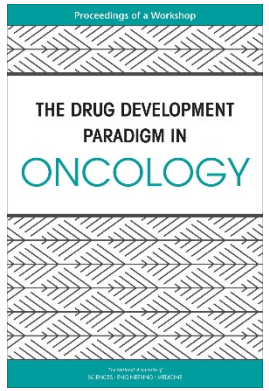
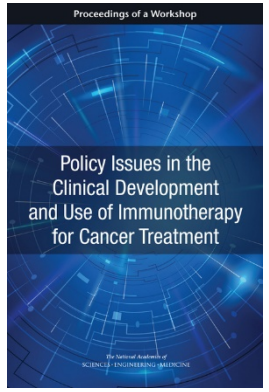
The National Academies of | SCIENCES ENGINEERING MEDICINE

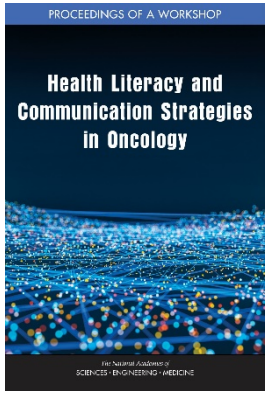
Nicole Dowling and Stanton Gerson
Co-Chairs, Workshop Planning Committee

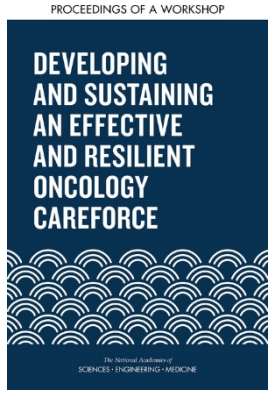
THE NATIONAL CANCER POLICY FORUM

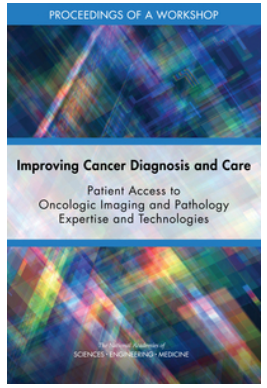
The Forum provides a continual focus within the National Academies on **cancer**, addressing issues in **science, clinical medicine, public health, and public policy** that are relevant to the goal of reducing the cancer burden.

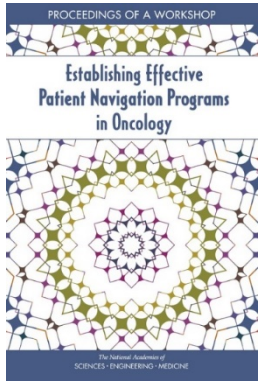


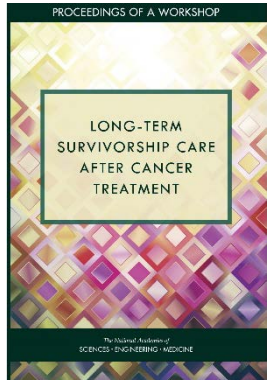


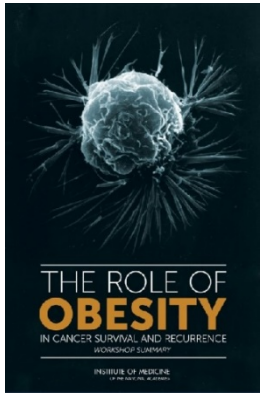


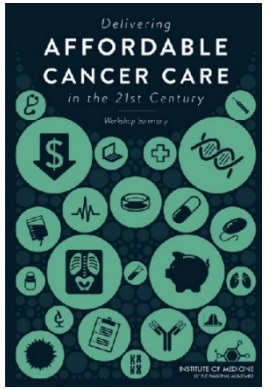


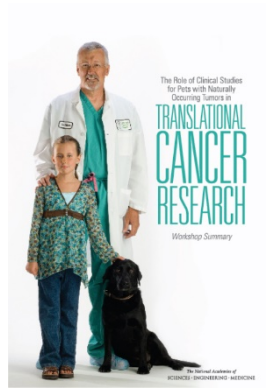












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NATIONAL CANCER POLICY FORUM

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WORKSHOP GOALS

- Describe the key principles of cancer screening.
- Review the evidence base for cancer screening, including key gaps and methodologic and statistical challenges in assessing the benefits and risk of cancer screening.
- Highlight opportunities to improve the evidence base for cancer screening, including the potential to leverage new research approaches and learning health systems.
- Consider the challenges and opportunities to developing new cancer screening tests, as well as the potential for new approaches to mitigate risk, improve patient outcomes, and deliver more personalized approaches to cancer screening.
- Examine opportunities to improve shared decision making in cancer screening decision-making, including strategies to better tailor population-based screening guidelines and improve risk stratification.
- Identify opportunities to reduce disparities in cancer outcomes by facilitating patient access to high-quality cancer screening and follow-up care.

