Revisions to the Standards and Guidelines for Cytology Education Programs and the Approval Process

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The Role of CAAHEP and the CPRC

Cytology programs are among a diverse group of health education professional degree and certificate programs that require accreditation and have partnered with the Commission on Accreditation of Allied Health Education Programs (CAAHEP) for these services. As an independent accrediting agency, CAAHEP is responsible for the accreditation of a multitude of health science professions, both nationally and internationally. The CAAHEP mission is to “provide value to stakeholders by setting standards for quality assurance in health professions education”. They work towards achieving this mission in conjunction with 25 Committees on Accreditation (CoAs), including the Cytotechnology Programs Review Committee (CPRC).
The CPRC is comprised of members from each of its sponsors and CAAHEP. The sponsors are the American Society of Cytopathology (ASC), the American Society for Clinical Pathology (ASCP), the American Society for Cytotechnology (ASCT), and the College of American Pathologists (CAP). The sponsors select leaders from their membership to serve on the CPRC as either a representative and/or commissioner to CAAHEP. The number of selected leaders for each sponsor is based on their percentage of involvement. In addition, there are CAAHEP liaisons appointed to the CPRC. However, only sponsor representatives serve as CPRC voting members. Through collaboration, the members of the CPRC, sponsors, and CAAHEP work towards the common goal of providing standards to ensure quality cytology education.

Accreditation is achieved through annual reviews and a formal process that involves a self-study and a site visit, both of which are based on the Standards and Guidelines (S&G) for cytology education programs. The CPRC plays a key role in various cytology program review and accreditation tasks (Figure 1). Cytology programs complete an annual report. The results of the reports are reviewed by the CPRC, and any recommendations or items requiring an action plan are communicated with the program. The accreditation cycle begins with the self-study component. The self-study is a compilation of extensive program documents that is then reviewed by the CPRC. Upon completion of the self-study phase, a site visit typically follows within a year, and the CPRC is responsible for conducting the site visits. The decision of accreditation by CAAHEP relies on the CPRC’s formal recommendation once all accrediting activities have been performed, as the accrediting body looks to the CoA for its knowledge and expertise regarding the profession and cytology education. For a program to obtain and maintain accreditation, it must be found in compliance with the S&G.

Figure 1: Annual report, self-study, and site visit process conducted by the CPRC with subsequent submission of a formal recommendation to CAAHEP.

<table>
<thead>
<tr>
<th>Annual Report</th>
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<tr>
<td>• Completed by the program</td>
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<td>• Initially reviewed by one pathologist and one cytologist assigned by the CPRC</td>
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<tr>
<td>• Findings from the initial review discussed as a group by the CPRC</td>
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<td>• Recommendations and action items communicated to the program by the CPRC</td>
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<th>Self-Study</th>
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<td>• Completed by the program</td>
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<tr>
<td>• Initially reviewed by one pathologist and one cytologist assigned by the CPRC</td>
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<tr>
<td>• Findings from the initial review discussed as a group by the CPRC</td>
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<tr>
<td>• Requests for clarification or confirmation of information and items communicated to the program by the CPRC</td>
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<tr>
<td>• Schedule site visit, typically within a year of submitting self-study</td>
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<tr>
<th>Site Visit</th>
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<tr>
<td>• Conducted by a different pathologist and cytologist than self-study review</td>
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<tr>
<td>• Summary of findings from the site visit discussed as a group by the CPRC</td>
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<tr>
<td>• CPRC makes and approves a recommendation on accreditation</td>
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<td>• Formally submit CPRC recommendation to CAAHEP</td>
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<td>• Length of accreditation based on review process findings</td>
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The Standards and Guidelines

