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Positioning Paper

MRI Efficiency Through Telepresence:

A New Cardiovascular Service Line Imperative

MRI has unique advantages as a cardiovascular imaging modality, driving growth in the number of studies performed. There is also an expanding range of image acquisition protocols that need to be tailored to the specific needs of individual patients. The need to incorporate the clinical context with the technical aspects of MRI has led to a shift in supervision and reading from Radiologists to Cardiologists (analogous to echocardiography). MRI is now the most sought after subspeciality training in Cardiology, and those trained in MRI are now the most sought-after hires.

While there are clear benefits to having a cardiologist trained on advanced imaging in the MRI control room during study acquisition, doing so significantly impacts their overall productivity and their ability to perform other revenue generating activities. It can limit their ability to meet with patients, teach residents, and read completed imaging studies. In an academic setting this likely will affect the advanced cardiology imaging fellow, while in a non-academic setting an attending cardiologist might take on these oversight responsibilities. Therefore, many organizations that perform cardiac MRI cannot afford to have a cardiologist sit in the control room during the entire 45 – 60 min. exam, or even part of the exam. In fact, many sites that perform cardiac MRI do not have a cardiologist oversee study acquisition at all.

Healthcare providers need a means to balance these conflicting requirements to maximize cardiac MRI productivity, image quality, and patient care, while enabling their advanced imaging cardiologist to maximize their daily productivity and revenue generating activities.

The current model of having a cardiologist in the MRI control room and immediately available to the technologist has significant merit but is not possible or practical for many organizations.

Cardiac MRI Challenges

Cardiac anatomy and pathology can be very complicated, and every patient may be different. In addition, there are a number of unique technical aspects to every cardiac MRI exam. As such, they require a cardiologist with subspecialty training in advanced imaging, a technologist trained in cardiac MRI technology and anatomy, and an appropriately equipped scanner.

Cardiac imaging studies are typically gated to the patient's ECG or pulse, so irregularities in the patient's heart rate, pulse rate, or breathing can create image acquisition and quality challenges that require troubleshooting by the technologist and/or the cardiologist. If the MRI technologist encounters such problems and does not have access to a trained cardiologist, and a non-diagnostic or incomplete study is the result, it can affect reimbursement, as well as subsequent aspects of the diagnostic workup and ultimately patient care. Alternatively, a site may choose to repeat the study but they will not receive reimbursement for the additional study.

Given the relative newness of cardiac MRI, there are a limited number of cardiologists and technologists trained in cardiac MRI. Such staff shortages can limit the potential number of cardiac MRI studies performed even though their value may be well understood. Conversely, performing cardiac MRI can stretch already thin resources.

Lastly, because contrast enhancement is often part of the cardiac MRI exam, studies that are performed after the contrast agent is given must be diagnostic quality. If not, the study cannot be performed again and either the study is read as non-diagnostic or incomplete, or the entire study must be rescheduled.

Value of a Cardiologist Overseeing the Study

When the cardiologist is in the MRI control room, it is efficient for them to work with the technologist to immediately resolve any patient specific problems, view the imaging studies to ensure the anatomy and pathology are being visualized and they are of diagnostic quality, and educate the technologist. This enables the exam to proceed smoothly and quickly by eliminating the need for the technologist to chase down a physician.

As a result, it ensures a higher percentage of complete diagnostic studies which directly improves clinical quality, patient outcomes, and billing for exams performed. Most advanced imaging cardiologists and radiology/cardiology administrators agree there is value to physician oversight of cardiac MRI. But how to achieve these benefits while maximizing cardiologist productivity is a real and persistent challenge.

Benefits of Virtual Presence and Interaction

What is needed is a technology solution that enables the on-demand, live remote viewing and interaction between the MRI technologist and the cardiologist. Such a solution should enable the MRI technologist to rapidly notify and engage with a remote physician, whether they are sitting at their PACS workstation, in a clinic, or teaching. It should enable a remote physician to view imaging protocols and images as they are acquired by the MRI scanner and enable two-way visual and verbal communication. Optimally, the ability to conference in a 3rd party should also be possible. And the cardiologist should be able to interact with more than one scanner at the same time.

The operational, clinical, and financial benefits of such a solution are the following:

Clinical Benefits

1. Ensure that all exams are diagnostic and complete.
2. Maintain or improve cardiovascular MRI clinical value, clinical outcomes, and patient satisfaction.

Operational Benefits

1. Ensure cardiologists can address technologist questions without being pulled away from their current activities and wasting time getting to the MRI control room.
2. Enable the cardiologist to spend more time reading cardiac MRI studies, echo, and CT studies, which are all revenue generating activities.
3. Enable the cardiologist to spend more time educating other physicians, including fellows and referring physicians, about the appropriateness and value of the procedure.
4. Improve physician quality of life, which benefits physician retention and recruitment.

Financial Benefits

1. Enable the cardiologist to spend more time on revenue generating activities such as reading studies and seeing patients.
2. Ensure that technologist productivity remains high, and scan times are minimized.
3. Reduce the number of non-diagnostic or incomplete studies that cannot be billed.

As healthcare organizations continue to weigh the value of embracing cardiac MRI, they must fully understand all the challenges and opportunities of implementing this service. The current model of having a cardiologist in the MRI control room and immediately available to the technologist has significant merit but is not possible or practical for many organizations. All organizations would benefit from a technology that enables the cardiologist to provide clinical oversight from a remote location.

If a remote viewing and interaction technology solution was available, it could enable the following:

- An organization that currently schedules the cardiologists in the MRI control room to eliminate this need and increase their overall productivity.
- An organization that currently does not have a cardiologist oversee their cardiac MRI studies would benefit from more consistent cardiac MRI study quality and greater clinical value, while maintaining current cardiologist productivity levels.

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