



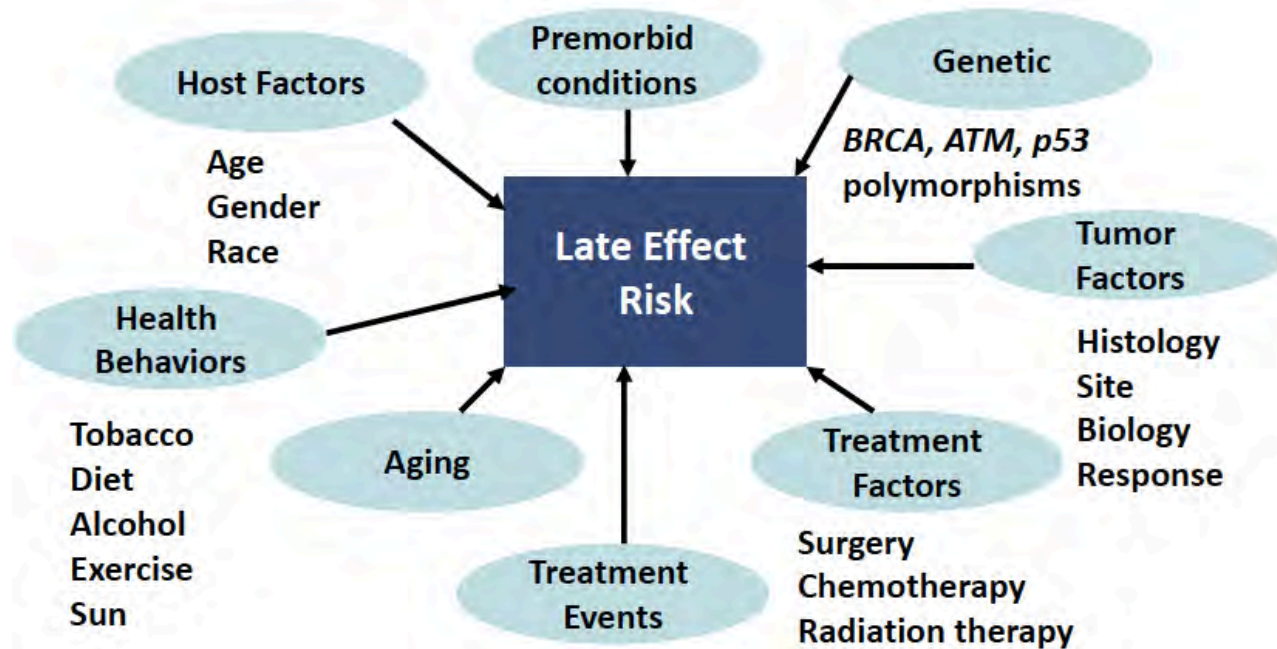
- N= 1713 (St. Jude Cohort)
- Median age of dx: 6 years (0-24)
- Median age at study: 32 years (18-60)
- Median time from dx: 25 yrs (10-47)

# Late Mortality in Cancer Survivors





# Late effects have many influences



# Late effects have many influences: Time from exposure

Cancer treatment	Time from exposure to manifestation		
	Weeks	Months	Years
<b>Cisplatin</b>	<b>Hearing loss</b>		
<b>Ifosfamide</b>	<b>Renal tubular injury</b>		
<b>Brain radiation</b>		<b>Neurocognitive deficits</b>	
<b>Neck radiation</b>		<b>Thyroid dysfunction</b>	
<b>Doxorubicin</b>			<b>Cardiomyopathy</b>
<b>Breast radiation</b>			<b>Breast cancer</b>

