

EFFICACY OF THE CHILDREN'S ONCOLOGY GROUP (COG) LONG-TERM FOLLOW-UP (LTFU) GUIDELINES IN REDUCING RISK OF CONGESTIVE HEART FAILURE (CHF) IN CHILDHOOD CANCER SURVIVORS (CCS)

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Background:

CCS are at risk for left ventricular dysfunction (LVD) and subsequent CHF due to exposure to anthracyclines and chest radiation (RT). COG LTFU guidelines recommend screening for LVD using echocardiograms (ECHOs) every 1-5y depending on anthracycline dose, RT, and age at cancer diagnosis. The relevance and cost-effectiveness of these consensus-based guidelines are unknown.

Methods:

Life expectancy and age at onset of CHF were projected in a simulated cohort (>1 million) of CCS undergoing screening ECHO per COG guidelines. Intervention for LVD was modeled to reduce annual CHF risk by 30%. Quality-adjusted life-years (QALYs) and lifetime costs with and without ECHO screening were calculated. Non-CHF mortality was estimated from the Childhood Cancer Survivor Study and US population rates. Costs and QOL adjustments were obtained from the Healthcare Cost and Utilization Project and medical literature. Screening was considered cost-effective if it resulted in a >6 month delay in onset of CHF and <\$50,000/QALY gained.

Results:

Recommended screening strategies (Table) were cost-effective in: i) CCS exposed to $\geq 300\text{mg/m}^2$ of anthracycline regardless of RT or age; and ii) CCS diagnosed at age 1-4y, exposed to RT and $< 300\text{mg/m}^2$ of anthracycline. Screening was most cost-effective for CCS diagnosed at age 1-4y exposed to RT + $\geq 300\text{mg/m}^2$ of anthracycline (1.4y delay in CHF onset; \$15,821/QALY gained). Screening as currently proposed was not cost-effective for other age/anthracycline/RT combinations.

Conclusions:

Recommended ECHO screening strategies are cost-effective for all CCS exposed to $\geq 300\text{mg/m}^2$ of anthracycline; screening was also cost-effective for those 1-4y at diagnosis, exposed to anthracycline $< 300\text{mg/m}^2$ + RT. Alternate screening strategies are needed for CCS with other exposure conditions.

Age Dx (years)	RT	Anthracycline dose (mg/m ²)	Recommended ECHO interval (years)	Delay in CHF onset age (years)	Cost / QALY gained (US\$)
1-4	Yes	<300	1	0.8	\$49,750
		≥ 300	1	1.4	\$15,821
	No	<100	5	0.3	\$17,798
		100-299	2	0.4	\$29,415
≥ 5	Yes	≥ 300	1	1.2	\$25,065
		<300	2	0.4	\$36,874
	No	≥ 300	1	0.8	\$28,093
		< 200	5	0.1	\$50,750
		200-299	2	0.2	\$86,867
		≥ 300	1	0.7	\$36,401