Cancer Screening

Using Best Evidence to Guide Practice

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Selected Controversies

• Breast Cancer Screening
  – Does screening really reduce mortality?
  – Who should be screened?
  – 3D mammography
• Cervical Cancer Screening
  – New Recommendations
• Colorectal Cancer
  – What test and how often?
  – Are there new screening options?

Selected Controversies

• Lung Cancer
  – Does screening work?
  – Chest X-Ray?
  – Low dose CT?
• Prostate Cancer
  – Should we screen?

Breast Cancer Screening

• Breast cancer is the most common cancer in women and the second leading cause of cancer death
• Screening mammography reduces mortality from breast cancer
• Younger women have lower breast cancer risk
• Increased density of pre-menopausal breast tissue leads to decreased sensitivity
Harms Of Screening

- False positives
  - Anxiety
  - Additional tests including biopsies
  - One-third of total screening cost
- Over-diagnosis
  - Cancers diagnosed that never would cause symptoms: patients receive all the costs and harms of treatment
  - Estimates: 10% to 26% of invasive breast cancers and 34% of all breast cancers
- Radiation exposure
  - One breast cancer for 3000 women screened annually for 10 years

Kimberly

- Kimberly is a 43-year-old healthy female who has been getting annual mammograms since the age of 40. She is a non-smoker, drinks alcohol occasionally, and exercises regularly. She has no family history of cancer.
- She notes that her mammograms are quite painful and fairly inconvenient. She has been called back twice for "minor abnormalities" which necessitated additional images (all of which were negative).
- She recently read an article in The New York Times which stated that mammograms may be less beneficial than previously thought. She wonders if she needs her mammogram this year.

What do you recommend to Kimberly?

1. Yes, of course. Every woman needs a mammogram once a year.
2. Let’s talk about it (even though you are already 20 minutes behind)
3. We can talk about this next time you come in (maybe the guidelines will be more clear then)
4. I don’t know….what do you want to do?

Background

- Several trials have shown that mammography reduces breast cancer mortality, although their results may be affected by the adequacy of randomization.
- Mammography may also be associated with significant harms, including false-positives and over-diagnosis.

Jorgensen, BMJ, 2009

The News


- Aims:
  - 1. To evaluate the benefit of annual breast physical exam and screening mammography among women aged 40-49 compared with usual care.
  - 2. To evaluate the risk/benefit of adding mammography to breast physical examination among women aged 50-59.

Results: Years 1-5 (screening phase)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control Arm (usual care, annual breast exam) N = 524</th>
<th>Mammogram Arm N = 666</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age at diagnosis (years)</td>
<td>52.6</td>
<td>52.5</td>
</tr>
<tr>
<td>Died from breast cancer (%)</td>
<td>171 (32.6)</td>
<td>180 (27.0)</td>
</tr>
<tr>
<td>Tumor size (cm)*</td>
<td>2.1 (0.2-7.0)</td>
<td>1.9 (0.2-9.0)</td>
</tr>
<tr>
<td>Lymph node status positive (%)**</td>
<td>170 (32.4)</td>
<td>204 (30.6)</td>
</tr>
<tr>
<td>Estrogen receptor status (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>85 (16.2)</td>
<td>102 (15.3)</td>
</tr>
<tr>
<td>Equivocal</td>
<td>41 (7.8)</td>
<td>41 (6.2)</td>
</tr>
<tr>
<td>Positive</td>
<td>261 (49.8)</td>
<td>312 (46.9)</td>
</tr>
</tbody>
</table>

*p = 0.01

**p = 0.53

Overdiagnosis = 22%

All cause mortality, by assignment to mammography or control arms (all participants).

Breast cancer specific mortality, by assignment to mammography or control arms (all participants).
**Potential limitations**

- **Selection bias**
  - Exclusion of prevalent breast cancers did not change results
  - Equal proportions of women in both groups were diagnosed with breast cancer after screening was complete (mammogram arm: 5.8%, control arm: 5.9%)

- **Contamination**
  - 26% of usual care group received mammograms
  - Adjustment for outside mammography did not change results

- **Mammography after end of screening phase**
  - Unlikely that screening after the study was differential between study arm participants or masked a benefit from screening during the study

**Comparison with Other Trials**

- Swedish Two-County Trial
  - 30% breast cancer mortality reduction
  - Randomization was by county
    - Possible selection bias?
  - Analysis was based on invitation to screen
    - Possible selection bias?

