SURVIVORSHIP CARE FOR CHILDHOOD AND ADOLESCENT BLOOD CANCER

JULY 16, 2020

LEUKEMIA & LYMPHOMA SOCIETY®

1

LEARNING OBJECTIVES

- Describe an overview of long-term and late effects of treatment for childhood blood cancers
- Explain the importance of following a care plan, consultation in a survivorship program and communication between the treating pediatrician/family physician and family
- Address survivorship guidelines, including screening and management strategies
- Identify strategies and resources to support survivors, including as they continue their education

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

2

FACULTY

Tara O. Henderson, MD, MPH, FASCO
Professor of Pediatrics
Director, Childhood, Adolescent and Young Adult Survivorship Center
Director, Cancer Survivorship and Co-Leader, Cancer Prevention and Control Program
Comprehensive Cancer Center
The University of Chicago
Chicago, IL

Danielle Novetsky Friedman, MD, MS
Assistant Member
Pediatric Long-Term Follow-Up Program
Memorial Sloan Kettering Cancer Center
New York, NY

DISCLOSURES

Survivorship Care for Childhood and Adolescent Blood Cancer

Dr. Henderson has received research grants from Seattle Genetics

Dr. Friedman has no affiliations to disclose

OUTLINE

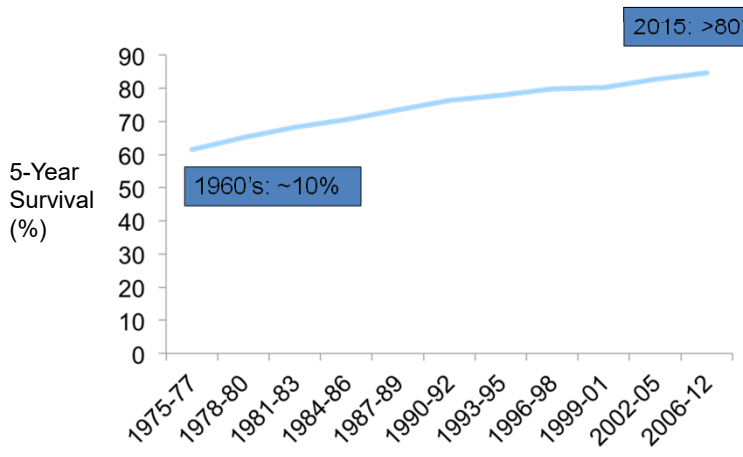
1. Epidemiology of childhood cancer survivorship
2. Three patient stories from leukemia and lymphoma survivors
3. Models of risk-based survivorship care
   * Resources for the future

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

5

THE CHILDHOOD AND ADOLESCENT CANCER SUCCESS STORY



- Laboratory discovery
- More intense therapy
- Clinical trials
- Supportive care
- New therapies
  - Stem cell transplant
  - Targeted agents
  - Immunotherapy

SEER Cancer Statistics, 1975-2011

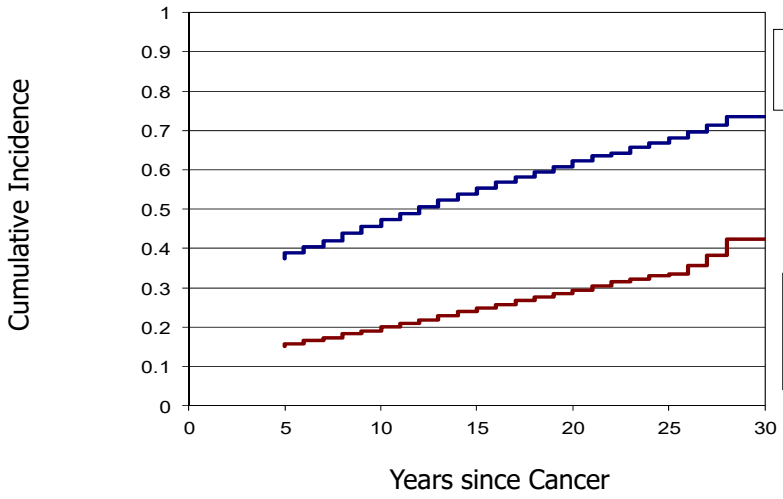
BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

6

WHAT IS THE COST OF CURE?

Childhood Cancer Survivor Study
(n=10,397 survivors diagnosed 1970-1986)



73.4% with at least one chronic condition

42.4% with a severe or life-threatening condition or death

BEATING CANCER IS IN OUR BLOOD.

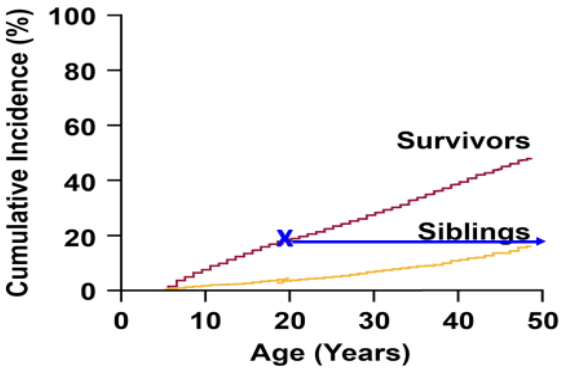
Oeffinger KC, et al. NEJM, 2006

LEUKEMIA & LYMPHOMA SOCIETY®

7

SURVIVORS HAVE A PHENOTYPE OF PREMATURE AGING

Cumulative incidence of serious, disabling, life threatening chronic conditions



BEATING CANCER IS IN OUR BLOOD.

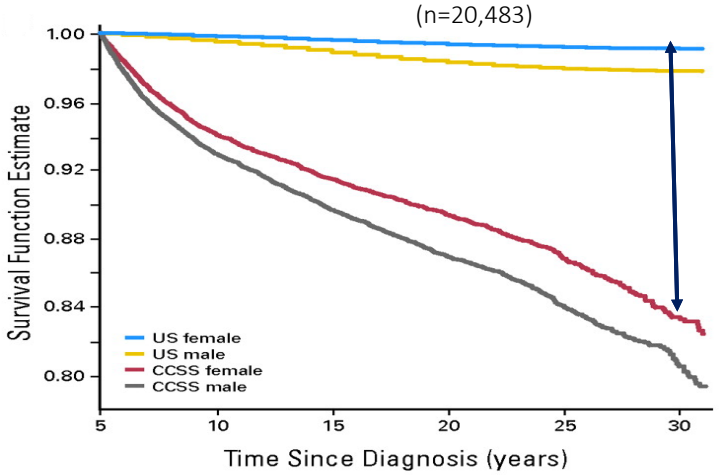
Armstrong GT, et al. JCO, 2014

LEUKEMIA & LYMPHOMA SOCIETY®

8

EXCESS RISK OF EARLY MORTALITY PERSISTS OVER TIME

Childhood Cancer Survivor Study
(n=20,483)



Cause-specific mortality

- Subsequent malignancy (SMR = 15.2)
- Cardiac (SMR =7.0)
- Other medical causes (SMR=2.6)

BEATING CANCER IS IN OUR BLOOD.

