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Healthcare AI, Radiology solutions

A 2019 prediction: Radiologists accelerate the adoption of workflow-integrated AI solutions

Nuance Communications

December 21, 2018

The coming year will see radiologists continue their long-standing role as technology pioneers as they increasingly adopt workflow-integrated AI, the Nuance AI Marketplace, and context-aware language understanding to extract structured data from narrative text.

I have a prediction for the adoption of AI in radiology in 2019: radiologists not only will adopt workflow-integrated AI solutions in increasing numbers, they will accelerate development and application of these solutions throughout the healthcare value chain.

I base that on three observations from last month's RSNA conference in Chicago:

- There's been a sea change in radiologists' views of AI. Practical understanding and a grounded sense of curiosity and excitement are dispelling the concern, confusion, and hype that has surrounded the technology.
- The top three factors that will drive widespread adoption of AI-driven diagnostic and report automation tools in radiology are — workflow, workflow and workflow.
- Radiologists are doing with AI now what they have done so well over the past 30 years with RIS and PACS, speech recognition, and every other new disruptive healthcare technology – leading the way forward by exploring, adapting, and adopting it to advance patient care.

Each of those three observations is notable by itself, and I mentioned them in the RSNA recap in my last blog post. But what's remarkable is how they coalesced at this year's conference in a virtual circle — each supporting and propelling the other two. You could see it in the exhibits, on social media, and in the news coverage, and hear it in the presentations and in conversations with attendees. You could *feel* the energy and optimism that the show produced.

The change in attitude is a product of increased understanding, partly from the results of studies exploring the promising performance of image characterization algorithms as well as the real-world challenges of using them. Radiologists also are seeing FDA clearance for a growing number of diagnostic algorithms from developers and healthcare organizations including from more than 40 distributing their AI models via the Nuance AI Marketplace for Diagnostic Imaging.

That leads to the second observation and the recognition of the radiology workflow as the linchpin for AI adoption. PowerScribe One is designed specifically to integrate the practical use of AI into radiologists' trusted and familiar workflows. It embeds powerful AI tools within the workflow in ways that naturally extend and enhance a radiologist's own experience and expertise.

That includes seamless access to the Nuance AI Marketplace where radiologists can subscribe to, use and refine continuously learning algorithms in a collaborative feedback loop with developers. Instead of trying to work with countless developers one-by-one, radiologists have one-stop, integrated access to a range of AI models. Current use cases include worklist prioritization and workflow automation, specifically:

- Aidoc, Nuance, and the University of Rochester are collaborating on a potentially life-saving worklist prioritization application. The FDA-cleared application analyzes CT exams indicating a suspected intracranial hemorrhage, then prioritizes them on the PowerScribe Workflow Orchestration worklist for a radiologist's immediate attention in cases when time-to-treatment is critical.
- Aidence, eUnity, Nuance, and the University of Pennsylvania are collaborating on the development of an application to assist radiologists in the time-consuming task of detecting and characterizing pulmonary nodules for reporting and follow-up comparisons. The Aidence Veye Chest algorithm can detect, measure, and characterize lung nodules in CT exams. It also can compare lung nodules in follow-up exams to assess changes. The accuracy of Aidence's automated nodule diameter and volume measurement, growth rate, and composition have been validated in a clinical study at NHS Lothian and the University of Edinburgh. Aidence's Veye Chest application has received a CE mark but is not yet cleared by the FDA for clinical use.
- Zebra Med's Coronary Calcium Scoring application checks for calcium buildup in the coronary arteries. Calcium in these arteries may be a sign of heart disease. Zebra has developed several algorithms that are designed to help institutions uncover incidental findings across a patient population that have meaning and potential impact on risk stratification. The Coronary Calcium Scoring application is intended for value-based institutions that hold preventative methodologies as a priority.
- Densitas' FDA-cleared densitasdensity™ application automatically assesses breast density, an important predictor of breast cancer risk, while radiologists focus their time and attention on finding breast cancer. The densitasdensity algorithm can analyze images to provide consistent and reproducible breast density grades that align with the ACR's 4th or 5th edition breast density scales. The application is intended for use with compatible full-field digital mammography systems.

These algorithms also can work hand-in-hand with the advanced context-aware language understanding platform integrated into PowerScribe One. The language understanding platform converts unstructured narrative text into structured data and derives its meaning in a clinical context. That enables the content of the spoken narrative to be used alongside the results of AI algorithms, matched with current and applicable decision-support tools, checked for consistency and accuracy, and shared with PACS, EMR, and other systems.

As you can see, the focus is not on AI technology per se, but on using AI to support and enhance workflow. That's absolutely essential for making it relevant and practical. That leads to the final observation. When it comes to exploring new technology, seeing ways to use it to assist in the diagnosis and treatment of disease, and then adopting it in daily practice, radiologists have repeatedly "been there and done that."

So, it is now with AI. Radiologists are not seeing AI as a threatening abstract technology. Instead, they are coming to understand it as an incredibly powerful tool they can use in practical, everyday ways to address physician burnout, meet the growing demand for radiological services, advance the state-of-the-art in radiology, and improve the quality and outcomes of patient care. As we witnessed at the RSNA conference, radiologists are energized by this change because it comes from a how-to "playbook" of technology empowerment and achievement that they know well.

Which brings us back to the first observation, then to workflow integration and the practical application of AI, which leads to more excitement and innovations. And the cycle continues.

I do not consider my prediction bold; rather, it's the most sensible and likely path ahead. Any uncertainty I

have is not about if AI adoption will accelerate, but how rapidly and widely it will. Time will tell, of course, but I suspect that when we look back after the 2019 RSNA conference we are going to be talking even more about radiology's contributions to improving healthcare costs and outcomes using AI.

Tags: AI Marketplace, RSNA, Future of healthcare, Predictions