TREATING ADOLESCENTS AND YOUNG ADULTS WITH BLOOD CANCER

May 13, 2021

1:00 – 2:00 pm ET

LEUKEMIA & LYMPHOMA SOCIETY®

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WELCOME AND INTRODUCTIONS

Caroline Kornhauser, MPH
Senior Manager, Professional Education Programs
The Leukemia & Lymphoma Society

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LEARNING OBJECTIVES

At the conclusion of this activity, participants will be able to:

- **Describe common adolescent and young adult (AYA) blood cancers.**
- **Identify the signs and symptoms and AYA blood cancer and diagnostic tests**
- **Explain treatments, including the role of clinical trials**
- **Discuss management of short- and long-term late effects, including fertility challenges.**
- **Address unique considerations for AYAs (e.g., sexuality and intimacy, finances and health insurance)**
- **Discuss strategies to enhance provider communication with AYAs to help them navigate the challenges.**

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SPEAKER

Leidy L. Isenalumhe MD, MS
Assistant Member, Malignant Hematology
Director of Clinical Operations, Malignant Hematology
H. Lee Moffitt Cancer Center and Research Institute

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Conflicts of Interest

- I have no conflicts of interest to report

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Use one word to describe your 20s and 30s? (Required)

- ○ Independence or freedom
- ○ Party
- ○ New life
- ○ Adventure
- ○ College
- ○ Travel
- ○ Love
- ○ All of the above

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Use one word to describe your 20s and 30s?

Independence or freedom	18%
Party	0%
New life	16%
Adventure	6%
College	12%
Travel	0%
Love	0%
All of the above	46%

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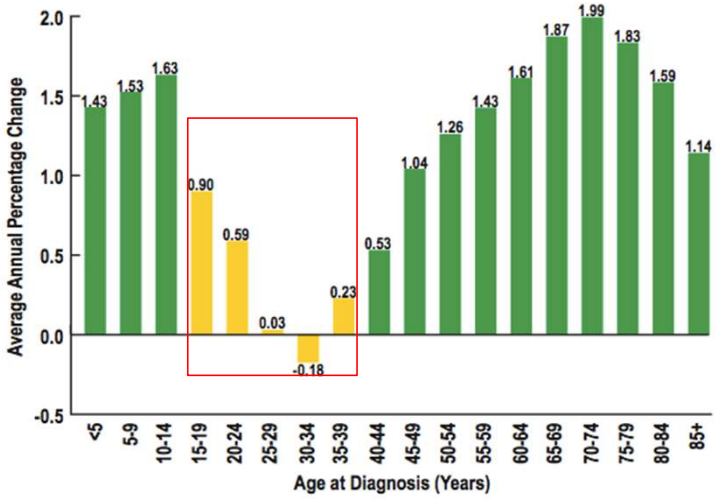

Figure 2. Improvement in 5-Year Relative Survival, Invasive Cancer, SEER 1975-1997

Closing the gap: research and care imperatives for adolescents and young adults with cancer. A report of the Adolescent and Young Adult Oncology Program Review Group. Bethesda, MD: National Cancer Institute; 2006

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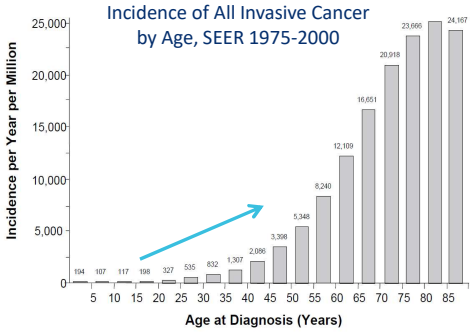
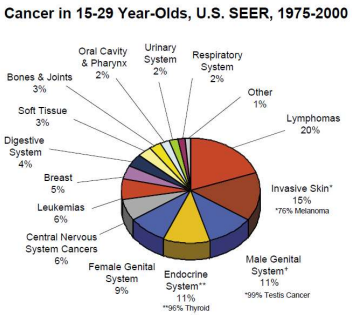
Adolescent and Young Adult Oncology

- Definition: **15-39 yo**
- In 2002 nearly 68,000 people ages 15 to 39 yo were diagnosed with cancer
  - **8x more than children under age 15 yo**





Closing the gap: research and care imperatives for adolescents and young adults with cancer. A report of the Adolescent and Young Adult Oncology Program Review Group. Bethesda, MD: National Cancer Institute; 2006

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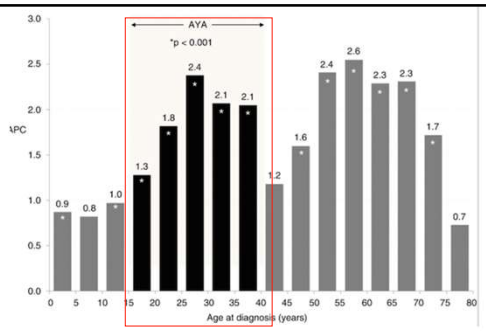

Figure 1. ALL: Annual Percentage Change (APC) in incidence and age, 1989-2011.

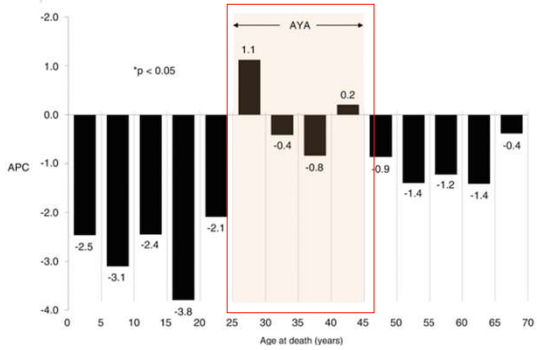

Figure 2. ALL: Annual Percentage Change (APC) in death rate by age, 1989-2011.

Bleyer, et al. Cancer in Adolescents and Young Adults (Pediatric Oncology) (Kindle Location 5915). Springer International Publishing. Kindle Edition.

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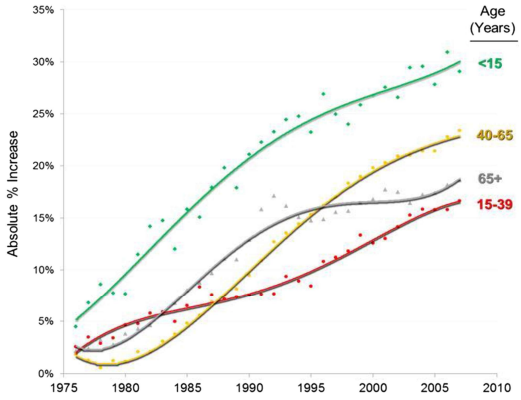
Absolute % increase in survival by age



Baseline is 1973 to 1975 average. Kaposi sarcoma is excluded due to the HIV/AIDS epidemic during the 1980s and early 1990s; thyroid cancer is excluded because of overdiagnosis and increasing survival inflation. Regressions are 4° polynomials. Data source is SEER 9 regions.75

Published in: Joseph M. Unger; Elise Cook; Eric Tai; Archie Bleyer; *American Society of Clinical Oncology Educational Book* 36185-198.
DOI: 10.1200/EDBK_156686

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Most Common Blood Cancers in AYA

- Acute Lymphoblastic Leukemia (ALL)
- Hodgkin Lymphoma (HL)
  - 16% of cancers in ages 15-24
  - Nodular sclerosing (most common)
  - Lymphocyte rich
  - Lymphocyte depleted
  - Mixed cellularity
  - Nodular lymphocyte predominant
- Non-Hodgkin Lymphoma (NHL)
  - Burkitt Lymphoma (BL)
  - Diffuse Large B-cell Lymphoma (DLBCL)
  - Mediastinal B-cell Lymphoma (MBCL)

