Cancer Screening 2015

Richard C. Wender, MD
Chief Cancer Control Officer
American Cancer Society
What We’ll Cover

1. Breast Cancer
2. Colon Cancer
3. Lung Cancer
4. Cervix Cancer
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Estimated new cases</td>
<td>234,190</td>
</tr>
<tr>
<td>Estimated deaths</td>
<td>40,730</td>
</tr>
</tbody>
</table>

Breast Cancer

2015
The Mammography Debate: Understanding the Science, Positions, and Beliefs

• Positions of scientists, journals, and reporters are largely entrenched.

• The randomized trial data have known limitations ... and are old.

• The ACA was a game changer:
  – Linking USPSTF guidelines to coverage
Bullet 2. I would not say “flawed,” but instead would say “have known limitations.” Flawed implies that they are wrong and that you’re inclined to dismiss them. Talking points below.

Robert Smith, 4/10/2014
The Evolving Evidence for Breast Cancer Screening: Benefits and Harms
Age-Adjusted Cancer Mortality in Women

C. Females, by site

- Stomach
- Pancreas*
- Breast
- Liver & intrahepatic bile duct*
- Colorectum
- Lung & bronchus
- Uterus†

Deaths per 100,000 Females

Year of Death

Premature Mortality and Incidence-Based Mortality from Breast Cancer, US Women

Percent of deaths from breast cancer by age at diagnosis, U.S., 2005-2006

- < 40  7.7%
- 40-49  17.8%
- 50-59  22.3%
- 60-69  19.0%
- 70-79  18.8%
- 80+  14.5%

Meta-analysis of the RCTs, Women age 39-49

<table>
<thead>
<tr>
<th>Location</th>
<th>RR (95% CI)</th>
<th>Hetero, p=0.30</th>
<th>I²=17%</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIP</td>
<td>0.77 (0.52, 1.13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malmo</td>
<td>0.70 (0.49, 1.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two-county</td>
<td>0.93 (0.63, 1.37)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edinburgh</td>
<td>0.75 (0.48, 1.18)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stockholm</td>
<td>1.52 (0.80, 2.88)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NBSS-1</td>
<td>0.97 (0.74, 1.27)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gothenburg</td>
<td>0.65 (0.40, 1.05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combined</td>
<td>0.85 (0.73, 0.98)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15% reduction in breast cancer mortality
20% reduction without NBSS-1
Results from Randomized Trials are a Solid Basis for Breast Cancer Screening Policy

• Mortality reductions in the trials, closely parallel the reduction in the risk of being diagnosed with an advanced breast cancer.

• Those trials that succeeded in downstaging, also succeeded in reducing breast cancer deaths.

• We see the same findings when we evaluate modern mammography outside of the experimental setting.
## Summary of RCT Relative Incidence of Node Positive Tumors and Relative Mortality Women Aged 40-49

<table>
<thead>
<tr>
<th>Study</th>
<th>Relative Incidence Node + Tumor (N+)</th>
<th>Relative Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two County (W-E)</td>
<td>.84 (16% &lt; N+)</td>
<td>.87 (13% &lt; deaths)</td>
</tr>
<tr>
<td>Malmo</td>
<td>.56 (44% &lt; N+)</td>
<td>.64 (36% &lt; deaths) *</td>
</tr>
<tr>
<td>Gothenburg</td>
<td>.64 (36% &lt; N+)</td>
<td>.56 (44% &lt; deaths) *</td>
</tr>
<tr>
<td>Stockholm</td>
<td>.98 (2% &lt; N+)</td>
<td>1.01 (1% &gt; deaths)</td>
</tr>
<tr>
<td>HIP</td>
<td>.82 (18% &lt; N+)</td>
<td>.77 (27% &lt; deaths)</td>
</tr>
<tr>
<td>Edinburgh</td>
<td>.73 (27% &lt; N+)</td>
<td>.81 (19% &lt; deaths)</td>
</tr>
<tr>
<td>NBSS-1</td>
<td>1.40 (40% &gt; N+)</td>
<td>.97 (3% &lt; deaths)</td>
</tr>
</tbody>
</table>

*Mortality reductions are statistically significant
Evaluation of Service Screening in Sweden
Effectiveness of Population-Based Service Screening With Mammography for Women Ages 40 to 49 Years

