David Novis, MD FCAP

- Owner, CEO Novis Consulting LLC.
- Managing Partner (Ret., Young Novis PA)
- Entrepreneur, Business Developer
- Lean Certification, University of Pittsburgh and Henry Ford Hospital
- Past CAP Positions:
  - Speaker of the House of Delegates
  - Member of CAP Board of Governors
  - Vice Chair Quality Practice Committee
Stephen Raab, MD CAP

• AP/CP Pathologist >30 years
• Medical Officer Agency for HealthCare Research and Quality
• Co-Chair, CAP Interpretive Diagnostic Error Committee.
• Researcher, educator, author in quality and error reduction.
• Recipient CAP Humanitarian Award and Lansky Award (leadership)
Esther Yoon, M.D., FCAP

- Section Head in Surgical Pathology, Florida Region, Cleveland Clinic
- New In Practice Committee, CAP
- Member - CAP, USCAP, ASCP
- Board certified AP/CP
Disclaimer

The information presented today represents the opinions of the panelists and does not represent the opinion or position of the CAP.

This should not be used as a substitute for professional assistance.

The information in this presentation is provided for educational purposes only and is not legal advice.
Errors in Anatomic Pathology
The Current State

Esther Yoon, M.D. FCAP
Errors = Amendments ?

- How are we doing now?
- Effect of practice setting on error
- Effect of case volume on error
- Can we do better than counting amendments?
Q. Every month our anatomic pathology laboratory amends patient reports. Does the CAP have a benchmark for amended reports, such as how many are acceptable per month?

• Amendment rates range from 0.1 to 10 percent
  ○ does not provide a benchmark for amended reports.
Pathology Report and Errors

Histology Specimen Workflow Example

- Receive Specimen in Surg Path for accessioning
- Accessioning Stations
  - Storage of unused portion of Specimen
    - Specimens are Grossed and Blocks are created
      - Blocks are placed onto tissue processors
      - Move tissue from embedders to cutting/microtomy stations
    - Prepare slides for staining
    - H&E Staining/cover slipping
    - Slide Assembly
    - Off Site
  - Specimen Material
    - Specimen
    - Supplies
    - Tissue Material
    - Bio Waste
    - Slides

Pathology report

Amended Pathology report

DISCOVERY

Image modified from https://www.medlabmag.com/article/1436

© College of American Pathologists.
Surgical pathology report defects: a College of American Pathologists Q-Probes study of 73 institutions.

• 73 participating institutions
• Median defect rate of 5.7/1000 reports

<table>
<thead>
<tr>
<th>DEFECT (ERROR) RATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGHER</td>
</tr>
<tr>
<td>Training program</td>
</tr>
<tr>
<td>LOWER</td>
</tr>
<tr>
<td>Pre- and Post- sign out Review</td>
</tr>
</tbody>
</table>

FIGURE 1 Number of amendments and case volume each month (y-axis, left). Rate of amendments each month (y-axis, right).

## % Change in amendments

<table>
<thead>
<tr>
<th>Types of “Amendments”</th>
<th>Identification (%)</th>
<th>Report defect (%)</th>
<th>Diagnostic information (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total change (P=.46)</td>
<td>-53.3</td>
<td>-3.8</td>
<td>23.2</td>
</tr>
</tbody>
</table>
Tracking Errors

• Amended Reports
  ❖ Underestimation of magnitude: Follow up
  ❖ Underestimation of severity: Who Decides?
  ❖ Retrospective: Too little too late

• Revised Reports:
  ❖ Accurate estimate
  ❖ Prospective: mitigates risk
  ❖ Promotes intradepartmental standardization
Reducing AP Errors
What Works?

Stephen Raab, M.D.
Why Do a Secondary Review

1. Types and methods of secondary review
2. The benefits of disagreement
3. Standardization of reports
What does a blinded retrospective secondary review of a cohort of surgical pathology and cytopathology specimens show?

The College of American Pathologists and the Association of Directors of Anatomic and Surgical Pathology expert panel (2015)

Evidence-based guidelines
What does a blinded retrospective secondary review of a cohort of specimens show?

Guideline Statement 1 – Summary of Studies

<table>
<thead>
<tr>
<th>Discrepancy rates (%)</th>
<th>Major Discrepancy rates (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of studies</td>
<td>Median</td>
</tr>
<tr>
<td></td>
<td>(25th-75th percentile)</td>
</tr>
<tr>
<td>116</td>
<td>18.3 (7.5-34.5)</td>
</tr>
<tr>
<td></td>
<td>No. of studies</td>
</tr>
<tr>
<td></td>
<td>Median</td>
</tr>
<tr>
<td></td>
<td>(25th – 75th percentile)</td>
</tr>
<tr>
<td>78</td>
<td>5.9 (2.1-10.5)</td>
</tr>
</tbody>
</table>
Science Behind Discrepancies—Sources of Variations

1. Processes occurring in the patient
2. Diagnostic pathways
3. Pathologist observers
Science Behind Discrepancies—Pathologist Judgements of Diagnoses