# Effects of cancer and treatments: Chemotherapy

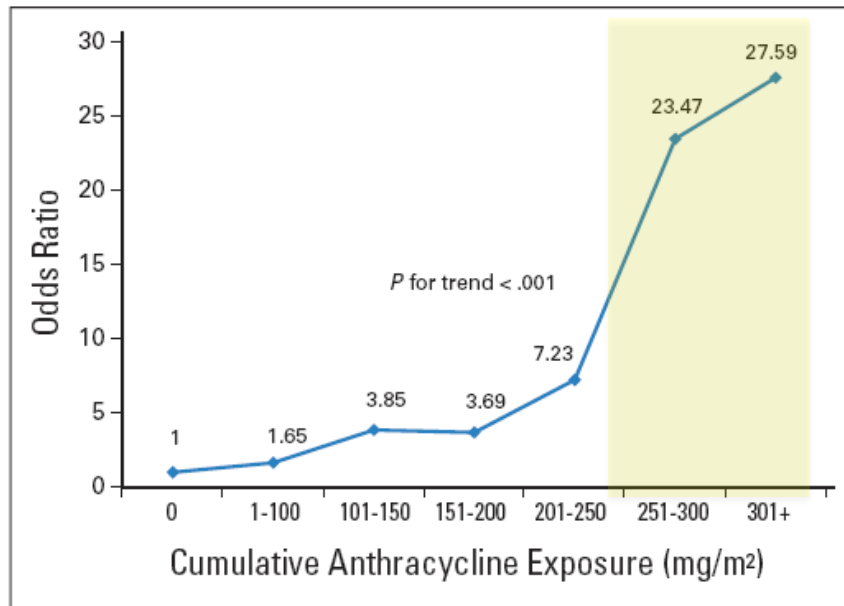


- Heart
- Bones
- Lungs
- Fertility/sexual dysfunction
- Cognitive
- Pain

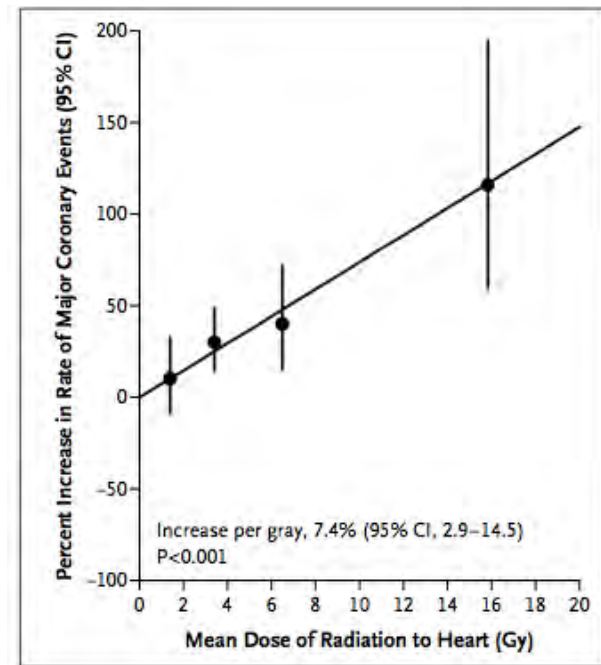


# Late effects have many influences: Doses

## Chemotherapy



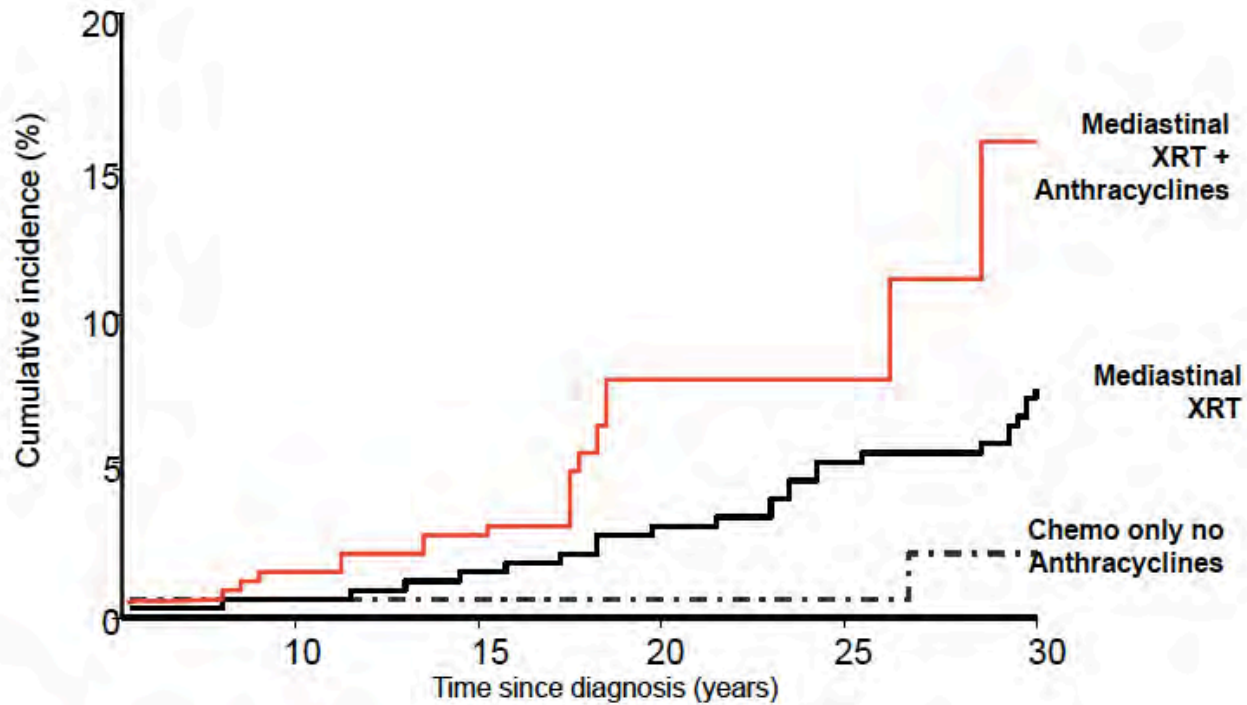
## Radiation



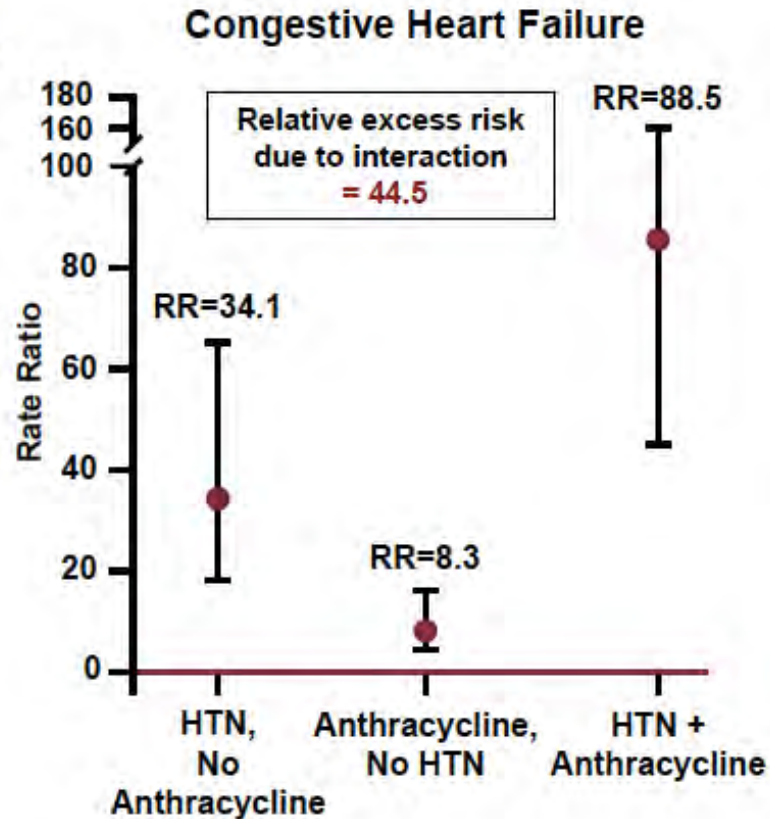


# Late effects influences: Combinations

- Treatment related risk of heart failure



# Late effects influences: Addition of chronic health conditions



• N=10,724

# Cardiac effects: syndromes associated with specific drugs

## Agents associated with myocardial depression

Anthracyclins

Mitoxantrone

Cyclophosphamide (high dose)

