

Heart Health in Adult Survivors of Childhood Cancer: Fostering a Healthier Future

Eric Chow, MD MPH

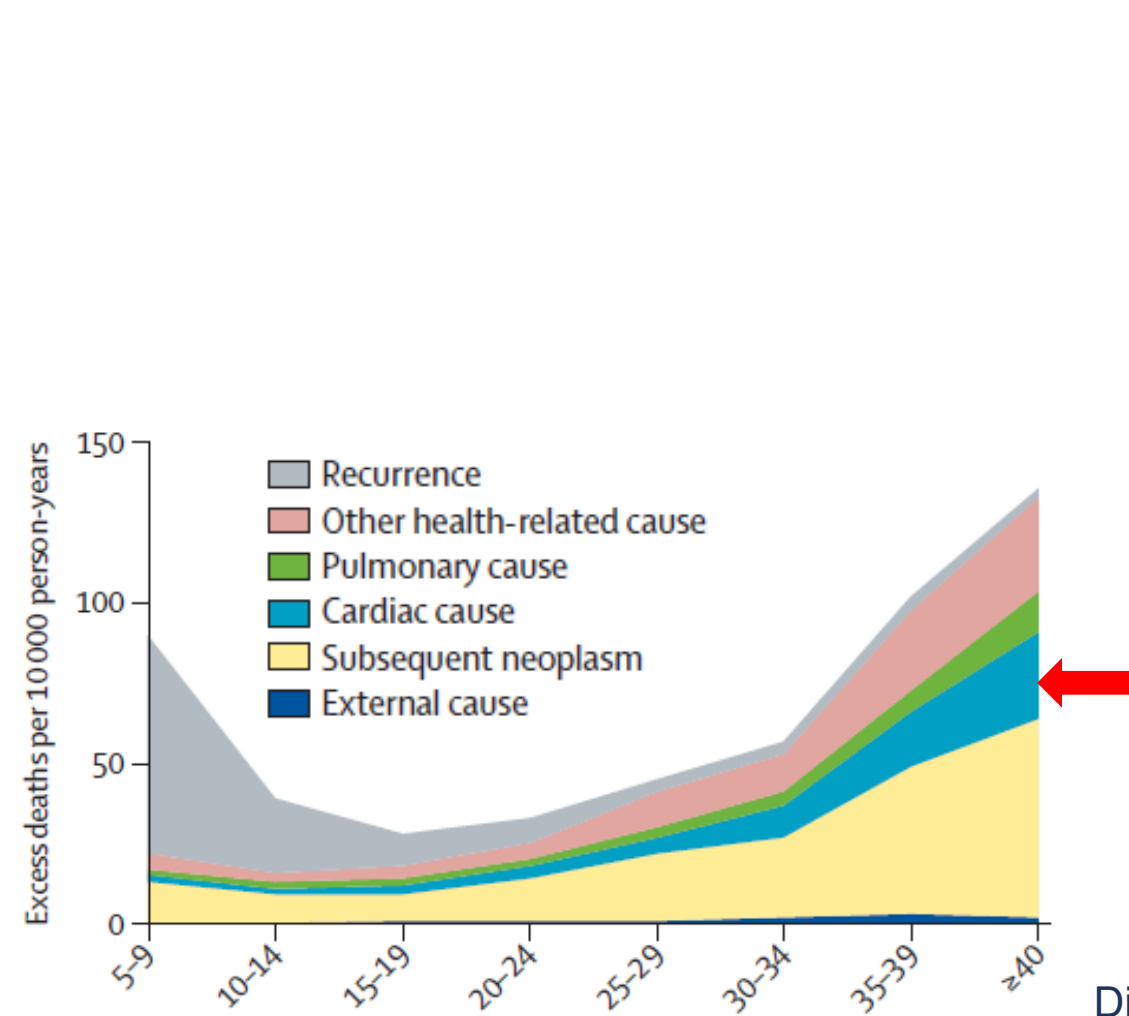
Fred Hutchinson Cancer Center / University of Washington
Seattle Children's Hospital



