

Adolescent and Young Adult (AYA) Survivorship



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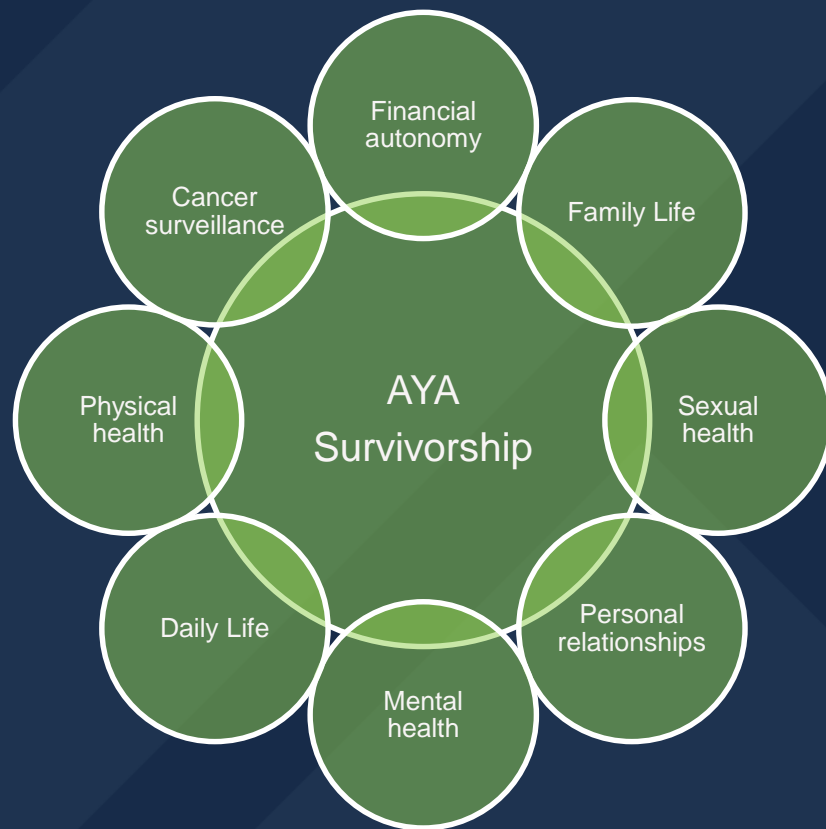
Disclosures: No ongoing financial relationships.

One-time advisory board participation for Astra Zeneca (Alexion).

One-time advisory board participation for Springworks.

Outline

- What is AYA survivorship?
- Fertility preservation
- Financial independence
- Treatment at recurrence
- Supportive services



Who is an AYA (adolescent and young adult) cancer survivor?

NCI definition of cancer survivor:

Any person with cancer, from time of diagnosis until the end of life.

Who is an AYA (adolescent and young adult) cancer survivor?

NCI definition of AYA:

Patients diagnosed with cancer within the ages of 15-39

Similar survivorship issues as pediatric cancer survivors:

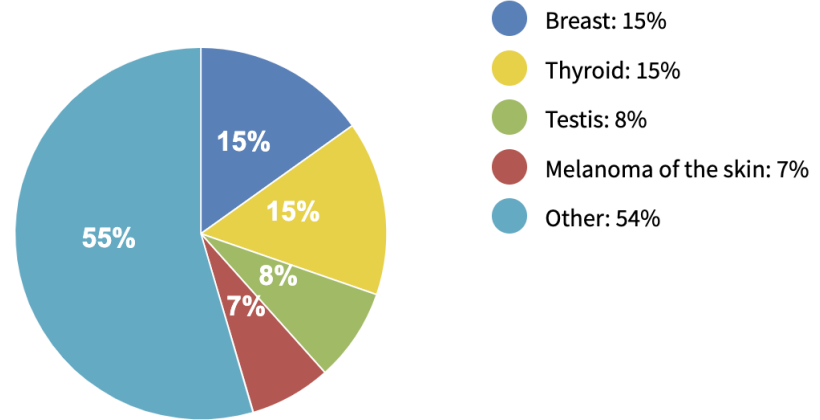
Pediatric patients diagnosed <15yo, now age 15-39

Incidence of cancer among AYA patients

New Cancer Cases, 2023

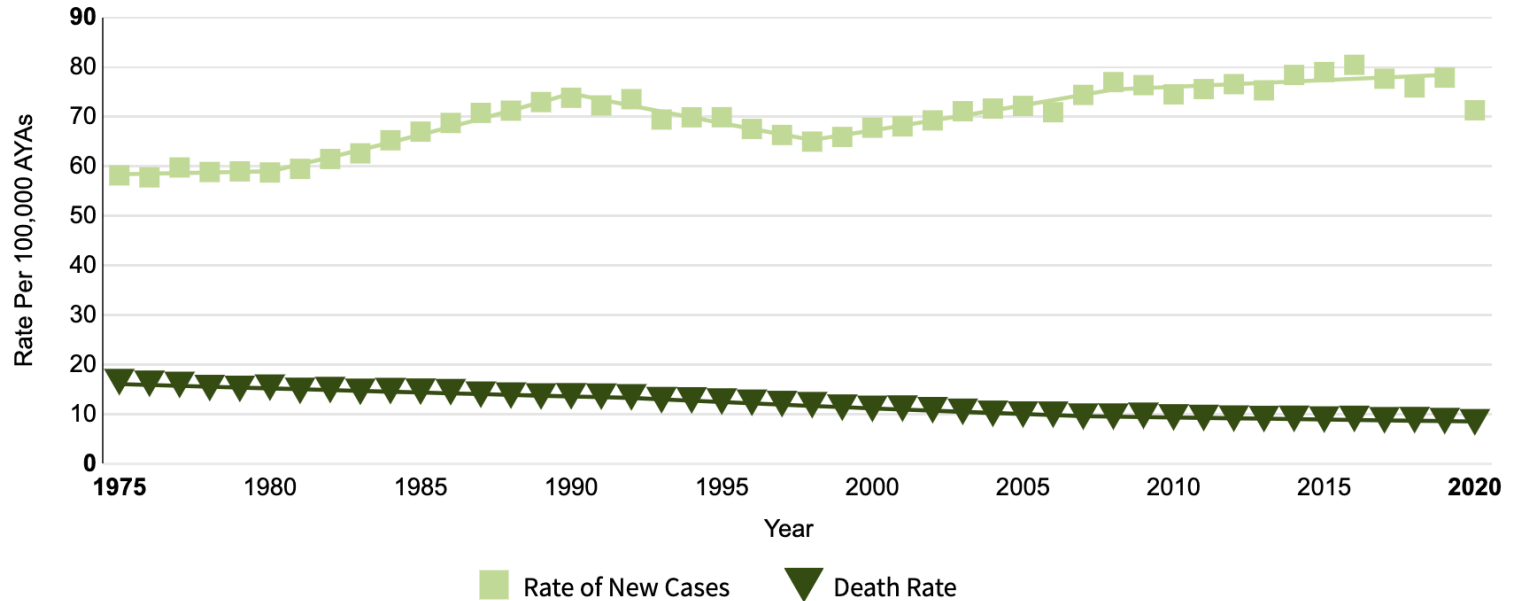
Estimated New Cancers Among AYA in the U.S. in 2023	85,980
% of All New Cancer Cases at Any Age	4.4%

