

Adolescents & Young Adults with Cancer

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Disclosures

**Co-Chair of Canadian AYA Task Force
Funded from CPAC**

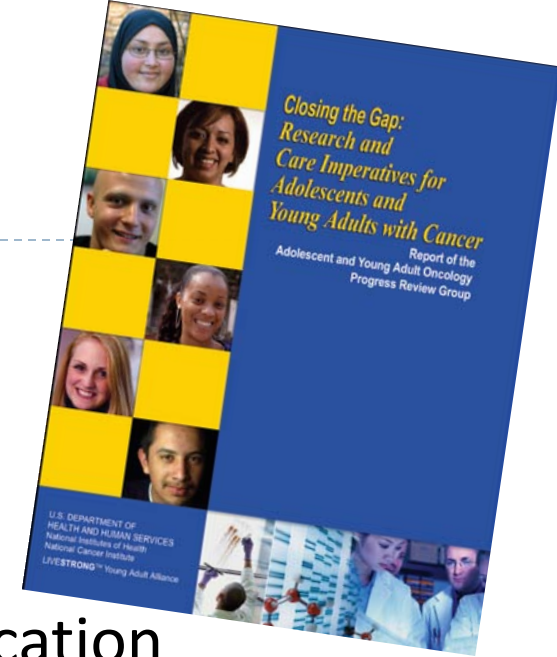
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AYA Committee

NCI Progress Review Group

1. Identify the characteristics that distinguish the unique cancer burden in the AYA patient
 2. Provide education, training, and communication to improve awareness, prevention, access, and quality cancer care for AYAs
 3. Create the tools to study the AYA cancer problem
 4. Ensure excellence in service delivery across the cancer control continuum (from prevention to end of life)
 5. Strengthen and promote advocacy and support of the AYA cancer patient
-



What Are the Issues

- ▶ After homicides, suicides and unintentional injury (accidents), cancer is the commonest cause of death in the 15-39 year age group in industrialized societies
- ▶ While cancer is relatively uncommon among AYA compared to older adults, its personal, societal, and socioeconomic impact is disproportionately greater



AYA with Cancer

Challenges:

- ▶ Diagnosis – delay in diagnosis
- ▶ Active Treatment – where
- ▶ Psycho-Social Support
- ▶ Follow up – survivorship

AYA Survivors of Paediatric Cancer

AYA Survivors of AYA Cancers



Who are AYA with Cancer

- ▶ Adolescents: 15 to 19 years of age
- ▶ Young adults: 20 to ?
 - SEER: 29
 - NCI/LAF/PRG: 39
 - Eurocare: 24

* Major resource implications



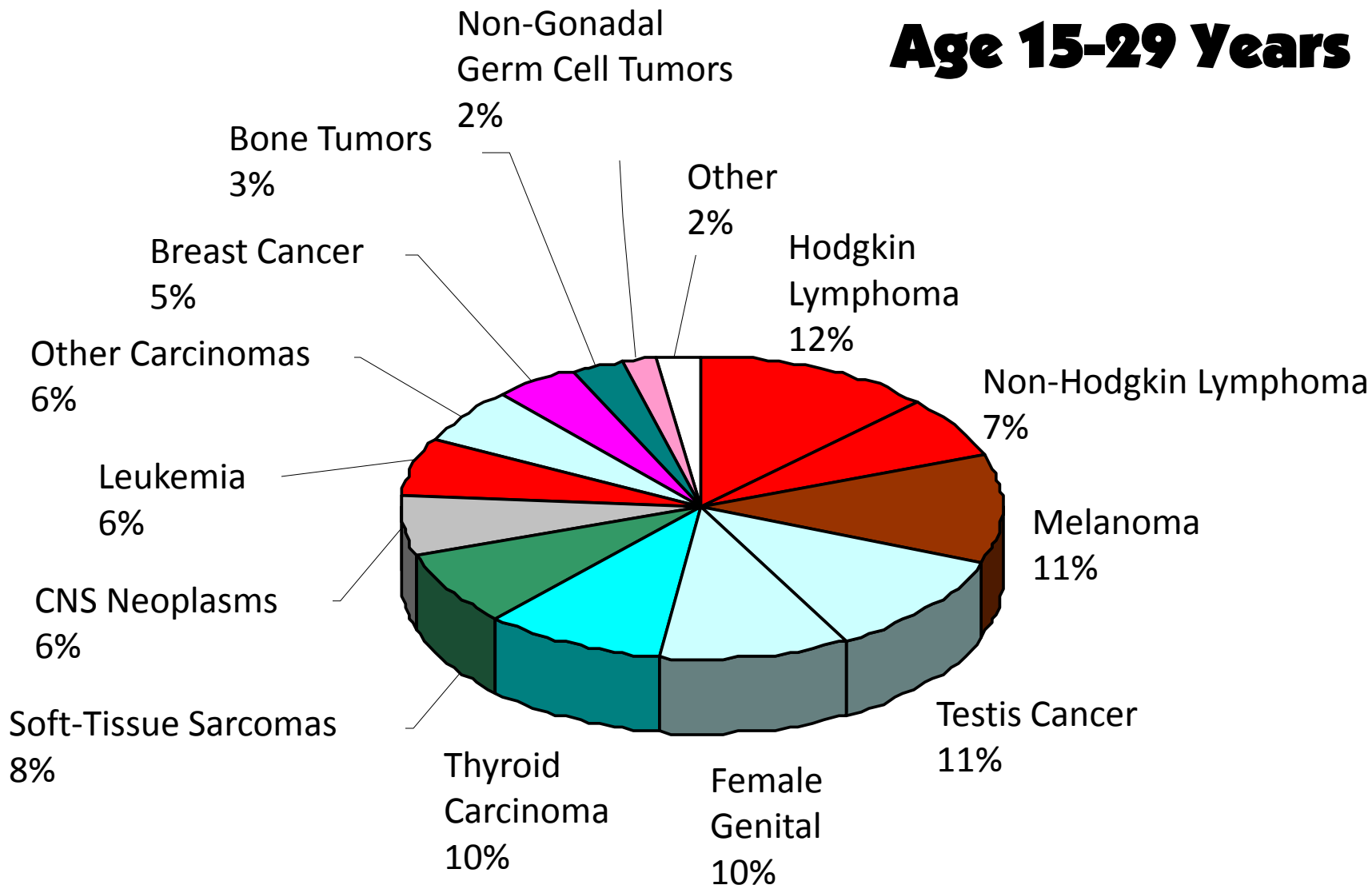
Incidence of Cancer (per million per year)

Age (years)	Rate
(0-14)	150
15-19	200
20-24	350
25-29	550
(40-44)	2,000



AYA Cancers are Unique in Type and Biology

Age 15-29 Years



Estimated Five-Year Observed Survival Proportion (95% Confidence Interval) for Selected Cancers in Adolescents and Young Adults (15-29 Years), by Calendar Period, Canada (Excluding Quebec*)

