Secrets of Successful Journal Club Presentations

Dr. Helen Shields

Friday, January 9, 2015
12:00 – 1:00 PM
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The Art and Practice of Mentoring: 
Developing Skills and Building Networks

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- Mentoring Across Identity Differences • March 5th
- Effective Mentoring Feedback • April 2nd

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SECRETS TO SUCCESSFUL JOURNAL CLUB PRESENTATIONS
HELEN SHIELDS, MD
Conflict of Interest: Disclosures

- Dr. Helen Shields Has No Conflicts of Interest to Disclose
# 1 Who founded Journal Clubs at McGill in 1875?

A. Madame Curie  
B. William Osler  
C. Harvey Cushing  
D. Banting and Best
# 2 Who benefits most from a Journal Club presentation?

A. Presenter
B. Residents
C. Fellows
D. Faculty
# 3 Why do people go to Journal Clubs?

A. Required activity  
B. Hear a prominent paper “trashed”  
C. Learn new innovations and the evidence for their effectiveness  
D. Find an area of research for grant support
# 4 Why do Journal Club presenters sometimes fail?

- Presenting a great article with few flaws
- Exposing the weaknesses of the statistical methods
- Detailing excellent background information
- Choosing a flimsy article that they poke “fun” at
# 5 Which improves attendance at Journal Clubs?

- Rotating room and time of day to suit attendees
- Food
- Early morning time of 7-8 AM
- Early evening time of 5-6 PM
Objectives: Secrets of a Successful Journal Club Presentation

1. Recognize that critical evaluative skills are on display.
2. Choose the “best” new article in an area you enjoy reading about or think is important.
3. Consult a statistician regarding methods.
4. Describe key background information.
5. Demonstrate how the article advances the field.
What Would I Choose?

- Cologuard was 92% sensitive for detecting colon cancer compared to 74% for FIT
- Controversial, exciting, long awaited
- Many questions to be asked and answered

Imperiale T.F., NEJM 2014; 370:1287-1297
This 2004 prospective study of asymptomatic people 50 years of age or older compared a fecal DNA panel with a fecal occult-blood test (Hemoccult II) for colorectal-cancer screening. Colonoscopy was the reference standard. The fecal DNA panel detected 52 percent of cancers, whereas Hemoccult II detected only 13 percent. The sensitivity of the fecal DNA panel for any advanced neoplasia was 18 percent, as compared with 11 percent for Hemoccult II. The two tests had similar specificity. The fecal DNA panel is more sensitive than Hemoccult II, but the majority of cancers and polyps found by colonoscopy were not detected by a one-time use of either noninvasive test.
Characteristics of Subjects Who Could Be Evaluated and Those Who Were Analyzed

Table 1. Characteristics of Subjects Who Could Be Evaluated and Those Who Were Analyzed.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Group That Could Be Evaluated (N=4404)</th>
<th>Analyzed Subgroup (N=2507)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean — yr</td>
<td>68.6</td>
<td>69.5</td>
</tr>
<tr>
<td>50–59 yr — no. (%)</td>
<td>570 (12.9)</td>
<td>210 (8.4)</td>
</tr>
<tr>
<td>60–69 yr — no. (%)</td>
<td>1971 (44.8)</td>
<td>1150 (45.9)</td>
</tr>
<tr>
<td>70–79 yr — no. (%)</td>
<td>1678 (38.1)</td>
<td>1025 (40.9)</td>
</tr>
<tr>
<td>≥80 yr — no. (%)</td>
<td>185 (4.2)</td>
<td>122 (4.9)</td>
</tr>
<tr>
<td>Male sex — no. (%)</td>
<td>1963 (44.6)</td>
<td>1115 (44.5)</td>
</tr>
<tr>
<td>Race or ethnic group — no. (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>3846 (87.3)</td>
<td>2180 (87.0)</td>
</tr>
<tr>
<td>Black</td>
<td>369 (8.4)</td>
<td>217 (8.7)</td>
</tr>
<tr>
<td>Other</td>
<td>189 (4.3)</td>
<td>110 (4.4)</td>
</tr>
<tr>
<td>Family history of colorectal cancer — no. (%)</td>
<td>615 (14.0)</td>
<td>348 (13.9)</td>
</tr>
</tbody>
</table>