Mertens AC, et al. JNCI, 2008
SMR=standardized mortality ratio

LEUKEMIA & LYMPHOMA SOCIETY®

9

CHILDHOOD AND ADOLESCENT CANCER SURVIVORSHIP: A NEW CHRONIC DISEASE PARADIGM

- Distinct from classic chronic disease
- Once cured, often no signs of sequelae for many years
- Traditional chronic disease model inadequate to describe evolution of health issues and premature aging in survivors

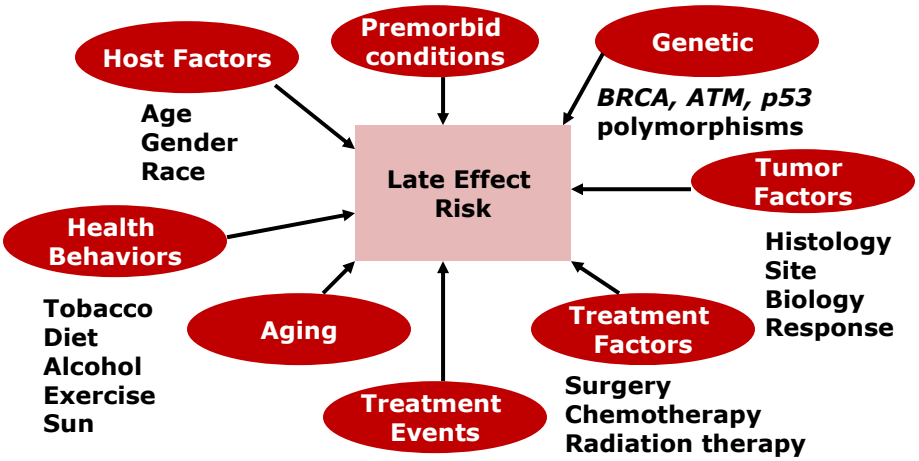
BEATING CANCER IS IN OUR BLOOD.

Oeffinger & Robison, JAMA 2007

LEUKEMIA & LYMPHOMA SOCIETY®

10

WHAT CONTRIBUTES TO LATE EFFECTS AFTER CANCER?



BEATING CANCER IS IN OUR BLOOD.

Hudson M, *Cancer,* 2005

LEUKEMIA & LYMPHOMA SOCIETY®

11

What are some of the long-term problems, or "late effects," that can result from being diagnosed and treated for blood cancer during childhood and adolescence?

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

12

LATE EFFECTS: PHYSICAL

Growth and Development
- Linear growth
- Skeletal maturation
- Intellectual function
- Emotional/social maturation
- Sexual development

Fertility and Reproduction
- Sexual function
- Fertility
- Health of offspring

Organ Function
- Cardiac
- Pulmonary
- Endocrine
- GI/Hepatic
- Genitourinary
- Musculoskeletal
- Neurocognitive
- Neurologic
- Neurosensory

Cancer
- Recurrent (primary)
- Second cancers

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

13

LATE EFFECTS: PSYCHOLOGICAL

Mental Health
- Depression/mood disorders
- Cancer-related anxiety
- Post-traumatic stress

Physical/Body image
- Weight loss/gain
- Loss of organs/tissues

Chronic Symptoms
- Fatigue/ Low energy
- Disrupted sleep
- Poor memory/concentration
- Chronic pain

Self-care
- Independent living

Education/Vocation
- Academic underachievement
- Vocational limitations
- Under/unemployment
- Loss of job/benefits

Insurance Discrimination
- Access to health care

Financial Toxicity
- Debt (medical/other)

Social Interaction
- Family/peer relationships
- Social withdrawal/isolation
- Intimacy/marriage/family
- Cancer-related stigma

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

14

System →	Exposure →	Potential Late Effects
Cardiac	Chest radiation Anthracyclines	Valvular disease Pericarditis Myocardial infarction Congestive heart failure
Pulmonary	Radiation therapy CCNU/BCNU Bleomycin	Restrictive lung disease
Endocrine	Cranial radiation Total body irradiation High-dose alkylating agents	Hypothalamic-pituitary dysfunction: GH deficiency, ACTH deficiency, FSH/LH deficiency, TSH deficiency Thyroid dysfunction Ovarian or testicular dysfunction
Metabolic	Abdominal radiation Total body irradiation Cranial radiation	Diabetes mellitus Metabolic syndrome Obesity
Hearing	Platinum agents, cranial radiation	Hearing loss
Renal	Surgery (nephrectomy) Radiation therapy Platinum agents Cyclophosphamide/Ifosfamide	Renal insufficiency or failure
Neurocognitive	Cranial radiation Young age at treatment High-dose methotrexate	Learning disabilities Cognitive dysfunction
Subsequent malignancies	Alkylating agents Epipodophyllotoxins Radiation therapy	Leukemias Solid tumors

15

Three Patient Stories

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY

16

STORY 1…

14-year old male has been referred to long-term follow up 3 years after completing treatment for standard risk ALL which was diagnosed at age 9.

He received 3 years of multiagent chemotherapy which included low doses of anthracycline, vincristine, cyclophosphamide, asparaginase, 6-MP, methotrexate and steroids.

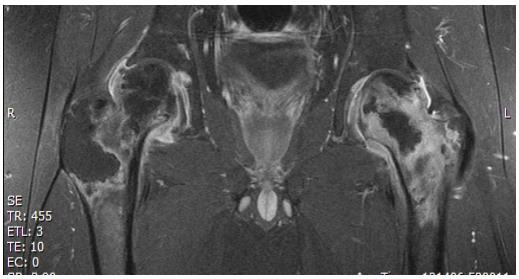
In taking his history, he notes that he has developed hip pain in the last month and his grades in school have been B's and C's.

WHAT TESTS SHOULD HIS PROVIDER ORDER TO INVESTIGATE HIS HIP PAIN/BONY PROBLEMS?

A. Serum calcium
B. DEXA scan
C. Hip x-ray
D. Parathyroid hormone

SKELETAL COMPLICATIONS

- Osteonecrosis
  - Associated with:
    - Older age
    - Exposure to steroids
    - Exposure to methotrexate
    - Genetics
- Low bone mineral density
  - DEXA scans generally not recommended before age 18 years (results not standardized for pediatric patients)
  - Associated with:
    - Older age
    - Exposure to steroids
    - Exposure to methotrexate



HOW SHOULD THE PROVIDER ADDRESS SCHOOL ISSUES?

A. Don't worry about it, he's a normal kid
B. Refer to neuropsychology
C. Screen for depression and anxiety
D. Both B and C

LEARNING PROBLEMS

- Seen most commonly in those treated with radiation to the brain
- Risk is greatest in individuals under age 3-5 years at treatment
- Special neuropsychological testing required with serial educational/vocational assessments over time

NEUROPSYCHOLOGICAL OUTCOMES

- Executive functioning (planning, organization, problem solving - not IQ!)
  - Exposure to steroids
  - Exposure to methotrexate
  - Genetics
  - Early screening and social work intervention with schools
- Higher prevalence of adverse psychosocial outcomes in childhood cancer survivors
  - Depression and anxiety
  - Anger
  - Socially withdrawn
  - Early screening and referral to counseling and mental health providers

STORY 2…

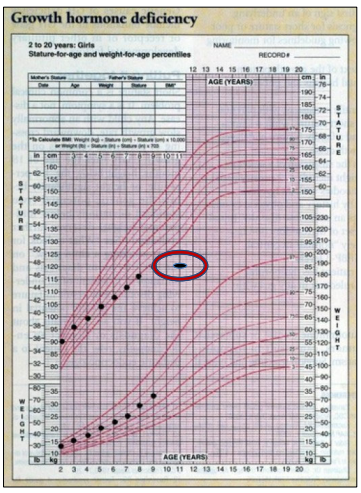
11-year old female **treated for high-risk** ***Acute Lymphoblastic Leukemia*** **when she was** ***4 years*** **old presenting for LTFU**

She received combination chemotherapy followed by allogeneic stem cell transplantation

- Cytoreduction included **cyclophosphamide, thiotepa,** and **total body irradiation [TBI]** (1375 cGy)

Missed last year's visit because she felt so well…

GROWTH CURVE AT TODAY'S VISIT



WHAT ARE YOUR CONCERNS FOR THIS PATIENT?

