LONG-TERM FOLLOW-UP OF CHILDHOOD CANCER SURVIVORS

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Children’s Hospital of Eastern Ontario
The Ottawa Hospital
Disclosures

- No financial disclosures or conflicts of interest
Learning Objectives

1. Recognize childhood cancer survivors in need of long term surveillance
2. Gain knowledge of recommended surveillance
   - Become familiar with the existing Children’s Oncology Group long term follow up guidelines and know how to access them
3. Understand and Identify adverse psychosocial outcomes specific groups of patients are at risk for
Four components of survivorship care:

1. Prevention and detection of new cancers *recurrent* cancer;

2. Surveillance *recurrence* new primaries;

3. Interventions for long-term and late effects (hereafter referred to as late effects) from cancer and its therapies;

4. Coordination between specialists and primary care providers to ensure that all of the survivor's needs are met.
What is Long Term Surveillance in Childhood Cancer Survivors?

<table>
<thead>
<tr>
<th>ASCO</th>
<th>COG</th>
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</thead>
<tbody>
<tr>
<td>• High quality survivorship care includes:</td>
<td>• Patients “graduate” to long term follow-up care</td>
</tr>
<tr>
<td>1. Surveillance for recurrence</td>
<td>• They are no longer cancer patients – cancer survivors</td>
</tr>
<tr>
<td>2. Monitoring for and managing psychosocial and medical late effects</td>
<td>• Goal is to maintain the best state of health while monitoring for late effects of therapy- not recurrence</td>
</tr>
</tbody>
</table>

[http://www.asco.org/practice-research/key-components-survivorship-care](http://www.asco.org/practice-research/key-components-survivorship-care)

Children's Oncology Group Health Links Copyright 2013
Accessed September 17, 2015
Background

New Cancer Diagnoses by Age, Canada, 2006-2010

96% of cancer deaths in Canada occur in people aged 50 and older

Childhood cancer deaths account for only 0.01% of overall cancer deaths in Canada

Age standardized mortality rates (ASMR) for all cancers, by age

Declining overall mortality rates for all ages 0-39 years old

Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov)
Five-Year Survival - 80%

Overall
Wilms tumor
NHL
HL
ALL

Overall Survival

- In the last 40 years, the overall survival rate for children’s cancer has increased from 10% to 80% today.
- Approximately 375,000 adult childhood cancer survivors in the United States.
- 2/3 experience at least one chronic health condition as a result of their childhood cancer diagnosis: late effect.
Almost All

Recognize childhood cancer survivors (CCS) in need of long term surveillance
Goals of long-term follow-up clinics

- Educate about risk for late effects
- Monitor for any signs or symptoms of late effects
- Facilitate screening for modifiable late effects
Risk of late effects related to:

- Tumor-related factors
- Treatment-related factors
- Patient-related factors

Visits and screening should be tailored to each patient - not one-size-fits-all
Case

- 54 yo woman, referred post double mastectomy for breast CA
- PMHx of Hodgkin Lymphoma at 14 yo (1972)
- No previous late effects follow-up
- Treated with standard
  - Staging splenectomy
  - Cobalt mantle radiation
    - bilateral cervical, supraclavicular, mediastinal, hilar and axillary
Case

Late effects she knew of:

- Radiation side effects
  - Subsequent malignancies - breast and skin

What she DID NOT know:

- Breast screening guidelines
- Thyroid monitoring
- Cardiac dysfunction
- Metabolic abnormalities
- Risks associated with Asplenia
Subsequent Neoplasms

CI: 26.3%

CI: 10.6%

Table 2. Histologic Details of Multiple Neoplasms

<table>
<thead>
<tr>
<th>Site or Type of Subsequent Neoplasm</th>
<th>No. of Second Neoplasms (n = 32)</th>
<th>No. of Third Neoplasms (n = 32)</th>
<th>No. of Fourth Neoplasms (n = 5)</th>
<th>No. of Fifth Neoplasms (n = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast cancer</td>
<td>13</td>
<td>13</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Thyroid cancer</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Basal cell/squamous cell carcinoma</td>
<td>4</td>
<td>7</td>
<td>1</td>
<td>0</td>
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</tbody>
</table>

