# AI and Readiness

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**Becca Battisfore:**

Welcome to the latest edition of the College of American Pathologist CAPcast. I'm Becca Battisfore, content specialist at the CAP. In this episode, I'm joined by Dr. M.E. de Baca and Dr. Peter McCaffrey. We'll be discussing their upcoming course, the Present and Future Implications for AI Growth on the Field of Pathology, which is being offered at the 2023 Pathologist Leadership Summit on April 16th. With AI being perceived to have potential in the field of pathology, many pathologists feel under prepared when it comes to using it.

In their course, Dr. de Baca and Dr. McCaffrey will share pathologists’ current perspectives towards the use of AI and highlight practice implications of AI's growth and pathology testing. Dr. McCaffrey, can you introduce yourself?

**Dr. Peter McCaffrey:**

Certainly, and thanks for having us to be on the podcast. My name's Peter McCaffrey. I'm a clinical pathologist by training. I work at the University of Texas Medical Branch primarily and also in a startup capacity in a company in San Francisco called Pragma Biosciences. Really my interests are broad across AI in both bioinformatic imaging and clinical applications. Perhaps most germane to this discussion is I am part of the CAP committee on AI, of course. In that I lead a task force called the Gap Analysis Task Force, the results of which are really kind of the impetus for these data and that task force really focuses on trying to understand where the field is as far as his understanding of AI. Being deep in that process, that's I guess my most relevant job, if you will.

**Becca Battisfore:**

Great, and Dr. de Baca?

**Dr. M. E. de Baca:**

Hi, I'm Dr. de Baca. I am a hematopathologist based in Seattle where I work in a private practice, community practice. I have been long active in the CAP and informatics and when AI hit everyone's radar, sort of became interested in that.

Now on the Board of Governors, I'm really proud to be able to support the efforts of the Council on Informatics and Pathology Innovation and especially some of our newer endeavors, including the Artificial Intelligence Committee. I've got a long interest in education and so merging this gap analysis of what pathologists think they know about AI and what the CAP can do to try to inform pathologists and fill those gaps is something that I think has been extremely important. We look forward to sharing these experiences with the people who attend the Pathology Leadership Summit.

**Becca Battisfore:**

Great. Thank you both for joining me on the podcast. We'll dive right into the questions. With more and more laboratories making the transition to digital pathology, the potential of AI to create image analysis tools or derive novel insights into disease pathology beyond those achievable with the human observer seems to be on the horizon, but is pathology ready for this? Dr. de Baca, we'll start with you.

**Dr. M. E. de Baca:**

Thanks. No, we don't think that the field is ready at all. First and foremost, there's a need to define the role that pathology wants to play in the transformation of the field. If pathologists do wish to have a consequential role, then there will be required education about models, how they behave, and how they need to be stewarded.

**Becca Battisfore:**

So many of the uses of AI and pathology are yet to be realized, however, they all likely have common potential benefits. Can you describe some of these potential benefits you see with using AI and pathology? Dr. McCaffrey.

**Dr. Peter McCaffrey:**

Yeah, certainly. I think there's a couple of important distinctions that one can make in how AI interacts with pathology as a field. One, I think everyone's probably pretty familiar with which is image analysis, digital pathology, this sort of infrastructural wave making this data amenable to AI.

We've seen things happen in the world of radiology that really required models to be less human-like in general than anticipated while still being useful. One example would be triaging of slides. Telling me if something is absolutely benign or not absolutely benign has an impact on workflow and workload and what I might do or see as a pathologist without it having to be as good as I am, for example, at rendering a final diagnosis.

Other areas that are less appreciated, but definitely important are QC, something like identifying anomalies. This is something that is actually a big part of our job, especially as a clinical pathologist. A big part of what we do is not beyond the domain of something to model. I think this is an area of comparatively low hanging fruit where diagnosing and understanding what is the case with my instrumentation behavior in QC is within reach and probably will be reached in fact by models and that'll impact me and impact what I am asked to do on a day-to-day basis.

Then the sort of interesting open frontier is in this growth of molecular that we've been accustomed to for a long time in path, but we're seeing AI models do things that we never could do. Tell me about splicing or expression or the consequence of a variant was never even something we were able to master so now we're wielding a tool that's kind of clearly beyond our capability and we'll be using it so we have a relationship with that tool. In that case that might be led by that tool's capability honestly.

**Becca Battisfore:**

There's a concern among some pathologists that AI is a threat to their work in profession. Do you think pathologists should consider AI a threat? Dr. de Baca.