The S&G are educational standards and competencies that reflect current practice and expectations of an entry-level professional. Much like the profession of cytology, they evolve and must be updated accordingly. The last revision of the S&G and entry-level competencies (ELCs) was in 2004, with programs meeting compliance in 2013.
The S&G are based on the profession’s needs, expectations of the workforce, and the scope of practice. A major goal of the S&G is to align with these needs and expectations, by providing a rubric by means of standards, for programs to ensure quality education as they prepare competent entry-level cytologists. The revision process for the S&G is rigorous, thorough, and can take a significant amount of time to accomplish. For the current revised S&G, there have been significant events and activities leading to where we are in the process today. Prior to 2018, a series of surveys, meetings, articles, and presentations aided in data collection from communities of interest and initiated the revision process. In 2018, the CPRC submitted a formal notification to CAAHEP indicating the start of the revision process. This was followed by a CPRC retreat in 2019, where a line-by-line review of the S&G occurred. The 2019 calendar year also marked a workshop regarding the document, and the CPRC sponsors received the first draft of the revisions. In 2020, the Program Directors (PDs) were provided with the revised S&G for review and feedback. In addition, there was a CPRC webinar regarding the revisions. During 2021, there was a pause in the review process to allow the CPRC to adequately respond to sponsor feedback. The pause was lifted and the process moved forward in 2022 with the formal submission of the revised S&G to CAAHEP.

The CAAHEP Process

The revision and approval process conducted by the CPRC and CAAHEP is well-organized and comprehensive. The previous section focused on the activities prior to the main approval process. However, what happens as we move forward? There are certain steps the CPRC must take leading up to the final decision (Figure 2).

The first step in the process is the formal submission of the revised S&G to CAAHEP. This occurred in late 2022. Next, the CPRC solicited letters of endorsement from all sponsors. This was done in December 2022, with a 60-day window to which sponsors needed to respond. Once the letters of endorsement were received by the CPRC, a plan for aiding programs in the transition to the new S&G started to be developed. The transition plan is among the information included on the request for open hearing form, which is the following step. After the request for open hearing is submitted, the CPRC will then move to a public comment period. The public comment period is 30 days, providing the public and communities of interest with a platform for submitting feedback on the revised S&G. Upon completion of the 30 days, the feedback will be reviewed and addressed. The open hearing would occur following the public comment period. The final decision is made by the CAAHEP Board of Directors.

Figure 2: Graphic depicting the CAAHEP process. The filled bullet point indicates where the CPRC is in the process. Letters of endorsement have been received from all sponsors. Next step is the submission of the request for open hearing form.
Updates to the S&G

The updates to the S&G range from the more minor language changes to various standards (i.e., including “under the supervision of the pathologist”) to the more significant name change and move to a master’s degree level. Included in this section are highlights from the revised S&G.

Curriculum Changes

Appendix B contains the “Curriculum Competencies for Educational Programs in Cytology”, which includes the ELCs. The ELCs are derived from and comprised of the expectations of entry-level cytologists by laboratories upon entering the workforce. They are the minimum required to enter the profession. The ELCs are divided into seven major categories:

- Evaluation and Interpretation
- Laboratory Techniques
- Laboratory Operations
- Companion Technologies
- Evidence-Based Medicine
- Professional Development/Professionalism
- Communication and Teamwork

Those entering the profession must be exposed to and cultivate their skillset from these ELC categories during their training.

Various sections under Appendix B have been expanded to include additional competencies regarding small biopsies, ancillary testing, digital cytology, and curating specimen. Section 2 now includes a competency regarding the ability to describe the process of gross examination of small biopsies. Section 4 experienced inclusion of multiple new competencies involving:

- The ability to explain the theory behind, principles of, and indication for companion technologies
- The ability to incorporate findings and clinical significance of companion technologies
- Utilizing digital cytology to assist the pathologist on procedures including rapid on-site assessments
- Indicating areas of adequate material for companion testing on cellular and tissue specimens

A new section was included in the revised S&G with objectives geared toward communication and teamwork. This section addresses demonstrating the ability to:

- Recognize healthcare inequities
- Respect diversity when interacting with patients and the healthcare team
- Understand and respect diversity, equity, and inclusion
- Work as an efficient member of the healthcare team through effective communication

What’s in a Name?

The profession/professional name change is one of the more significant revisions. The name change, in addition to the master’s level degree requirement, are considered to be catalysts for elevating the profession. By dropping the technology/technologist terminology, communities of interest and stakeholders believe this more accurately represents the high degree of training completed by cytologists. Cytology/cytologists would also follow the precedent set by other health professions/professionals who have been through similar changes and evolution in their scope of practice.