**Observed Survival Proportion (%)
(95% Confidence Interval)**

	1992 – 1995	2001-2004
All Cancer	80 (79-81)	85 (84-85)
Thyroid	100 (99-100)	99 (99-100)
Testis	94 (92-96)	95 (94-97)
Hodgkin Lymphoma	95 (93-96)	95 (93-96)
Melanoma	93 (90-94)	93 (91-95)
Cervix	87 (83-90)	87 (83-90)
Non-Hodgkin Lymphoma	66 (62-71)	78 (74-81)
Breast	69 (63-75)	73 (67-78)
Soft Tissue & Other Extrasosseous Sarcoma	63 (57-68)	72 (67-77)
Central Nervous System	65 (60-69)	68 (64-72)
Leukemia	57 (52-61)	67 (63-72)

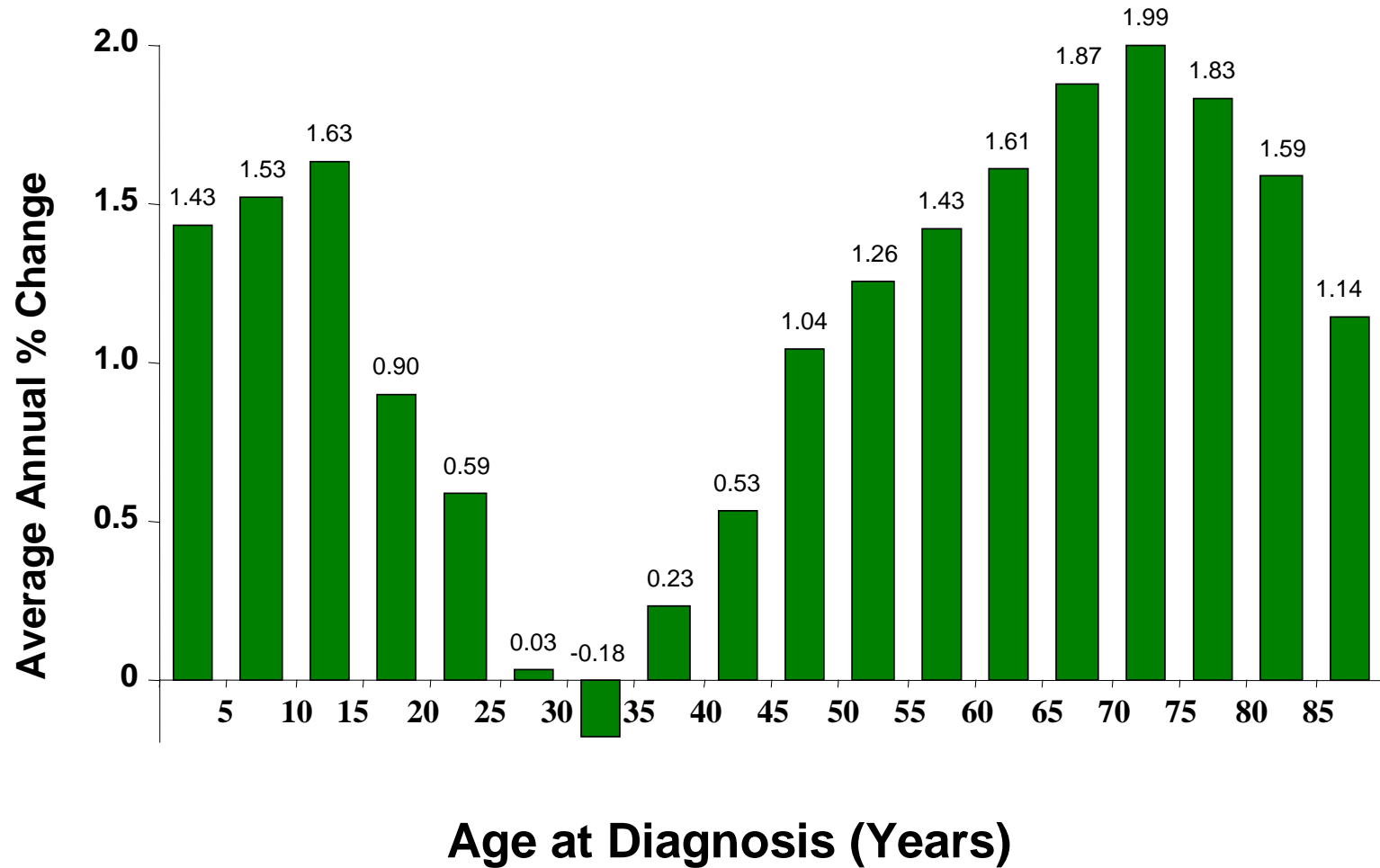
USA SEER

5 Year Survival Age

	1993 - 2000	2001 - 2007
15-19	79.4%	82.8%
20-24	82.2%	85.1%
25-29	80.6%	85.0%



Change in 5-Year Relative Survival Rate of All Invasive Cancer, SEER, 1975-1997



Locus of Care

Determines access to age and disease appropriate

- ▶ Health care system and providers
- ▶ Infrastructure, such as physical facilities
- ▶ Treatment including clinical trials



Why Does it Matter?

- ▶ In Canada and the USA only 30-40% of adolescents are treated in pediatric cancer centers
- ▶ Survival advantage in some instances
 - Pediatric v. adult protocols e.g. A.L.L (USA, France, Italy, the Netherlands, Denmark, UK) and soft tissue sarcomas (INT, Italy)
 - Pediatric v. adult centers e.g. Ewing sarcoma (Germany)



Pediatr Blood Cancer 2006;46:273–277

REVIEW

**Cancer Surveillance and Control in Adolescents—Similarities
and Contrasts Between Canada and the United States**

**Ronald D. Barr, MB, ChB, MD, FRCP (Glasg), FRCP (Lond), FRCP (C), FACP, FRCPATH, FRCPC^{1*}
and Mark L. Greenberg, OC, MB, ChB, FRCP (C), FAAP²**



TABLE III. Number of Registrations as a Surrogate for Locus of Treatment. Five Year Aggregate Data (1997–2001)