A. Growth hormone deficiency
B. Primary hypothyroidism
C. CBC is normal. No concerns.
D. Both A and B

25

Transplant Population

Prior therapy

Preconditioning chemotherapy

TBI

Post SCT chemo

GVHD

Potential Late Effects

- **Endocrinopathies**
- **Osteoporosis**
- **Osteonecrosis**
- **Gonadal dysfunction**
- **Insulin resistance/dyslipidemia**
- **Renal insufficiency**
- **Pulmonary complications**
- **Cataracts**
- **Oral/dental problems**
- **Gait and balance disturbances**

26

Transplant Population

Prior therapy

Preconditioning chemotherapy

TBI

Post SCT chemo

GVHD

Potential Late Effects

- **Endocrinopathies**
- **Osteoporosis**
- **Osteonecrosis**
- **Gonadal dysfunction**
- **Insulin resistance/dyslipidemia**
- **Renal insufficiency**
- **Pulmonary complications**
- **Cataracts**
- **Oral/dental problems**
- **Gait and balance disturbances**

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

27

LATE EFFECTS: ENDOCRINE COMPLICATIONS

- Most prevalent late effects in survivors of childhood cancer
- Observed in 40-60% of survivors followed into adulthood
- Most often seen in survivors treated with:
  - Radiation impacting the brain (including TBI)
  - High-dose alkylating agents

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

28

POOR LINEAR GROWTH (1)

Growth hormone deficiency (endocrine):

- Common after radiation doses ≥ 18 Gy impacting the brain
- Children treated with total body irradiation (TBI) doses ≥ 12 Gy are also at risk

- Screening: Height should be plotted every 6 months on standardized growth curves and pubertal development should be monitored
- Those with the above risk factors and poor growth rate should undergo formal growth hormone stimulation testing

POOR LINEAR GROWTH (1)

Impaired spinal growth (non-endocrine):

- Patients treated with spinal and/or total body irradiation may demonstrate stunted spinal growth
  - Becomes most apparent during puberty
- Due to radiation-induced direct damage to the growth plate, usually the vertebrae
- Monitor serial sitting heights
  - No clear data on utility of treatment

THYROID DYSFUNCTION

- Common after radiation to the neck
- Associated with tyrosine kinase inhibitor exposure (sunitinib, imatinib, etc)
- Risk increases with higher radiation doses
- Risk increases over time
- Screening: Annual TSH
- Easily treated with a single daily pill (levothyroxine)

GONADAL DYSFUNCTION

- Risk greatest after:
  - Radiation to the ovaries (or testes for boys)
  - Treatment with high doses of alkylating agents (cyclophosphamide, procarbazine, busulfan, thiotepa)
- In girls, younger age at treatment is protective
- Screening: Monitor serial blood tests of ovarian function as well as pubertal development, menstrual regularity
- Post-treatment egg freezing may be an option for menstruating females

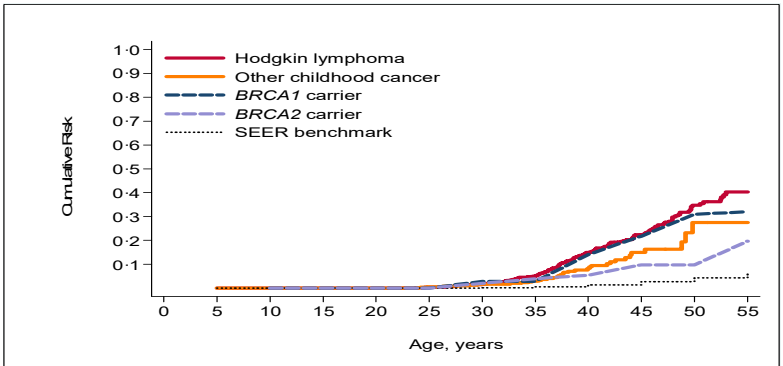
STORY 3…

26-year old female seeking to establish care in your practice
Recently moved to NYC from California
History notable for diagnosis of *Hodgkin lymphoma, Stage IIB, Nodular Sclerosing* at age 11

Treatment included multiagent chemotherapy and mantle radiation (25 Gy)

On exam, you palpate a breast mass…

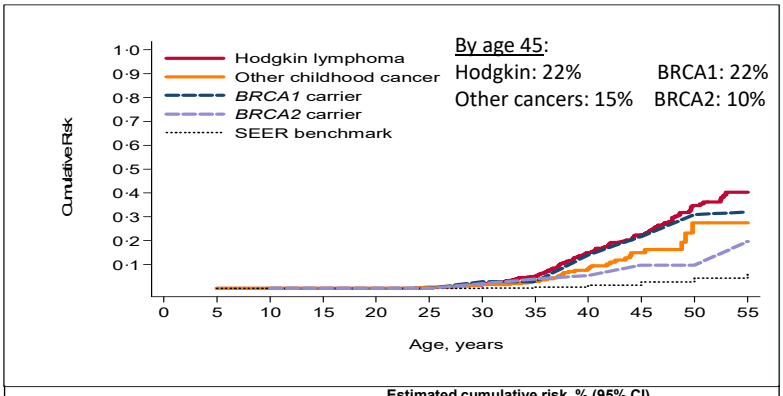
BREAST CANCER AFTER CHEST RADIATION



	Estimated cumulative risk, % (95% CI)		
	By age 40	By age 45	By age 50
Childhood cancer survivors			
Entire cohort	12 (10,14)	18 (16,21)	30 (25,34)
Primary cancer diagnosis			
Hodgkin lymphoma	15 (12,18)	22 (17,25)	35 (29,40)
Other childhood cancer*	8 (5,12)	15 (10,21)	- -
Carriers of genetic mutations			
BRCA1 carriers	14 (5,23)	22 (11,33)	31 (15,48)
BRCA2 carriers	5 (0,15)	10 (1,23)	10 (1,23)

Moskowitz CS, et al. *JCO*, 2014

BREAST CANCER AFTER CHEST RADIATION



	Estimated cumulative risk, % (95% CI)		
	By age 40	By age 45	By age 50
Childhood cancer survivors			
Entire cohort	12 (10,14)	18 (16,21)	30 (25,34)
Primary cancer diagnosis			
Hodgkin lymphoma	15 (12,18)	22 (17,25)	35 (29,40)
Other childhood cancer*	8 (5,12)	15 (10,21)	- -
Carriers of genetic mutations			
BRCA1 carriers	14 (5,23)	22 (11,33)	31 (15,48)
BRCA2 carriers	5 (0,15)	10 (1,23)	10 (1,23)

BEATING CANCER IS IN OUR BLOOD.

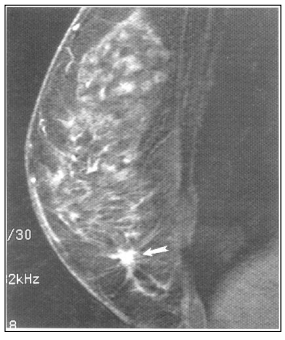
Moskowitz CS, et al. *JCO*, 2014

LEUKEMIA & LYMPHOMA SOCIETY®

35

BREAST CANCER SCREENING GUIDELINES AFTER CHEST RADIATION

- For all females exposed to chest-directed radiation (including TBI):
  - **Clinical breast exam** by a health care provider annually from puberty to age 25; then every 6 months after age 25
  - **Annual breast MRI and mammogram** beginning at age 25 or 8 years after completion of therapy, whichever occurs later



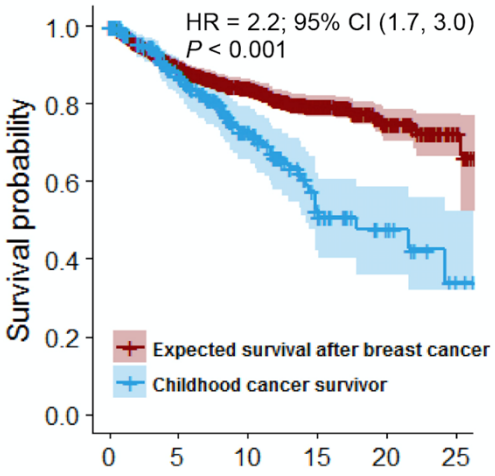
BEATING CANCER IS IN OUR BLOOD.

www.survivorshipguidelines.org

LEUKEMIA & LYMPHOMA SOCIETY®

36

BREAST CANCER MORTALITY



- Comparing 274 childhood cancer survivors with breast cancer to 1095 women with *de novo* breast cancer:
  - Breast cancer specific mortality modestly elevated (HR=1.3, 95% CI 0.9-2.0)
  - 5 times (HR=5.5, 95% CI 3.4-9.0) more likely to die of other health-related causes
    - SMN
    - Cardiovascular disease
    - Pulmonary disease

BEATING CANCER IS IN OUR BLOOD.