- Contemporaneous comparison of breast cancer mortality in Swedish counties offering mammography vs. those not offering mammography
- 1986-2005
- Average follow-up = 16 years
Swedish Mammography In Young Women Cohort

• Screened every 18 to 24 months.
• All outcomes in Sweden are recorded in the Swedish County Registry.
• Analyzed data both based on invitation and attendance.
Map of Study and Control Group Areas, and Crude Cumulative Breast Cancer Mortality per 100,000 Person Years

Cancer 2010; published online: 29 SEP 2010
The Importance of Long Term Follow-up:

- Long term follow-up is necessary to measure the full benefit of breast cancer screening.
- With long follow-up, the number-needed-to-screen to save one life steadily improves.

### Table 3

<table>
<thead>
<tr>
<th>Time between Randomization and Follow-up (y)</th>
<th>RR*</th>
<th>Deaths from Breast Cancer in ASP Group</th>
<th>Expected Deaths in ASP Group†</th>
<th>Deaths Prevented in ASP Group</th>
<th>No. of Women Needed to Screen*</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.74 (0.57, 0.98)</td>
<td>206</td>
<td>277</td>
<td>71</td>
<td>922 (515, 4410)</td>
</tr>
<tr>
<td>15</td>
<td>0.70 (0.56, 0.87)</td>
<td>284</td>
<td>408</td>
<td>124</td>
<td>526 (351, 1055)</td>
</tr>
<tr>
<td>20</td>
<td>0.70 (0.57, 0.85)</td>
<td>324</td>
<td>465</td>
<td>141</td>
<td>464 (316, 871)</td>
</tr>
<tr>
<td>25</td>
<td>0.70 (0.57, 0.85)</td>
<td>347</td>
<td>497</td>
<td>150</td>
<td>436 (297, 815)</td>
</tr>
<tr>
<td>29</td>
<td>0.70 (0.57, 0.85)</td>
<td>351</td>
<td>509</td>
<td>158</td>
<td>414 (286, 748)</td>
</tr>
</tbody>
</table>

* Numbers in parentheses are 95% confidence intervals.
† Expected deaths if the ASP had the same mortality rate as the PSP, calculated by dividing the observed deaths by the RR (e.g., at 10 years, 206/0.7435 = 277 expected deaths).

**31% fewer deaths After 29 years**

Radiology June 28, 2011 110469
Pan-Canadian Study of Mammography Screening

• Comparison of breast cancer screening among exposed (2.8 million) and non-exposed women, 1990-2009.

• 7 of 12 Canadian breast cancer programs, representing 85% of the population.

• SMRs were calculated comparing observed mortality in participants to that expected based upon nonparticipant rates.
Standardized Mortality Ratios (SMRs) by Canadian Province for Ages at Entry: Summary Estimates are Based Upon Random Effects Models. All statistical tests were two-sided.

### 40-49

<table>
<thead>
<tr>
<th>Region</th>
<th>SMR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Columbia</td>
<td>0.58</td>
<td>0.51 to 0.65</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>0.42</td>
<td>0.26 to 0.59</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>0.66</td>
<td>0.47 to 0.85</td>
</tr>
<tr>
<td>Summary (random)</td>
<td>0.56</td>
<td>0.45 to 0.67</td>
</tr>
</tbody>
</table>

**44% fewer deaths**

### 50-59

<table>
<thead>
<tr>
<th>Region</th>
<th>SMR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Columbia</td>
<td>0.57</td>
<td>0.51 to 0.64</td>
</tr>
<tr>
<td>Manitoba</td>
<td>0.54</td>
<td>0.44 to 0.63</td>
</tr>
<tr>
<td>Ontario</td>
<td>0.78</td>
<td>0.71 to 0.85</td>
</tr>
<tr>
<td>Quebec</td>
<td>0.57</td>
<td>0.51 to 0.63</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>0.37</td>
<td>0.25 to 0.48</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>0.75</td>
<td>0.57 to 0.92</td>
</tr>
<tr>
<td>Newfoundland and Labrador</td>
<td>0.65</td>
<td>0.34 to 0.97</td>
</tr>
<tr>
<td>Summary (random)</td>
<td>0.60</td>
<td>0.49 to 0.70</td>
</tr>
</tbody>
</table>

**40% fewer deaths**
Standardized Mortality Ratios (SMRs) by Canadian Province for Ages at Entry: Summary Estimates are Based Upon Random Effects Models. All statistical tests were two-sided.

