

Breast cancer screening in Hodgkin's disease survivors: can we reach a consensus on the guidelines?



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BACKGROUND

- Secondary breast cancer (SBC) incidence increases after treatment for Hodgkin's disease (HD) (standard incidence ratio (SIR) range 2.4-75.3).
- In the last 4 decades fewer HD patients are exposed to high doses and large volumes of radiotherapy (RT). In the context of these changes in RT, SBC incidence is envisaged to decrease over time.
- There are a variety of BC screening programmes for female childhood cancer survivors; including HD.
- We summarise their similarities and differences, and whether they require adaptation to reflect recent advances in treatment of HD.

METHODS

- A systematic search of PubMed was performed, using the terms 'Guidelines', 'Breast Cancer screening' and 'Childhood Cancer Survivors'. Articles published in English language between 01/01/1990 and 31/12/2018 were included.
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Table of published guidelines included in quantitative analysis-

	ACS (2018)	DCOG (2010)	COG (2008)	UKCCLG (2011)	Harmonisation guidelines (2013)	NRASP (2003)	NCCN HD (2019)	NCCN CAYA (2020)	NCCN HIGH RISK BC (2018)	ESMO (2018)	DeNaCaPST (French) (2017)	Joseph, Clark, Berman et al (1997)
Population at risk	Females exposed to chest RT (when aged 10-30)	Female CAYA survivors exposed to chest RT	CAYA survivors, exposed to RT of chest, axilla, TBI	CAYA survivors exposed to chest RT	CAYA survivors exposed to ≥20Gy chest RT	Supradiaphragmatic RT (when < 36 yrs old)	Female HD survivors with chest/axillary RT	CAYA survivors	Females exposed chest RT when age 10-30	Female HD survivors exposed to chest/axillary RT <40 years	CAYA survivors treated <20 yrs, ≥10Gy (to breast)	CAYA survivors
When to start screening (years)	30	25	25	25	≥ 8 yrs post RT/ age 25*	8 yrs post RT/ age 25*	8-10 yrs post RT/age 40**	8-10 yrs post RT/ age 25*	10 yrs post RT	8-10 yrs post RT	≥ 8 yrs post RT/ ≥25 years old*	10-15 yrs post tx
Frequency of screening	Annual	Annual	Annual	Annual	Annual	Annual (3-yrly post 50 yrs)	Annual	Annual	Annual	Annually	Dependent on Bi-RAD	Annually
Upper limit screening (years)	None	75	None	None	None	None	None	None	None	None	None	None
Screening modality	Clinical exam	Suggested only	Yes	Yes	-	-	Yes	-	Yes	-	Yes	Yes
	Mammogram	Yes	Yes	Yes	Yes	Yes (± ultrasound)	Yes	Yes	Yes	Yes	Yes	Yes
	MRI	Yes	Yes	Yes	Yes	Yes (± ultrasound)	If 10-30 yrs at RT	Yes	Yes	If <30 yrs old at RT	Yes	Consider
Age at starting each screening modality (years)	Clinical exam	25-30, according to risk	Puberty	25 yrs and >10 yr post RT	-	-	-	-	If <25, start >10 yrs post RT	-	≥ 8 yrs post RT/ ≥25 yrs old *	-
	Mammogram	30	30-35, according to risk	8 yrs post RT/ age 25*	30	≥ 8 yrs post RT/ age 25*	8-10 yrs post RT/age 40**	8-10 yrs post RT / age 25*	If ≥25, start 10 yrs post RT (not <30 yrs)	8-10 yrs post RT	≥ 8 yrs post RT, must be ≥ 30 yrs old	10-15 years post cancer tx
	MRI	30	25	25	25	25	25	25	If ≥25, start 10 yrs post RT (not <25 yrs)	8-10 yrs post RT	≥ 8 yrs post RT/ ≥25 yrs old *	10-15 years post cancer tx
Frequency of each screening modality	Clinical exam	Annual	6 monthly	Regularly	-	-	-	-	If <25, annual If ≥25, every 6-12 months	-	Annual / dependent on Bi-RAD	Annual
	Mammogram	Annual	1-2 yrly, according to age and risk	Annual	Aged 30-50: annual Aged >50: 3-yearly	Annual	Annual (aged 30-50 (± ultrasound and MRI))	Annual	Annual	Annual	Annual / dependent on Bi-RAD	Annual
	MRI	Annual	Annual (age 25-60)	Annual	Annual (if age 25-29/ age 30-50 + dense breast tissue)	Annual	Annual (aged 25-50 (± ultrasound))	Annual	Annual	Annual (if <30 yrs old at RT)	Annual / dependent on Bi-RAD	Annual

*= whichever occurs later, **=whichever is first. Bi-RAD= breast imaging and reporting data system (from ACR/ American College Radiologists). ACS= American Cancer Society, DCOG: Dutch Children's oncology group. COG: North American Children's oncology group. UKCCLG: UK Children's Cancer and Leukaemia group. NRASP: notification risk assessment and screening programme. CAYA: Children, adolescent and young adult survivors

RESULTS

- Of 12 published guidelines(table), 7 studies were aimed at CAYA cancer survivors. 2 studies included HD survivors only. 3 specified females exposed to chest RT only.
- 5 guidelines risk-stratified patients according to the exposed dose RT.
 - The cut off RT dose for inclusion in screening and 'high risk' patients was heterogeneous (range 7-20Gy).
- 5 studies identified an age range of RT exposure that was higher risk (10-40 years).
- There were discordances in the age at which screening should be started (25-40 years).
- Only 1 guideline specified an upper age limit (75 years).
- **All** studies (n=12) recommended annual screening, 5 studies suggest clinical examination should occur more frequently.
- **All** 12 studies advised mammography, 5 studies also suggest annual MRI for certain patient groups; the remainder recommend MRI for all patients. .

CONCLUSIONS

There are clear disparities between current BC screening guidelines; in particular, their age limits and risk stratification criteria.

A review and consensus of guidelines is necessary to reflect current knowledge of BC incidence after HD, and the evolution of HD treatment.

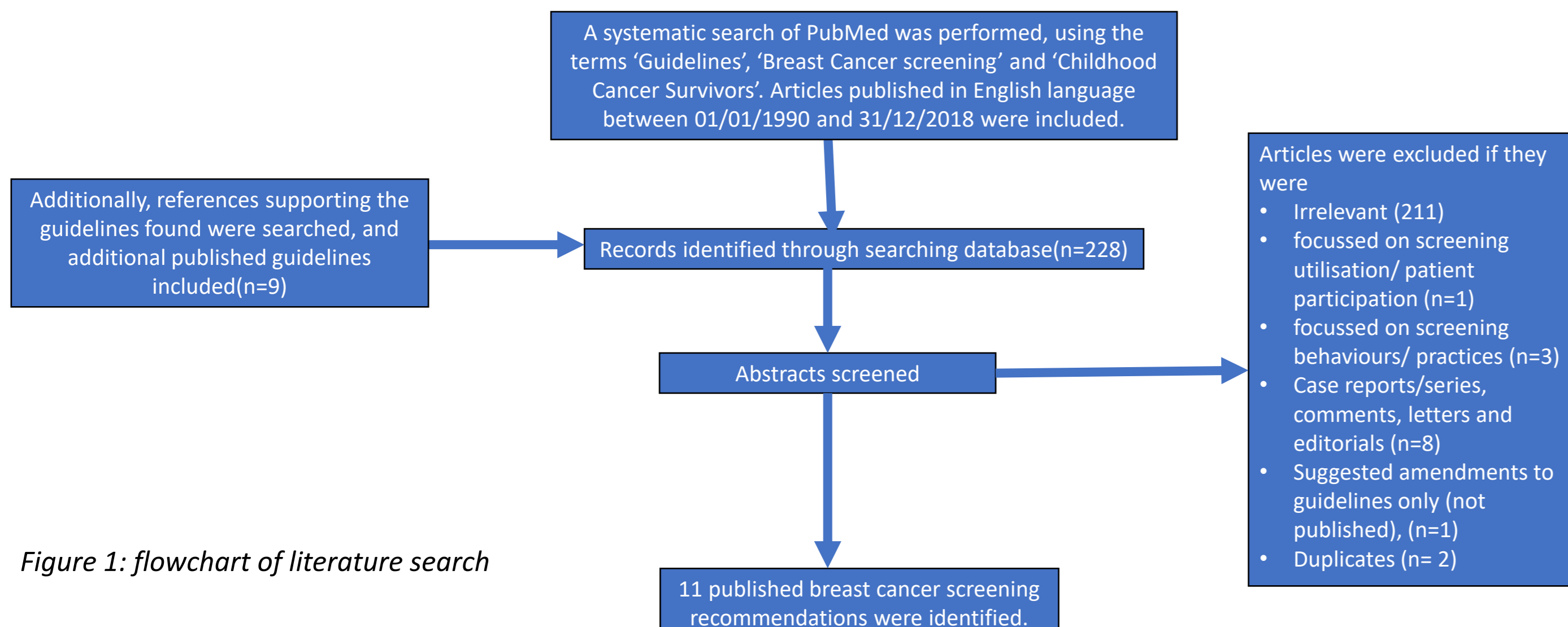


Figure 1: flowchart of literature search