Papanicolaou Society of Cytopathology

Pathologist Workload Distribution in the Era of Subspecialization: What is the Best Indicator for Determining Fair Allocation of Surgical and Cytologic Specimens?

Moderator: Tarik M. Elsheikh, M.D.

Speakers:
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S. Nicholas Agoff, M.D.

Disclosure information
“The speakers have no relationship that represents a possible conflict of interest with respect to the content of this presentation.”
Educational Objectives:

1) Understand the challenges associated with equal distribution of work to pathologists with subspecialization and/or expertise in different fields
2) Recognize the problems associated with calculating workload based on raw numbers such as specimen count, CPT codes, or RVUs
3) Appreciate the importance of utilizing a “weighted/adjusted” models for assessing and distributing workload to pathologists

Successful management of a pathology laboratory requires good knowledge of allocation of resources and distribution of work. There has been increasing pressure on laboratories to embrace sub-specialization among pathologists, in the face of increasing specimen complexity and detailed information needed for clinical management. It has been difficult, however, for laboratories to implement a fair system of work distribution among pathologists with different specialties. Many institutions have utilized raw data such as slide and case count, or billing data such as CPT and RVUs, to equalize the workload. These methods, however, have been shown to be extremely inaccurate in assessing true effort associated with individual cases, and have particularly underestimated cytology workload.

In this session, two pathologists will present distinctly different approaches to work distribution, which have been successfully implemented in their perspective academic and private practices. These include the application of an adjusted, RVU-based system for assigning service work credit, and a "tray-weighted" calculation that takes into account the number of slides, and pathologist’s assessed difficulty and time to evaluate individual cases. With proper weighting to reflect the complexity and value of each case, a variety of specimens (including, surgical pathology, cytology, autopsies, consults, etc.) can be distributed fairly among different subspecialties.
Pathologist Workload Distribution in the Era of Subspecialization: What is the Best Indicator for Determining Fair Allocation of Surgical and Cytological Specimens?

Stephen Black-Schaffer MD
Massachusetts General Hospital

Conflict of interest

None

Workload...

- Cytopathologist workload is a subset of pathologist workload
- Pathologist workload is a subset of physician workload
- Balancing physician workload is not just a matter of balancing time, effort and professional responsibility
- It's also a matter of resources
Considerations

- The department chair/anatomic pathology director needs to consider:
  - Keeping it simple – taking as few extra steps as possible – and no manual data collection
  - Keeping it sound – work credit should parallel payment as closely as possible
  - Keeping it fair – the same rules should apply to everyone as much as possible

Surg vs cyto disparities to be addressed

- Grossing: in larger practices, surgical specimens often grossed by pathologist assistants, residents and/or surgical pathology technicians
  - Part of the physician work RVU is for grossing
- Microscopy: surgical pathology intrinsically more efficient than cytopathology
  - Low power scanning versus whole slide screening
- Cytotechnologists: more definite with gynecologic than non-gynecologic specimens

Conceptual relative signout efficiency
Developed list of diagnostic subspecialties usefully covering all our specimens, as follows:

- **Autopsy**
- **Bone & Soft Tissue**
- **Breast**
- **Cardiovascular**
- **Cytopathology (FNA)**
- **Cytopathology (GYN)**
- **Cytopathology (NON-GYN)**
- **Dermatopathology**
- **Electron Microscopy**
- **ENT**
- **Eye**
- **Frozen Section**
- **Gastrointestinal (GI)**
- **Gynecologic (GU)**
- **Gynecologic (GYN)**
- **Hematopathology**
- **Neuropathology**
- **Obstetric/Perinatal**
- **Pulmonary Pathology**
- **Renal Pathology**
- **Renal**
- **Small \ Large**
- **Cytopath**
- **Autopsy**

Measurement of Histopathologist Work - Both Volume and Complexity

- **Specimens**
  - Number
  - Type (group)
  - CPT-4 total
- **Blocks / slides**
  - H&E
  - Special stains
  - Immunohistochemical stains
- **Reports**
  - Number of diagnoses
  - Amount (items or units) of information reported
  - Lines of diagnoses, templates, notes, gross and/or microscopic descriptions
Measurement of Cytopathologist Work
• Both Volume and Complexity

