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INFORMATION

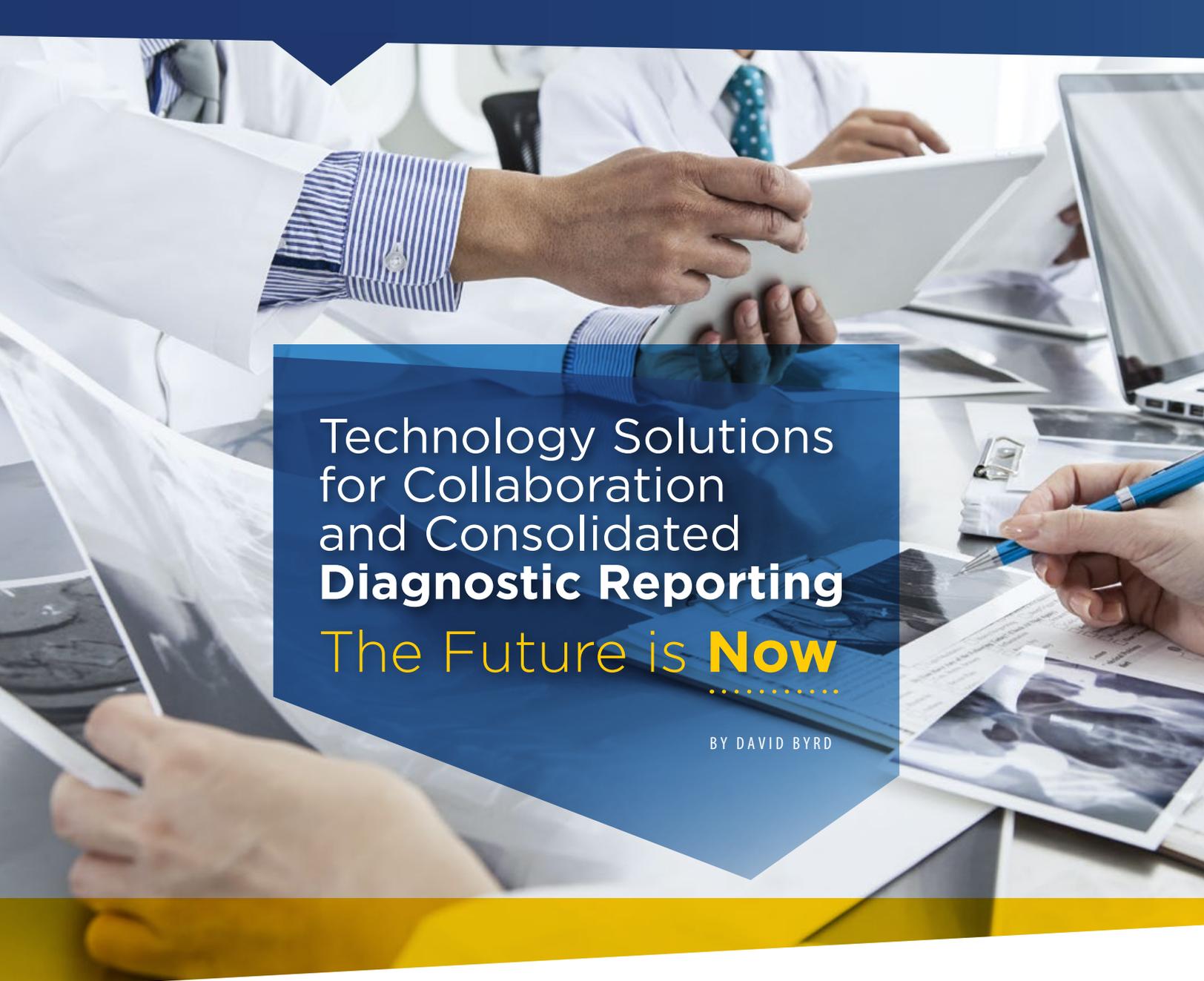
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Tales From the Radiology Jungle

Technology Solutions for
Collaboration and Consolidated
Diagnostic Reporting—
The Future is Now

Sharing Data Safely



Technology Solutions for Collaboration and Consolidated **Diagnostic Reporting** The Future is **Now**