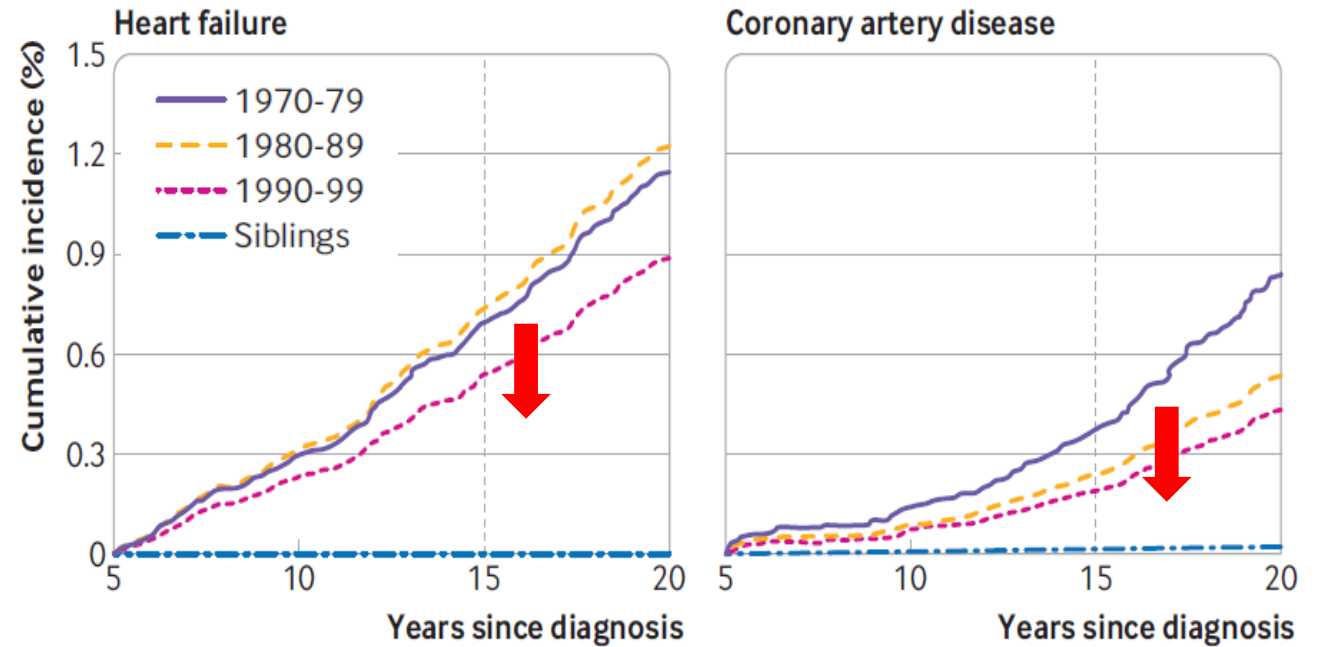
Background

- ~600k childhood cancer survivors (CCS) in the US by 2040
- Most long-term survivors are adult-aged and being followed by adult providers (whether they know it or not)
- Second cancers and early heart disease are the 2 most common long-term major side effects in long-term survivors of childhood cancer