Moskowitz et al J Clin Oncol 2019.

LEUKEMIA & LYMPHOMA SOCIETY®

37

How do we ensure that the health care of childhood and adolescent blood cancer survivors is maximized…..

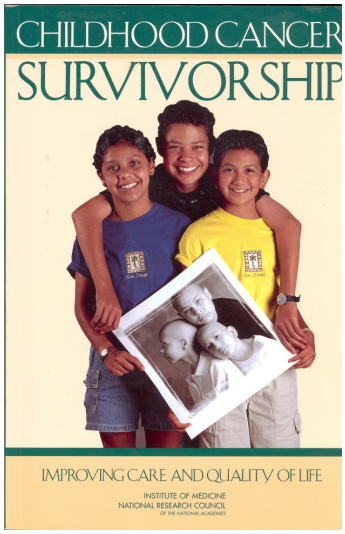
so health risks are minimized, and quality of life is optimal?

BEATING CANCER IS IN OUR BLOOD.

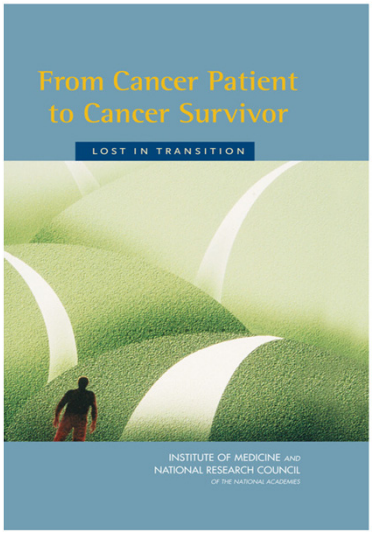
LEUKEMIA & LYMPHOMA SOCIETY®

38

INSTITUTE OF MEDICINE CALL TO ACTION



2003



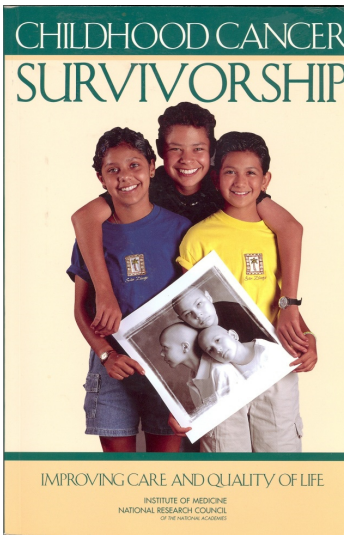
2005

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

39

INSTITUTE OF MEDICINE CALL TO ACTION



2003

2003 Recommendations:

- Risk-based health care
  - Monitor for cancer recurrence
  - Surveillance and intervention for late effects and second cancers
  - Prevention/education
    - Lifestyles, health behaviors
    - Education
    - Assistance with financial challenges

BEATING CANCER IS IN OUR BLOOD.

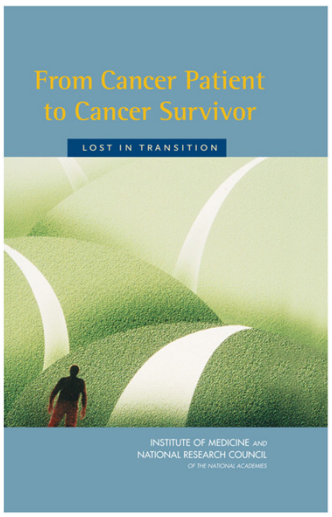
LEUKEMIA & LYMPHOMA SOCIETY®

40

INSTITUTE OF MEDICINE CALL TO ACTION

2005 Recommendations:

- Survivorship Care Plan for all cancer survivors
  - Roadmap for post-treatment care
  - Created by oncology provider
  - For survivor, primary care providers

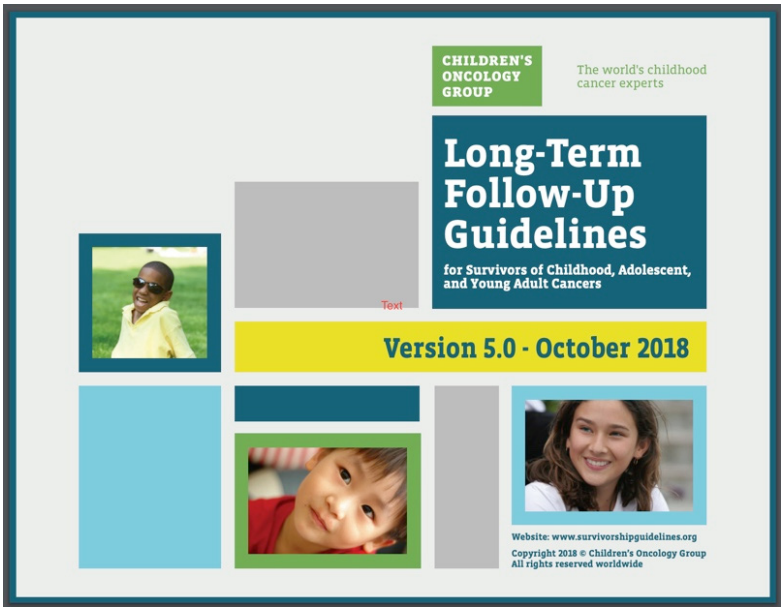


2005

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

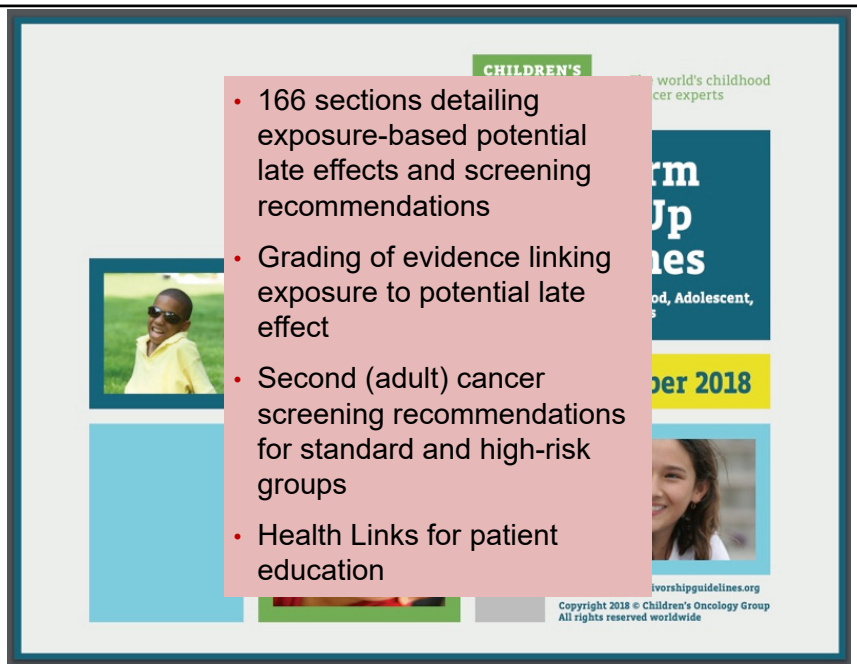
41



BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

42



- 166 sections detailing exposure-based potential late effects and screening recommendations
- Grading of evidence linking exposure to potential late effect
- Second (adult) cancer screening recommendations for standard and high-risk groups
- Health Links for patient education