- Review of data from SEER
  - 31% overdiagnosis rate
    - Wider age range included

**Conclusions**

- In this randomized study, mammography did not reduce breast cancer mortality; moreover, 22% of cancers were over-diagnosed

- **Taken in context...**
  - Prior trials may not have had adequate randomization
  - Benefit may be related to improvements in treatment rather than screening

**How Should I Counsel Kimberly?**
Key Article

- **Quantifying the Benefits and Harms of Screening Mammography**
  - Welch HG and Passow HJ. *JAMA* 2013.

- **Aim:** To use all available data to quantify the benefit-risk trade-off for screening mammography among women ages 40-69

- **Outcomes assessed:**
  - Reduction in breast cancer deaths
  - False-positive results
  - Over-diagnosis

How do I counsel Kimberly?

**Outcome** | **Among 1000 40-year old women screened with annual mammography for 10 years**
---|---
**Benefits** | 0.1-1.6 will avoid dying from breast cancer*  
**Harms** | 510-690 women will have a false-positive result  
| 60-80 will have a false-positive biopsy recommendation  
| Up to 11 women will be over-diagnosed and potentially receive unnecessary treatment

*Range of benefits include data from the Canadian National Breast Cancer Screening Studies and Swedish Two-County trials

Take-Home Message

- Decisions regarding mammographic screening should be highly individualized and take into account the range of possible benefits and risks.

3-D Mammography

- **Tomosynthesis** is a 3 D technique that can be added to digital mammography
- **Goal** is to make invasive cancers more obvious and to decrease false positives
- **Doubles the radiation dose** but dose is still well below FDA defined limits
3-D Mammography

- Multi-center comparison of digital mammography plus tomosynthesis vs digital mammography alone
  - Before and after introduction of tomosynthesis
  - 173,663 screens with tomosynthesis
  - 281,187 with digital mammography alone
- Outcomes were recall rate, cancer detection rate and PPV for recall and biopsy

3D Mammography: Outcomes

- Decrease in recall rate with 3D
  - 91 vs 107 per 1,000 (C.I. 73-108)
- Increase in biopsies with 3D
  - 19.3 vs 18.1 per 1000 (C.I. 0.4-2.1)
- Increase cancer detection with 3D
  - 5.4 vs 4.2 per 1000 (C.I. 4.9-6.0)
- Increase invasive cancer detection with 3D
  - 4.1 vs 2.9 per 1,000 (C.I. 2.5-3.2)
- PPV for recall and biopsy both improved
  - Recall: 6.4% vs 4.3%
  - Biopsy: 29.2% vs 24.2%

Impact for Practice

- Addition of tomosynthesis is associated with a decrease in recall rate and an increase in cancer detection rate
- Impact on clinical outcomes not yet known

USPSTF Guidelines

Mammography

- Age 50-74: screening mammography every 2 years
- Age 40-49: individualize decision to begin biennial screening according to patient's context and values
- Age ≥75: no recommendation (insufficient evidence)

Breast Exam

- Clinical breast examination alone — insufficient evidence
- Recommend against teaching women to perform routine breast self-examination
  - No mortality benefit
  - Higher rates of benign breast biopsies
ACS Recommendations: Average Risk Women

- Begin mammography at age 40
- Clinical breast exam
  - At least every three years for women in their 20s and 30s
  - Annually for women age 40 and over
- Women should be informed about the benefits and limitations of breast self examination (BSE)
  - Prompt reporting of any breast symptoms
  - Technique may reviewed, but it is acceptable not to do it
- Women should become informed about benefits, limitations and potential harms of routine screening

Bottom line

- 40-49 informed consent
- 50-74 screen every 2 years
- 75+ informed consent - don’t if life expectancy less than 10 years
- Don’t promote SBE
- Digital mammography for women < 50
- BRCA equivalent: MRI

Cervical Cancer Screening

- Dramatic reduction in mortality with routine cervical cancer screening
- HPV is the causative agent in the majority of cases of cervical cancer
- Long latency period for development of cervical cancer
- Many lesions will regress on their own
Cervical Cancer Screening Guidelines