Common Types of New Cancers Among AYA

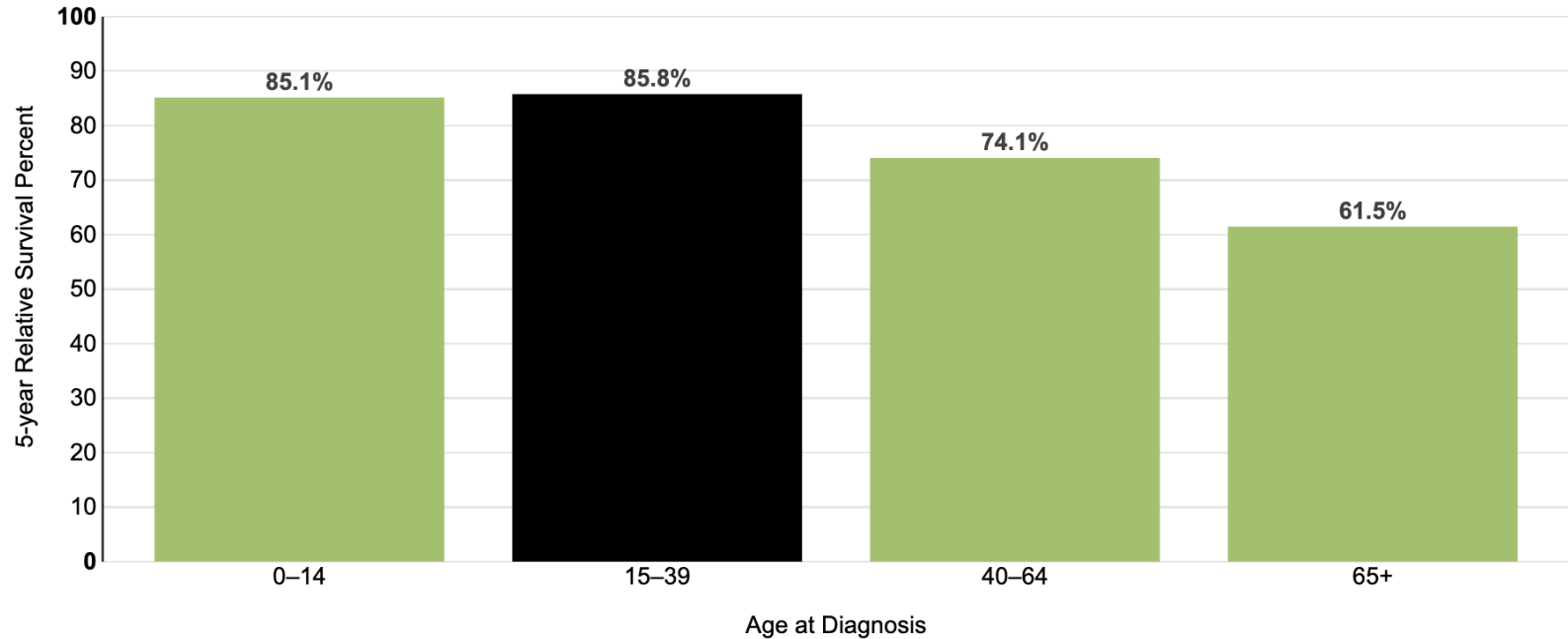


Distribution based on age-adjusted rates of new cases.
SEER 22, 2016–2020.