Trastuzumab

Ifosfamide

ATRA

## Agents associated with ischemia

5FU

Cisplatin

Capecitabine

IL-2

## Agents associated with hypotension

Etoposide

Paclitaxol

Alemtuzumab

Cetuximab

Rituximab

IL-2

Denileukin

IF-alpha

ATRA

Homoharrintonine

# Cardiac effects: syndromes associated with specific drugs

## Agents associated with hypertension

Bevacizumab

Cisplatin

## Agents associated with other toxic effects

Cardiac tamponade: Busulfan

Cardiac fibrosis: Busulfan

Bradycarrhythmias: paclitaxol, thalidomide

Reynaud: vinblastine

Autonomic neuropathy: vincristine

QT prolongation or torsades de pointes: arsenic trioxide

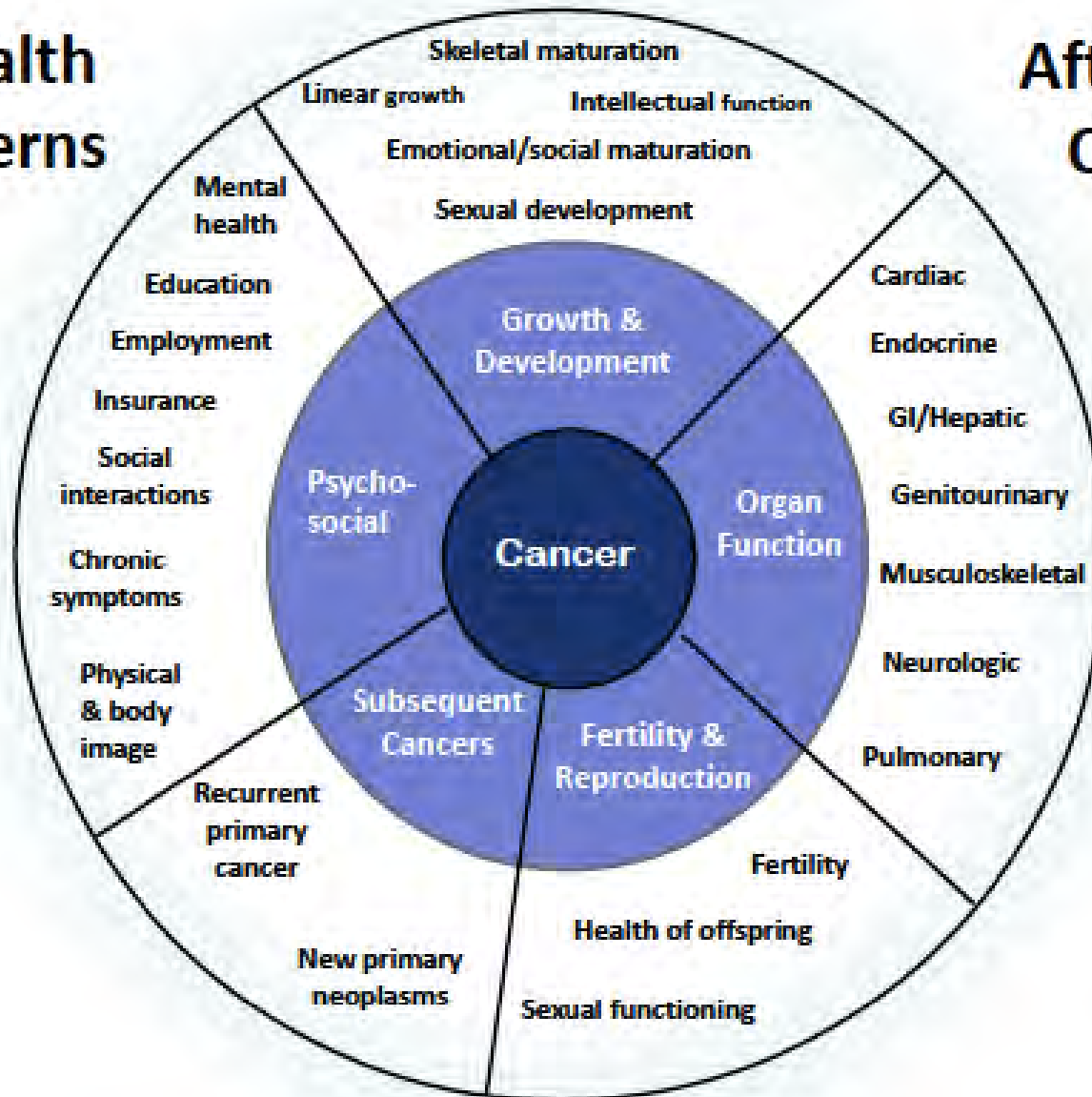
Fibrosis

# Nerve effect: peripheral neuropathy

- Peripheral neuropathy is a common dose limited toxicity for many chemotherapy agents
- Platinum agents most common
- Can be reversible or irreversible
- Hearing loss from cisplatin
- Therapy: gabapentin or venlafaxine

# Health Concerns

# After Cancer



# Psychosocial challenges

- Psychological- depression, anxiety, isolation, uncertainty, altered body image
- Social- changes in interpersonal relationships, jobs, school, financial burden
- Spiritual issues- sense of purpose or meaning, appreciation of life