Most Advanced Finding at Colonoscopy and Results of the Fecal DNA Panel and Occult-Blood Test in the Analyzed Subgroup

<table>
<thead>
<tr>
<th>Most Advanced Finding at Colonoscopy</th>
<th>Group That Could Be Evaluated (N=4404)</th>
<th>Analyzed Subgroup (N=2507)</th>
<th>Positive Fecal DNA Panel</th>
<th>Positive Occult-Blood Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>na/total no.</td>
<td>no/total no.</td>
<td>% (95% CI)</td>
<td>no/total no.</td>
</tr>
<tr>
<td>Adenocarcinoma</td>
<td>31/331</td>
<td>16/31</td>
<td>51.6 (34.8–68.0)</td>
<td>4/31</td>
</tr>
<tr>
<td>TNM stage I</td>
<td>15/150</td>
<td>8/15</td>
<td>53.3 (30.1–75.2)</td>
<td>1/15</td>
</tr>
<tr>
<td>TNM stage II</td>
<td>8/80</td>
<td>5/8</td>
<td>62.5 (30.6–86.3)</td>
<td>2/8</td>
</tr>
<tr>
<td>TNM stage III</td>
<td>8/80</td>
<td>3/8</td>
<td>37.5 (13.7–69.4)</td>
<td>1/8</td>
</tr>
<tr>
<td>TNM stage IV</td>
<td>0/70</td>
<td>0/0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Adenocarcinoma + high-grade dysplasia</td>
<td>72/715</td>
<td>29/71</td>
<td>40.8 (30.2–52.5)</td>
<td>10/71</td>
</tr>
<tr>
<td>Advanced adenoma</td>
<td>426/403</td>
<td>61/403</td>
<td>15.1 (12.0–19.0)</td>
<td>43/403</td>
</tr>
<tr>
<td>High-grade dysplasia</td>
<td>41/40</td>
<td>13/40</td>
<td>32.5 (20.1–48.0)</td>
<td>6/40</td>
</tr>
<tr>
<td>Villous adenoma</td>
<td>139/133</td>
<td>24/133</td>
<td>18.0 (12.4–25.4)</td>
<td>13/133</td>
</tr>
<tr>
<td>Tubular adenoma ≥1 cm</td>
<td>230/214</td>
<td>23/214</td>
<td>10.7 (7.3–15.6)</td>
<td>22/214</td>
</tr>
<tr>
<td>Unspecified</td>
<td>16/16</td>
<td>1/16</td>
<td>6.2 (1.1–28.3)</td>
<td>2/16</td>
</tr>
<tr>
<td>Minor polyps</td>
<td>1627/648</td>
<td>49/648</td>
<td>7.6 (5.8–9.9)</td>
<td>31/648</td>
</tr>
<tr>
<td>Tubular adenoma &lt;1 cm</td>
<td>762/286</td>
<td>23/286</td>
<td>8.0 (5.9–12.7)</td>
<td>13/286</td>
</tr>
<tr>
<td>Hyperplastic</td>
<td>633/276</td>
<td>17/276</td>
<td>6.2 (3.9–9.6)</td>
<td>10/276</td>
</tr>
<tr>
<td>Unspecified</td>
<td>232/86</td>
<td>9/86</td>
<td>10.5 (5.6–18.7)</td>
<td>4/86</td>
</tr>
<tr>
<td>No polyps on colonoscopy</td>
<td>2318/1423</td>
<td>79/1423</td>
<td>5.6 (4.5–6.9)</td>
<td>68/1423</td>
</tr>
</tbody>
</table>

* The total in both the group that could be evaluated and the analyzed subgroup includes two subjects who are not included in any other category in the table: one had a rectal carcinoid, and one had a carcinoid cancer. The subject with rectal carcinoid was not identified by means of either fecal DNA or fecal occult-blood testing. The subject with carcinoid cancer was identified by means of fecal DNA testing, but not by fecal occult-blood testing. CI denotes confidence interval, and TNM tumor–node–metastasis.

