

What's next



Healthcare

Winning game-changers for really “doing AI” in radiology

Context-aware language understanding and workflow-integrated access to a growing marketplace for AI diagnostic and decision-support tools signal a new generation in radiology reporting

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The annual meeting of the Radiological Society of North America (RSNA) reliably produces a lot of important radiology news, and it would be fair to say that this year’s conference was no exception.

In fact, it’s more accurate to call the news from this year’s conference – *game-changing*. RSNA 2018 was exceptional for the marked shift in how radiologists are energized by the practical and easily accessible ways to use AI to boost workflow productivity, reduce burnout, address healthcare costs and improve patient outcomes.

In fact, our introduction of [PowerScribe One](#) and our update on the vibrant first-year growth of the Nuance AI Marketplace for Diagnostic Imaging are at the vanguard of that shift. Specifically, our RSNA announcements demonstrate how AI – after a lot of fear, uncertainty, doubt and hype – is now both *useful and usable*. PowerScribe One and the AI Marketplace

together represent a new generation of radiology reporting systems that specifically address workflows and collaborative, interoperable solutions.

The innovations in PowerScribe One begin with a cloud-powered, continuously learning, and context-aware language understanding platform that converts unstructured speech-to-text input into structured clinical data while the radiologist speaks and without any additional steps or input. PowerScribe One uses the cloud and real-time input from thousands of Nuance users to continuously train machine learning algorithms that improve accuracy and specificity. That transforms the value of radiology with a wealth of actionable data that can be shared and used throughout the healthcare value chain. Structured narrative data also opens a path to expanded interoperability and a new generation of data-driven applications.

Workflow integration is the key

PowerScribe One is designed from the ground up with workflow-integrated access to AI tools for assisted diagnosis, clinical guidance, quality-checking, and report automation. That includes integrated access to the Nuance AI Marketplace for Diagnostic Imaging and its expanding library of workflow, diagnostic, and other radiology algorithms. Images are automatically routed through PowerShare, where algorithms from the AI Marketplace analyze them and send results back into PowerScribe One. The radiologist then reviews each AI finding, and accepted results and recommendations are automatically included in the report with no additional steps.

The practical benefits of workflow-integrated AI are as clear and accessible as the tools themselves. Radiologists are seeing:

- 94% reductions in report turnaround time
- 87% fewer phone call interruptions
- 31% productivity increases through analytics
- 95-100% critical findings message closure compliance
- 10% increases in workflow efficiencies

Those benefits cascade through the healthcare value chain with:

- 44+ hours saved per week managing lung cancer screening programs
- Cost savings equal to 1 FTE per 200K studies with automated patient reconciliation and order creation.
- 40% reductions in duplicate imaging and unnecessary repeat scans
- Optimized IR scheduling and length-of-stay reductions of up to 3 days

A collaborative, workflow-integrated AI marketplace

In less than a year since we [introduced it, the AI Marketplace for Diagnostic Imaging](#) has mobilized a community of developers, researchers and technology leaders building, testing,

validating and sharing algorithms for radiology. The AI Marketplace now has more than 40 developers and healthcare organizations including the Center for Clinical Data Science at Massachusetts General Hospital and Brigham and Women’s Hospital. We’re also working with the American College of Radiology (ACR) and other professional societies to establish standards for AI within radiology workflows, EHRs, PACS, and other areas.

A few examples of workflow-integrated algorithms available through the AI Marketplace are:

- 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.

Unlike other imaging AI marketplaces and exchanges, the [Nuance AI Marketplace](#) gives developers access to 70 percent of all radiologists across 5,500 healthcare facilities, continuous algorithm training using real-world data, and automated access to required registries. For subscribers, the AI Marketplace offers one-stop-shopping for imaging algorithms integrated into the radiology reporting workflow, with a collaborative feedback channel for continuous improvement.

It’s gratifying and incredibly encouraging for us to see the radiology community share in our

vision for AI. It’s also inspiring to see the growing commitment to AI among radiologists as they begin to realize the benefits and explore further advances.

One thing is for sure: PowerScribe One and the AI Marketplace are winning game-changers for really “doing AI” in radiology.

Tags: [healthcare AI](#), [Radiology AI](#), [Radiology Solutions](#)



About Karen Holzberger

Karen Holzberger is the senior vice president and general manager of Nuance’s Healthcare’s diagnostic solutions business. Karen joined Nuance in 2014 with more than 15 years of experience in the Healthcare industry. Prior to Nuance, she was the vice president and general manager of Global Radiology Workflow at GE Healthcare where she managed service, implementation, product management and development for mission critical healthcare IT software. Karen attended Stevens Institute of Technology where she earned a B.S in Mechanical Engineering.

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