Health Care Screening

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Goals & Objectives

- Learners will be comfortable discussing health care screening with patients and families
  - Be able to articulate concepts as overdiagnosis, positive and negative predictive value, lead time bias, the relation of disease and test characteristics to screening programs.

Health Care Screening is _____.

Health Care Screening is ____Good_____.

Health Care Screening is ___Always Good___.

Health Care Screening is ___A Real LifeSaver___.

Health Care Screening is ____Harmful_____.

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Why do we screen?

What is screening?

- Screening vs. Case finding vs. Diagnostic testing?
- Screening – Looking for a specific disease that is in a pre-symptomatic state and applied to a population/subpopulation.
  - "Screening" is often used when referring to populations or large groups of people
    - Can it be used when referring to one person?

How do we know when to screen?

- Disease characteristics to consider
- Test characteristics to consider
- Adverse effects of screening

Disease characteristics to consider when screening

- Seriousness
  - The Disease should be somewhat serious
    - cause significant morbidity or mortality
    - Some diseases are not serious themselves but lead to other diseases
      - Hypercholesterolemia (is it a disease or is it a risk factor for disease?)
- Benefit of early detection
  - There must be some therapy or intervention that is effective when the disease is found early.
    - (Can you help the patient more now than you could if you waited for symptoms?)
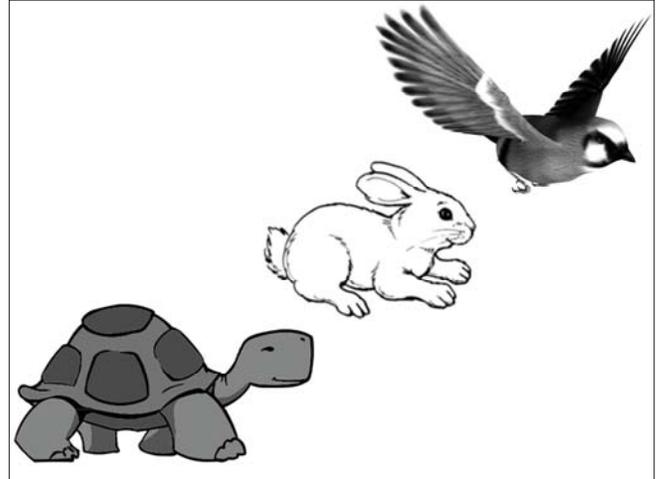
Disease characteristics to consider when screening

- Epidemiology
  - The prevalence of the disease must be considered
  - Screening for rare diseases leads to many false positive test results
    - What is a "false positive"?
    - False positives lead to increased cost, anxiety, inconvenience to patients, medical complications and difficulties finding those who are truly ill.
    - Do we need to screen for diseases that are very rare?
      - Can anyone name a very rare disease that we screen for?
    - Or very common?
      - Can anyone name a very common disease that we screen for?

Disease characteristics to consider when screening

- Availability of treatment
  - Who deals with the positive result?
  - Is follow up available?
  - What is the next step if results are positive?
    - Is the confirmatory test available?
    - Is treatment available if disease is present?
    - Does the patient understand the next steps?
    - Does the patient accept the next steps?

Characteristics of the test to consider when screening

- How expensive is the test?
- How easy is the test to do?
- How safe is the test?
- Is the test acceptable to the patient?
- What is the sensitivity, specificity, NPV and PPV of the test?

- Would you rather a screening test be very sensitive or very specific?
  - A) Sensitive
  - B) Specific

The table below shows the results from looking at the diagnostic accuracy of a new rapid test for HIV in 100,000 subjects, compared to the Reference standard ELISA test. The rows of the table represent the test result and the columns the true disease status (as confirmed by ELISA).