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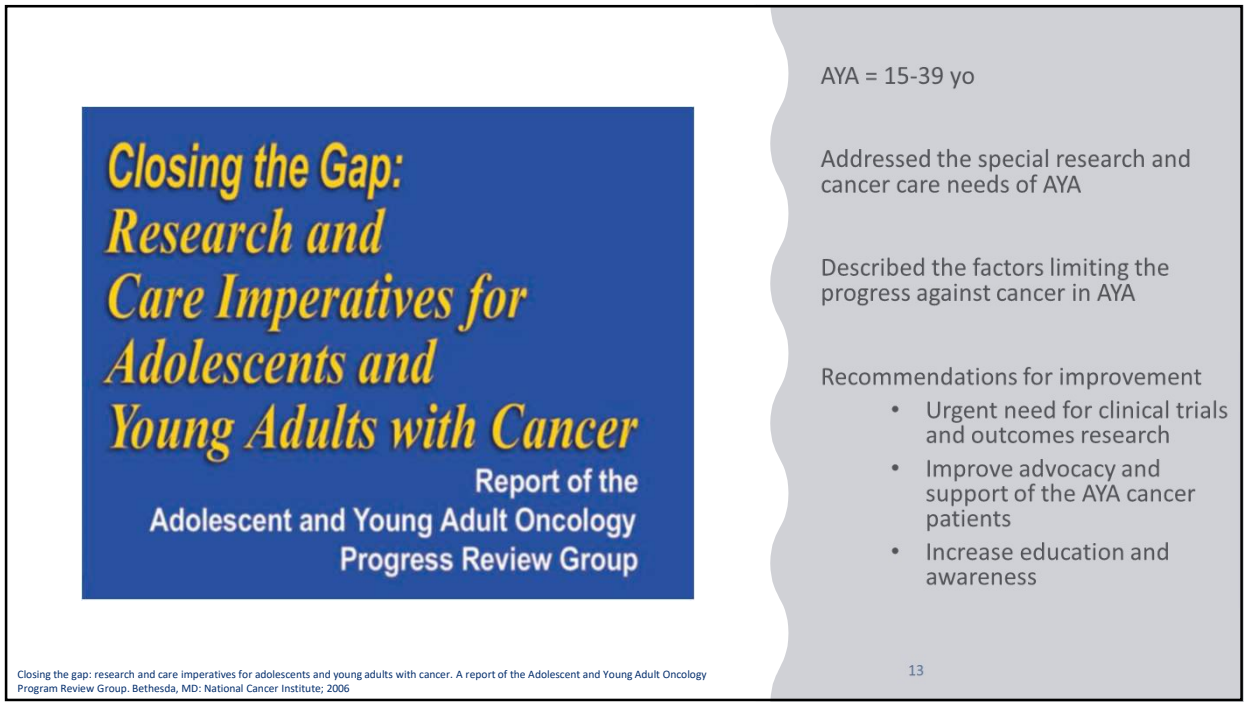
Closing the Gap:
Research and
Care Imperatives for
Adolescents and
Young Adults with Cancer
Report of the
Adolescent and Young Adult Oncology
Progress Review Group
AYA = 15-39 yo
Addressed the special research and cancer care needs of AYA
Described the factors limiting the progress against cancer in AYA
Recommendations for improvement
Urgent need for clinical trials and outcomes research
Improve advocacy and support of the AYA cancer patients
Increase education and awareness
Closing the gap: research and care imperatives for adolescents and young adults with cancer. A report of the Adolescent and Young Adult Oncology Program Review Group. Bethesda, MD: National Cancer Institute; 2006
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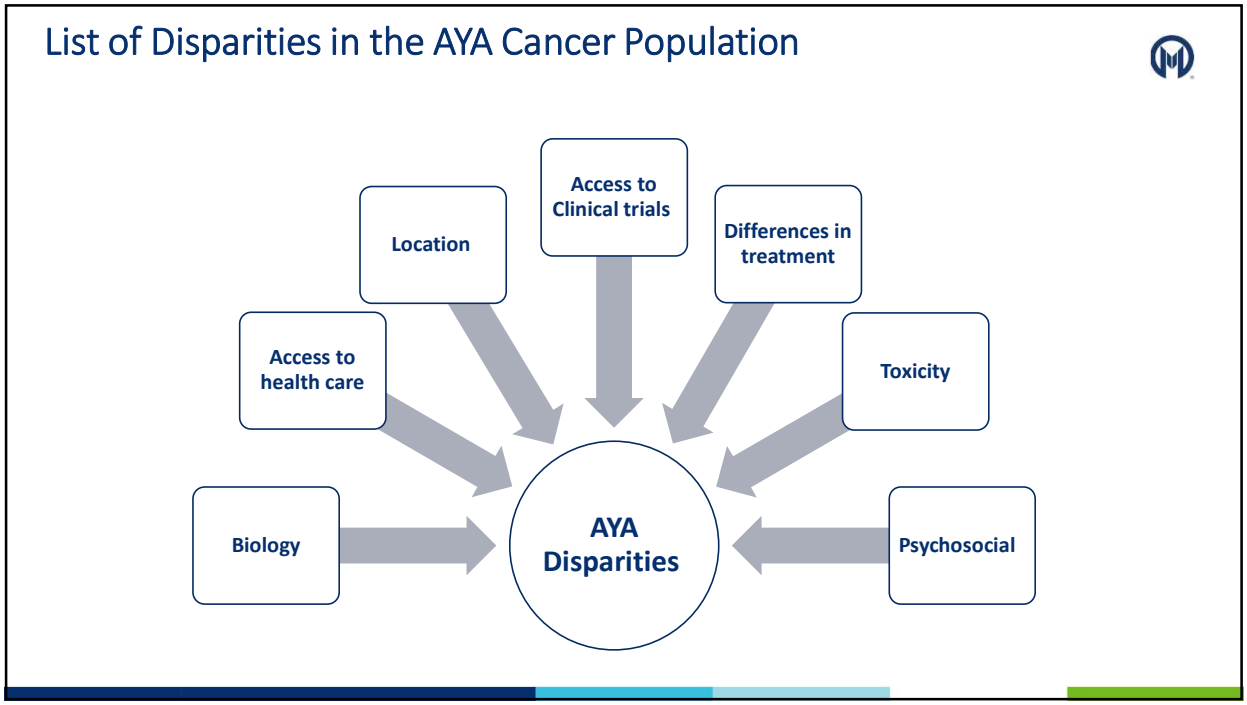
List of Disparities in the AYA Cancer Population
Access to Clinical trials
Location
Differences in treatment
Access to health care
Toxicity
Biology
AYA Disparities
Psychosocial

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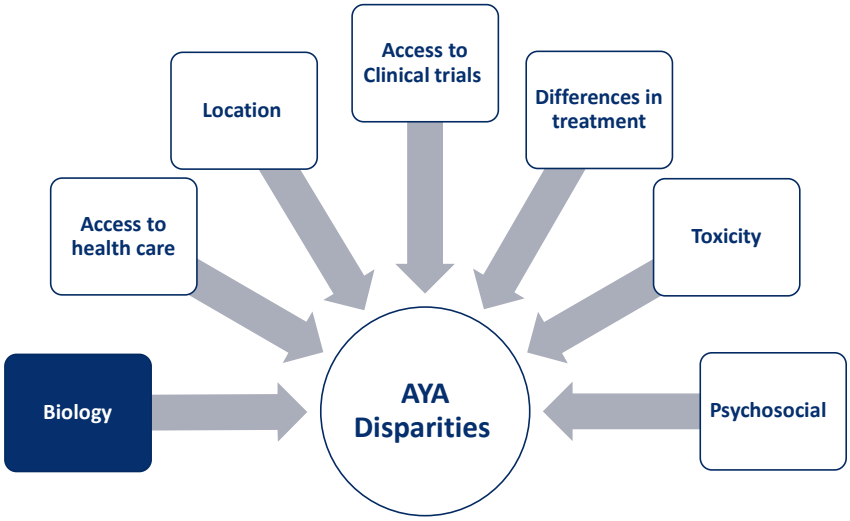
List of Disparities in the AYA Cancer Population



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ALL in the AYA Population

Presentation

- Cytopenia
- Lymphocytosis
- Fatigue
- Bone pain
- Petechia
- Fevers

Work up

- Bone marrow biopsy
  - Flow cytometry
  - Clonoseq ID
  - Foundation Heme
- Lumbar puncture
- CT NTAP

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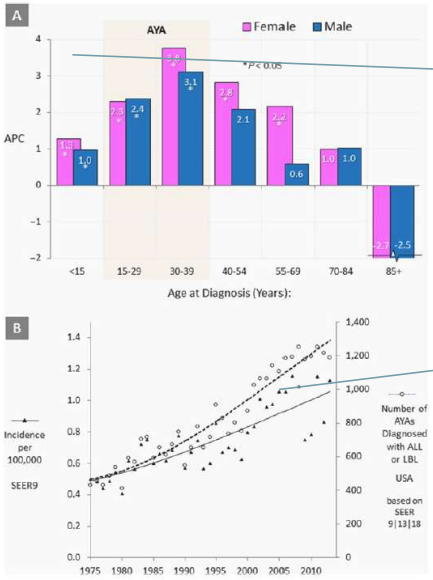


- Incidence of ALL/Lymphoblastic Lymphoma (LBL) has increased **most** in AYA
- 30-39 yo: higher in females

- Incidence of ALL/LBL doubled since 1975

McNeer JL, Bleyer A. Pediatr Blood Cancer. 2018;65:e26989

ALL/LBL AYA survival through the years

- In the last decade, only half of AYA patients with ALL/LBL survived 10 years

- The death rate in AYAs did not begin to decline until after 2000
  - It declined in children in the 1970s
  - The decrease is not as pronounced as in <15 yo

McNeer JL, Bleyer A. Pediatr Blood Cancer 2018;65:e26989

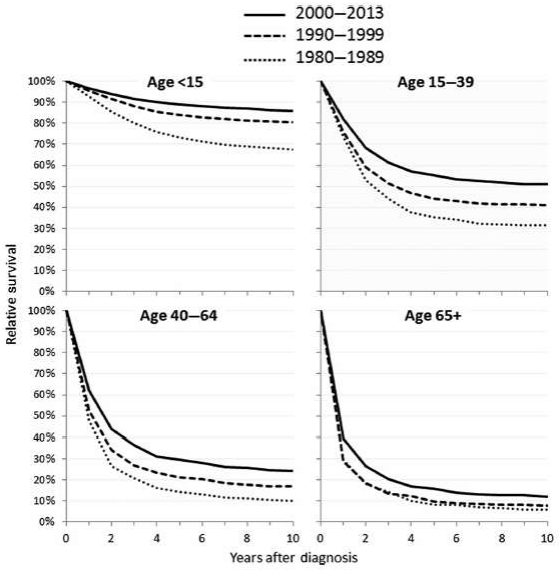
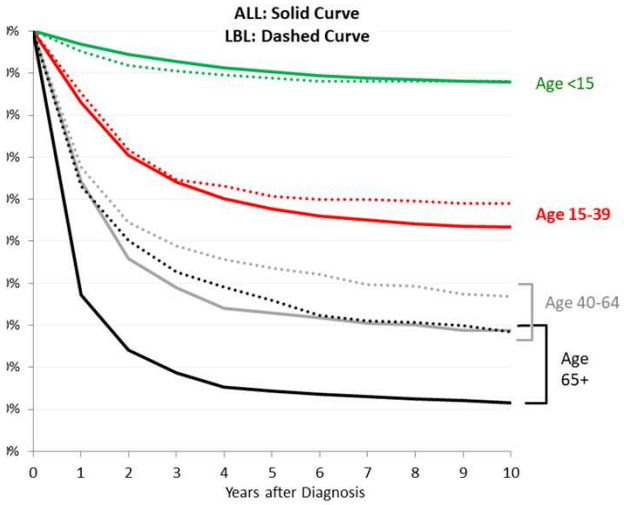


