COLLEGE of AMERICAN PATHOLOGISTS

Partnering with You on Your Digital Pathology Journey

Presented by the Digital and Computational Pathology Committee

Marilyn Bui MD, PhD, FCAP
Savitri Krishnamurthy MD, FCAP
S. Joseph Sirintrapun MD, FCAP
Lewis Hassell MD, FCAP
Patricia Raciti MD, FCAP
Clarissa Jordan MD

March 22nd, 2023

Conflicts of Interest

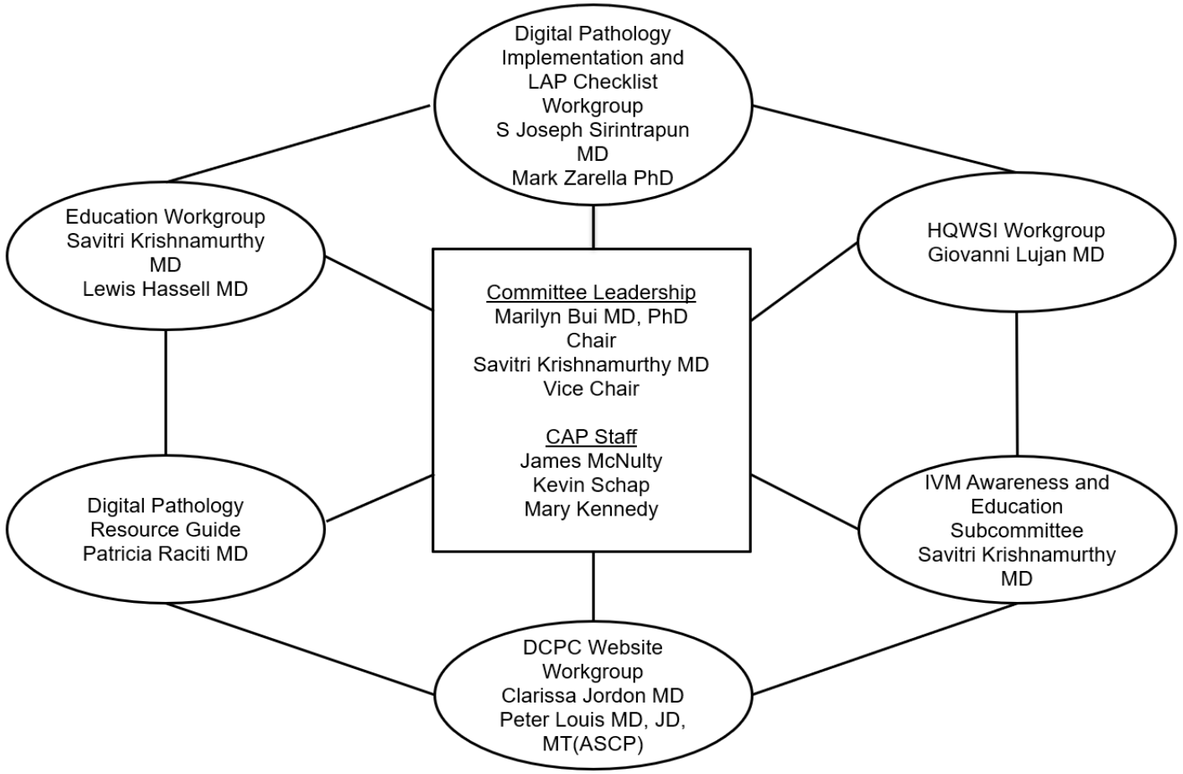
None of the speakers have any Conflicts of Interest

