# Digital Pathology Implementation at UoL Health

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**Becca Battisfore:**

Welcome to the latest edition of the College of American Pathologists' CAPcast. I'm Becca Battisfore, Content Specialist with the CAP. In this episode, Dr. Joe Sirintrapun will be talking with Dr. Dibson Gondim about his experience with implementing digital pathology. Before we get into the questions, let's learn more about our guests. Thank you both for joining the podcast today. Dr. Sirintrapun, I'll let you take it from here.

**Dr. Joe Sirintrapun:**

Hi, I'm Joe Sirintrapun. I am at Memorial Sloan Kettering Cancer Center. My title is the Director of Path Informatics and I've been involved with CAP for quite a while. I am on the Digital and Computational Pathology Committee. And incidentally, I also served as past President of the Association of Pathology Informatics. I forgot what year, but maybe a couple of years back. Anyway, that's a little bit about me.

**Dr. Dibson Gondim:**

My name is Dibson Gondim. I currently serve as an Assistant Professor of Pathology and Director of Pathology Informatics at University of Louisville, located in Louisville, Kentucky. I'm both certified in anatomic pathology, neuropathology and clinical informatics. Regarding CAP, I serve in the Artificial Intelligence Committee. At the University of Louisville, we provide essential and atomic pathology services for U of L Health, one of the largest health systems in the state of Kentucky. Our academic department oversee tertiary hospitals, numerous community medical centers, and clinics across the region. Within our AP division, we have nine pathologists. In terms of case volume, we managed 30,000 surgical cases, 3,500 cytopathology cases, and 2,500 hematopathology cases. Thank you for having me.

**Dr. Joe Sirintrapun:**

So let me start with the first question here. What were your challenges getting your institutional leaders and leaders of the laboratory to agree to the digital pathology implementation that you did there?

**Dr. Dibson Gondim:**

In our case, there were two layers of leadership that needed to be engaged, the Department of Pathology leadership and the health system leadership. But before delving into that, I would like to begin with my personal motivation. So in terms of digital pathology and AI, these are fields that I find particularly captivating because it combines both my interest in pathology and computer science. When I first joined the department, we had minimal digital pathology capabilities. However, I was steadfast in my belief that the department required a comprehensive digital pathology infrastructure capable of scanning 100% of these slides. This approach would not only lay the foundation for integration with AI, but also lead to numerous efficiency improvements. The pathology leadership quickly backed my idea and then I presented the concept of fully transition to digital pathology to the health system leadership in 2021, who were equally receptive. When discussing digital pathology implementation, many pathologists reflexively allude to finance and return on investment calculations, and rightfully so because these elements are extremely important. However, the challenge in achieving this goal often lies in prioritizing all the essential factors such as effectively communicating a clear vision, articulating the need and the value, and presenting a sound implementation plan. Actually, our health system leadership saw digital pathology as an incredible opportunity to innovate and to prepare our department for the future.

**Dr. Joe Sirintrapun:**

Dibson, you and I have known each other over the years and the thing that impressed me is that, and this is more of a personal question, because I think you sign out everything, you sign out GU, and we'll get to that maybe a little bit later too. But not only have you managed to convince your leaders to get them on board, and that's not an easy thing to do because a lot of people in the audience are trying to figure that out, but how'd you juggle all this? Signing out, doing all the work you do, plus actually trying to manage this implementation as well as trying to win hearts and minds of leadership? Tell us a little bit about that.

**Dr. Dibson Gondim:**

Yeah, so this job at University of Louisville, it's my first job as an attendee, and I believe I came here with a lot of energy and I really wanted to take us to the next level in informatics. So yes, I would be signing out a lot of cases and I would try my best to reschedule things when I was off service, but most of the time I had to really use my own service time to do this work because, actually, digital pathology implementation, there are so many parties involved that you need to make sure the schedule of the project manager, the schedule of the vendors, the schedule of your colleagues match up. So I didn't really have the opportunity to do that when I was off service so I tried my best, and I'm glad that I was able to figure that out and make everything work. But there were a lot of challenges. Yes.

**Dr. Joe Sirintrapun:**

Well, if your leaders are listening, I would say they should appreciate what you've done, being able to do extra above and beyond before I move to the next question, I'm just going to throw that in there in case they're listening. Anyway. All right. So the second question. Did you face any pushback from your colleagues when you went to do this digital pathology implementation or when you first proposed it?