<table>
<thead>
<tr>
<th>USPSTF 2012</th>
<th>ACS/American Society for Colposcopy and Cervical Pathology, and American Society for Clinical Pathology Joint Guidelines 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pap smear every 3 years in women aged 21-65</td>
<td>Pap every 3 years in women aged 21-29</td>
</tr>
<tr>
<td>For women aged 30-65 who want to lengthen the screening interval, screen with a combination of cervical cytology and HPV testing every 5 years</td>
<td>For women aged 30-65 Pap plus HPV testing is the preferred method Pap every 3 years is acceptable</td>
</tr>
<tr>
<td>Discontinue in women over the age of 65 in whom smears have been consistently normal</td>
<td>Discontinue in women over the age of 65 in whom smears have been consistently normal Continue to screen women diagnosed with cervical pre-cancer</td>
</tr>
<tr>
<td>No HPV screening in women younger than 30</td>
<td>No HPV testing in women less than age 30 unless needed after an abnormal test result</td>
</tr>
<tr>
<td>No screening in women who have had a hysterectomy</td>
<td>No screening in women who have had a hysterectomy and have no history of cervical cancer or pre-cancer</td>
</tr>
</tbody>
</table>

Lung Cancer Screening

Question?

Mr. Nico Teen is a 69 year old man with a 50 pack-year history of smoking and COPD. You have previously been unsuccessful in encouraging him to quit smoking. He comes in for a check-up, is worried about developing lung cancer and wants to know what test you think he should have. What do you recommend?

1. Chest X ray
2. Sputum cytology
3. Spiral CT
4. None of these tests

Lung Cancer Screening: Systematic Review of Chest X-rays

- 7 trials of lung cancer screening
- Frequent screening with chest x-rays was associated with an increase in mortality – RR 1.11 (95% C.I. 1.00-1.23)
- No difference in chest X-ray plus cytology versus chest X-ray alone

Manser, Thorax, 2003
PLCO: Lung Cancer Screening

- PCLO randomly assigned 154,901 adults aged 55 through 74 to annual CXR for 4 years vs. usual care
- Followed for 13 years
- Cumulative lung cancer mortality
  - 14.0/10,000 py screening group vs. 14.2/10,000 py control group
  - Rate ratio: 0.99 (95% CI 0.87-1.22)

Low Dose Spiral Computed Tomography

- Scans lung in < 20 seconds (single breath)
- No IV contrast
- More radiation exposure than CXR but less than conventional CT
- Can detect much smaller lesions than chest X-ray

The National Lung Screening Trial (NLST)

- 53,454 participants randomized to CT or CXR
  - Current or former heavy smokers: ≥ 30 pack-years
  - Ages 55 to 74
  - Annual CT scans x 3 years. 6.5 years follow-up

<table>
<thead>
<tr>
<th></th>
<th>LDCT RR (95% CI)</th>
<th>CXR</th>
<th>Δ</th>
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</thead>
<tbody>
<tr>
<td>Lung Cancer Deaths</td>
<td>.80 (.73-.93)</td>
<td>443</td>
<td>87</td>
</tr>
<tr>
<td>Any death</td>
<td>1877</td>
<td>2000</td>
<td>.93 (.86-.98)</td>
</tr>
</tbody>
</table>

Number needed to invite to screen

- NNI to prevent one lung cancer death in 6.5 years = 320
- NNI to prevent one death from any cause in 6.5 years = 218
Balanced by…

- 75,000 CT scans
- 18,146 positive tests
- 17,066 false positive tests
- 673 thoracotomy / mediastinoscopy
- 303 broncoscopies
- 99 needle biopsies
- To prevent 62 deaths from lung cancer

NLST Harms

- False positives
  - At least 1 positive test in 39% CT
    - False positive results in 96% CT
- Possible over diagnosis
  - Higher cancer incidence with CT
    - 1060 vs. 941 cancers
    - Rate ratio 1.13 (95% CI 1.03–1.23)
- Radiation exposure
- Incidental findings

Concern: Control = Chest x-ray

- Screening with CXR was ineffective in 30,341 subjects in the PLCO meeting NSLT criteria
  - 30+ pack year, smoked within past 15 years
  - Cumulative lung cancer mortality was 36.1/10,000 py screening group vs. 38.3/10,000 py controls
    - Rate ratio: 0.94 (0.81–1.10)
- Reasonable to conclude that CT screening is more effective than usual care
Health Policy

- ~94 million current or former smokers in the U.S.
- ~7 million meet NLST criteria
- Implementation issues
  - Multidisciplinary teams
  - Trained radiologist
- Expensive... $ $ $