† Stool specimens were selected for DNA testing on the basis of available data (i.e., polyp size and histologic findings) at the time of selection for processing. Subsequent audit of data by the clinical research organization resulted in reclassification of less than 5 percent of subjects.

§ The fecal DNA panel had a specificity of 92.4 percent, and the occult-blood test had a specificity of 93.2 percent (95 percent confidence interval for the difference in specificity, –5.4 percent to 0.1 percent).

‖ The fecal DNA panel had a specificity of 94.4 percent, and the occult-blood test had a specificity of 93.2 percent (95 percent confidence interval for the difference in specificity, –2.4 percent to 0.9 percent).

Screening for colorectal cancer: clinical summary of a U.S. Preventive Services Task Force (USPSTF) recommendation. For a summary of the evidence systematically reviewed in making these recommendations, the full recommendation statement, and supporting documents, please go to http://www.preventiveservices.ahrq.gov. FOBT = fecal occult blood testing.

*These recommendations do not apply to individuals with specific inherited syndromes (the Lynch syndrome or familial adenomatous polyposis) or those with inflammatory bowel disease.

Figure Legend:
Essential Background: FIT Testing for Colon Cancer
Fecal Immunochemical Testing recommended as a reasonable alternative to colonoscopy or flexible sigmoidoscopy on a yearly basis with one stool test being sufficient rather than 3 consecutive days of stool being necessary.

Harvard Vanguard has used this more expensive but sensitive and specific testing for blood in the stool for several years.
Comparison of Guaiac-Based and Quantitative Immunochemical Fecal Occult Blood Testing in a Population at Average Risk Undergoing Colorectal Cancer Screening

Sensitivity

Specificity

Essential Background: Multi-Target Stool DNA Test = FIT + Stool DNA
We compared a noninvasive, multitarget stool DNA test with a *fecal immunochemical test (FIT)* in persons at average risk for colorectal cancer.

The DNA test includes:

- Quantitative molecular assays for *KRAS mutations*, *aberrant NDRG4 and BMP3 methylation*, and β-actin, plus a *hemoglobin immunoassay*.


Figure 1. Enrollment and Outcomes.
Multi-Target Stool DNA Testing: Sensitivity & Specificity

Table 1. Sensitivity and Specificity of the Multitarget Stool DNA Test and the Fecal Immunochemical Test (FIT) for the Most Advanced Findings on Colonoscopy.

<table>
<thead>
<tr>
<th>Most Advanced Finding</th>
<th>Colonoscopy (N = 9989)</th>
<th>Multitarget DNA Test (N = 9989)</th>
<th>FIT (N = 9989)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no.</td>
<td>Positive Results</td>
<td>Sensitivity (95% CI)</td>
</tr>
<tr>
<td>Colorectal cancer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>65</td>
<td>60</td>
<td>92.3 (83.0–97.5)</td>
</tr>
<tr>
<td>Stage I to III*</td>
<td>60</td>
<td>56</td>
<td>93.3 (83.8–98.2)</td>
</tr>
<tr>
<td>Colorectal cancer and high-grade dysplasia</td>
<td>104</td>
<td>87</td>
<td>83.7 (75.1–90.2)</td>
</tr>
<tr>
<td>Advanced precancerous lesions†</td>
<td>757</td>
<td>321</td>
<td>42.4 (38.9–46.0)</td>
</tr>
<tr>
<td>Nonadvanced adenoma</td>
<td>2893</td>
<td>498</td>
<td>17.2 (15.9–18.6)</td>
</tr>
<tr>
<td>All nonadvanced adenomas, non-neoplastic findings, and negative results on colonoscopy</td>
<td>9167</td>
<td>1231</td>
<td>86.6 (85.9–87.2)</td>
</tr>
<tr>
<td>Negative results on colonoscopy</td>
<td>4457</td>
<td>455</td>
<td>89.8 (88.9–90.7)</td>
</tr>
</tbody>
</table>