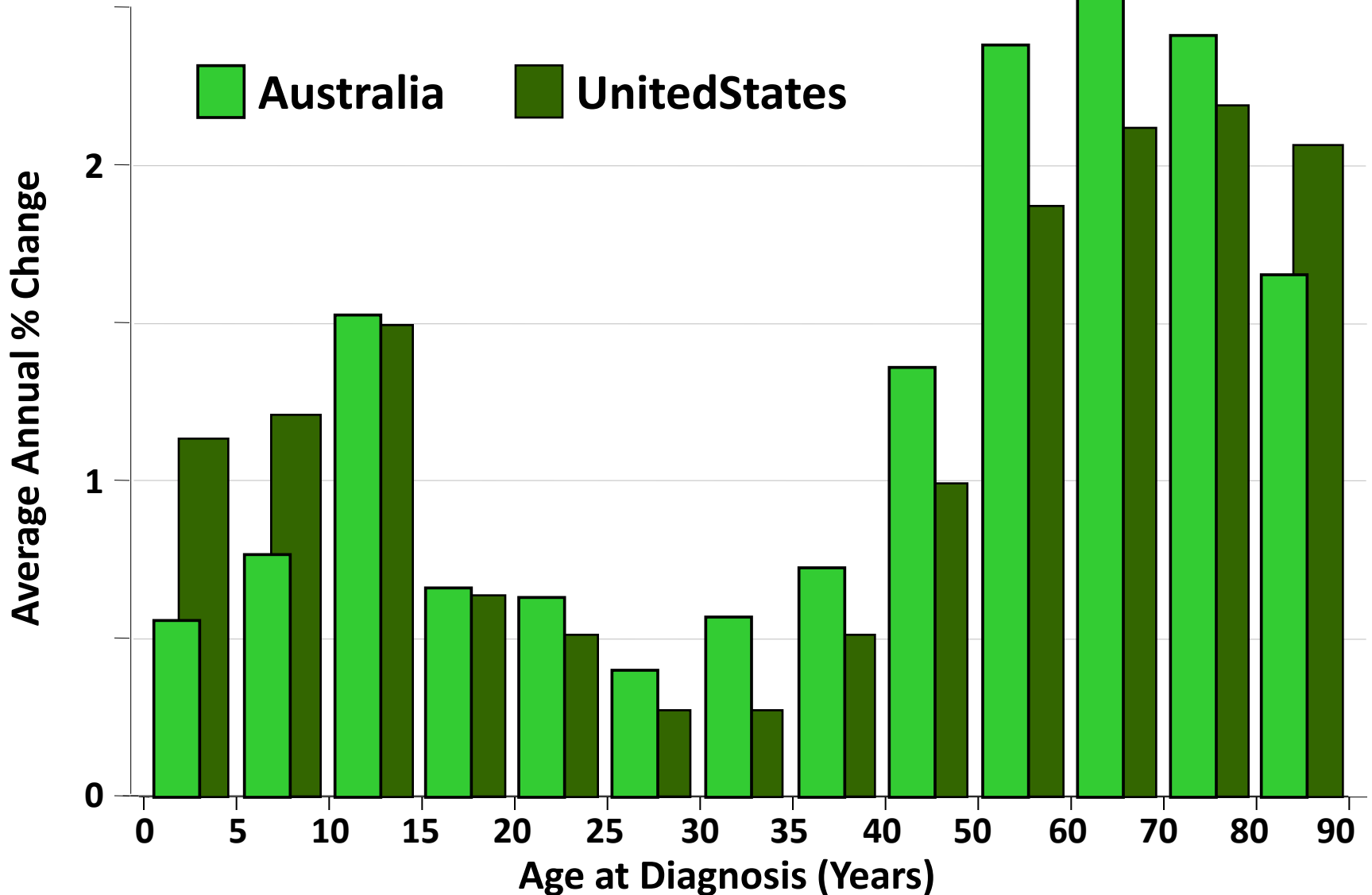
	Age at diagnosis (years)				
	15	16	17	18	19
POGO	121	81	37	13	0
OCR	141	138	156	182	160

POGO, Pediatric Oncology Group of Ontario (five pediatric treatment centres); OCR, Ontario Cancer Registry (all cases of cancer). The proportion of the total registrations (OCR) captured by POGO falls progressively with age, from almost 85% of 15 year olds to fewer than 25% of 17 year olds.



Improvement in Relative Survival by Age at Diagnosis of Invasive Cancer, 1982-1997

Prepared by A. Bleyer from data provided by the Australia Institute of Health and Welfare and from U.S. SEER9



blood

2011 117: 5803-5815
Prepublished online March 11, 2011;
doi:10.1182/blood-2010-12-283093

Malignant hematologic diseases in adolescents and young adults

William A. Wood and Stephanie J. Lee




Table 1. Retrospective data for AYAs treated on representative pediatric or adult ALL protocols

Trial	Pediatric	Adult
FRALLE-93/LALA-94 ²⁸	5-y EFS: 67%	5-y EFS: 41%
CALGB/CCG ³⁴	7-y EFS: 63%	7-y EFS: 34%
MRC ALL 97-99/UKALLXII-E2993 ²⁹	5-y EFS: 65%	5-y EFS: 49%
GIMEMA/AIEOP ³⁰	2-y OS: 80%	2-y OS: 71%
HOVON/DCOG ³¹	5-y EFS: 71%	5-y EFS: 38%
Adult ALL Grp/NOPHO-02 ³²	5-y OS: 74%	5-y OS: 39%
Finnish Leukemia/NOPHO ³³	5-y OS: 67%	5-y OS: 60%

AAPC – Two Disease Clusters

High survival rates: Hodgkin lymphoma, testicular tumors, thyroid cancer and melanoma

- More than 40% of incident cases aged 15 – 29 years
- Range of 5 year survival rates is 90 – 99%

Lower survival rates: all other diseases

- Less than 60% of incident cases aged 15 – 29 years
 - Range of 5 year survival rates is 40 – 75%
-



Age as a Poor Prognostic Factor?

- ▶ May represent different biological spectrum i.e. different disease
- ▶ Delayed diagnosis
- ▶ Rx given may be different, less available or less effective in older age pt
- ▶ Pediatric type Rx to older age pt may not be tolerated
- ▶ Greater problem of pt adherence

