

## Case study

# Speech accuracy and stability: How one radiology group handles 1.7 million exams per year

Charlotte Radiology, Charlotte, N.C.

### Radiology group snapshot



**1.7 million**  
annual exams



**120**  
radiologists



**15**  
hospitals



**25**  
imaging centers

### Organizational profile

Established in 1967, Charlotte Radiology's mission is to provide quality driven, innovative and customer focused care. In 2018, this large and progressive radiology group co-founded US Radiology Specialists (USRS), which has continued to grow. Charlotte Radiology reads primarily for the greater Charlotte metro area, including for a large Carolina-based health system.

### 3M technology

- 3M™ M\*Modal Fluency for Imaging

*“We are a very busy, high volume practice. We read almost two million exams per year, so it’s mission critical for us to have a speech solution that we can rely on. 3M Fluency for Imaging has made a big difference in how we dictate and create reports.”*

– Dr. Jonathan Clemente, chief of the department of radiology at Carolinas Medical Center and neuroradiologist with Charlotte Radiology

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## Prioritizing accuracy above all

In 2013, Charlotte Radiology sought a speech vendor capable of handling the array of outpatient, inpatient and emergency room (ER) exams that the group reads for numerous hospitals and imaging centers.

“The test I use when evaluating radiology software solutions is: Can a reasonably intelligent person figure out how to use the product without any sort of manual or vendor support?” said Dr. Jonathan Clemente, chief of the department of radiology at Carolinas Medical Center in Charlotte, North Carolina, and a member of Charlotte Radiology’s neuroradiology section for more than 20 years. “I would say 3M Fluency for Imaging passes the test. It is pretty intuitive. I don’t have a lot of people asking how to do this or that. Most people can figure it out pretty quickly. It’s very straightforward and the learning curve is not very steep.”

When it came to choosing a speech partner, accuracy ranked even higher than intuitive technology on Charlotte Radiology’s list. “The *sine qua non* of voice recognition is voice recognition,” Dr. Clemente said. “Does it recognize your voice? That is the number one thing. For speech recognition, all we can judge is our anecdotal experience and I think that 3M Fluency for Imaging does a very good job.”

## Making a difference with macros

For radiology teams looking for a speech reporting system, Dr. Clemente advised, “Don’t become enamored with the bells and whistles. At the end of the day, voice recognition and stability are the key drivers.” Even still, he appreciates the additional functionality of templates and macros, which save him significant time.

Within 3M Fluency for Imaging, radiologists can develop customizable templates to facilitate the creation of consistent, comprehensive and compliant reports for common imaging exams. Macros also enable time savings by allowing radiologists to populate their reports using keywords and phrases – which helps decrease cognitive load as well.

Templates and macros help Dr. Clemente maximize his time as he manages a high volume of cases each shift. “I have macros for everything,” he said. “I have 20 chest X-ray macros just because I know it will make me more efficient than doing any kind of manual free text dictation. We try to minimize the amount of actual dictation because it’s more efficient for me to click ‘normal head CT’ than to actually dictate out a normal head CT report.”

Building the templates may take some time, but Dr. Clemente believes it is well worth it. Once built, he’s found them easy to use. “For new radiologists learning how to use them, it would probably take only half a day,” he said. “Plus, it is very easy to share useful macros and report templates with your colleagues.”

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## Saving time with seamless workflows

Accurate speech recognition, templates and macros all speed up report creation for the team at Charlotte Radiology. Another benefit of 3M Fluency for Imaging is how easily it integrates with other imaging tools. Charlotte Radiology uses Laurel Bridge Compass™ to automatically pull measurements from the imaging modalities and put them directly into the radiology report. This seamless communication saves time, supports clinical report accuracy and helps reduce radiologist burnout.

Dr. Clemente recalled one weekend when he read more than 400 exams. “These exams were not just X-rays, they were cross-sectional MRIs and CTs, complicated stuff.” 3M Fluency for Imaging’s capabilities helped him keep pace with this workload.

“We are a very busy, high volume practice,” Dr. Clemente said. “We read almost two million exams per year, so it’s mission critical for us to have a speech solution that we can rely on. 3M Fluency for Imaging has made a big difference in how we dictate and create reports.”

## Leveraging data to support quality outcomes

Natural language understanding (NLU) within 3M Fluency for Imaging has not only helped Charlotte Radiology with report creation; it has also made an impact for the ER team at one of the hospitals the group supports. “There is a huge need for natural language processing,” Dr. Clemente said. “The ability to mine your report database is so important, not only for research, but to help drive outcomes and do clinical analytics.”

When the ER at the main level 1 trauma center in Charlotte was inundated with head trauma cases from surrounding community hospitals, the neurosurgeons worked with Charlotte Radiology to develop a template program with the goal of reducing inappropriate transfers. “We created a standard structured report in 3M Fluency for Imaging with brain injury guidelines,” Dr. Clemente said. Smart fields within the report mapped to the electronic health record (EHR) and a database, which allowed the team to see the cases where the template was used, run analytics and leverage the information for real time management.

## Key benefits

Charlotte Radiology has experienced these benefits using 3M Fluency for Imaging:



**Accurate speech recognition**  
with advanced NLU technology



**System stability**  
and reliability



**User friendly system**  
with minimal learning curve



**Interoperability**  
within its imaging ecosystem



**Efficient report creation**  
with templates and macros



**Enhanced productivity**  
and time savings

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The results have benefited providers, patients and the hospital. “This template has helped an incredibly busy level 1 trauma center avoid inappropriate patient transfers for those who could be treated locally,” Dr. Clemente said. “This is a case where speech recognition has actually helped drive care by facilitating data analysis and has had an intangible ROI by helping save the system a lot of money.”

## The speech recognition pyramid

For Dr. Clemente, speech understanding all comes back to accuracy. “If you envision speech recognition as a pyramid, at the base you have stability and interoperability,” he said. “At the top of the pyramid you have the extra bells and whistles. I can live without the bells and whistles, but I need the solution to be stable and interoperable. Does it function as intended? Does it get along with the rest of the ecosystem?”

In his experience with 3M Fluency for Imaging, the answer to these questions is yes. “3M Fluency for Imaging has high marks when it comes to recognizing voice and it’s easy for the end user,” Dr. Clemente said. “I would highly recommend 3M Fluency for Imaging for those looking into a new speech recognition system.”



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