	HIV+	HIV-	Total
Test +	378	397	775
Test -	2	98,823	98,825
	380	99,220	100,000

What is the Sensitivity of the new rapid test for HIV?
a) 378/397
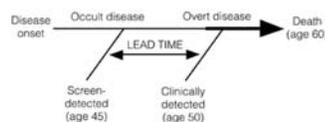b) 2/378
c) 378/380
d) 397/99,220

Positive Mammogram

■ Ms. Levona (56yo) is in your office crying because she got a letter from the radiologist that her mammogram was positive. She read that 90% of women with breast cancer, and who had a mammogram, have a positive mammogram, so she's convinced that she has 90% chance of having breast cancer.

1. She's confusing sensitivity and positive predictive value.
2. She's confusing specificity and positive predictive value.
3. She's confusing sensitivity and negative predictive value.
4. She's confusing specificity and negative predictive value.

The table below shows the results from looking at the diagnostic accuracy of a new rapid test for HIV in 100,000 subjects, compared to the Reference standard ELISA test. The rows of the table represent the test result and the columns the true disease status (as confirmed by ELISA).

	HIV+	HIV-	Total
Test +	378	397	775
Test -	2	98,823	98,825
	380	99,220	100,000

What is the Positive predictive value (PPV) for the new rapid test for HIV in this cohort?
a) 378/379
b) 378/775
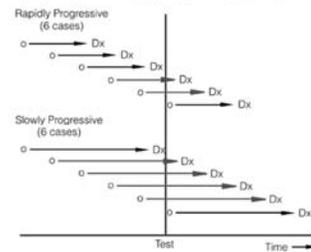c) 378/380
d) 397/99,220

Adverse Effects of screening

■ What happens to people with positive test results?

■ What are the risks of the next test or treatment?
■ What effect does the positive test result have on the well being of the patient and family and how important is that effect?
■ What are the costs and harms of treatment

Biases

■ Selection Bias
■ Lead-time Bias
■ Length Bias
■ Over Diagnosis

■ Importance of RCT's.

■ Lead Time Bias

■ Length Bias

■ Over Dx

Questions

■ Which of the following statements is true about Lead time bias and length bias?

■ A) They tend to cancel each other out.
■ B) They can both lead to over estimation of the benefit of screening.
■ C) They can both lead to the under estimation of the benefit of screening.
■ D) They are only important in assessing the HARM of screening, not the benefit.

Sample Case from the FMC Bob Jones

HPI: Mr. Jones is a 59 year old male presents to establish care. He is changing PCPs for insurance reasons. He is without complaint today.

PMH: Gastro-esophageal reflux for 3 years
Status post left inguinal hernia repair in 1992
Meds: omeprazole 20 mg PRN

SH: Married x 38 yrs. Retired. No tob, etoh, drugs

FH: 1 brother with type 2 diabetes, 1 brother with unknown type of Cancer, but recovered

Bob Jones

Physical Exam:

Vital signs: P-68 BP-128/86 R-12 T-98.6

Alert, oriented, NAD

Neck: supple without LAD

Heart: RRR, no murmur

Chest: CTA bilaterally

Abdomen: Soft, NT, small reducible LIH

Ext: No C/C/E

Bob Jones

- Assessment and Plan
1. GERD. Will continue with PRN Omeprazole as only has symptoms rarely
2. Health Care Maintenance. Routine labs to be checked include TSH, CBC, CMP, and lipids. He appears in excellent health, but will check a PSA as well. Tetanus booster up to date.

Health Care Screening

- How do we know what tests to order and who to order them on?
- What diseases should we screen for and in who?

Who Creates Screening Guidelines?

- Everybody
- USPSTF, ACS, AAFP, AHA, ADA, CDC, AAP, ACOG, ACA, ……………
- Many organizations create their own set of screening guidelines.
- Which are best to follow?

The United States Preventive Services Task Force

- Created in 1984
- Independent, volunteer experts
- Makes evidence based recommendations about preventive clinical services

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USPSTF

- "The mission of the USPSTF is to evaluate the benefits of individual services based on age, gender, and risk factors for disease; make recommendations about which preventive services should be incorporated routinely into primary medical care and for which populations; and identify a research agenda for clinical preventive care. Recommendations issued by the USPSTF are intended for use in the primary care setting."