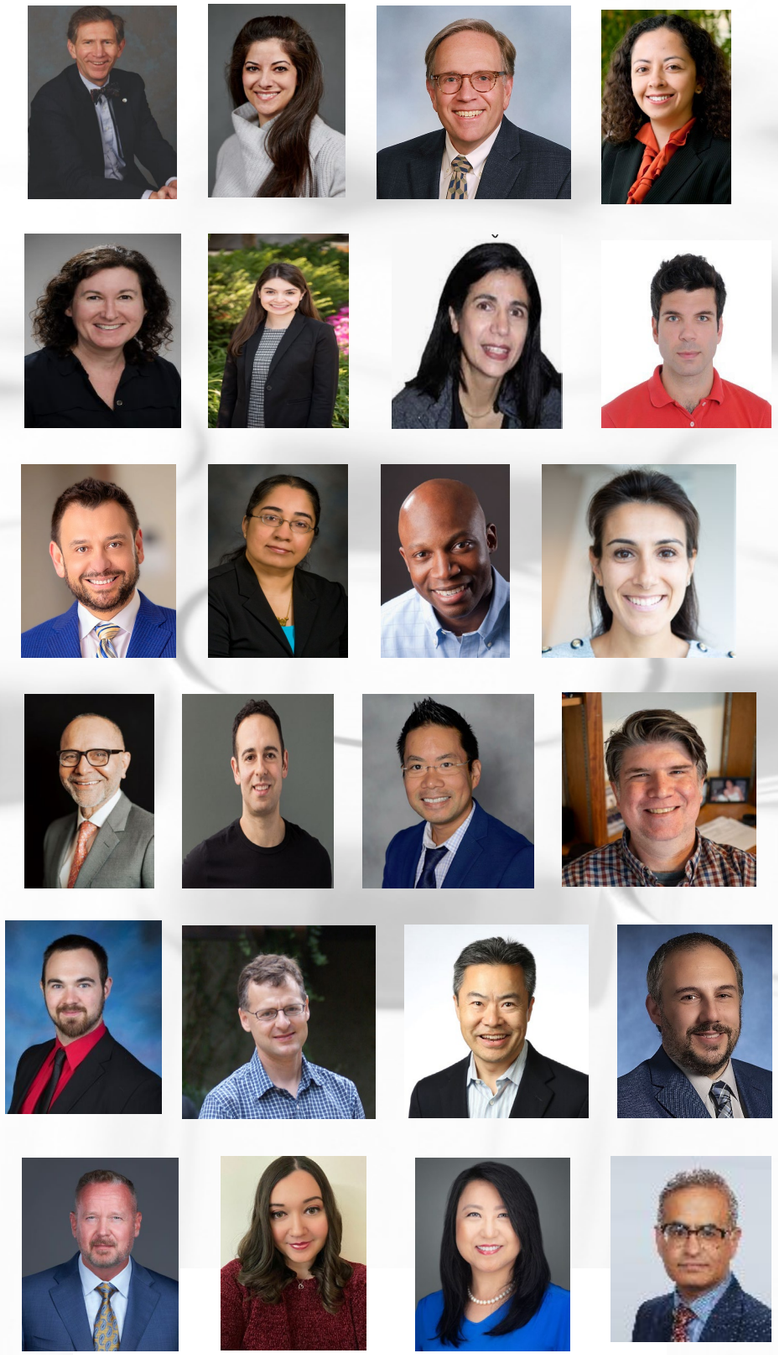
Marilyn Bui, MD, PhD, FCAP

Dr. Bui is the chair of the Digital and Computational Pathology Committee, Vice Speaker of the House of Delegates, and the ex-officio member of the Board of the Governors. She is a Senior Member in the Department of Pathology at Moffitt Cancer Center in Tampa, FL. She serves as the Scientific Director of Analytic Microscopy Core and the Section Head of Bone and Soft Tissue Pathology. She is also a Professor and Director of the Cytopathology Fellowship at the University of South Florida (USF) Morsani College of Medicine.

Digital and Computational Pathology Committee (DCPC)

- **Charge of DCPC is to advance the adoption of digital pathology within the CAP and to serve as a respected resource for information and education for pathologists, patients and the public on the practice and science of digital pathology.**
- **Committee structure**





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Composition of the DCPC

- Pathologists - 24 with variety of specialty interests/niches
- Junior members - 2
- Academic institutions - >18 represented
- Private practice- at least 8 members, some with industry
- Expertise - Informatics, digital pathology use, development, standards, and validation, AI, IVM/EVM, etc.

Objectives of this webinar

1. Learning how DCPC can help facilitating the digital pathology journey for practicing pathologists
2. Be familiar with the existing resources of CAP on digital pathology
3. Explore opportunities that DCPC and CAP can help members in their digital pathology journey

Savitri Krishnamurthy, MD, FCAP

Dr. Krishnamurthy is the vice chair of the Digital and Computational Pathology Committee and is Professor of Pathology at The University of Texas MD Anderson Cancer Center in Houston, TX. She completed her Pathology residency training in New England Medical Center, Tuft's University in Boston followed by fellowship training in Oncologic Pathology at Memorial Sloan Kettering Cancer Center in New York and Cytopathology at the University of Texas MD Anderson Cancer Center.

Webinar agenda

TOPICS	PRESENTER
Resource of the Digital and Computational Pathology Committee	Dr. Hassell
Digital Pathology Resource Guide	Dr. Raciti
Digital Pathology Implementation Workgroup	Dr. Sirintrapun
DCPC Website and the role of Junior Members in the Committee.	Dr. Jordan
A moderated discussion of audience questions	Dr. Krishnamurthy

Our Speakers and Panelist

Lewis Hassell, MD, FCAP

Lewis Hassell is professor of pathology at the University of Oklahoma Health Sciences Center in Oklahoma City, OK, but much of his current day to day work is performed remotely, using digital pathology, from his home in New Hampshire. He is the director of Gynecologic and Gastrointestinal pathology, and former chief of anatomic pathology at OU. His primary interests are in the role of digital pathology in medical, especially residency, education and the use of such means to increase health equity by expanded training opportunities in developing world settings. He completed his residency in pathology at the Massachusetts General Hospital and worked in private practice for over 20 years before joining the faculty at OUHSC.

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Scratching the itch you didn't know you had

DCPC and you: What can it do for you?

Lewis Hassell, MD, FCAP

March 22nd, 2023

Six working groups divide and conquer

- Education
  -webinars
  -White papers (validation guidance)
- Resource Guides and member services
  -DP
  -IVM/EVM
- Webpage, Blogs
  -FAQs
- Implementation
- HQWSI
- EVM/IVM
- Collaboration with other CAP committees in education, accreditation, advocacy, etc.

