redone every time a protocol is updated.

CAP has introduced several initiatives to assist laboratories in minimizing and maintaining customizations. As we described in a previous editorial, we have been working to reduce the burden of data entry by simplifying question-answer sets and have attempted to include elements that decrease the need for customizations. We have also introduced an eCC XML comparator, which is a browser-based tool that allows users to compare versions of eCC XML templates. The tool reads the eCC XML files and enables users to identify all content and metadata changes from one release to the next. We are currently discussing with AP-LIS vendors the best way to incorporate this tool into their update processes. Unfortunately, as these solutions tend to be resource-intensive, vendors are reluctant to spend time and money if demand is low.

The CAP’s professional staff and committee members have been working closely with the AP-LIS vendors for several years but have not yet found a simple method of solving the customization update issue. Renshaw and Gould state that Web-based tools can easily solve the problem of lost customizations, but they do not identify such tools or describe how they would work for most laboratories that use eCC within their AP-LIS. We are very interested to learn how their Web-based method works and welcome open dialogue with them, but if the customization tools are designed for a homemade system, they may not be applicable to eCC templates integrated directly into vendor systems in most pathology departments. We would point out that Renshaw and Gould’s analogy of customized cell phone contact lists being retained when the operating system is updated is not an accurate comparison with eCC updates. Everyone with an iPhone or an Android phone uses the same operating system, but this is not the case with laboratory information systems.

Patrick L. Fitzgibbons, MD1; Mary Kay Washington, MD2

1 Department of Pathology, St Jude Medical Center, Fullerton, California; 2 Department of Pathology, Vanderbilt University Medical Center, Nashville, Tennessee

References


Open-Source Whole Slide Image Preparation and Viewing Pipeline

To the Editor.—Whole slide imaging (WSI) of pathology slides for education provides several benefits, including consistency and durability of materials, simultaneous viewing by physically distant users, and the ability to access materials in situations or locations not amenable to traditional microscopic viewing. Despite these benefits, the adoption of WSI in education has been slowed by the technical complexity and expense of WSI systems, existing incompatibilities between scanners, viewers, and institutional computing platforms, and a dearth of WSI applications designed for educational content. These problems have begun to be addressed by a number of proprietary cloud-based platforms, but those solutions often come with image sharing requirements or associated costs. Herein, we describe an open-source WSI preparation and viewing pipeline that addresses concerns of cost while maintaining compatibility between a wide variety of scanning and viewing devices. This technology is currently used for educational applications at multiple levels, including undergraduate medical education, pathology training programs, and continuing medical education offerings.

Briefly, this WSI pipeline uses open-source software for conversion (libvips [https://cuppitt.github.io/libvips/] and OpenSlide [https://openslide.org]), storage (Deep Zoom specification, Microsoft, Redmond, Washington; http://msdn.microsoft.com/en-us/library/cc645050(VS.95).aspx), and viewing (OpenSeadragon; https://openseadragon.github.io). Using libvips and OpenSlide, whole slide images are converted from a proprietary format into the Deep Zoom image format, which is an XML specification including a small XML document and a subdirectory containing JPEG-encoded image tiles. Using the OpenSeadragon JavaScript library (or other compatible viewers), the virtual slides are rendered for viewing in any modern Web browser (eg, Chrome, Safari) on any platform (eg, Windows, Macintosh, Linux) or device (eg, laptop, tablet, or mobile phone). For educational uses, associated images or contextual clinical information can easily be added in a simple HTML Web page. We generate templated Web pages on a weekly basis for our resident unknown slide conferences using an automated Jekyll static site generator that converts human readable markdown syntax (.md) into an HTML5-compliant mobile-responsive Web page. The infrastructure requirements for this pipeline are modest; the entire system is currently hosted on a 2010 iMac computer (Apple Inc, Cupertino, California). In a survey of our pathology trainees, the speed, image quality, and ease of use of this browser-based viewer were highly rated and compared favorably with proprietary viewers.

Virtual slides generated using this pipeline are easily shared using cloud storage services, removing local infrastructure requirements and allowing for global distribution of images. We have had great success using this infrastructure to transfer images to international servers, maximizing performance for end users. In our implementation, we perform slide deidentification and image processing locally, and then upload image tiles and HTML files to a cloud storage provider offering Web-based file access. Cloud-based whole slide images can be presented to end users either through a stand-alone Web page or embedded in any secondary platform that accesses Web-based content (eg, Blackboard Learn, Blackboard Inc, Washington, DC). Cloud-based storage using static files provides an infrastructure-free alternative to proprietary cloud solutions and can be implemented with few technical requirements and low initial and ongoing costs. Instructions for implementing this pipeline and examples are available at https://github.com/AndrewNorgan/wsi.

