

Sarcoma Survivorship

Managing the Physical & Psychological
Effects of Cancer and its Treatment

Laurence H. Baker, DO

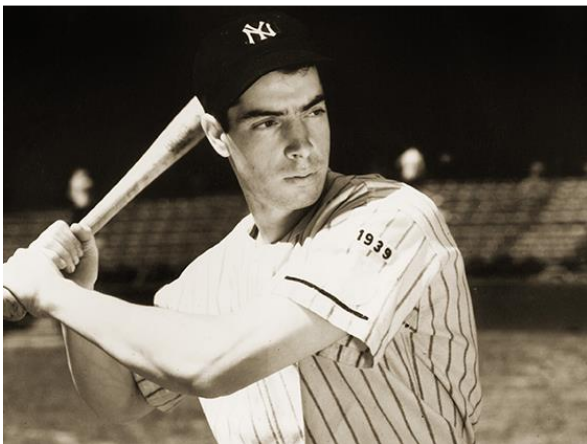
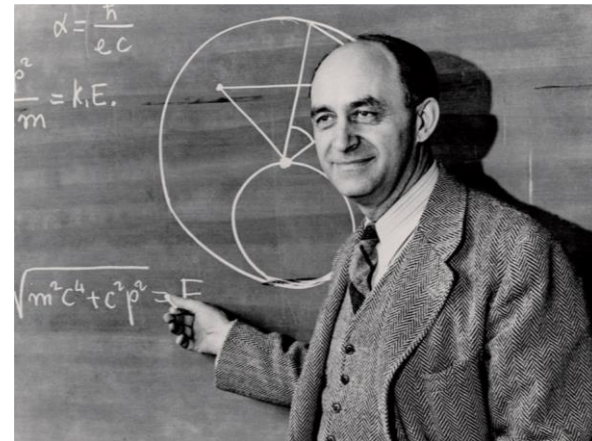
Collegiate Professor Cancer Development Therapeutics

Professor of Internal Medicine & Pharmacology



SARCOMA SURVIVORSHIP PROGRAM
UNIVERSITY OF MICHIGAN HEALTH SYSTEM

The Capone Principle



The costs of immigration are outweighed by the benefits.

Impact of Sarcoma Treatment

Sarcoma Treatment:
chemotherapy, radiation, surgery

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graph TD; A["Sarcoma Treatment:  
chemotherapy, radiation, surgery"] --> B["Medical issues that shorten life  
heart failure, hypertension, renal failure,  
pulmonary insufficiency, anxiety,  
depression/suicide, etc."]; A --> C["Medical issues that affect quality of life  
thyroid disorders, fertility issues, problems of  
mobility and strength, social problems  
(employment, marriage)"];
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Medical issues that shorten life
heart failure, hypertension, renal failure,
pulmonary insufficiency, anxiety,
depression/suicide, etc.

Medical issues that affect quality of life
thyroid disorders, fertility issues, problems of
mobility and strength, social problems
(employment, marriage)

Progress in Sarcoma

**Advances in
adjuvant &
neoadjuvant
therapies
&
Fewer
amputations**

**70% of Ewing & Osteosarcoma
50% of Rhabdomyosarcoma

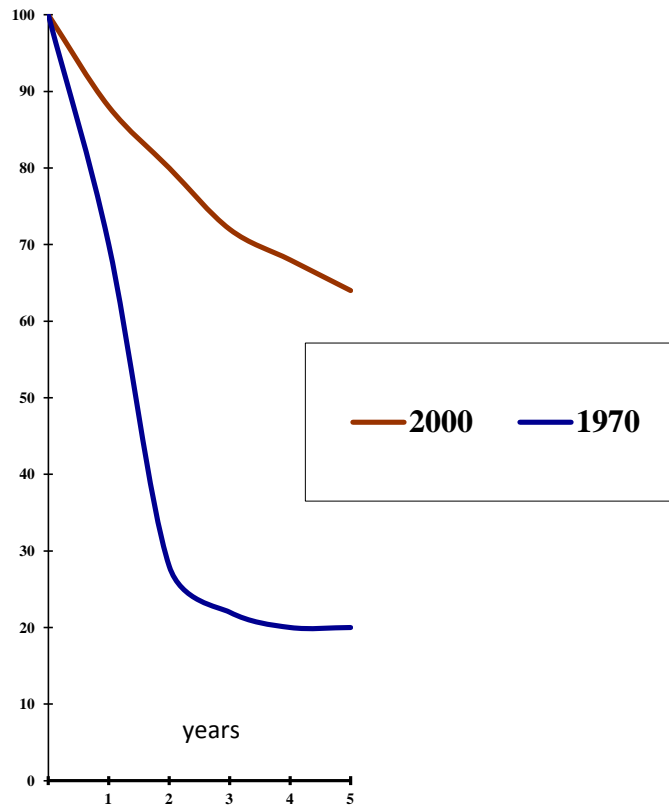
More Sarcoma Patients Cured**

- 1. Sarcoma recurrence**
- 2. Second cancers**
- 3. Chronic Health Conditions**
 - Heart disease
 - Hypertension
 - Type 2 diabetes
 - Lipid disorders
 - Renal failure
 - Anxiety, depression
 - Suicide