Education driven by experience and perspective on the future

- DP can be a transformative shift
  -pain
  -possibilities
  -process changes
  -pitfalls
- Educational resources and pragmatic advice aimed to minimize the bad and accelerate the good

Resources to facilitate your journey- when you need them

- Annual meeting education
- DP Resource Guide-- from pdf to virtual/on-line searchable format
- Blogs, FAQs, Webinars
- CAP guidelines (Validation of WSI for primary diagnosis and HER2 QIA for breast cancer)

Models and paths others have used

- Prior editions of the Resource Guide have included a “users’ guide” of experience from prior DP adoptions or implementations, with various use-cases
- We aim to make this more “live” and interactive, perhaps even social

A knowledgeable voice

- Who will speak with an informed voice for pathology and pathologists' interest when
  -a pandemic makes social distancing a necessity?
  -a technology faces a reimbursement challenge?
  -new regulatory interpretations are applied to tools in use by pathologists?

- For Advocacy in CAP to work, the foundational work and expertise must be in place in advance.

Supporting your labs journey to excellence

Within CAP's drive to promote laboratory quality, informed eyes need to be able to provide guidance on:

- **Proposed changes to standards or checklists**
- **Types of PT and other QI materials/programs that are offered**

Increasingly DP will play a role in both the means used, and in the benchmarks against which quality is assessed.

Patricia Raciti, MD, FCAP

Dr. Raciti leads the Digital Pathology Resource Guide Workgroup of the DCPC. She is a Scientific Director within Molecular Pathology in the Oncology Translational Research division of Janssen Pharmaceuticals; she was previously was Medical Director of AI Development at Paige and a practicing general pathologist in community practice. She is Board-certified in AP, CP, Hematopathology and Dermatopathology. Her expertise is in developing, testing, and studying machine learning algorithms applied to digital pathology.

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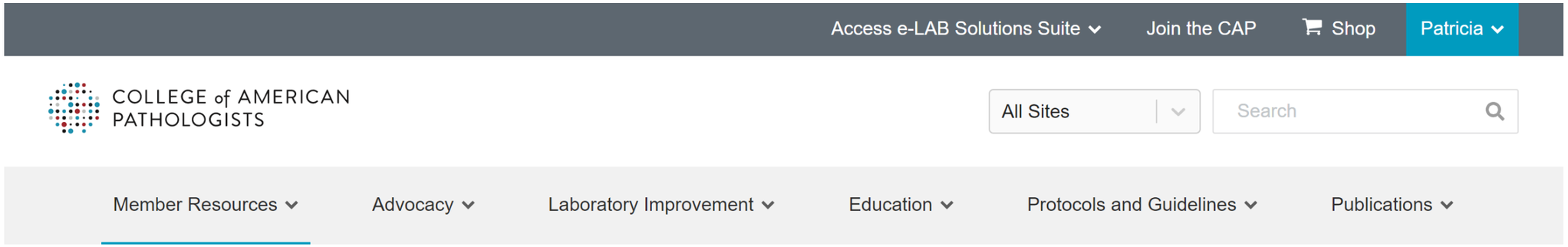
Digital Pathology Resource Guide

Digital Pathology Resource Guide Workgroup

Patricia Raciti, MD, FCAP

March 22nd, 2023

Digital Pathology Resource Guide



Curated, current journal articles + CAP Resources + "Insights from Adopters"

Digital Pathology Resource Guide Revision

- ✓ Expertly curated, comprehensive handbook for the digital journey
- ✓ 100% digital at cap.org
- ✓ Expanded offering
- ✓ Free to all CAP members

Planned Table of Contents

First Available Section

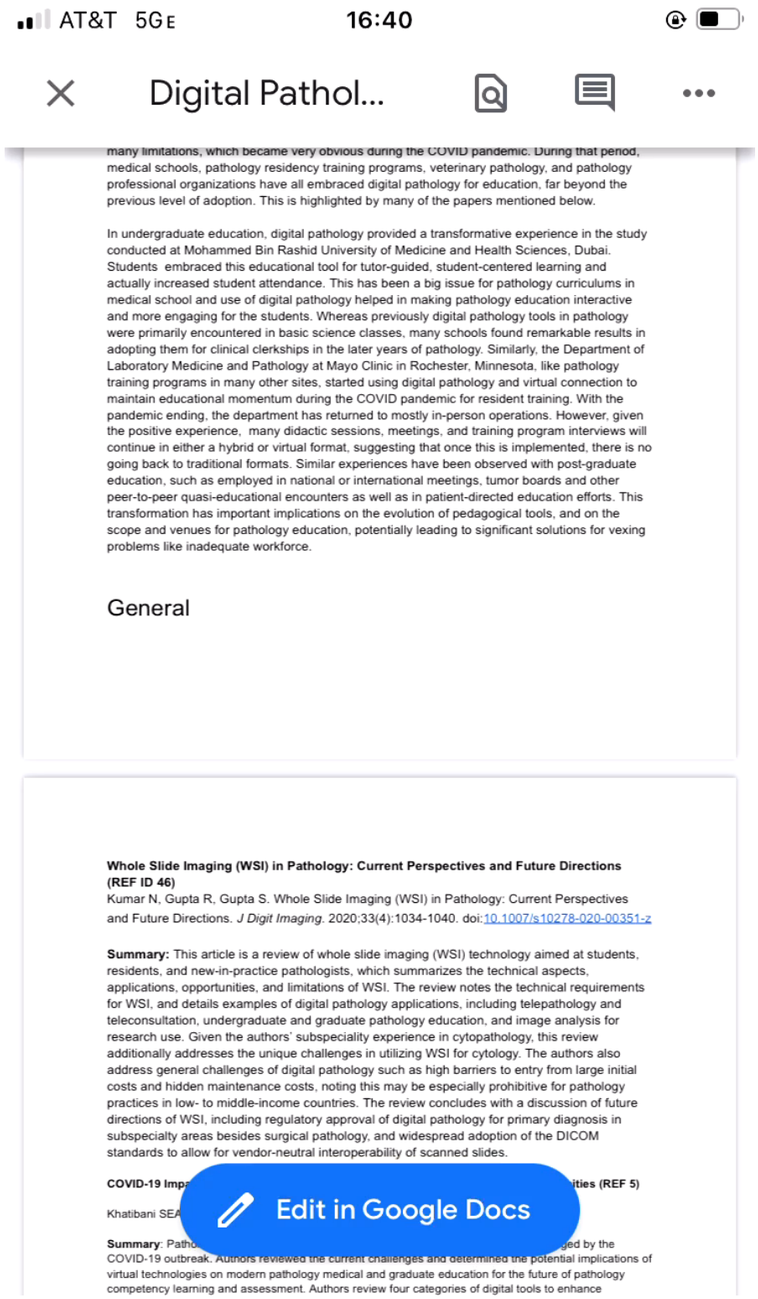
- **Overview & Introduction**
  - Background and Framework
  - Components of Whole Slide Imaging
  - Applications of Digital Pathology
  - Why Use Digital Pathology?
- **Components of Whole Slide Imaging**
  - Digital Pathology Informatics Standards
  - Hardware (e.g., scanner)
  - Software (e.g., viewer)
  - Storage

- **Incorporating Digital Pathology into the Pathology Laboratory**
  - Clinical Application Overview
- **Frozen Section Interpretation**
  - *Validation, Training & Quality Assurance*
  - *Workflow, Technology & Reimbursement Considerations*
  - *Regulatory Environment*
  - *Reporting & LIS Integration*
- **Primary Diagnosis**
  - *Validation, Training & Quality Assurance*
  - *Workflow, Technology & Reimbursement Considerations*
  - *Regulatory Environment*
  - *Reporting & LIS Integration*
- **Collaboration**
  - Consultation/Expert Second Opinion/Intrapractice Consultation
  - International In-sourcing
  - Clinical Conferences
  - *Validation, Training & Quality Assurance*
  - *Workflow, Technology & Reimbursement Considerations*
  - *Regulatory Environment*
  - *Reporting & LIS Integration*
- **Decision/Diagnostic Support**
  - Digital Image Analysis Algorithms & AI
  - Digital Biomarker
  - Machine Learning Education
  - *Validation, Training & Quality Assurance*
  - *Workflow, Technology & Reimbursement Considerations*
  - *Regulatory Environment*
  - *Reporting & LIS Integration*
- **Cytopathology**
  - Scanning Hardware
  - ROSE
  - AI/Assistance for Monolayer Cytology
- **Clinical Pathology**

- **Setting Up Your Digital Pathology Lab**
  - Personnel, Physical Space and Practical Issues
  - Financial & Business Considerations
- **Digital Pathology In Education & Apps**
  - Medical Education
    - Undergraduate
    - Graduate
    - General
    - Patient
  - Online Digital Image Sharing
  - Mobile Pathology Apps
- **Insights from Current Users of Digital Pathology & AI**
- **Insights from Adopters Outside the U.S.**
- **Resources**
  - CAP Center: Guidelines
  - Guidelines (nonCAP)
  - CAP Proficiency Testing (PT)
  - CAP Laboratory Accreditation Program
  - CAP Education Programs
  - Digital Pathology Organizations
  - Industry Conferences
  - Archived Webinars
  - Platform and Vendor Overview
  - Digial Slide Repositories

Digital Pathology in Medical Education

- Section introduction
- Article summaries and links
- Digital Slide Archives
- Pathology Apps



Contributing to the Digital Pathology Resource Guide – For Trainees

- ✓ For digital pathology enthusiasts, or newcomers eager to learn
- ✓ Deep dive into literature on a topic through the CAPs Research Resources
- ✓ Work with a Senior Supervising Pathologist Mentor
- ✓ Contact Jim McNulty at jmcnult@cap.org

Contributing to the Digital Pathology Resource Guide – For Attending Pathologists

- ✓ For those with experience and deep knowledge in digital pathology
- ✓ Share your extensive knowledge of literature and resources in all aspects Digital Pathology
- ✓ Work with a dedicated trainee and CAP staff
- ✓ Contact Jim McNulty at jmcnult@cap.org

S. Joseph "Joe" Sirintrapun, MD, FCAP

Dr. Sirintrapun leads the Implementation Workgroup of the DCPC. He is an Associate Attending, Director of Pathology Informatics, and a member lead of the Warren Alpert Center for Computational Pathology at Memorial Sloan Kettering Cancer Center (MSKCC). He is also the past 2021 president of the Association for Pathology Informatics (API).

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Digital and Computational Pathology Committee (DCPC)

Implementation Workgroup

S. Joseph Sirintrapun MD, FCAP

March 22nd, 2023

Implementation Workgroup “The Why” – Our Purpose

- “Operationalize” digital and computational technologies into practice

Implementation Workgroup “Who” – Scope of Practice Types

- Small private practices
- Community hospitals
- Commercial labs
- Academic institutions

Implementation Workgroup “How”

- Education
- Quality Guidelines
- Coordination within CAP
  - Working closer with Economic Affairs Committee (EAC) and informatics related committees within CAP (i.e., Council on Informatics and Pathology Innovation (CIPI), AI committees)

Implementation Workgroup Future “How’s”

- Proficiency Testing
- Laboratory Accreditation Program (LAP) Checklists
  - Periodically review questions by the community on the CAP LAP Checklists
  - Make recommendations for updates and changes

Implementation Workgroup “Tools”

- Digital Pathology Resource Guide (DPRG)
  - Working closely with DPRG workgroup for content
- DCPC website
  - Disseminate knowledge regarding new regulatory issues and guidance for laboratories
- Podcasts

Many forms of implementation depending on the laboratory

- Create use cases for how a lab might want to implement digital pathology

Digital Pathology Use Cases - Examples

- WSI Validation for the frozen sections and primary diagnosis
- CMS Remote Sign out Waiver updates
- Digital Pathology CPT codes

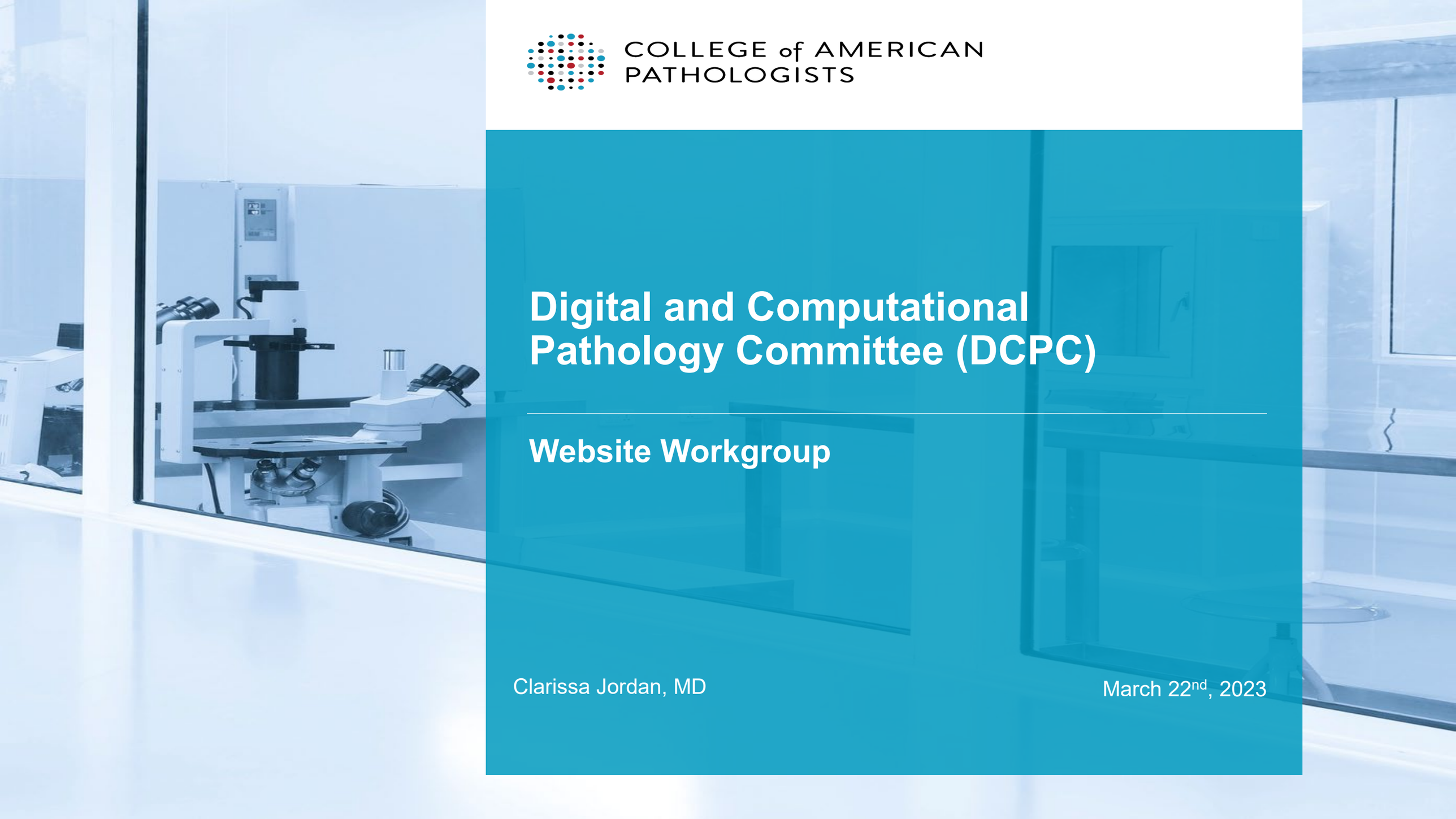
Podcasts Stay Tuned ☺…

Theme

- What challenges do pathologists encounter related to their digital pathology implementations?
- What insight does the interviewee have on these challenges?

Clarissa Jordan, MD

Dr. Jordan leads the Website Workgroup. She is a chief Anatomic and Clinical Pathology resident and future Hematopathology fellow at the Mayo Clinic in Rochester, Minnesota. She is a graduate of Baylor College of Medicine; prior to medical school, she earned her undergraduate degree in bioinformatics from the School of Engineering and Computer Science at Baylor University. Dr. Jordan also currently serves as a CAP Residents Forum Delegate for Mayo Clinic.



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Digital and Computational Pathology Committee (DCPC)

Website Workgroup

Clarissa Jordan, MD

March 22nd, 2023

DCPC Website

Home > Member Resources > Councils and Committees > Digital Pathology Topic Center

Digital Pathology Topic Center

CAP Resources

- Digital Pathology Committee
- Digital Pathology Resource Guide
- US Food and Drug Administration Approval of Whole Slide Imaging for Primary Diagnosis: A Key Milestone Is Reached and New Questions Are Raised
- Implementation of Whole Slide Imaging for Clinical Purposes
- Validating Whole Slide Imaging for Diagnostic Purposes in Pathology - Guideline from the College of American Pathologists: Pathology and Laboratory Quality Center
- 2018 Webinar - Whole Slide Imaging (WSI) For Primary Diagnosis: Is Your Digital Future?
- Case of the Month
- DigitalScope whole slide image system - CAP programs that contain WSI
- Informatics Committee

Other Resources

- Digital Pathology Association (DPA)
- American Telemedicine Association (ATA) Practice Guidelines
- Association for Pathology Informatics (API)

Contact Information

Have questions?
Email digpath@cap.org.

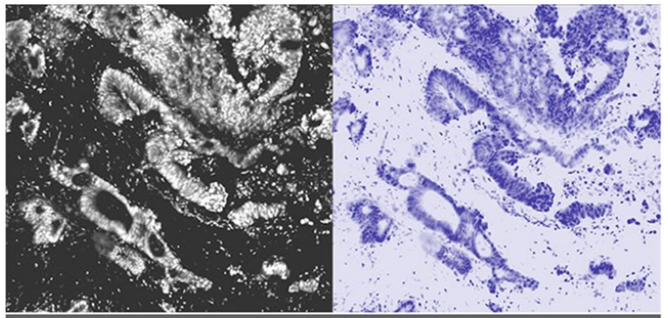
Home > In Vivo Microscopy Topic Center

In Vivo Microscopy Topic Center

Pathologists are key players in the development, validation, and clinical implementation of new microscopic imaging technologies. At the forefront is In Vivo Microscopy, where microscopic images are obtained in vivo, in real- time, during clinical procedures.

In Vivo Microscopy in Detail

In Vivo Microscopy (IVM) is an exciting field where microscopic images are obtained in vivo, in real-time, during clinical procedures. IVM imaging technologies use light and rapidly produce 2D or 3D (tomographic) microscopic images. These images may be obtained using instrumentation compatible with existing standard of care clinical instruments (e.g., that can be inserted into endoscope accessory ports) or as standalone imaging tools. IVM is in clinical use in Gastroenterology, Ophthalmology, Cardiology, Dermatology, and in other clinical disciplines, including Pulmonary Medicine, Urology, Breast, and Neurosurgery.



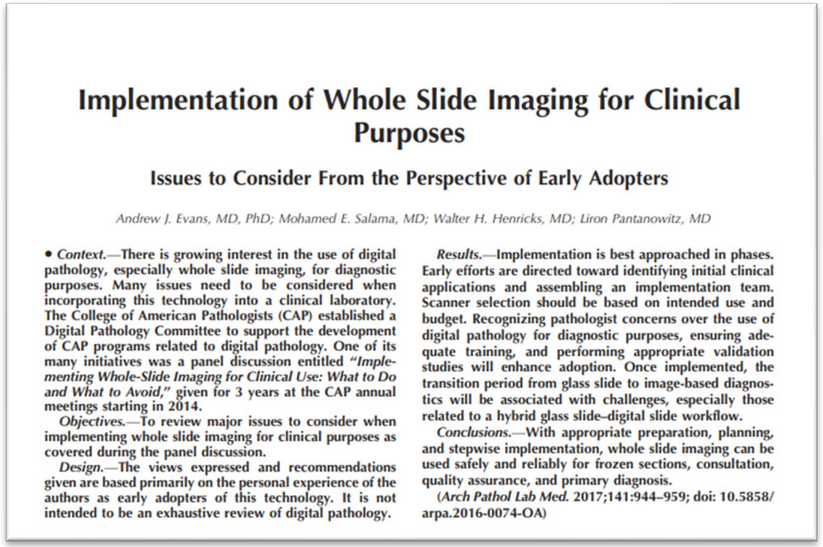
Confocal fluorescence micorscopic images of metastatic Adenocarcinoma in liver from colon primary, grey scale and false colored images. (Image courtesy of Savitri Krishnamurthy, MD, FCAP: The University of Texas MD Anderson Cancer Center)

Contact Information

Please direct questions or comments to:

IVM Committee
ivminfo@cap.org
800-323-4040

DCPC Website Resources



Implementation of Whole Slide Imaging for Clinical Purposes

Issues to Consider From the Perspective of Early Adopters

Andrew J. Evans, MD, PhD; Mohamed E. Salama, MD; Walter H. Henricks, MD; Liron Pantanowitz, MD

• *Context.*—There is growing interest in the use of digital pathology, especially whole slide imaging, for diagnostic purposes. Many issues need to be considered when incorporating this technology into a clinical laboratory. The College of American Pathologists (CAP) established a Digital Pathology Committee to support the development of CAP programs related to digital pathology. One of its many initiatives was a panel discussion entitled *"Implementing Whole-Slide Imaging for Clinical Use: What to Do and What to Avoid,"* given for 3 years at the CAP annual meetings starting in 2014.

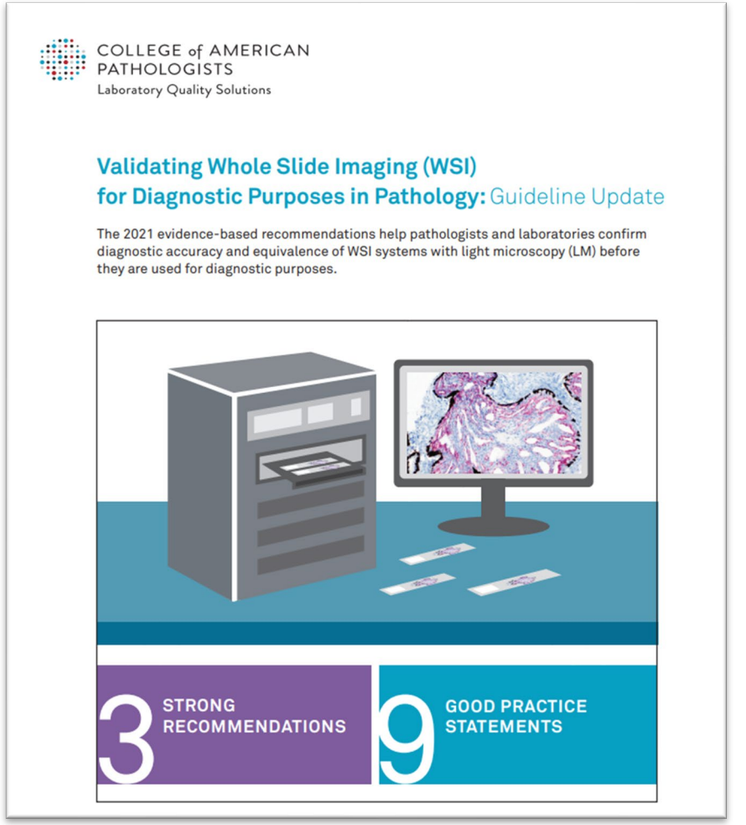
Objectives.—To review major issues to consider when implementing whole slide imaging for clinical purposes as covered during the panel discussion.

Design.—The views expressed and recommendations given are based primarily on the personal experience of the authors as early adopters of this technology. It is not intended to be an exhaustive review of digital pathology.

Results.—Implementation is best approached in phases. Early efforts are directed toward identifying initial clinical applications and assembling an implementation team. Scanner selection should be based on intended use and budget. Recognizing pathologist concerns over the use of digital pathology for diagnostic purposes, ensuring adequate training, and performing appropriate validation studies will enhance adoption. Once implemented, the transition period from glass slide to image-based diagnostics will be associated with challenges, especially those related to a hybrid glass slide–digital slide workflow.

Conclusions.—With appropriate preparation, planning, and stepwise implementation, whole slide imaging can be used safely and reliably for frozen sections, consultation, quality assurance, and primary diagnosis.

(*Arch Pathol Lab Med.* 2017;141:944–959; doi: 10.5858/arpa.2016-0074-OA)



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Laboratory Quality Solutions

Validating Whole Slide Imaging (WSI) for Diagnostic Purposes in Pathology: Guideline Update

The 2021 evidence-based recommendations help pathologists and laboratories confirm diagnostic accuracy and equivalence of WSI systems with light microscopy (LM) before they are used for diagnostic purposes.

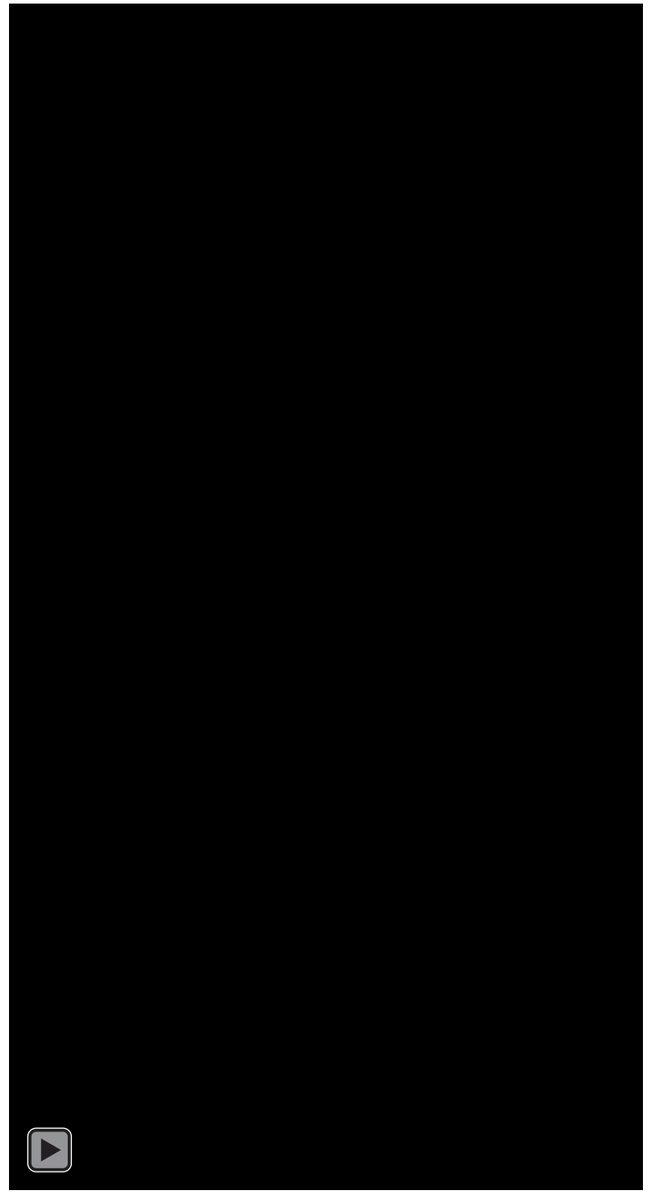
DCPC Blog Posts

After each webinar, members of the DCPC will distill the information shared by the webinar speakers and panelists into a succinct blog post.

- **Provides the CAP community with an accessible review of the topics discussed, which can be easily referenced again at any time.**

The blog post also incorporates responses to any questions asked by the audience during (or after) the webinar.

- **Allows webinar speakers to answer CAP community questions that they may not have had an opportunity to address during the webinar due to time constraints.**



Getting Involved with the Digital and Computational Pathology Committee as a Trainee

Connect with us

Contribute to the Digital Pathology Resource Guide

- **Work on a team with a senior pathologist mentor (supervising attending)**
  - **Assisted by CAP staff, CAP librarians, and Dr. Raciti**
- **Review the literature and summarize key articles in a specific sub-topic of digital pathology**

Digital Pathology In Education & Apps				
Medical Education	Article Summary	High	Raj Singh, Lewis Hassel, Trish Raciti	N/A
Undergraduate	Article Summary	High	Raj Singh	Peter Louis
Graduate	Article Summary	High	Lewis Hassel	Clarissa Jordan
General	Article Summary	High	Lewis Hassel	Clarissa Jordan
Patient	Article Summary	High	Raj Singh	Peter Louis

Benefits of Junior Committee Membership

- Meet experts in the field from a variety of practice settings
  - Attend committee meetings
- Participate in developing recommendations for practice and implementation and collaborate on publications
- Join a variety of working groups on the committee
- Learn about digital and computational pathology!

Junior Committee Membership

- **Apply for a Junior Member position**
  - **Must be a Junior Member of CAP (registering is free!)**
  - **Applications for the 2024 appointment cycle are due April 28, 2023**
  - **Junior Member committee positions are reserved for those residents who have not yet passed their boards**
  - **Application requires a letter of recommendation from your program director**
- **If you are a pathology resident and want to become more involved in digital and computational pathology, apply to the CAP Digital and Computational Pathology Committee as a Junior Member!**

Questions

Audience Questions

Thank You!

The DCPC will be producing more digital pathology educational content in 2023.

- **In addition to webinars the committee will produce podcasts on digital pathology implementation and will create a digital pathology frequently asked questions (FAQ) section for our updated and enriched website.**
  - **DCPC Website**

We are also updating the Digital Pathology Resource Guide. Please reach out if you are interested in assisting with this effort.

To become a DCPC member please apply during the upcoming committee appointment cycle.

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