Guidelines and recommendations

- Recommend for those meeting NLST entry criteria at specialized centers
  - ACCP / ASCP / ATS
  - ACS
  - ALA
  - NCCN
  - AATS

The NLST Setting

- 76% of sites were NCI designated cancer centers
- 82% were large academic medical centers
- All likely to have specialized thoracic radiologists and board certified thoracic surgeons on site
- CT scanners extensive quality control
- Nodule management algorithm but not mandated

Guidelines and recommendations

- USPSTF prior recommendations
  - Smoking cessation counseling: “A” (2009)
    - 85% of cancers among smokers attributed to smoking
USPSTF Recommendation

- USPSTF recommends annual screening for lung cancer with low-dose computed tomography (LDCT) in persons at high risk for lung cancer based on age and smoking history
  - Grade B recommendation
  - Published December 31, 2013

USPSTF

- Age
  - 55-79
- Total exposure to tobacco smoke
  - 30 pack years or more
- Years since quitting
  - Those who have smoked within the past 15 years are at highest risk
- Consider other comorbidities

Primary Prevention Of Lung Cancer

- Smoking cessation
- Smoking cessation
- Smoking cessation
- Smoking cessation
- Smoking cessation
- Smoking cessation
- Smoking cessation
- Smoking cessation
- Smoking cessation

Implications

- Smoking cessation
- Strict adherence to guidelines
  - 55-79 years, 30+ pack years
- Use experienced centers / demonstration projects to ensure quality and effectiveness
What do you most commonly recommend for colorectal cancer screening?

1. Fecal occult blood test (FOBT)
2. Sigmoidoscopy
3. Colonoscopy
4. Air contrast barium enema
5. Virtual Colonoscopy
6. Fecal DNA
7. Fecal immunochemical Test (FIT)

Joint Guideline: ACS, ACR,…
- FOBT annually
- Fecal immunochemical test annually
- Flexible sigmoidoscopy every 5 years
- DCBE every 5 years
- CT colonography every 5 years
- Colonoscopy every 10 years
- Stool DNA testing (interval uncertain)

Joint Guideline Recommendation
- Clinicians should make patients aware of the full range of screening options
- Offer patients a choice between a screening test that is effective at both early cancer detection and cancer prevention through the detection and removal of polyps and a test that is primarily effective at cancer detection
- CRC prevention should be the primary goal of screening

Levin, Gastroenterology, 2008
USPSTF

• USPSTF: “A” recommendation (2008)
  – Routine screening from age 50 until 75
    • Individualized decisions from 76 to 85
    • No screening after 85

USPSTF (continued)

• USPSTF: “A” recommendation (2008)
  – Acceptable modalities
    • Colonoscopy
    • Fecal blood test
      – Fecal immunochemical test, high-sensitivity hemoccult
      • Flexible sigmoidoscopy
    – Insufficient evidence for CT colonography, fecal DNA

Fecal Immunochemical Testing (FIT)

• Uses labeled antibodies that attach to antigens of any human globin present in the stool
  – Globin does not survive passage of the upper GI tract
• No dietary restrictions (easier than FOBT)
• More sensitive in detecting CRC and large adenomas (>1 cm) than FOBT
• FIT is a little less specific than FOBT

Colonoscopy

• American College of Gastroenterology guidelines for colorectal cancer screening
  (Rex DK. Am J Gastroenterol 2009;104:739)
  – Colonoscopy… remains the preferred CRC screening strategy
Colonoscopy: RCTs in progress

- VA
  - Colonoscopy versus fecal immunochemical test in reducing mortality from colorectal cancer
- Spain
  - Colorectal cancer screening in average-risk population: immunochemical fecal occult blood testing versus colonoscopy
- Netherlands
  - Colonoscopy or colonography for screening

Sigmoidoscopy: PLCO

- 154,890 average risk men and women aged 55-74 assigned to screening with FS with repeat at 3-5 years vs usual care
  - 11.9 year follow up
- Reduced CRC incidence
  - Relative risk: 0.79 (95% CI 0.72-0.85)
  - Absolute risk reduction: 3.3/10,000 person years
    - Number needed to invite to screening (NNI): 285 (95% CI 210-427)
  » Schoen et al NEJM 2012

Flexible Sigmoidoscopy: PLCO

- Reduced CRC mortality
  - Relative risk: 0.74 (95% CI 0.63-0.87)
  - Absolute risk reduction: 1.0/10,000 person years
    - NNI: 871 (95% CI 567-1874)
  - Mortality reduction limited to distal cancers

