SURVIVORSHIP CARE FOR CHILDHOOD AND ADOLESCENT BLOOD CANCER

JULY 16, 2020

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
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

THE CHILDHOOD AND ADOLESCENT CANCER SUCCESS STORY

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

5-Year Survival (%)

SEER Cancer Statistics, 1975-2011
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

WHAT IS THE COST OF CURE?

Survivors have a phenotype of premature aging

Cumulative incidence of serious, disabling, life threatening chronic conditions

Armstrong GT, et al. JCO, 2014
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)

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
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?
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

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

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**Three Patient Stories**
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
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…
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

Potential Late Effects

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

Transplant Population

- Prior therapy
- Preconditioning chemotherapy
  - TBI
- Post SCT chemo
- GVHD
### Transplant Population

- **Prior therapy**
  - Preconditioning chemotherapy
    - TBI
  - Post SCT chemo
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### Potential Late Effects

- **Endocrinopathies**
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### 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

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**BEATING CANCER IS IN OUR BLOOD.**

**LEUKEMIA & LYMPHOMA SOCIETY**
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…

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**BREAST CANCER AFTER CHEST RADIATION**

<table>
<thead>
<tr>
<th></th>
<th>By age 40</th>
<th>By age 45</th>
<th>By age 50</th>
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</thead>
<tbody>
<tr>
<td>Childhood cancer survivors</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Entire cohort</td>
<td>12 (10,14)</td>
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<td>30 (25,34)</td>
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<td>22 (17,25)</td>
<td>35 (29,40)</td>
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<tr>
<td>Other childhood cancer*</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>BRCA1 carriers</td>
<td>8 (5,12)</td>
<td>15 (10,21)</td>
<td>- -</td>
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<tr>
<td>Carriers of genetic mutations</td>
<td></td>
<td></td>
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</tr>
<tr>
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<td>14 (5,23)</td>
<td>22 (11,33)</td>
<td>31 (15,48)</td>
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<tr>
<td>BRCA2 carriers</td>
<td>5 (0,15)</td>
<td>10 (1,23)</td>
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## BREAST CANCER AFTER CHEST RADIATION

### Estimated cumulative risk, % (95% CI)

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### By age 45:
- Hodgkin: 22%
- BRCA1: 22%
- Other cancers: 15%
- BRCA2: 10%

### 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
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

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?
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
2005 Recommendations:

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

**CHEMOTHERAPY**

<table>
<thead>
<tr>
<th>Sec #</th>
<th>Therapeutic Exposure</th>
<th>Potential Late Effects</th>
<th>Periodic Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>Anthracycline Antibiotics</td>
<td>Cardiac toxicity, Cardiomyopathy, Subclinical left ventricular dysfunction, Congestive heart failure, Antithyroid</td>
<td>Cardiac function screening every 6 months</td>
</tr>
<tr>
<td></td>
<td>Doxorubicin: Multiply total dose x 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Epirubicin: Multiply total dose x 0.5</td>
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<td></td>
<td>Idarubicin: Multiply total dose x 4</td>
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<td>Mitoxantrone: Multiply total dose x 6</td>
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</table>

To gauge the frequency of screening, use the following formula to convert to doxorubicin isoeffective equivalents prior to calculating total cumulative anthracycline dose. Clinical judgment should ultimately be used to determine indicated screening for individual patients.

**ANTHRACYCLINE ANTIBIOTICS (CONT)**

**HEALTH LINKS**
Heart Health, Cardiotoxic Risk Factors, Diet and Physical Activity

**COUNSELING**
- Monitor appropriate weight, blood pressure, and heart healthy diet.
- Regarding exercise:
  - Regular exercise is generally safe and should be encouraged for patients who have normal cardiac function.
  - Patients 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 patients (i.e., those requiring an ECG every 3 years who plan to participate in intensive exercise).

**SCREENING**
- ECG (or comparable imaging to evaluate cardiac function)
  - Baseline at entry into long-term follow-up, repeat as clinically indicated

**SYSTEM = Cardiotoxic Score = 1**
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?

MOST SURVIVORS ARE NOT FOLLOWED IN A CANCER CENTER

Nathan PC, et al. JCO, 2009
HIGH-RISK SURVIVORS ARE NOT COMPLIANT WITH GUIDELINES

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

However, in response to a clinical vignette:

- 90.6% of respondents did not appropriately recommend yearly breast cancer surveillance
- 85.1% did not appropriately recommend cardiac surveillance
- 23.6% did not appropriately recommend yearly thyroid surveillance