USPSTF

ePSS

Electronic Preventive Services Selector Tool.
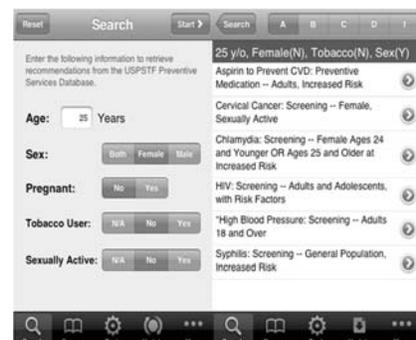
USPSTF Grades

Grade	Definition	Suggestions for Practice
A	The USPSTF recommends this service. There is high certainty that the net benefit is substantial.	Offer or provide this service.
B	The USPSTF recommends this service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer or provide this service.
C	The USPSTF recommends selectively offering or providing this service to individual patients based on judgement and patient preferences. The is at least moderate certainty that the benefit is small.	Offer or provide this service for select patients.
D	The USPSTF recommends against this service. There is moderate or high certainty that the service has no net benefit or that harms outweigh benefits.	Discourage the use of this service.
I	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, poor quality, or conflicting.	If offered, patients should understand uncertainties

Prostate Cancer - 2018

For men aged 55 to 69 years, the decision to undergo periodic prostate-specific antigen (PSA)–based screening for prostate cancer should be an individual one. Before deciding whether to be screened, men should have an opportunity to discuss the potential benefits and harms of screening with their clinician and to incorporate their values and preferences in the decision.

- C Recommendation

Prostate Cancer-AAFP 2018

- Do not routinely screen for prostate cancer using a prostate-specific antigen (PSA) test or digital rectal exam. For men who desire PSA screening, it should only be performed after engaging in shared decision making.

Breast Cancer - 2016

1. Women 50 to 74 years, The USPSTF recommends biennial screening mammography
   - B recommendation
2. Women 40 – 49 years, The decision to start screening mammography in women prior to age 50 years should be an individual one. Women who place a higher value on the potential benefit than the potential harms may choose to begin biennial screening between the ages of 40 and 49 years.
   - C recommendation

Breast Cancer- ACS

1. Women between 40 and 44 have the option to start screening with a mammogram every year.

2. Women 45 to 54 should get mammograms every year.

3. Women 55 and older can switch to a mammogram every other year, or they can choose to continue yearly mammograms. Screening should continue as long as a woman is in good health and is expected to live 10 more years or longer.

Osteoporosis- 2018

1. Women 65 and older, The USPSTF recommends screening for osteoporosis with bone measurement testing
   - B recommendation
2. Postmenopausal women younger than 65 at increased risk, The USPSTF recommends screening for osteoporosis with bone measurement testing to prevent osteoporotic fractures in postmenopausal women younger than 65 years who are at increased risk of osteoporosis, as determined by a formal clinical risk assessment tool.
   - B recommendation

Statin use - 2016

1. The USPSTF recommends that adults without a history of cardiovascular disease (CVD) use a low- to moderate-dose statin for the prevention of CVD events and mortality when all of the following criteria are met: 1) they are aged 40 to 75 years; 2) they have 1 or more CVD risk factors (ie, dyslipidemia, diabetes, hypertension, or smoking); and 3) they have a calculated 10-year risk of a cardiovascular event of 10% or greater.
2. Identification of dyslipidemia and calculation of 10-year CVD event risk requires universal lipids screening in adults aged 40 to 75 years.
   - B Recommendation

Colorectal cancer- 2016

1. The USPSTF recommends screening for colorectal cancer starting at age 50 years and continuing until age 75 years.
   - A Recommendation
2. The ACS recommends that people at average risk of colorectal cancer start regular screening at age 45. This can be done either with a sensitive test that looks for signs of cancer in a person's stool (a stool-based test), or with an exam that looks at the colon and rectum (a visual exam). 2018.

Vitamin D - 2014

1. The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for vitamin D deficiency in asymptomatic adults.

   - I Recommendation

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   - I Recommendation