Burden of Heart Disease among Long-Term Survivors



Dixon S, Lancet 2023

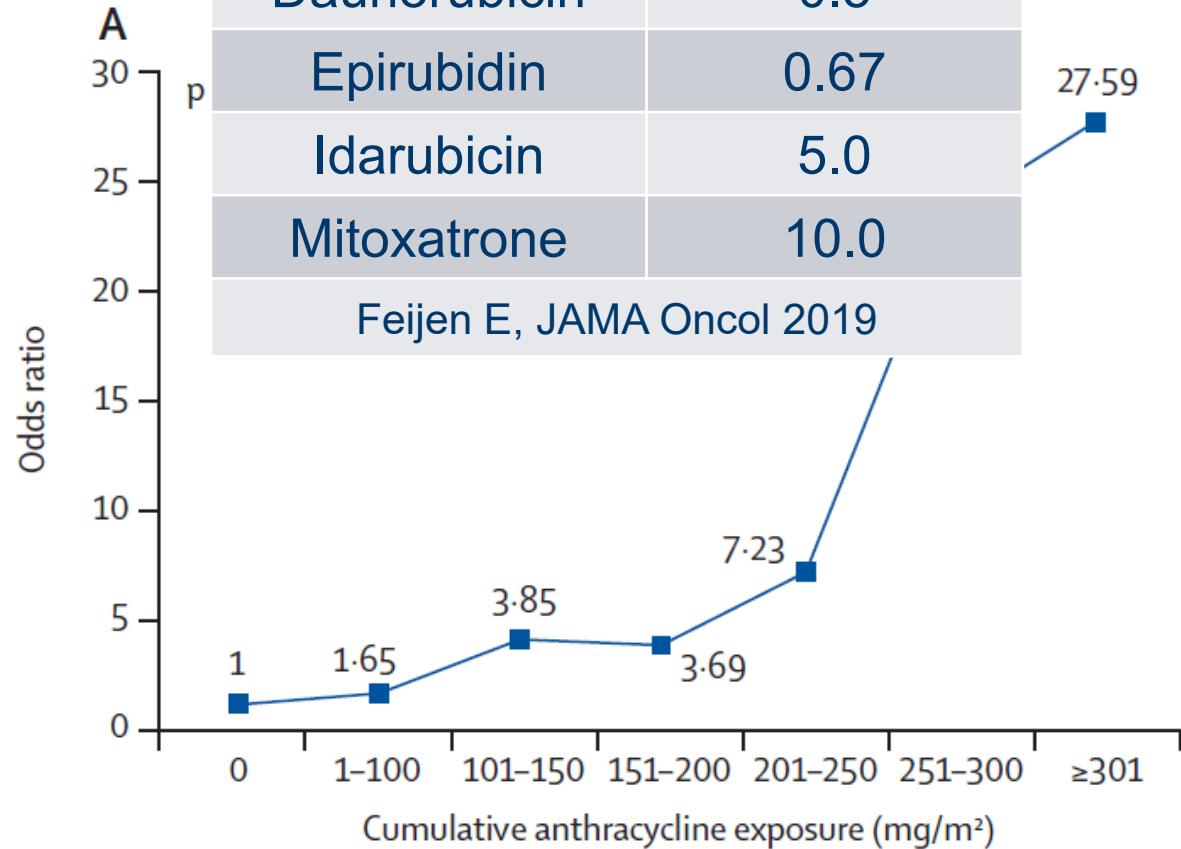
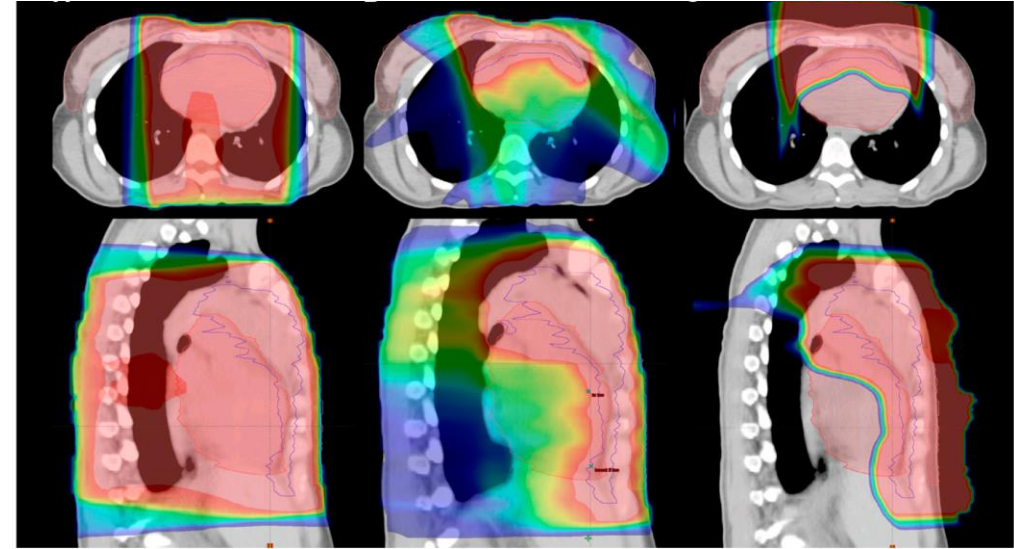


