

Case Study: Patient-Friendly Radiology Reports

Radiologists in Colorado collaborate on an interactive and educational tool to help patients read and understand their radiology reports.

By Chelsea Krieg

Key Takeaways:

- With increased access to radiology reports through patient portals, patients are eager to understand their imaging results.
- A radiology group and medical imaging center partnered to offer a radiologist-developed tool that creates patient-friendly radiology reports.
- Among patients who access their radiology reports with the tool, 86% report a positive experience.

Natalie Law had been suffering from chronic migraines for years, but when the headaches grew severe, she knew she needed medical attention. In December of 2017, Law visited her primary care physician (PCP), who ordered an MRI. When her PCP asked her to come into the office to review the MRI results, Law knew the news couldn't be good.

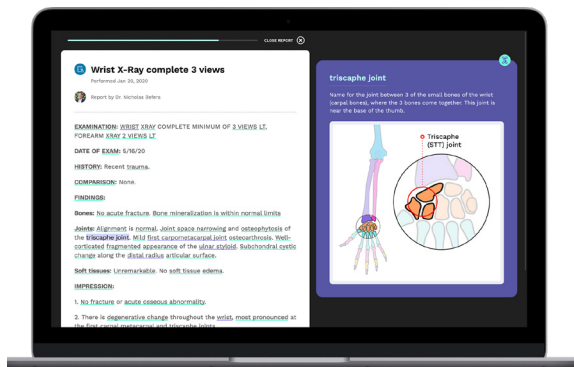
The images revealed meningioma, a tumor that forms on the brain membrane and spinal cord. Law was devastated. "It was the last thing I expected," says Law, a social worker and hospital liaison with a rehab skill nursing facility in Parker, Colorado. "When I received the diagnosis, I was rattled with anxiety. It was overwhelming to process."

Since then, Law's care team, including technologists at Touchstone Medical Imaging and radiologists at Diversified Radiology, has monitored her meningioma with regular MRI scans. After each scan, Law has suffered anxiety about whether the tumor has grown and how it has changed while waiting days for a doctor to call to discuss her scans.

"It was hard when I had to wait for the doctor to call and explain the findings to me," she says. "I started searching for answers online and ended up looking at things that had nothing to do with my situation. My immediate thought was, 'I'm going to die,' and I was so scared."

In late 2020, Touchstone Medical Imaging and Diversified Radiology empowered Law and other patients in their care when they partnered to introduce a new patient portal with a radiologist-developed reporting interface called Scanslated. The portal allows patients to access their reports sooner, and the interactive interface includes definitions and explanations of medical terminology and diagrams of the anatomy to help patients better understand their imaging results.

Law says the new system has eased her anxiety and allows her to participate more fully in her care. "Now, I know what the terms mean and can ask more relevant questions during the consultations with my doctor," she says. "I'm no longer living in constant fear of the unknown."



Scanslated is an interactive reporting interface that provides diagrams and definitions to help patients understand their imaging results.

Seeing a Need

Law is not alone. Research indicates that as patients receive increased access to their radiology reports, they want language that helps them understand those reports, which are traditionally written with the referring physician in mind. When reports are written in lay language, patients can better prepare for appointments and they are empowered in their care.¹

"When patients better understand their radiology reports, they are more engaged in their healthcare," says Jennifer L. Kemp, MD, FACR, who at the time was vice president and a body imaging subspecialist at Diversified Radiology. "They are better positioned to advocate for the care they need when they have discussions with their physicians and are more likely to adhere to treatment recommendations if they understand the reasoning behind those recommendations. This means that, ultimately, patients will have better outcomes."

With this in mind, Kemp led an effort at Diversified Radiology, the radiology group that reads images for Touchstone Radiology, to implement a patient portal with interactive patient-friendly reports to help patients understand their imaging results. The project was just one of several patient-centered care efforts that Kemp and the Diversified team has initiated in recent years. In 2017, for example, Kemp helped develop an immediate results delivery program that enables

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Jennifer L. Kemp, MD, FACR, who at the time was vice president and a body imaging subspecialist at Diversified Radiology, recognized the value in the interactive reporting interface to help patients understand their imaging results.

radiologists to speak with patients about radiology results over the phone ([read more about this initiative in this Imaging 3.0™ case study](#)).

Kemp got the idea to implement the interactive interface when she met Nicholas T. Befera, MD, during his interview for a vascular and interventional radiologist position with Diversified and was eager to learn more about the interactive, patient-friendly reporting tool that he co-developed called Scanslated.

"I'm passionate about patient-centric radiology because I want the entire patient experience to be easier in radiology, and I want patients to see the value that radiologists bring to the table," Kemp says. "Scanslated is the first company that I was aware of that offered a patient-friendly radiology report interface, and I was immediately interested."