**Dr. Dibson Gondim:**

I was fortunate to not have any outright opposition, though a few colleagues were skeptical to some degree. And the main reason for the doubt was that they were not familiar with such large scale and advanced implementation of digital pathology. To gain their support, I had to clearly communicate the vision and the value and that was essential to educate them on what we are doing. However, full support only materialized as we progressed with implementation. Now, digital pathology is at the core of our clinical operation, and looking back, it's hard to believe that anyone could have envisioned how integral it could become to our work. Today, I don't think anyone in our department could imagine functioning without it.

**Dr. Joe Sirintrapun:**

Yeah, actually that's what, we've had a couple of these podcasts, and that's been the consensus. Yeah, there might be some initial resistance. Once you get these early wins, and we'll get to that, it seems like people really can't imagine it lies without it, you just don't go back, and that seems to be a consensus we've been hearing. Once you go down this road, there's so many immediate wins that you just can't imagine life before, which is great.

**Dr. Dibson Gondim:**

Yes, I agree.

**Dr. Joe Sirintrapun:**

So let me go to question three. What advice would you give yourself if you could do this project again?

**Dr. Dibson Gondim:**

So first I want to begin that most of our decisions have been proven to be well-thought-out and I'm quite pleased with the choices we made, this including selecting the Leica GT 450 scanners, partnering with Paige for our image management system and AI product provider. The decisions that were made in 2020 still promise to meet our needs for the foreseeable future. However, development of our second generation interface, between our LIS and digital pathology system, is still a work in progress. We've been experiencing a significant delay. If I were to go back and do this in time and do this project again, I would pay close attention to determining whether the LIS would be compatible with digital pathology, or if the vendors have a high degree of motivation and resources to implement it. One might need to consider changing the LIS when deploy a large scale digital pathology implementation.

**Dr. Joe Sirintrapun:**

Absolutely. I'm so glad you mentioned that. This is something that should be very insightful to the audience because this has also been my experience. Interfacing is huge and the LIS is a key player and, as we know, I'm sure some of the audience knows, certain LISs are better partners than others, and it's really hard when you have a sclerotic LIS that's not able to play in the sandbox with all these advanced technologies out there. So it's been my mission, even after being past President of API, to continue the fight on getting these vendors out there, even the big ones and cooperative ones, to get them at the table for this better integration. Because this is an effort, and if they were better players, and I'd say they've got a lot of work to do, even the better ones have a lot to work to do, is that this is still heavy burden on IT teams at the local level, in your lab, to really make things work.

So as of right now, it's a heavy commitment just to make sure that information flows, data flows, and that things can actually go into the LIS if possible. This is if you have an LIS that's actually very friendly. So I appreciate your advice and I'm sure there are probably a lot of groans out there for those that don't have very friendly LISs out there.

Let me go into the next question. Were there any immediate wins your institution experienced?

**Dr. Dibson Gondim:**

Yes, our institution experienced several immediate wins, in areas such as intra departmental consultations, consensus conferences, tumor boards, and education. I can give some examples. So for the intra departmental consultations, it became so much easier for us to get our opinions in a timely manner, pathologists who are located in different buildings. For tumor boards, the amount of time that we need, the pathologist in the lab needs to invest to prepare for tumor boards has been reduced drastically. And in addition to that, the quality of the tumor bot presentation is much higher. The availability of all slides make it possible to answer last minute critical questions for patient care. So once in a while this happens and by having all these slides there, the clinical team doesn't need to wait another week, we can give an answer right away.

For consensus conferences, so after COVID, all our consensus conferences are being doing through Teams, and the quality of the digital pathology images are much higher than the quality of the images of the cameras that are mounted on scopes. And the last, for education, actually here, we created a custom search engine for pathology reports and we integrated digital pathology into that. So if we want to search any diagnosis in our files, we just need to go to the search engine, we type, it pulls all the relevant reports, and we have the links to launching page. So this has enhanced a lot our educational capabilities.

**Dr. Joe Sirintrapun:**

I think on that latter one, and we're going to delve on this question a little bit more, but the latter one, I remember I think your resident who presented at one of the summits, and I was very impressed because this is a tool that many people in the audience would love to pick your brain on it because it had a very extensive search cataloging mechanism, ways to annotate it so you could search it. It's a pretty sophisticated way to, not only do education, but I guess if you wanted to do research you could actually use it for that to find cohorts, which is kudos for that. I remember seeing it and maybe at some later time you can give a presentation on it, but I think people would love to see that mechanism.