• GYN
  – Cases
  – Source
  – Nature of screened population
  – Diagnostic threshold for cytopathologist review

• Non-GYN
  – Cases
  – Type (group)
  – Abnormality rate
  – Special procedures
  – Cytopathologist performance of FNAs

Subspecialization’s Biggest Obstacle is:

• MEASURING PATHOLOGIST WORK
• Equitable responsibilities among pathologists
  => consistent with practice mission
• WORKLOAD EQUITY...
  • In a general diagnostic practice, if you work by weeks, this can be hard enough when a week is a week (because sometimes it’s not)
  • But when it becomes an issue not just of time on service, but of how much time on which service
  • How to measure / assign this work equitably?

Subspecialization - the Obstacle of Actual Service Work Measurement

• Need to count specimens and assess complexity
  => how well can these services be assessed
  => by the only measure ready to hand
  => CMS physician work RVUs?
Subspecialization - Considerations from Measurement by CMS RVUs

- Services => very different in size
- Differences => change over time
- Quantification => ongoing
- Minimize => overhead
- Utilize data from existing processes
  - Utilize this process for other purposes
  - Including monitoring compliance

Subspecialization – the first decade – Empirical Efficiency at MGH – 1995 to 2005

- AP work (in physician RVUs) increased 99%
- AP staffing (in service FTEs) increased 18%
- As we worked out how to measure/assign work, we realized substantial increases in productivity.
- Average assigned service work weeks per FTE stable: 31.0 in 1995 => 30.6 in 2005
- Average service RVUs per FTE increased 47%, from 4,194 in 1995 => 6,176 in 2005

Quantitative Considerations - CMS RVU Advantages:

- Specific physician work component
  - => very convenient
- Most prevalent single basis of payment
  - => service work credited and allocated on RVU basis has a close relationship between work done and payment received
  - => simultaneous tracking of physician work for service credit and of physician billing for compliance
Quantitative Considerations - CMS
RVU Limitations - Absence of:

- Established values for autopsy services;
- Measures for the work contribution of resident physicians / ancillary staff;
- Measures for the differential effect of subspecialization on:
  - special study services,
  - routine diagnostic services, versus
  - procedural / intraoperative services;
- Miscellaneous subspecialty specific factors.

Quantitative Considerations - Autopsy

- MGH staff on both the autopsy and surgical services => relative values for staff activities on autopsy services => multiples of 88309 (Level VI) surgical specimen:

<table>
<thead>
<tr>
<th>Service Description</th>
<th>CPT</th>
<th>RVUs</th>
<th>88309s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Necropsy; with brain</td>
<td>88025</td>
<td>25.2</td>
<td>9.0</td>
</tr>
<tr>
<td>Necropsy; without brain</td>
<td>88020</td>
<td>21.0</td>
<td>7.5</td>
</tr>
<tr>
<td>Necropsy; stillborn/newborn</td>
<td>88029</td>
<td>14.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Necropsy; brain only</td>
<td>88037</td>
<td>8.4</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Quantitative Considerations – Special Study and Intraop Consult

- Special studies always easier for the subspecialist => decreased 40% in credit for all services.
- Intraoperative consultations / procedural services => often less efficient than routine signout => 40% increment in credit for all services.
Quantitative Considerations - Surgical Grossing

- Grossing surgical pathology specimens
  ==> included in CMS physician component RVUs
  ==> performed by trainees under staff supervision.
- Equity with cytopathology services
  ==> actually performed entirely by staff
  ==> 50% increment in cytopathology credit.
Other Measurement Systems - Kim Units

• A few other systems to measure pathologist (rather than pathology department) work:
• Kim Units (KUs)
• For routine surgical specimens, KUs roughly parallel the RVU physician work component at a conversion factor of 1 KU = 1.8 RVUs

Kim Units and RVUs Compared

• KUs roughly parallel RVU physician work component at 1 KU = 1.8 RVUs
• However, using this as a conversion factor:

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>KUs</th>
<th>1.8 • RVUs</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>NON-GYN Cytology</td>
<td>1.01</td>
<td>88104</td>
<td></td>
</tr>
<tr>
<td>GYN Cytology</td>
<td>2</td>
<td>88141</td>
<td></td>
</tr>
<tr>
<td>Autopsy Pathology</td>
<td>10</td>
<td>88309</td>
<td></td>
</tr>
</tbody>
</table>

*KUs > than RVU values by factor of 2.6
*KUs < than MGH values by factor of 4.5

Surgical and cytopathology specimens (except for kidney and liver, excluded to allow for special studies), with physician work RVUs scaled (X1.8) to KUs.
The sum of the Macroscopy and Microscopy scores from the matrix above is considered to be the relative work of the service.
Maung RTA. What is the best indicator to determine anatomic pathology workload?