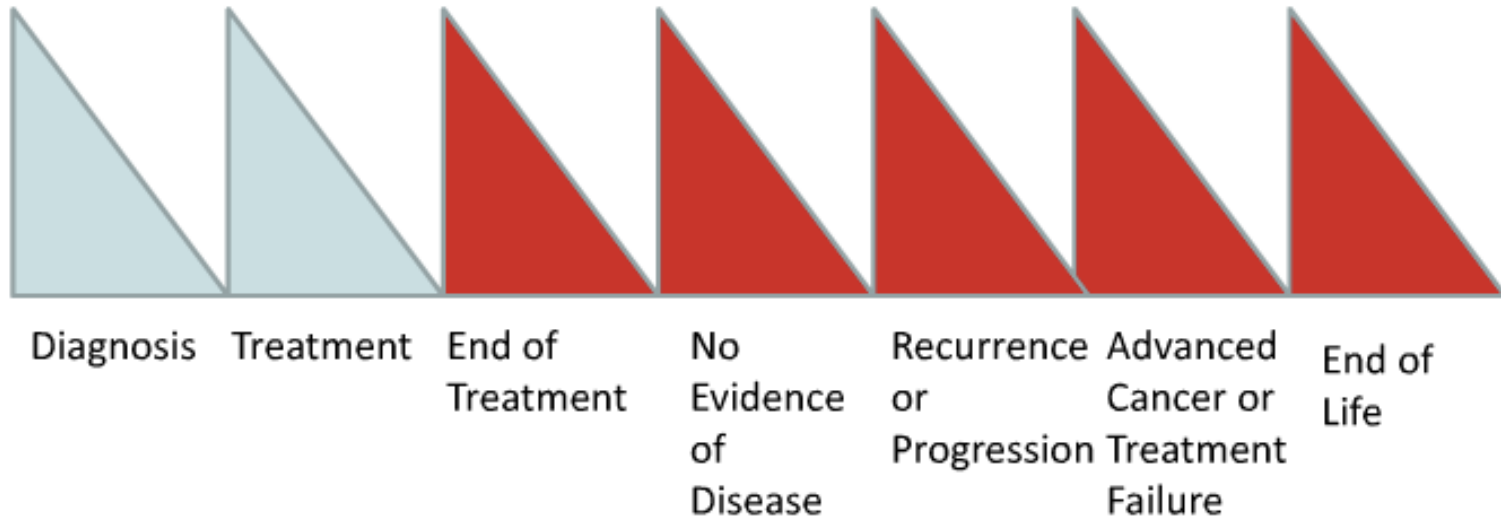


# Psychosocial challenges



- Anxiety and Depression
  - 29% of survivors
  - Suicide rate twice that of general population
- Post traumatic stress disorder
  - Up to 19% of cancer survivors

# Points of increased vulnerability to distress





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COMPREHENSIVE CANCER CENTER  
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# CANCER SURVIVORSHIP INSTITUTE

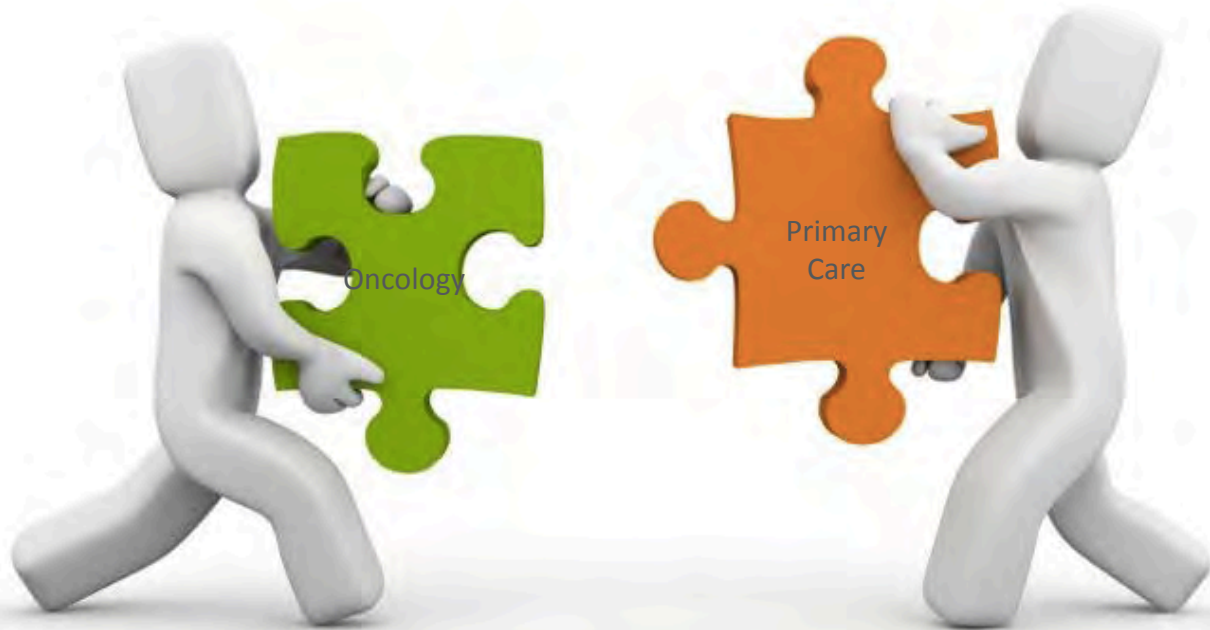
*Enhancing quality of life and health of patients, families and caregivers  
beyond cancer diagnosis and treatment*