Flexible Sigmoidoscopy

- United Kingdom study showed one-time flex sig reduced CRC incidence by 23% and mortality by 31% (Atkin WS. Lancet 2010;375:1624)
  - 78% (2000) to 26% (2007)
Flexible Sigmoidoscopy

- United Kingdom study showed one-time flex sig reduced CRC incidence by 23% and mortality by 31% (Atkin WS. Lancet 2010;375:1624)
  - 78% (2000) to 26% (2007)
  - Colonoscopy recommendations increased from 38% to 95%

Other Tests

- Virtual Colonoscopy
- Stool based molecular testing
  - Fecal DNA

Computed Tomographic Colonography (Virtual Colonoscopy)

- Non-invasive radiological technique
  - Radiation dose similar to barium enema
- Bowel preparation similar to colonoscopy
  - Prep-less technique is being evaluated
- Does not require sedation
- Colon distended with carbon dioxide or air
- Breath holding for 20-50 seconds
- Colonoscopy to remove polyps

Laxative-Free CT Colonography

- Low fiber diet, orally ingested contrast material and specialized processing software “electronic cleansing”
- 605 adults underwent CTC and OC
- CTC was more accurate in detecting adenomas 10 mm or larger and less so for smaller lesions
  - 91% sensitivity vs 70% for adenoma 8 mm or larger
- Patients preferred it
Potential Harms

- Radiation Exposure
  - 1/1000 could develop solid cancer or leukemia
- Procedure related harms
  - Perforation rate low
- Extra-colonic findings

Extra-colonic Findings

- Extra-colonic findings common: 27 – 69%
- “High” clinical significance require surgical or medical treatment or intervention or further investigation
  - 5 - 11%
- 7-16% of individuals need additional evaluation for extra-colonic findings, but very few abnormalities ultimately required definitive treatment

Fecal DNA Testing

- PCR test for DNA mutations in the stool
- Potential advantages
  - Non-invasive
  - No preparation
  - Detection along entire length of the colon

Multi-target Stool DNA Testing

- Screening test in multi-center study
- Multi-target DNA test (and hemoglobin), FIT, and colonoscopy
- 9989 average risk adults
- Fecal DNA detects more neoplasms than FIT, but with more false positive results
  - Sensitivity for CRC 92.3% vs 73.8%
  - Specificity for CRC 86.6% vs 94.9%

Imperiale, 2014
Multi-Target Stool DNA testing

- Number needed to screen to detect one CRC
  - 154 colonoscopy
  - 166 with DNA
  - 208 with FIT
- Problems with sample collection or assay application greater with DNA test
  - 6.3% vs 0.3%

Colorectal Cancer Screening

- Randomized screening trial in Spain of biennial FIT vs. one-time colonoscopy
  - 53,302 subjects ages 50 to 69
- Primary outcome is CRC mortality after 10 years
- Interim report on participation rates and diagnostic findings
  - (Quintero E. NEJM 2012;366:697)

Screening Outcomes

- Recommending only colonoscopy led to lower adherence

Colorectal Cancer Screening: Choices

- Randomized trial offering colonoscopy, FOBT, or choice of colonoscopy/FOBT
- 997 subjects ages 50 to 79
- 12-month follow up
  - (Inadomi JM. Arch Intern Med 2012;172:575)

Quintero E. NEJM 2012;366:697
Colorectal Cancer Screening: Conclusions

- Any screening is better than no screening for reducing colorectal cancer mortality
- Increase awareness of the importance of colorectal cancer screening
- Virtual colonoscopy and fecal DNA testing are included as options in the joint guidelines but not in USPSTF guidelines

Implications for Practice

- Offer screening
- Testing modalities
  - Fecal immunochemical tests more acceptable and accurate than Hemoccult II
  - Flex sig no longer routinely performed
  - Colonoscopy RCT ongoing
  - CT colonography not reimbursed by Medicare

Screening Completion

<table>
<thead>
<tr>
<th>Year</th>
<th>FOBT in past year or ever scope in 10?</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>54%</td>
</tr>
<tr>
<td>2004</td>
<td>57%</td>
</tr>
<tr>
<td>2006</td>
<td>61%</td>
</tr>
<tr>
<td>2008</td>
<td>64%</td>
</tr>
<tr>
<td>2010</td>
<td>65%</td>
</tr>
<tr>
<td>2012</td>
<td>65%</td>
</tr>
</tbody>
</table>

Inadomi JM. Arch Intern Med 2012;172:575

MMWR, 2013
**Implications for Practice**

- Recognize importance of patient preferences
  - “The best test is the one that gets done”
- Positive fecal blood tests must be evaluated with diagnostic colonoscopy

**QUESTION**

What is your usual practice for PSA screening for men aged 50-70?