Developing a Solution

Befera, who is now assistant professor of radiology at Duke University Medical Center, created the Scanslated tool in 2016 with Ryan G. Short, MD, assistant professor at Mallinckrodt Institute of Radiology at the Washington University School of Medicine. Befera and Short, both fellows at Duke Medical Center at the time, conceived the idea for the patient-friendly reporting tool after patients who accessed their reports through a patient portal began calling with questions about their studies.

"Patients were accessing their reports and having difficulty understanding them," Befera says. "We recognized

the opportunity to improve the patient experience and increase the visibility of radiologists. We wanted a patient-centered report that could engage and empower patients in a way that hadn't been possible before."

To that end, Befera and Short developed software that analyzes radiology reports and provides explanations (written in patient-friendly language) for over 7,000 radiology terms and phrases along with hundreds of interactive diagrams that explain areas of the body in the context of the report. For example, the interface defines axilla as "another name for the armpit area. This area is important in breast exams because a small amount of breast tissue extends into it. The axilla also contains lymph nodes." It also includes a diagram indicating the exact area where the axilla is located.

"It isn't just a dictionary," Befera explains. "These are plain-language explanations of terms and phrases that are commonly found in radiology reports. We built the phrase bank over time and are continuously adding to it. All of our explanations are written by board-certified radiologists. They include definitions for non-radiology terms used in a radiology context. Something like *unremarkable* is a great example. The meaning is different in a radiology report than in a dictionary."

To test the effectiveness of the interface on improving the patient experience, Befera and Short piloted a study. The study asked users on an online crowdsourcing program to review a standard radiology report, a patient letter modeled after the Mammography Quality Standards Act requirements, or the Scanslated interactive patient-centered report.

Befera, Short, and their research team collected data on participant preferences between these three groups for two hours. After that, they surveyed the participants. The results of the survey indicated that participants who accessed the "Scanslated" report and those who received the patient letter had much better understandings of the radiology reports than those who only had access to the radiology report. Patients who had access to Scanslated were also much more satisfied with the interpreting radiologist, whose photograph, name, and contact information are included as part of the interface.²

Making a Plan

Based on the impressive pilot results, Kemp saw a lot of potential for leveraging the tool at Diversified Radiology, which serves 68 hospitals, clinics, and imaging centers in Colorado and Kansas. After Befera joined the Diversified team in September of 2018, he and Kemp immediately began discussing how they might implement the tool within the radiology group. "We knew we couldn't roll it out everywhere all at once," Kemp says.

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“So, we had a conversation about the easiest way to get this initiative off of the ground the fastest.”

After discussing the tool with Diversified’s CEO and president, Kemp and Befera decided to approach Touchstone Medical Imaging, an imaging center that partners with Diversified’s radiologists for reading studies. “We knew that Touchstone had a large presence in the area, which could provide more patients with access to the interface and its benefits,” Kemp says, “and we know that they also have a heart for patient-centric care.”

Kemp and Befera reached out to Touchstone’s administrative leaders and set up an appointment to meet with them to discuss the tool. In a presentation to the group, Kemp and Befera shared statistics about the value of patient portals, emphasized the challenges that patients face when navigating and understanding radiology reports, and offered Scanslated as a solution.

Touchstone saw offering Scanslated’s services as an extension of the patient-centered practices they value. “When the physicians from Diversified Radiology first reached out to us about incorporating this into our shared approach to patient-centric care, we immediately recognized the opportunity to differentiate ourselves from other outpatient imaging centers and to better connect with patients,” says Tyler Rauenzahn, Touchstone’s vice president of operations for Colorado, Montana, and Nebraska. “We just needed to see exactly how the technology would work in the real world.”

Implementing the System

With interest from the Touchstone team and their referring providers, Kemp and Befera turned to the technology. At the time, Touchstone did not have a patient portal, so their first step was for Scanslated’s software developers to build a patient portal through which patients could access their imaging reports.

“Once we had buy-in, we had to figure out from an IT perspective how to allow our systems to talk to each other safely as we connected the Scanslated portal at Touchstone with the radiology reports developed at Diversified,” Kemp says. The team implemented a HIPAA-compliant two-step verification process to ensure patient records would remain secure.

It took almost a year to develop and integrate the systems, but by November of 2020, Touchstone was ready to launch the tool in a pilot program that focused on a singular modality, X-ray, at three of its 10 imaging centers in Denver.

“With any new technology that involves patient care, it’s important to roll it out incrementally to make sure it works as intended,” Rauenzahn explains. “We wanted to understand how this technology was received among

patients who had undergone X-rays before expanding it to modalities used for more acute issues. It was also easier for us to navigate the early phases of the pilot with one type of modality.”

Promoting the System

To encourage patients to access their patient-friendly reports via the patient portal, Befera and Kemp distributed flyers to all of Touchstone’s participating centers. The [flyers](#) explained how the tool works: After a patient receives a scan at Touchstone, the radiology images are sent to Diversified. Once the radiologist reads the images and completes the report, they send their report to Scanslated and the tool automatically annotates it. After that, the system sends an automated text message to the patient with an invite to access the report via the patient portal.

“Delivering the link via text message allows us to manage the process and ensure that any communication that needs to occur with the referring provider happens before patients access their imaging reports,” Rauenzahn says. “Receiving reports in an interactive format with easily consumable language and without having to hunt down a separate link to a website creates a radiology experience that we believe differentiates Touchstone from other providers in our region.”

To help patients understand how to access and view their reports, Befera and Kemp developed postcards to distribute to patients. The [postcards](#) explain that



Nicholas T. Befera, MD, assistant professor of radiology at Duke University Medical Center, co-developed Scanslated, an interactive tool that helps patients understand their imaging reports.

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Tyler Rauenzahn, Touchstone Medical Imaging's vice president of operations for Colorado, Montana, and Nebraska, says the interactive reporting interface is an extension of the group's patient-centered care efforts.

patients will be contacted through text messaging when their reports are available in the portal, usually within a day. The cards also describe the secure link that patients will use to access their reports and how to log into the system on their computer or mobile device and navigate the two-step verification process using their name, date of birth, and phone number. After logging in, they are able to access current and former imaging reports — including studies that occurred before Touchstone began using the tool.

Reviewing the Results

Since Touchstone and Diversified began piloting and subsequently expanding the implementation of the patient-friendly reporting tool, nearly 8,000 patients have viewed over 9,100 reports. Patient response has been overwhelmingly positive, with 86% of patients pleased with the tool. According to one patient's response to a feedback survey: "The educational diagrams and definitions make me, as the patient, feel like I have some insight over my own health instead of feeling left in the dark. Knowledge is a great thing a doctor can give a patient!"

In December of 2020, Touchstone rolled out the program to all of the modalities at seven of its Denver centers. Just in time for the holidays, Law received an unexpected gift — the chance to read and understand her most recent MRI. "Having access to my radiology reports in a way I can understand has helped me cope with accepting that this tumor is a part of me, but it doesn't define me," she says. "I now feel like I have the tools and knowledge to advocate for myself. That is incredibly empowering and so good for my mental health."

Law says that the tool has been empowering for both her and her husband as they navigate her care. "I wish I had this when I was initially diagnosed," she says. "It has helped me take back control. I haven't even touched Google to look up medical questions since I've had access to Scanslated."

Monitoring Results

Patients aren't the only ones who have been happy with the tool. Despite initial concerns about call volume and challenges associated with communicating difficult results, referring providers have also offered positive feedback. "Referring providers were very supportive of the Scanslated reports throughout the pilot. Early anecdotal feedback indicates we're heading in the right direction," says Rauenzahn, who emphasizes that Touchstone's referring providers share an appreciation for the value of patient-centric care.

Touchstone is continuing to monitor results and feedback from both patients and referring providers while evaluating opportunities to expand this service to all of their imaging centers. The tool has also allowed radiologists to feel more connected to patients. "Radiologists provide a lot of value, but we are often in the background and the patients don't know about the work we do. This is a chance for radiologists to add value to the patient experience in a way that they can see," Befera says.

In turn, Law feels more connected to her radiologists. She even looks to see if she recognizes the radiologist who read her report. "It sounds strange," she says, "but you are building a relationship with a person you don't know. It is comforting to know I have a number I can call and a hand that I can reach out to if I need it. I'm not alone."

Endnotes

1. Johnson AJ, Easterling D, Williams L, Glover S, Frankel RM. Insight from patients for radiologists: improving our reporting systems. *J Am Coll Radiol.* 2009;6(11):786-794. doi:10.1016/j.jacr.2009.07.010
2. Short RG, Middleton D, Befera NT, Gondalia R, Tailor TD. Patient-centered radiology reporting: using online crowdsourcing to assess the effectiveness of a web-based interactive radiology report. *J Am Coll Radiol.* 2017;14(11):1489-1497. doi:10.1016/j.jacr.2017.07.027

Now It's Your Turn

Follow these steps to begin integrating patient-friendly reporting systems into your practice, and tell us how you did at imaging3@acr.org or on Twitter with the hashtag [#Imaging3](https://twitter.com/Imaging3):

- Put yourself in the patient's position. Consider how imaging reports come across to people without medical training and brainstorm opportunities to institute patient-friendly reports.

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- Consider integrating a patient-friendly reporting interface into your patient portal.
- Track the impact of your patient-friendly reporting system and make changes and updates to the tool as needed.

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