Survivors Taking Action and Responsibility  
(STAR)

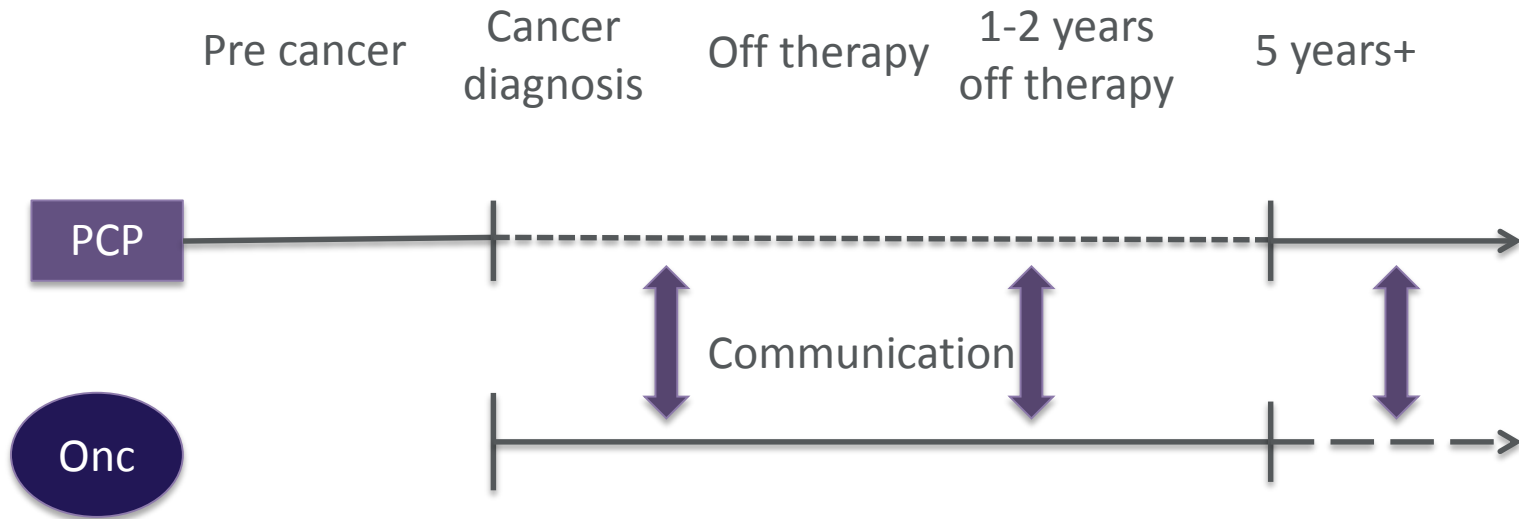
Adolescent and Young Adult Oncology  
Program (AYAO)

Lynn Sage Breast Cancer Survivorship  
Program  
AND  
Survivor Specialty Clinics





# Shared care model



## What can you do?

- Continue follow up with primary care and oncology as recommended
- Exercise, “eat well”, decrease stress
- Ask questions





**Cancer Survivorship Institute**  
Enhancing Life Beyond Cancer

<https://www.cancer.northwestern.edu/cancer-care/survivorship/index.html>

Cure sometimes, treat often, comfort always  
~Hippocrates