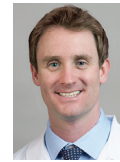


# Combined MRI-Angio Suite will overcome imaging limitations

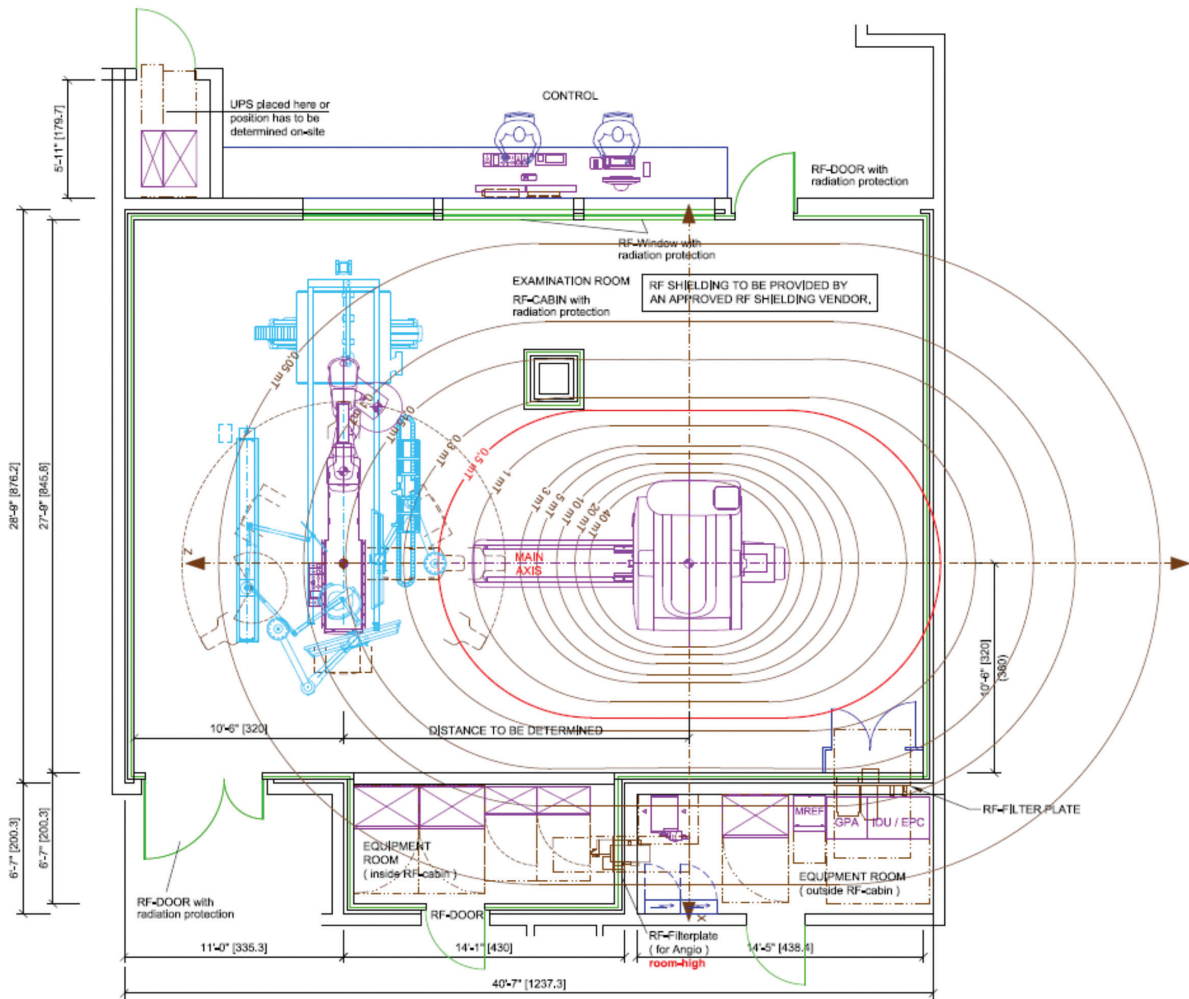


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Interventional radiologists have made great strides in using medical imaging to guide minimally invasive procedures to treat various conditions. The angiography typically employed in interventional suites provides accurate and detailed imaging of radiopaque structures and those rendered radiopaque with injected contrast agents, as well as the catheters and other devices interventionalists employ in performing procedures. With excellent spatial and temporal resolution, angiography is well-suited to guiding interventionalists through the intricate anatomy they often must navigate to perform a range of procedures without exposing patients to the risks of open surgery.



However, other imaging modalities far surpass angiography when it comes to imaging most tissues. Interventional radiologists often consult CT and MRI images before procedures to help plan their interventions and after procedures to see the results more clearly and make decisions on further care.

