

# Individualized Approach to Cancer Screening in Older Adults

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## KEYWORDS

- Cancer screening • Personalized medicine • Life expectancy • Harms and benefits
- Older adults

## KEY POINTS

- Cancer screening in older adults is associated with uncertainty with a small degree of benefit that is not evident until many years later but harms that could occur immediately.
- Health status and functional status vary considerably among older adults, which leads to significant heterogeneity in benefit-risk considerations.
- Individualization of cancer screening decision involves considering the degree of benefits and harms, time horizon to benefits in relation to life expectancy, time horizon to harms, and patient preferences.

## INTRODUCTION

Cancer screening increases the chance of detecting cancers early but is also associated with several potential harms.<sup>1–4</sup> The screening decision needs to balance the likelihood for benefit versus the likelihood for harm, consider the time horizon to benefit versus the time horizon to harm, and incorporate patient preference.<sup>5–8</sup> Because all of these considerations vary depending on individual level factors, a more individualized approach to cancer screening is important. An individualized approach is especially critical for older adults because of the high degree of heterogeneity in both the health status and the health trajectory among this population, which then leads to significant variation in the benefit-harm considerations related to cancer screening.<sup>5,9</sup>

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In this article, the authors review key considerations in a more individualized approach to screening; they review current guidelines regarding cancer screening in older adults and propose frameworks in the literature that are relevant to individualized cancer screening. Finally, they discuss tools and challenges to implementing an individualized approach for cancer screening. Discussions focus around breast, colorectal, and prostate cancer screening as examples, because these are the most common cancer screenings in older adults. The objectives are to provide an overview of how to better tailor the cancer screening decision so that benefits outweigh the harms and to acknowledge the gaps and limitations in the available evidence that need to be addressed as next steps.

### WHAT TO CONSIDER IN AN INDIVIDUALIZED APPROACH TO CANCER SCREENING

#### *Magnitude of Benefit and Time Horizon to Benefit*

One's potential benefit from cancer screening depends on 3 factors: (1) the baseline risk for a specific type of cancer in the absence of screening; (2) the relative risk reduction from screening; and (3) the time horizon over which the risk reduction occurs. Each of these factors is discussed later.

One common and practical consideration when thinking about baseline risk for cancer is to categorize patients as above average risk (have known risk factors for developing a certain type of cancer) or average risk (have no known risk factors). Many risk factors can be easily assessed in routine care of older adults (Table 1).<sup>2-4,10-12</sup> Guidelines on cancer screening and studies on the benefits of cancer screening focus on those at average risk.<sup>2-4</sup> Less data are available to guide the management of those with above average risk. Patients who have genetic predispositions for higher risks of certain cancers, such as BRCA gene mutations for breast and ovarian cancers, or familial adenomatous polyposis for colorectal cancer (CRC), should be considered separately (use available guidelines specific to the risk factor) and referrals to specialists such as high risk cancer screening clinics are reasonable<sup>10-12</sup>; however, it is unlikely that these issues are first discovered in older adults. The nongenetic cancer risk factors are often epidemiologic associations without clear causal link.<sup>13</sup> Although it is intuitive to think that patients with these risk factors would stand to benefit more from screening, and a more aggressive screening approach may be reasonable, it is important to note that there is uncertainty about whether screening is more beneficial in this population. This is because screening is beneficial only for certain subtypes of

**Table 1**  
Risk factors for breast, colorectal, and prostate cancers

	Breast Cancer	Colorectal Cancer	Prostate Cancer
Risk factors	<ul style="list-style-type: none"> <li>• Age</li> <li>• Family history</li> <li>• Race/ethnicity</li> <li>• BRCA 1 or BRCA 2 gene</li> <li>• Time of first menstrual period</li> <li>• Time of first birth of child</li> </ul>	<ul style="list-style-type: none"> <li>• Age</li> <li>• Family history</li> <li>• Race/ethnicity</li> <li>• Inflammatory bowel disease</li> <li>• Familial adenomatous polyposis</li> <li>• Body mass index</li> <li>• Vegetable intake</li> <li>• Use of NSAIDs</li> <li>• Smoking history</li> </ul>	<ul style="list-style-type: none"> <li>• Age</li> <li>• Family history</li> <li>• Race/ethnicity</li> <li>• Urinary symptoms</li> </ul>

Data from Refs.<sup>2-4,10-12</sup>

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