BY DAVID BYRD

The advantages of collaborative medicine have been widely recognized, especially with the shift toward value-based pricing. In fact, studies show that when healthcare providers like pathologists, radiologists, and oncologists collaborate on cases, diagnoses can change as much as 25 percent¹ of the time, resulting in the potential for improved patient outcomes. In the area of breast cancer diagnosis and treatment, a 2010 SciMetrika study estimated that radiological-pathological discordance caused missed or delayed diagnosis in 5 percent of all new breast cancer cases in the United States—nearly 10,000 cases.² But for many care teams, the practicalities of collaboration have proven difficult. For radiology and pathology in particular, the specialties have long operated in silos, with both institutional

and IT barriers standing in the way of progress. Despite recent and rapid advancements in healthcare information technology, interoperability and regulatory mandates for meaningful use, challenges for improving diagnostic outcomes through collaboration of the two disciplines from a workflow, imaging, and reporting standpoint has persisted.

For those administrators and radiologists who are seeking ways to collaborate, there is good news on the technology front. Technology has at long last reached a tipping point, and commercial solutions are on the market today that not only allow for system interoperability between radiology and pathology—the ability for both specialties to securely exchange information bi-directionally—but also enable deeply integrated clinical workflows

that improve communication and collaboration between the two specialties. Since integrated workflows allow for the right information to be shared at the right time in the process, they can significantly impact operational efficiencies, saving time and money.

In addition to system interoperability and integrated workflows, current technology provides for secure, online, synchronous and asynchronous collaboration between specialties, both within and outside of a given network. In a synchronous collaboration environment, a radiologist and pathologist could review and discuss test results in real time, whereas asynchronous collaboration might mean sharing notes or annotating results to be read later by other members of the care team. These same solutions can also open up new revenue streams by allowing radiologists and pathologists to provide consultations on cancer cases outside of their network and even internationally. This represents expanding opportunities as the international community looks to the United States to meet the shortfall of radiologists and pathologists worldwide.

Further, companies like VisualShare are taking collaboration to new levels with solutions that actually combine radiology images and digital pathology scans. This system in particular supports whole-slide pathology imaging, DICOM and non-DICOM images, video and next-generation sequencing, and allows the user to view, manage, and annotate radiology and whole-slide pathology images digitally. When radiology, pathology, and even clinical information and images, which previously existed only in disparate systems, are integrated into a single, holistic technology platform, they can be further synthesized into what is commonly referred to as a consolidated diagnostic report (CDR). The CDR consists of much of the information that would be presented at a tumor board—the diagnosis, staging information, and radiology and pathology information—with the added benefit that all of the information is organized in one place, making it efficient to digest and act on it. This is very important to note not only because we are now in a healthcare environment that increasingly rewards based on quality of care versus quantity of services rendered, but also because healthcare is becoming a consumer-driven market.

Even artificial intelligence, once the domain of science fiction, can add value to the multidisciplinary collaboration process and enhance consolidated diagnostic reporting. Natural Language Processing (NLP), a component of artificial intelligence, is the ability of a computer program to read and understand text just as a human would. Radiolo-

gists and administrators have been familiar with NLP solutions for the past decade, due to computer-assisted coding solutions, but the newer NLP solutions on the market go well beyond ICD and CPT coding. vRad recently hosted a webinar on its use of an advanced NLP solution, SyTrue, identifying how they are leveraging NLP to read through millions of radiology reports to abstract critical findings, hedging terms, follow-ups, BIRADS, and more, for analytics and overall quality improvement. NLP, when integrated into workflow and collaborative IT solutions, can be used to identify discordance in results between radiology and pathology, send notification alerts utilizing configurable rules, and streamline workflow in these environments potentially reducing time to diagnosis. Further, NLP technology can be used to read through a database of existing consolidated radiology/pathology reports, using semantic search capabilities, identify cases based on designated criteria such as patient history, medications prescribed, diagnosis, etc. In doing so, it has the potential to take much of the leg-work out of researching and preparing to present a case at tumor board in an expedited fashion, and drive quality for better patient outcomes.

As more radiology locations get up-and-running with IT solutions that improve collaboration with pathology and enable them to deliver consolidated diagnostic reports, we can expect to see some real efficiencies to existing processes. For example, both radiology and pathology workups may each result in a number of different reports, with at least some of those residing in different systems. The referring physician, often an oncologist, then has to access each of those reports individually to review and assess the information. When all that information is organized in one system, the review process is streamlined significantly, and diagnostic accuracy is improved.