Interventional radiologists have long pondered how advantageous it would be to bring other imaging modalities — specifically MRI imaging — into the interventional suite. However, the technological barriers to doing so have until now been

insurmountable. “Putting an MRI scanner together with an X-ray scanner is very challenging because of the mixing of magnetism and metal,” explains John Moriarty, MD, FSIR, professor of radiology and medicine and vice chair of clinical research in the UCLA Health Department of Radiology. “People have been thinking about this for decades.”

Working with Siemens Healthineers, UCLA plans to bring this vision to fruition with the launch of its Combined MRI-Angio Suite in 2025. According to Dr. Moriarty, “What makes this unique

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is that it combines the most up-to-date type of MRI scanner with the most up-to-date type of X-ray scanner. The new suite is going to have a special type of magnet and exceptional equipment — both the angio suite and what we use in it — allowing us to combine the two. With both machines in the same room — and with the procedure table able to be repositioned for either — physicians will have rapid access to information about the relevant tissue and its function as they perform interventional procedures.

An excellent example of the combined suite’s power is in treating acute ischemic stroke. “Currently, I’ll have an MR or CT image of the affected tissue from before I begin the procedure to get an idea of what the function of that tissue is,” explains Gary R. Duckwiler, MD, professor of radiology and director of interventional neuroradiology at UCLA Health. However, during the interventional procedure to treat the cause of the stroke, Dr. Duckwiler now has no source of updated information on the health of the affected tissue, no way of knowing whether it is receiving some blood flow or if it is entirely cut off from circulation. As the interventional procedure continues and the functional imaging information from before the procedure grows more and more outdated, the lack of clarity on the current status of that tissue increasingly hampers the treatment team’s ability to determine how aggressively to treat the ischemia.

“With the new combined suite, we’ll have the exquisite tissue and functional resolution of MR imaging that we don’t currently have just doing angiography,” continues Dr. Duckwiler, “It will not only improve treatments we already provide, it could also dramatically expand what we can do because we’ll be able to see structures that we can’t currently see with X-ray imaging. We feel this will open up new realms of possibilities in assessing and treating acute stroke.”

Another significant advantage that the Combined MRI-Angio Suite will offer in acute stroke care is the time savings associated with having the MR scanner in the interventional procedures room. “Normally for acute stroke, the patient will come in through the ER, they’ll have a quick evaluation, they’ll get a scan, and then decisions on their condition and care will be made, including administering or not administering intravenous thrombolytic,” explains Dr. Duckwiler. “If it is a large vessel occlusion and there is tissue that we can salvage, they are transported to the angio suite, and we’ll do our procedure. Afterward, to reassess what is happening, we do imaging again.” The vision for the new suite will be for patients to be transported

directly from the emergency department to the combined suite, where the initial MR scan will occur. This change to a “one-room solution” is estimated to advance the treatment timetable by approximately one hour. Because of the critical importance of rapid revascularization of brain tissue in acute stroke patients, this time savings should result in a striking reduction of lost brain tissue, which equates to lives saved, patients walking and talking, and families not burdened by rehabilitation costs and tasks.

Dr. Moriarty says of the combined MRI-Angio Suite, “The main areas we think this will be very helpful include the brain, where we’re going to be able to see either stroke or bleed or tumor within the brain. The next is within the heart and lungs, visualizing and treating either clots or tumors. The third is within the liver.”

One of the exciting applications of the Combined MRI-Angio Suite is in treating heart arrhythmias. “The ability to identify tissue characteristics of the heart and simultaneously perform ablations opens up a new frontier in interventional therapeutics,” states Kalyanam Shivkumar, MD, PhD, Professor of Medicine (Cardiology), Radiology & Bioengineering and director of the UCLA Cardiac Arrhythmia Center & EP Programs.

Currently, liver tumors are very challenging to treat, and patients with liver cancer who are listed for transplantation often see their cancer advance while they await treatment; many will die before a suitable organ becomes available. “The ability to see the tumor, to treat the tumor, with this specific room is going to help us prevent that from happening,” states Dr. Moriarty. “We hope to be able to see and treat things that we cannot see and treat right now. We will be able to do this without having to open the abdomen to see the tumor.”

UCLA leveraged technical expertise within the university to help make it possible to add an MR scanner to the angio suite. “This involves impressive engineering and architectural changes to the hospital itself,” explains Dr. Moriarty. UCLA is also willing to commit its resources to making the new suite a reality. “This is a costly endeavor; it takes a lot of time and expertise to put together. We have made a long-term commitment to improving our patients’ care.” 