

Do No Harm: Cancer Screening

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Story from the Front Lines

A woman in her 60s presented to clinic for follow up. She has a history of morbid obesity, diabetes mellitus type II, hypertension, chronic lower extremity edema, complex sleep apnea, recent lower gastrointestinal bleed, pulmonary embolism, abdominal aortic aneurysm (AAA), large ventral hernia, osteoarthritis, and iron deficiency anemia. She is non-ambulatory and largely homebound. In the last year, she has been hospitalized for a pulmonary embolism and again for a GI bleed that occurred after she was put on warfarin. At a follow up appointment a few weeks after her last hospitalization, she was struggling to cope with her medical problems and the many doctor visits this entails. In addition to discussing her pulmonary embolism, GI bleed, and unrepaired AAA, an automated reminder in the electronic health record to complete colorectal and breast cancer screening was noted. In recent months fecal occult blood testing was positive though colonoscopy was deemed too risky with her large ventral hernia and AAA. She was worried about the prospect of undiagnosed colon cancer and was struggling to prioritize the importance of many potential medical interventions.

Teachable Moment

Currently, several guidelines recommend that patients aged 50-75 years be screened for colorectal cancer. Breast cancer screening guidelines vary, but generally agree that women in a similar age group get annual vs biannual mammograms. Cancer screening – looking for cancer in patients without symptoms of the disease in question – is not immediately beneficial to most patients. There is a time lag between the screening event and the hypothetical prevention of a cancer diagnosis or death from cancer. This means that even if a screening test detects an early malignancy, it may not positively impact the patient's overall health or life expectancy. Current guidelines recommend avoiding cancer screening in patients whose life expectancy is less than 10 years. This recommendation comes from several studies that evaluated time lag between detection of a pre-malignancy or malignancy and potential avoidance of death from cancer as a result of early detection. In a meta-analysis published in BMJ in 2013, it was found that it takes 10.3 years to prevent one colorectal cancer for every 1000 patients screened when using fecal occult blood testing. Similarly, it takes 10.7 years to prevent one death from breast cancer for every 1000 women screened with mammography. [1] These numbers are only looking at cancer deaths. They do not take into account the possible harms of screening including over-diagnosis, complications, and emotional and psychological stress caused by the procedures themselves.

So who can reasonably avoid screening for colorectal and breast cancers? An article written in JAMA suggests that a practitioner take into account the patient's life expectancy (not just age), the lag time of the proposed screening test, and the tradeoff between benefits and harms of the procedure. If life expectancy is less than the lag time, screening will likely not benefit the patient and may cause avoidable harms. If life expectancy is longer than lag time, screening is reasonable. If the life expectancy is approximately equal to the lag time, a patient-centered risk-benefit discussion is warranted. Using this framework, unnecessary screening tests can be avoided, reducing waste and preventing patient harm.

A useful tool for estimating life expectancy can be found at <http://eprognosis.ucsf.edu>. [2] For the patient in the described above, her estimated 5-year mortality risk is 35% and 10-year mortality risk is about 75%. This suggests a life expectancy of approximately 7 years (50% mortality risk). Extrapolating data from the above meta-analysis and other studies suggest that the lag time of both colorectal and breast cancer screening is about 10 years. For our patient, her life expectancy is less than the lag time for both colorectal and breast cancer screenings and thus these interventions can be deferred. We opted to forgo her "age-appropriate cancer screening" and focus on her quality of life, improving patient satisfaction and preventing harm.

[1] S. J. Lee, W. J. Boscardin, I. Stijacic-Cenzer, J. Conell-Price, S. O'Brien and L. C. Walter, "Time lag to benefit after screening for breast and colorectal cancer: a meta-analysis of survival data from the United States, Sweden, United Kingdom, and Denmark," *BMJ*, vol. 346, p. e8441, 2013.

[2] S. J. Lee, R. M. Leipzig and L. C. Walter, "Incorporating lag time to benefit into prevention decisions for older adults," *JAMA*, vol. 310, no. 24, pp. 2609-2610, 2013.