**Imprecise judgment**
(noise or repeatability)

↓

You are uncertain this tumor is A or B, but do not consider the possibility of C

_We don’t know what we don’t know_

**Inaccurate judgment**
(absence of truth or bias)

↓

You are confidant that this tumor is reactive for S100, when it is not

**Best Detected and Resolved By...**

↓

Case Review

↓

Standardization
## Agreement for Juror First Votes

### Table 1: Demographics and Juror First Vote

<table>
<thead>
<tr>
<th>Category</th>
<th>Not Guilty</th>
<th>Undecided</th>
<th>Guilty</th>
<th>n</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>African-American juror</td>
<td>46%</td>
<td>13%</td>
<td>41%</td>
<td>743</td>
<td>0.000***</td>
</tr>
<tr>
<td>White juror</td>
<td>31%</td>
<td>12%</td>
<td>57%</td>
<td>1,298</td>
<td>0.000***</td>
</tr>
<tr>
<td>Hispanic juror</td>
<td>36%</td>
<td>15%</td>
<td>49%</td>
<td>629</td>
<td>0.542</td>
</tr>
<tr>
<td>African-American juror-minority defendant</td>
<td>47%</td>
<td>12%</td>
<td>40%</td>
<td>651</td>
<td>0.000***</td>
</tr>
<tr>
<td>African-American juror-white defendant</td>
<td>22%</td>
<td>11%</td>
<td>67%</td>
<td>18</td>
<td>0.140</td>
</tr>
<tr>
<td>White juror-minority defendant</td>
<td>32%</td>
<td>13%</td>
<td>55%</td>
<td>960</td>
<td>0.008***</td>
</tr>
<tr>
<td>White juror-white defendant</td>
<td>30%</td>
<td>10%</td>
<td>60%</td>
<td>136</td>
<td>0.312</td>
</tr>
<tr>
<td>Hispanic juror-minority defendant</td>
<td>36%</td>
<td>13%</td>
<td>51%</td>
<td>496</td>
<td>0.955</td>
</tr>
<tr>
<td>Hispanic juror-white defendant</td>
<td>33%</td>
<td>9%</td>
<td>58%</td>
<td>33</td>
<td>0.617</td>
</tr>
<tr>
<td>Male</td>
<td>36%</td>
<td>11%</td>
<td>53%</td>
<td>1,206</td>
<td>0.311</td>
</tr>
<tr>
<td>Female</td>
<td>36%</td>
<td>15%</td>
<td>50%</td>
<td>1,920</td>
<td>0.311</td>
</tr>
</tbody>
</table>

**Note:** Significance levels test the hypothesis that the variables listed in the first column are not associated with a juror’s first vote. Significance levels were calculated using ordered logit regression models accounting for the nonindependence of jurors who sat on the same case. The juror’s first vote served as the dependent variable. Dummy variables reflecting the juror characteristic or juror characteristic-defendant characteristic combination listed in the first column served as the independent variable.
Interpretive Summary of Guideline Recommendations

- Implement procedures to detect disagreements and interpretive errors.
- Perform case reviews in manners timely enough to improve patient care.
- Document case reviews and case review procedures.
- Track outcomes of case reviews.
- Implement procedures to maximize diagnostic agreement.
### Retrospective vs Prospective Review

<table>
<thead>
<tr>
<th>Retrospective</th>
<th>Prospective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed baseline error rate</td>
<td>Dynamic evolving error rate</td>
</tr>
<tr>
<td>Delayed error correction</td>
<td>Immediate error correction</td>
</tr>
<tr>
<td>Individual or team activity</td>
<td>Team activity</td>
</tr>
</tbody>
</table>

Models of Retrospective Case Review

- Formal Model*
- Difficult case conference review,
- Curbside consults
- Secondary opinion (pre-sign-out)
- Tumor boards
- Send outs
- Others.

Methods of Prospective Case Review

- Rapid pre-review (e.g., hot seat review)
- Reference class forecasting
- Dyad or team sign-out
- Pilot-Co-pilot diagnosis
- Calibration exercises
Team Signout in a Private Pathology Practice
12K-Acquisitions

David Novis, MD FCAP
Objectives

- Review Protocol
- Requirements
- Standardization
- Outcomes
- Considerations
Team Protocol

Reports Signed by Both Pathologists
Case Review Protocol

• 100% Prospective Review

• Quality Control—NOT a double blind read

➢ Is what’s on the report on the slides?
➢ Is what’s on the slides in the report?
➢ Is the report readable and grammatically correct?
➢ Does the report address the clinical question?
Requirements of 100% Prospective Review

Culture

- Intolerance of defects
- Tolerance of work styles
- Group rather than individual accountability
- Trust

Standardized criteria (templates)

- ALL diagnoses
- Diagnostic terms
Standardized Reporting Templates
Diagnostic Terms and Criteria

