

BREAST CANCER  **AWARENESS MONTH**

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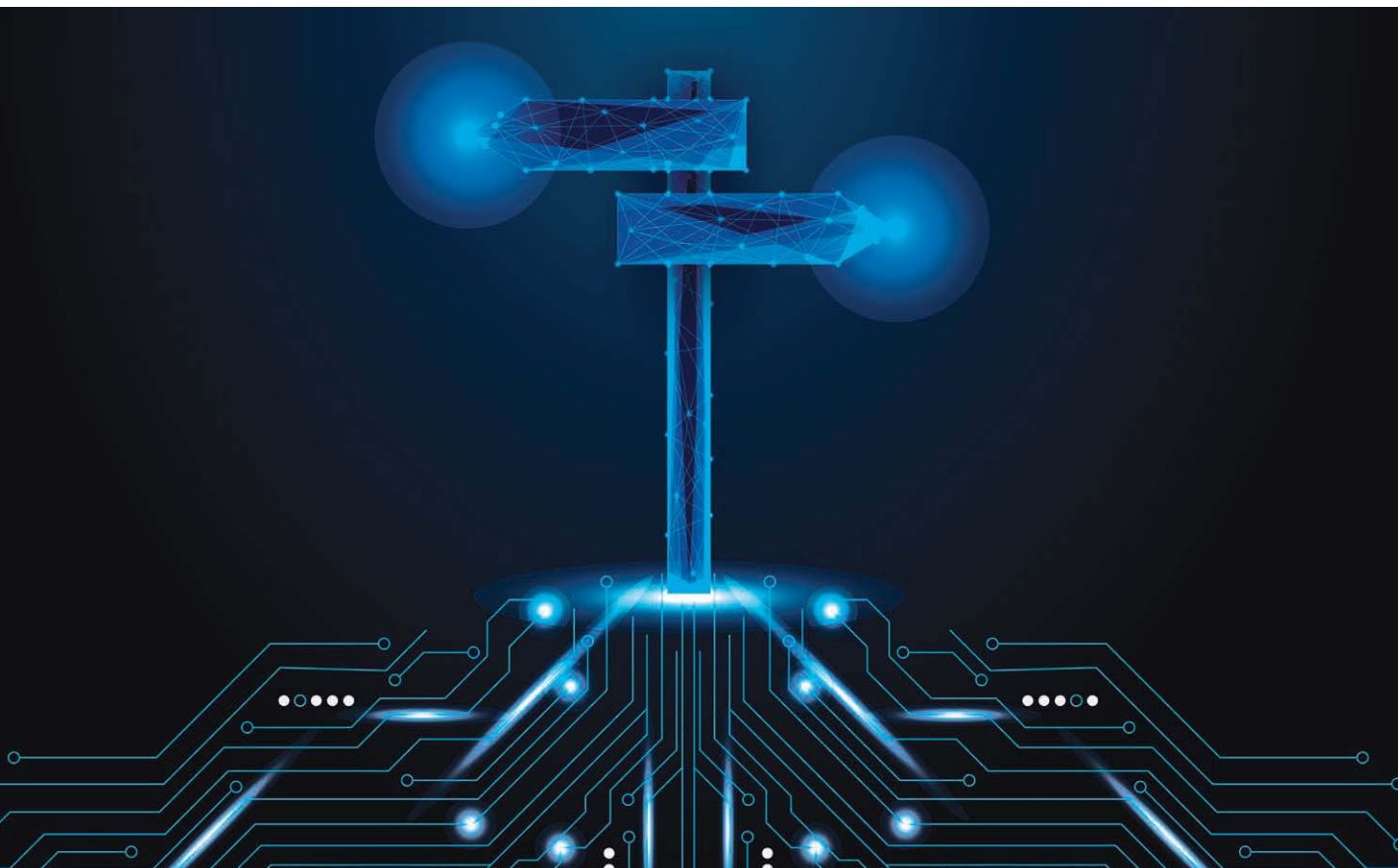
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Channeling AI

DICOM SR will play a critical role in imaging's AI adoption.

The explosion of medical imaging data, combined with a persistent shortage of radiologists, is driving the adoption of AI in radiology. From detecting subtle pathologies to quantifying disease burden and even drafting report impressions, AI is increasingly finding its way into medical imaging workflows. However, to truly harness its power, we need to discuss something far less flashy: how AI results are integrated into radiologists' reading workflow.

That's where DICOM Structured Reporting (DICOM SR) comes in. DICOM SR is a long-established medical imaging standard for communicating structured data. Most commonly, it has been used to transmit quantitative information such as ultrasound measurements, CT dose, and mammography computer-aided

detection findings, as noted in the June/July 2024 issue of *Radiology Today*. Now, SR is being used in a new, critical role: serving as the backbone for integrating AI outputs with reporting systems, PACS, and EHRs.

Today, some AI algorithm vendors deliver their outputs using nonstandard and unstructured technologies, including DICOM Secondary Capture (SC), essentially static screenshots, or PDF. The result? When an AI tool measures a lung nodule, for example, the radiologist is forced to manually dictate these measurements into the diagnostic report. This process is slow, error-prone, and risks negating productivity benefits provided by the AI algorithm.

In contrast, by implementing DICOM SR, AI outputs are encoded in a standardized and structured format. Whether measurements, annotations,

risk scores, or probabilistic assessments, these findings can be automatically inserted into a reporting template, eliminating manual transcription and ensuring data accuracy. In short, DICOM SR transforms AI from a siloed add-on into an integrated partner to the radiologist's workflow.

Real-World Impacts

The benefits of this structured approach aren't theoretical. In workflows that leverage DICOM SR, such as automated ultrasound measurement reporting, reading efficiency has been shown to improve by approximately 25%.¹ That's a huge gain, especially given the pressure radiologists are under to handle increasing imaging volumes. Just as importantly, structured data transfer eliminates the risk of transcription errors—mistakes that often lead to report addenda or, worse, potential patient care delays. By freeing radiologists and technologists from repetitive, manual data entry, DICOM SR has enabled them to focus on what

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Newfoundland and Labrador Health Services (NLHS), a leading provincial health care provider in eastern Canada, provides a real-world example that shows the integration of AI into a reporting system. To automatically calculate breast density and grade across 10 mammography sites, NLHS purchased an AI application from Denisitas. These calculations are now an important component of their diagnostic mammography reports. NLHS utilized a DICOM SR gateway to provide the connection, mapping, and transmission of this information directly to Nuance PowerScribe 360, eliminating the need for manual transcription.

Of course, none of this is without challenges. Implementing DICOM SR requires specialized expertise. While DICOM SR provides a structured framework, it also allows for flexibility in the way data is represented. AI vendors should ensure that engineers with DICOM SR expertise participate in the design for each AI application. A well-thought-out SR structure will facilitate downstream integration with other enterprise systems.

Multivendor Integration

Health care facilities may purchase solutions from many disparate AI vendors that ultimately need to be integrated. Utilizing an SR gateway application is often required to successfully map new AI results on top of existing ultrasound measurements, CT

dose, and other important structured data. They may even rely on the gateway vendor to provide connectivity to nonstructured data, such as DICOM SC for AI applications that have not yet implemented DICOM SR.

Another benefit of DICOM SR gateway applications is the ability to normalize units. Two different ultrasound vendors may use differing units (eg, cm vs mm) for measurements, and we expect that as AI is rolled out, we will see similar mismatches. Gateway vendors can provide normalization of units as part of their mapping functionality, assuring consistency in downstream reporting.

For example, RadNet, a national leader in outpatient imaging, is at the forefront of AI application adoption. They currently have integrated See-Mode for automatic thyroid measurements, suiteHEART for MR cardiac characterization, and Riverain for CT lung disease screening. Multivendor SR integration and data mapping to their reporting system requires a DICOM SR gateway, which allows AI output from all three vendors to be passed and added to diagnostic reports, assuring the maximum benefit from their AI investments.

AI-Powered Workflow

The next frontier is AI that automatically drafts report summaries, autofills the reporting template, and drafts recommendations. These cutting-edge tools are evolving rapidly, promising to eliminate repetitive work and dramatically reduce report

turnaround times. However, they also introduce new complexities. AI-generated summaries may incorporate quantitative metrics, qualitative assessments, and multimodality correlations, often with associated risk scores. Accurately integrating all inputs to these reporting systems is critical for their success. Manual dictation of numerical data will be incompatible with AI reporting.

As highlighted by industry experts like Herman Oosterwijk, one of the main barriers to effective AI integration is precisely this lack of structured, standardized encoding. In his words, relying on DICOM SC is a “curse,” creating more work instead of less.² The future demands richer, more adaptable SR frameworks that can evolve alongside emerging AI capabilities.

If we want to fully realize AI’s promise in medical imaging—faster interpretations, fewer errors, and ultimately better patient care—those involved cannot treat AI data integration as an afterthought. AI developers, dictation system vendors, and imaging informatics professionals must commit to DICOM SR. Selection of an SR gateway partner to assure multivendor integration, data normalization, and connectivity to nonstructured data is an important prerequisite to successfully implementing AI.

Getting this process right will transform AI from a set of isolated point solutions to a deeply embedded, workflow-enhancing force multiplier. Radiologists will spend less time manually transposing numbers and more time focusing on the diagnostic process. Adopting AI isn’t about chasing the latest tech trend—it’s about ensuring radiologists can provide the most accurate and timely diagnosis to patients and referring clinicians. DICOM SR isn’t just an industry standard; it’s the linchpin that makes your AI vision possible. ■

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For references, view this article on our website at www.RadiologyToday.net.