But let me go back to a couple other things. I've mentioned this in some of the other podcasts. For us, we started out with archival and not primary sign out, but some of our wins were that the immediacy, like you mentioned, like for instance, at the time it was recording, I'm actually handling a couple... I'm technically on vacation, and you can argue maybe I shouldn't be doing work, but here I am, I was viewing things remotely, just to try to do that instantaneous rather than having to spend it two hours in traffic, to get to work just to look at two slides. And that immediacy you mentioned is really big, but frozen sections was a very big for us too. We didn't have to go to slide file room, and it was just a big plus. You could trust that we had things available. I'm assuming that you probably had those type of wins as well. You never had to... It makes the residents a little bit lazy but they don't have to check what's on the OR schedule to pick which slides need to come from the slide file room. But I'm wondering, have you experienced that as well?

**Dr. Dibson Gondim:**

Oh, absolutely. Those were just immediate wins. So in terms of other wins, because we went with prospective 100% scanning, we are doing primary diagnosis by digital pathology. We have the capability of doing remote primary diagnosis. Some colleagues, they screen cases at home, they all the stains, and they all the recuts at home. By the time they come to the lab, they may have the case completely complete for them to sign out. So we have a lot of wins here, and again, research as well, like our research files, if we want to do a project about anything, we can combine that search engine with digital pathology and right away you have slides, you can look at prior cases, you can find rare cases, like things that would take an incredible amount of effort, these IT systems can organize this information and make it easier for us to quickly create value from this information.

**Dr. Joe Sirintrapun:**

I didn't have a chance to ask my other podcast guests this too, but since you mentioned primary sign out, have you managed to implement the new digital pathology codes? How's that experience been, if you can describe, if you're starting on it?

**Dr. Dibson Gondim:**

Yeah. We are using the primary digital pathology codes. We did have some hiccups in the beginning because we have a company that does our billing and we had to engage them to make that happen. Currently, it's working. What we do, we add the digital pathology codes to our report, and the company is able to parse that and send that to the payers. Knowing that we are not going to be reimbursed based on those codes but it's to create, to determine how much digital pathology is being used in the United States. So we hope that, at some point, payers will see the value and going to be able to reimburse us for this additional investment that we've done.

**Dr. Joe Sirintrapun:**

And I think you spoke very... That's a great point because, putting on my CAP advocacy hat, that's the entire point. This is a community effort. People should be trying to track all these codes because at some point we're hoping to get reimbursed. And from our experience at MSK, to automate it has been difficult. We have a special situation, which I can get into another time, but it's been hard to automate. But that said, we are trying, and we realize the importance too. So it's great to hear that you've done that. And maybe my last thing on this last question is just the AI, because I know you've been working on using AI in terms of it and you mentioned Paige, they have a prostate algorithm, and I'm wondering how's the experience been in terms of sign outs? Has it made you faster? How is that being used? I'd just love to hear more about that.

**Dr. Dibson Gondim:**

So in terms of AI here, there are two different layers. That is research, there are projects that I've done, I've created and I've published about a classifier to distinguish between six different types of kidney cancers, including benign tumors. And we are doing multiple projects on the research side and there is that the AI that develop, that we deployed in the clinical workflow, which we use Paige, and we are using Paige Prostate AI.

We did a validation study, we should be submitting that, the results that for peer review. We ran over 1,200 slides. We have discrepancies in 4% of slides, and some discrepancies in favor of AI, some discrepancies in favor of the pathologists. Overall, it didn't change much because, for example, in cases that pathologists missed cancer, they missed in one of the cores, but the pathologists found cancer in other cores. So in the end of the day, we didn't see any results that changed patient management. I think the tool is very promising, we've been using regularly. There are a couple of interesting things that are happening in a way, for example, like residents using this tool, and sometimes I've seen residents favoring the AI diagnosis over their diagnosis. There are so many new questions that this created.

I think the value now of these tool, it's not only the tool per se, but to develop the expertise on using these tools, because this tool is just the first generation tool that was approved by the FDA, and I truly believe that we're going to have next generation tools that they're going to be much better, but you're only going to be able to take advantage of them if you develop expertise with these two. So I'm very satisfied with the Paige Prostate AI, I'm using routinely in my practice. And my major hope is that this tool creates an ecosystem here in my hospital because you need to create a team of people, you need to have laboratory staff who can help you validating these tools. You need to have people who have expertise in data science. You need to build a team that's going to be able to help you to deal with these tools in the future. And I think, to me, I've been able to build this team here, and adopting this tool, this has been the major contribution of adopting these Paige Prostate AI at the moment, and I can't wait to adopt more products. But it takes a lot of effort to validate and it takes a lot of effort to maintain, and so most important thing now is to develop the expertise.