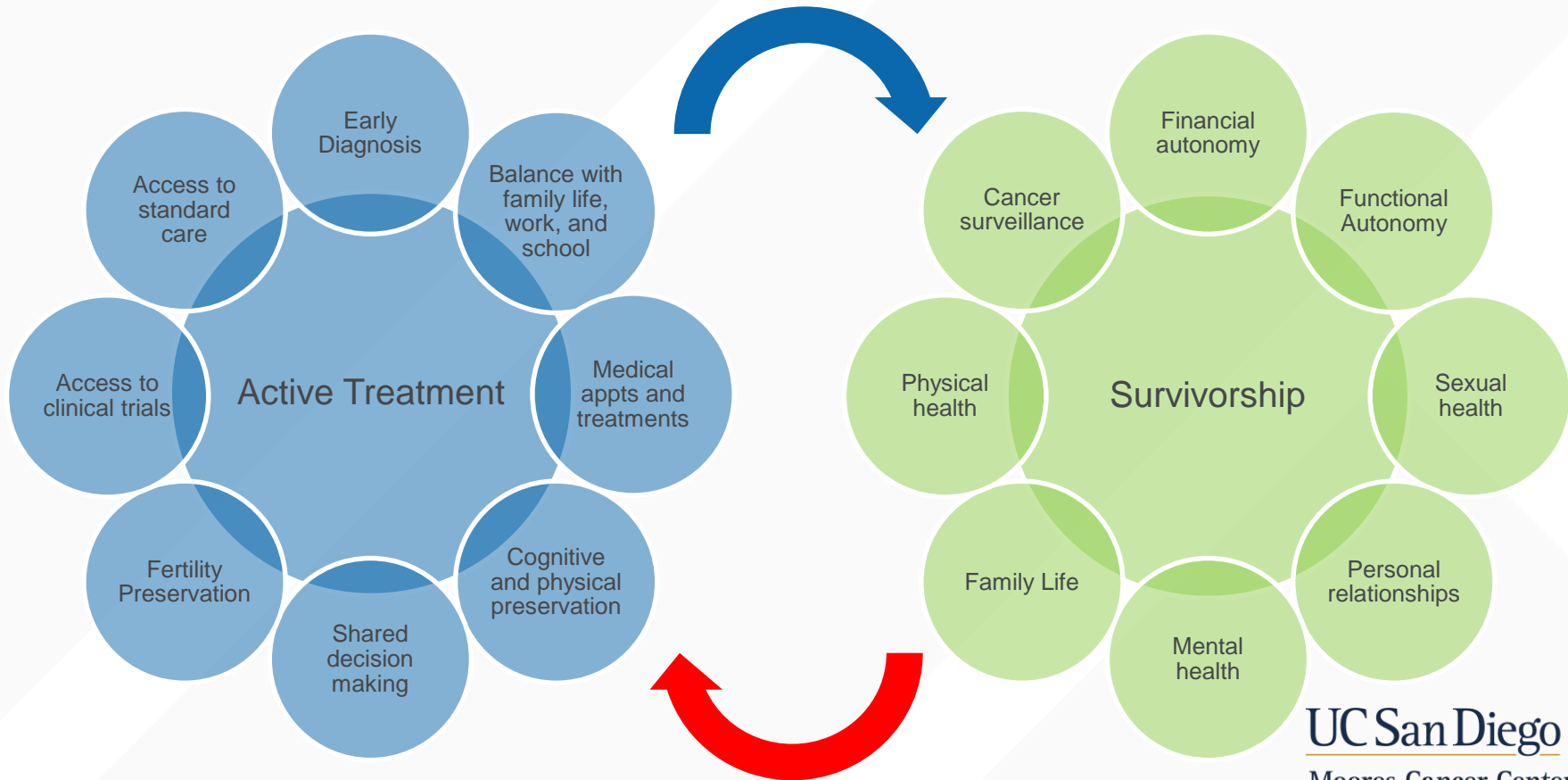
AYA cancer incidence and death rate over time