Breast Cancer

Cardiac Outcomes

Cardiac Outcomes

## Cardiac Outcomes

<table>
<thead>
<tr>
<th>Age at Treatment</th>
<th>Radiation with Potential Impact to the Heart</th>
<th>Anthracycline Dose</th>
<th>Recommended Frequency</th>
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</thead>
<tbody>
<tr>
<td>&lt;1 year old</td>
<td>Yes</td>
<td>Any</td>
<td>Every year</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>&lt; 200 mg/m²</td>
<td>Every 2 years</td>
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<tr>
<td></td>
<td></td>
<td>≥ 200 mg/m²</td>
<td>Every year</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>Any</td>
<td>Every year</td>
</tr>
<tr>
<td>1-4 years old</td>
<td>No</td>
<td>&lt;100 mg/m²</td>
<td>Every 5 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≥100 to &lt;300 mg/m²</td>
<td>Every 2 years</td>
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<tr>
<td></td>
<td></td>
<td>≥300 mg/m²</td>
<td>Every year</td>
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<td>Yes</td>
<td>&lt;300 mg/m²</td>
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<td>≥300 mg/m²</td>
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<td>≥5 years old</td>
<td>No</td>
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<td>≥200 to &lt;300 mg/m²</td>
<td>Every 2 years</td>
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<td></td>
<td></td>
<td>≥300 mg/m²</td>
<td>Every year</td>
</tr>
</tbody>
</table>

Any age with decrease in serial function: Every year

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*Age at time of first cardiotoxic therapy (anthracycline or radiation [see Section 81], whichever was given first)

*See Section 81

Based on doxorubicin isotoxic equivalent dose [see conversion factors on previous page, “Info Link (Dose Conversion)”]
Gain knowledge of recommended surveillance for Childhood Cancer Survivors

- Become familiar with the existing Children’s Oncology Group long term follow up guidelines and know how to access them:

  http://www.survivorshipguidelines.org/
COG Follow-Up Guidelines

- Resource for healthcare professionals
- Screening recommendations are for
  - asymptomatic survivors of childhood, adolescent, or young adult cancer
  - presenting for routine exposure-based medical follow-up
**ANY CANCER EXPERIENCE**

<table>
<thead>
<tr>
<th>Sec #</th>
<th>Therapeutic Agents</th>
<th>Potential Late Effects</th>
<th>Risk Factors</th>
<th>Highest Risk Factors</th>
<th>Periodic Evaluation</th>
<th>Health Counseling/Further Considerations</th>
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<tbody>
<tr>
<td>1</td>
<td>Any Cancer Experience</td>
<td>Adverse Psychosocial/QOL Effects</td>
<td>Host Factors</td>
<td>Host Factors</td>
<td>HISTORY</td>
<td>Health Links</td>
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<tr>
<td></td>
<td>Info Link</td>
<td>Social withdrawal</td>
<td>Female sex</td>
<td>CNS-directed therapy</td>
<td>Psychosocial assessment with attention for:</td>
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<td></td>
<td>The Children's Oncology Group Long-Term Follow-Up Guidelines</td>
<td>Educational problems</td>
<td>Family history of depression, anxiety, or mental illness</td>
<td>Hearing loss</td>
<td>- Educational and/or vocational progress</td>
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<td></td>
<td></td>
<td>Dysfunctional marital relationship</td>
<td>Younger age at diagnosis</td>
<td>Premature learning or emotional difficulties</td>
<td>- Social withdrawal</td>
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<td>Under-employment/Unemployment</td>
<td>Neurocognitive problems</td>
<td>Physical limitations</td>
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<td>Dependent living</td>
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**SOCIETY = Psychosocial
SCORE = 2A**