Relapse-free Survival Extremity Osteosarcoma

Advances

- Adjuvant chemotherapy
- Multidisciplinary care



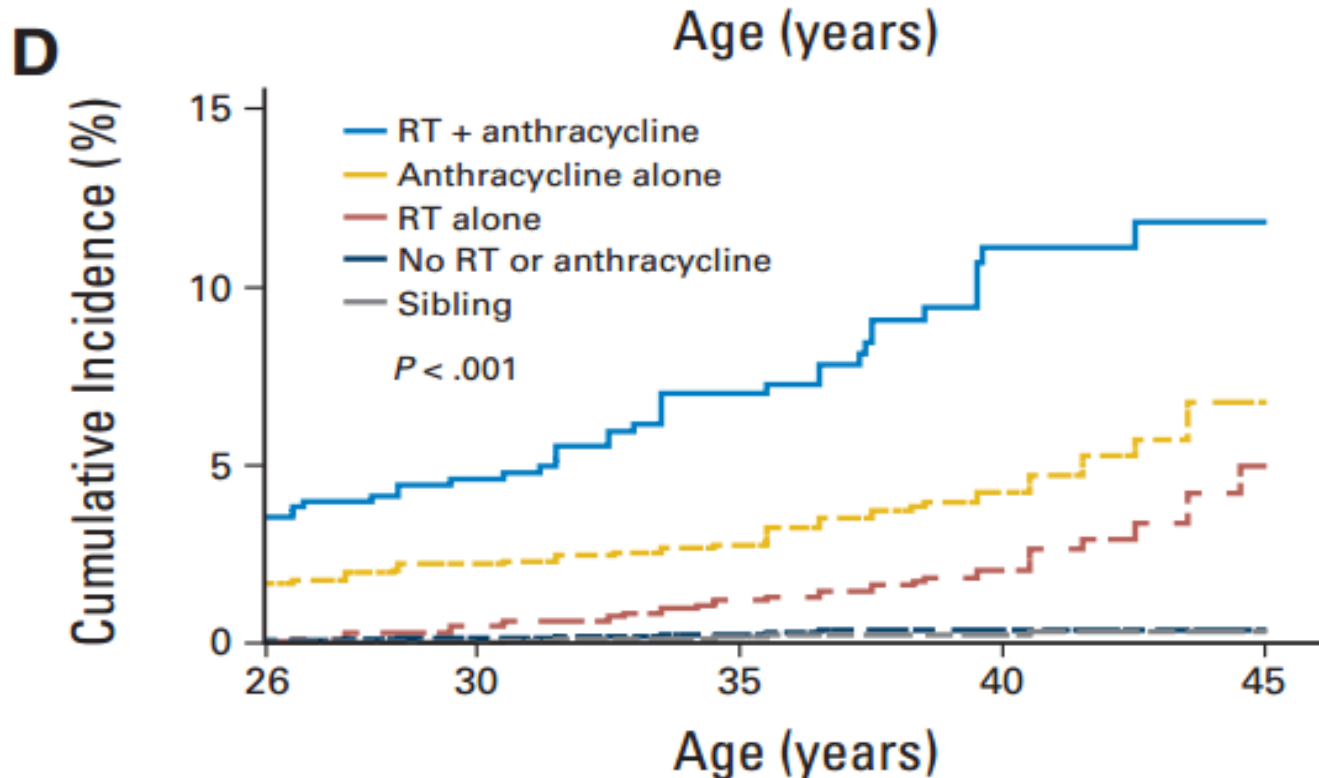


Major Cardiac Events by Age 45 in Cancer survivors

Cardiac Conditions	Cancer Survivors	Siblings
Coronary artery dx	5.3%	0.9%
Heart Failure	4.8%	0.3%
Valvular disease	1.5%	0.1%
Arrhythmia	1.3%	0.4%