**GRADING OF BREAST DUCTAL ADENOCARCINOMA**
(Nottingham modification of Bloom & Richardson criteria)

<table>
<thead>
<tr>
<th>SCORE</th>
<th>TUBULE LUMENS</th>
<th>CYTOLOGY</th>
<th>MITOSES/10 HPF(40X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&gt;75% clear</td>
<td>small, uniform</td>
<td>&lt;0-5</td>
</tr>
<tr>
<td>2</td>
<td>10-75% clear</td>
<td>some nucleoli</td>
<td>6-10</td>
</tr>
<tr>
<td>3</td>
<td>≤10% lumens</td>
<td>anaplastic b</td>
<td>&gt;10</td>
</tr>
</tbody>
</table>

TOTAL: (3-5) GRADE I (6-7) GRADE II (8-9) GRADE III


**GRADING OF DUCTAL CARCINOMA IN SITU OF THE BREAST**

<table>
<thead>
<tr>
<th>SCORE</th>
<th>Nuclear Size</th>
<th>Nuclear Chromatin</th>
<th>Nucleoli</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1-1.5 rbc</td>
<td>diffuse</td>
<td>none</td>
</tr>
<tr>
<td>2</td>
<td>1.5-2 rbc</td>
<td>coarse</td>
<td>rare</td>
</tr>
<tr>
<td>3</td>
<td>&gt;2 rbc</td>
<td>vesicular</td>
<td>many</td>
</tr>
</tbody>
</table>

TOTAL: (3-5) GRADE I (6-7) GRADE II (8-9) GRADE III

**GRADING OF ENDOMETRIAL ADENOCARCINOMA**

ARCHITECTURAL GRADE

<table>
<thead>
<tr>
<th>Architectural Growth Pattern (%) Solid Growth</th>
<th>FIGO</th>
<th>Glandular Nuclear Atypia</th>
<th>AJCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>G1</td>
<td>G3</td>
<td>G1</td>
</tr>
<tr>
<td>6-50%</td>
<td>G2</td>
<td>G3</td>
<td>G2</td>
</tr>
<tr>
<td>&gt;50%</td>
<td>G3</td>
<td>G3</td>
<td>G4</td>
</tr>
</tbody>
</table>

* Modified criteria for adenocarcinoma: cribriform, papillary glandular architecture or irregular glandular infiltration associated with atypical glands or acinar lumens. Minimally invasive adenocarcinoma (MIA) not included in this table.

© College of American Pathologists.
Standardized Reporting Templates

MICROSCOPIC DESCRIPTION
B: Squamous mucosa, Squamocolumnar mucosa, glandular mucosa
Epithelium
- Squamous component:
  - acanthosis
  - spongiosis
  - transepithelial migration
    - severity: mild
    - cells: lymphocytes, eos
- dysplasia: none
Glandular Component
- type:
  - gastric cardia (subsurface mucous glands)
  - gastric body (parietal, chief cells)
- Specialized (intestinal) type mucosa: not identified
Inflammation
- amount: mild
- distribution: focal
- type: chronic
- reactive/inflammatory
  - hypertrophy
  - hyperplasia
- dysplasia: none
Lamina propria/Stroma
- Inflammation
  - amount: severe
  - distribution: diffuse
  - type: chronic
Outcomes

- Reduced errors
- Saved time
- Grew customer satisfaction
- Grew business
Reduced Errors

• Amended Reports Rate Decreased From 6 to 1.2 per 10,000*
• Pre-release corrections—Revised Reports: 1/20-1/50

Saved Time

1. Pareto
2. Standardized templates  
   o Delegation (conversation not dictation)  
   o Clicking on checklist items  
3. Eliminate disruptive calls for 2\textsuperscript{nd} looks
Customer Satisfaction
Business Growth

• Review by second pathologist
• Templates
  o Customized
  o Complete
  o Customer input…Sense of ownership
Provider Concerns

1. Delays turnaround time
2. Not paid for QC
3. Most errors do not affect patient care
   • Who decides that?
   • Coexisting conditions
   • How long is the follow up?
   • Nightmares

*Bottom Line:* Comfort level in releasing a defective report with your name on it
QUESTIONS
Membership

Did you find this information useful?

This program was funded by your CAP membership. Please be sure to keep your membership current so we can continue to bring timely and relevant resources like this to you.

Visit [cap.org](http://cap.org) to renew your membership or email [membership@cap.org](mailto:membership@cap.org).
Pathology Business Fundamentals
Essential online courses to help grow your management skills to lead your practice

1. Relative Value Units (RVU's)—Understanding the Basics
2. How Pathology Practices Get Paid
3. Revenue Cycle Management
4. Analysis and Interpretation of Billing Reports
5. Basic Practice Cost Analysis
6. Capacity Management and Workflow Analysis
7. Basic Contracting and Fee Analysis
8. Basic Budget Development

Learn more and register
Additional Resources

Practice Management
- [https://www.cap.org/member-resources/practice-management](https://www.cap.org/member-resources/practice-management)

Practice Management Articles
- [https://www.cap.org/member-resources/articles/category/practice-management](https://www.cap.org/member-resources/articles/category/practice-management)
We value your feedback!

If after attending this discussion and later you applied any of what you learned to your practice, please share your feedback of how it worked for your practice at https://www.cap.org/member-resources/practice-management/practice-management-inquiry-form.

Watch for the session evaluation form. Your feedback is important!