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

43

CHEMOTHERAPY

ANTHRACYCLINE ANTIBIOTICS (CONT)

Sec #	Therapeutic Exposure	Potential Late Effects	Periodic Evaluation	Health Counseling/ Further Considerations
33	**Anthracycline Antibiotics** Daunorubicin Doxorubicin Epirubicin Idarubicin Mitoxantrone ~~Dose Conversion~~ To gauge the frequency of screening, use the following formulas to convert to doxorubicin isotoxic equivalents prior to calculating total cumulative anthracycline dose. Clinical judgment should ultimately be used to determine indicated screening for individual patients. Doxorubicin: Multiply total dose x 1 Daunorubicin: Multiply total dose x 0.5 Epirubicin: Multiply total dose x 0.67 Idarubicin: Multiply total dose x 5 Mitoxantrone: Multiply total dose x 4	**Cardiac toxicity** Cardiomyopathy Subclinical left ventricular dysfunction Congestive heart failure Arrhythmia	**HISTORY** **Shortness of breath** **Dyspnea on exertion** **Orthopnea** **Chest pain** **Palpitations** **If under 25 yrs: abdominal symptoms (nausea, vomiting)** Yearly **PHYSICAL** **Blood pressure** **Cardiac exam** Yearly **SCREENING** **ECHO (or comparable imaging to evaluate cardiac function)** **Recommended Frequency of Echocardiogram** Anthracycline Dose* / Radiation Dose** / Recommended Frequency None / < 15 Gy or none / No screening None / ≥ 15 - < 35 Gy / Every 5 years None / ≥ 35 Gy / Every 2 years < 250 mg/m² / < 15 Gy or none / Every 5 years < 250 mg/m² / ≥ 15 Gy / Every 2 years ≥ 250 mg/m² / Any or none / Every 2 years *Based on doxorubicin isotoxic equivalent dose. See dose conversion instructions in section 33. **Based on radiation dose with potential impact to heart (radiation to chest, abdomen, spine [thoracic, whole], TBI). See section 76. **EKG (include evaluation of QTc interval)** Baseline at entry into long-term follow-up, repeat as clinically indicated	**HEALTH LINKS** **Heart Health** **Cardiovascular Risk Factors** **Diet and Physical Activity** **COUNSELING** Maintain appropriate weight, blood pressure and heart-healthy diet. Regarding exercise: - Regular exercise is generally safe and should be encouraged for patients who have normal LV systolic function. - Survivors with asymptomatic cardiomyopathy should consult cardiology to define limits and precautions for physical activity. - Cardiology consultation may be reasonable to define limits and precautions for physical activity for high risk survivors (i.e., those requiring an ECHO every 2 years) who plan to participate in intensive exercise. If QTc interval is prolonged: Caution regarding use of medications that may further prolong the QTc interval (e.g., tricyclic anti-depressants, antifungals, macrolide antibiotics, metronidazole). **POTENTIAL CONSIDERATIONS FOR FURTHER TESTING AND INTERVENTION** Cardiac MRI as an adjunct imaging modality when echocardiographic images are suboptimal. Cardiology consultation in patients with subclinical abnormalities on screening evaluations, left ventricular dysfunction, dysrhythmia, or prolonged QTc interval. Female patients only: For patients who are pregnant or planning to become pregnant, additional cardiology evaluation is indicated in patients who received: - ≥250 mg/m² anthracyclines - ≥35 Gy chest radiation, or - Anthracycline (any dose) combined with chest radiation (≥15 Gy) Evaluation should include a baseline echocardiogram (pre- or early-pregnancy). For those without prior abnormalities and with normal pre- or early-pregnancy baseline echocardiograms, follow-up echocardiograms may be obtained at the provider's discretion. Those with a history of systolic dysfunction or with pre- or early-pregnancy systolic dysfunction are at highest risk for pregnancy-associated cardiomyopathy. Such individuals should be monitored periodically during pregnancy and during labor and delivery due to increased risk for cardiac failure. **SYSTEM = Cardiovascular** **SCORE = 1**

Additional Information

Although Mitoxantrone technically belongs to the anthracenedione class of anti-tumor antibiotics, it is related to the anthracycline family and is included in this section because of its cardiotoxic potential.

44

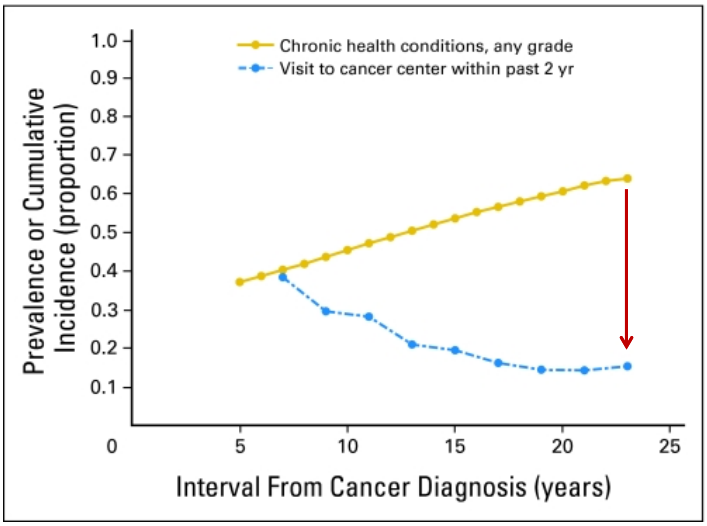
Are survivors receiving risk-based health care, such as early breast cancer screening for women exposed to chest radiation, after treatment for childhood blood cancer?

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

45

MOST SURVIVORS ARE NOT FOLLOWED IN A CANCER CENTER



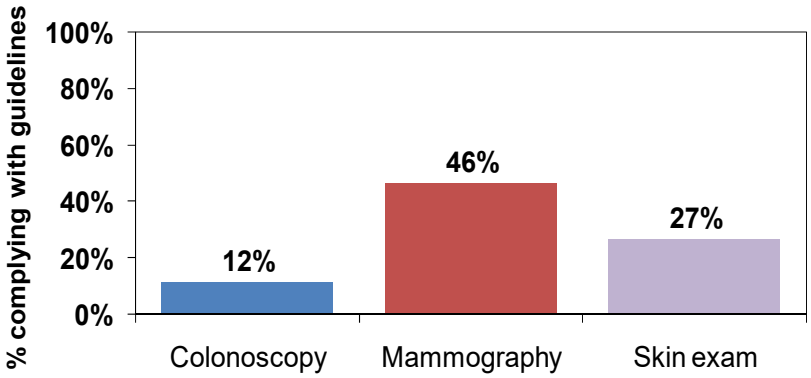
BEATING CANCER IS IN OUR BLOOD.

Nathan PC, et al. JCO, 2009

LEUKEMIA & LYMPHOMA SOCIETY®

46

HIGH-RISK SURVIVORS ARE NOT COMPLIANT WITH GUIDELINES



BEATING CANCER IS IN OUR BLOOD.

Nathan et al. Ann Intern Med. 2010.

LEUKEMIA & LYMPHOMA SOCIETY®

47

Are physicians aware of available long-term follow-up guidelines for childhood and adolescent blood cancer survivors?

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

48

PERSPECTIVES ON SURVIVORSHIP CARE

- In a recent survey of 1110 internists, on average, primary care providers reported being:
  - **"Somewhat uncomfortable"** caring for childhood cancer survivors
  - **"Somewhat unfamiliar"** with available surveillance guidelines

BEATING CANCER IS IN OUR BLOOD.