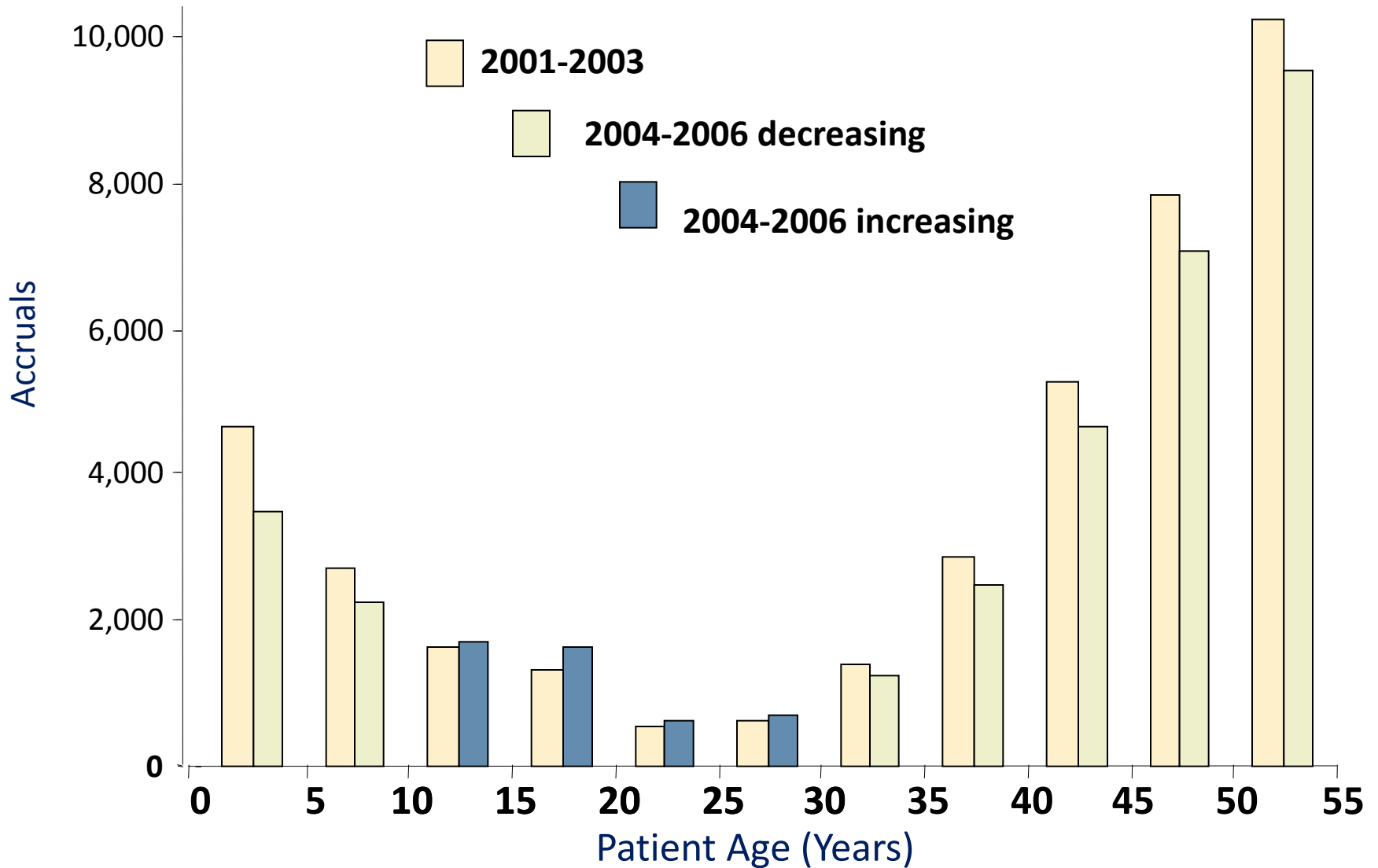


Age as a Poor Prognostic Factor?

- ▶ Pharmacology and pharmacogenetics drug distribution, delivery and metabolism may be different
- ▶ Supportive care may be greater in pediatric population
- ▶ Fewer pts entered onto clinical trials
- ▶ Place of care
- ▶ Expertise of care for age and disease
- ▶ Other

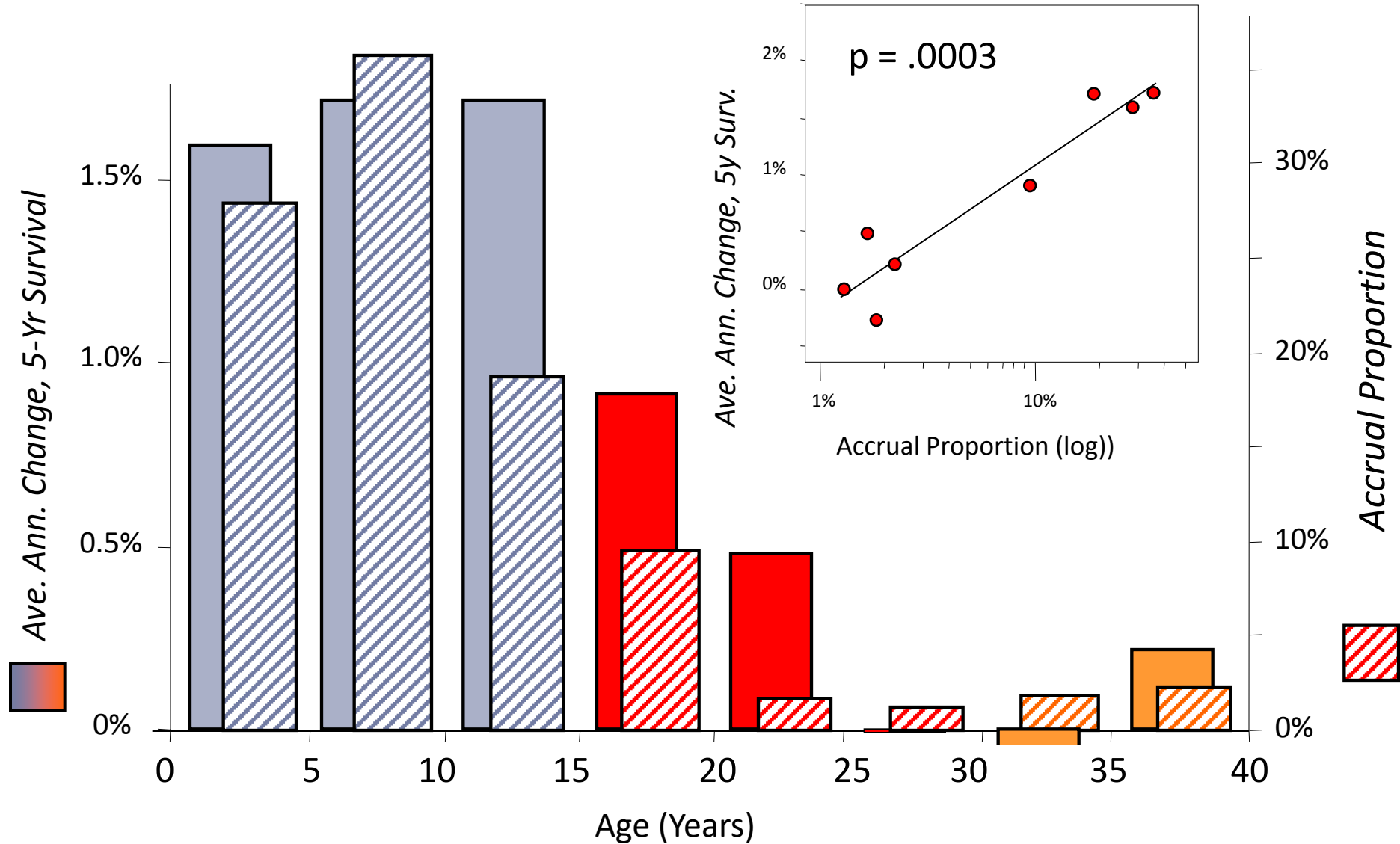


Clinical Trial Accrual in the U.S.