1. Usually order PSA
2. Sometimes order PSA
3. Rarely order PSA
4. Never order PSA

---

**Prostate Cancer: Should We Screen?**

- Disease has high prevalence
  - 10% lifetime risk
  - 30% of men have prostate cancer at autopsy
- Disease has serious consequences
  - Sometimes but may be a benign disease for many men
- Detectable preclinical phase- ?? PSA
- Treatment for preclinical disease is more effective?
  - Complications of prostate cancer treatment
    - 8.4% incontinence
    - 60% impotence
    » Prostate Cancer Outcomes Study 24 month follow up Screening
- Screening reduces cancer mortality?

**SCREENING TESTS: PSA**

- PSA testing has increased dramatically since 1988
- Observational studies have had conflicting findings about the benefits of screening
- Two large randomized controlled trials of PSA screening and mortality
PLCO Cancer Screening Trial

- 76,693 men randomized to annual PSA for 6 years plus rectal examination for four years vs usual care
- High rates of screening in the control group
- No significant difference in death between the two groups at 7 year follow-up
  - 2.0 deaths per 10,000 person years in the screening group
  - 1.7 deaths per 10,000 person years in the controls
- Similar results after 10 years
  - Andriole, NEJM 2009

European Randomized Study of Screening for Prostate Cancer (ERSPC)

- 182,160 men aged 50-74 in eight European countries
- PSA screening at least once every four years vs no screening
- During 9 year follow up, incidence was higher in the screened group
  - 8.2% vs 4.8%
- Mortality lower in the screened group
  - 7 fewer prostate cancers per 10,000 screened men
- To prevent one prostate cancer death at 11 year follow up
  - 1,410 men needed to be screened
  - 48 additional prostate cancers treated
  - Schroder NEJM 2009; Schroder NEJM 2012

PSA Screening: Conclusions

- PSA screening may lead to a modest reduction in mortality
- To achieve this mortality reduction, there is a substantial amount of over-diagnosis and over-treatment

USPSTF Recommendations 2012

- Recommends against PSA based screening for prostate cancer
  - PSA can detect early prostate cancer, but inconclusive evidence about whether early detection improves health outcomes.
  - Harms include frequent false positives and unnecessary anxiety, biopsies and potential complications of treatment of some cases of cancer that may never have affected a patient’s health.
  - Grade "D" recommendation
  - USPSTF 2012
American Cancer Society

- Men with at least a 10 year life expectancy should have an opportunity to make an informed decision with their health care provider about whether to be screened
- Screening should not occur without an informed decision making process
- Men at average risk should receive the information beginning at age 50
- Information should be provided at age 45 for men at higher risk and age 40 for very high risk
  - American Cancer Society, 2010

- For men unable to decide, the decision can be left to the discretion of the health care provider
- Men with less than a 10 year life expectancy should not be offered screening
  - At age 75, only half of men have a life expectancy of 10 years or more
- Men without access to regular care should be tested only if high quality informed decision making is available through community based programs
  - Follow-up and counseling
  - ACS 2010

- For those who choose to be screened
  - PSA with or without DRE
  - Screening yearly for men whose PSA is 2.5 ng/ml or greater
  - If PSA <2.5 ng/ml, screening can be extended to every 2 years
  - PSA of 4.0 ng/ml or greater- referral
  - PSA of 2.5-4.0 ng/ml individualized risk assessment
  - Age, African American, family history, previous negative biopsy
  - ACS, 2010

American Urological Association Guidelines

- May, 2012 News Release “AUA outraged at USPSTF’s failure to amend guidelines”
- Men who choose to be screened should have both DRE and PSA
- The decision to use PSA testing should be individualized
  - Inform men of the potential benefits and risks
- Early detection and risk assessment for prostate cancer should be offered to all men aged 40 and older who wish to be screened and who have an estimated life expectancy of more than 10 years
  - American Urological Association, 2009
ACP Guidance Statement