Suh E, et al. Ann Intern Med, 2014

LEUKEMIA & LYMPHOMA SOCIETY®

49

PERSPECTIVES ON SURVIVORSHIP CARE: PCPS

- However, in response to a clinical vignette:
  - **90.6%** of respondents did not appropriately recommend yearly breast cancer surveillance
  - **85.1%** did not appropriately recommended cardiac surveillance
  - **23.6%** did not appropriately recommend yearly thyroid surveillance

Table 2. **Clinical Vignette Questions and Physician Responses**

Question and Answer Choices	Responses, n (%)†
Breast cancer surveillance	
In thinking about C.L.'s medical care, how would you approach breast cancer screening?	
I would follow current accepted guidelines for average-risk individuals and ask her to begin yearly mammograms when she turns 50.	220 (20.0)
I would recommend yearly mammograms starting this year.*	196 (17.8)
I would recommend every-other-year mammograms starting this year.	123 (11.2)
I would recommend yearly breast magnetic resonance imaging and mammograms starting this year.*	103 (9.4)
Don't know or unsure	458 (41.6)
Missing	10
Cardiac surveillance	
You see that C.L. had an echocardiogram 5 years after chemotherapy. The echocardiogram was normal. How would you approach cardiac care for this patient?	
I would not proceed with further testing.	567 (51.5)
I would refer her at this time to a cardiologist for evaluation and stress testing.	81 (7.4)
I would recommend every-other-year echocardiogram.*	164 (14.9)
I would recommend yearly echocardiogram.	85 (7.7)
Don't know or unsure	205 (18.6)
Missing	8
Thyroid surveillance	
You review C.L.'s past laboratory results and see that she has undergone yearly thyroid function tests. They have all been normal. What would be your approach to thyroid screening?	
I would repeat thyroid-stimulating hormone and free thyroxine test and plan to check both yearly.*	843 (76.4)
I would check thyroid-stimulating hormone this year and then discontinue if test is normal.	56 (5.1)
I would discontinue thyroid function tests since they have been normal.	70 (6.3)
Don't know or unsure	135 (12.2)
Missing	6

* Correct answers.
† Percentages were not calculated for answers deemed "missing."

BEATING CANCER IS IN OUR BLOOD.

Suh E, et al. Ann Intern Med, 2014

50

PERSPECTIVES ON SURVIVORSHIP CARE: PCPS

- However, in response to a clinical vignette:
  - **90.6%** of respondents did not app… bre…
  - **85.** … rec… surveillance
  - **23.6%** did not appropriately recommend yearly thyroid surveillance

5.4%
answered in full accordance with COG guidelines

Table 2. **Clinical Vignette Questions and Physician Responses**

Question and Answer Choices	Responses, n (%)†
Breast cancer surveillance	
In thinking about C.L.'s medical care, how would you approach breast cancer screening?	
I would follow current accepted guidelines for average-risk individuals and ask her to begin yearly mammograms when she turns 50.	220 (20.0)
…tarting	196 (17.8)
	123 (11.2)
…arting	103 (9.4)
	458 (41.6)
	10
…years …h was …ic care	
	567 (51.5)
I would refer her at this time to a cardiologist for evaluation and stress testing.	81 (7.4)
I would recommend every-other-year echocardiogram.*	164 (14.9)
I would recommend yearly echocardiogram.	85 (7.7)
Don't know or unsure	205 (18.6)
Missing	8
Thyroid surveillance	
You review C.L.'s past laboratory results and see that she has undergone yearly thyroid function tests. They have all been normal. What would be your approach to thyroid screening?	
I would repeat thyroid-stimulating hormone and free thyroxine test and plan to check both yearly.*	843 (76.4)
I would check thyroid-stimulating hormone this year and then discontinue if test is normal.	56 (5.1)
I would discontinue thyroid function tests since they have been normal.	70 (6.3)
Don't know or unsure	135 (12.2)
Missing	6

* Correct answers.
† Percentages were not calculated for answers deemed "missing."

BEATING CANCER IS IN OUR BLOOD. *Suh E, et al. Ann Intern Med, 2014*

51

SIGNIFICANT GAPS IN PROVIDER KNOWLEDGE

AYA Hodgkin Lymphoma Survivor Vignette			
Responses Concordant with COG Guidelines	**General Internists (N=1110)**	**Family Physicians (N=1124)**	**Pediatric Oncologists (N=665)**
Breast cancer screening	27%	16%	66%
Thyroid screening	76%	74%	76%
Cardiac screening	15%	10%	57%
Total	5%	2%	33%

BEATING CANCER IS IN OUR BLOOD.

Henderson, et al. *J Clin Oncol* 2010; Nathan P, et al. *J Cancer Surv* 2013; Suh E et al, *Ann Intern Med* 2014

LEUKEMIA & LYMPHOMA SOCIETY

52

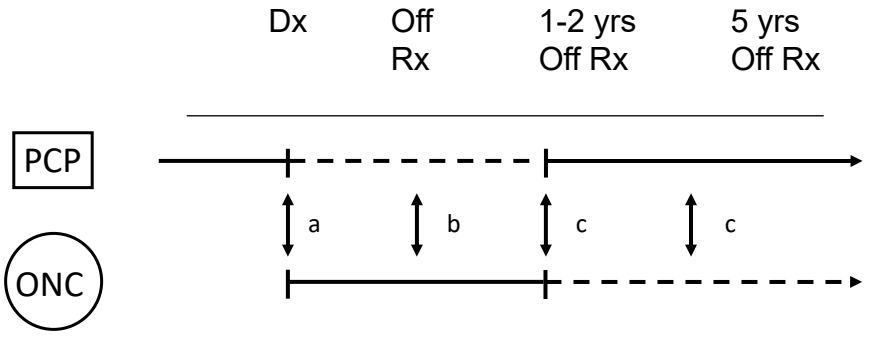
How do we overcome barriers to survivors receiving risk-based health care?

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

53

STRATIFIED CARE OF LOW-RISK SURVIVORS



a. Treatment plan
b. Treatment summary
c. Continued communication and updating

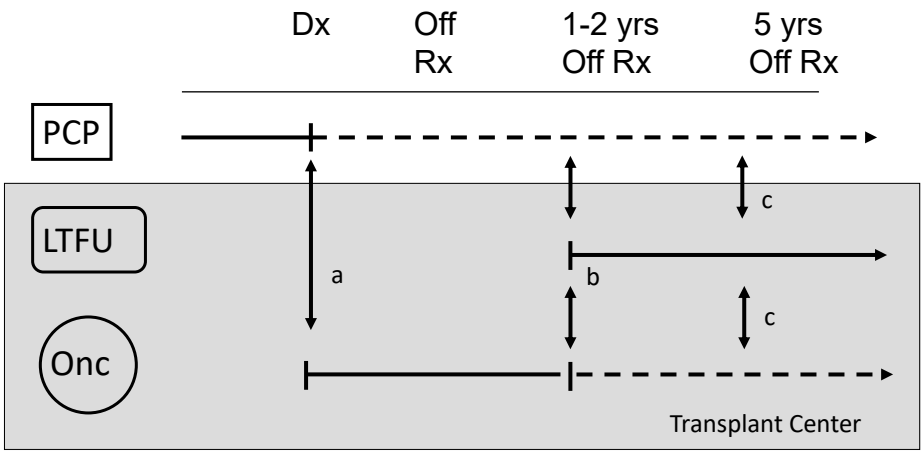
BEATING CANCER IS IN OUR BLOOD.