Courtesy of A. Bleyer, MD

Survival improvement is correlated with clinical trial participation





Long term Follow Up of AYA Cancer Survivors



SPECIAL ARTICLE

Chronic Health Conditions in Adult Survivors of Childhood Cancer

Kevin C. Oeffinger, M.D., Ann C. Mertens, Ph.D., Charles A. Sklar, M.D., Toana Kawashima, M.S., Melissa M. Hudson, M.D., Anna T. Meadows, M.D., Debra L. Friedman, M.D., Neyssa Marina, M.D., Wendy Hobbie, C.P.N.P., Nina S. Kadan-Lottick, M.D., Cindy L. Schwartz, M.D., Wendy Leisenring, Sc.D., and Leslie L. Robison, Ph.D., for the Childhood Cancer Survivor Study*

N Engl J Med 355:1572-82, 2006

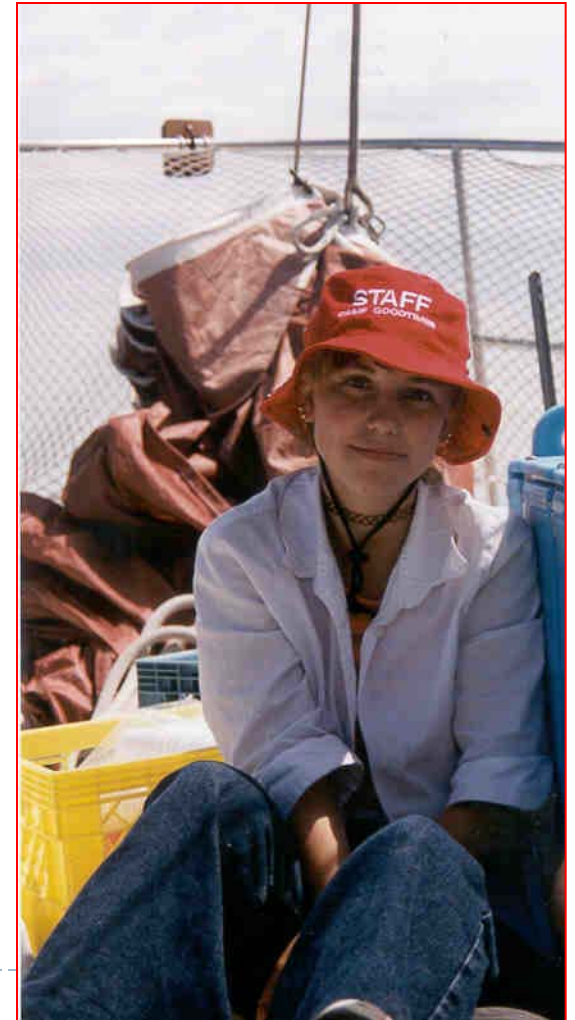
Late Effects

- ▶ Late effects are persistent disabilities or adverse outcomes that are the result of the cancer, the treatment or both
- ▶ 65% of survivors will have at least one late effect
- ▶ 25% will have a severe or life threatening late effect
- ▶ Many of these late effects do not become apparent until many years later
- ▶ Many of these problems were not known when the child or AYA was treated
- ▶ We do not yet know the extent or severity of late effects which will occur as this population reaches middle or old age



Long Term Complications

- ▶ Second Malignancy
 - ▶ Cardiovascular
 - ▶ Endocrine
 - ▶ Fertility
 - ▶ Growth, Bone composition
 - ▶ Neurological
 - ▶ Psychosocial
-



Breast Cancer Surveillance Practices Among Women Previously Treated With Chest Radiation for a Childhood Cancer

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Leslie L. Robison, PhD

WOMEN TREATED WITH chest radiation for a pediatric malignancy face a significantly increased risk of breast cancer at a young age.¹⁻⁶ The risk of breast cancer begins to increase as early as 8 years after radiation and the median age of breast cancer diagnosis ranges from 32 to 35 years.^{1,2,4} Risk of breast cancer is greatest among women who were treated for Hodgkin lymphoma with high-dose mantle radiation.² By age 45 years, it is estimated that from 12% to 20% of women treated with moderate- to high-dose chest radiation will be diagnosed with breast cancer.^{1,2,4} For perspective, among women with a *BRCA* gene

Context Women treated with chest radiation for a pediatric malignancy have a significantly increased risk of breast cancer at a young age and are recommended to have an annual screening mammogram starting at age 25 years or 8 years after radiation, whichever occurs last.

Objective To characterize the breast cancer surveillance practices among female pediatric cancer survivors who were treated with chest radiation and identify correlates of screening.

Design, Setting, and Participants Between June 2005 and August 2006, a 114-item questionnaire was administered to a random sample of 625 women aged 25 through 50 years who had survived pediatric cancer, who had been treated with chest radiation, and who were participating in the Childhood Cancer Survivor Study (CCSS), a North American cohort of long-term survivors diagnosed from 1970-1986. Comparisons were made with similarly aged pediatric cancer survivors not treated with chest radiation (n=639) and the CCSS siblings cohort (n=712).

Main Outcome Measure Screening mammogram within the previous 2 years.

Results Of 1976 cancer survivors and siblings who were contacted, 87.9% participated. Among the 551 women with a history of chest radiation, 55% reported a screening mammogram in the past 2 years (ages 25-39 years, 36.5%; 95% confidence interval [CI], 31.0%-42.0%; ages 40-50 years, 76.5%; 95% CI, 71.3%-81.7%). In comparison, 40.5% of survivors without chest radiation and 37.0% of CCSS siblings reported a screening mammogram in the same time interval. Notably, among women with a history of chest radiation, 47.3% (95% CI; 41.6%-53.0%) of those younger than 40 years had never had a mammogram and only 52.6% (95% CI; 46.4%-58.8%) of women aged 40 through 50 years were being regularly screened (2 mammograms within 4 years). Screening rates were higher among women who reported a physician recommendation than those who did not (ages 25-39 years, 76.0% vs 17.6%; ages 40-50 years, 87.3% vs 58.3%). In multivariate models, the association was particularly strong for younger women (ages 25-39 years, prevalence ratio [PR], 3.0; 95% CI, 2.0-4.0; ages 40-50 years, PR, 1.3; 95% CI, 1.1-1.6).

Conclusions In this cohort of women who had childhood cancer treated with chest radiation, 63.5% of those aged 25 through 39 years and 23.5% of those aged 40 through 50 years had not had mammography screening for breast cancer within the previous 2 years despite a guideline recommendation that survivors of childhood cancer who were treated with chest radiation should undergo annual screening mammography.