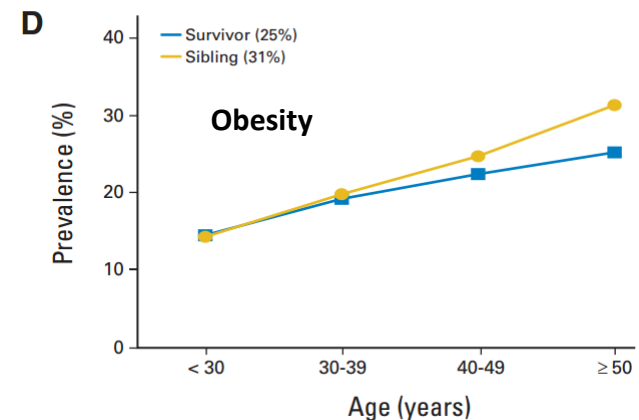
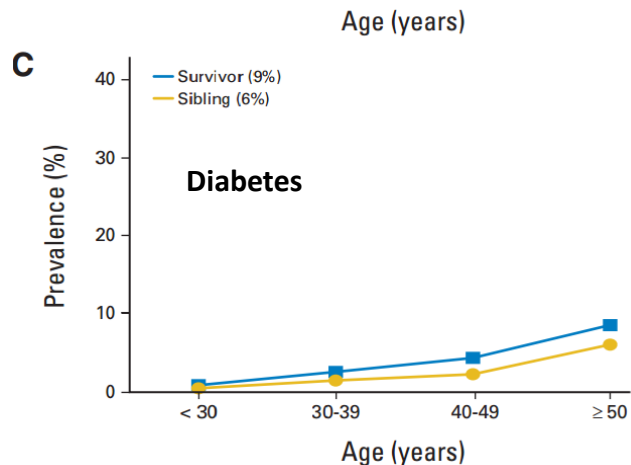
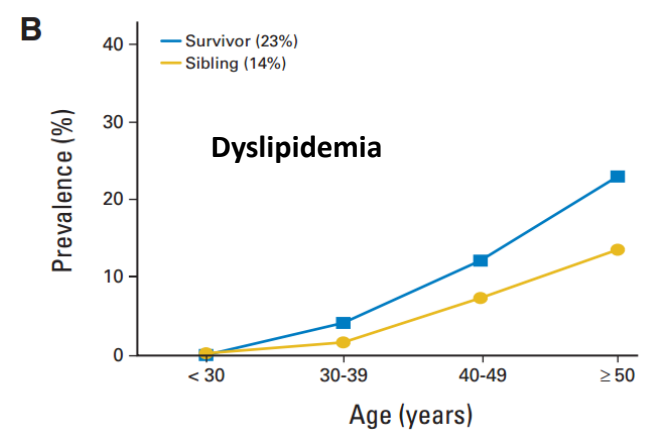
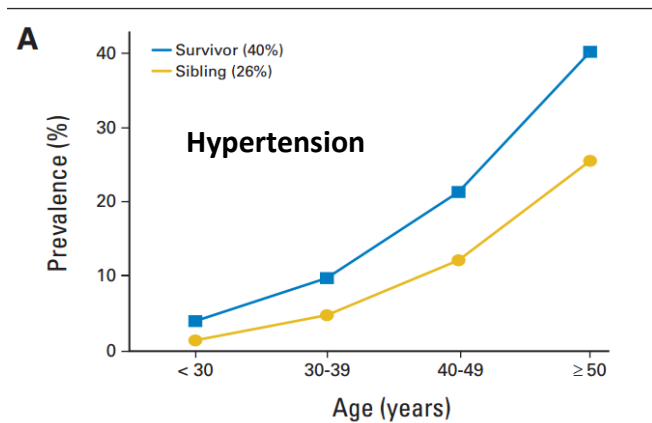
Armstrong, Gregory T., et al. "Modifiable Risk Factors and Major Cardiac Event Among Adult Survivors of Childhood Cancer." JCO September 3, 2013.

Age Specific Cumulative Incidence of 4 Major Cardiac Events



Armstrong, et al. "Modifiable risk factors and major cardiac events among adult survivors of childhood cancer."
JCO, September 3rd, 2013

Cardiovascular Risk Factors & Major Cardiac Events



Armstrong, Gregory T., et al. "Modifiable Risk Factors and Major Cardiac Event Among Adult Survivors of Childhood Cancer." JCO September 3, 2013.

Principles of Hypertension Treatment

- Treat to BP <140/90 mmHg or BP <130/80 mmHg in patients with diabetes or chronic kidney disease
add sarcoma survivors
- Majority of patients will require two medications to reach goal.

Who Should Care for a Sarcoma Survivor?

PEDIATRIC ONCOLOGIST

MEDICAL ONCOLOGIST

MEDICAL ONCOLOGY SUBSPECIALIST

PRIMARY CARE PHYSICIAN

NURSE PRACTITIONER/PHYSICIAN ASSISTANT



Survivorship Models of Care

Children	Pediatric Late Effects Clinics
Adults	Institute of Medicine Model
Adult Survivorship Clinics <ul style="list-style-type: none">• Dana Farber Cancer Center• MD Anderson Cancer Center• Memorial Sloan Kettering Cancer Center<ul style="list-style-type: none">◦ Adult Survivors◦ Adult Late Effects Clinic• Abramson Cancer Center of the University of Pennsylvania	

Sarcoma Survivorship Research Projects



Early Diagnosis & Treatment Intervention of Life Threatening Chronic Medical Diseases

Monica Leja MD, cardio-oncologist
Laurence H. Baker DO, oncologist
University of Michigan
SARCOMA SURVIVORSHIP CLINIC

Transition from Pediatrics to Adult Medicine

Lara Davis, MD
Oncologist at Oregon Health & Science University
SWOG AYA Committee

SWOG Sarcoma Survivorship Network

Lara Davis MD, Oncologist, Oregon Health & Science University
Laurence H. Baker DO, University of Michigan