**Dr. Joe Sirintrapun:**

I totally agree. It's actually how to use the product. The AI is already a fancy tool out there, but how to use it, when to override it, because it's not right all the time, but that's where expertise comes in, is that interaction between the human expert and the AI itself. That's really where things are critical and it's a fascinating... We'll discover more as the years go on. I'm assuming that you LBTed it, maybe? You've already got into clinical practice? Or have people been just experimenting at this point? Or are you already passed that?

**Dr. Dibson Gondim:**

We did an internal validation and we are using clinical practice. One of our guidelines here is that AI is just ancillary. In the end of the day, the pathologist responsible for the case, and the case needs to be worked up as it was without AI.

**Dr. Joe Sirintrapun:**

Yeah. Well, I appreciate you sharing that. I spent a lot of time on that question, but I knew that at some point I was going to be able to ask you these questions. Let me go on some more personal notes here. So the next question, what was your first experience with digital pathology?

**Dr. Dibson Gondim:**

My first experience with digital pathology dates back more than 10 years ago when I was a resident at Indiana University, in short, IU. Initially, over there, I used a PD scanner that had a 20-slide holder, mainly for research and education. Then around 2017, IU bought the Philips UFS scanner that, at the time, was the state-of-the art scanner. Well, these early experience, especially the limitations that I encountered, were essential to shaping my large-scale digital pathology project at U of L.

So over there, I faced two important limitations. First, it was amazing to have this Philip scanner with 300 slide capacity, but the lack of integration with LIS made retrieval of the case is very challenging. So essentially we could scan a lot of slides, but it would be very difficult to find them, which was not helpful.

Second, at the time, the IC syntax file, there were two issues. One, it was very hard to download. I didn't have access to the file share. Those files needed to be downloaded manually. And even after you downloaded the file, there were no libraries such as OpenSlides that would allow you to open the file for programming and this was a severe limitation. So my first AI project, to overcome these limitations, I had to download the TIFF image that had a maximum of 10x resolution, and I had to download them one by one, and my project involved 500 slides. So you can imagine, it took me weeks to do it. But those were great experiences because, based on that I said, "Well, I need to have access to the fire share. I need to work with a file format that I'm able to use with open-source libraries such as OpenSlides," and that's what I did. And for example here, with the Leica GT 450, the project that took me at the time over just a couple of weeks just to download the files, like my new infrastructure, I would be able to do the same in a couple of hours.

**Dr. Joe Sirintrapun:**

Wow. Yeah, I've had similar experience, but I think just from a story, I can tell how much of a labor of love it was to do all those manual steps. That's just a story of grit and persistence, so just keeping at it, because I know how frustrating that is. So if nobody's done it, I hope nobody has to go through that too, because I've had similar experiences.

Anyway. So we're moving on to the last question. So this is where you put your futuristic hat, and I appreciate you're on the AI Committee because this is all about the future, but where do you see digital pathology, and I'll add AI, where do you see all that heading in the next five to 10 years?

**Dr. Dibson Gondim:**

So digital pathology coupled with AI will become an indispensable tool in the practice of pathology in the next five to 10 years. Like any technological advancement, the value it offers will be most realized by those who not only have access to those tools, but also develop the expertise to utilize them effectively. It's anticipated that many laboratories will make the transition to digital pathology within the next five years. Those who fail to adapt to this transformation will risk becoming obsolete and may find it difficult to be competitive in the marketplace.

**Dr. Joe Sirintrapun:**

Well, I think that's well-spoken for the people that are, particularly leaders, that are hesitant to go down that. I would probably record that part and play it to every leadership C-suite meeting out there. Anyway. Well, I appreciate, Dibson, your perspective on things. I'm going to turn things back over to Becca.

**Dr. Dibson Gondim:**

Thank you very much for this opportunity.

**Becca Battisfore:**

Thank you Dr. Sirintrapun and thank you Dr. Gondim for joining the podcast to talk about your experiences. And I want to thank you all for listening to this CAPCast. To learn more about digital pathology, the Digital and Computational Pathology Committee has a great resource center on the CAP's website. The link to that will be in the episode description. And for more information about the CAP, visit cap.org.