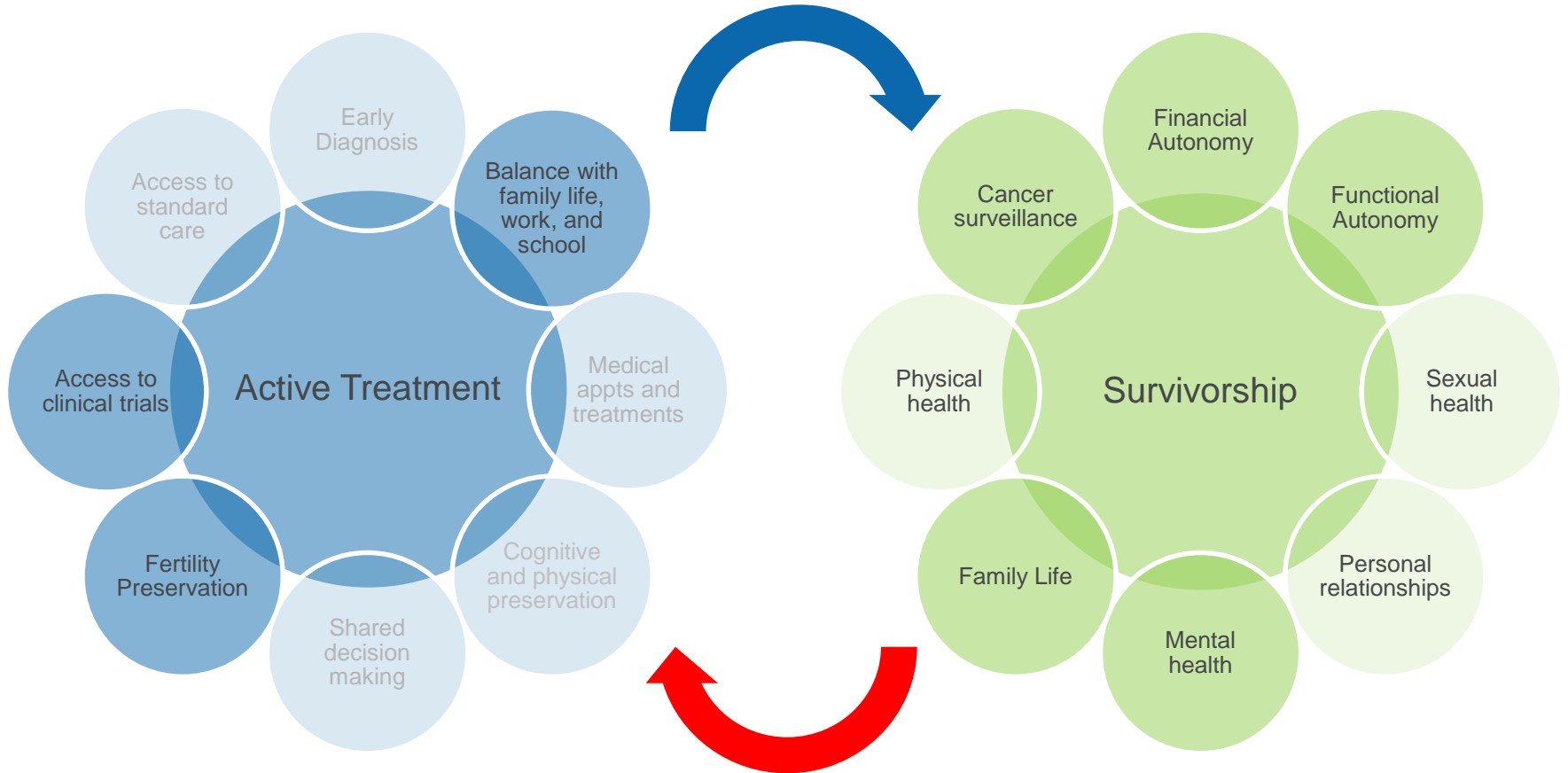
5-yr survival from all cancers by age



Oncology survivorship



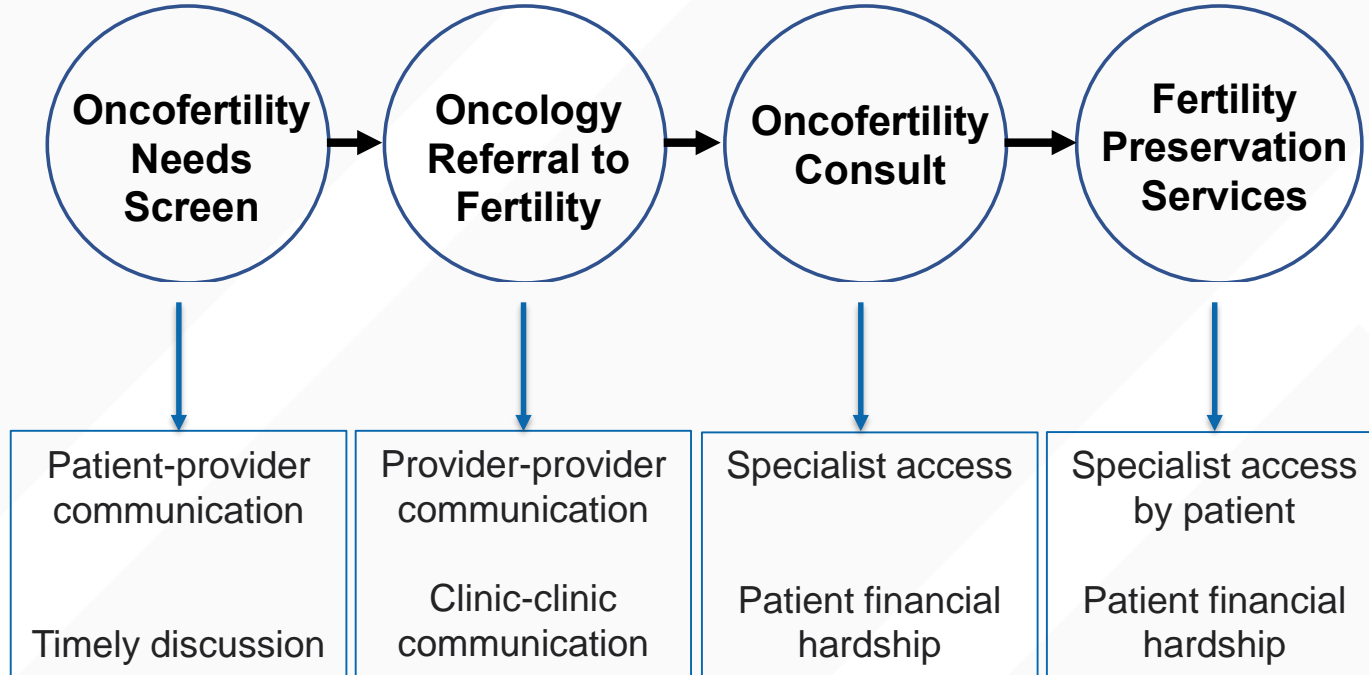
Oncology survivorship – AYA considerations



ONCOFERTILITY

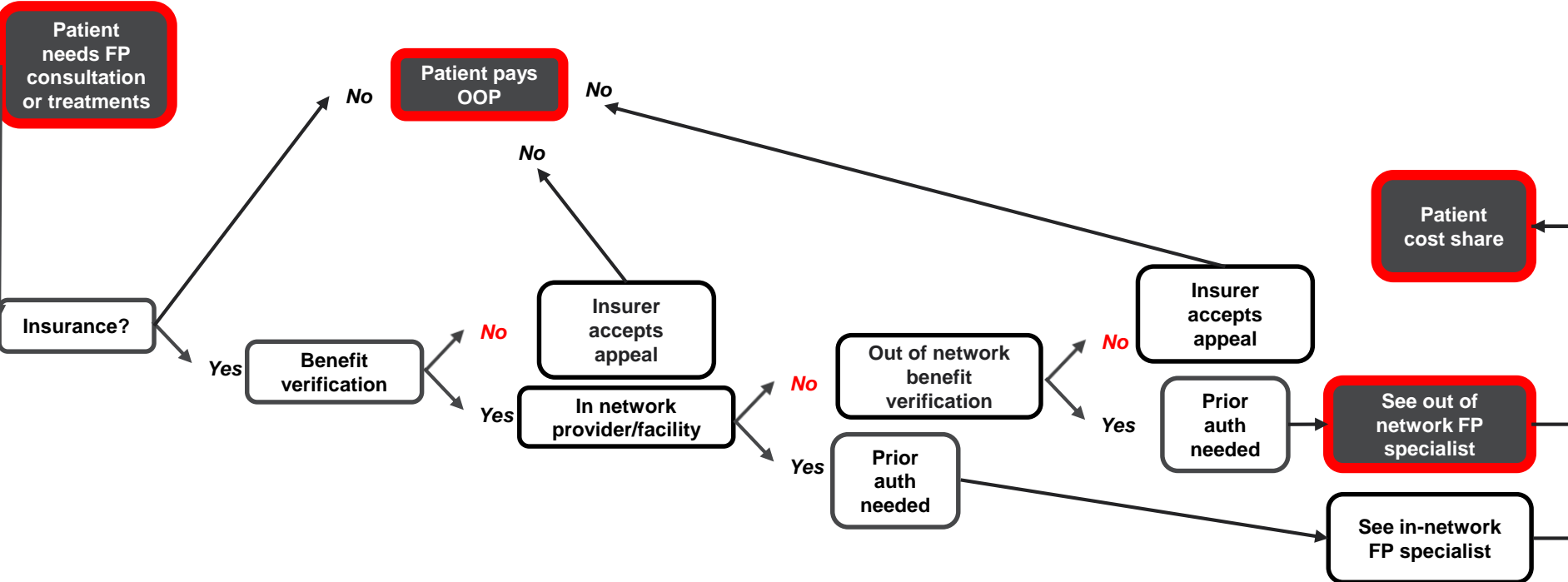
- Rate of fertility planning counseling (FPC) varies widely by specialty and medical care site, range varies ~7-84%
- There are multiple barriers to oncofertility counseling and preservation, including provider training, insurance, and female gender.