Much thought and deliberation went into the various options for the name change. In 2021, a survey was conducted by the CPRC in conjunction with the ASCP. It was sent out to 6,700 cytotechnologists (CT) and specialists in cytotechnology (SCT). A total of 861 CT/SCT responded and voted for their name preference (Table 1). Of the 861
participants, 415 (48.20%) voted for cytology/cytologist, 202 (23.46%) for cytopathology practice/cytopathology practitioner, 141 (16.38%) for cytotechnology/cytotechnologist, and 103 (11.96%) for cytopathology assistant/cytopathologists' assistant. Overall, 721 (84%) were in favor of a name change, and 141 (16%) voted for no change to the name.

On October 30, 2021, the ASCP Board of Certification Board of Governors approved and adopted the name change from cytotechnology/cytotechnologist to cytology/cytologist. Classes of graduates have already received ASCP documents containing the new terminology. Three of the four CPRC sponsors (the ASC, ASCP, and ASCT) have approved the name change.

Table 1: Results from the name change survey.

<table>
<thead>
<tr>
<th># of Votes</th>
<th>Name Preference</th>
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<tbody>
<tr>
<td>415</td>
<td>Cytology/Cytologist</td>
</tr>
<tr>
<td>202</td>
<td>Cytopathology Practice/Cytopathology Practitioner</td>
</tr>
<tr>
<td>141</td>
<td>Cytotechnology/Cytotechnologist</td>
</tr>
<tr>
<td>103</td>
<td>Cytopathology Assistant/Cytopathologists’ Assistant</td>
</tr>
</tbody>
</table>

Move to Master’s

The move to a master’s degree level echoes similar rationale as the name change. Communities of interest and stakeholders agreed the degree level should reflect the training required to enter the profession, needs and expectations of laboratories, and the evolving scope of practice.2,4,5,6 The transition would streamline the level of degree offered across the programs, and many programs (that are not currently master’s level) are already functioning at a higher degree workload between credit hours and curriculum content. By incorporating skills currently used in practice and expectations of laboratories into the standards, entry-level cytologists will be prepared to take on nontraditional roles and the growing workforce needs.4 Ultimately, these factors play a part in the overall goal of elevating the profession.

Standard I.A.2. addresses sponsorship. In the revised S&G, all pathways and sponsor types lead to a master’s degree with the awarding of the degree by the sponsor. A sponsor must be one of the following:

- “A post-secondary academic institution accredited by an institutional accrediting agency that is recognized by the U.S. Department of Education and must be authorized under applicable law or other acceptable authority to provide a post-secondary program, which awards a minimum of a master’s degree at the completion of the program.”
- “A branch of the United States Armed Forces, or a federal or state governmental agency, which awards a minimum of a master’s degree at the completion of the program.”
- “A consortium, which is a group made up of two or more education providers, that operate an educational program through a written agreement that outlines the expectations and responsibilities of each of the partners. At least one of the consortium partners must meet the requirements of a program sponsor set forth in I.A.1. - I.A.3. Consortium does not refer to clinical affiliation agreements with the program sponsor.”

Implementation

Implementation of the revised S&G will not occur until the final approval decision has been made by the CAAHEP Board of Directors. Implementation will not be a one-size-fits-all process. Programs are located within different types of institutions, each having their own needs and available resources. Therefore, the way in which they incorporate the new S&G and ELCs into their curriculum to show compliance will differ.
Currently, the CPRC is discussing a two-pronged approach. The implementation and compliance of the ELCs/curriculum content changes will occur within a shorter timeframe. In the past, it has ranged from one to two years. The process of moving a program to a master's degree level is more in depth and will require a longer period of time for the transition to occur. The timeframe that has been discussed for compliance with this particular standard is five to six years.

The CPRC is in the development stage of a plan to help programs transition to the new S&G, contingent upon CAAHEP approval.

**Conclusion**

The revised S&G have been thoroughly discussed and reviewed over a number of years and across a wide variety of platforms. Feedback and data obtained through multiple methods from sponsors, stakeholders, and communities of interest have been taken into consideration. The revised S&G include new and expanded standards and ELCs, in addition to the name change and master's degree transitions. The CPRC, in collaboration with its sponsors and CAAHEP, continues to move forward in the review process. Currently, the CPRC is developing a plan to aid programs in the transition to the new S&G should approval by the CAAHEP Board of Directors occur. It is the hope that this update to the S&G will accurately represent the current role of the practicing cytologist, while supporting the main goals of ensuring quality education programs and being an advocate of cytology education.