FIGURE 3 Relative survival after diagnosis of ALL/LBL*, by age and era, SEER.[5] *ICD-O-3 codes are given in Supplementary Table S1

ALL/LBL AYA survival through the years

- 10-year relative survival between 40%-60%
- 30-35% lower than in children <15 yo



ementary Figure S1. **Specific Survival after Diagnosis of ALL^ and LBL*, 2000-2009, 2018, by age** (2). ^SEER AYA Recode *ICD-O-3 codes per Supplementary Table S1 minus ALL

19 McNeer JL, Bleyer A. Pediatr Blood Cancer. 2018;65:e26989

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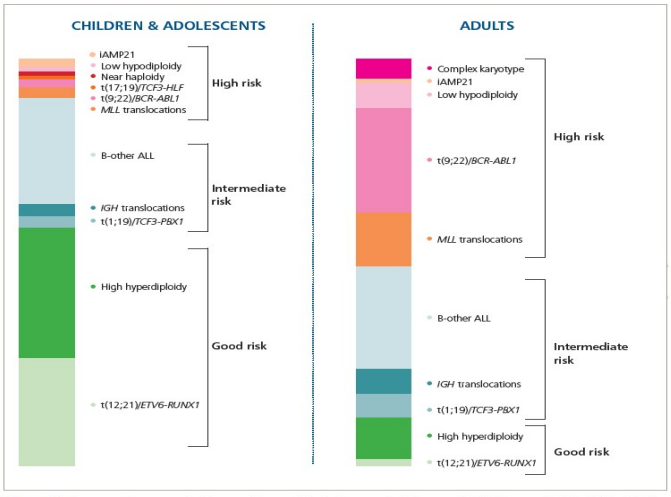

Figure 1. Common Cytogenetic Abnormalities and Their Prognostic Relevance in Children and Adults With B-Cell Acute Lymphoblastic Leukemia (ALL)—From Moorman. Haematologica. 2016.[117] Used with permission.
iAMP21 = intrachromosomal amplification of chromosome 21.

ALL in AYA

Decrease incidence of GOOD mutations:
ETV6-RUNX1 t(12;21)
Hyperdiploidy

Increase incidence of poor mutations
Ph-like
iAMP21
MLL translocations
Complex Karyotype
T-Cell ALL
ETP ALL

Creutzig U, Kutny MA, Schlenk RF. Acute myelogenous leukemia. In: Cancer in Adolescents and Young Adults. Springer-Verlag Berlin Heidelberg. 2007;10.1007/978-3-540-68152-6
Tricoli JV, Blair DG, Anders CK, et al. Biologic and clinical characteristics of adolescent and young adult cancers: acute lymphoblastic leukemia, colorectal cancer, breast cancer, melanoma, and sarcoma. Cancer. 2016;122:1017-1028.
Mulligan CG, Willman CL. Advances in the biology of acute lymphoblastic leukemia from genomics to the clinic. J Adolesc Young Adult Oncol. 2011;1:77-86

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The Big Question: How to treat ALL in AYAs?

Pediatrics vs. Adult Regimen for ALL

Issues with comparisons:

- There is no direct head-to-head trial comparing Pediatric regimens versus Adult regimens in treating AYA patients
- When comparing the trials, the age range differs between each trial making it more difficult to compare
- I will review the most popular trials that led to the modification of NCI guidelines
  - Recommend to treat AYA with clinical trial or pediatric based regimen

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CLINICAL TRIALS AND OBSERVATIONS

A pediatric regimen for older adolescents and young adults with acute lymphoblastic leukemia: results of CALGB 10403

Wendy Stock,[1] Selina M. Luger,[2] Anjali S. Advani,[3] Jun Yin,[4] Richard C. Harvey,[5] Charles G. Mullighan,[6] Cheryl L. Willman,[7] Noreen Fulton,[1] Kristina M. Laumann,[4] Greg Malnassy,[1] Elisabeth Paietta,[7] Edy Parker,[8] Susan Geyer,[4] Krzysztof Mrózek,[16] Clara D. Bloomfield,[16] Ben Sanford,[4] Guido Marcucci,[16] Michaela Liedtke,[16] David P. Claxton,[17] Matthew C. Foster,[18] Jeffrey A. Bogart,[19] John C. Gregula,[20] Frederick R. Appelbaum,[21] Henry Erba,[22] Mark R. Litzow,[23] Martin S. Tallman,[24] Richard M. Stone,[25] and Richard A. Larson[1]

Remission Induction (Course I)
- **Allopurinol** –300 mg/day (unless allergic), to continue until peripheral blasts and extramedullary disease are reduced
- **IT-Ara-C** – Ara-C 70 mg IT on D 1.
- **Pred** –60 mg/m²/day PO or IV in two divided doses on D 1-28
- **VCR** –1.5 mg/m² (maximum dose 2 mg) IV on D 1, 8, 15, and 22
- **DNR** –25 mg/m² IV on D 1, 8, 15, and 22
- **PEG** –2500 IU/m² IM or IV D 4
- **IT-MTX** – 15 mg IT on D 8 and D 29 (also administered on D 15 and 22 for patients with CNS3)

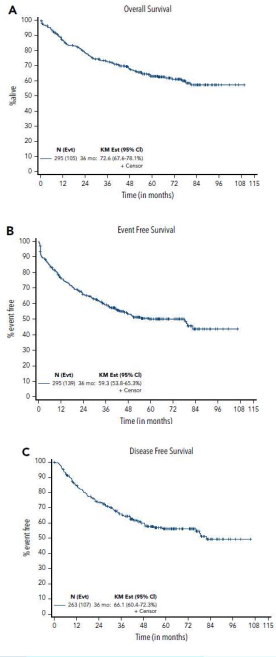
Extended Remission Induction (if required)(Course IA)
- **Pred** –60 mg/m²/day PO or IV (methylprednisolone) in two divided doses on D 1-14
- **DNR** –25 mg/m² IV on D 1
- **VCR** – Vincristine 1.5 mg/m² (maximum 2 mg) IV on D 1 and 8
- **PEG** –2500 IU/m² IM or IV D 4

Remission Consolidation (Course II)
- **CTX** –1000 mg/m² IV on D 1 and 29
- **Ara-C** –75 mg/m² IV or SC on D 1-4, 8-11, 29-32, and 36-39
- **6-MP** –60 mg/m² PO on D 1-14 and 29-42
- **VCR** –1.5 mg/m² (maximum 2 mg) IV on D 15, 22, 43, and 50
- **PEG** –2500 IU/m² IM or IV on D 15 and 43
- **IT-MTX** – 15 mg IT on D 1, 8, 15, and 22 (omit doses on D 15 and 22 for patients with CNS3)

Interim Maintenance (Course III)
- **IV-MTX** –starting dose 100 mg/m² IV (escalate by 50 mg/m²/dose on D 1, 11, 21, 31, and 41
- **VCR** – 1.5 mg/m² (maximum dose 2 mg) IV on D 1, 11, 21, 31, and 41
- **PEG** –2500 IU/m² IM or IV on D 2 and 22
- **IT-MTX** – 15 mg IT on D 1 and 31

Delayed Intensification (Course IV)
- **VCR** – 1.5 mg/m² (maximum dose 2 mg) IV on D 1, 8, 15, 43, and 50
- **DEX** – 10 mg/m² PO (or IV) divided BID on D 1-7 and 15-21
- **DOX**- 25 mg/m² IV on D 1, 8, and 15
- **PEG** – 2500 IU/m² IM or IV on D 4 (or D 5 or D 6) and D 43
- **CTX** – 1000 mg/m² IV on D 29
- **Ara-C** – 75 mg/m² IV or SC on D 29-32 and 36-39
- **6-TG** – 60 mg/m²/day PO on D 29-42
- **IT-MTX** – 15 mg IT on D 1, 29, and 36

Maintenance (Course V)*
- **VCR**–1.5 mg/m² (maximum dose 2 mg) IV on D 1, 29, and 57
- **DEX**- 6 mg/m²/day PO (or IV) in 2 divided doses every 4 weeks on D 1-5, 29-33, and 57-61
- **6-MP**–75mg/m²/day PO on D 1-84
- **IT-MTX** – 15 mg IT on D 1(also is given on D 29 of the first 4 courses of maintenance)
- **IDO-MTX** – 20 mg/m² PO weekly on D 8, 15, 22, 29, 36, 43, 50, 57, 64, 71, and 78 (held on D 29 of the first 4 courses of maintenance when IT-MTX is given)



3y-OS
73% vs. 58%

3y-EFS
59% vs. 30%

3y-DFS
81.7% vs. 34%

Stock W, et al. Blood. 2019; 133(14):1548-1559

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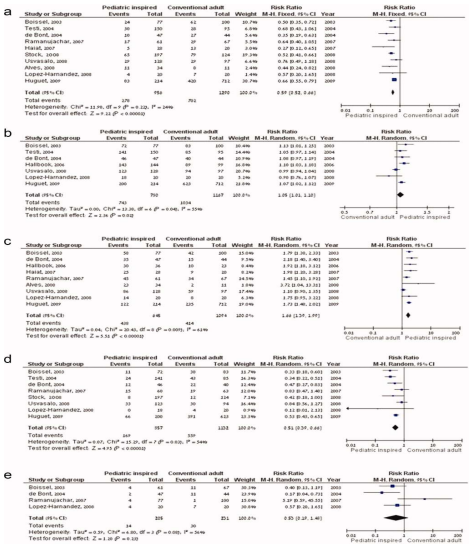
CALGB 10403

- Feasibility to treat AYAs > 40 yo with intensive pediatric regimen, identical to that developed by COG
- Low treatment related mortality (3%)
  - Similar to pediatric trials
  - Higher incidence of hepatic and thrombotic complications during induction compared to AALL0232 trial.
- Improvement in outcomes
  - 3-year OS: 73% vs. 58% (previous CALGB trials)
- Risk factors for worst outcomes:
  - Obesity
  - Ph-like ALL

Stock W, et al. Blood. 2019; 133(14):1548-1559

Adolescents and young adults with acute lymphoblastic leukemia have a better outcome when treated with pediatric-inspired regimens: Systematic review and meta-analysis



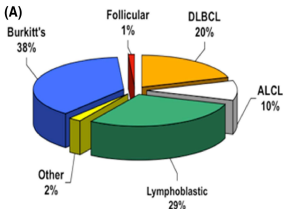
American Journal of Hematology, Volume: 87, Issue: 5, Pages: 472-478

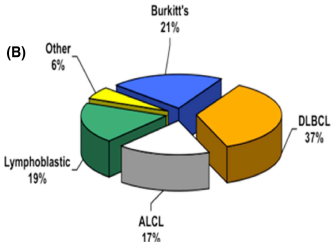
Summary of results

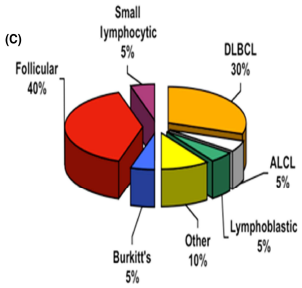
AYA patients given pediatric-inspired regimens had a statistically significant:

- Lower all cause mortality (a)
- Superior complete remission rate after induction (b)
- Superior EFS (c)
- Lower Relapse Rate (d)
- No difference in Non-relapse related mortality (e)

Common NHL by Age







0-14 yo
1) Lymphoblastic Lymphoma
2) Burkitt's Lymphoma
3) DLBCL

15-19 yo
1) DLBCL
2) Burkitt's
3) ALCL

≥ 20 yo
1) Follicular Lymphoma
2) DLBCL
3) Other

British Journal of Haematology, Volume: 173, Issue: 4, Pages: 637-650, First published: 12 April 2016, DOI: (10.1111/bjh.14074)

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Differences in NHL in AYA Patients

- Staging classifications are different in children:
  - St. Jude classification is used because of the predominance of extranodal primaries compared to adults
  - Lack of a standardized prognostic scoring system in pediatrics similar to the International Prognostic Index (IPI) utilized in adults
- There is no head-to-head comparison between pediatric based protocols versus adult based protocols
- Primary Mediastinal B-cell Lymphoma (PMBCL) worst outcomes compared to BL and DLBCL
  - Better treatment response with EPOCH-R regimen

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Difference in HL in the AYA Population

- Pediatric protocols have generally followed a strategy of upfront chemotherapy dose intensity in order to limit cumulative doses of chemotherapy.
- It is unclear if pediatric protocols have better outcomes than adult protocols.

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ORIGINAL RESEARCH

Cancer Medicine WILEY

Treatment patterns and outcomes in adolescents and young adults with Hodgkin lymphoma in pediatric versus adult centers: An IMPACT Cohort Study

Sumit Gupta[1,2,3,4] | Nancy N. Baxter[3,4,5,6] | David Hodgson[2,4,7,8] | Angela Punnett[1,2,4] | Rinku Sutradhar[3,4,5] | Jason D. Pole[5,8,9] | Chenthilla Nagamuthu[3] | Cindy Lau[3] | Paul C. Nathan[1,2,3,4]

- The IMPACT Cohort includes data
- Ontario, Canada AYA (15-21 yo) diagnosed with HL between 1992-2012
  - Linkage to population-based health administrative data identified late effects
- Examined Locus of Care (LOC) based differences in treatment modalities, cumulative doses, event-free survival (EFS), overall survival (OS), and late effects in 954 AYA patients ages 0-25 yo
- No differences in EFS or OS
- No LOC based outcome disparities were observed
- Higher incidences of second malignancies in pediatric center AYA and of cardiovascular events in adult center AYA were observed

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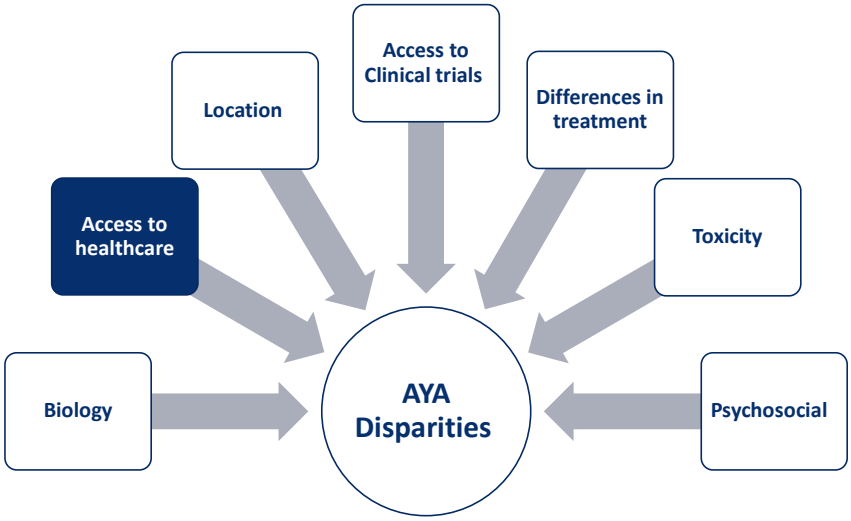
List of Disparities in the AYA Cancer Population



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Access to health care for the AYA population

- 18-34 highest rate of uninsured

- <u>Lack of insurance or public health insurance:</u>
  - Delay in evaluation and treatment
  - Increase risk of advance disease at diagnosis
  - Barriers to treatment at National Cancer Institute designated cancer centers, where outcomes are superior to other institutions
  - Increase mortality regardless of stage

Wolfson J. et al. Cancer Epidemiol Biomarkers Prev; 26(3) March 2017
Smith JC, Medalia C. Health Insurance Coverage in the United States: 2013.
US Department of Commerce, Economics and Statistics Administration, Bureau of the Census. 2014
Smith EC, Ziogas A, Anton-Culver H. Association between insurance and socioeconomic status and risk of advanced stage Hodgkin lymphoma in adolescents and young adults. Cancer. 2012;118:6179-6187.
Rosenberg AR, Kroon L, Chen L, et al. Insurance status and risk of cancer mortality among adolescents and young adults.

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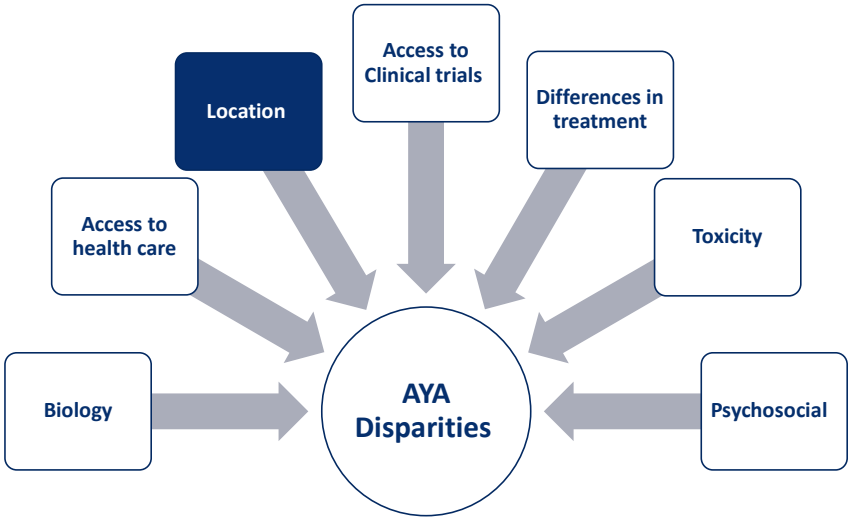
List of Disparities in the AYA Cancer Population



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Importance of Location

- % of patients receiving inpatient care at specialized cancer centers (SCC) has increased from 27% to 41% (1991-2014)
- Treatment in SCC have improved overall survival
- AYA were less likely to always receive care from SCC:
  - Public insurance
  - Uninsured
  - Hispanic
  - > 5 miles from SCC
  - Dx other than leukemia and CNS cancer

Alvarez, et al. Cancer 2017; 123:2516-23.

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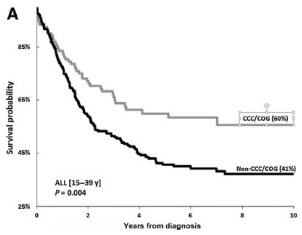
Table 1. Survival by age at diagnosis: AYAs versus children

Primary diagnosis	5-year OS* OS* (95% CI)	P	Hazard of death† HR† (95% CI)	P
Acute lymphoblastic leukemia				
1–9 years	89.1% (86.7–91.5)	<0.001	1.0	—
10–14 years	72.3% (65.6–79.0)		2.5 (1.8–3.4)	<0.001
15–21 years	55.7% (47.7–63.7)		4.4 (3.2–6.0)	<0.001
22–29 years	41.5% (30.7–52.3)		7.0 (5.0–9.9)	<0.001
30–39 years	35.4% (25.8–45.0)		8.6 (6.3–11.7)	<0.001
Acute myeloid leukemia				
1–14 years	62.8% (54.1–71.5)	0.03	1.0	—
15–21 years	48.9% (37.9–59.9)		1.6 (1.1–2.5)	0.02
22–39 years	48.9% (42.5–55.3)		1.5 (1.1–2.1)	0.02

*OS: Kaplan-Meier survival analysis.
†HR: univariable Cox regression.



AYAs treated in SCC/COG vs. non-SCC-COG

Poorer 5 yr-OS for AYA with ALL treated in non-CC/COG treatment center (41 vs. 60%)

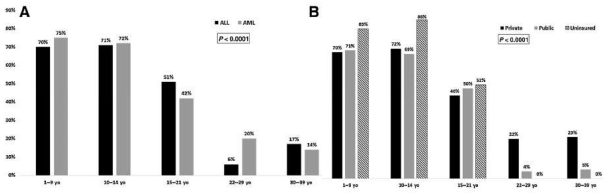


Figure 1.
Proportion of children, adolescents, and young adults with hematologic malignancies treated at CCCs or COG sites. Proportions are presented by age (**A**) and diagnosis and by age and payor (**B**).

- AYAs with ALL <30 yo have poor outcomes when not treated at SCC/COG sites when compared with those treated at SCC/COG sites
- Higher proportion of children were treated at SCC/COG
- 12-21 yo: older age was associated with less likely to be treated at SCC/COG
  SES was not associated with treatment site
- >22 yo: race and insurance predicted a lower odd of SCC/COG treatment, distance did not

Wolfson J. et al. Cancer Epidemiol Biomarkers Prev; 26(3) March 2017

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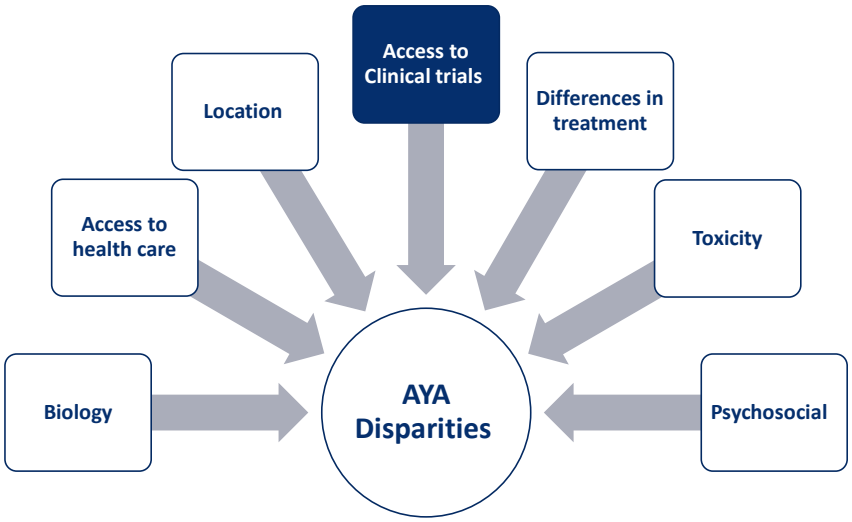
List of Disparities in the AYA Cancer Population



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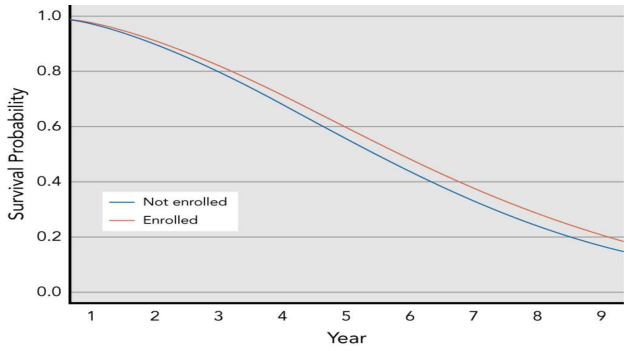
Importance of Clinical Trials



Enrollment in clinical trials at the first line of therapy in the United States is exceedingly low, at 0.1% of patients.

Patients with cancer treated in clinical trials live longer than those not treated in trials

J Natl Compr Canc Netw 2019 Nov 1;17(11):1309-1316. doi: 10.6004/jnccn.2019.7321

35

Hx of Clinical Trials in Pediatric ALL

- Enrollment of children (<15 yo) to clinical trials has historically been much higher than for adult cancers (>50%)
- At the same time, mortality rates for children have been decreasing since the 1970s
  - For adults they have been decreasing only since the 1990s
- The average reduction in the rate of mortality from 1975–1995 was 2.6% per year for those <20 yo
- Interestingly, the reduction was weakest among older children (15–19 yo; 2.0% per year),
  - Other studies found both lower trial enrollment for adolescents and young adults with cancer and lower rates of mortality reduction
- Clinical trial system that enrolls patients at higher rates produces treatment advances at a faster rate and concurrent survival increases and mortality reductions in the cancer population

Published in: Joseph M. Unger; Elise Cook; Eric Tai; Archie Bleyer; *American Society of Clinical Oncology Educational Book* 36185-198.
DOI: 10.1200/EDBK_156686

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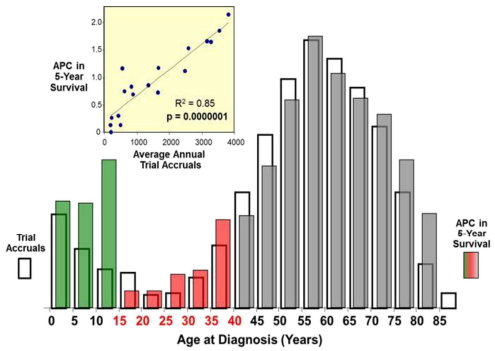

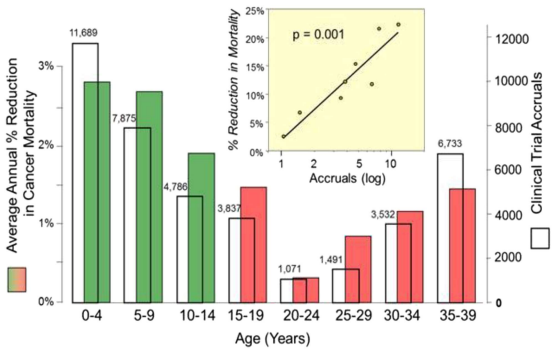

Trial accruals and average percent change in 5-year relative survival rates of all invasive cancers

- **Less trial accrual in 15-39 yo**
- **Lower APC in 5-year survival**

Trial accruals and average reduction in cancer mortality of all invasive cancers

- **Less trial accrual in 15-39 yo**
- **Lower average annual reduction in cancer mortality**

Published in: Joseph M. Unger; Elise Cook; Eric Tai; Archie Bleyer; *American Society of Clinical Oncology Educational Book* 36185-198.
DOI: 10.1200/EDBK_156686

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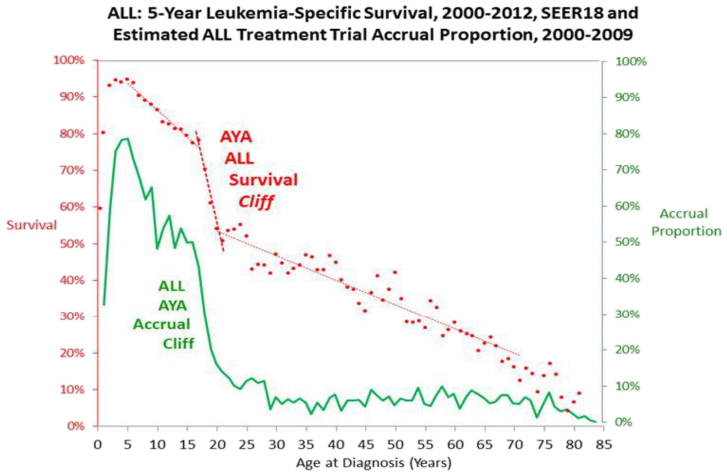

AYA ALL clinical trial accrual and AYA ALL survival

Decrease (drop) in Accrual = decrease in ALL survival

Joseph M. Unger; Elise Cook; Eric Tai; Archie Bleyer; *American Society of Clinical Oncology Educational Book* 36185-198.

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Barriers to Clinical Trial Enrollment

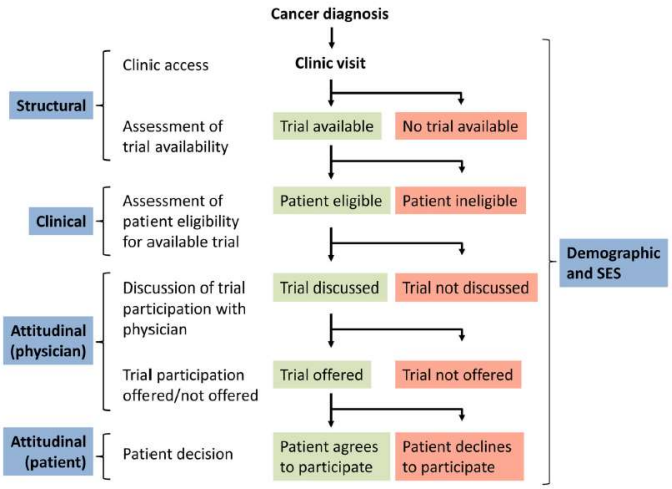

Figure 1.
Model pathway of trial enrollment process

JNCI J Natl Cancer Inst, 2019, Vol. 111, No. 3

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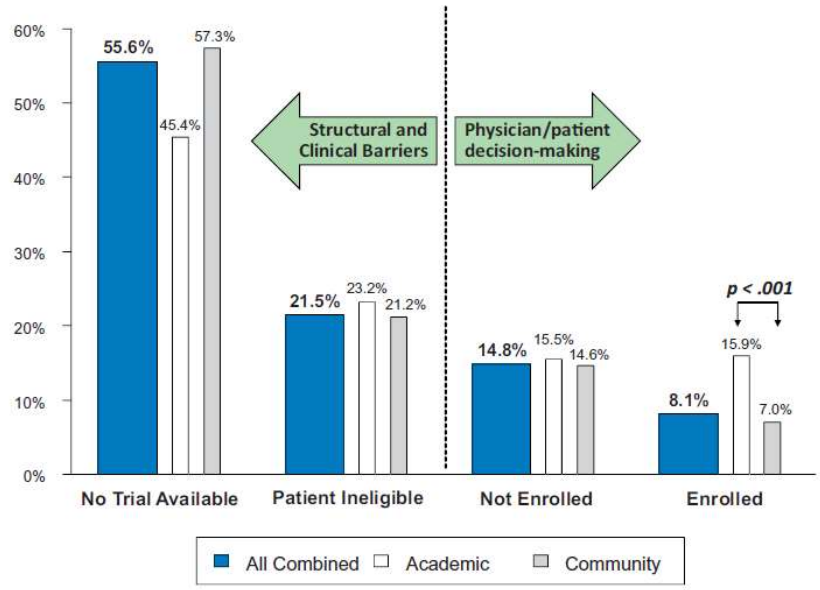

JNCI J Natl Cancer Inst, 2019, Vol. 111, No. 3

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List of Disparities in the AYA Cancer Population

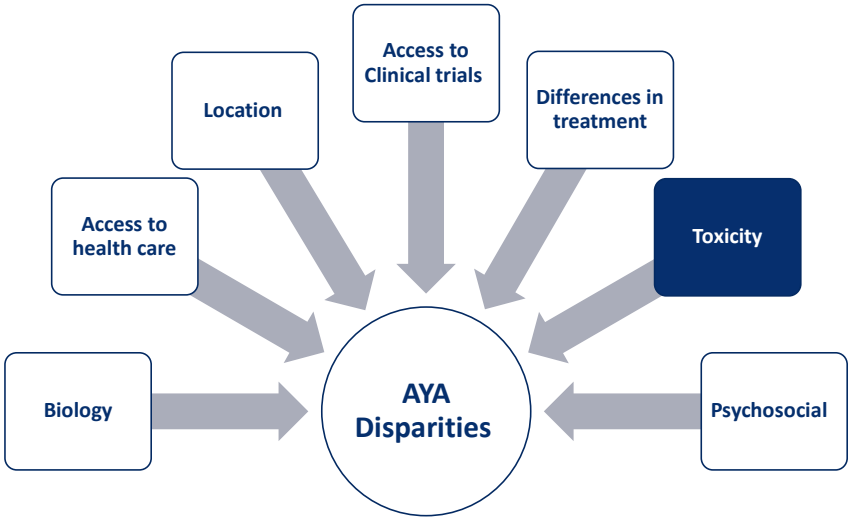

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Table 1. Main differences between pediatric-based and adult-type programs for Ph– ALL in AYA patients.

Treatment phase	Characteristics of pediatric-based therapy (*versus* adult standard therapy)	Annotations
Chemotherapy (induction, consolidation, maintenance)	Corticosteroids: higher cumulative dose	Dexamethasone preferred (higher activity); Higher penetration into CNS; Toxicity: osteonecrosis (age-related), other (metabolism, hypertension, peptic ulcer, infections (fungal))
	Vincristine: higher injection no. and cumulative dose	Risk of neuropathy (higher doses)
	Asparaginase/Peg-ASP: higher cumulative dose	Peg-ASP recommended/preferred (minimum 4 injections); Careful association with other potentially hepatotoxic drugs; Toxicity (risk factors: age >45, liver steatosis, BMI >30): hepatic, metabolic, pancreatic coagulation/thrombosis, allergy
	Antimetabolites: more intensive use and higher cumulative dose of MTX, 6-thiopurines, cytarabine	Higher MTX dose recommended/preferred (>1.5 g/m^2, up to 3–5 g/m^2)
	Anthracyclines: less intensive use	Lower risk of myelotoxicity and cardiomyopathy
CNS prophylaxis	IT chemotherapy: intensified, higher injection no.	Single agent IT MTX, cytarabine or triple IT combination (MTX, cytarabine, corticosteroids)
	Cranial prophylaxis: omitted or in high-risk subsets only	Higher activity of systemic CNS-active therapy and IT prophylaxis; Better treatment compliance, lower risk of short- and long-term brain damage; Radiation-related risk of secondary brain neoplasms
Treatment intensity/adherence	Aim: higher overall intensity without undue dose reductions and treatment delay	Dedicated, well-trained staff (medical and nonmedical); Compliance to intensive chemotherapy
Allogeneic HCT	First CR: according to MRD/risk-based strategy	More frequently used in AYA/adults (>15–18 years) compared with children
	Salvage: standard procedure in second/later CR	–

ALL, acute lymphoblastic leukemia; AYA, adolescents and young adults; BMI, body mass index; CNS, central nervous system; CR, complete remission; HCT, hematopoietic cell transplantation; IT, intrathecal; MRD, minimal residual disease; MTX, methotrexate; Peg-ASP, pegylated asparaginase; Ph–, Philadelphia chromosome-negative B-ALL.

Ther Adv Hematol 2020, Vol. 11: 1–25DOI: 10.1177/ 20406207209035

Toxicities in the AYA Population

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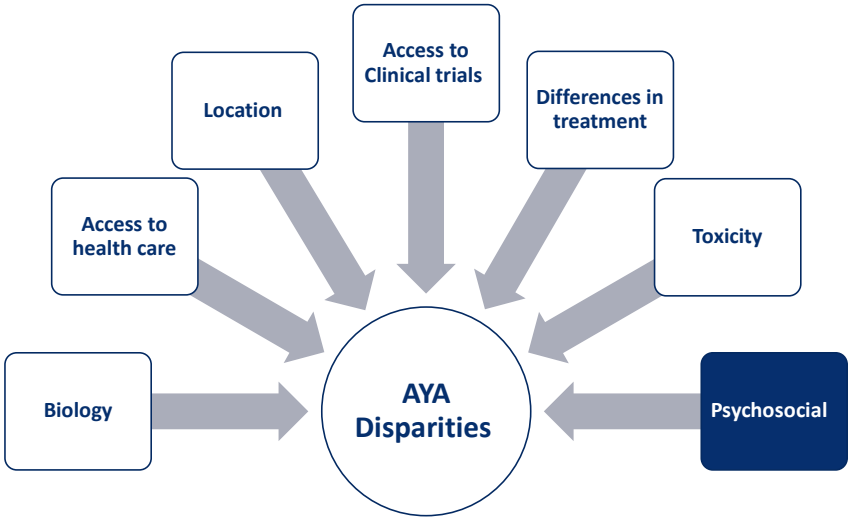
List of Disparities in the AYA Cancer Population



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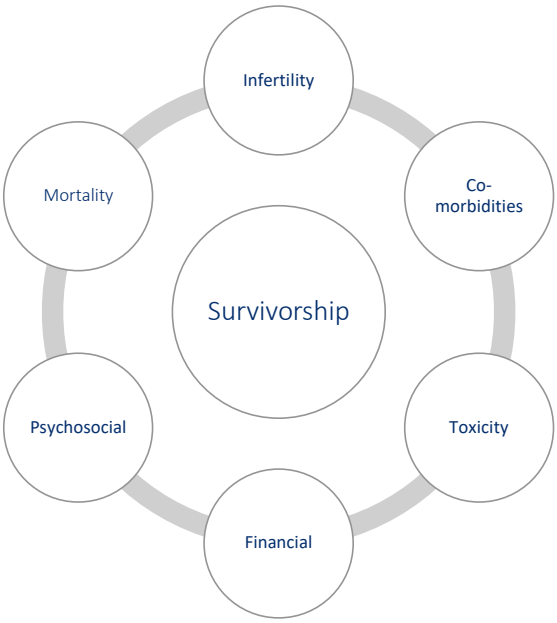

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Unique Psychosocial Issues

- The AYA age gap is very large
  - 15 yo ≠ 20 yo
  - 30 yo ≠ 30 yo
- Each have very different needs
- They require enhanced psychological and financial support

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Unique Psychosocial Issues

Cancer diagnosis in the AYA population interferes with:

- Age-specific milestones
  - Physical, social, emotional development
  - Underdeveloped coping skills
  - Underdeveloped decision making
- Establishing autonomy
- Moving
- Financial independence
- Career development
- Starting or sustaining romantic relationships

Perez G. Am Soc Clin Oncol Educ Book 2020 March; 40: 1-15. doi: 10.1200/EDBK_279787

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Fertility in the AYA Population

- This is a major concern for AYAs
- Lack information on post-treatment infertility risk
- Unrealistic expectations on reproductive health
- Limited knowledge on reproductive health
- Fertility information is the most unmet needs among AYA survivors
- Infertility leads to reduced mental health and low quality of life

Katz A. Breaking the Silence on Cancer and Sexuality: A Handbook for Healthcare Providers. Pittsburgh, PA: Oncology Nursing Society;2007
Murphy D. *Contraception*. 2013;88(2):215-220.
Perez G. Am Soc Clin Oncol Educ Book 2020 March; 40: 1-15. doi: 10.1200/EDBK_279787

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Fertility in the AYA Population

Risk depends on

- Age
- Type, dose, intensity and duration of treatment
- Diagnosis
- Financial limitations

- Fertility preservation is now standard of care
- Low % of oncologists follow ASCO/NCCN guidelines of fertility preservation
- Low % of oncologists provide fertility information to the patient
- Financial limitations also limit access to fertility preservation services

Katz A. Breaking the Silence on Cancer and Sexuality: A Handbook for Healthcare Providers. Pittsburgh, PA: Oncology Nursing Society;2007
Murphy D. *Contraception*. 2013;88(2):215-220.
Perez G. Am Soc Clin Oncol Educ Book 2020 March; 40: 1-15. doi: 10.1200/EDBK_279787

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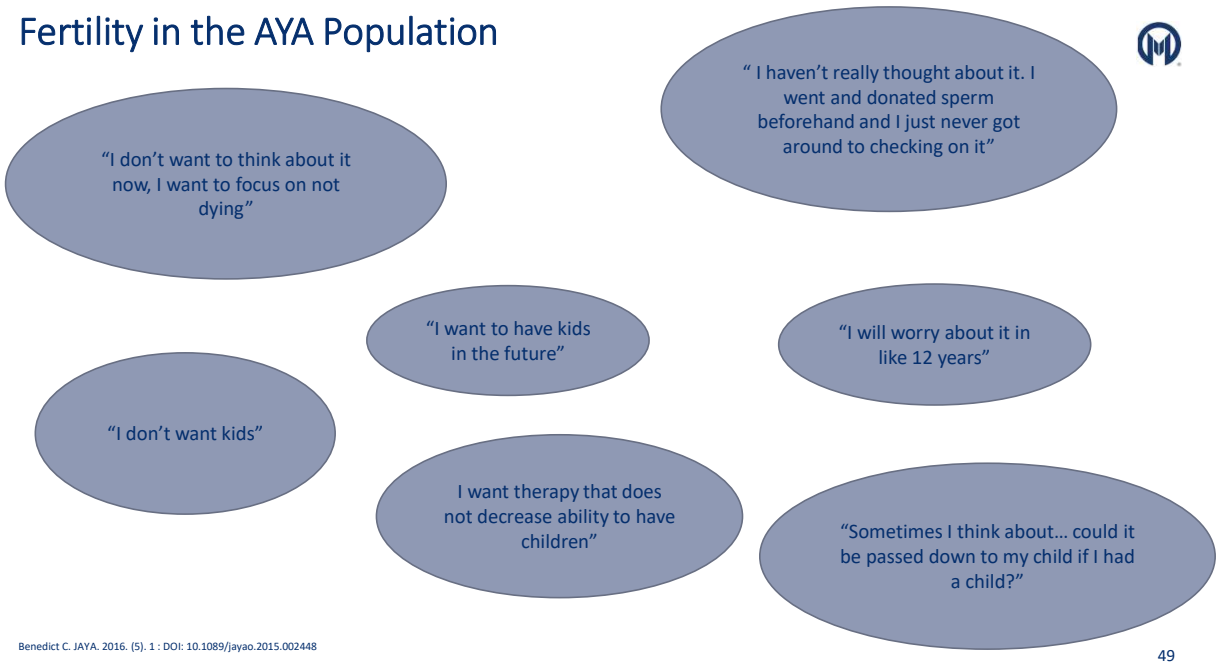
Fertility in the AYA Population



Benedict C. JAYA. 2016. (5). 1 : DOI: 10.1089/jayao.2015.002448

49

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Sexual Health

AYA patients are perceived as asexual

- Leads to unmet sexual health education in this population
- Increased risk of risky sexual behavior
- Increased risk of STD
- Increased mental health issues
- Decreased quality of life

- There is lack of physician recognition of sexual health as an unmet need in this population

Katz A. Breaking the Silence on Cancer and Sexuality: A Handbook for Healthcare Providers. Pittsburgh, PA: Oncology Nursing Society;2007
Murphy D. *Contraception*. 2013;88(2):215-220.

50

50

Financial Toxicity in the AYA Population

- Greater negative affect on finances in older AYAs
  - 26-39 yo (77.8%) vs. 15-25 yo (37.5%)
- Many years of treatment
- Decrease in long-term earning potential
- Unemployment
- Lack of insurance
- Continued caregiver role even while undergoing therapy
  - Primary caretaker of children or elderly parents

Kaddas H. JAYAO. 2019.0051
Perez G. Am Soc Clin Oncol Educ Book 2020 March; 40: 1-15. doi: 10.1200/EDBK_279787

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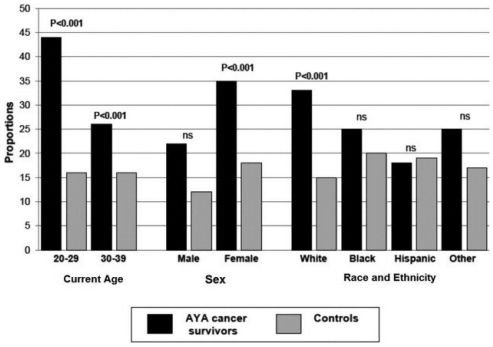
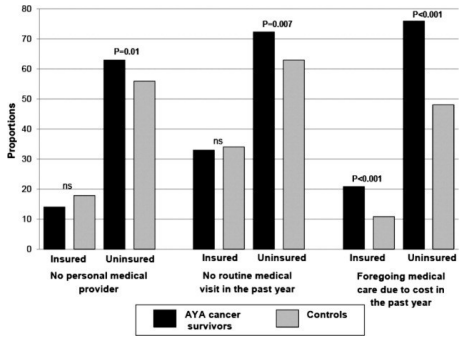
Limitations in health care access and utilization among long-term survivors of adolescent and young adult cancer





Proportions of survivors of AYA cancer compared to control who reported forgoing care due to costs

Proportion of heathcare access and utilization for survivors of AYA cancer compared with controls

Cancer, Volume: 118, Issue: 23, Pages: 5964-5972

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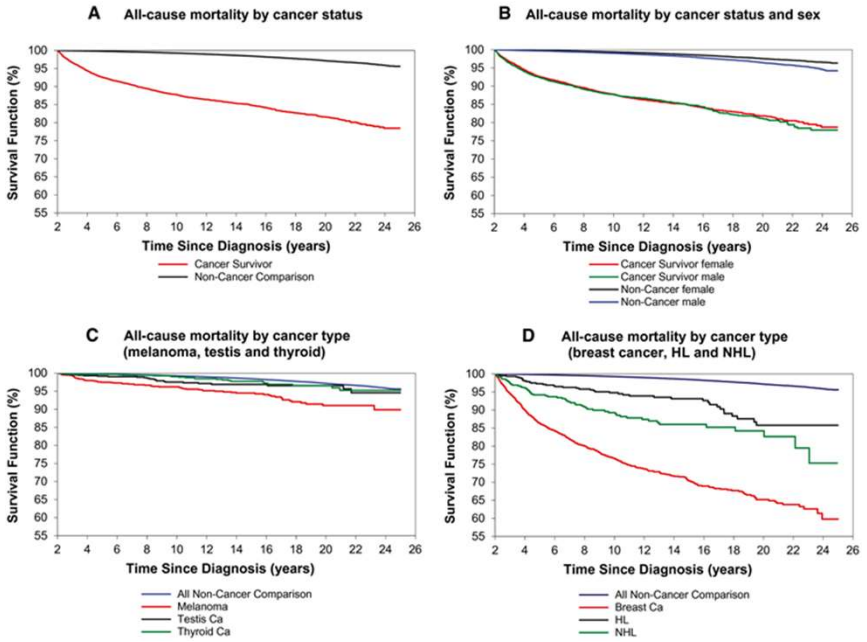

Cancer, Volume: 126, Issue: 10, Pages: 2305-2316

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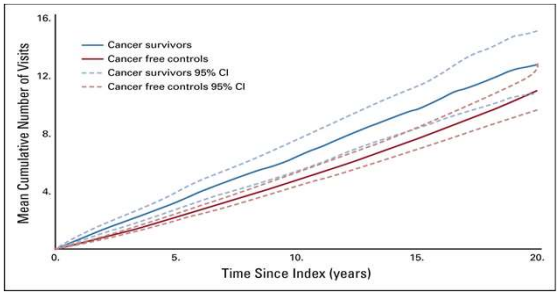
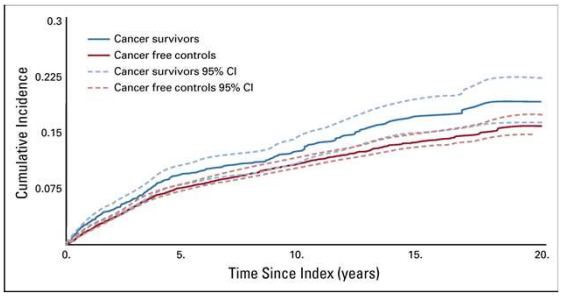
Psychosocial



Estimated mean cumulative number of outpatient mental health visits among 5-year survivors of AYA cancer compared with matched controls.