Oeffinger KC et al, *ASCO Ed Book, 2014*

LEUKEMIA & LYMPHOMA SOCIETY®

54

STRATIFIED CARE OF HIGH-RISK SURVIVORS



a. Treatment plan
b. Treatment summary
c. Continued communication and updating

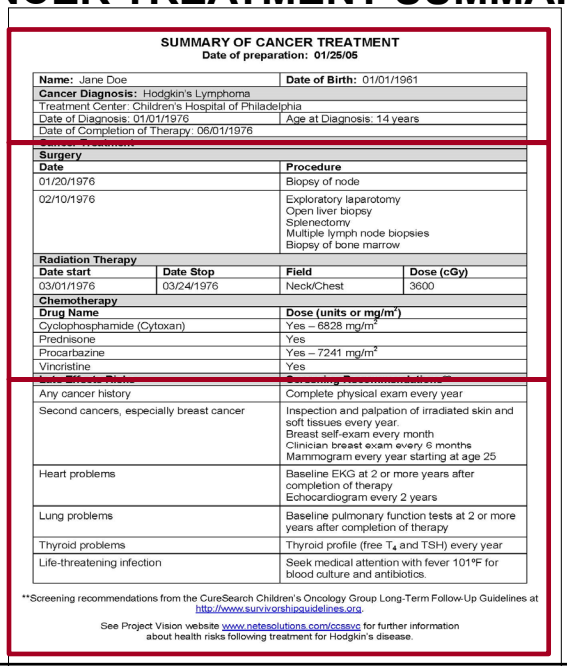
55

STRATEGIES FOR OPTIMIZING CARE

- Provide longitudinal, stratified risk-based health care for survivors of childhood blood cancer
  - Dedicated LTFU Programs
  - Partnerships with local providers
- Investigate the health outcomes and health care needs of this population
  - Research is key!
- Educate health care professionals regarding health care of survivors
  - More sessions like this one!

56

CANCER TREATMENT SUMMARY



SUMMARY OF CANCER TREATMENT
Date of preparation: 01/25/05

Name: Jane Doe		**Date of Birth:** 01/01/1961	
Cancer Diagnosis: Hodgkin's Lymphoma			
Treatment Center: Children's Hospital of Philadelphia			
Date of Diagnosis: 01/01/1976		Age at Diagnosis: 14 years	
Date of Completion of Therapy: 06/01/1976			
Cancer Treatment			
Surgery			
Date		**Procedure**	
01/20/1976		Biopsy of node	
02/10/1976		Exploratory laparotomy Open liver biopsy Splenectomy Multiple lymph node biopsies Biopsy of bone marrow	
Radiation Therapy			
Date start	**Date Stop**	**Field**	**Dose (cGy)**
03/01/1976	03/24/1976	Neck/Chest	3600
Chemotherapy			
Drug Name		**Dose (units or mg/m^2)**	
Cyclophosphamide (Cytoxan)		Yes – 6828 mg/m^2	
Prednisone		Yes	
Procarbazine		Yes – 7241 mg/m^2	
Vincristine		Yes	
Late Effects Risks		**Screening Recommendations**	
Any cancer history		Complete physical exam every year	
Second cancers, especially breast cancer		Inspection and palpation of irradiated skin and soft tissues every year. Breast self-exam every month Clinician breast exam every 6 months Mammogram every year starting at age 25	
Heart problems		Baseline EKG at 2 or more years after completion of therapy Echocardiogram every 2 years	
Lung problems		Baseline pulmonary function tests at 2 or more years after completion of therapy	
Thyroid problems		Thyroid profile (free T_4 and TSH) every year	
Life-threatening infection		Seek medical attention with fever 101ºF for blood culture and antibiotics.	

**Screening recommendations from the CureSearch Children's Oncology Group Long-Term Follow-Up Guidelines at http://www.survivorshipguidelines.org.

See Project Vision website www.netesolutions.com/ccssvc for further information about health risks following treatment for Hodgkin's disease.

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

57

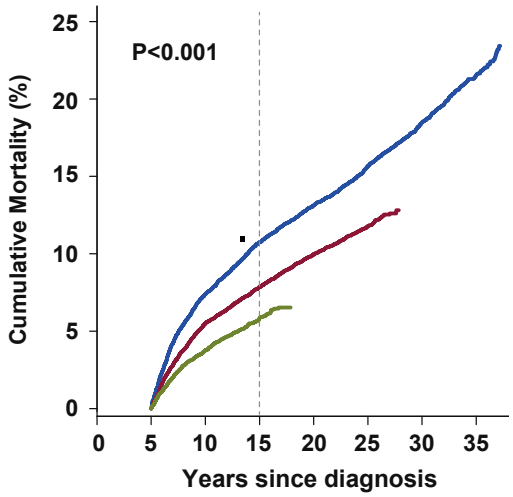
How does the understanding of long-term outcomes of cancer survivors impact cancer treatments?

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

58

WE ARE DOING BETTER WITH MODERN THERAPIES



15-Year Cumulative Mortality

1970s
10.7% (10.1 - 11.4)

1980s
7.9% (7.4 - 8.3)

1990s
5.8% (5.4 - 6.3)

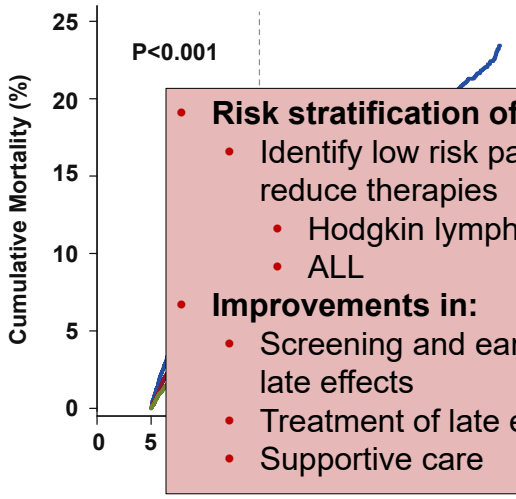
BEATING CANCER IS IN OUR BLOOD.

Armstrong GT et al. *NEJM* 2016.

LEUKEMIA & LYMPHOMA SOCIETY®

59

WE ARE DOING BETTER WITH MODERN THERAPIES



- **Risk stratification of therapy**
  - Identify low risk patients and reduce therapies
    - Hodgkin lymphoma
    - ALL
- **Improvements in:**
  - Screening and early detection of late effects
  - Treatment of late effects
  - Supportive care

15-Year Cumulative Mortality

970s
10.1 - 11.4)

980s
7.4 - 8.3)

990s
5.4 - 6.3)

BEATING CANCER IS IN OUR BLOOD.

Armstrong GT et al. *NEJM* 2016.

LEUKEMIA & LYMPHOMA SOCIETY®

60

SUMMARY

- Survivors of childhood and adolescent blood cancer face lifelong, long-term risks
- Many late effects are modifiable
- Goal of risk-based survivor care:
  - Reduce morbidity and mortality
  - Enhance quality of life
- Importance of shared-care model involving oncologist/survivorship team, primary care provider, and the patient/family

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

61

RESOURCES FOR HCPS

- ❑ Free CME & CE courses – www.LLS.org/CE
- ❑ Podcasts – www.LLS.org/HCPpodcast
- ❑ Staying Connected: Facilitating the Learning Experience During and After Cancer Treatment – www.LLS.org/StayingConnected

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

62

RESOURCES FOR HCPS AND PATIENTS

- LLS Online Community
  HCP, Patient/Survivor & Caregiver account types:
  www.LLS.org/community
- LLS Children's Initiative: Cures & Care for Children
  $100 million multi-year endeavor to attack pediatric blood cancer
  - Global precision medicine clinical trial/pediatric acute leukemia in collaboration w/NCI & COG:
    www.LLS.org/PedAL

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

63

FOR PATIENTS AND CAREGIVERS

- Follow-up care for childhood cancer survivors
  www.LLS.org/ChildhoodFollowUp
- Childhood & YA cancer resources
  www.LLS.org/ChildhoodYAResources
- Education programs – web, video, telephone
  www.LLS.org/Programs & www.LLS.org/Educationvideos
- Support: www.LLS.org/Support
  - Financial Assistance, Referral to Medication Access programs
  - Online chats (Live, weekly, for Caregivers, Young Adults)
  - Peer-to-Peer First Connection Program
  - One-On-One Free Nutrition Consultations

BEATING CANCER IS IN OUR BLOOD.

