

FEATURE ARTICLE

Screening for Disease: Making Evidence-Based Choices

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Screening for illness should be an evidence-based activity. Screening tests are useful only if they reduce mortality or morbidity. Therefore, healthcare professionals must know how to evaluate research about screening tests to be sure that, in fact, the tests actually accomplish their goals. Tests that generate many false-positive results may cause harm from anxiety and unnecessary procedures. Tests that generate many false-negative results may worsen outcomes by leading to delayed diagnosis and treatment. Characteristics that make a disease amenable to screening include a significant negative impact on health, an identifiable asymptomatic period, and improved outcomes with early intervention. A useful screening test must have sensitivity and specificity for the disease being screened. It also must be cost effective and acceptable to patients. Sensitivity, specificity, and disease prevalence all interact to determine a test's positive predictive value—the likelihood that a positive test result indicates that the disease is present. Several types of test bias can undermine the validity of a screening trial. Screening bias occurs when the sample of patients used in a trial to evaluate a screening test is not representative of the patient population to be screened. Another bias results from the fact that indolent disease is more likely to be detected in a screening program than aggressive disease. The apparent improved outcome that results is called length bias. Finally, lead-time bias occurs when survival of a screened population is measured from the date of screening, whereas survival of an unscreened population is measured from detection of symptomatic disease. In screening for illnesses, the goal must not be merely to do something. It must be to do something useful.

C*aveat emptor*: Let the buyer beware. Healthcare dollars are limited. Evidence-based practice mandates that decisions be based on science, not hunches. Healthcare professionals cannot assume that all screening tests are useful; all tests must be critically evaluated for use in general and high-risk populations. Healthcare professionals should critically evaluate current and newly developed screening tests for general and high-risk populations. As new developments are made, more and more nurses are being asked to provide and interpret statistical information to patients, especially in the statistic-filled areas of genetics and cancer screening. Therefore, nurses must develop an understanding of the terminology and statistical relationships among variables to be able to communicate accurately and effectively (Hanoch & Pachur, 2004).

Factors Affecting Screening Efficacy

The risk versus benefit ratio must be considered in every medical intervention provided or endorsed. Few people undergoing a screening test actually have the disease; all, however, experience the cost and discomfort of the test. Two additional hazards of screening must be recognized. False-positive results may cause unnecessary anxiety, expense, and even a risk of hazardous in-

At a Glance

- ◆ Characteristics that make a disease amenable to screening include a significant negative impact on health, an identifiable asymptomatic period, and improved outcomes with early intervention.
- ◆ The positive predictive value of a screening test is determined by the test's sensitivity and specificity and the disease's prevalence in a population.
- ◆ A useful screening test must reduce mortality or morbidity and have high sensitivity and specificity. It also must be cost effective and acceptable to patients.

tervention in unaffected individuals. False-negative results may speciously reassure and delay diagnosis of people who, in fact, have a disease (Gates, 2001). Breast self-examination may be an

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