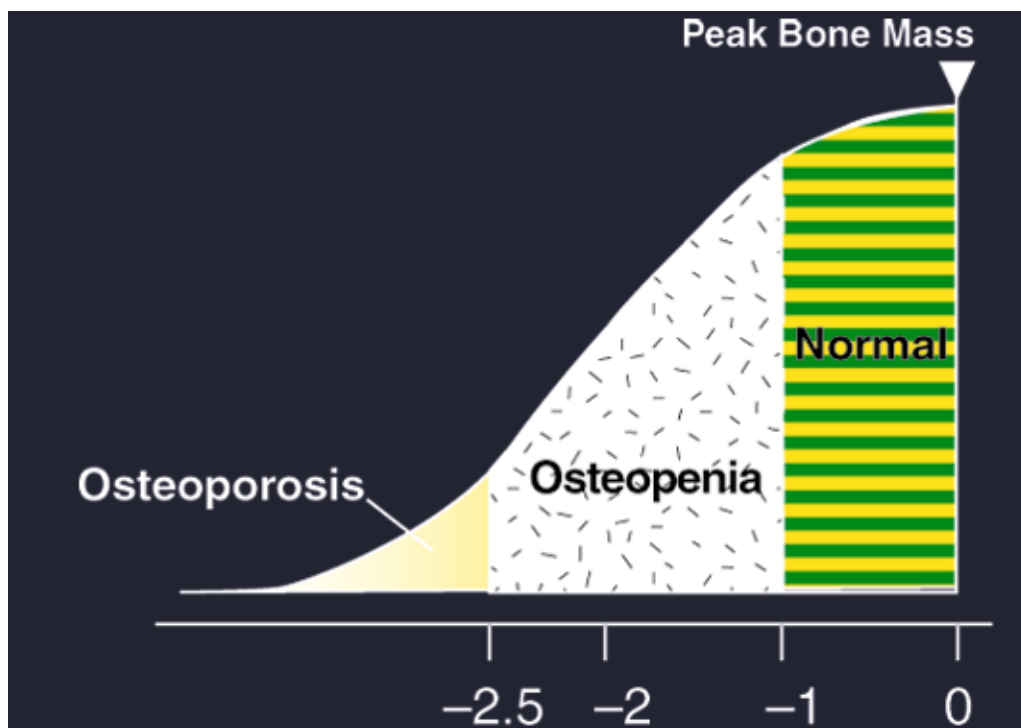
Sarcoma Survivorship Subcommittee

- Sarcoma Survivor multisite Registry
- Bone Health Study

Cardiac Disease in Osteosarcoma Survivors

- New improved diagnostic methodology
- ECHO with Strain
- Cardiac MR
- Morphomics-SARC SPORE developmental Project (Paul Meyers MSKCC, Rich Gorlick Einstein/Montefiore)

SWOG Bone Health Study in Survivors of Bone Sarcomas



Peak in boys: 13 - 17 years
girls: 11 - 14 years

Retrospective Data

From time of diagnosis:

- site of primary tumor
- pathologic diagnosis
- radiologic images
- height & weight (BMI)

Treatment details:

- cumulative chemotherapy doses
- total radiation dose received
- orthopedic surgical procedure(s)

Prospective Data

≥ 2 time points at least 1 year apart:

- Quantitative CT
- Serum & urine biomarkers
- Diet (calories, calcium, vitamin D)
- Activity questionnaires

