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PROCEED *With* CAUTION

*Personalizing
AI may be
one key to
its success.*



PELVIC PUZZLE

Understanding unexplained pain with the EMBOLIZE trial.

TALK ON THE STREET

Radiologists weigh in on the promises and pitfalls of large language models.

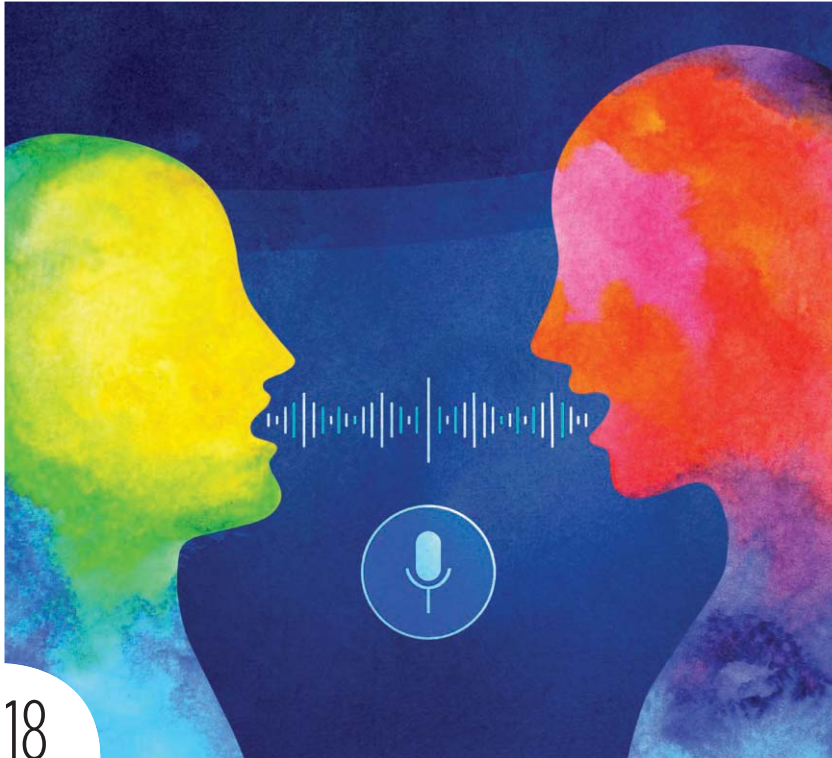
SUBTLE CONTRAST

A Look at Best Practices for MR, CT, and Ultrasound Contrast Dose Safety

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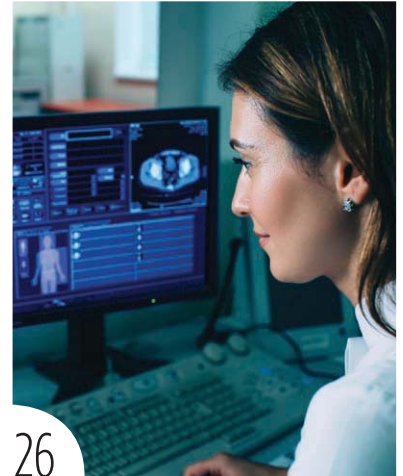
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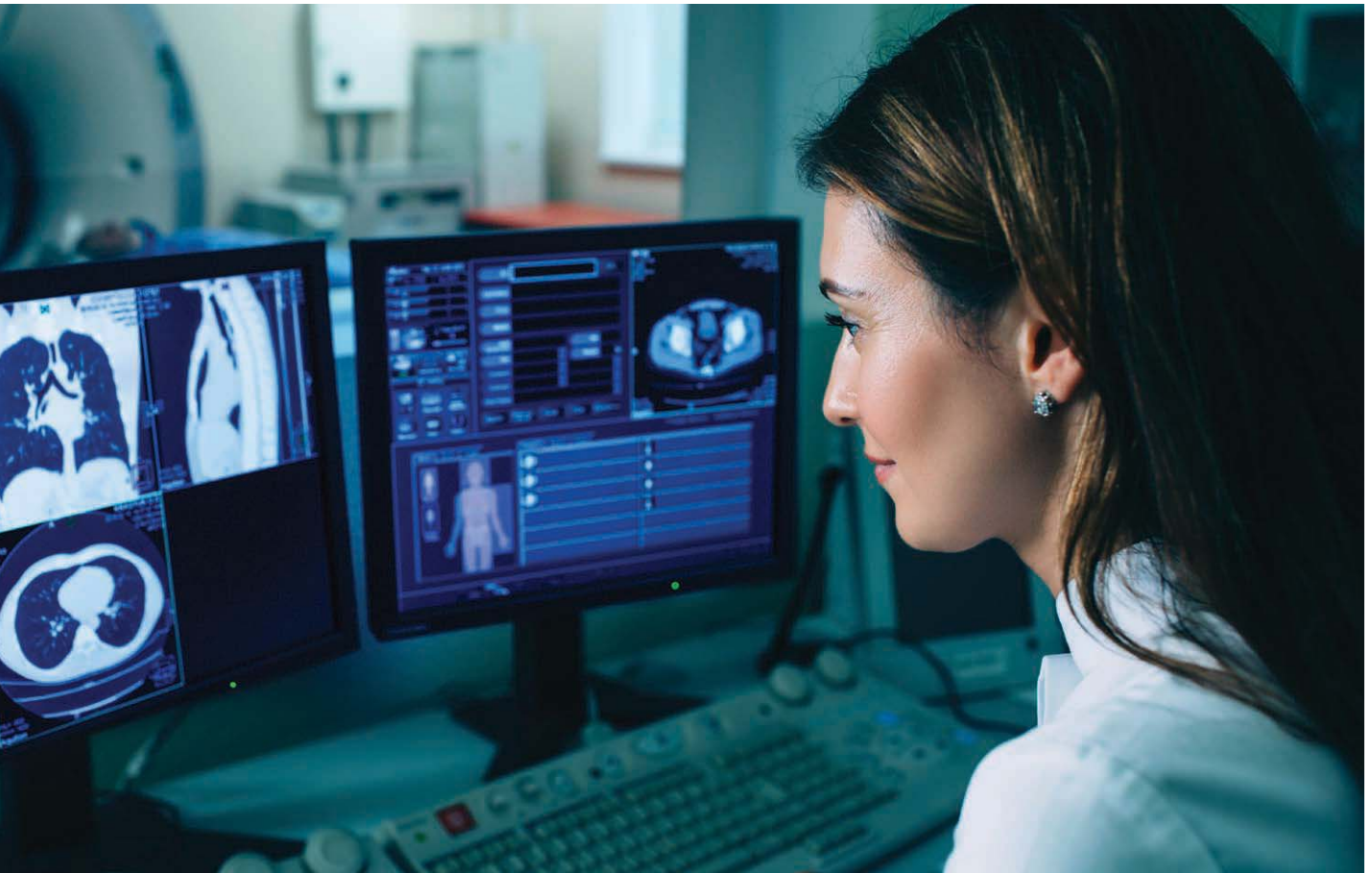
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Measuring Up

It's alarming that radiologists are still dictating exam measurements!

The DICOM Structured Report (SR) standard was developed over 20 years ago by the DICOM standards committee, and much has been written about its benefits.¹ About the same time, voice dictation systems began to replace manual transcription, enabling the automation and streamlining of diagnostic report creation. Many of these dictation systems have now added the capability to receive structured measurement information, which can be automatically inserted into report templates. This eliminates the need for the radiologist to dictate numerical values.

It is, therefore, surprising that the automation this technology enables and the subsequent productivity

and quality benefits radiologists and technologists can achieve are still largely unrealized. This is particularly so, given the increased focus on improving radiologists' reading efficiency over the last five years.

The ongoing reliance on manual processes reduces radiologist and technologist productivity and impacts their focus on both the patient and the clinical report. Most ultrasound and dual-energy X-ray absorptiometry (DEXA) measurement data workflows still involve the following:

- Technologists manually writing measurements on paper and doing one of three things—handing paper to the radiologists, typing measurements into a RIS, or scanning paper into a RIS or PACS.

- Radiologists sifting through the imaging measurements and either manually copying/pasting or dictating them into their clinical report.

Exacerbating these manual processes is the fact that:

- Multiple measurements are often associated with each exam type.
- Ultrasound measurement values are displayed with different labels and units by scanners from different manufacturers.
- Each manufacturer, and even scanners from the same manufacturer running different versions of software, may output measurement data differently.
- Significant radiologist and technologist shortages exist.

Automating and standardizing the workflow for capturing and inserting quantitative ultrasound and DEXA measurements into the radiologist's clinical report is a significant opportunity for improving radiologist productivity and report quality.

This opportunity is magnified by the prevalence of ultrasound and DEXA across inpatient and outpatient imaging and the fact that these exams commonly include 10 to 20 measurements. Beyond ultrasound and DEXA, SR data can provide computer-aided diagnosis values, CT dose data, and, increasingly, AI algorithm measurement results.

Growing Pains

Over the last 10 to 15 years, health care organizations have grown dramatically through mergers and acquisitions, impacting both inpatient and outpatient imaging organizations. This consolidation has burdened clinical information technology departments by requiring them to integrate disparate EHR, PACS, dictation, and many other enterprise systems. Merged organizations are also likely to have ultrasound and DEXA scanners from a wide variety of manufacturers—running a variety of software versions. Integrating all these modalities with one or more dictation system can result in inconsistent data across the entire health care enterprise.

To manage these inconsistencies, technologists and radiologists largely rely upon manual processes. Eliminating these processes involves implementing an automated solution that can accommodate varied measurement workflows and facilitate organizational change. Because of the complexity surrounding integration of all the different types of modalities, eliminating these manual processes is typically a low priority.

Simplifying the Process

Automating DICOM SR measurement workflows that involve dozens of scanners and possibly multiple reporting systems can be a time-consuming and daunting process.

In addition, the process should ideally involve the radiologists, as they know best what data needs to be

in their report, yet their availability for such projects is typically limited.

Technically, the implementation of DICOM SR automation involves mapping and converting the DICOM SR measurements from individual scanners to an interface provided by the dictation system or RIS. The good news is that modern SR mapping tools that support the following capabilities can dramatically simplify and speed up the implementation process, as well as the ongoing management of this automation:

- integrate with the major reporting templates from Nuance, M*Modal, and others;
- enable configuration changes to be immediately implemented so physicians can provide real-time feedback and benefit from immediate changes;
- include point-and-click visual mapping;
- simplify customization and support the mapping of hidden and non-standard SR fields that arise from different software versions;
- permit the standardized conversion and rounding of measurement units;
- facilitate the copying and customization of mappings to accommodate slight differences between vendor models; and
- allow SR data to be entered into an electronic form for easier editing, as well as orchestration and automation.

Stacking Benefits

Like all efforts to automate clinical workflows, any time human intervention and manual steps are eliminated, a cascade of benefits results. This is particularly true when trivial and repetitive tasks are eliminated, and the technologist can focus on the patient and the exam—while the radiologist can better focus on their diagnostic process and other critical tasks only *they* can perform.

The greatest benefits from automating and standardizing SR measurement reporting workflow involve improved radiologist productivity that results in the following:

- shortened report turnaround times; and
- eliminating the need for the radiologist to revise their clinical report.

Another downstream benefit of eliminating manual reporting processes is the improvement in report quality and the elimination of data errors on diagnostic reports. Each step of the traditional workflow, from writing numerical values onto paper forms to dictating numbers into a report, is an opportunity for mistakes. An estimated 3% to 5% of diagnostic reports contain some type of error that may lead to improper or delayed treatment.² By automating manual reporting workflows, the quality of diagnostic reporting increases, and errors can be eliminated.

Improved data quality and accuracy are realized by eliminating the risk of the following:

- radiologists accidentally dictating measurements incorrectly;
- technologists transposing measurements incorrectly; and
- medical errors.

Future Productivity

Health care providers and imaging organizations are under increasing pressure to improve radiologist productivity. The ongoing shortage of radiologists and growing problems with radiologist burnout, combined with the increasing use of medical imaging, are creating new levels of urgency to implement solutions that increase radiologists' productivity by eliminating tedious, low-value tasks. Automating the insertion of DICOM SR measurements into the radiologist report is low-hanging fruit that supports these goals. ■

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