- Derived from an appraisal of available guidelines
  - ACPM, ACS, AUA, USPSTF
- Inform men aged 50-69 about limited potential benefits and substantial harms of screening for PSA
  - Base decision on risk for prostate CA, discussion of benefits and harms, health and life expectancy and preferences
  - Do not screen in those who do not have a clear preference for screening

Prostate Cancer Screening: Summary

- PSA testing may reduce prostate cancer mortality but is not recommended by USPSTF
- Risks of early detection and treatment
- Shared decision making is key

Summary Of Recommendations

- Women aged 50 to 74 should undergo mammography every 2 years
- Screening decisions for women in their forties and for women and for women aged 75 and older should be individualized
- All men and women aged 50-75 should be screened for colorectal cancer
  - Any screening is better than no screening
Summary Of Recommendations

• Screening for lung cancer with low-dose CT reduces mortality
  – USPSTF Recommends screening high risk individuals
• Screening for prostate cancer is not recommended by USPSTF but a shared decision making approach is recommended by other organizations

Questions?

Question

• Ms. O. is a 52 year old woman whose best friend was recently diagnosed with ovarian cancer. She is concerned about ovarian cancer and wants “whatever test you can give her” for it. What do you recommend?

Ovarian Cancer: What Test?

1. CA-125
2. Transvaginal ultrasound
3. CA-125 and transvaginal ultrasound
4. None of these tests
OVARIAN CANCER: SHOULD WE SCREEN?

- Lifetime risk of ovarian cancer
  - No affected relatives: 1%
  - One affected relative: 5%
  - 2 affected relatives: 7%
  - Hereditary syndrome: 40%
- Ovarian cancer limited to the ovaries is associated with a much higher survival rate

Ovarian Cancer: Screening Techniques

- Serum CA-125 assay
- Trans-vaginal ultrasound
- Serum CA-125 plus ultrasound

PLCO Trial 2011

- 78,216 women aged 55-74 randomized to screening or usual care
- Annual CA 125 plus ultrasound
  - CA 125 >35 or abnormal sono was positive
- Follow-up of positive screens by patients’ physicians
- 12.4 years follow-up

PLCO Results

<table>
<thead>
<tr>
<th>Group</th>
<th>Screen</th>
<th>Control</th>
<th>RR</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>39,105</td>
<td>39,111</td>
<td>--</td>
</tr>
<tr>
<td>OC diagnosis</td>
<td>212 (5.7)</td>
<td>176 (4.7)</td>
<td>1.2 (1.0-1.5)</td>
</tr>
<tr>
<td>Deaths</td>
<td>18 (3.1)</td>
<td>100 (2.6)</td>
<td>1.2 (0.8-1.7)</td>
</tr>
</tbody>
</table>

Ovarian Cancer (rate/10,000)
PLCO Results

- 3285 women with false positive screens
  - 1080 surgical follow-up
  - 163 serious surgical complications

Conclusion: “Annual screening for ovarian cancer…with simultaneous CA-125 and transvaginal ultrasound does not reduce disease-specific mortality in women at average risk for ovarian cancer but does increase medical procedures and associated harms.”

Screening Pelvic Examination?

- A part of preventive health care for women for many years
- Not needed for contraception or STD screening
- What is the goal of a screening pelvic examination?

Pelvic Exam at the Well-Woman Visit

ACOG Committee Opinion 534; August 2012

- Women younger than 21 years
  - Pelvic exam only when indicated by medical history
  - Screen for GC, chlamydia with vaginal swab or urine
- Women aged 21 years or older
  - “ACOG recommends an annual pelvic examination”
    - No evidence supports or refutes routine exam if low risk
  - If asymptomatic, pelvic exam should be a “shared decision”
    - Individual risk factors, patient expectations, and medico-legal concerns may influence these decisions
  - If TAH-BSO, decision “left to the patient” if asymptomatic

Screening Pelvic Examination: ACP Evidence Report

- Review of 52 studies
- No evidence supporting the use of pelvic examination in asymptomatic average risk women
  - May cause pain, discomfort, fear, anxiety and embarrassment in about 30% of young women
Impact for practice

- Clinicians who choose to perform pelvic examinations in asymptomatic women should be aware that there is uncertain benefit and there is the potential to cause harm through a positive test result and subsequent testing.

Primary Prevention of Ovarian Cancer

- Oral contraceptives
  - 37% risk reduction
- Pregnancy
- Breast feeding