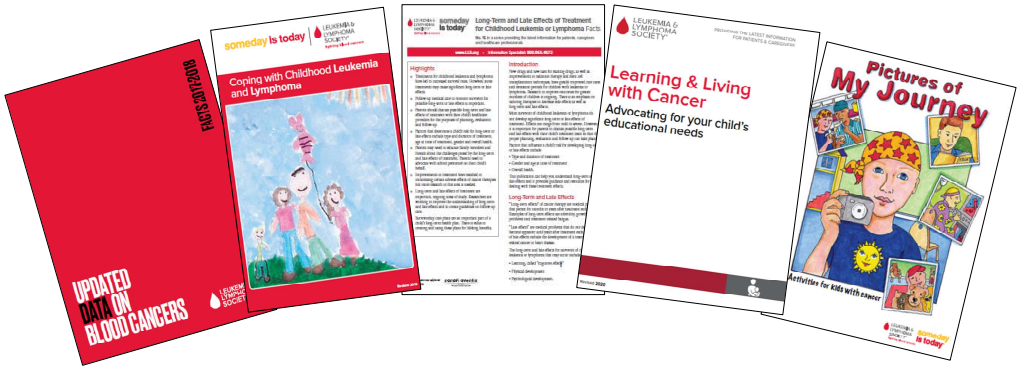
LEUKEMIA & LYMPHOMA SOCIETY®

64

FREE GUIDES, BOOKLETS, AND FACT SHEETS

For Patients, Caregivers and Professionals

www.LLS.org/Booklets



BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY

65

ADDITIONAL RESOURCES

Information Resource Specialists: one on-one information & support on treatment, financial & psychosocial resources www.LLS.org/IRC

Clinical Trial Nurse Navigators: RNs with expertise in blood cancers work one-on-one with patients, caregivers or HCPs, or You can Refer a patient www.LLS.org/CTSCreferral

An extension of your team, providing support to you & your patients

- ❑ Phone: (800) 955-4572, M-F, 9 am to 9 pm ET
- ❑ Email: infocenter@LLS.org
- ❑ Live chat: www.LLS.org/InformationSpecialists

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY

66

CDN'S PRIMARY ACTIVITIES

RESEARCH

We accelerate research translation. CDN has over 25 years of experience developing, conducting, implementing and evaluating practice-based research with Community Health Centers and other safety-net practices.

EDUCATION

We provide peer support through training and education that integrates online and on-site didactic and experiential learning. Collaborate with us to meet your training needs.

PARTNERSHIP

We conduct research and educational activities in partnership with government, academic, not-for-profit, and for profit organizations. CDN has an extensive network of multidisciplinary researchers, clinicians, clinical leaders and policy-makers.

DISSEMINATION

We provide dissemination services through webcasts for public health and clinical research projects. CDN has extensive experience disseminating research and training programs to our extensive network of multidisciplinary researchers, clinicians, clinical leaders and policy-makers.

CDN
CLINICAL-DIRECTORS-NETWORK

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

67

CDN
CLINICAL-DIRECTORS-NETWORK

WEBCASTS, DISSEMINATION, TRAINING, SUPPORT TOOLS & CONTINUING MEDICAL EDUCATION (CME)

TRANSLATING PRACTICE INTO RESEARCH™

SUMMER 2020

UPCOMING WEBINAR SCHEDULE

Thursday, July 16, 2020, 1:00 PM - 2:00 PM ET

Survivorship Care for Childhood and Adolescent Blood Cancer

Presenters: Tara O. Henderson, MD, MPH, FASCO, Professor of Pediatrics, Director, Childhood, Adolescent and Young Adult Survivorship Center, Director, Cancer Survivorship and Co-Leader, Cancer Prevention and Control Program, Comprehensive Cancer Center, The University of Chicago, Chicago, IL

Danielle Novetsky Friedman, MD, MS, Assistant Member, Pediatric Long-Term Follow-Up Program, Memorial Sloan Kettering Cancer Center, New York, NY

Sponsored by: The Leukemia & Lymphoma Society (LLS) and Clinical Directors Network, Inc. (CDN)

Friday, July 17, 2020, 12:00 PM - 1:00 PM ET

Opioid Prescribing in the Era of COVID-19

Presenter: Joanna L. Starrels, MD, MS, FACP, Associate Professor of Medicine, Division of General Internal Medicine, Albert Einstein College of Medicine and Montefiore Medical Center

Hector R. Perez, MD, MS, Assistant Professor of Medicine, Division of General Internal Medicine, Albert Einstein College of Medicine and Montefiore Medical Center

Sponsored by: The Opioid Post-Marketing Requirements Consortium (OPC), Syneos HealthTM, N²: Virtual Training Series (AHRQ, Grant No. 1P30-HS-021667) and Clinical Directors Network, Inc. (CDN)

Tuesday, July 21, 2020, 1:00 PM - 2:00 PM ET

Sex in the Time of COVID-19

Presenter: Kenneth H. Mayer, M.D, Medical Research Director, Fenway Health, Co-Director, The Fenway Institute, Professor of Medicine, Harvard Medical School, Attending Physician, Infectious Disease Division, Beth Israel Deaconess Hospital

Sponsored by: CDN Center of Excellence (P30) for Practice-based Research and Learning, N²: Virtual Training Series (AHRQ, Grant No. 1P30-HS-021667) and Clinical Directors Network, Inc. (CDN)

PREVIOUS TOWN HALLS/WEBINARS

COVID-19 Virtual Town Hall: Leading in a Time of Rapid Change

Presenters: Erin E. Sullivan, PhD, Research Director, Center for Primary Care at Harvard Medical School, Lecturer, Department of Global Health and Social Medicine, Harvard Medical School

Alden Lai, PhD, MPH, Assistant Professor of Public Health Policy and Management, School of Global Public Health, Stern School of Business (affiliated), NYU

Discussion: 1) Cultivating team culture and resilience; (2) Maintaining relationships and meaning in work

COVID-19 Virtual Town Hall with CDN Board of Directors: Addressing Mental Health Issues for Staff and Patients & Reductions in Workforce and Patient Volume

Presenters: CDN Board of Directors

Discussion: 1) Mental health of their staff and patients, 2) implementing stress management techniques, and 3) handling rapid reductions in patient volume

Prescription Pain Medication Use in the Community

Presenter: Linda B. Cottler, PhD, MPH, FACE, Associate Dean for Research, College of Public Health and Health Professions and Dean's Professor of Epidemiology at the University of Florida

Sponsored by: The Opioid Post-Marketing Requirements Consortium (OPC), Syneos Health™, N²: Virtual Training Series (AHRQ, Grant No. 1P30-HS-021667) and Clinical Directors Network, Inc. (CDN)

The Beatrice Renfield Lecture in Research Nursing: Diversity and Inclusion in Clinical Research

Presenter: Sylvia Trent-Adams, PhD, RN, FAAN, Rear Admiral, US Public Health Service Commissioned Corps, Principal Deputy Assistant Secretary for Health

Sponsored by: The Heilbrunn Family Center for Research Nursing, Rockefeller University Center for Clinical and Translational Science (NIH-NCATS Grant No. #UL1- TR-000043), Clinical Directors Network, Inc. (CDN) and the N² PBRN Virtual Training Series (AHRQ #1P30-HS-021667)

WEBCAST SERIES

Visit the CDN Webcast Library! View our many archived CME-accredited webcasts at: www.CDNetwork.org/Library

BEATING CANCER IS IN OUR BLOOD.

WWW.CDNETWORK.ORG

LEUKEMIA & LYMPHOMA SOCIETY®

68

Q & A

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

69

THANK YOU

BEATING CANCER IS IN OUR BLOOD.

LEUKEMIA & LYMPHOMA SOCIETY®

70