MRI for LV Function

Improved Diagnostic Capability

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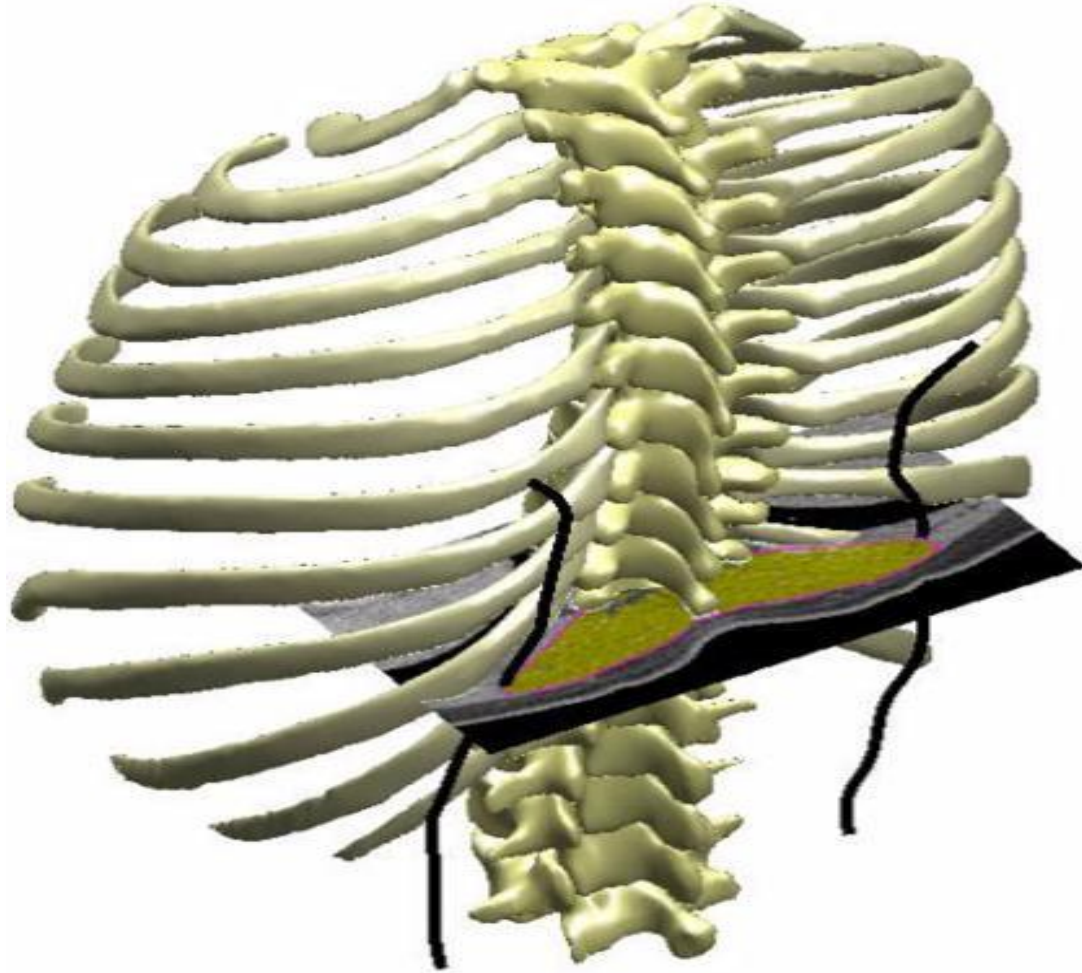
Screening Adult Survivors of Childhood Cancer for Cardiomyopathy: Comparison of Echocardiography and Cardiac Magnetic Resonance Imaging

Gregory T. Armstrong, Juan Carlos Piana, Nan Zhang, Deekumar Srivastava, Daniel M. Green,
Kirsten K. Ness, F. Daniel Donovan, Monika L. Metzger, Alejandro Arevalo, Jean-Bernard Durand,
Vijaya Joshi, Melissa M. Hudson, Leslie L. Robison, and Scott D. Flamm

Compared to CMR-

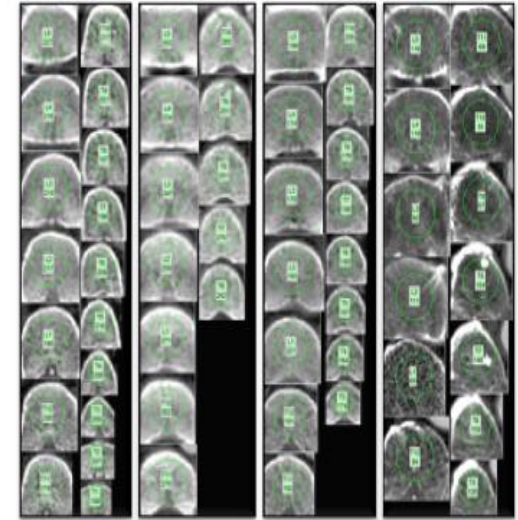
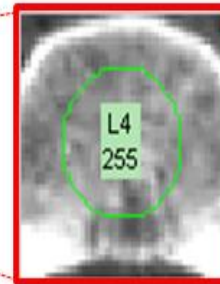
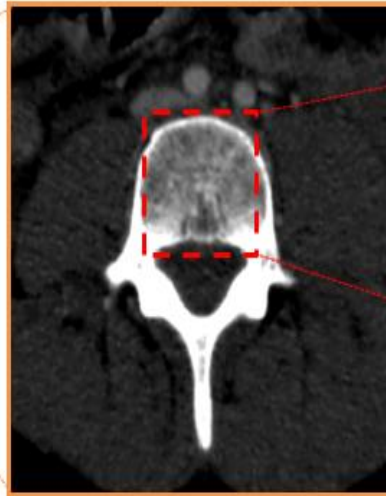
2D echo yielded sensitivity of 25% (false negative rate 75%)
for detection of EF<50%

