Case Study

Helios-Kliniken Cardiology Clinic Finds the Ideal Tool for Studying Wall-Motion Abnormalities.

If you're like Dr. Georg Haltern, whose cardiology clinic in Wuppertal, Germany does more than 2,500 dedicated cardiovascular examinations each year, you are driven to get as much quantitative information as possible from each test. That's why Haltern says he was always particularly interested in exploring the frontiers of MRI scanning in cardiology.

"We felt that wall-motion studies in cardiology are largely under-represented because a lot of radiologists always just look at perfusion," he says. Haltern's desire to research wall-motion abnormalities led him to a new software solution that reads and analyzes DICOM images of MR tagging to determine more about the motion of the heart. His research team looked at two vendors who had developed tagging analysis software. "But, only Diagnosoft had the open-minded approach we wanted," Haltern says.

Haltern's Helios Kliniken site is part of the leading hospital group in Germany, a country with an aging society where coronary artery disease is a major healthcare burden. Traditionally, the clinic had done studies to see how wall motion develops under rising levels of pharmacological stress. "By adding tagging," Haltern says, "we could endeavor to see how the very interesting parameter of rotation adds to our understanding of how the motion of the heart develops under stress. We are interested in trying to obtain the whole picture, not just information about circumferential strain."

Haltern believes the technology has major implications for treatment of patients who suffer from having had myocardial infarctions. "Our dilemma is, 'Do we operate on the patient, or do we do chronic CTO revascularizations?' 'Is there viable myocardium, or is it dead?'" MRI studies using delayed enhancement show white spots in the myocardium that presumably indicate dead parts of the heart. "But as we learned from tagging," Haltern explains, "there are parts that are white that do seem to contract. So there is hope that it is not completely dead, but, rather, sort of "lifeish." We learn that we can do revascularization on these patients with a goal of seeing if there is improvement—a very important clinical consequence of patients with coronary artery disease." By having access to a very sensitive tool, Haltern says they can predict that an area will recover from revascularization, and make the right treatment decision for the patient.

> *"I feel Diagnosoft products offer a great enhancement to regional wall motion," he says. "There is a great deal of objectivity in it, and it gives us a perfect means to communicate the wall motion abnormality and dysfunctional areas of the heart to the radiologists and cardiologists to whom we present data."*
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> **Georg Haltern, M.D., Cardiologist**

"The drama in echocardiography," Haltern explains, "is that you can watch and explore deformation, but you can only see the bulk motion of the heart. If you try to measure the motion of the heart, you struggle to discern passive movement from active contraction. Strain imaging ensures you only see active contraction, which is why it is so important for defect analysis."

In wall motion studies, Haltern wrestles with the knowledge that interpretations of studies are subjective. Diagnosoft PLUS software reduces subjectivity and provides a means of quantifying the results. "I feel that this software is a great enhancement to regional wall motion abnormality study," he says. "There is a great deal of objectivity in it, and it gives us a perfect means to communicate the wall motion abnormality and

dysfunctional areas of the heart to the radiologists and cardiologists to whom we present data."

Haltern says he likes that Diagnosoft PLUS provides a *single* tool to analyze *all* the images you obtain. PLUS combines HARP® MR analysis using tagged images, as well as first-pass, cine, and viability MR image analysis. It also provides T2* analysis, an easy and automated way to measure T2* from images acquired at different echo time (TE) by MRI.

Haltern can definitely see clinical applications for his team's research. "MRI in cardiovascular medicine offers a lot of imaging modalities, multi-perspective views of the heart, wall motion, perfusion, and other aspects traditionally worked up by methods such as nuclear scan and echocardiography. Now all these modalities can be integrated, with tagging adding even more detail to the abundant information obtained from the other methods. It is like a puzzle, and it will be very interesting to see how it all matches together."

Dr. Haltern also expects implications for patients with pacemakers and defibrillators, because once patients have such a device, they are no longer able to be examined by MRI. "When more devices become MRI capable, tagging and post-processing of tagging analysis with Diagnosoft software will become very valuable," he says. Haltern also looks forward to quantification of longitudinal strain, a capability that is on Diagnosoft's roadmap, as well as the scientific research results of using the software in a large scale study. "Up until now, a useful post-processing unit for tagging has not been implemented in Siemens, GE or Philips scanners. Diagnosoft has a monopoly on this, far as I can see."

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