### SECTION 1 REFERENCES

### CHEMOTHERAPY

<table>
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<tr>
<th>#</th>
<th>Therapeutic Agent(s)</th>
<th>Potential Late Effects</th>
<th>Risk Factors</th>
<th>Highest Risk Factors</th>
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<td>Extensive information regarding infertility for patients and healthcare professionals is available on the following websites: American Society for Reproductive Medicine (<a href="http://www.asrm.org">www.asrm.org</a>); Fertile Hope (<a href="http://www.fertilehope.org">www.fertilehope.org</a>)</td>
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#### Historic
- Pubertal (onset, tempo), menstrual, pregnancy history
- Sexual function (vaginal dryness, libido)
- Medication use

#### Physical
- Tanner staging
- Yearly until sexually mature

#### Screenings
- FSH
- LH
- Estradiol

Baseline at age 13 AND as clinically indicated in patients with delays of arrested puberty, irregular menses, primary or secondary amenorrhea, and/or clinical signs and symptoms of estrogen deficiency

#### Health Counseling/Further Considerations
- Healty Links
- Female Health Issues

### SECTION 13 REFERENCES


![System = Reproductive (female) Score = Alkylation Agents = 1 Non-Classic Alkylators = 2A Heavy Metals = 2A]

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COS LTFU Guidelines — Page 15

Version 4.0 — October 2013
Recommendations

- Annual breast MRI & mammograms x 25 yo
- Echocardiogram & fasting glucose and lipids every 2 years
- Annual thyroid exam and labs
- Baseline PFTs then PRN
- Immunization update +/- medic alert
- Counselling about skin protection, healthy lifestyle habits, dental care, MSK, GERD, salivary glands…
Understand and Identify adverse psychosocial outcomes specific groups of patients are at risk for … and what to do about them.
Almost too many to list…

- Social withdrawal/isolation
- Educational problems
- Under/Un-employment
- Dysfunctional (marital) relationships
- Mental health disorders
  - Anxiety/Depression
  - PTSD
Neurocognitive Impairment

Among the most common late effects experienced by survivors of ALL and CNS tumors:

- Slow processing speed
- Inattention
- Memory impairment

Neurocognitive Impairment

Other Psychological Challenges

- Fatigue/Sleep problems
- Physical limitations
- Appearance/self-esteem
- Need to compensate for long school absences
- Inability to have meaningful social interactions
- Inertia limiting ability to get things done
Most at Risk – Host Factors

- CNS directed therapy
  - ALL- IT chemotherapy with or without cranial rads
  - CNS tumors
  - HCT
  - Pre-morbid learning or emotional difficulties
  - Older age at diagnosis (Adolescence and early Young Adulthood: AeYA)

Most at Risk – Social Factors

- Lower household income
- Failure to complete high school
- Lower educational achievement
What to do?

- Consider community resources
  - Social work consultation
  - Psychology consultation
  - School liaison
  - Office of students with disabilities
- Address sleep hygiene among survivors
Pediatric Oncology Group of Ontario’s (POGO) AfterCare Program
POGO AfterCare

- Since 2001, formal AfterCare clinics for childhood cancer survivors have been launched in five tertiary pediatric oncology programs and in two adult survivor sites across Ontario.

- In Ottawa:
  - If < 18 yo: AfterCare program at CHEO
  - Once ≥ 18: AfterCare program at The Ottawa Hospital Cancer Centre
AfterCare in Ottawa

**CHEO team**
- Pediatric Oncologist
- Amy Givogue- Pediatric Nurse Practitioner
- Josée Hamon- Nurse Case Manager
- Sarah Brandon- SAVTI Counsellor
- Krisann Dennis- Social Worker
- Dr. Clarissa Bush and Dr. Isabelle Montour-Proulx-Neuropsychologist

**TOHCC team**
- Almost the exact same team- just in a different building!
- Kathy Thompson- Patient Designated Nurse
- No neuropsychologist
Childhood Cancer Survivors Need Follow-up!
Conclusions

- Almost all CCS require some long term f/u
- Follow-up plan should be individualized based on exposure not diagnosis
- Radiation risks are tremendous
- Risks increase with increasing time from exposure
- CCS often require multidisciplinary care
Thank You

mbassal@cheo.on.ca