CORE COMPONENTS OF ONCOFERTILITY CARE

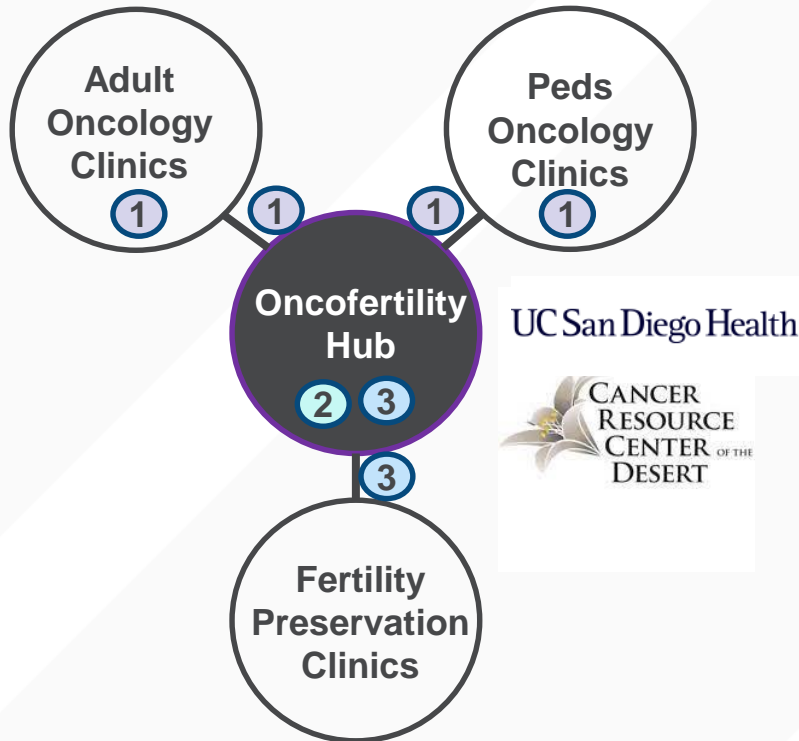


Multi-level
barriers

Barriers and facilitators to accessing FP health insurance benefits



ONCOFERTILITY CARE - INTERVENTION



- ① EHR-based oncofertility needs screen and referral pathway
- ② Telehealth oncofertility counseling
- ③ Telehealth financial navigation



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EMPLOYMENT AND INSURANCE

AYA cancer survivors have a high rate of unemployment even 5 years after baseline assessment

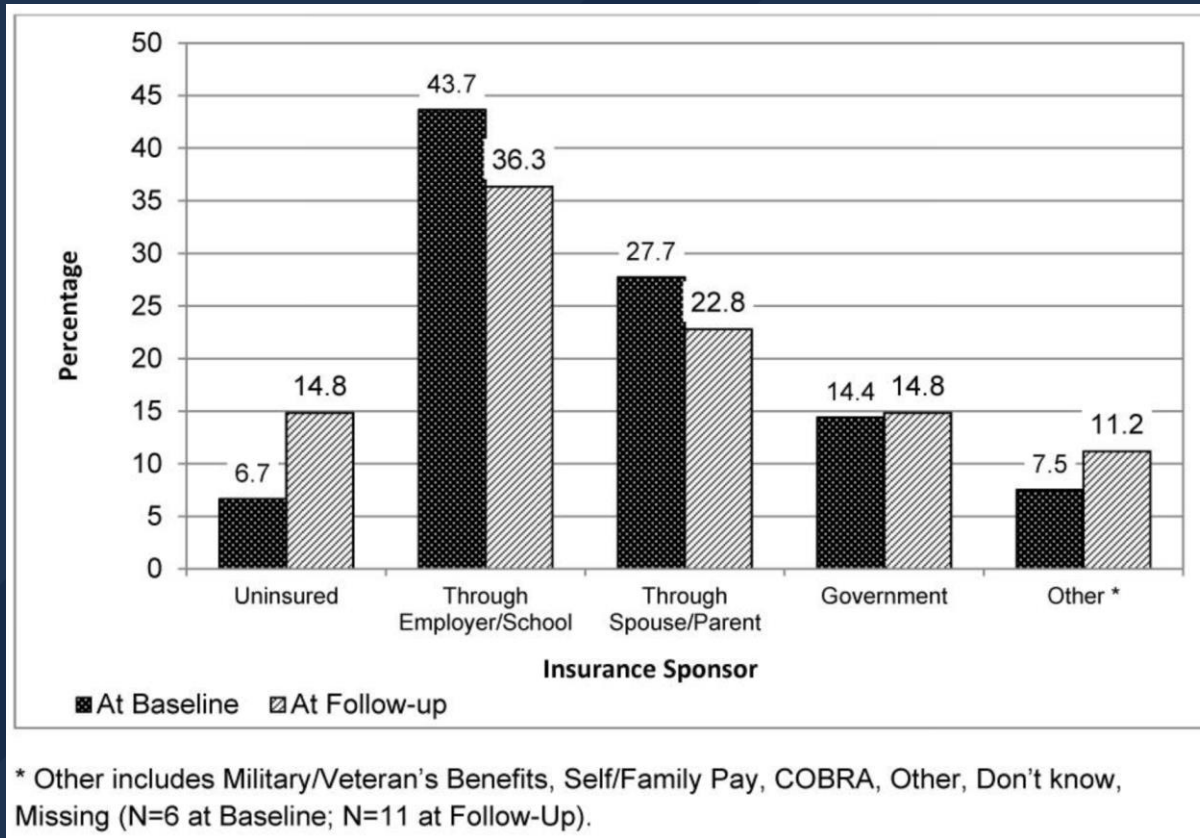
Table 2. Short- and long-term employment and financial outcomes of the AYA cancer survivors and their matched controls

	Baseline		<i>P</i> value	One year after baseline (short-term)		<i>P</i> value	Five years after baseline (long-term)		<i>P</i> value
	AYAs (<i>N</i> = 2527)	Controls (<i>N</i> = 10 108)		AYAs (<i>N</i> = 2527)	Controls (<i>N</i> = 10 108)		AYAs (<i>N</i> = 2527)	Controls (<i>N</i> = 10 108)	
	<i>N</i> (%)	<i>N</i> (%)	<i>N</i> (%)	<i>N</i> (%)	<i>N</i> (%)	<i>N</i> (%)			
Employed ^a									
No	440 (17.4)	2037 (20.2)	0.002	601 (23.8)	2072 (20.5)	<0.001	522 (20.7)	1669 (16.5)	<0.001
Yes	2079 (82.3)	8071 (79.8)		1924 (76.1)	8036 (79.5)		2005 (79.3)	8438 (83.5)	
Missing	8 (0.3)	—		2 (0.1)	—		—	1 (0.0)	