Oncofertility

- ▶ Second major concern of AYA patients and survivors after mortality
- ▶ Greater awareness of sperm and ova collection prior to the onset of therapy
- ▶ Research into tissue preservation and prepubertal gonadal tissue



Developing a LTFU Strategy

- ▶ Do all patients need to be followed up for life?
 - Significant resource implications
- ▶ Patients who have had surgery alone or low dose chemotherapy
 - Contact needs to be maintained but this can be achieved by letter or phone contact
- ▶ Patients who have had more intensive chemotherapy, radiation or BMT
 - Lifetime follow up is important



LTFU Strategy

Risk Assessment

- ▶ Low risk – surgery alone or limited intensity chemotherapy, no significant organ impairment e.g. Low risk ALL, Stage 1 or 2 Wilms Tumour – GP follow up/letter follow up
- ▶ Intermediate Risk – significant chemotherapy exposure, minimal radiation e.g. HD – referral to regional oncology clinic
- ▶ High Risk – Intensive Chemotherapy and/or Radiation Therapy, known organ impairment - CNS Tumours, BMT, High Stage solid Tumours – referral to Specialised LTFU Clinic with appropriate subspecialty involvement



Major Clinical and Research Challenges

Continual change in landscape of cancer survivorship research because of introduction of:

- ▶ New therapeutic agents or combination agents
- ▶ Radiation oncology techniques
- ▶ Surgical procedures
- ▶ Supportive care techniques



Future Directions

- ▶ Identification of late occurring adverse outcomes (beyond the first decade after diagnosis)
- ▶ Identification of genetic predisposition to adverse outcomes and the interaction with therapeutic exposures
- ▶ Identification or role of lifestyle choices (alcohol, tobacco, diet, exercise) as risk modifiers
- ▶ Development of effective intervention strategies



Canadian National Task Force Adolescent and Young Adult Oncology

A Program of CI7 and CPAC

Co-Chairs: R Barr, P Rogers, B Schechter

Addressing the Needs of a “Lost Tribe”

▶ **Mission:**

To ensure that AYA Canadians with cancer and AYA survivors of cancer have prompt, equitable access to the best care, and to establish and support research to identify how their health outcomes and health-related quality of life can be optimised



Addressing the Needs of a “Lost Tribe”

▶ **Vision:**

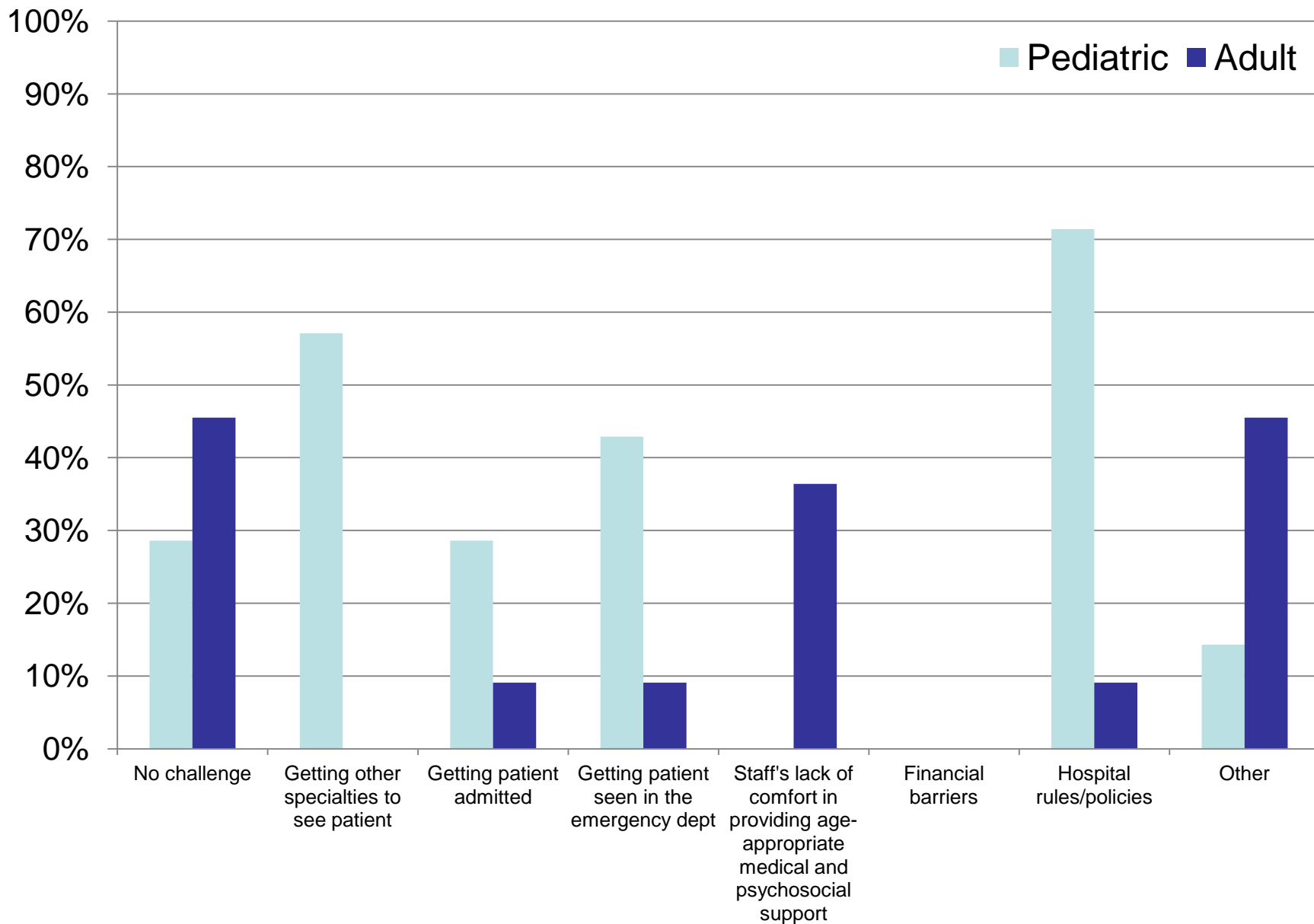
To mitigate the current disparities of care for AYA with cancer or survivors of childhood cancer through advances in treatment and research, respecting the unique circumstances and needs of this population, enacted across all health care jurisdictions in Canada