* These stages of colorectal cancer, as defined by the system recommended by the American Joint Committee on Cancer, are associated with an increased rate of cure.
† Advanced precancerous lesions include advanced adenomas and sessile serrated polyps measuring 1 cm or more.
Sensitivity of DNA vs FIT testing for early colorectal cancer detection

Multi-Target Stool DNA Testing for Precancerous Lesions and Cancers

A. Colorectal Cancer According to Stage

- Stage I (N=29): DNA, FIT
- Stage II (N=21): DNA, FIT
- Stage III (N=10): DNA, FIT
- Stage IV (N=4): DNA, FIT
- Stage I-III (N=60): DNA, FIT

B. Cancer and Advanced Precancerous Lesions According to Location

- Proximal Cancer (N=30): DNA, FIT
- Distal Cancer (N=35): DNA, FIT
- Proximal Advanced Precancerous Lesions (N=151): DNA, FIT
- Distal Advanced Precancerous Lesions (N=225): DNA, FIT

C. Higher-Risk Types among Advanced Precancerous Lesions

- High-Grade Dysplasia (N=39): DNA, FIT
- Sessile Serrated Polyp ≥1.0 cm (N=99): DNA, FIT

D. Advanced Precancerous Lesions According to Size of Largest Lesion

- P value for trend: Multitarget DNA Test, P<0.001
  FIT, P<0.001

Imperiale T.F. NEJM 2014;370:1290
Multi-Target Stool DNA Testing

Table 2. Numbers of Persons Who Would Need to Be Screened with Colonoscopy, Multitarget DNA Test, and FIT to Detect One Colorectal Cancer and One Advanced Precancerous Lesion.

<table>
<thead>
<tr>
<th>Finding</th>
<th>Colonoscopy</th>
<th>Multitarget DNA Test</th>
<th>FIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any colorectal cancer</td>
<td>154 (120–200)</td>
<td>166 (130–217)</td>
<td>208 (156–286)</td>
</tr>
<tr>
<td>Stage I to III colorectal cancer</td>
<td>166 (130–217)</td>
<td>178 (140–238)</td>
<td>227 (169–313)</td>
</tr>
<tr>
<td>Advanced precancerous lesion</td>
<td>13 (12–14)</td>
<td>31 (28–35)</td>
<td>55 (48–65)</td>
</tr>
</tbody>
</table>

Imperiale T.F. NEJM 2014;370:1290
Table 3. Extrapolation of Findings to an Expanded Population of 10,000 Persons at Average Risk for Colorectal Cancer Undergoing Screening with Colonoscopy, Multitarget Stool DNA Test, and FIT.*

<table>
<thead>
<tr>
<th>Coloscopy Finding</th>
<th>Persons with Finding</th>
<th>Multitarget DNA Test</th>
<th>FIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no.</td>
<td>Positive Results</td>
<td>Negative Results</td>
</tr>
<tr>
<td>Colorectal cancer</td>
<td>65</td>
<td>60 (3.7)</td>
<td>5 (0.06)</td>
</tr>
<tr>
<td>Advanced precancerous lesions</td>
<td>758</td>
<td>321 (19.9)</td>
<td>437 (5.2)</td>
</tr>
<tr>
<td>Nonadvanced adenomas</td>
<td>2896</td>
<td>498 (30.9)</td>
<td>2398 (28.6)</td>
</tr>
<tr>
<td>Negative results: no colorectal</td>
<td>6281</td>
<td>732 (45.4)</td>
<td>5549 (66.1)</td>
</tr>
<tr>
<td>cancer, advanced precancerous lesions, or nonadvanced adenomas</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Listed are data from the study that have been extrapolated to a theoretical population of 10,000 persons.
Test Performance in Two Studies Involving Persons Who Underwent Screening Colonoscopy in the United States and Germany.