CNS cancer is a risk factor for unemployment in AYA oncology survivors

	One year after baseline (short-term)				Five years after baseline (long-term)			
	Univariable logistic regression		Multivariable logistic regression		Univariable logistic regression		Multivariable logistic regression	
			Nagelkerkes $R^2 = 0.253$				Nagelkerkes $R^2 = 0.276$	
	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value
Breast	Reference		Reference		Reference		Reference	
Digestive tract	0.897 (0.578-1.392)	0.627	0.628 (0.311-1.265)	0.192	1.612 (0.9750-2.665)	0.063	1.507 (0.675-3.364)	0.317
Respiratory tract	0.403 (0.174-0.934)	0.034	0.414 (0.126-1.357)	0.146	0.471 (0.202-1.098)	0.081	0.377 (0.114-1.244)	0.109
Skin	2.668 (1.918-3.712)	<0.001	1.25 (0.573-2.727)	0.575	3.056 (2.167-4.311)	<0.001	1.823 (0.814-4.082)	0.144
Bone, articular cartilage and soft tissues	1.03 (0.589-1.802)	0.917	0.95 (0.389-2.322)	0.910	0.771 (0.452-1.314)	0.339	0.5 (0.2-1.248)	0.138
Head and neck	1.015 (0.51-2.023)	0.965	1.183 (0.448-3.124)	0.734	0.801 (0.414-1.552)	0.512	0.467 (0.177-1.233)	0.124
Female genital organs	0.95 (0.659-1.369)	0.781	0.787 (0.432-1.433)	0.433	1.065 (0.733-1.547)	0.743	1.075 (0.578-1.999)	0.819
Male genital organs	1.494 (1.102-2.026)	0.010	0.898 (0.474-1.702)	0.742	2.56 (1.814-3.612)	<0.001	0.953 (0.478-1.899)	0.891
Urinary tract	1.2 (0.61-2.36)	0.597	1.144 (0.423-3.089)	0.791	1.689 (0.801-3.563)	0.169	0.754 (0.274-2.078)	0.585
Hematological malignancies	0.808 (0.598-1.093)	0.167	0.694 (0.388-1.242)	0.219	1.134 (0.826-1.558)	0.436	0.97 (0.531-1.771)	0.92
Endocrine glands	1.327 (0.83-2.121)	0.238	1.482 (0.715-3.073)	0.29	2 (1.181-3.387)	0.010	1.202 (0.548-2.634)	0.647
Central nervous system	0.526 (0.323-0.855)	0.010	0.39 (0.17-0.895)	0.026	0.282 (0.174-0.457)	<0.001	0.147 (0.061-0.352)	<0.001
Other [†]	0.862 (0.22-3.379)	0.831	n.s.	n.s.	0.845 (0.215-3.313)	0.809	n.s.	n.s.

AYA patients have high rate of underinsurance



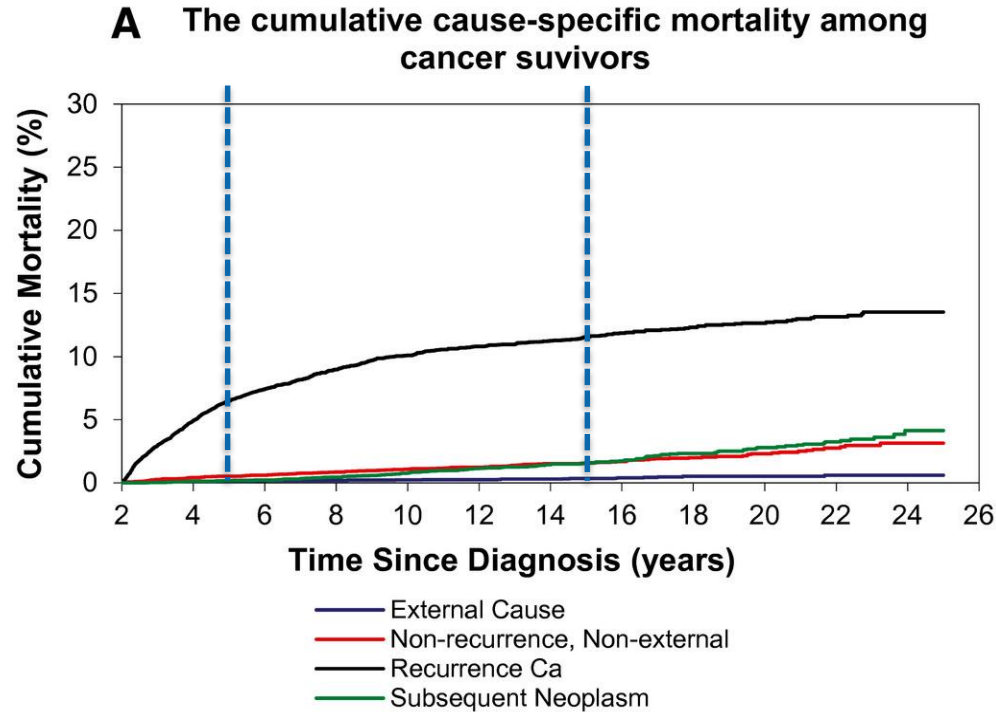
*Furthermore, 25% of AYA patients had no insurance at some point during the first 35 months after diagnosis.