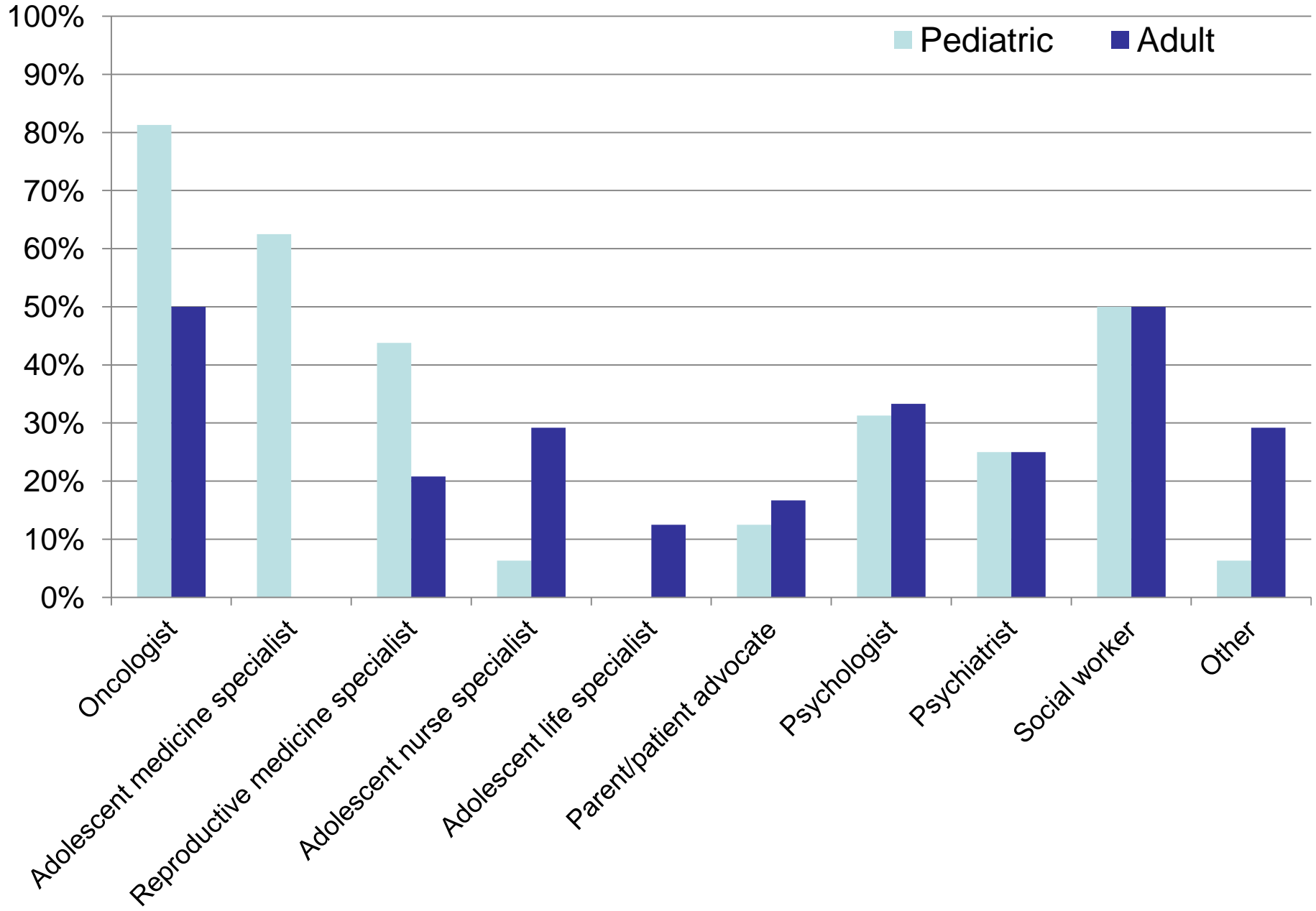
AYA Task Force Survey

- ▶ A questionnaire about services available to AYA cancer patients, and for follow-up care of survivors of cancer as children or AYA, was developed by a working group of the AYA Task Force
- ▶ Questionnaires were mailed between April 15 and May 13, 2009 to:
 - C¹⁷ Council members, representing all pediatric cancer centers in Canada
 - All cancer treatment institutions listed by the Canadian Association of Provincial Cancer Agencies (CAPCA)

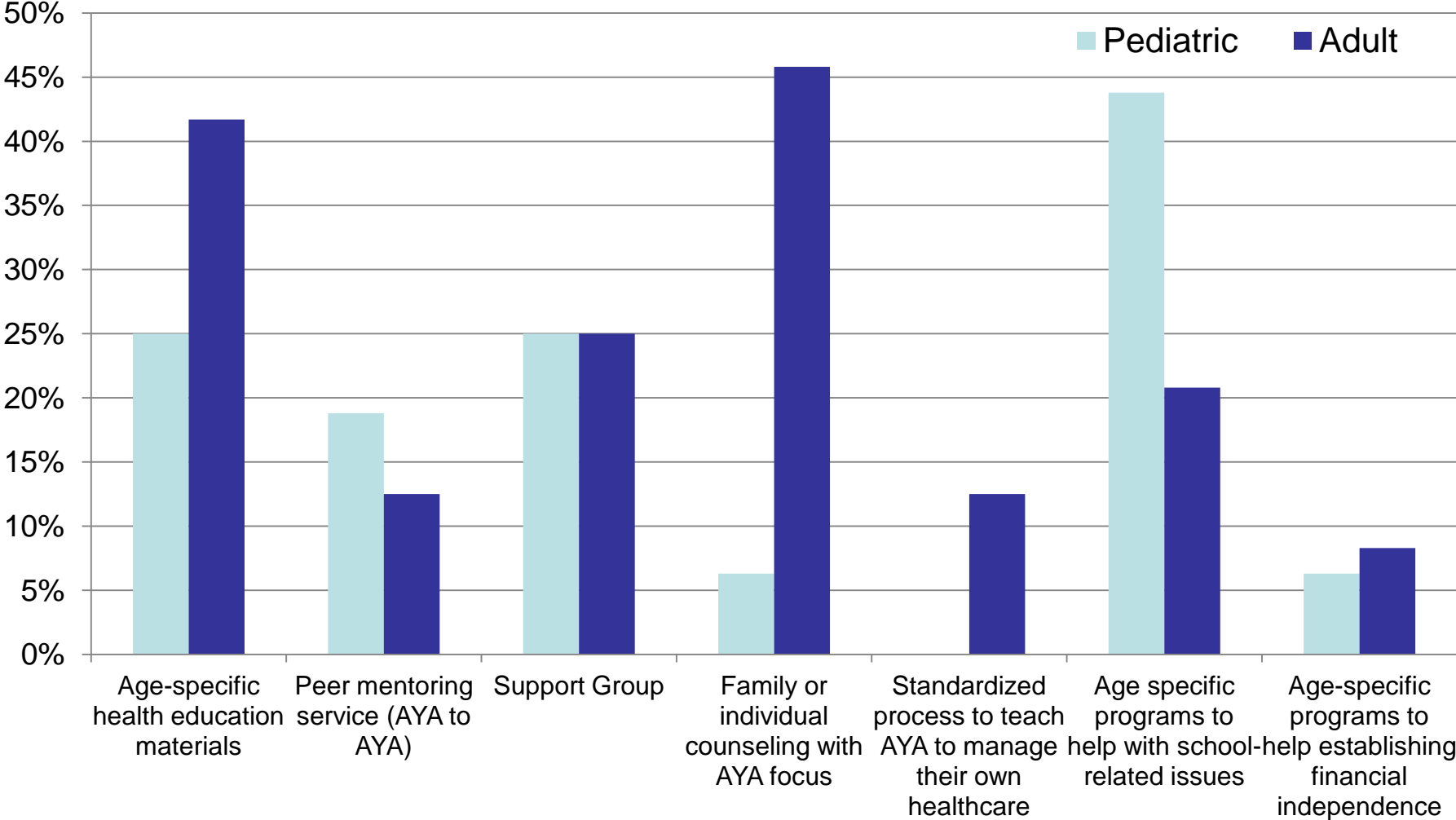
Challenges faced by institutions who reported treating patients outside their institutional age limit