<table>
<thead>
<tr>
<th>Question and Answer Choices</th>
<th>Responses n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast cancer surveillance</td>
<td></td>
</tr>
<tr>
<td>In thinking about C.J., a medical care, how would you approach breast cancer screening?</td>
<td></td>
</tr>
<tr>
<td>I would follow current standard guidelines for average-risk individuals and ask her to begin</td>
<td>230 (20.9)</td>
</tr>
<tr>
<td>yearly mammograms when she turns 40</td>
<td></td>
</tr>
<tr>
<td>I would recommend every-other-year mammograms starting this year</td>
<td>196 (17.8)</td>
</tr>
<tr>
<td>I would recommend yearly mammograms starting this year</td>
<td>123 (11.2)</td>
</tr>
<tr>
<td>I would recommend yearly breast magnetic resonance imaging starting this year</td>
<td>103 (9.4)</td>
</tr>
<tr>
<td>Don’t know or unsure</td>
<td>498 (44.1)</td>
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<tr>
<td>Missing</td>
<td>58</td>
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<tr>
<td>Cardiac surveillance</td>
<td></td>
</tr>
<tr>
<td>You see that C.J. had an echocardiogram 6 years after chemotherapy. The echocardiogram was normal. What would you approach cardiac care for this patient?</td>
<td></td>
</tr>
<tr>
<td>I would not proceed with further testing</td>
<td>912 (81.9)</td>
</tr>
<tr>
<td>I would refer her at this time to a cardiologist for evaluation and stress testing</td>
<td>81 (7.4)</td>
</tr>
<tr>
<td>I would recommend every-other-year echocardiogram</td>
<td>124 (11.3)</td>
</tr>
<tr>
<td>I would recommend yearly echocardiograms.</td>
<td>85 (7.7)</td>
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<tr>
<td>Don’t know or unsure</td>
<td>208 (18.7)</td>
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<tr>
<td>Missing</td>
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<tr>
<td>Thyroid surveillance</td>
<td></td>
</tr>
<tr>
<td>You receive C.J.’s post-laboratory results and see that she has undergone yearly thyroid function tests. They have all been normal. What would be your next step?</td>
<td></td>
</tr>
<tr>
<td>I would repeat thyroid-stimulating hormone and free T4 hormone test and plan to check both yearly.</td>
<td>1972 (76.9)</td>
</tr>
<tr>
<td>I would check thyroid-stimulating hormone</td>
<td>196 (5.1)</td>
</tr>
<tr>
<td>I would discontinue thyroid function tests since her TSH is normal</td>
<td>70 (6.0)</td>
</tr>
<tr>
<td>Don’t know or unsure</td>
<td>385 (14.9)</td>
</tr>
<tr>
<td>Missing</td>
<td>6</td>
</tr>
</tbody>
</table>

* Correct answers.

- Recommendations not available for previous thyroid “screening.”
However, in response to a clinical vignette:

- **90.6%** of respondents did not appropriately recommend yearly breast cancer surveillance.
- **85.1%** did not appropriately recommend cardiac surveillance.
- **23.6%** did not appropriately recommend yearly thyroid surveillance.

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<th>General Internists (N=1110)</th>
<th>Family Physicians (N=1124)</th>
<th>Pediatric Oncologists (N=665)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast cancer surveillance</td>
<td>I would refer her at this time to a cardiologist for evaluation and stress test.</td>
<td>66%</td>
<td>66%</td>
<td>66%</td>
</tr>
<tr>
<td>Throat throat screening</td>
<td>I would check thyroid-stimulating hormone (TSH) and thyroglobulin test and plan to check both if normal.</td>
<td>76%</td>
<td>74%</td>
<td>76%</td>
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<tr>
<td>Total</td>
<td></td>
<td>5%</td>
<td>2%</td>
<td>33%</td>
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**SIGNIFICANT GAPS IN PROVIDER KNOWLEDGE**

**AYA Hodgkin Lymphoma Survivor Vignette**

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<td>27%</td>
<td>16%</td>
<td>66%</td>
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<tr>
<td>Thyroid screening</td>
<td>76%</td>
<td>74%</td>
<td>76%</td>
</tr>
<tr>
<td>Cardiac screening</td>
<td>15%</td>
<td>10%</td>
<td>57%</td>
</tr>
<tr>
<td>Total</td>
<td>5%</td>
<td>2%</td>
<td>33%</td>
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</table>

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

<table>
<thead>
<tr>
<th>Dx</th>
<th>Off</th>
<th>1-2 yrs</th>
<th>5 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rx</td>
<td>Off Rx</td>
<td>Off Rx</td>
<td></td>
</tr>
</tbody>
</table>

PCP

ONC

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

Oeffinger KC et al, ASCO Ed Book, 2014
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!
How does the understanding of long-term outcomes of cancer survivors impact cancer treatments?
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)

- 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

Armstrong GT et al. NEJM 2016.
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

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
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

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
FREE GUIDES, BOOKLETS, AND FACT SHEETS
For Patients, Caregivers and Professionals
www.LLS.org/Booklets

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
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.

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

UPCOMING WEBINAR SCHEDULE

WEBCAST SERIES
Visit the CDN Webcast Library View our many archived CME-accredited webcasts at www.CDNetwork.org
Q & A

THANK YOU