### 60-69

<table>
<thead>
<tr>
<th>Region</th>
<th>SMR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Columbia</td>
<td>0.57</td>
<td>0.49 to 0.64</td>
</tr>
<tr>
<td>Manitoba</td>
<td>0.70</td>
<td>0.55 to 0.85</td>
</tr>
<tr>
<td>Ontario</td>
<td>0.69</td>
<td>0.62 to 0.77</td>
</tr>
<tr>
<td>Quebec</td>
<td>0.63</td>
<td>0.56 to 0.71</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>0.39</td>
<td>0.27 to 0.52</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>0.45</td>
<td>0.30 to 0.60</td>
</tr>
<tr>
<td>Newfoundland and Labrador</td>
<td>0.69</td>
<td>0.30 to 1.09</td>
</tr>
<tr>
<td>Summary (random)</td>
<td>0.58</td>
<td>0.50 to 0.67</td>
</tr>
</tbody>
</table>

**42% fewer deaths**

### 70-79

<table>
<thead>
<tr>
<th>Region</th>
<th>SMR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Columbia</td>
<td>0.63</td>
<td>0.49 to 0.76</td>
</tr>
<tr>
<td>Ontario</td>
<td>0.66</td>
<td>0.52 to 0.79</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>0.63</td>
<td>0.30 to 0.96</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>0.84</td>
<td>0.36 to 1.31</td>
</tr>
<tr>
<td>Summary (random)</td>
<td>0.65</td>
<td>0.56 to 0.74</td>
</tr>
</tbody>
</table>

**35% fewer deaths**
Breast Cancer Mortality among Participants in the Norwegian Breast Cancer Screening Program, 1996-2010

Crude Cumulative Breast Cancer Mortality Rates for Screened and Unscreened Cohorts Among Women Invited to the Norwegian Breast Cancer Screening Program, 1996 to 2010

Fifteen years after the start of the program, the screened cohort had 43% lower breast cancer mortality rate compared with the unscreened cohort.

Cancer Mortality Rates in Denmark, by Major Cancer, Women
Adverse Effects and Harms

- False positive findings
- Anxiety
- Overdiagnosis
False Positive and Patient Recall in Mammography Screening

• The USPTF labeled all women with an initial abnormal mammogram who were found to not have cancer as “false positives” – 100 out of 1,000 women screened.
False Positives and Patient Recall: An Analysis of the 100 Recalls

• 56 out of 100 will have additional views and a mammogram and will be found to be normal.
• 25 out of 100 will have a 6 month follow-up.
False Positives and Patient Recall: An Analysis of the 100 Recalls

- 19 (1.9% of the 1000) will have a biopsy.
- 6 of 19 (32%) will have cancer. An excellent yield.
- Biopsies of a palpable lump: only 15% have cancer.
US women’s attitudes to false positive mammography results and detection of ductal carcinoma in situ: cross sectional survey

Lisa M Schwartz, Steven Woloshin, Harold C Sox, Baruch Fischhoff, H Gilbert Welch

Abstract

Objective To determine women’s attitudes to and knowledge of both false positive mammography results and the detection of ductal carcinoma in situ after screening mammography.

Design Cross sectional survey.

Setting United States.

Participants 479 women aged 18-97 years who did not report a history of breast cancer.

Positive result (n = 76) expressed the same high tolerance: 39% would tolerate 10 000 or more false positives. 62% of women did not want to take false positive results into account when deciding about screening. Only 8% of women thought that mammography could harm a woman without breast cancer, and 94% doubted the possibility of non-progressive breast cancers. Few had heard about ductal carcinoma in situ, a cancer that may not progress, but when informed, 60% of women wanted...
Schwartz & Colleagues Found

• Women had high awareness of false positives from mammography.
• Women were highly tolerant of false positives.
  – 63% felt 500 FP per life saved was reasonable.
  – 37% felt 10,000 FP per life saved was reasonable.
Schwartz & Colleagues Found:

• Women who had experienced a FP result had the same level of tolerance as women who had not had experienced a FP.