Mulrooney D, BMJ 2020

Cancer Treatment Risk Factors

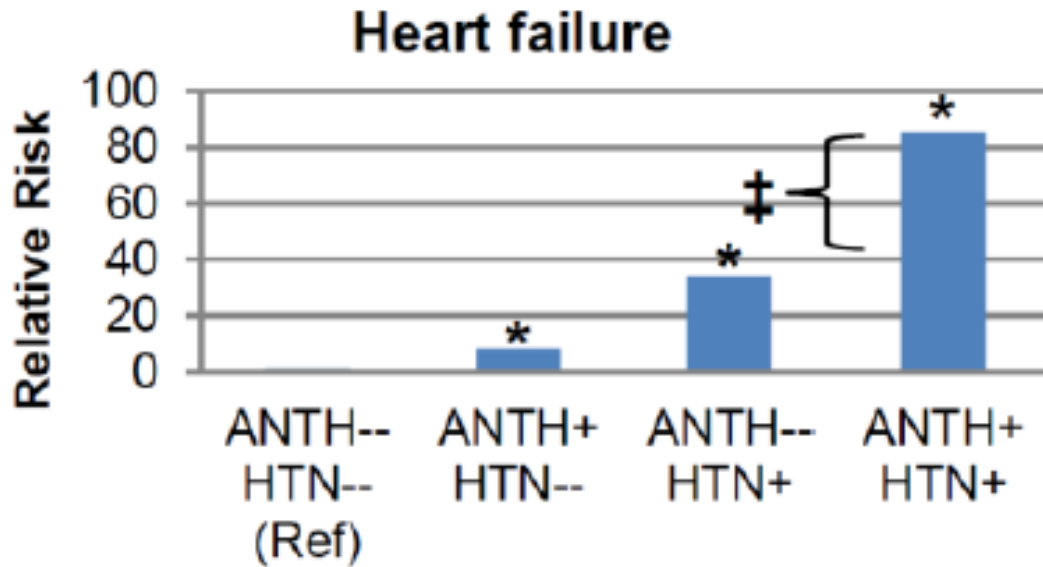
Anthracycline	Dose equivalence
Doxorubicin	1.0
Daunorubicin	0.5
Epirubicin	0.67
Idarubicin	5.0
Mitoxatrone	10.0
Feijen E, JAMA Oncol 2019	

Hoppe B,
IJROBP 2012



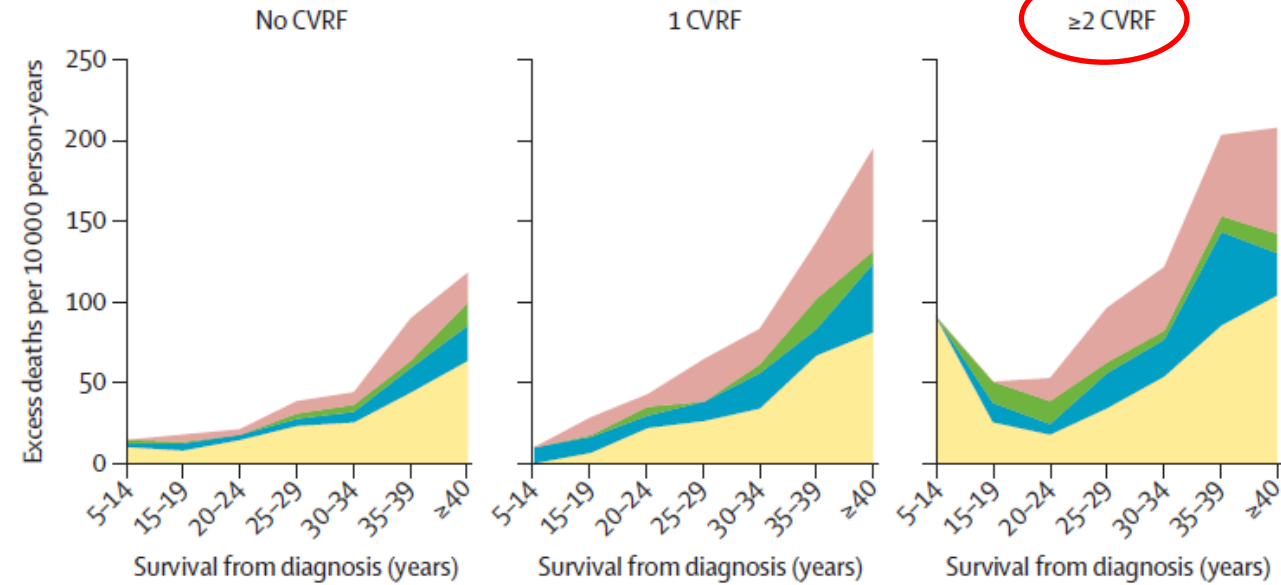
Armenian S, Lancet Oncol 2015

Conventional Risk Factors Still Matter

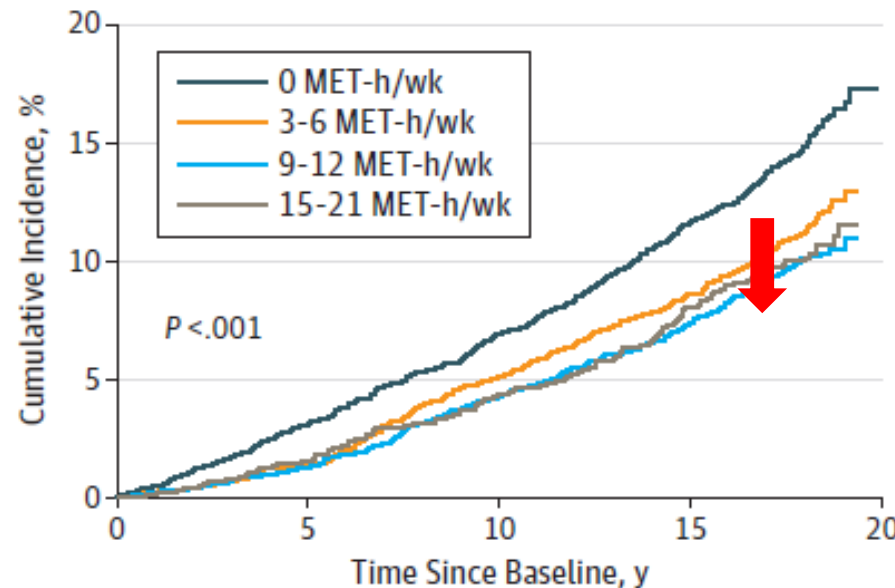


†More than additive effect
Armstrong G, J Clin Oncol 2013

Benefits of exercise?
Scott J, JAMA Oncol 2018



Dixon S, Lancet 2023



CV Screening

General Population Guidelines

- Hypertension
 - Annual if age 40+
 - If age<40, every 3-5y if risk factors present (e.g., overweight)
- Dyslipidemia
 - Routine men age 35+, women 45+
 - Earlier screening if incr'd CAD risk
- Diabetes
 - Screen overweight adults 35-70

Children's Oncology Group / IGHG

- Hypertension
 - Annually if any cardiotoxic / nephrotoxic exposures (*anthracyclines, ifosfamide, platinum agents, any BMT, XRT to kidney / heart, nephrectomy*)
- Dyslipidemia & Diabetes
 - Abdominal or total body irradiation; consider checking lipid profile and diabetes screen every 2 years
- Cardiac toxicity
 - Periodic Echo
 - Baseline ECG

2023 COG Guidelines

RECOMMENDED FREQUENCY OF ECHOCARDIOGRAM		
Anthracycline Dose*	Radiation Dose**	Recommended Frequency
<100mg/m ²	<15Gy	No screening
<100mg/m ² ≥100 to <250mg/m ²	15Gy to <30Gy <15Gy	Every 5 years
≥100 to <250mg/m ² Any ≥ 250mg/m ²	≥15Gy ≥30Gy Any	Every 2 years
*Based on doxorubicin isotonic equivalent dose. **Based on radiation dose with potential impact to heart (radiation to chest, abdomen, spine [thoracic, whole], TBI). See section 77.		

Frequency & risk categories informed by cost-effectiveness analyses

CV Risk Factor Undertreatment Common

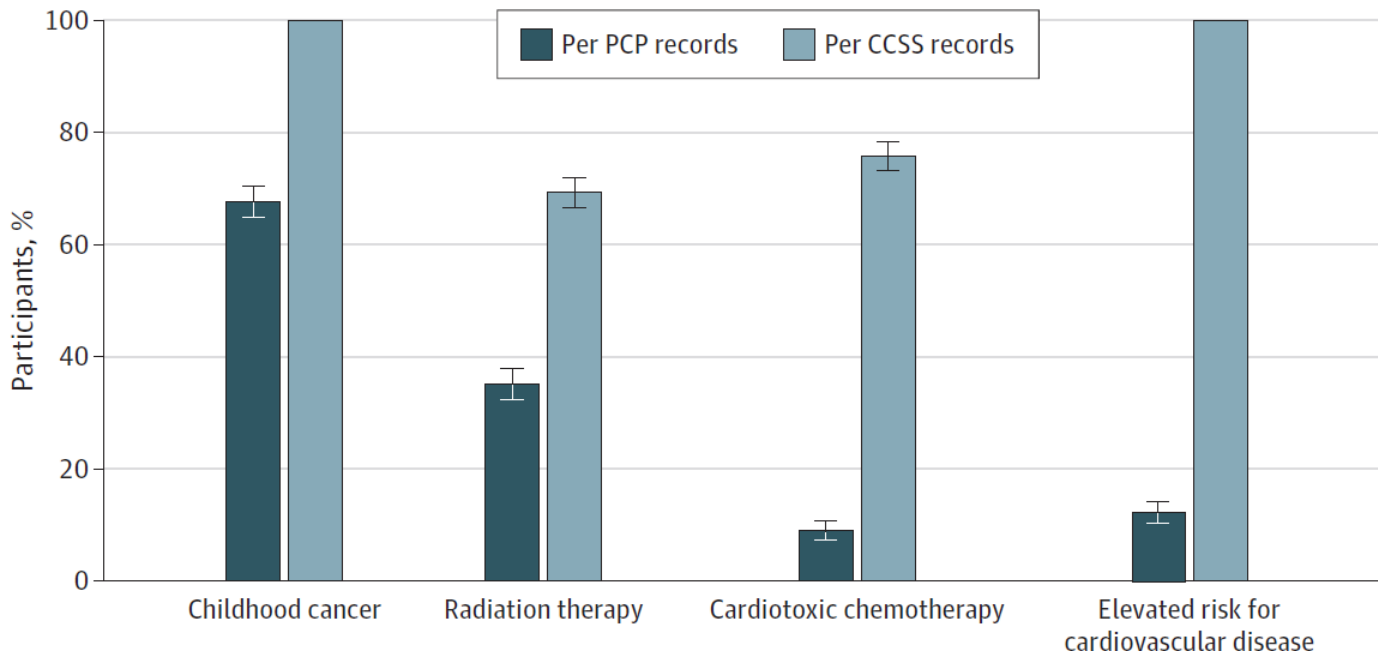
	Long-term survivors, overall N=571	High Blood Pressure ≥130/80	Cholesterol Issues LDL ≥160 / TG ≥150	Diabetes / Pre-diabetes
Underdiagnosis	27%	19%	13%	1% DM 23% pre-DM
Undertreatment (proportion of those affected)	21%	5% (18%)	16% (49%)	5% (54%)

Undertreatment **2x** more common in survivors compared with a same-age general population sample

Chow, JAHA 2020

Challenges: EHR inaccuracy

Adult survivors of childhood cancer with history of anthracycline and/or chest RT, and with undertreated CVRF found on home visits (n=293 primary care records reviewed)



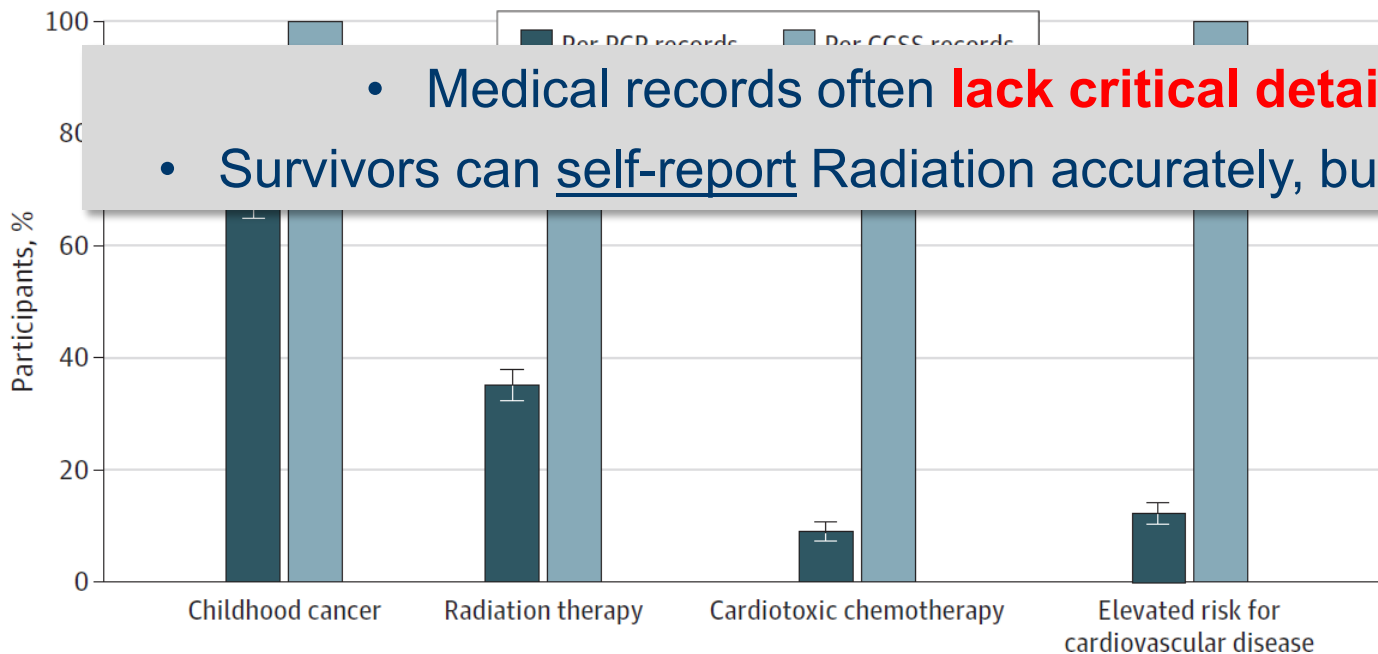
In the past 2 yrs:

- 81% PCP visit (median 3); 22% subspecialty visit(s)
- 29% cardiac testing
- 32% documented late effects surveillance plan
- <5% comprehensive survivorship care plan

Ohlsen T, JAMA Netw Open 2024

Challenges: EHR inaccuracy

Adult survivors of childhood cancer with history of anthracycline and/or chest RT, and with undertreated CVRF found on home visit (n=293 primary care records reviewed)



- Medical records often **lack critical details** that inform risk-based care

- Survivors can self-report Radiation accurately, but recall of Anthracycline chemo is poor

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Ohlsen T, JAMA Netw Open 2024

Take Home Points

- CCS at greatly increased future heart disease, especially after anthracycline and/or radiation exposures
- Observational studies show that modifiable conventional CV risk factors (including lifestyle factors) also contribute to this problem, but undertreatment is common
- CCS-specific CVD prediction models likely produce more accurate estimates of future risk than general population models
- CCS likely benefit from more intensive screening and management than same-age general population peers; what remains unclear is whether tight management will yield similar net benefit

Resources from the American Heart Association

<https://www.heart.org/en/healthy-living/healthy-lifestyle/lifes-essential-8>

Life's Essential 8

Your checklist for living healthy

Sign up for health & wellness resources

Health Behaviors: Eat Better

Health Behaviors: Be More Active

Health Behaviors: Quit Tobacco

Health Behaviors: Get Healthy Sleep

Health Factors: Manage Weight

Health Factors: Control Cholesterol

Health Factors: Manage Blood Sugar

Health Factors: Manage Blood Pressure