**References**

3. A position Paper of American Society for Clinical Laboratory Science (ASCLS) and the American Society for Clinical Pathology Board of Certification. Available at: https://www.ascp.org/content/docs/default-source/boc-pdfs/about_boc/standardizing-the-professional-title-of-medical-laboratory-professionals.pdf
6. Goulart R, Atkison K, Spiczka A. The MS Level Cytologist: Further Data on Regional Employer Expectations

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**Trivia Question Corner**

*Question by Hannah Krigman, MD*

Q. Tyrosine rich crystals are most commonly associated with...

https://www.surveymonkey.com/r/69PHJMO

or scan the QR code.
How Did I Get Here?
Sarah Sprinkle, MHPTT, CT(ASCP)CM
University of Nebraska Medical Center

In this interview, we speak with Sarah Sprinkle, MHPTT, CT(ASCP)CM, regarding her work, education, and career journey.

1. Please introduce yourself and your role at the University of Nebraska Medical Center?
   My name is Sarah Sprinkle and I am the education coordinator and an instructor with the University of Nebraska Medical Center (UNMC) Diagnostic Cytology Program. While I wear numerous hats to serve our university, college, and program, daily you can find me leading group discussion or going over student slides at the microscope.

2. What inspired you to pursue a career in health care and laboratory medicine?
   During my undergrad internships at UNMC and the National Institutes of Health, I was fortunate to have mentors that sought opportunities for me to learn about different healthcare professions. Through these opportunities, I came to realize the vastness of the healthcare field that works together to have an impact on community health. I wanted to be a part of that difference.

3. Talk about your education journey as a Cytology student and when you realized your love for Cytology?
   With my positive experiences at UNMC, I sought available programs to continue my education—enter Cytology! While in the UNMC cytology program, I participated in educational advancements receiving an E-learning scholarship for a group module titled Rapid On-Site Evaluation (ROSE) of FNA Specimens in Cytology. FNA’s were my favorite aspect of the cytology profession as they provided an opportunity to see different professions come together in an interprofessional team to care for the patient.

4. What makes Cytology such a special field?
   Cytologists are considered high-complexity technologists in the hospital setting. This title opens the door for ancillary roles such as grossing small biopsies or aiding in molecular testing. I explain to young students that pathologists are the superhero and cytologists are the super cool sidekick.

5. Talk about your work and career journey as a Cytologist?
   After graduation, I took a job as a practicing cytologist at a local hospital in Cedar Rapids, IA. While there, I always jumped at the opportunity to share the cytology profession with other colleagues and improve interdepartmental experiences. I was invited to give the molecular lectures to the hospital medical lab science students wherein the education roots began to grow. I knew I desired to give back to others through providing mentorship like what I received.

6. What inspired you to become active with the American Society of Cytopathology (ASC)?
   I have been inspired by my cytology mentors who have forged a path of service to the cytology profession through involvement in the ASC. Their commitment inspires me to be a voice for the cytology profession and the future education of cytology students.
7. Talk about your committee role and works and its importance to our profession?

   This year I joined the ASC Bulletin and CytoPathPod Editorial Board committee. This committee provides content for the ASC community to grow in knowledge and connection. I look forward to creatively participating in future content creation.

8. How do you see yourself shaping and impacting our profession and industry in the future?

   My desire is to make a positive impact on the UNMC cytology graduates that enter the workforce. I aim to give them the confidence and knowledge to be successful professionals who can take on any role and equip them with the necessary skills to provide exceptional patient care. Encouraging these young professionals to get involved in our professional societies will spark innovation and comradery for the future.

9. What are your hopes for the future of Cytology and the American Society of Cytopathology?

   With fewer cytology schools and numerous cytology job openings, my hope is that the ASC comes together as a community to support the advancements of the cytology profession and the training of these professionals across the country.

10. Who and what inspires and support you? How do you find resilience and hope for the future?

    I am truly grateful for the connection and mentorship I have experienced at UNMC and in Cedar Rapids throughout my academic and professional career. My family has been devout supporters as I have continued to grow in my educational and professional advancements. I look forward to participating in the continued growth of the UNMC Diagnostic Cytology Program through the training of future cytologists across the country.