Comparison survey - 27 Canadian pathology services
- current / projected optimal pathologist FTEs,
- annual number anatomic pathology specimens
  - autopsy pathology =>
  - cytopathology => categorized for weighting,
  - surgical pathology =>
  - number blocks & slides, and
  - patient population served by practice

Anatomic pathology consultative procedures (professional services) => categorized & weighted relative to level IV surgical (≈88305)

<table>
<thead>
<tr>
<th>Individual Consultative Procedures</th>
<th>Decision Weighting</th>
<th>CMS professional components (%) of 90501</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical pathology consultation</td>
<td>27%</td>
<td>90501 - 0.00 - 11%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>27%</td>
<td>90501 - 0.19 - 17%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>44%</td>
<td>90340 - 0.27 - 20%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>46%</td>
<td>90340 - 0.79 - 50%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>17%</td>
<td>90331 - 1.04 - 21%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>17%</td>
<td>90331 - 1.57 - 21%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>21%</td>
<td>90390 - 2.84 - 31%</td>
</tr>
</tbody>
</table>

Maung RTA. What is the best indicator to determine anatomic pathology workload?

<table>
<thead>
<tr>
<th>Individual Consultative Procedures</th>
<th>Relative Weighting</th>
<th>CMS professional components (%) of 90501</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical pathology consultation</td>
<td>69%</td>
<td>90501 - 0.41 - 56%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>10%</td>
<td>90340 - 0.73 - 10%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>10%</td>
<td>90340 - 1.30 - 10%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>10%</td>
<td>90331 - 1.13 - 10%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>10%</td>
<td>90331 - 2.05 - 10%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>10%</td>
<td>90331 - 2.54 - 93%</td>
</tr>
</tbody>
</table>

Maung RTA. What is the best indicator to determine anatomic pathology workload?

<table>
<thead>
<tr>
<th>Individual Consultative Procedures</th>
<th>Relative Weighting</th>
<th>CMS professional components (%) of 90501</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical pathology consultation</td>
<td>56%</td>
<td>90501 - 0.46 - 56%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>69%</td>
<td>90340 - 0.99 - 10%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>69%</td>
<td>90340 - 1.59 - 10%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>69%</td>
<td>90331 - 1.15 - 10%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>69%</td>
<td>90331 - 2.05 - 10%</td>
</tr>
<tr>
<td>Surgical pathology consultation</td>
<td>69%</td>
<td>90331 - 2.56 - 93%</td>
</tr>
</tbody>
</table>
Maung RTA. What is the best indicator to determine anatomic pathology workload?

- “The accuracy of the calculated AP FTEs using the various indicators of the optimal FTE as indicated ... shows that only the calculations based on L4E and slides were accurate to 1% to 2%, with the other indicators overestimating or underestimating by +27% to −33%.”
- “These results suggest that calculations based on numbers of specimens, blocks, and SP cases and population and the [RCP] model are too inaccurate (imprecise) to be used to determine the needed AP FTEs in a department.”

Maung RTA. What is the best indicator to determine anatomic pathology workload?

- “Of the numbers of L4E cases and slides, the calculation using slides as the indicator has an SD (variability) that is more than twice that of the calculation using L4E. This is borne out by the minimum and maximum values for each indicator.”
- “The regression analysis data ... show that L4E has the highest R2 value (0.994), which indicates that it can explain 99.4% of the variables to determine the needed AP FTEs and also has the lowest P value, which suggests that it also is the most statistically significant of the indicators analyzed.”

Maung RTA. What is the best indicator to determine anatomic pathology workload?