**Dr. M. E. de Baca:**

Well, our field actually exists due to people who were open to changes. Rudolph Virchow brought microscopy into medicine and that's where pathology had its origins. We've had myriad other technologies that have been developed and integrated into what brings us the practice that we consider normal, if you will, and comfortable today. Even in the last 20 years or so, there were new and threatening technologies that have been integrated into the profession, and these include things like immunohistochemistry and genomics and now we see AI as the newest threat.

I don't think that Peter or I would consider AI as a vital threat to pathology. I think that that same could be said for the AI committee and the Council on Informatics and Pathology Innovation and actually the entire CAP leadership because we do think that pathologists who know something about AI and being able to integrate this into their portfolio of expertise will be less threatened by it and will gain more from it in the long term than the pathologists who do not.

I think that that could be followed along retrospectively in all of the other subspecialty or then new technologies that I already mentioned. Even though disruptions are really threatening, they create opportunities for those who align with change, and those opportunities are asymmetrical so the people who decide to become curious and interested and learn and move with the changes will have more opportunities than the people who decide that they're set.

**Becca Battisfore:**

What are the current limitations in the use of AI that pathologists need to be aware of, Dr. McCaffrey?

**Dr. Peter McCaffrey:**

Yeah, that's a good question. I think there's an abstract and then a few specific ones. The abstract one that I want to actually put out there is I think people in any area that has disruption happening, AI is certainly no exception, do tend to really overestimate what might happen in the next one or two years, but really underestimate what could happen in the next 10.

One limitation I think of us as a field may be our own ability to properly calibrate what's going to happen with this technology. Either over or as our data would suggest, perhaps underestimate where it may grow to. If you think about, okay, then what specifically do we need to know about models? How is it relevant to us? Well, a lot of it has to do with responsibility and risk like anything. We may not be the engineers who invent the AI models, but if we're using them for clinical practice and we're guaranteeing either explicitly or implicitly that they're going to be accurate or helpful in diagnosis, then just like any assay or analyzer, we need to know with confidence the behavior of the tools.

One thing that AI is sort of notorious for is having unexpected, sort of counterintuitive failure modes. There's lots of literature on this. This is well understood in the field, but it's a technical area that we need to know about because we would be the ones I think most proximal to those misbehaviors. If we're going to stamp our approval on and say, yeah, this diagnosis was aided by an AI, trust me, this is what the diagnosis is, trust me, it didn't miss anything, then we have to understand those esoterica really and make them part of our expertise in practice.

Those limitations are basically, AI can be fragile and overfit to unexpected things. A shift in hue or pixels here or there, a feature here there can throw off a classification, but that's okay. I mean, errors happen in all modalities. We just have to know those really well and be able to lead in the liability and governance of those things.

**Becca Battisfore:**

What needs to happen for pathology to embrace the use of AI and other novel technological capabilities? Dr. de Baca.

**Dr. M. E. de Baca:**

When thinking about education, this is the question that the AI task force was actually initially asked to investigate. Our data indicate that AI remains really mystifying and esoteric to many of the people who practice pathology currently.

I think that we've seen that there's low confidence in understanding the technologies and therefore in implementing and trying to govern them. As an organization, we have an opportunity to create educational tools that will help inform pathologists as to the machinations of the technology and how it works and how it behaves. It's important that the education allows the pathologists to become confident with AI tools. As confident as they have been with other technologies with which they currently work. This is a fun next couple of years in the CAP to understand something brand new and come up with modalities that allow other pathologists to jump on and also feel comfortable.

**Becca Battisfore:**

For sure. Finally, let's talk about what people should expect from this course that will be held at the Pathologist Leadership Summit. How will this course help participants better understand the implications of AI and pathologist readiness for using AI in pathology? Dr. McCaffrey.

**Dr. Peter McCaffrey:**

Yeah, I think maybe the most enticing aspect of this is that the results of this task force are a data-driven survey rooted picture of what our field thinks about pathology and how much we know about it and how we prognosticate its impact and its growth.

At the very least, we'll hear from our own voices really. Where we are as a field and how much we really know about this incoming technology. Where that's most useful to an attendee of this presentation would be, well, you get to see that picture, which is nice to know rather than speculate on, but we also have distilled it down to specific things that we commonly don't know, commonly would need to know. I think that would let people leave with a better compass of, here's where I stand, here's what specifically I should be equipped for and importantly, here's why because of the expectations of where AI will go in our field.

**Becca Battisfore:**

Thank you both for joining the podcast to talk about this exciting new course. For more information on this course and to register for the leadership summit, visit pathologistleadershipsummit.org.