<table>
<thead>
<tr>
<th>Test</th>
<th>Results of Multitarget Stool DNA Test and FIT Reported in U.S. Study</th>
<th>Results of FIT Derived from Additional Analyses of German Study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cutoff Adapted to Yield Same Specificity as FIT in U.S. Study</td>
<td>Cutoff Adapted to Yield Same Specificity as Multitarget Stool DNA Test in U.S. Study</td>
</tr>
<tr>
<td>Multitarget stool DNA test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensitivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colorectal cancer</td>
<td>92.3 (83.0–97.5)</td>
<td>86.7 (59.5–98.3)</td>
</tr>
<tr>
<td>Advanced adenoma†</td>
<td>42.4 (38.9–46.0)</td>
<td>41.6 (34.8–48.6)</td>
</tr>
<tr>
<td>Nonadvanced adenoma</td>
<td>17.2 (15.9–18.6)</td>
<td>20.6 (16.7–24.9)</td>
</tr>
<tr>
<td>Specificity: no advanced neoplasm</td>
<td>86.6 (85.9–87.2)</td>
<td>85.7 (83.9–87.4)</td>
</tr>
<tr>
<td>FIT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensitivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colorectal cancer</td>
<td>73.8 (61.5–84.0)</td>
<td>73.3 (44.9–92.2)</td>
</tr>
<tr>
<td>Advanced adenoma†</td>
<td>23.8 (20.8–27.0)</td>
<td>29.5 (23.4–36.2)</td>
</tr>
<tr>
<td>Nonadvanced adenoma</td>
<td>7.6 (6.7–8.6)</td>
<td>8.3 (5.8–11.5)</td>
</tr>
<tr>
<td>Specificity: no advanced neoplasm</td>
<td>94.9 (94.4–95.3)</td>
<td>94.9 (93.7–95.9)</td>
</tr>
</tbody>
</table>

* CI denotes confidence interval, and FIT fecal immunochemical test.
† In the U.S. study, these data refer to a combined category of advanced adenomas and sessile serrated polyps measuring 1 cm or more.
Extrapolation of Findings to a Population of 10,000 Persons Undergoing Screening with a Multitarget Stool DNA Test and FIT.

Table 1. Extrapolation of Findings to a Population of 10,000 Persons Undergoing Screening with a Multitarget Stool DNA Test and FIT.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Multitarget Stool DNA Test</th>
<th>FIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>number</td>
<td></td>
</tr>
<tr>
<td>Sample size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate samples</td>
<td>625</td>
<td>31</td>
</tr>
<tr>
<td>Adequate samples</td>
<td>9375</td>
<td>9969</td>
</tr>
<tr>
<td>Positive tests</td>
<td>1500</td>
<td>681</td>
</tr>
<tr>
<td>Cancers detected</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colorectal</td>
<td>56</td>
<td>47</td>
</tr>
<tr>
<td>Advanced adenomas</td>
<td>301</td>
<td>175</td>
</tr>
<tr>
<td>Needed to screen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To detect one colorectal cancer</td>
<td>179</td>
<td>213</td>
</tr>
<tr>
<td>To detect one advanced adenoma</td>
<td>33</td>
<td>57</td>
</tr>
<tr>
<td>Needed to undergo colonoscopy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To detect one colorectal cancer</td>
<td>27</td>
<td>14</td>
</tr>
<tr>
<td>To detect one advanced adenoma</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>
Stool DNA and Colorectal-Cancer Screening: Editorial Caveats

1. Number of participants who were excluded because of sample collection (689 or 6.3% of total compared to 34 or 0.3% of FIT)

2. Study compared only one-time sensitivity of the two tests. Given lower specificity and greater expense of stool DNA testing, it is unlikely that the DNA testing would be performed annually. So, only a long term prospective study comparing stool DNA testing at a clinically defined interval with annual FIT screening would yield sensitivities for the detection of cancer that would be directly comparable.