- “I believe that AP consultative activities are best expressed as L4E. Although not ideal, this would meet many of the requirements of a good indicator for measuring AP workload. L4E represents a direct output indicator, which measures the value of AP consultations.”
- “With proper weighting to reflect the complexity and value of each consultation, one can include all consultative activities (eg, SP cases, cytologic examinations, autopsies, internal and external consultations).”
Maung RTA. What is the best indicator to determine anatomic pathology workload?

• “This proposal uses routinely collected data, which makes the system easy to implement and compare.”
• “Finally, the analysis of L4E shows very solid statistical values and has the best results of all the indicators analyzed.”

Bottom Line Considerations - Major Drawbacks of Alternative Systems

• 1) No explicit special study / procedure credit => fails to recognize large parts of much subspecialty work;
• 2) information not already collected => requires some additional administrative procedures;
• 3) not directly related to billing => less readily linked to compliance.
• So,
• => despite some attractive features of each alternative system,
• => MGH still uses CMS RVUs, adjusted as described.

Thank you!

• Questions?
Workload Distribution in a Private Practice Setting.

S. Nicholas Agoff, MD
Co-Director, Cytology Department
Virginia Mason Medical Center, Seattle WA

Conflict of interest

None

Pathology Department at VMMC

- 13 Pathologists
  - 10.5 FT equivalents.
  - 6 sign-out cytology currently.
- 30,000 cytology specimens/year
  - 4000 non-gyn cytology specimens.
- 37,000 surgical pathology specimens/year
  - Muscle and renal medical biopsies.
level-loading system

- System devised >15 years ago.
- Initiated secondary to concerns of that workload was not even.
  - Were cytology cases were given too much credit?
- "tray-equivalent" weighted calculation.
  - Initially measured Pathologist perceived difficulty.

assessement sheet from 1997

<table>
<thead>
<tr>
<th>Task</th>
<th>Scale Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical Path</td>
<td></td>
</tr>
<tr>
<td>Cytology - 3 cases/TAV</td>
<td>20</td>
</tr>
<tr>
<td>Surgically - 3 cases/30 min/test/tray</td>
<td>30</td>
</tr>
<tr>
<td>Non-gen - 3 cases/tray</td>
<td>6</td>
</tr>
<tr>
<td>Gyn - 9 cases/tray</td>
<td>3</td>
</tr>
<tr>
<td>Histopathology (tumor)</td>
<td>1.5</td>
</tr>
<tr>
<td>Malignant path (one case)</td>
<td>3</td>
</tr>
<tr>
<td>Multi-electro path (one case)</td>
<td>2</td>
</tr>
<tr>
<td>Flow (one case - 0.5 H/T)</td>
<td>10</td>
</tr>
<tr>
<td>ASC/SCM (two out of three electrophoresis)</td>
<td>5</td>
</tr>
</tbody>
</table>

devising the “weights”

- Modified over the years.
- Track cases for 1 month
  - Record time (TPS)
  - Record number of slides
  - Pathologist perceived difficulty
- All pathologists participate
- Decide on the final tray equivalents
  - Can take into account other factors
- Update as needed
Not included in this system

- Immediate FNA assessments.
- Autopsies
  - Around 20 per year
- Outside consults
- Tumor boards.
- Additional duties
  - Administrative obligations
  - Academic pursuits

Controversies in this system

- One or 2 slide cytology specimens.
  - Increased diagnostic demands (BD brush, fluids)
  - Molecular demands (lung samples)
  - New types of specimens (anal paps)
- Time for adequacy interpretation.
  - Basically a frozen section request.

Good but not perfect system.

- Continues to be an issue in practice
- New IHC and molecular tests
- Current system is flexible and adaptable.
Workload Equalization – the Virginia Mason Experience.

S. Nicholas Agoff, MD

Workload equalization is a thorny issue in many practices. At times, some feel that they are doing more than others and some feel like they never have enough to do. Making sure that patient samples are distributed equitably between Pathologists is important for group harmony. This issue often arises concerning the distribution of cytology and surgical cases. The following describes the experience at Virginia Mason Medical Center (VMMC) in Seattle, WA.

VMMC is a private practice with around 37,000 surgical pathology specimens and 28,000 cytology specimens per year. The cytology samples include fine needle aspirate (FNA) assessment of adequacy for a busy GI/Pulmonary/Radiology practice, along with routine gynecological (pap) and non-gynecological specimens. The patient samples are distributed between 12 pathologists (10.5 full time equivalent pathologists). While the practice is not strictly sub-specialized, cases are distributed according to interest, sub-specialty boards, and workload. Most cytology samples are seen by board certified Cytopathologists, though some non-gynecological specimens are seen by pathologists without subspecialization.