Staff with special expertise or interest in AYA

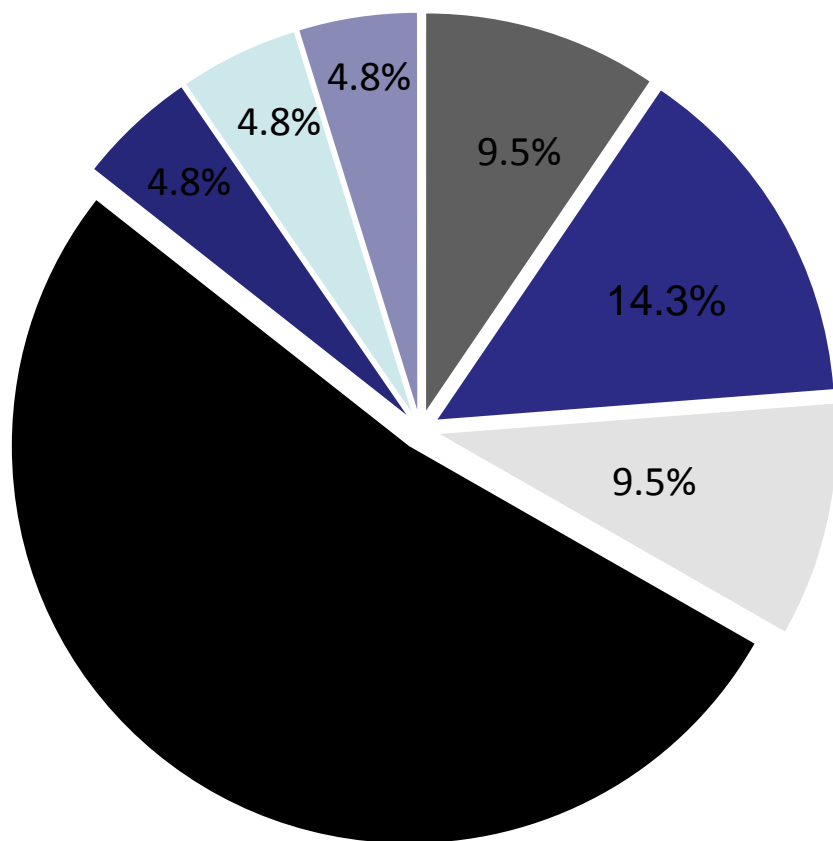


Dedicated AYA resources available at centre



ADULT ONLY

Which best describes your facility's usual plan for follow-up care of AYA who have received all or a part of their cancer therapy at your facility, after the conclusion of their active treatment?



- 1. followed in dedicated survivor clinic
- 2. followed in a disease-specific active treatment clinic
- 3. discharged and transferred back to their family physician
- 4. followed periodically in active treatment clinic but are also followed by their family physician
- 5. discharged from cancer centre without a formal plan for follow-up care
- other mechanism
- both option 1 and 2
- both option 2 and 3

Conclusion of Survey

- ▶ Disparity and inconsistent care for AYA patients with cancer
- ▶ Inadequate model of care for long-term survivors of paediatric and AYA cancer in most jurisdictions across Canada
- ▶ Coherent cancer control strategy for AYA patients is required





Workshop on Adolescents and Young Adults with Cancer: Towards Better Outcomes in Canada

March 11 – 13, 2010

Novotel Toronto Centre • 45 The Esplanade • Toronto, Ontario, Canada • MSE 1W2

Workshop Programme

Organized by the Task Force on Adolescent and Young Adult Cancer, an initiative of the Canadian Partnership Against Cancer, and C¹⁷ Council, the national network of Canadian Pediatric Hematology/Oncology Programs.

CANADIAN PARTNERSHIP
AGAINST CANCER



PARTENARIAT CANADIEN
CONTRE LE CANCER



Children's Cancer
& Blood Disorders



Volume 117 / Issue 10
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www.interscience.wiley.com/cancer

Cancer

Interdisciplinary International Journal of the
American Cancer Society

Supplement to Cancer

Adolescents and Young Adults
with Cancer: Towards Better
Outcomes in Canada



 WILEY-BLACKWELL

Themes from the Workshop

Publication as a supplement to Cancer

- ▶ Awareness and advocacy
- ▶ Active therapy and supportive care
- ▶ Palliation and symptom management
- ▶ Psychosocial needs
- ▶ Survivorship
- ▶ RESEARCH AND METRICS



**Principles and Recommendations for the
Provision of Healthcare in Canada to
Adolescent and Young Adult-Aged Cancer
Patients and Survivors**

Canadian AYA Task Force

JOURNAL OF ADOLESCENT AND YOUNG ADULT
ONCOLOGY Volume 1, Number 1, 2011



Recommendations

I. Active Therapy and Supportive Care

Services must be provided to address the unique needs of AYAs with cancer and survivors of cancer in childhood, adolescence and young adulthood in order to redress inequities in the care provided to this group relative to both younger and older cancer patients



Recommendations

2. Psychosocial Needs

AYA with cancer have unique psychosocial needs that must be met to enable each one to reach their full potential as productive functioning members of society



Recommendations

3. Palliation and Symptom Management

The challenge of providing palliative care to AYA patients, who have unique needs related to their developmental stage, must be addressed



Recommendations

4. Survivorship

Implementation of life-long monitoring and follow-up of survivors of cancer in childhood, adolescence and young adulthood will provide economic and other societal benefits and help mitigate late and long-term treatment effects



Recommendations

5. Research and Metrics

Research and establishment of outcome metrics are required to investigate issues critical to AYAs with cancer and survivors of cancer in childhood, adolescence and young adulthood in order to target interventions and health care policy to improve all phases of the cancer journey



Recommendations

6. Awareness and Advocacy

Awareness of issues specific to AYAs with cancer must be improved, and advocacy efforts to increase awareness and advocate for change must be nurtured



Next Steps

- ▶ Communications strategy to involve all stakeholders especially Adult Oncologists
- ▶ 2nd Workshop March 2012 – to discuss and develop an implementation strategy of the recommendations across Canada
- ▶ Develop a framework for implementation cognizant that there are jurisdictional and geographic variables



Conclusion

- ▶ AYA patients need to be viewed in a new context
- ▶ They require care that is different from Paediatrics or the older adult
- ▶ The divide between Paediatric Oncologists & Adult Oncologists requires dialogue and co-operation
- ▶ Health Services Research, age appropriate clinical trials, and research into the different biology is required



What to do in BC

- ▶ Partnership between BCCA & BCCH
- ▶ Involve Networks
- ▶ Form local BC taskforce
- ▶ Review national recommendation - How can they be implemented within BC
- ▶ Two Components requiring new framework
 - Active Care
 - Survivorship



Concept for Model of Care



Take Home Message

- ▶ Awareness of Cancer in the AYA demographic patients with persistent symptoms
- ▶ High cure rate with age appropriate therapy
- ▶ Adherence to therapy is a problem
- ▶ Unique psycho-social needs and support requirements – awareness of developmental status
- ▶ Life years saved – need for long-term surveillance & treatment for delayed effects of the cancer and its treatment
- ▶ Prevention-Lifestyle-Diet-Exercise – Behaviour Screening
- ▶ New framework of care for AYA patients