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**Apply NOW. The deadline to apply is May 15.**

https://cytopathology.org/mpage/FoundationResearch
Case Study Pancreatic Masses in a Patient with Li Fraumeni Syndrome

Daniel Martinez Coconubo, MD
Dartmouth-Hitchcock Medical Center
Dept. of Pathology & Laboratory Medicine
Lebanon, New Hampshire

Xiaoying Liu, MD
Dartmouth-Hitchcock Medical Center
Dept. of Pathology & Laboratory Medicine
Lebanon, New Hampshire

Disclosure: None

Continuing Medical Education (CME): The American Society of Cytopathology is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

The American Society of Cytopathology designates this enduring educational activity for a maximum of 1 AMA PRA Category 1 credit(s). Physicians should only claim credit commensurate with the extent of their participation in the activity.

American Board of Pathology Maintenance of Certification (MOC): This product can help fulfill the CME requirements and Self-Assessment Modules (SAMs) mandated by the American Board of Pathology MOC process.

Continuing Medical Laboratory Education (CMLE): The ASC designates this activity for the indicated number of CMLE credit hours and also fulfills requirements of the ABMS to participate in the Maintenance of Certification program.

This program is approved for continuing education credits in the State of Florida for 1 credit and the State of California for ½ credit.

Disclosure for Education Planners

Review the Case Study and visit the ASC Web site to take the test for Continuing Education Credit.

Clinical History

A 58-year-old man with a history of Li–Fraumeni Syndrome presents with a focally ulcerated sessile polyp in the distal greater curvature of the stomach. Further workup reveals a 2.5 cm left lower lobe nodule, and endoscopic ultrasound (EUS) demonstrates three subcentimeter hypoechoic, well-defined pancreatic masses. Multiple passes were done with a 25-gauge Sharkcore needle. Touch preps were made from tissue cores.

Cytopathology Features:

Typical features of leiomyosarcoma include variably cellular smears comprised of tissue fragments with spindled and occasional polygonal cells. Rare dispersed single cells are seen in the background. Tissue fragments show variable morphology, including fascicular and rare storiform features. Spindled cells are elongated and show blunt-ended nuclei, nuclear indentations, nuclear segmentation, and occasional nuclear pseudo-inclusions. Mitotic figures are seen in about a third of cases. Cellblock material commonly demonstrates fascicles of pleomorphic spindled cells with conspicuous mitoses and focal necrosis. Smooth muscle actin, caldesmon, and desmin immunohistochemical stains are usually positive [1,2].
Established in 2014, the award is presented annually to recognize and honor a resident or fellow in an approved training program in the United States or abroad, who submits the best scientific work as an abstract in cytopathology at the poster or platform session during the USCAP Annual Meeting. For an abstract to be considered for this award, the first author must be a physician-in-training in an approved training program.

The 2023 Award was presented prior to the ASC Companion Meeting in New Orleans by JASC Associate Editor, Dr. Sara Monaco to Dr. Diane Libert, Stanford University, for the following abstract: Detecting effusion tumor cells (ETCs) under different storage and processing conditions.

Congratulations!
The second edition of *The Paris System for Reporting Urinary Cytology* (TPS 2.0) came out recently. This book has 67 contributors with vast experience in urinary cytology – Cytopathologists, Cytotechnologists, and Urologists including the editors – Drs. Wojcik, Kurtycz and Rosenthal.

Five diagnostic categories had been defined by the first edition of TPS in 2016, the same diagnostic categories have been refined by the second edition – unsatisfactory, negative for high-grade urothelial carcinoma, atypical urothelial cells, suspicious for high-grade urothelial carcinoma, and positive for high-grade urothelial carcinoma. TPS2.0 has many changes/additions as compared to the initial TPS, including updated images and sample reports. Below are some of the most noteworthy changes in the second edition.

**Adequacy Criteria:** There are no uniform criteria for judging the specimen adequacy for urinary cytology. Any urine sample with atypia, suspicious or high-grade malignant cytology is considered adequate irrespective of the cellularity or volume of the specimen. For voided specimens, TPS2.0 has a new recommendation of using a volume of 30 mL for ascertaining adequacy when there is appropriate benign urothelial cellularity and absence of obscuring factors. However, volume alone should be a criterion for rejecting voided specimens. For instrumented specimens, the authors suggest using volume-independent adequacy criteria comprised of cellularity. A minimum cellularity criterion has not suggested by the authors due to paucity of adequate data in literature regarding the role of collection type, cellularity, and volume. The authors recommend that laboratories validate their own cut off for urine cellularity for both instrumented and voided specimens.