• **63% did not regard false positives as an important factor in decisions about screening.**
Over-diagnosis: The Hottest Topic In Cancer Screening

• Lack of consistent definition and methods of measurement causes confusion.
Over-diagnosis Definitions

• Three potential definitions:
  – A cancer with no biologic potential to cause harm.
  – A cancer that is very unlikely to cause harm within the predicted life expectancy of the individual.
  – Any cancer case where the individual dies before the cancer causes harm.
Measuring Over-diagnosis

• Excess number of cancers detected in the screening arm compared to the control arm.
  – Effective screening should detect more cancers earlier than no screening.
  – Cancers detected through usual care should catch-up with time.
  – If there is over-diagnosis the usual care group will never catch up.
Measuring Over-diagnosis

• The natural history of cancers may be longer than we suspected.

• Usual care group may take many years to catch up.
Best Estimates of Over-diagnosis of Breast Cancer

- 1-3% for invasive cancer
- 15-25% for DCIS
  - Ductal Carcinoma In Situ is a pre-cancerous condition that is currently treated just like cancer
Reducing Over-diagnosis of Breast Cancer and Particularly DCIS

• New approaches to genetic profiling and to treatment options hold potential to reduce overtreatment.
Are There Harms From Not Screening?

- A study of 1977 women aged 40-49 diagnosed with breast cancer compared the tumor characteristics, treatment regimens used, and long-term outcome of women with symptomatic versus women with mammographically detected breast cancer.

Radiology 2012;262:797-806.)
Are There Harms From Not Screening?

• Women with symptomatically detected breast cancer had:
  – A higher rate of mastectomy (47% vs. 25%)
  – Larger average tumor size (3.02 vs. 1.63 cm)
  – Significantly worse disease survival

Radiology 2012;262:797-806.)
Is There a Role for Ultrasound Screening in Women with Significant Breast Density?

- 2,809 women with heterogeneously dense breasts in at least one quadrant were recruited to undergo both mammography and ultrasound, with the exams delivered in a randomized order.
### Performance of Screening With Combined Mammography and Ultrasound vs. Mammography or Ultrasound Alone

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammography plus ultrasound</td>
<td>77.5%</td>
</tr>
<tr>
<td>Mammography alone</td>
<td>50%</td>
</tr>
</tbody>
</table>

Screening with Mammography and Ultrasound Improves the Detection of Cancer, but at Significant Increase in False Positives

- The positive predictive value of biopsy recommendation after full diagnostic workup was:
  - Mammography: **22.6%** (95% CI, 14.2%-33%)
  - Ultrasound: **8.9%** (95% CI, 5.6%-13.3%)
  - Combination: **11.2%** (95% CI, 7.8%-15.6%)

Breast Cancer Screening Guidelines: More Agreement Than Disagreement
USPSTF 2009 Guideline Change

• The USPSTF downgraded their recommendation for mammography screening in women aged 40-49 years from a B to a C.

• A “C” recommendation indicates that harms and benefits are about equal.
“The USPSTF recommends against routine screening mammography in women aged 40 to 49 years.”

Ann Intern Med; 151:716-726 W236
They Continued:

“...the decision to start regular, biennial screening mammography before the age of 50 years should be an individual one and take into account patient context, including the patient’s values regarding specific benefits and harms.”
The American Cancer Society Recommends

• All women should have an annual mammogram beginning at age 40 and should continue screening as long as healthy life expectancy exceeds 10 years.
Every Guideline Recommends That …

• All women 50 and older should have a mammogram every 1 to 2 years, until life expectancy becomes limited.

• All women ages 40-49 should be offered a mammogram with or without shared decision making.

• Corollary: Accepting a refusal without discussion is NOT recommended.
Stay Tuned ...

• Both the American Cancer Society and the USPSTF are updating their breast cancer screening guidelines right now.
Colorectal Cancer

2015

Estimated new cases 132,700
Estimated deaths 49,700
Colon Cancer Screening: A Public Health Success Story

• Colon cancer mortality has dropped 43% from its peak.
• Colon cancer incidence dropped 30% between 2000 and 2010.
• Colon cancer incidence is rising in younger people and in other countries.
Trends in Colorectal Cancer Incidence* by Age and Sex, 2001-2010

*Rates are age adjusted to the 2000 US standard population.
Age-Adjusted Cancer Mortality in Men

B. Males, by site

Deaths per 100,000 Males

- Stomach
- Liver & intrahepatic bile duct
- Lung & bronchus
- Leukemia
- Colorectum
- Pancreas
- Prostate

Timeline: 1930 to 2011
Colorectal Cancer Incidence

Sedentary lifestyles, increase in red meat consumption and obesity increase risk for colorectal cancer.
Increasing Decline in Colorectal Cancer Death Rates, 1970-2010

Decline per decade:

Year of death

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>29.2</td>
<td>28.2</td>
<td>25.0</td>
<td>20.9</td>
<td>15.5</td>
</tr>
</tbody>
</table>

Decline per decade: 3% 11% 15% 25%
Nine Basic Truths of Colon Cancer Screening

1. If you **only** offer colonoscopy you can achieve very good **but not spectacular** screening rates.
Stool Blood Testing: A Critical Part of ANY CRC Screening Strategy

- Even if you recommend colonoscopy for all, some people won’t get one or can’t get one.
- Using colonoscopy exclusively will, inevitably, lead to a screening gap.
Evaluating Test Strategies for Colorectal Cancer Screening

Zauber and her team conducted a decision analysis using microsimulation models.

• Number of life-years gained is essentially identical regardless of screening strategy used:
  – Sensitive guaiac FOBT annually
  – Fecal Immunochemical Test (FIT) annually
  – Flexible sigmoidoscopy every 5 years with mid-interval sensitive FOBT
  – Colonoscopy every 10 years

ASSUMING 100% ADHERENCE
Meta-analysis of FIT vs. Hemoccult Sensa

Conclusion: **FIT is a superior option** for annual stool testing.

<table>
<thead>
<tr>
<th></th>
<th>FIT</th>
<th>Hemoccult Sensa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>73-89%</td>
<td>64-80%</td>
</tr>
<tr>
<td>Specificity</td>
<td>92-95%</td>
<td>87-90%</td>
</tr>
</tbody>
</table>

Many Patients Prefer FOBT

Diverse sample of 323 adults given detailed side-by-side description of FOBT and colonoscopy:
(DeBourcy et al. 2007)

• **53%** preferred FOBT

• Almost **half** felt very strongly about their preference
Many Patients Prefer FOBT

Randomized clinical trial in which 997 patients in the San Francisco PH care system received different recommendations for screening:

<table>
<thead>
<tr>
<th>Recommended Test</th>
<th>Completed Screening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colonoscopy</td>
<td>38%</td>
</tr>
<tr>
<td>FOBT</td>
<td>67%</td>
</tr>
<tr>
<td>Colonoscopy or FOBT</td>
<td>69%</td>
</tr>
</tbody>
</table>

Many patients may forgo screening if they are not offered an alternative to colonoscopy.

(Inadomi et al. 2012)
# FITs Available in the US

<table>
<thead>
<tr>
<th>Name</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>InSure</td>
<td>Enterix, Quest Company</td>
</tr>
<tr>
<td>Hemoccult-ICT</td>
<td>Beckman-Coulter</td>
</tr>
<tr>
<td>Instant-View</td>
<td>Alpha Scientific Designs</td>
</tr>
<tr>
<td>MonoHaem</td>
<td>Chemicon International</td>
</tr>
<tr>
<td>Clearview Ultra-FOB</td>
<td>Wampole Laboratory</td>
</tr>
<tr>
<td>Fit-Chek</td>
<td>Polymedco</td>
</tr>
<tr>
<td>Hemosure One Step</td>
<td>WHPM, Inc.</td>
</tr>
<tr>
<td>Magstream Hem Sp</td>
<td>Fujirebio, Inc.</td>
</tr>
</tbody>
</table>
2. Activating Messages that Motivate

<table>
<thead>
<tr>
<th>There are several screening options available, including simple take home options. Talk to your doctor about getting screened.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colon cancer is the second leading cause of cancer deaths in the U.S., when men and women are combined, yet it can be prevented or detected at an early stage.</td>
</tr>
<tr>
<td>Preventing colon cancer, or finding it early, doesn’t have to be expensive. There are simple, affordable tests available. Get screened! Call your doctor today.</td>
</tr>
</tbody>
</table>
3. Make Colonoscopy as Widely Available as Possible

- The increase in CRC screening rates between 2000 and 2010 resulted from a 36% increase in colonoscopy rates.
- Getting to 80% demands that colonoscopy must be available to everyone.
**COLONSCOPY:** Good for 10 years

- 2015: Tested
- 2016: No test needed
- 2019: No test needed
- 2020: No test needed
- 2022: No test needed
- 2023: No test needed
- 2024: No test needed
- 2025: Tested

**FIT:** Only good for one year

- 2015: Tested
- 2016: Tested
- 2017: Tested
- 2018: Tested
- 2019: Tested
- 2020: Tested
- 2021: Tested
- 2022: Tested
- 2023: Tested
- 2024: Tested
- 2025: Tested
Nine Basic Truths of Colon Cancer Screening

4. If you **only** offer screening to patients who are coming to a primary care office, you can achieve very good **but not spectacular** screening rates.
Population Management is Vital

- Every practice must have a system to assess screening gaps and conduct population outreach by letter or by phone.
Nine Basic Truths of Colon Cancer Screening

5. If you give out FIT or FOBT tests but do not track whether the patient returns the test and prompt them to do so, return rates will be poor.
Nine Basic Truths of Colon Cancer Screening

6. If you ask a patient to schedule their own colonoscopy, only about half of all patients will do it.
Nine Basic Truths of Colon Cancer Screening

7. If you are “screening” patients with a stool blood test following a rectal examination, it’s time to stop. This test doesn’t work and is not an approved screening test.
Seven Basic Truths of Colon Cancer Screening

8. The quality of colonoscopy varies dramatically ... and this has a major impact on outcomes.
Interval Cancer: Why?

• New, fast growing lesions
• Incomplete removal (19-27%)
• Missed lesions
  – Up to 17% of polyps > 1cm are missed!
  – Less protection in proximal colon
Percent of Colonoscopies where Biopsy Was Taken (and Findings on Biopsy) for Colonoscopists Who Performed >30 Colonoscopies between 7/1/2006--3/31/2012 in Average Risk Clients 50+ Years of Age Who Reported No Bleeding in the CRF CRC Screening Program, MD

The number on the X axis represents the number of colonoscopies performed by the endoscopist from which these results were derived.

(5,598 were done statewide and the bar represents the statewide percentages for Maryland)

- Neoplasia (adenocarcinoma, suspected cancer, or adenoma)
- Hyperplastic polyp
- Bioosy with no neoplasia/hyperplastic finding
Seven Basic Truths of Colon Cancer Screening

9. Surveillance guidelines are not being followed, leading to some over-testing and some under-testing.
## Recommendations for Adenoma Surveillance

<table>
<thead>
<tr>
<th>Category</th>
<th>Next examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2 tubular adenomas &lt; 10 mm</td>
<td>5-10 years</td>
</tr>
<tr>
<td>&gt; 3 tubular adenomas &lt; 10 mm</td>
<td>3 years</td>
</tr>
<tr>
<td>&gt; 10 adenomas</td>
<td>&lt; 3 years</td>
</tr>
<tr>
<td>Any adenoma with villous features</td>
<td>3 years</td>
</tr>
<tr>
<td>Any adenoma with high grade dysplasia</td>
<td>3 years</td>
</tr>
<tr>
<td>Sessile adenoma with piecemeal excision</td>
<td>2-6 months</td>
</tr>
</tbody>
</table>

Recommendations for Adenoma Surveillance After First Surveillance Colonoscopy

<table>
<thead>
<tr>
<th>Baseline Colonoscopy</th>
<th>First Surveillance</th>
<th>Interval for 2nd Surveillance (y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low risk adenoma (LRA)</td>
<td>HRA</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>LRA</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>No adenoma</td>
<td>10</td>
</tr>
<tr>
<td>High risk adenoma (HRA)</td>
<td>HRA</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>LRA</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>No adenoma</td>
<td>5</td>
</tr>
</tbody>
</table>

# Surveillance Recommendations Serrated Polyps

<table>
<thead>
<tr>
<th>Category</th>
<th>Surveillance interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperplastic polyp</td>
<td>No surveillance, unless multiple, large and proximally located</td>
</tr>
<tr>
<td>Sessile serrated adenoma/polyp (SSA/P) without cytological dysplasia</td>
<td>q5 years if &lt; 3 lesions, all &lt;1 cm size; q3 years if ≥ 3 lesions, or any ≥1 cm size</td>
</tr>
<tr>
<td>SSA/P with cytological dysplasia</td>
<td>q3 years, after ensuring complete resection</td>
</tr>
<tr>
<td>Traditional serrated adenoma (TSA)</td>
<td>Same as SSPD</td>
</tr>
<tr>
<td>Suspected Type I hyperplastic polyposis (serrated adenomatous polyposis)</td>
<td>q1-3 years, with resection of polyps &gt;5 mm vs. surgery</td>
</tr>
</tbody>
</table>

*Rex et al. Am J Gastroenterol 2012;107:1315-1329*
An Opportunity to Substantially Eliminate Colon Cancer as a Major Public Health Problem

• More than 200 organizations from all sectors of public life have signed a pledge to achieve the goal of having 80% of all eligible adults up to date with CRC screening by the end of 2018.
We Have a Symbol
We Have A Month

(...March)
We Have A Plan
Time for Coordinated PUSH
80% Colon Cancer Screening Rate By 2018

... I Can See It!!!
# Lung Cancer

**2015**

<table>
<thead>
<tr>
<th>Estimated new cases</th>
<th>221,200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated deaths</td>
<td>158,040</td>
</tr>
</tbody>
</table>
American Cancer Society Lung Cancer Screening Guidelines

Richard Wender, MD¹; Elizabeth T. H. Fontham, MPH, DrPH²; Ermilo Barrera, Jr, MD³;
Graham A. Colditz, MD, DrPH⁴; Timothy R. Church, PhD⁵; David S. Ettinger, MD⁶; Ruth Etzioni, PhD⁷;
Christopher R. Flowers, MD⁸; G. Scott Gazelle, MD, MPH, PhD⁹; Douglas K. Kelsey, MD, PhD¹⁰;
Samuel J. LaMonte, MD¹¹; James S. Michaelson, PhD¹²; Kevin C. Oeffinger, MD¹³; Ya-Chen Tina Shih, PhD¹⁴;
Daniel C. Sullivan, MD¹⁵; William Travis, MD¹⁶; Louise Walter, MD¹⁷; Andrew M. D. Wolf, MD¹⁸;
Otis W. Brawley, MD¹⁹; Robert A. Smith, PhD²⁰
National Lung Screening Trial

• 53,000 current or ex-smokers (≥ 30 pack-year) ages 55-74

Randomly Assigned

Low dose helical (spiral) CT  Chest X-Ray
NLST – Preliminary Results

• 20% fewer lung cancer deaths in spiral CT group.
• Results were highly statistically significant.
... And That’s Not All

7% reduction in all cause mortality in CT group!
A 20% reduction in lung cancer death rate would prevent 30,000 lung cancer deaths every year!
That’s equivalent to wiping out all deaths from prostate cancer in men, or...
...all deaths from cervix cancer, uterine cancer, and ovarian cancer in women – combined.
Major Complication Associated With Invasive Diagnostic Procedure Following Positive Low-Dose CT Screen

<table>
<thead>
<tr>
<th>Category</th>
<th>% with Major Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not result in cancer diagnosis</td>
<td>0.06</td>
</tr>
<tr>
<td>Did result in cancer diagnosis</td>
<td>11.2</td>
</tr>
</tbody>
</table>
16 participants in low-dose CT group (10 of whom had lung cancer) and 10 in the radiography group (all of whom had lung cancer) died within 60 days after an invasive diagnostic procedure.
The ACS Guideline

“Clinicians with access to high volume, high quality lung cancer screening and treatment centers should initiate a discussion about screening with apparently healthy patients aged 55 to 74 years who have at least a 30 pack/year smoking history and who currently smoke or have just quit within the past 15 years.”
“A process of informed and shared decision making ... should occur before any decision is made to initiate lung cancer screening.”
“Smoking cessation counseling remains a high priority for clinical attention in current smokers.”
“Where risk seems to approximate or exceed the NLST eligibility criteria in one category but not another, clinicians should consider offering the chance to screen.”
Coverage for Low-Dose CT Screening is a Reality

• USPSTF B recommendation requires coverage by most commercial plans.
• On Feb. 5, CMS issued a final decision to cover screening in high risk patients.
  – Decision outlined strict requirements for what a center must provide to permit coverage.
Beneficiary Eligibility Criteria

• Age 55-77 years
• Asymptomatic
• Tobacco smoking history of at least 30 pack-years (one pack-year = smoking one pack per day for one year; 1 pack = 20 cigarettes)
• Current smoker or one who has quit smoking within the last 15 years
Beneficiary Eligibility Criteria, cont.

• A **written order** for initial and subsequent CTs must include:
  – Date of birth
  – Actual pack-year smoking history
  – Current smoking status
    • For former smokers, number of years since quitting smoking
  – Statement that the person is asymptomatic
Reading Radiologist Eligibility Criteria

• Involvement in the supervision and interpretation of at least 300 chest computed tomography acquisitions in the past 3 years

• Furnish lung cancer screening with LDCT in a radiology imaging facility that meets the radiology imaging facility eligibility criteria below
Radiology Imaging Facility Eligibility Criteria

• Performs LDCT with volumetric CT dose index (CTDIvol) of ≤ 3.0 mGy (milligray) for standard size patients (defined to be 5’ 7” and approximately 155 pounds) with appropriate reductions in CTDIvol for smaller patients and appropriate increases in CTDIvol for larger patients

• Utilizes a standardized lung nodule identification, classification, and reporting system

• Makes available smoking cessation interventions for current smokers
All Facilities Must Establish a Registry

• Required elements include:
  – Patient and facility identifiers
  – Smoking status
  – Type of classification and reporting system
  – Effective radiation dose
  – Dates of all CTs
We Have An Opportunity to Dramatically Reduce Mortality from Lung Cancer
Cervical Cancer

2015

Estimated new cases 12,900
Estimated deaths 4,100
## Guideline Recommendations

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women &lt;21</td>
<td>No screening</td>
</tr>
<tr>
<td>Women ages 21-29</td>
<td>Cytology alone every 3 years (liquid or conventional)</td>
</tr>
<tr>
<td></td>
<td>Recommend AGAINST annual cytology</td>
</tr>
<tr>
<td>Women ages 30-65</td>
<td>HPV + cytology “cotesting” every 5 years (preferred) or Every 3 years with cytology alone (acceptable)</td>
</tr>
<tr>
<td></td>
<td>Recommend AGAINST more frequent screening</td>
</tr>
<tr>
<td>Women ages &gt;65</td>
<td>Discontinue after age 65 if 3 negative cytology tests or 2 negative HPV tests in last 10 years with most recent test in last 5 years</td>
</tr>
<tr>
<td>Post-Hysterectomy</td>
<td>Discontinue if for benign reason</td>
</tr>
<tr>
<td>Screening after HPV vaccination</td>
<td>Follow age-appropriate recommendations (same as unvaccinated women)</td>
</tr>
</tbody>
</table>
## Management of Discordant Results

<table>
<thead>
<tr>
<th>HPV-negative ASC-US</th>
<th>Rescreen with cotesting in 3 years* (preferred) or Rescreen with cytology in 3 years (acceptable)</th>
</tr>
</thead>
</table>
| HPV positive, cytology negative | **Option 1**: 12-month follow-up with cotesting  
**Option 2**: Test for HPV16 or HPV16/18 Genotyping  
- If HPV16 or HPV16/18 positive: refer to colposcopy  
- If HPV16 or HPV16/18 negative: 12-month follow-up with cotesting |

* Updated in 2015
Comments

• Women at any age should NOT be screened annually by any screening method.
• HPV testing should NOT be used for screening women <30 years of age.*
• Screening by HPV testing alone is not recommended for most clinical settings.*

* See Interim Guidance, 2015
Comments

• Women with a history of CIN2 or a more severe diagnosis should continue screening for at least 20 years.

• These guidelines do NOT address women:
  1. With a history of cervical cancer
  2. Who were exposed in utero to diethylstilbestrol (DES)
  3. Who are immune-compromised, e.g. HIV+
Cancer screening is our best opportunity to reduce cancer mortality, to convert living with a chronic illness into avoiding a cancer diagnosis, or to being completely cured.

Our challenge is making sure that everyone has an equal opportunity to be screened.