

Breast screening. Whom to screen, why to screen and what to offer.

Although this Ask-Me-Anything is centred on breast density, it is important to understand breast screening in general in order to understand mammographic breast density and personalized supplemental screening in context.

My first post will highlight, in point form, breast screening in general. Subsequent posts will elaborate on strategies for personalized screening for those women who have risk factors for developing cancer and for delayed diagnosis or “interval cancers”. Interval cancers are those cancers which present clinically after a screening event, in the interval before the next screen. These occur for several reasons and these cancers tend to be larger, with poorer outcomes. [1,2]. Despite modern treatment, survival remains closely linked to tumour size and node stage at time of diagnosis (figures 1 & 2, from reference 1). In my last post I will discuss some of the technology improvements and their impact on interpretation of the evidence as well as their practical significance for modern screening.

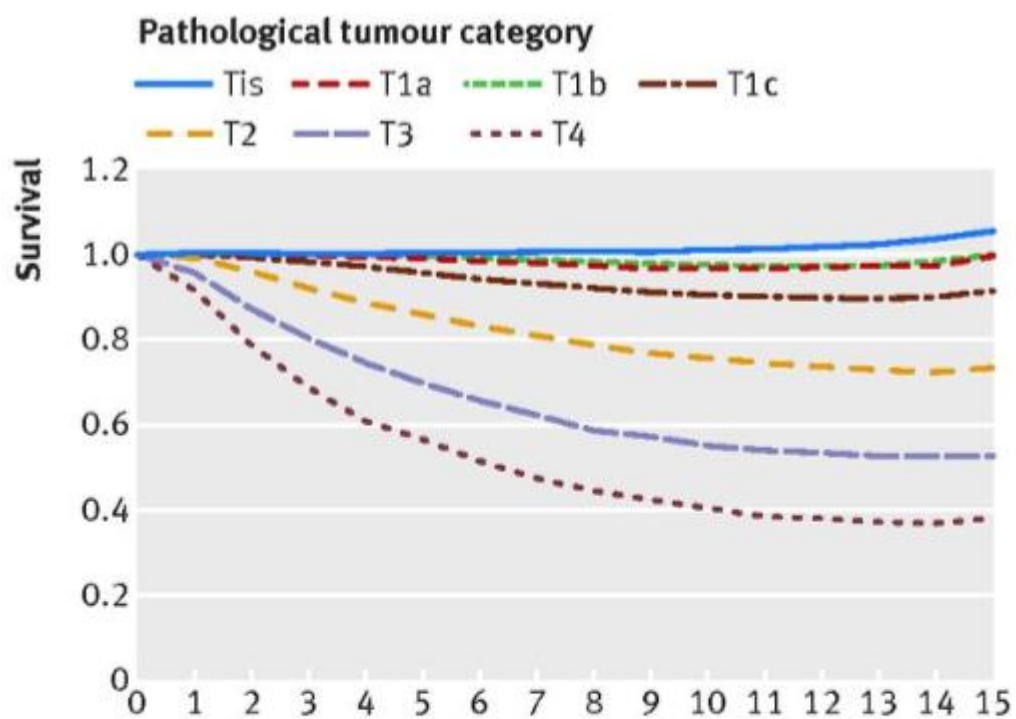
Current breast screening recommendations for average risk women from the Canadian Association of Radiologist and Canadian Society of Breast Imaging are summarized as follows:

1. Women aged 40-49 should screen annually with mammography
2. Women aged 50-74 should screen every one to two years with mammography
3. Women over aged 74 should screen every one to two years with mammography for as long as they are in good general health with life expectancy of approximately 7 years or greater
4. Below age 40 screening is not recommended for average risk women, but risk should be assessed by age 25-30 in order to determine if early screening is appropriate.

A few facts:

1. Breast cancer is the most common cause of death for Canadian women age 35 to 54 (<https://www.partnershipagainstcancer.ca/wp-content/uploads/2019/01/Breast-cancer-control-EN.pdf>)