Estimated cumulative incidence of severe psychiatric episodes among 5-year survivors of AYA cancer and matched controls.

De Riddita et al. Journal of Clinical Oncology 29, no. 9 March 2021

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What can be done?

Progress has been made, but we cannot stop now

Education, Education, Education

Specialized AYA training

- Combined Pediatric and Adult oncology training
- AYA fellowships
- Education of residents
- Expand education into the community

Continued increase in clinical trial enrollment

- Expansion of age limits in cooperative clinical trials

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Has there been any progress?

- COG was the first group in North America to have a formal committee dedicated to AYA patients with cancer.
- In 2014, the National Cancer Institute formed the National Clinical Trials Network (NCTN), bringing together both adult and pediatric groups such as The Alliance for Clinical Trials in Oncology, COG, SWOG, and others to form a coordinated research network
  - Enhancing care for AYA patients through the expansion of clinical trial access via cross-group enrollment
  - Formation of trials with broader age eligibility
  - Improved availability of trials in communities with a high prevalence of AYA patients

Blood (2018) 132 (4): 376–384.

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TREATING ADOLESCENTS AND YOUNG ADULTS WITH BLOOD CANCER

Resources for HCPs

- ❑ Free CME & CE courses: www.LLS.org/CE
- ❑ Fact Sheets for HCPs: www.LLS.org/CE
- ❑ Podcast series for HCPs – www.LLS.org/HCPpodcast
- ❑ HCP Patient Referral Form: www.LLS.org/HCPreferral

TREATING ADOLESCENTS AND YOUNG ADULTS WITH BLOOD CANCER

RESOURCES FOR HCPS AND PATIENTS

- ❑ LLS Online Community
  HCP, Patient/Survivor & Caregiver account types:
  www.LLS.org/Community
- ❑ Clinical Trials: Learn more about clinical trials:
  www.LLS.org/ClinicalTrials
- ❑ 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

TREATING ADOLESCENTS AND YOUNG ADULTS WITH BLOOD CANCER

Resources for Patients

- Telephone and Web Education Programs: www.LLS.org/Programs & www.LLS.org/EducationVideos
- Information Booklets: www.LLS.org/Booklets
- Free Mobile Apps: *LLS Health Manager:* www.LLS.org/Health-Manager
- Support Resources: www.LLS.org/Support
  - LLS Regions
  - Online Chats
  - One-On-One Nutrition Consultations (PearlPoint)
  - LLS Community (social media platform)
  - Patti Robinson Kaufman First Connection Program (peer-to-peer)
- Financial Assistance
  - Co-Pay Assistance
  - Urgent Need
  - Travel Assistance
  - Referral to Medication Access programs

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TREATING ADOLESCENTS AND YOUNG ADULTS WITH BLOOD CANCER

Additional Resources for Patients

- *Caring for Kids And Adolescents with Blood Cancer* workbook - includes a set of worksheets and activities in addition to a tote, journal, pen and pill organizer. Available as a PDF at: www.LLS.org/FamilyWorkbook
- *The LLS Coloring Book App* includes blank canvases, general coloring pages, and pages from the LLS coloring books.
  Download at https://www.LLS.org/Coloring-for-Kids
- Medi Teddy™
- Dry erase/magnetic calendar
- *Coming Soon* – Children's book trilogy
- Available in English and Spanish: www.LLS.org/ChildhoodYAresources

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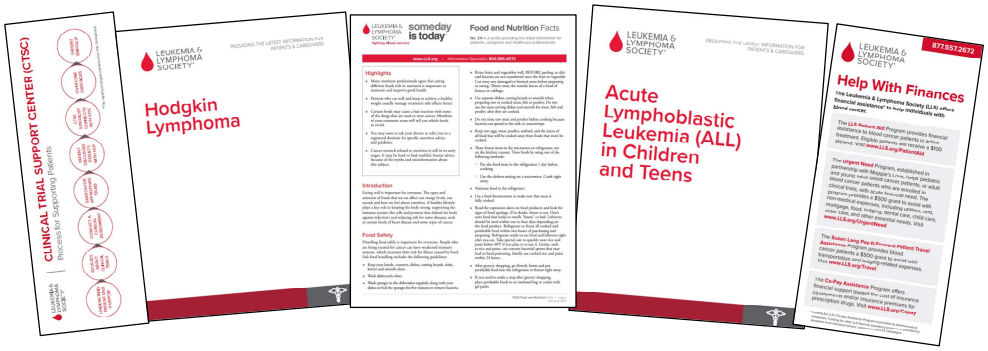
FREE GUIDES, BOOKLETS, AND FACT SHEETS
For Patients, Caregivers and Professionals

www.LLS.org/Booklets



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TREATING ADOLESCENTS AND YOUNG ADULTS WITH BLOOD CANCER

Resources for Patients

- **Information Specialists** – Personalized assistance for managing treatment decisions, side effects, and dealing with financial and psychosocial challenges.
- **Clinical Trial Nurse Navigators** – RNs navigate patients to find an appropriate clinical trial and sift through the information.
- **Registered Dieticians** – (LLS) provides PearlPoint Nutrition Services® to patients/caregivers of all cancer types, free nutrition education and one-on-one consultations by phone or email.
- **Reach out** **Monday–Friday, 9 am to 9 pm ET**
  - Phone: (800) 955-4572
  - Live chat: www.LLS.org/InformationSpecialists
  - Email: infocenter@LLS.org

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SPRING 2021

UPCOMING WEBINAR SCHEDULE

Wednesday, May 12, 2021, 12:00 PM – 1:30 PM ET
Treating Substance Users for HCV via Telemedicine: Implementation and Engagement Considerations

Presenter:

Andrew H. Talal, MD, MPH, *Professor of Medicine, State University of New York, Buffalo, New York, NY*

A live webinar brought to you by:

Clinical Directors Network, Inc. (CDN) and the Patient-Centered Outcomes Research Institute project on Patient-Centered HCV Care via Telemedicine for Individuals on Opiate Substitution Therapy (PCORI Grant #1507-31640)

For registration information, click here

Thursday, May 13, 2021, 1:00 PM – 2:00 PM ET
Treating Adolescents and Young Adults with Blood Cancer

Presenter:

Leidy L. Isenalumhe, MD, MS, *Assistant Member, Malignant Hematology Director of Clinical Operations, Malignant Hematology H. Lee Moffitt Cancer Center and Research Institute – Tampa, Florida*

A live webinar brought to you by:

The Leukemia & Lymphoma Society & Clinical Directors Network, Inc. (CDN)

For registration information, click here

Monday, June 28, 2021, 12:00 PM – 1:30 PM ET
HCV Telemedicine study - Topic: TBD

Presenter:

Marianthi Markatou, PhD., *Associate Chair of Research and Healthcare Informatics Professor, Department of Biostatistics, School of Public Health and Health Professions, Core Faculty, CDSE PhD Program, Adjunct Professor, Department of Computer Science and Engineering, School of Engineering and Applied Sciences, Assistant Director, Institute for Healthcare Informatics, Jacobs School of Medicine and Biomedical Sciences*

A live webinar brought to you by:

Clinical Directors Network, Inc. (CDN) and the Patient-Centered Outcomes Research Institute project on Patient-Centered HCV Care via Telemedicine for Individuals on Opiate Substitution Therapy (PCORI Grant #1507-31640)

PREVIOUS COVID-19 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, New York University

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

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, N°: Virtual Training Series (AHRQ, Grant No. 1P30-HS-021667) and Clinical Directors Network, Inc. (CDN)

Clinical Leadership Virtual Town Hall on COVID-19 with CDN Board of Directors

Presenters: *Daniel Miller, MD,* Chief of Residency Training and Behavioral Health Integration, Hudson River Health Care, Inc., Peekskill, New York

Alison Dubois, MPH, Chief Operating Office and Executive Vice President, Hudson River Health Care, Inc., Peekskill, New York

Daron Wu, MD, (Immediate Past Chair), Chief Medical Officer, Open Door Family Medical Centers, Ossining, New York

Nancy Piper Jenks, MS, CFNP, FAANP (Treasurer), Family Nurse Practitioner, Internal Medicine Department, Hudson River Health Care, Inc., Peekskill, New York

Jonathan N. Tobin, PhD, (Moderator), President/CEO, Clinical Directors Network, Inc. (CDN)

Sponsored by:

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

The Emergence of a Novel Coronavirus

Presenter: *Mary Foote, MD, MPH,* Senior Medical Coordinator for Communicable Disease Preparedness, Bureau of Healthcare System Readiness, New York City Department of Health and Mental Hygiene

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Q & A

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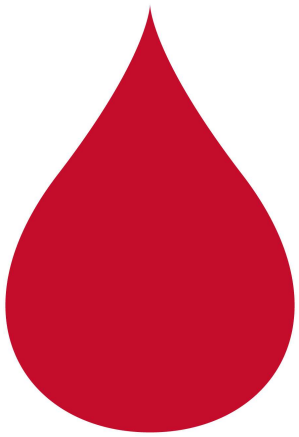

Thank you for participating.
Please complete the program evaluation

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