CT Data from Osteosarcoma Patients



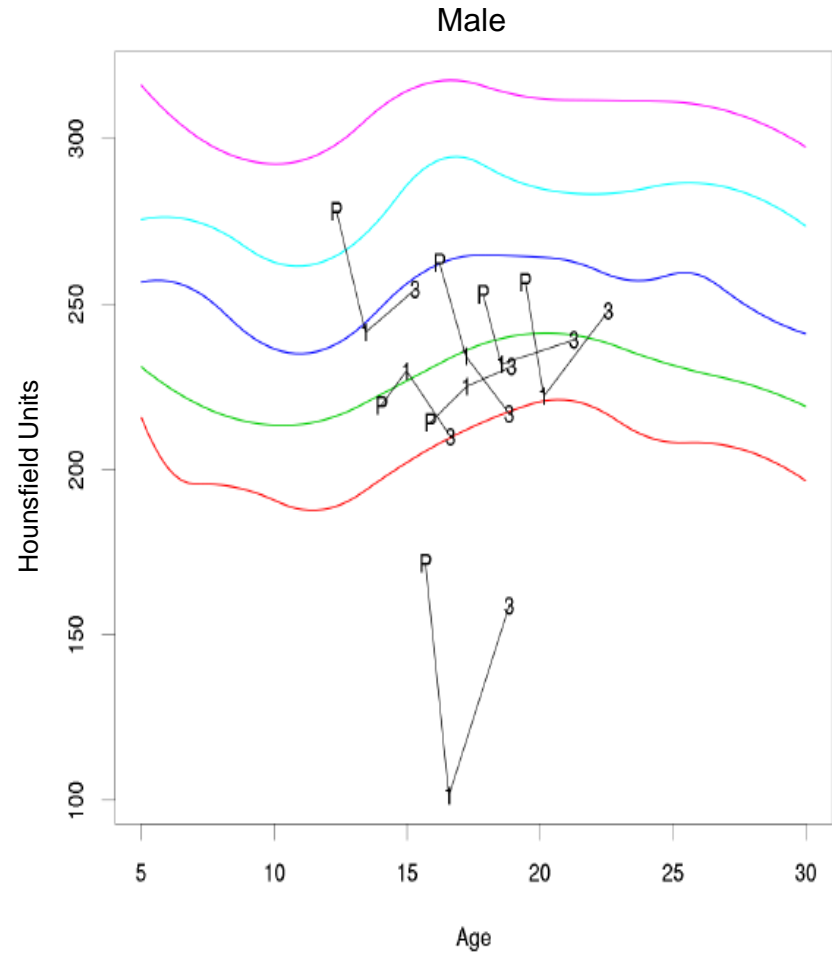
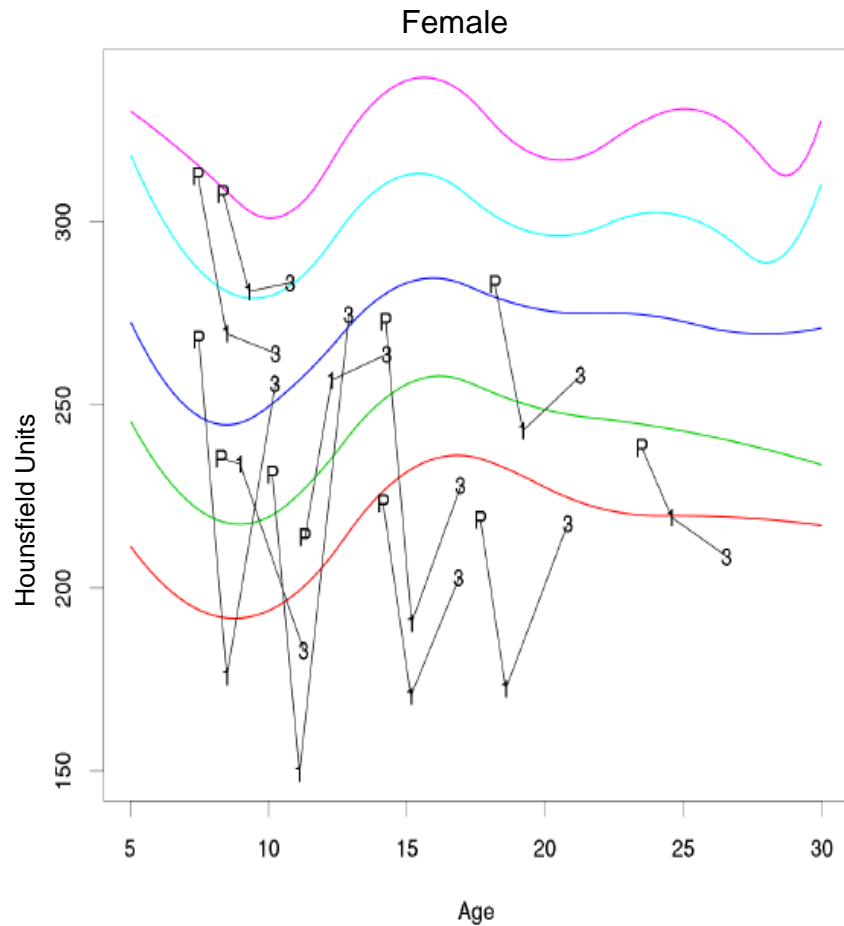
The Dorsal Muscle Group (DMG) being measured at the lower thoracic level.