In order to level-load the cases at VMMC, around 15 to 20 years ago the pathology group came up with a plan. For a month, members of the group were asked to keep track of perceived difficulty in evaluating cases. These cases were then ranked and given “tray equivalents” based on the evaluation. All of the members of the practice were asked for input, and the final schedule of "tray" equivalents was decided and agreed upon by all members.

At that time, a tray was defined as 20 slides and the formula only took into account the pathologist evaluated difficulty in assessing a case. (Figure A) Eventually, the amount of time it took to evaluate a case and number of slides was incorporated into the formula. (As VMMC is quite invested in the Toyota Production System many members advised measuring the actual time it took to evaluate a case with a stopwatch – which worked quite well.) Currently, the distribution plan is a "tray" weighted calculation that takes into account the number of slides in a case, the time to evaluate a case and the pathologist assessed difficulty in evaluating a case.
The group had considered using RVU data to equalize the distribution of cases, however some felt that there was uneven weight given to some RVU’s. For example, pap smears are given relatively low RVU values, as are some non-gynecological specimens, while a large and uncomplicated surgical specimen is given a large RVU value. This was objected to by the Cytopathologists on the basis that many cytology specimens take much longer to evaluate than their corresponding surgical specimens. (Examples include bile duct brushings and pancreatic aspirates which can take many times longer to evaluate than a tray of colon adenomas or cervical biopsies)

Thus, the group agreed on “tray” equivalents, which have been adjusted over time for changes in practice. Currently a “tray” is considered 10 paps (Surepath), or a non-gyn cytology case or cases > 5 slides. (Figure B) For biopsy/clinic cases, a “tray” was agreed upon as 10 cases (regular GI, dermatology, GU, or gynecological biopsies) NOT to exceed 15 slides. For surgical cases, 10-15 slides in a case is equal to a “tray” unless the case is greater than 20 slides – then each 20 slide tray is equal to 1 “tray”. Special cases like renal, medical liver biopsies, alopecia and immunoflourescent samples were given their own weighted “tray” numbers.
During the work day at VMMC, cases are passed out according to subspecialty/interest and "tray" load. The number of trays are kept track of by the histology and cytopathology technicians handing out the cases on a work sheet that is accessible to all staff and pathologists on a common computer file. (Figure C) Pathologists on-call receive only 2 "trays" during their on-call day. Administrative, tumor board duties, outside cases and many other time consuming duties are not taken into account in the worksheet.

Figure 3. Online accessible distribution worksheet.
The accessibility of the worksheet by all staff is a double-edged sword. As cases are distributed throughout the day, some pathologists may feel that they are getting overloaded in the morning, however the cytology cases are distributed throughout the day, so the perceived inequities are almost always balanced at the end of the day. Also, pathologists who have done more than others are allowed “carry-overs”, in other words, credit for extra cases than they have done so that they get less cases on the following day.

This system has been revisited in the recent past to take into account variations in the practice. However, the system has worked remarkably well in level loading the pathologist work and reducing stress among members. One drawback to the current system is that it does not take into account those with increased administrative or educational duties, something which may be revisited in the future.

Current controversies with this system still include cytology distribution and credit. Cytopathologists at times have to defend how long it takes to evaluate specimens that seem uncomplicated. Examples include anal pap smears, bile duct brushings and fluid samples. These are often 1 or 2 slide specimens and, according to the current system, are credited as \( \frac{1}{2} \) of a “tray” equivalent. The Cytopathologists response is that these specimens often take much longer to evaluate than corresponding biopsies, including immunohistochemistry and consultation with other colleagues. Another issue is the immediate evaluation of fine needle aspirate specimens. These can take up quite a bit of the day for a busy cytopathology practice, and currently there is no accommodation for these in this system.

While the distribution of workload in pathology practices is a can be a contentious issue and subject to many different interpretations, we feel that at VMMC we have a system that is open to change and can accommodate future challenges. Examples of some issues which may need addressing in the future include molecular diagnostics and future therapy defining tests.