Robertson D.J., Dominitz J.A. NEJM 2014; 370:1350-1351
Stool DNA and Colorectal-Cancer Screening: Editorial Caveats

3. 10% of the cohort had a positive stool DNA result and negative results on colonoscopy. This false positive rate is an important consideration when determining the appropriate interval for screening.

4. The stool DNA was evaluated among participants who had complete data for all 3 screening tests. However real work effectiveness may be different particularly given the higher technical failure rate.

Robertson D.J., Dominitz J.A. NEJM 2014; 370:1350-1351
Multi-Target Stool DNA Testing Editorial Summary

- Definite Improvement
- Need Comparative – effectiveness studies
- Determine appropriate place for DNA testing after key factors such as screening interval, adherence, cost and diagnostic evaluation of positive results are known.

Robertson D.J., Dominitz J.A. NEJM 2014; 370:1350-1351
ACP Journal Club July 15, 2014

Great example of translational research but “Not ready for Prime Time”

Richard Hoffman, M.D., M.P.H.

Exact Sciences Marketing:
A COLORECTAL CANCER SCREENING TEST THAT WILL HAVE YOUR PATIENTS SAYING, "I’LL TAKE IT!"
Rules for Success # 1

- Find a “Great” paper in a field you enjoy.
- Choose a paper that “Breaks” new ground.
- Give yourself “Plenty of Time” (1 month) to:
  a. Do Background Research to put paper in context.
  b. Consult a statistician on the methods.
  c. Create key points and questions for an exciting and interactive presentation that enhances your reputation.
Rule # 2 Anticipate Questions on All Fronts

- Ask for an experienced faculty member to guide you to the approved format
- Prepare, Prepare, Prepare!
- Use Editorials and Letters to the Editor by competing experts in the field to help guide your criticisms
Rule # 3 Focus Initially on Research Question Asked

- What was the Research Question?
- Why was this study done?
OR
- What is already known?
- What was the hypothesis?
Rule # 4 Elucidate Research Design

- Demonstrate clarity with your depiction of experimental design on blackboard, slide or flip chart
- Answer the Question “Was the research design appropriate to the question?“
- Is it a randomized controlled trial or should it have been?
Rule # 5 Ask Statistical Questions of an Expert

Important numbers include:

- Size of sample
- Who was excluded and why?
- Was a “Power” calculation done?
- What was the duration of follow-up?
- What was the completeness of follow-up?
Rule # 6 Features of Successful Journal Clubs

- Regular provision of food
- Mandatory attendance
- Faculty mentors
- Meeting at Lunchtime
- Reviewing original research and essential background material
- Formal teaching by presenters
- Faculty participation

Rule # 7 The dos and don'ts for Journal Club

- **DO** PICK “excellent” articles
- **DO NOT** PICK “poor” articles
- **DO** critically appraise even the “best” of articles
- **DO** teach key background information.
- **DO** demonstrate how your article moves the field forward.
Successful Journal Club is Characterized by:

- Routine, Regular Meetings
- Mentor: Faculty Supervised
- Mandatory Attendance
- Original Research
- Food: Incentive for coming
- Convenient meeting time and place
- Learning something new and important is guaranteed!!
Summary: Successful Journal Club Presentations

- Prepare a month or more ahead of date.
- Choose a “Great” and “Important” Article.
- Put the article’s findings in context.
- Review letters, editorials, journal opinions
- Ask a statistician about Methods.
- Create an engaging presentation with questions for the audience. Practice out loud!
- How does the new information advance field?