Trabecular Bone Density



Measure	Unit	Meaning
BMDHUVBALIGNED	HU	Average pixel intensity (in CT Hounsfield Units) inside central bone core sample

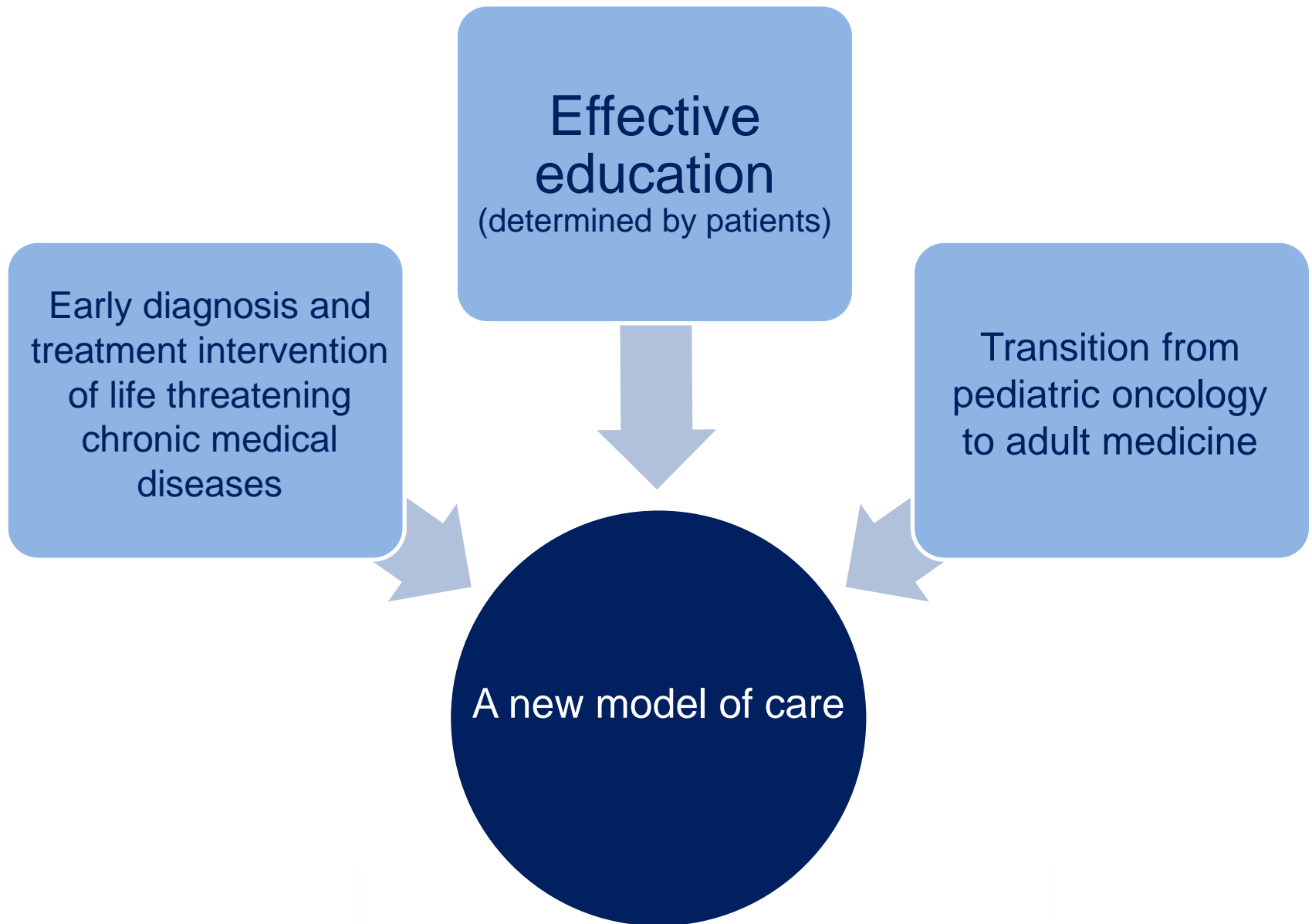
Trabecular Bone Density



Morphomics Analysis: Trabecular Bone Density

	1-year scan Decrease	1-year scan Increase	Recover to Baseline or Better at 3 years	Did NOT Recover at 3 years	Continuing to Decrease from 1-year scan
Female (11)	10/11	1/11	2/10	6/10	2/10
Male(7)	5/7	2/7	2/5	1/5	2/5

Sarcoma Survivorship Clinic Goals



Survivorship Annual Visit



- Blood pressure
- BMI
- Lipid panel
- Echo(with strain)
- Serum BUN, creatinine
- Spot urine protein/creatinine
- 6 minute walk
- Timed PBJ sandwich
- PROMIS® Questionnaires



