

## Table of Contents

[Home](#)

[Whole-body imaging survives era of undirected screening to emerge as tool for specific indications](#)

[Systems-based healthcare hinges on imaging research](#)

[Experts pinpoint benefits of hybrid systems in cancer management](#)

[Precise and quick imaging allows whole-body screenings for suspected disease](#)

[Hardware, software advances give fMRI a place in abdominal imaging](#)

[Clarity and brevity prove essential for meaningful breast imaging reports](#)

[Hybrid imaging makes headway in cardiac and oncologic imaging, but caveats persist](#)

[Coronary CTA finds an affordable home](#)

## Videos



### ECR Philippe Houssiau interview

Data must not only converge but be managed easily and efficiently, if sophisticated diagnostics are to result in better patient care. Philippe Houssiau, president of Agfa Healthcare, discusses with DI Business Editor Greg Freiherr the company's strategy for managing this convergence over the short and long term.

[View video](#)

An information partnership between



&



## Coronary CTA finds an affordable home

*By: C. P. Kaiser*

At last year's European Congress of Radiology, research regarding 64-slice angiography was focused on its feasibility. This year, feasibility is no longer an issue. Rather, a wealth of evidence is being presented attesting to the fact coronary CTA is a powerful and useful tool to evaluate patients suspected of coronary artery disease who are at intermediate risk. It is within this niche patient group -- those who would otherwise undergo invasive catheter angiography -- that coronary CTA is finding an affordable home.

In a study presented on Saturday, Dr. Gudrun Feuchtner and colleagues at Medical University Innsbruck in Austria found coronary CTA was a cost-effective pretest to exclude stenosis greater than 50% in intermediate risk patients with clinically suspected CAD.

In one part of the study, researchers evaluated 22 patients whose ECG-stress test was mild-pathologic. In 17 of them, CT ruled out coronary stenosis greater than 50%. The savings from not performing catheter angiography on these patients was €20,000 (\$26,000). Factoring in CT's one false-positive and two true-positives, total amount saved by using CT as a second noninvasive test after a positive ECG-stress was €18,000 (\$23,000).

Overall, the group clocked sensitivity (100%), specificity (78%), positive predictive value (80%), and negative predictive value (100%) similar to the of published references, Feuchtner said.

Many coronary CTA studies are problematic because they concentrate only on significant stenosis, not hemodynamically relevant stenosis (>70%); they don't use quantitative catheter angiography as a reference standard; and the patient population is too homogeneous, according to Dr. Christoph Herzog, radiologist at Johann Wolfgang Goethe University in Frankfurt, Germany.

Herzog and colleagues at Medical University of South Carolina conducted a study that sought to remedy those problems. They included 100 patients with a variety of cardiac scenarios such as angina pectoris, unstable conditions, bypass grafts, stents, and elevated troponin levels. They used QCA as the reference and sought results for both thresholds of stenosis.

CT detected all patients with significant and with hemodynamically relevant stenosis. For all stenoses greater than 50%, CTA performed reliably on a per-patient basis (100% accuracy). Its diagnostic accuracy decreased slightly on a per-segment and per-vessel basis (both 96% accuracy), primarily because of limited spatial resolution, Herzog said. Stenoses greater than 70% were detected with greater accuracy than stenoses greater than 50%, but the difference was not statistically significant.

Researchers are also testing to determine what incremental value CT has in various patient populations. Dr. Filippo Cademartiri, a radiologist at Erasmus University Medical Center in the Netherlands, and colleagues at University Hospital Azienda in Parma, Italy, evaluated CT's ability to detect potential culprit lesions in patients with acute myocardial infarction and a catheter angiogram negative for significant stenosis.

In 19 of 30 patients, CTA identified a potential culprit lesion, with positive remodelling. Of these, 13 lesions were associated with segmental alteration of left ventricular motion found with echocardiography. And there was agreement between the location of the lesion and left ventricular segments



**Brainlab: Minority Report comes to Radiology**

Christopher Hamilton of BrainLab demonstrates the company's new touch-based viewing screen.

[View video](#)

with motion abnormalities, said presenter Dr. Antonello Palumbo. He suggested that therapy for these patients can be adapted to this different risk stratification.

MRI may also have a role for plaque characterization. Dr. Mai-Lin Oei and colleagues at the University of Munster in Germany used an inversion recovery MRI sequence to detect intraplaque hemorrhage in plaques identified with CTA. Work such as this has been conducted in the carotids, but not in the coronaries, Oei said.

Of the 43 plaques evaluated, five appeared hyperintense on IR-MRI, indicating intraplaque hemorrhage. The average signal-to-noise ratio for the hyperintense plaques was three times that of the hypointense lesions and the average contrast-to-noise ratio of the hyperintense lesions was seven times that of the hypointense plaques.

No one knows right now how to treat these vulnerable lesions once they are detected and characterized, said moderator Dr. U. Joseph Schoepf in an interview after the session.

"We don't have enough experience in vivo. We extrapolate from pathology findings more or less to know what we should do with these lesions. Nobody knows whether it would be worthwhile to intervene. A scientific rationale to support such an approach is not there," he said.

One of the last frontiers of the newer CT scanners is cardiac function. Schoepf's group at the Medical University of South Carolina presented a study that compared 64-slice CT functional analysis with SPECT myocardial perfusion imaging in 42 patients with suspected or known CAD. Researchers found a good ( $r = 0.68$ ) correlation between CT functional analysis and SPECT for detection of regional functional abnormalities.

There's no rush to replace SPECT perfusion imaging with CT functional study, said lead author Dr. Christian Thilo. However, because CTA and quantitative coronary angiography correlated well with each other, he suggested that CT may replace catheter angiography in a myocardial perfusion-based algorithm for workup of patients with known or suspected CAD.

"There is no doubt that functional analysis based on CT is accurate in comparison with clinical reference standards. The problem is that CT is probably not the right test to look at cardiac function, per se," Schoepf told *Diagnostic Imaging*.

At his institution, radiologists perform cardiac function analysis on every CT scan because the information is inherently available. He says it's the ethical thing to do.

"We apply all the radiation to look at the coronary arteries. So, I find it ethical to utilize the data to the utmost extent and provide the referring physician with a comprehensive report on structure and function on every patient," he said.

[Back to Home Page](#)

Advanced Digital Radiography Uncompromising Precision Image Quality Automated Clinical Reporting  
 RIS/PACS/Reporting Advanced Clinical Applications Advanced Clinical Data Center  
 Clinical Workflow Integrated RIS/PACS/Reporting Advanced Clinical Applications