EMPLOYMENT AND INSURANCE Interventions

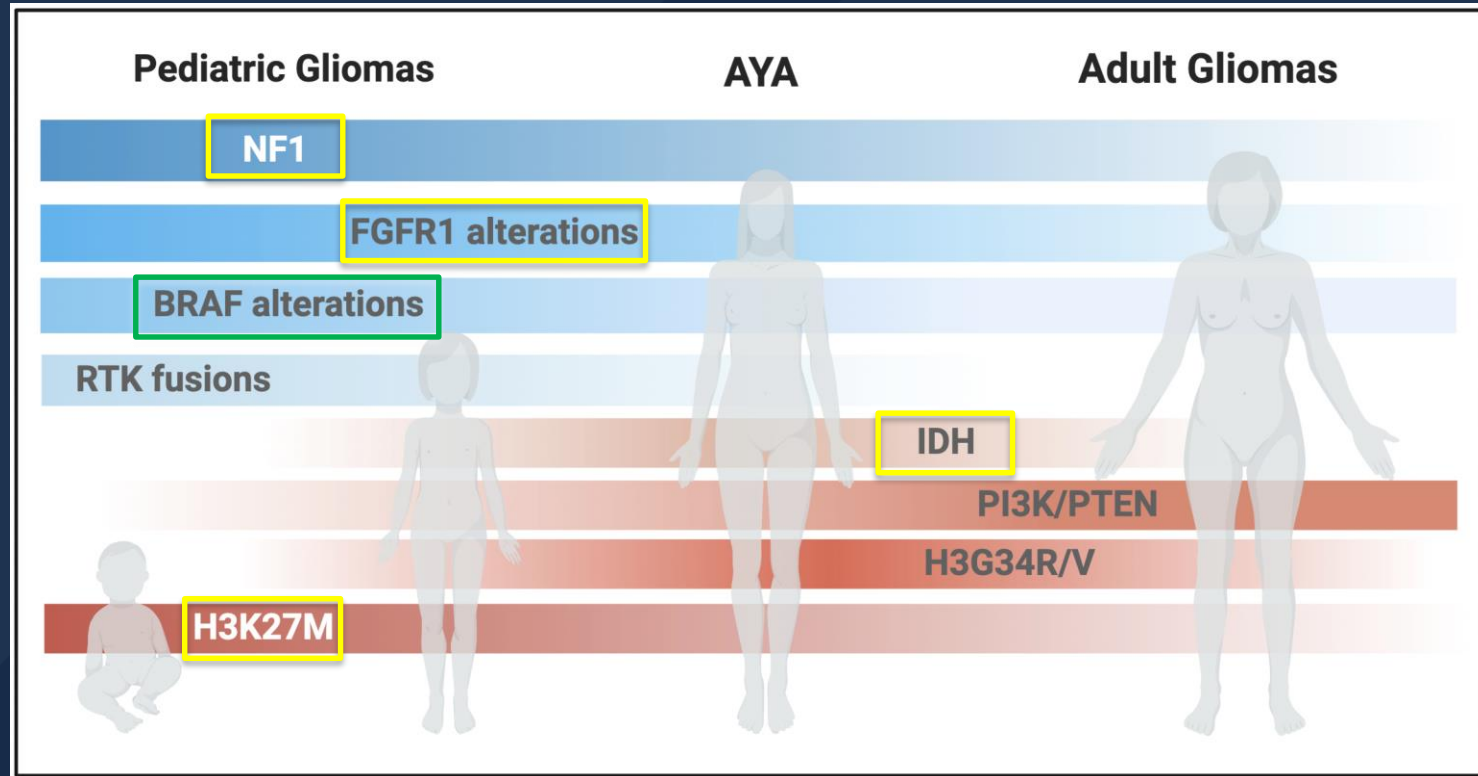
- early social worker/case worker involvement
- alternative work/school scheduling to minimize cognitive and physical fatigue
e.g. 5 hrs/day, 5 day/week (rather than 8 hrs/day, 3 days a week)
- cognitive/speech therapy
- vocational counseling
- early application for disability
- early application for Medi-cal (after 2 years of disability)

CANCER RECURRENCE IN AYA PATIENTS

Recurrence is the leading cause of death in AYA Patients



Differences in molecular subtype across age spectrum: example glioma



AYA clinical trial enrollment

Barriers

- Administrative/logistical issues (45%)
- Disparate enrollment practices (42%)
- Perceived limited trial availability (27%)
- Communication issues between pediatric and medical oncology (27%)

Stimulants

- Strong communication between pediatric and medical oncology (48%)
- Supportive research infrastructure (35%)
- Presence of AYA champions (33%)

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***Consider clinical trial options on both the pediatric and adult sides.**

Trial	Eligible cancer types
TyrNovo TYR-219-01 (dual inhibitor of IRS 1/2, STAT3)	HNSCC
IO BIOTECH IO102-IO103	lung, UBC, and HNC
Poseida Therapeutics - MUC1-C Allogeneic CAR-T Study	epithelial-derived cancer
Merus MCLA-158-CL01 (EGFR and LGR5)	HNSCC
KINNATE Biopharma KN-8701 (pan-RAF inhibitor)	Solid tumor
Kinnate KN-4802 (FGFR)	Any type of advanced tumors harboring FGFR2 and/or FGFR3 gene alterations
Merus MCLA-145-CL01 (ab for PD-L1 and CD137)	NSCLC, immunotherapy naive MSI-H or dMMR
Takeda TAK-676-1002 (IV STING agonist)	Solid Tumor: neuroendocrine, small cell lung, CRC, HNSCC
A2 Biotherapeutics BASECAMP-1 (site 107)	CRC, pancreatic, NSCLC, ovarian, mesothelioma
Gilead GS-US-570-6015	HNSCC, NSCLC, gastric and EGJ adenocarcinoma, breast cancer (all subtypes), MSS mCRC, cervical, vaginal, and vulvar carcinoma, esophageal SCC, and cutaneous SCC.
HiberCell HC-366	SCCHN, CRC, NSCLC, TCC, other solid tumors
BioEclipse CRX100-001 (somatostatin receptor)	MSI-H CRC, HCC, TNBC, Ovarian Epithelial Cancer, Gastric Cancer, Osteosarcoma
GenMab GCT1042-01 (bsAb CD40/4-1BB)	Melanoma, NSCLC, HNSCC
DSP-107 KAHR Medical	MSS-CRC or NSCLC w/wild-type actionable oncogenic driver mutation.
CA111-001 BMS	NSCLC, RCC, PDAC, gastric/gej, CRPC, ovarian, SCCHN, bladder, melanoma, mesothelioma, TNBC, and soft tissue sarcoma
Biomea COVALENT-102 (pan KRAS)	NSCLC, PDAC, CRC
Profound Bio PRO1184-001 (ADC folate receptor α FR α)	Ovarian and Endometrial cancers
Immunocore (PRAME) IMC-F106C-101	Non-Small Cell Lung Cancer (NSCLC), Melanoma, Uterine / Endometrial Carcinoma
Strata Oncology STR-004-001	Cohort 1: ALK ROS fusion, Cohort 2: BRAF P.V600X (not P.V600E), Cohort 3: (Lof) BRCA 1/2 or PALB2
NCI 10572	Solid tumor w/MGMT, Extracranial solid tumor (Neuroendocrine tumor, small cell lung cancer, melanoma or soft tissue sarcoma)
Pyxis PYX-106-101 (Siglec-15)	NSCLC, BC, Endometrial ca., Thyroid ca., RCC CCA, bladder, CRC, HNSCC
Takeda TAK-500 (STING agonist with high specificity for CCR2)	Gastroesophageal adenocarcinoma, Pancreatic adenocarcinoma, HCC, NSCLC, SCCHN, Mesothelioma, TNBC, NPC, RCC