**Negative for high-grade urothelial carcinoma:** It is the most frequently encountered diagnostic category by Cytopathologists (70-90% frequency per TPS 2.0). As compared to the first edition, the category of low-grade urothelial neoplasia now falls under the umbrella of negative for high-grade urothelial carcinoma category. The rationale is that urinary cytology is not a good modality for diagnosing low-grade urothelial carcinoma, atypical urothelial cells, suspicious for high-grade urothelial carcinoma, and positive for high-grade urothelial carcinoma. TPS2.0 has many changes/additions as compared to the initial TPS, including updated images and sample reports. Below are some of the most noteworthy changes in the second edition.

**Atypical urothelial cells:** TPS2.0 has retained all the cytologic criteria for atypical urothelial cells as the original Paris System, which are urothelial cells with increased nuclear to cytoplasmic (N:C) ratio of greater than /or equal to 0.5 (required criteria) plus one of the three minor criteria – nuclear hyperchromasia, irregular nuclear membranes, and irregular coarse clumped chromatin. Hence, this category should be used only for cases with mild to moderate cytologic change that is somewhat worrisome for HGUC. The authors reiterate the importance of not
using the atypical category for cases with known benign (or reactive) causes of atypia. They recommend that reactive urothelial cells are best classified as negative for high-grade urothelial carcinoma. The ROHM for this category has been updated to 24 - 53%.

Suspicious for high-grade urothelial carcinoma: Similarly, criteria for diagnosing suspicious for high-grade urothelial carcinoma remain the same as before, which include N:C ratio of greater than /or equal to 0.7 (major required criteria) plus any two of the minor criteria – nuclear hyperchromasia, irregular nuclear membranes, and irregular clumped chromatin. The updated ROHM is 59 - 94% for the suspicious for high-grade urothelial carcinoma category.

High-grade urothelial carcinoma: For the category of high-grade urothelial carcinoma, it is noted that the cytologic criteria from the first edition have been successful and are now universally being used. These include the presence of at least 5-10 malignant cells, N:C ratio of 0.7 or greater, marked nuclear hyperchromasia, irregular nuclear membranes and irregular clumped chromatin. The authors accept that the N:C ratio may show a wide variation in high-grade urothelial carcinoma, however note that at least some malignant urothelial cells in most samples will show a high N:C ratio of 0.7. The recommend not changing this criterion to maintain the high specificity associated with this category. Other many valuable additions have been made detailing the cytology of sub-types of high-grade carcinoma, role of hypochromasia and presence of fibrovascular cores for this diagnosis. For the sub-types of high-grade urothelial carcinoma, in addition to describing the squamous and glandular differentiation (which were part of the first edition), cytomorphology of nested, micropapillary, and plasmacytoid variants have been added. The ROHM for this category is 76 - 100%.

Cytology of upper urinary tract has been added in more detail. The role of ancillary tests now also includes next-generation sequencing (NGS) technology. TPS2.0 also details preparatory techniques for cell block preparation which is another welcome change to the prior edition. Interesting additions have also been made to the chapter on clinical management, including recommended steps for evaluation of microscopic hematuria, enhanced cystoscopy techniques and role of reflex testing. The fascicle ends with a very interesting section on evolution of urinary cytology over many centuries. The History of Urinary Cytology written by the late Dr. Stefan E. Pambuccian, details the significant developments in urinary cytology starting from the 16th century to the current state of urinary cytology.

In conclusion, TPS2.0 has built substantially on the first edition of The Paris System for Reporting Urinary Cytology. The risk of high-risk malignancy has been updated based on additional data that became available after the first edition. The authors and editors have also updated this edition with more recently known molecular biology of the variants of urothelial carcinoma. The inclusion of sample reports is very helpful for practicing cytopathologists. For future, more studies are needed for collecting data to determine the adequacy of instrumented samples. Also, it will be very useful to know the risk of high-grade malignancy not just for each diagnostic category, but also for each specimen collection type.

References: