# Digital Pathology Implementation at Memorial Sloan Kettering Cancer Center

June 2, 2023

**Becca Battisfore:**

Welcome to the latest edition of the College of American Pathologist’s CAPcast. I'm Becca Battisfore, Content Specialist with the CAP. In this episode, Dr. Joe Sirintrapun will be talking with Dr. Matthew Hanna about his experience with implementing digital pathology. Before we get into the questions, let's learn more about our guests. Dr. Sirintrapun, would you like to introduce yourself?

**Dr. Joe Sirintrapun:**

I'm Joe Sirintrapun. Go by Joe. It's a lot easier than my last name. I'm at Memorial Sloan Kettering Cancer Center. I have a title of Director of Pathology Informatics. Been around in the space for a couple years. I was the 2021 past president of the Association of Pathology Informatics and I'm also involved pretty heavily in CAP on the Digital and Computational Pathology Committee. And that's pretty much it.

**Becca Battisfore:**

Great. And Dr. Hanna?

**Dr. Matthew Hanna:**

Hi, everyone. Thank you to the CAP for inviting me for this CAPcast and to Becca and Joe for having me. My name is Matthew Hanna. I am a pathologist at Memorial Sloan Kettering Cancer Center. I'm also the Director of Digital Pathology Informatics and I'm very much engaged with the CAP as the vice chair of the AI Committee, as well as a member of the Informatics Committee.

**Becca Battisfore:**

Thank you both for joining the podcast today. Dr. Sirintrapun, I'll let you take it from here.

**Dr. Joe Sirintrapun:**

All right. Thank you so much, Becca. So Matt, I know we're all in the same institution and we have a slew of questions that I'm basically going to ask everybody who gets invited for the podcast, but this is for the audience and would be great to actually hear your answers for these. So let me start with question one. What were your challenges getting your institutional leaders to agree to the digital pathology implementation?

**Dr. Matthew Hanna:**

It's a great question, Joe, and also if you have things to chime in as we both kind of experienced this together, I'd love to engage you here. I do want to say that we were thankful at our institution that we had support from the get-go. Because of that support, we didn't face as many challenges as some other institutions may have. Memorial Sloan Kettering has really prided itself on being an innovative institution and we were thankful to have that support from the get-go. Otherwise, there's a lot of opportunity for challenges without that institutional leadership support. And so thankfully that there weren't any challenges. Challenges that I have heard from other institutions are mostly related to providing some sort of return on investment, especially something quick.

In my opinion, this is a long-term venture. This is not a get-rich-quick scheme. This is going to take a lot of effort on behalf of the institution or the enterprise as a whole to really get some champions to lead this effort, especially now that computational pathology is on the rise. People may see those challenges and there is a good amount of literature out there today that at least highlights the concepts people should be aware of when trying to embark on their digital journey and using those as a framework or blueprint for their own institution to then overcome whatever challenges they may find.

**Dr. Joe Sirintrapun:**

Let me just chime in. I mean, the publications you've put out there, basically they can basically just PubMed your name and you'll bring up some of those maybe answers to people's challenges and such. But as Matt said, I came in a couple years before and so I could second that I was lucky when I came in on 2013 that the buy-in was there maybe a little bit more early. At least when I came in, I could say at our institution there was a need for archival so we kind of also approached from a quality perspective. At the time, 30% of our stuff comes from the outside and we had to return it very quickly. And whole slide imaging was a good answer to all these different things. So implementing digital sort of made sense. We want to be able to archive and not sort of keep these cases indefinitely for patients.

We had to return them. And on top of that, medical legal issues, you don't want to lose important slides, we get a lot of outside slides, we return them back, we have no idea what happens to them. So it just made a lot of sense from the quality perspective. And also I think we probably should, both of us, probably have give out a shout-out to Dr. Reuter who is the vice chair, who had been working tirelessly even five or six years before I came on board, just trying to work on the challenges because I think the challenges that he faced were pretty much what everybody else is sort of facing now. What are you going to do about cost and storage? And he sort of broke the ice before I even came on board.

In some ways we are lucky, but I would say the big one for us is the quality part, archiving quality, that's kind of where we started. And then success sort of beget success. As that became successful and people were very happy about it, we started gradually moving to things like primary sign-out and all these other different great things. It was kind of an incremental stage process. It all started out with the context that both of us provided.

Anyway, let's move on to question two. Did you face pushback from your colleagues when digital pathology was proposed? I assume it wasn't from me.

**Dr. Matthew Hanna:**

No, not from you Joe. You've always been a great supporter. I remember first starting out when we were just starting to scan from archive slides, there was definitely an unfamiliarity, or I should say uncomfortability with adopting new technology, which is normal. We're all humans and there's human nature factor there. If somebody rode a scooter to work every day for many years and you gave them a bicycle, they may say, "No, I'm okay with my scooter." It's all about familiarity, getting comfortable with the new technology, getting comfortable with the new workflow. Initially surprisingly, there was skepticism in if the image quality, if there would be a high fidelity of the digital image compared to the glass slide, again, likely related to just unfamiliarity or uncomfortability using the technology. And I found over the years that the same people who were skeptical of the image quality and if it would be diagnostic quality enough are the same pathologists who email me when their cases aren't scanned.

So I think it's really just about the learning curve and about becoming familiar with the technology and comfortable using it. There is an adoption curve to every new technology and there will be the innovators and early adopters that move through. It's really on each section of adopters, I should say, that need to show that success and need to show that additional value to then bring in the next cohort of adopters. And we've come a long way over the years. In the last five years, we've definitely seen a significant uptick in use of digital pathology across the board and it's exciting.

**Dr. Joe Sirintrapun:**

Maybe I'll add something too, because you and I know this too, but you did a survey a couple years back and then one follow-up, maybe you can provide some insights about that survey, that departmental one that we did.

**Dr. Matthew Hanna:**

That's great. Thank you for bringing that up. So we like to survey our faculty and trainees and test the temperature of how we're doing as a digital pathology arm of the department during our first validation, which was around 2018 for primary diagnosis. And then during 2020 when we did an additional validation for remote diagnosis. And so less than a quarter of the pathologists in 2018 were comfortable doing a pure digital sign-out, meaning no glass slides. After that second survey, it was about 90% of the respondents, the faculty said that they would be comfortable signing out digitally if they had the glass slides available upon request, which is the hybrid model that a lot of institutions are buying into at least initially until they can get comfortable reliably scanning all of their slides.

So it's been incredible to see how pathologists are adopting it and we continue to see that growth at the CAP conferences, at the USC, at other international and domestic pathology conferences where we don't just have the digital pathology cheerleaders at the podium now talking about digital pathology. We have bread and butter pathologists that are experts in their area talking about how they're using digital pathology in their field. It's definitely been a significant movement.

**Dr. Joe Sirintrapun:**

It's a great, in terms of change management, and winning hearts and minds, you could definitely see the difference. As people start using it, they start loving it. I've heard quite often from other digitally-enabled institutions, some just don't want to go back as well. I'm not sure we're there yet, for us, but I do hear that a lot. It's really a great trend. What tips would you give yourself if you could do this project again?

**Dr. Matthew Hanna:**

It's a great question and one that I've actually given a lot of thought to. I think what works at one institution may not be exactly portable to another institution. And so it's really important I think to understand what use cases are relevant for your organization, how pathologists will find value from this technology, because I really do believe this technology does have value, but you almost have to showcase that in a sense to again, bring on that adoption.

Let me just take a step back. At MSK, there was much more of a phased approach because the technology, in my opinion, was maturing over the years and we were learning what we didn't know. And ultimately I think with that experience now, it could have a much quicker trajectory in terms of being able to build faster from all the lessons learned to be able to stand up a larger enterprise digital pathology system in a faster fashion. And so I think it's more about the lessons learned and being able to try to tackle everything at once, which probably could be met with some criticisms, but I think doing more of a big bang approach now, it'd actually be more preferable than doing a phase approach to be able to really drive all of the value points home for the various stakeholders.

**Dr. Joe Sirintrapun:**

I think I kind of have the same sentiment too in terms of, I guess we could have been more aggressive, but it's like a hindsight bias too. It had a lot of success. You knew it worked. We could have done that. And when you start this thing, you never really know if something's going to fly as well as it does. And I guess we've been fortunate.

**Dr. Matthew Hanna:**

It's also kind of where you have a taste of what a fully digital workflow could be and you kind of see the vision there and just to get it done and implement it as a one-time kind of breakthrough to cover all of the use cases, then it makes it much more, in my opinion, exciting or useful for all the various use cases that we could be leveraging digital pathology for.

**Dr. Joe Sirintrapun:**

Great, great. This next question actually it's interesting, I don't think we've ever talked about this, but what was your first experience with digital pathology?

**Dr. Matthew Hanna:**

So I guess that will take me back to, and what we think of as a conventional digital pathology. I mean, digital pathology could be the capturing of gross specimen static images that embedding them in the laboratory information system, which we did in residency. From a pure definition standpoint, maybe that makes sense. But for conventional, what we think of whole slide imaging and digital pathology in that aspect, it'd probably take me back to my fellowship, which I was very fortunate to train under Dr. Liron Pantanowitz at UPMC in my informatics fellowship.

Really gave me a broad view and access and productive time to really invest and learn and gain experience with the various digital pathology applications at the time. I was kind of being like a kid in a candy store, just learning and trying to be as productive as possible under Dr. Pantanowitz's mentorship. It was an incredible experience. I think for anybody who's interested in digital pathology or informatics in general, that definitely if you have the time and availability, expose yourself to informatics fellowships so you can become more engaged and gain your experience that way. But it was an incredible year.

**Dr. Joe Sirintrapun:**

I think your story sounds very similar to mine. Both of us did fellowships at Pittsburgh and so Matt you did with it Liron and I came a little bit before, so I did with it Anil. So Noah was there and it was the same experience. I felt like a kid in a candy store. That's exactly how I felt like, "Oh my gosh, there's gadgets everywhere." Like back in the days when I had Legos, I can only imagine what it's like now. We didn't have a Lego store back when I grew up, but it's kind of like that like, "Oh wow. Mind-blowing." That was kind of my experience as well. And I do encourage anybody has the time, please do it, if you have that drive and desire. Anyway, we better move on to the next question. Let's see. Were there any immediate wins your institution experienced?

**Dr. Matthew Hanna:**

Thankfully there were, and I think that's what helped drive a lot of the value add and for the pathologist adoption. One of the main wins, so to speak, that I've said before, but it's really transformed our pathology workflow, is having access to the patient's prior archived slides available. Because we started out in the phased approach of scanning a lot of the slides from an archive fashion because they were integrated in the laboratory information system, pathologists could very easily have ready access, instant availability to any patient slide that was scanned before that. If a patient comes in, they can pull up any of their previous pathology and not have to fill out a form and wait for somebody in the slide file room to go find it and put it in their mailbox. That instant availability was so transformative to then immediately just pull up that image, review the pathology as they're reviewing the patient's current specimen.

I mean, it was just transformative for our pathology workflows and for our clinical patient care, especially working at a cancer center, being able to see the longevity of patients and cancer care, we're improving and patients are living longer. And so having that archive is incredible from both a training perspective and both the patient care faculty perspective for pathologists to review all of the relevant patient pathology specimens and then be able to aggregate that information altogether to really drive patient care experience home.

**Dr. Joe Sirintrapun:**

Well, I'll get more specific. I mean, you were here during the transition when... You probably remember when you were a fellow and you were on frozens, remember that crazy list that I don't think any of the fellows do anymore? We had to pull slides and go to the slide file room? Well guess what happened when the whole slide imaging came, nobody even bothers to know what's on the... I don't think a lot of people even look at the schedule. They sort of just wing it because everything's there. You have it at your fingertips, you have whatever case, you can pull the slide. You don't have to look at what's ahead of you, what's going to hit you in the face. For me, that was an emotional like, "Wow, that's awesome." And no more having to pin on the slide file room. I'd say that was the one that just sort of hit me emotionally in terms of frozen sections.

But the other one is also something that you had a lot of, I'll give you a total kudos, was the LDT for the primary sign-out remote during COVID. I recall everybody being fearful about what we're going to do with the remote sign-out. There was all that uncertainty how we're going to do that, and the ability to do remote sign-out digital. That was really transformative, especially during the COVID times. I signed out from the safety of home when things were really rough. And I know there's a lot of our older pathologists that were given that opportunity to be able to do that. And I think that was something also emotionally that I'll never forget. Those are some things like, from my standpoint, what happened.

**Dr. Matthew Hanna:**

No, you're right. That time was obviously very dire, especially in New York City early on in the pandemic, that got hit very hard. And so we needed to both continue to provide care for patients seeking treatment at our institution. Cancer surgeries are not very elective and we needed to provide continued care for those patients and also had to protect our pathologists who were under quarantine orders or dealing with that whole early phase of the pandemic New York, was a lot. We were thankful we had a great team, Joe, you signed up and many other pathologists participated in that validation and it was really an all hands-on deck effort at the time as most of the things were. And we were really able to quickly drive a validation study and submit it to New York State to get provisional approval and eventual full approval. That was also a big win, I would say. Thank you for bringing that up.

**Dr. Joe Sirintrapun:**

I think we're at our last question. This is a fun one. Where do you see digital pathology heading in the next 5 to 10 years?

**Dr. Matthew Hanna:**

If I had a crystal ball, this would make it easier. For digital pathology, especially if the last few years are any indication of what's to come, there's definitely piquing interest from not just your high volume academic medical center. There's reference labs now signing on board. There's community hospitals trying to see where digital pathology can provide value. And at bare minimum there will be significantly more adoption of digital pathology across the board. What I would like to see is more collaboration and consultation workflows. Because if your site is digital now and our site is digital, then we don't have to courier these glass slides around and we could transfer these digital slides much faster and easier than we can the glass. At baseline we should see an increase in digital pathology adoption for clinical practice. And what I would like to see are more integrations.

We hear a lot about machine learning and AI and all these hot topics. I think we'll start to see that in clinical decision support tools incorporated into digital workflows. And there's a booming number of research investigators that are looking at those from a research perspective and a handful of ones that have actually deployed them clinically. I think we'll start to see an increase in what that value add is for computational pathology to become mainstream and become integrated in pathology workflows, I won't say digital pathology anymore. These are really just pathology workflows that we’re using digital tools and technology. We're still doing exactly what we did before with bright field microscope and glass slides, but now we'll have digital workflows to work off of, computer workstations and software for assistive pathology workflows.

That being mainstream I think will happen over the next 5 to 10 years and maybe even future thinking with some of these direct tissue imaging technologies, these kind of slide list technologies, that's maybe the next thing to start thinking of even more down the pike. So I think it's an exciting time to be in pathology. I think a lot of these technologies will also increase recruitment from medical students into pathology residencies and will help drive pathology to become one of these really competitive and exciting fields that people go into and are happy to practice patient care.

**Dr. Joe Sirintrapun:**

Hear hear. Hear hear. I'm with you on everything you said and pretty much on everything. Well, I guess this wraps up the questions. I'm going to turn it back over to Becca.

**Becca Battisfore:**

Thank you. And I just want to plug that the Digital and Computational Pathology Committee has a great resource center. We'll have the direct link in the description of this episode. But thank you both for joining and talking about your experiences and I want to thank you all for listening to this CAPcast. For more information about the CAP, visit cap.org.