Recent *Science* perspective: Improving Cancer Screening Programs

PUBLIC HEALTH

Improving cancer screening programs

Evaluating diagnostic tests in learning screening programs could improve public health

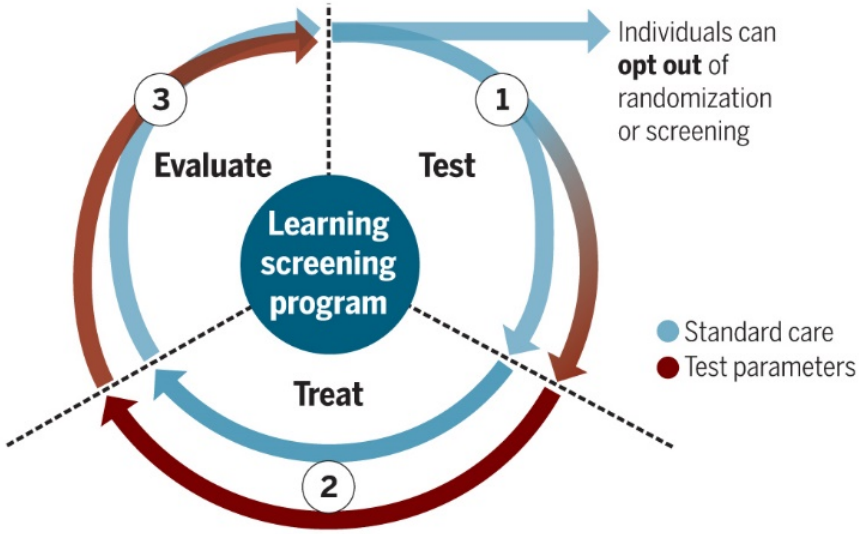
By **Mette Kalager** *and* **Michael Bretthauer**

National cancer screening programs, such as mammography for breast cancer, are widely implemented to reduce cancer incidence and mortality in high-income countries. Their introduction is also being considered in low- and middle-income countries. For many cancer types, the benefits and harms of different screening tests and the intervals at which they should be implemented are unknown. Thus, randomized comparison testing is warranted. However, this is not possible because most people in high-income countries have already undergone screening or have refused screening and are not comparable (*1*). There is and cancer precursors that would not have progressed to symptoms or death in the absence of screening (*3*). Because overdiagnosed lesions cannot be distinguished from lesions that will progress, all patients are treated. Therefore, overdiagnosed patients only experience harms and do not gain any benefit from screening.

For many cancers, not only are the comparative benefits and harms of available screening tests unknown, there is also a lack of consensus regarding the appropriate choice of test interval and threshold for a positive diagnosis. Screening programs in different countries use different tests, intervals, and thresholds. For example, the UK National Health Service (NHS) offers a screening sigmoidoscopy at age 55 and FIT harms, and is most likely to be acceptable in the population. Individuals in national screening programs are asked to be randomized to receive either a new screening test, interval, or threshold, or the standard option. Testing thus involves randomized comparisons of thousands or even tens of thousands of participants with clinically relevant end points, such as cancer incidence or mortality. After the testing phase is over, it will be possible to make valid estimates of benefits and harms. For example, overdiagnosis can be measured in terms of the difference between numbers of cancers detected in individuals randomized to one screening test versus those randomized to another. Then, the best test or method will be introduced to all. When a new test

Learning screening programs

Patients enrolled in national screening programs agree to be randomized into testing arms that assess different tests, intervals, or thresholds to identify the optimal screening test that improves population mortality without overdiagnosing patients for additional treatment.



1 Volunteers undergoing national screening are randomized into **different treatment arms**

2 Individuals receive **different screening tests**, at different intervals or with different thresholds for positivity

3 Treatment arms are **compared** and the optimal screening test is selected as the standard test, which can be compared to additional variations in the future

WORKSHOP AGENDA: MARCH 2

SESSION 1

Principles and Methods of Cancer Screening

SESSION 2

The Evidence Base for Cancer Screening: Key Gaps and Statistical and Methodological Challenges

SESSION 3

Opportunities and Challenges in the Validation and Implementation of Novel Screening Technologies

SESSION 4

Patient Access to High-Quality Cancer Screening and Follow-Up Care

WORKSHOP AGENDA: MARCH 3

SESSION 5

Shared Decision Making and Communication in Screening

SESSION 6

Participant Recommendations to Improve Cancer Screening

We encourage you to suggest policy changes to promote the development and implementation of high-quality cancer screening.

Please state your name and affiliation prior to asking questions at the microphone.