Another area where we're likely to see a big impact is in the identification and resolution of discordant diagnoses. When radiologists and pathologists work within their traditional silo structures, they have no visibility into the other's findings, and no straightforward way of knowing if their findings are in discordance. Faced with conflicting information, the oncologist may not be able to get a resolution until the next tumor board. As a result, diagnosis and treatment planning are also delayed; costs increase and quality of care decreases, negatively impacting value based pricing incentives. But for healthcare systems that have invested in IT solutions that allow radiologists and pathologists to collaborate, not only are both parties aware of the discordance, they work together to resolve

the discordance prior to sending the information to the oncologist, resulting in a more timely, accurate diagnosis.

For evidence that addresses IT solutions that enable collaborative medicine and consolidated diagnostic reporting as a reality, one need look no further than the David Geffen School of Medicine at the University of California Los Angeles (UCLA). A proof-of-concept project is currently underway at UCLA in which the radiology and pathology departments are teaming up to provide integrated diagnostic reports to the referring physician. The UCLA project, which is limited to lung cancer patients, is interesting in that it's tackling barriers to collaboration on both the institutional and technological fronts. From an institutional standpoint, both specialties have contributed funds toward a single diagnostic center where patients can receive radiology and pathology services. It's a patient-friendly solution that sends a clear message about UCLA's integrated approach.

To deliver the integrated reports, UCLA has set up a workflow that includes radiology, pathology, and other clinical services relevant to the diagnosis. Once the individual reports are aggregated in a portal, the radiologist and pathologist must work together to ensure their findings are concordant. At that point, the system can begin building the combined report. Since the project is early-stage, data is still being collected, and long-term outcomes remain to be seen. Still, the program does provide tangible evidence that IT solutions have advanced to the point that they can be used to integrate radiology and pathology workflows and deliver consolidated diagnostic reports.

UCLA isn't the only early adopter of technology-enabled collaboration tools and consolidated diagnostic reports. At the University of Kansas, radiologists and pathologists are working side by side in review of primary images addressing breast cancer patients, issuing a single consolidated diagnostic report leading to measurable improvements and therefore improved patient outcomes.

So what does all this mean for radiologists and radiology practices, and what does it mean for their patients? For starters, it's a big step on the path toward value-based care—the best patient outcomes at the lowest cost to the healthcare system. From a care standpoint, we can expect to see more accurate diagnoses delivered with fewer delays, although it will take some time for data to be collected and analyzed to determine what the long term impact will be on patient outcomes. From a cost standpoint, the significant operational efficiencies

to be gained, especially those that come from streamlining time-consuming, labor-intensive tasks, should drive savings. Taking a long term perspective, one can envision that more accurate, timely diagnoses will lower the overall, long term costs of treating a given patient while improving the quality of care.

Another important potential outcome for radiologists, whose contributions to the diagnostic process have been increasingly commoditized, is that it means a seat at the table. Diagnostics are the foundation to patient care; with more synchronized communications and greater visibility among the rest of the care team comes greater appreciation of the value radiologists add to the continuum of care. Radiologists have the opportunity here to step into a more consultative role, thereby putting an end to commoditization, and ultimately, reimbursement erosion.

It's important to note that technology, once a barrier to collaboration between radiology and pathology, is now the key to it. Advanced IT solutions that allow for integrated workflows, synchronous and asynchronous collaboration, advanced imaging solutions that incorporate radiology and digital pathology, as well as consolidated diagnostic reports, are real and they are available today. And when armed with these smart data solutions, radiologists have the opportunity to deliver the highest quality care at the lowest cost to the healthcare system and fully participate in the value-based healthcare system. ■

RESOURCES

1. Burns, Joseph. "UCLA Pathologists, Radiologists Produce Combined Reports." *The Dark Report*, 26 January 2015. Web. <http://www.darkreport.com/dark/recent.htm>. 21 May 2015.
2. "The Importance of Radiology and Pathology Communication in the Diagnosis and Staging of Cancer: Mammography as a Case Study." *Improving Cancer Research Policy through Information Technology*. ASPE.hhs.gov, November 2010. Web. <http://www.aspe.hhs.gov/sp/reports/2010/PathRad/index.shtml>. 21 May 2015.



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