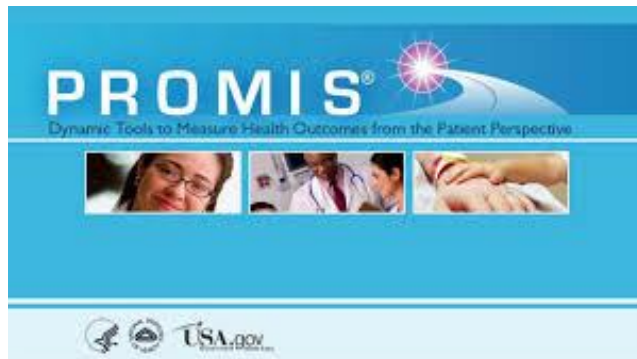
NIH PROMIS®

Patient Reported Outcomes Measurement Information System

- Cooperative development group lead by the NIH (6 universities) begun in 2004
- Longitudinal validation studies to test reliability and validity in new populations and treatments to refine the meaning, clarity, and literacy demands of all items conducted
 - focus groups
 - cognitive interviews
 - reading level analyses

Self-Reported Patient Health

- Physical Health
- Anxiety
- Depression
- Fatigue
- Sleep Disturbance
- Social Function
- Pain Interference
- Global Health



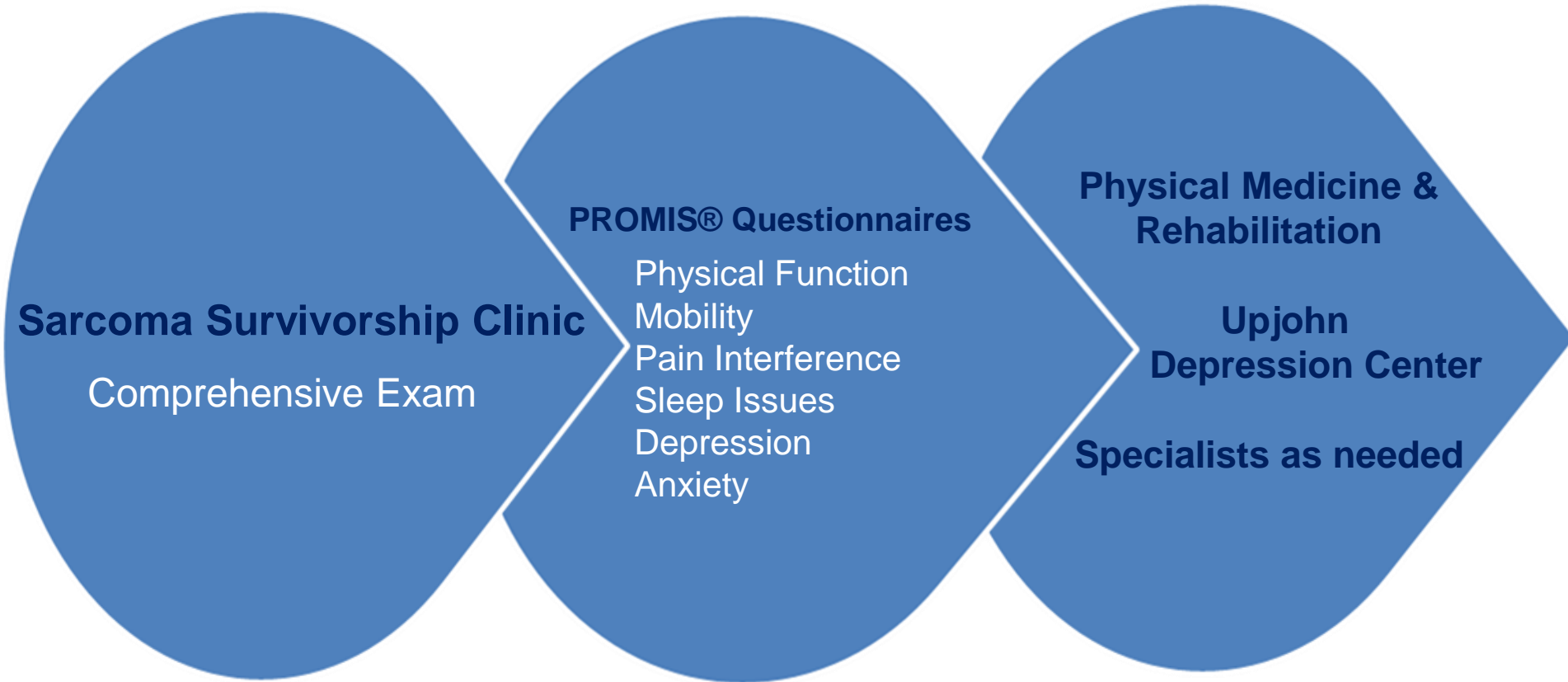
PROMIS Questionnaire: Depression

In the past 7 days...					
DEPRESSION					
	Never	Rarely	Sometimes	Often	Always
I felt worthless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt helpless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt depressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt hopeless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt like a failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt unhappy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt like I had nothing to look forward to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt that nothing could cheer me up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Questionnaires are sent prior to 1st visit and every 6 months thereafter

Sarcoma Survivors with Issues

There is a paucity of data related to illnesses such as depression in sarcoma survivors.



Systematically collect data prospectively measuring physical & mental function over time

