OIS holds the key to value-based care

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An estimated 80% of serious medical errors occur between caregivers during the transfer of patients.[1] These errors lead to more adverse events, more hospital readmissions, more unnecessary duplication of care, and higher costs.[1]

Medical specialties, including radiation oncology, are implementing strategies to reduce these types of medical mistakes in the continuum of care (COC) — the sharing, coordination, and integration of medical information among different providers[1] — by leveraging the robust tools available in next-generation oncology information systems (OIS).

Value-based healthcare

As healthcare moves from volume-based to value-based models, collaboration within and across departments such as radiation and medical oncology, radiology, pathology and surgery is critical for delivering care efficiently and safely.

"As the incentives in the American Recovery and Reinvestment Act of 2009 and the Affordable Care Act of 2010 drive the transition from volume-based to value-based medical care, highly effective COC will be integral to the success of new primary care practice models, such as the Patient Centered Medical Home and new reimbursement models, such as Accountable Care Organizations," said David M. Schlossman, MD, PhD, FACP, MMI, Missouri Cancer Associates, Columbia, MO.[2]

Seth Blacksburg, MD, Assistant Professor of Radiation Oncology, and Robert Ghafar, Radiotherapy Technical Administrator, Department of Radiation Oncology, at Mount Sinai Hospital, New York, NY, are thought leaders in the initiative to embrace value-based care.

"It's impossible to accurately predict how changes in healthcare policy will affect care, but it is easier to expect an emphasis on preventive care, wellness programs, and health initiatives, and certainly COC if the value-based payments reward physicians and the healthcare systems for quality parameters and not just simply volume-based ones," said Dr. Blacksburg.

"It's clear that healthcare delivery will become more integrated and complex. We have enough evidence that traditional models that incentivize physicians for visits and for procedures don't always result in superior patient outcome; therefore, certainly COC has the potential to provide improved patient outcomes based on altering the focus of the physician-patient interaction," he added.

OIS bridges the gap

It is well established that miscommunication between providers can lead to error. One of the leading ways to bridge the communication gap is through electronic health records (EHRs). Today, an OIS does more than manage patient data — it acts as an EHR portal for oncology. An OIS enhances the overall workflow, supports physician collaboration across disciplines, provides modules for meeting MU objectives, enables data mining for tracking patient care, and facilitates the physician-patient relationships.

Effective communication

Collaboration tools in the OIS help to streamline department workflow and communication. Treatment planning, for example, is one of the most common tasks in radiation oncology, yet the exchange between the dosimetrist and radiation oncologist is often cumbersome. The dosimetrist first brings in the imaging data sets and draws the normal structures. The radiation oncologist then reviews the normal structures and defines the target. Once that is completed, the dosimetrist begins the planning, which is finally reviewed by the radiation oncologist. The challenge along the way is communicating completion of the task and that it is ready for the next step and team member.

The care path module on Varian Medical System's ARIA version 11 system facilitates this communication. ARIA for radiation oncology (v11) is a certified EMR for ambulatory environments. It incorporates a comprehensive

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FIGURE 1. *Using Elekta's MOSAIQ Oncology Information Management System, clinicians at Kettering Medical Center (Kettering, OH) can access the electronic medical records of patients who undergo treatment on the facility's Leksell Gamma Knife Perfexion system.*

oncology-specific EMR that enables clinicians to design a personalized care path for each patient, from initial diagnosis through follow-up. In the care path interface, users can define a specific task for treatment planning and assign it to a colleague. When the task is completed, an alert pops up on the assigned colleague's task pad. That alert hyperlinks to the Eclipse treatment planning system by Varian.

"When I complete the task the dosimetrist is aware of the status of each plan. This significantly helps that," said Ajay Bhatnagar, MD, MBA, a radiation oncologist at Cancer Treatment Services International (CTSI), Casa Grande, AZ, and an Assistant Professor of radiation oncology at the University of Pittsburgh School of Medicine, Pittsburgh, PA.