2. The only proven imaging modality that has been shown to reduce breast cancer mortality is screening mammography. The largest risk factor for death if you get breast cancer is not undergoing regular screening. Most breast cancer deaths occur in the minority of women who do not undergo regular screening.[3]
3. Being female and getting older are the largest risk factors for developing breast cancer. Most cancers are found in women with no other identifiable risk factors.
4. Most deaths from breast cancer occur in the younger age group with 69% of deaths occurring before age 60 and 83% of non-cancer deaths after age 60. [3]
5. Survival benefits of mammographic screening are seen over multiple decades. Beware survival data limited to a decade or less. Number needed to screen to prevent one breast cancer death is 414 at 29 yrs. [9]
6. Screen-detected cancers are, on average, smaller than non-screen detected cancers and are associated with improved survival. Mortality benefit is between 40% and 60% for regular screening mammography [1,2, 3, 4,5,9].
7. Non-mortality benefits should be considered when offering screening and include less aggressive treatment with decreased mastectomy and axillary dissection rates. [10,11]
8. The vast majority (92%) of screening events result in a normal result, 8% are recalled and 1.5% have biopsy, almost always minimal access and well tolerated. Of those biopsies, 30-40% are malignant [OBSP data].
9. The woman should be offered screening, starting at age 40 for the highest life years gained. The 40 to 49 year age group has the greatest mortality benefit from screening in Canada. [4,6]
10. Overdiagnosis is approximately 1-10% when adjusting for background incidence and lead time bias, but overdiagnosis is least likely to occur in the younger age group. [7,8]
11. Anxiety associated with recall and biopsy is not inconsiderable, but should be viewed in context and weighed against the emotional benefits of screening reassurance as well as the emotional trauma of an avoidable late breast cancer diagnosis.
12. Radiation risk is minimal, with annual natural background radiation exposure far greater than the radiation from a mammogram. Overall, the potential to have one's life saved by early detection from a screening mammogram is far greater than the risk of dying because of a mammogram-induced cancer [12].
13. Mammography misses approximately 15% of breast cancers and this may be mitigated by careful selection of patients at high risk for interval cancer who may benefit from personalized supplemental screening. These missed cancers and strategies to minimize them are discussed in the next post...



	Numbers at risk			Follow-up time (years)		
	0	5	10	0	5	10
DCIS	6920	6456	3998			
T1a	2398	2222	1399			
T1b	9599	8874	5422			
T1c	29 114	25 471	15 065			
T2	26 624	20 040	10 724			
T3	2711	1688	801			
T4	2862	1254	585			

Figure 1

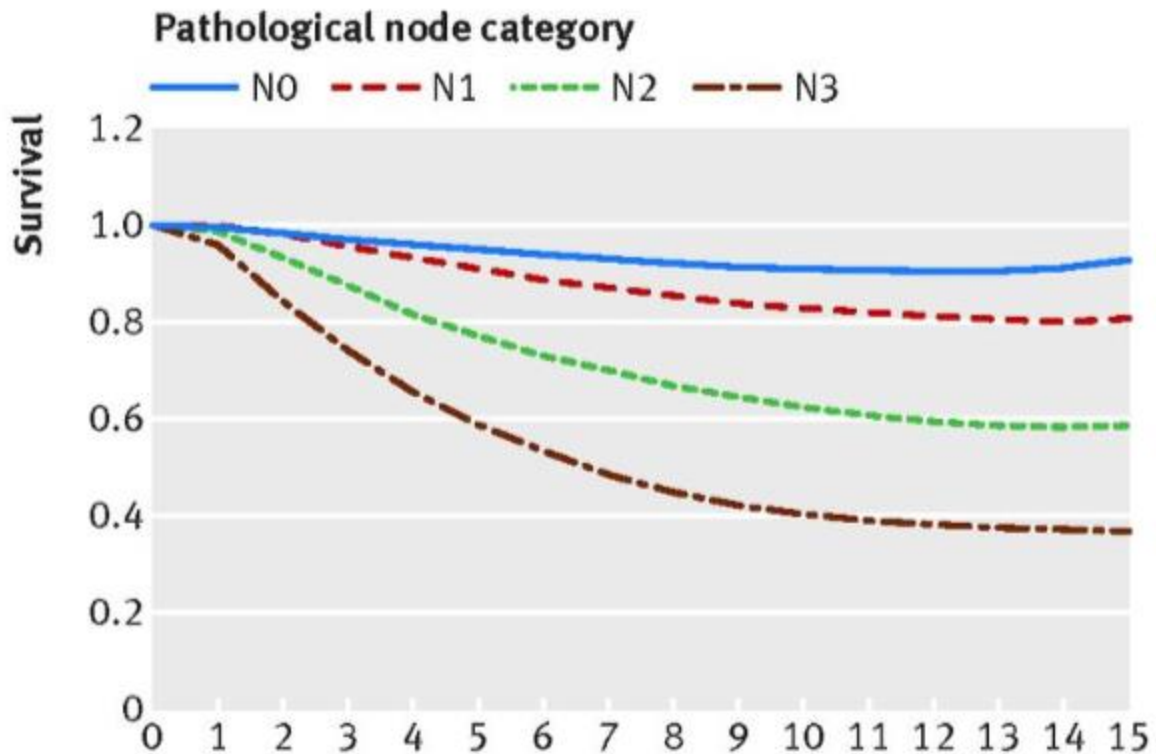


Figure 2

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