Andrew Paul Norgan, MD, PhD; Kabeer Kevin Shah, DO; Justin Eddie
Letters to the Editor

Are You a Doctor, Too?

To the Editor.—In the June 2017 issue of Archives of Pathology & Laboratory Medicine, Carlquist et al1 described the results of an informative survey of physicians regarding the relationship between social media and dermatopathology. The authors demonstrated the utility of social media as a “powerful tool with the ability to instantaneously share dermatopathology with medical professionals across the world,”2(p184) pointing out its use as a platform for “education and collaboration.”2(p184)

Although the investigators focused primarily on social media in the subspecialty of dermatopathology, they did refer to its universal benefits, which apply to any specialty in medicine, and include discussing challenging cases, bringing awareness to rare diagnoses, and unifying physicians with similar interests. If in 2011, 87% of physicians used social media,3 it is safe to assume their use is close to universal today.

However, as stated by Carlquist et al, “physician use of social media is often viewed as a controversial practice,”3(p185) which is likely because of questions regarding appropriateness of content and setting. Concerns include maintaining patient privacy and applying safeguards to ensure it; obtaining appropriate permissions from institutions and people when publishing or posting content related to their work, such as content from lecturers or speakers; ensuring that denigrating comments about colleagues or places of work are not posted; and not using hours allotted to hands-on conventional patient care activities for social media interactions. Further education can facilitate use and lessen the aforementioned risks, which will simultaneously maximize the constructive use of social media in medicine in general and in pathology in particular. A recent dramatic increase in the number of publications addressing its benefits points to the significance of social media use and its power as a tool for professional advocacy. For example, Haller et al2 demonstrated, by way of a survey, the value of a pathologist’s participation in disease-centered Facebook groups in terms of improved understanding and lessened anxiety for patients. There was an almost unanimous agreement (98%) that having a pathologist involved in patient support groups is a “good thing,”2 with 83% of participants wanting more pathologists involved.

Juskewitch, MD, PhD; Joseph John Maleszewski, MD

Department of Laboratory Medicine and Pathology, Mayo Clinic, Rochester, Minnesota

Accepted for publication July 17, 2018.

doi: 10.5858/arpa.2018-0300-LE

PAM50 and Pathologic Tumor Size

To the Editor.—PAM50, a 50-gene mRNA assay marketed by Prosigna (NanoString Technologies, Seattle, Washington), received US Food and Drug Administration approval as a breast cancer prognostic signature in 2013. This technique is advantageous as it allows laboratories to perform this test locally using designated equipment. PAM50 classifies breast cancer into intrinsic molecular subtypes and evaluates the risk of recurrence (ROR), incorporating pathologic data (gross tumor size and number of metastatic lymph nodes).

This technology was made available at my hospital, a cancer institute, and I was asked, per the manual, to select the area for analysis and to indicate the number of metastatic lymph nodes and gross tumor size.

Size is an important and independent prognostic factor in breast cancer for both node-negative and node-positive cases. Pathologic evaluation of tumor size (pT) can be difficult for varied reasons, some related to confusing guidelines such as the ones endorsed by the American Joint Committee on Cancer (AJCC) TNM staging system.4 Regardless of the recognition within these guidelines that pT based on gross measurements may be inaccurate, the preferred recommendation for “larger” lesions is to use the gross measurement nonetheless. Regarding small invasive carcinomas that can be submitted in one block, these are assessed microscopically. In the College of American Pathologists (CAP) breast protocol, “the best size for AJCC T classification should use information from imaging, gross examination and microscopic evaluation.”2

As a breast pathologist I follow the CAP guidelines for breast carcinoma reporting and confirm all gross tumor sizes microscopically. In the case of discrepancies, microscopic tumor size is preferred for pT designation.

The gross measurement of a breast carcinoma can underestimate or overestimate its real size.3,4 This occurs by the presence of an in situ component, fibrotic stroma, reactive changes of a biopsy site, or particular features of the tumor (eg, carcinomas with lobular features). In a recent work,5 using gross size resulted in a change in T stage in 44.8% of cases.

In conclusion, the Prosigna PAM50’s record of gross tumor size for ROR evaluation is largely unsubstantiated. Size discrepancy between recorded gross tumor size and pT (usually microscopically confirmed) can occur. In ROR evaluation the gross tumor size is simplistically recorded as T1 or T2. Even minor differences between gross and microscopic tumor size can result in a different T stage.

One would wonder about the impact of the guidelines for PAM50 ROR evaluation on individual breast cancer treatment.

Conceiçao Leal, MD

Department of Pathology, Portuguese Institute of Oncology, Porto, Portugal


Accepted for publication August 7, 2018.

doi: 10.5858/arpa.2018-0300-LE