

Surveillance

- Why ?
- What ?
- When ?
- How ?
- Dr C Fryer
FRCPC)



Disclosure;

- Disclosure; None.
- I have no conflicts.
- I have no industry financial relationships.

Background:

- Relapse is the single most likely late effect (5% @ 10yrs 6% @ 20yrs)
- Screening tests for relapse in 5yr survivors limited benefit and increased psychological stress. Possible exception Ewings sarcoma which has 13% cumulative relapse @ 20yrs
- The same might be said in regards to many of the surveillance tests for late effects.
- What screening tests and their frequency is controversial and is a focus of the International Guideline Harmonization Group (IGHG).
- **Current North American recommendations utilize the 2013 Children's Oncology Group consensus based guidelines:**

Refs:

Childhood cancer: Long-term follow-up
Foundation for Medical Practice Education
Education Module Vol22(5) May 2014
www.fmpe.org <https://members.fmpe.org/>

http://www.survivorshipguidelines.org/pdf/LTFUGuidelines_40.pdf

BCCH Recommendations

- All survivors should have **annual history and physical**. Healthy adult survivors can be screened by their primary health care provider for adverse health issues such as life-style, healthy heart, dental problems, obesity, hypertension, physical inactivity and psychological aspects.
- Screening tests should be selective and based on decreasing morbidity, mortality and improving quality of life for **patients at significant risk**
- The study by Hudson clearly identified the risk for specific organ toxicities based on **therapy received**
(*JAMA 2013;309:2371-81*)
- Studies by Landier W. (*J Clin Oncol 2012;30:4401-8*) and Wong FL. (*Ann Int Med 2014;160:672-83*) **suggest** that less frequent monitoring than the COG guidelines may be more cost effective and expose patients to less psychological stress. **Requires study**

Proposed screening for “healthy” adult survivors of childhood cancer

<i>Pediatric population</i>	<i>Organ system</i>	<i>Proposed test</i>	<i>Benefit</i>	<i>Action</i>
Females, alkylator CED>8gm/m² XRT ovaries hypothal/pit	Endocrine Fertility Female	Anti Mullerian hormone (FSH,LH,) During reproductive period	Predictor of early menopause	Oocyte cryo-preservation. early pregnancy hormonal replacement
Males, alkylators, (CED>8gm/m²) XRT to hypothal/pit /testes	Endocrine Fertility Male	FSH/LH/ Testosterone Sperm analysis Post pubertal	Predicts Leydig cell failure	Testosterone replacement (Prevention sperm freezing)
XRT to thyroid region/hypothal/pit	Thyroid	T4/TSH Recommended annually	Asymptomatic Hypothyroidism	Thyroid replacement
XRT hypothal/pit	Pituitary	Refer to Endocrinologist	Exclude ACTH /GH deficiency	Replacement therapy Medical alert bracelet

Proposed cardiac screening

<i>Pediatric population</i>	<i>Organ system</i>	<i>Proposed test</i>	<i>Benefit</i>	<i>Action</i>
Anthracyclines **(>250mg/m²) XRT to heart	Cardiac	Echo/ECG Frequency dependant on risk** NT-proBNP^^^	Identifies asymptomatic toxicity	Rx ACE inhibitors etc
XRT to great vessels	Cardiovascular ischemia	Examination (Bruit?MRI) Annually	Identifies asymptomatic	?low dose aspirin ? Early surgery

****Risk dependant on:**

Age when anthracycline given

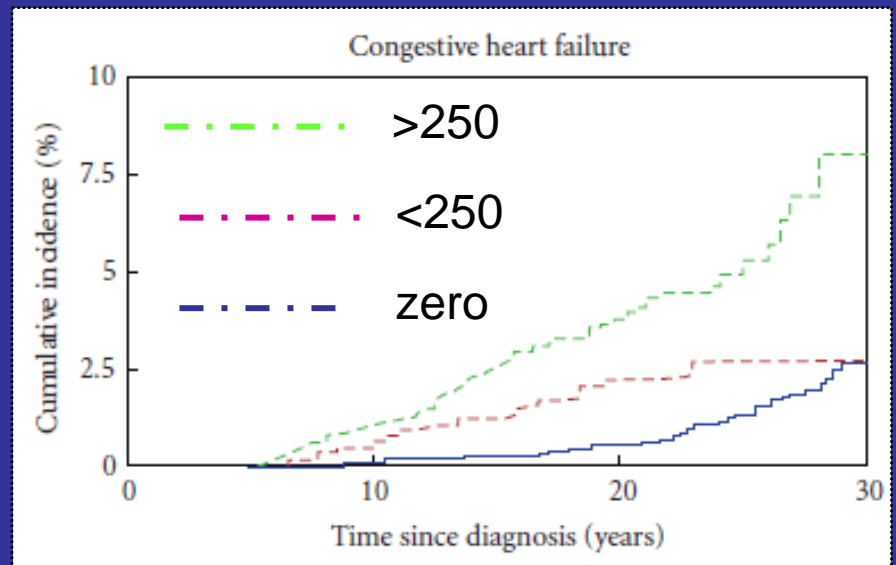
Dose of anthracycline

Radiation to heart

Gender

Genetic profiling

^^Plasma N-terminal pro-brain natriuretic peptide (Ylanan K Acta paediatr 2015;104:313-9)



COG

Recommended frequency of echocardiogram

Age at treatment	XRT to heart	Anthracycline dose	Frequency
< 1yr old	Yes	any	Every year
	No	<200mg/m ²	Q2 yrs
		>200mg/m ²	Every year
1-4yr old	Yes	any	Every year
	No	<100mg/m ²	Every 5 yrs
		>100<300mg/m ²	Every 2 yrs
		>300mg/m ²	Every year
>5yr old	Yes	<300mg/m ²	Every 2 yrs
		>300mg/m ²	Every year
	No	<200mg/m ²	Every 5 yrs
		>200<300mg/m ²	Every 2 yrs
		>300mg/m ²	Every year
Any age with decrease in serial function			Every year

Risk factors

- *Chow EJ Individual prediction of heart failure among childhood cancer survivors J Clin Oncol 2015;33: 394-402*

Risk of CHF by age 40yrs

- *Low risk score < 3 or No anthracycline no XRT risk 0.5%
? no monitoring*
- *Moderate risk score 3-5 risk 2.5-5%
? Echo q 5yrs*
- *High risk score 6-8 risk 8-10%
? Echo q 2 yrs*
- *V high risk score >8 risk 15-33%
? Echo annually*
- *In future genetic factors will be included*

female	1
Age <5	2
5-14	1
Anthracycline <100	1
100-249mg/m2	2
>250mg/m2	4
Chest XRT <5 Gy	1
5-14 Gy	2
15-34 Gy	3
>34Gy	4
Obesity	1
Hypertension	2

Proposed screening for second cancers in irradiated survivors

<i>Pediatric population</i>	<i>Second neoplasm</i>	<i>Proposed test</i>	<i>Benefit</i>	<i>Action</i>
Females with chest XRT	Breast	MRI breast Mammography Start 8yrs post XRT or age 25yrs annual	Earlier detection	Less advanced disease survival benefit?
Neck XRT	Thyroid	Ultrasound Thyroid Q5yrs 5yrs post Rx	Earlier detection	Less advanced disease survival benefit?
XRT 35Gy+ to abdomen/pelvis	Colon cancer	Colonoscopy Annually from Age 35yrs	Earlier detection	Less advanced disease survival benefit?
Brain XRT	Brain meningioma	MRI brain Q5yrs 10 yrs post Rx	Earlier detection	Less advanced disease survival benefit?