Similarly, the radiation oncology department at Mount Sinai uses automatic trigger-based electronic checklists on Elekta's MOSAIQ, a comprehensive OIS that centralizes traditional radiation oncology, particle therapy, and medical oncology patient data into a single user interface. MOSAIQ provides oncology staff access to the underlying clinical and administrative data to improve both clinical care and operational efficiency.

"MOSAIQ has a robust set of manual and automatic trigger-based electronic checklists," said Dr. Blacksburg. "These fully-automated checklists remind the department of their responsibilities for a given task."

As one of the leading users of the automated and trigger-based checklist feature on MOSAIQ, Mount Sinai is ready to expand upon its functionality.

"The next step for us with MOSAIQ is to explore the potential of clinical and operational, system-based alerts. What that means is, for example, if two physicians put in an order for the same patient, the system would alert the providers that the same order was already put in 15 minutes ago," said Ghafar. Such a system could eliminate redundancy and waste.

The centerpiece of many clinical cancer programs is the tumor boards, a multidisciplinary approach where specialists from radiation and medical oncology, surgery, radiology, and pathology review and discuss treatments and options for a particular patient. The doctors at Mount Sinai Hospital not only embrace the concept of multidisci-

plinary collaboration but also consider tumor boards critical to patient care.

"In the era of the value-based model and sophisticated EHRs like MOSAIQ, there is a tremendous need to define the parameters of quality care and to foster meaningful, bi-directional dialogue between departments," said Dr. Blacksburg. "We are involved in multidisciplinary tumor boards on a regular basis. I think patient care is enhanced by a multidisciplinary tumor board setting, and as we turn to a more value-based model, as long as value is understood as incentivized, I think it's clear that multidisciplinary tumor collaboration will continue to meaningfully evolve."

MOSAIQ achieves this by integrating with an array of hospital systems, treatment devices, and imaging systems, increasing accessibility to critical data anytime by remote users on various platforms. MOSAIQ captures the entire patient chart in a common database that users can customize, allowing radiation oncologists and medical oncologists to coordinate care for complex cases (Figure 1).

In one of the busiest stereotactic radiosurgery centers in the United States, performing about 550 cases a year, the doctors at the Mary Hillman Jennings Radiation Oncology Center at UPMC Shadyside, Pittsburgh, PA, rely heavily on multidisciplinary collaboration. "Our paradigm is collaborative, and I work with other surgeons as a team in delivering and creating the radiosurgical plan. This is an interdisciplinary approach," said Dwight Heron, MD, Vice Chairman and Professor of Radiation Oncology, and Director of Radiation Services for UPMC, Pittsburgh, PA. The department uses a native Cyberknife OIS, but its imaging and lab data are available in the Varian Aria OIS.

"We have our medical oncologists and radiation oncologists using the same system, so we can see where in the course of chemotherapy they are in. Our surgical
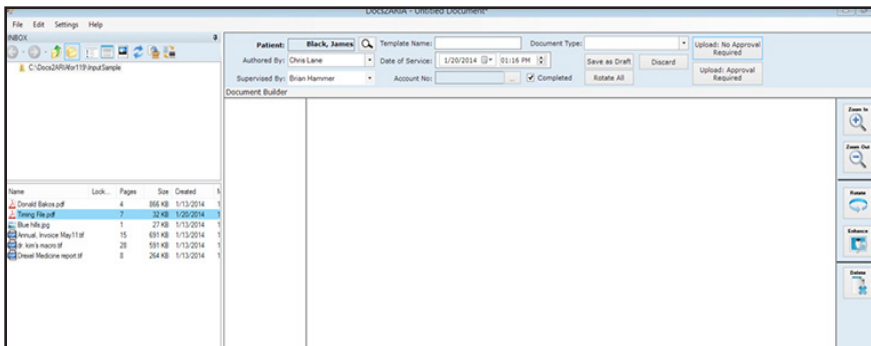
FIGURE 2. Docs2ARIA is a plug-in that enables uploading of documents from other offices directly into an EHR instead of forcing users to scan them in. It will soon be available on Varian's ARIA v.11 platform.

oncologists are on a different platform, but we have an interchange system to enable passing information between these systems," said Dr. Heron. "With this unified system, there is less opportunity for miscommunication."

Workflow enhancements

In an era where ubiquitous access to data is expected, interoperability between EHRs continues to be a challenge, despite the presumed adoption of HL7 interoperability protocols among certified EHRs.

As a result, a new trend in EHR-platforms is the development of plug-ins that allow third-party vendors to include applications allowing users to communicate and import information without having to integrate other software. Version 11 of ARIA allows third parties to develop them. One such example is Docs2ARIA, a plug-in that enables uploading of documents from other offices directly into an EHR, instead of forcing users to scan them in (Figure 2).

One of the pilot sites for Docs2ARIA is CTSI. "Previously, if there was a 20- to 30-page fax, comprising discrete documents, whether it's the pathology report, or a CT or MRI or brain scan, we had to individually create those documents that were printed out and filed. With Docs2ARIA, we can upload the documents directly," explained Dr. Bhatnagar. "I am pleased that Varian recognizes the possi-

bility of enhancing ARIA, allowing third-party vendors to create useful features through the web service interfaces. At the end of the day, we as end users want to be able to use EHRs, such as ARIA, with high efficiency and high quality," said Dr. Bhatnagar.

Quantifying the value of MU

An important piece of the value-based care puzzle is the Meaningful Use (MU) initiative. The Medicare and Medicaid EHR Incentive Programs provide financial incentives for the "meaningful use" of certified EHR technology to improve patient care. To receive an EHR incentive payment, providers have to show that they are "meaningfully using" their EHRs by meeting thresholds for a number of objectives.[3]

The objectives set in Stage 2 MU can be recorded in an OIS, such as Elekta's MOSAIQ and Varian's ARIA platform. With the reports embedded in these systems, the task of attesting to MU is less daunting. Nonetheless, compliance with MU in 2012 was <1% in radiation oncology. Dr. Bhatnagar believes the lack of participation is due to the view that these measures are not really impacting quality of care.

"There is the perception that MU measures were developed for primary care physicians and not specialists," he said. "However, CMS is allowing for the different ways specialties practice,

and there isn't going to be an excuse for specialists not to participate. Finding and identifying true quality metrics is the basis of quality-based care."

As Dr. Bhatnagar explains, specific oncology measures are available; these include stage or (ER)-positive and/or progesterone receptor (PR)-positive status.

"For prostate cancer, you want to [know] if the patient received conformal therapy, and if the patient's stage is listed. For breast cancer, the estrogen receptor or progesterone receptor should be listed. Other oncology measures are radiation dose limits to normal tissue and documenting whether the clinicians used conformal therapy for prostate cancer," he said.

"These are the discrete measures relevant for oncologists that are part of MU measures," added Dr. Bhatnagar. "We believe the requirements for MU are helpful for patients. The Varian medical record meets requirements for MU, providing the COC documents, a patient portal, and patient reminders. All of these new requirements for MU are a part of Varian's EHR system, ARIA, which helps us provide COC."

As one of the first radiation oncology departments in New York State to attest to MU, Mount Sinai has positioned itself as a champion of the initiative. Dr. Blacksburg agrees that MU promotes the adoption of tasks that can improve patient outcomes.

"Without a doubt it makes sense to use paperless patient records and to mandate the use of CPOE (computerized physician order entry) and drug and allergy checks," said Dr. Blacksburg.

"One of the limitations I have seen with MU is that one of the parameters of quality care metrics isn't as germane to select patient populations. For instance, for patients with end-stage cancer who come to me with palliative radiation therapy, allocating resources to calculate body-mass index or to avert hyper-

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tension really aren't the most pressing issues and, frankly, it can really result in inferior care," he said.

ELEKTA built the MU metrics upon pre-existing MOSAIQ workflows within its radiation oncology system to make it easier for the radiation oncology department at Mount Sinai to attest without much interruption to the clinic workflows.

In addition, ELEKTA will roll out new features for its U.S.-based users. The new functionality will include features for meeting MU Stage 2 objectives, such as ePrescribing, a patient portal, an immunizations interface, and a clinical quality measures interface.

Data mining

Big data is more than just a buzzword; it is an important tool for measuring performance across healthcare.

"Through the use of big data, COC has the ability to hugely reduce errors and, therefore, cost," said Ghafar.

Value-based care involves quality metrics on the EHR, and the MU initiative requires clinicians to submit the clinical quality measures. At Mount Sinai, a team of physicians led by Dr. Blacksburg and Ghafar meet regularly to help define quality metrics and what outcomes they want to limit. While platforms like MOSAIQ provide a template for conducting and measuring steps to limit medical issues, the onus is on the clinicians to define the parameters they want to measure and the quality of care they want to deliver, as well as how to derive those measures to help achieve them.

"You have to define what patient outcomes, what inventory management parameters, and what quality metrics matter to you the most and which improve patient care at the end of the day," Dr. Blacksburg said. "If you wanted to improve workflow in a global level, you could utilize these features and the consequent data to refine operations management so that you could include identification of bottlenecks."

Mining clinical data can lead to better outcomes. Dr. Heron and his staff use the Clinical Pathways system to review clinical evidence to determine optimal treatments. "With bone metastases, there's evidence that 1 to 5 treatments is just as good as more than 10 treatments and is better than 20 treatments. However, many places still treat patients with 10 or more treatments. By developing our Clinical Pathways system, all 38 doctors at UPMC use the same recipe book. That's important, because if 5 treatments are just as good as 10 or 20, and have the same outcome — the same control rates and the same toxicities — the shorter courses are more cost-effective," said Dr. Heron.

Next on the horizon is leveraging data to predict outcomes. "Predictive analytics really is the future of radiation oncology EHRs. On a local level, we are very close to achieving this and other exciting models," said Ghafar.

Tips for implementing value-based care

Physician champions are guiding other healthcare facilities in adopting quality improvement measures. The team at Mount Sinai, for example, has provided guidance to local hospitals across the country.

To efficiently implement an MU program and make it as seamless as possible, Ghafar suggests going back to the basics of clinical workflow. "It's really all about defining your existing workflow. You're not going to get full adoption of an EHR, which includes MU, without first mapping out the individual tasks, and then designating those tasks to the responsible staff," said Ghafar.

"When we moved from a paper-based environment to a fully electronic one, we also spent the time redefining our existing workflow to incorporate MU adoption. We also redefined our workflow to incorporate MU adoption. When we talk to folks around the country we say go back to the basics and redefine your workflow and move forward from there." he said.

While an OIS may be a robust template for conducting and measuring steps to limit medical issues, as Dr. Blacksburg points out, clinicians should define the parameters they want to measure and what level of quality care they want to achieve. .

Another important strategy for supporting COC is to engage patients through patient-based portals. "These portals allow patients to interface with physicians. More importantly, we can employ other key healthcare practitioners, such as nurse practitioners, physician assistants, facilitating dialogue between different physicians and really employing the entire healthcare team," noted Dr. Blacksburg.

Ultimately, physician buy-in is fundamental to the success of any value-based model. "You need to engage leadership internally, have buy-in, and then have leadership empower the clinician champions, the people who have training and background and want to dedicate themselves to the task," said Dr. Blacksburg. "The department has to allocate time, and to provide monetary resources and access to people in IT.

These tips to implementing value-based care are essential to really emerge as champions of EHR and MU.

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