Treatment in AYA patients with recurrence

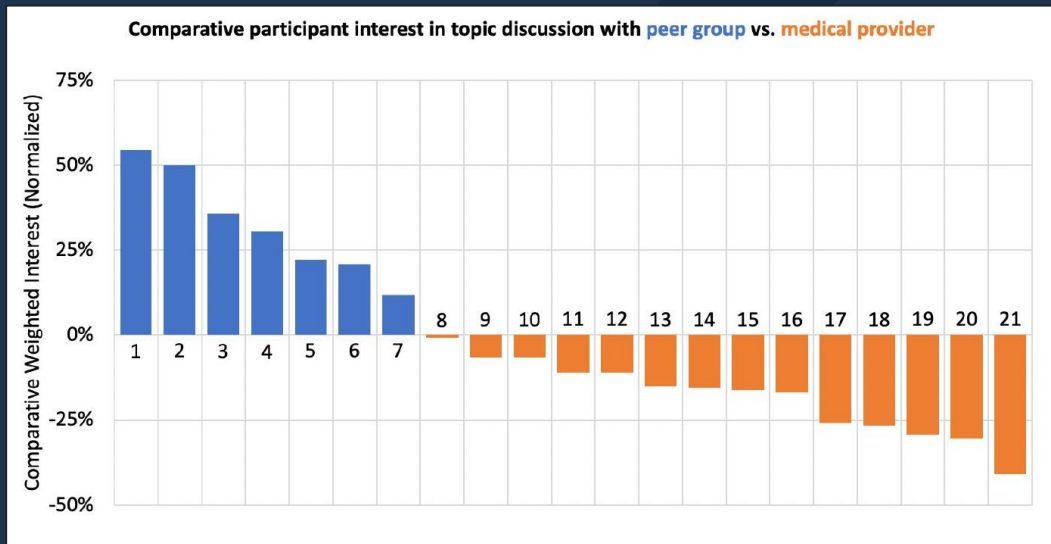
Consider:

- repeating molecular testing and consideration of different targeted therapies
- Clinical trial opportunities on adult AND pediatric side, including disease specific trials and basket trials

SOCIAL AND EMOTIONAL SUPPORT

- Psychotherapy for patients and families
- Consider psychiatric referral
- AYA specific support groups

AYA patients have different support needs from peers versus providers



- 1 Friendships
- 2 Romantic relationships & Sexual health
- 3 Anxiety
- 4 Meditation and mindfulness
- 5 Depression
- 6 Exercise
- 7 Cognitive challenges
- 8 Spirituality
- 9 Employment and Disability Income
- 10 Financial and legal resources
- 11 Fertility & family planning
- 12 Stress management
- 13 Physical disability
- 14 Sleep
- 15 Integrative approaches for health
- 16 Strategies for thinking, learning, remembering
- 17 Nutrition and nutritional supplements
- 18 Symptom management
- 19 Advanced Directives
- 20 Seizures
- 21 Brain tumor and treatment updates

Look for AYA support groups

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Young Adult Support Groups

The Adolescent Young Adult Support Group is open to patients ages 18-40 with all diagnoses. Different topics and events are discussed.

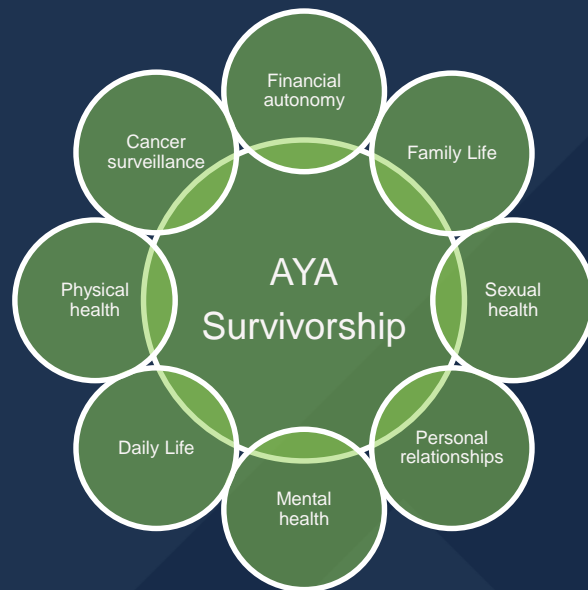
Young Adult Neuro-Oncology (YANO) Patient Support Group. Join us for a virtual support group with patients, ages 18-40, with primary brain and spinal cord tumors.

See All Young Adult Events



Summary

- AYA patients have **different information and resource needs** than adult and pediatric patients
- **Oncofertility counseling** should be offered early
- AYA patients may benefit from **early vocational and social service planning** to improve employment and insurance outcomes
- AYA patients benefit from an **AYA-specific approach to treatment** at recurrence





THANK YOU!

Other AYA resources

General info

- [American Society of Clinical Oncology \(ASCO\): Cancer in Young Adults](#)
- [Livestrong: Adolescents and Young Adults](#)
- [Stupid Cancer](#)

Fertility

- [The Oncofertility Consortium](#)
- [Livestrong: Fertility](#)

Survivorship

- [National Coalition for Cancer Survivorship \(NCCS\)](#)
- [Expect Miracles Foundation](#)
- [Young Survival Coalition \(YSC\)](#)
- [CancerCare](#)
- [Cancer and Careers](#)

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