

# TRA *Imaging News*

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## A Closer Look at CTA & MRA



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Significant technological advancements in computed tomography (CT) and magnetic resonance imaging (MRI) enable more accurate evaluation of the body's vasculature utilizing MR angiography (MRA) and CT angiography (CTA). These *non-invasive vascular imaging techniques* are diagnostically reliable in clinical applications involving almost the entire body from head to toe.

Multidetector scanners have revolutionized CT data acquisition, allowing for increased speed, thinner slices, and improved spatial resolution without sacrificing body part coverage. Similarly, new MR technologies have resulted in the development of contrast-enhanced MRA, minimizing patient breathing motion artifacts, improving contrast to noise resolution and eliminating signal loss caused by in-plane and turbulent flow.

The CTAs and MRAs of today can produce vascular maps that are nearly identical to those of conventional catheter angiography. Although catheter angiography remains the gold standard in vascular imaging, if advances in technology continue at the current pace, MRA and CTA will surpass the capabilities of catheter angiography. In the future, catheter angiography will likely be reserved for select problematic cases and intervention purposes. This scenario already exists in the workup of pulmonary emboli, as CTA has largely replaced pulmonary angiography.

### Specific Applications for CTA/MRA

CTA and MRA applications are myriad. CTA has a greater than 96% sensitivity for detecting intracranial aneurysms 3mm or greater. Workup of cerebrovascular accidents caused by steno-

occlusive disease of the supra-aortic vessels can be facilitated by CTA or MRA as both have sensitivities and specificities of 95% or greater in detecting surgically significant internal carotid stenoses. Evaluation of mesenteric ischemia as a cause of abdominal pain has been shown to be far more reliable with MRA/CTA than duplex ultrasound. MRA/CTA can be used in the workup of upper and lower extremity peripheral vascular disease. Whether the patient is suffering from claudication or limb threatening ischemia, non-invasive imaging can be performed with peripheral CTA or MRA with accuracy very near that of conventional angiography.

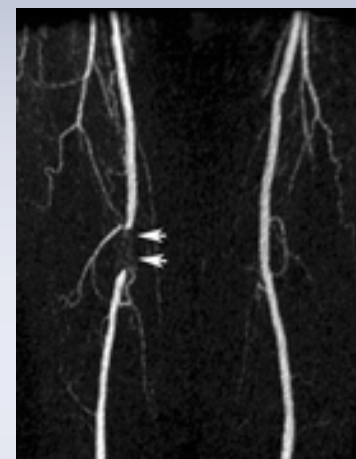
In many centers, renal MRA is the imaging modality of choice when screening for renovascular hypertension, due to its superior sensitivity and specificity relative to duplex ultrasound. The MRA in the patient with renovascular hypertension yields added benefits in pre-procedure planning for renal artery stenting or angioplasty. The anatomic information from these vascular maps helps minimize procedure time, iodinated contrast load, and procedure related risks.

Spatial resolution has improved to the point that, in some centers, coronary CTA and MRA are already being utilized on a select basis to evaluate anomalous coronary arteries and to assess coronary artery stenoses. A CTA can be performed in 15 minutes or less. (cont'd p. 2)

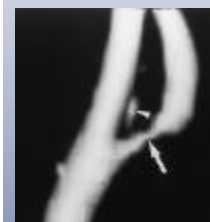
*The image screened behind this article is a contrast enhanced renal MRA.*



Normal pelvic MRA



Thigh MRA shows short segment occlusion of right superficial femoral artery.



Internal carotid artery stenosis identified on CTA. Arrowhead: portion of adjacent enhancing jugular vein.

Conventional catheter angiographic correlation.

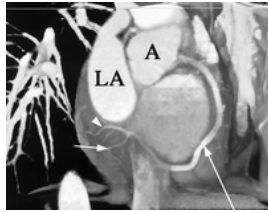


A routine contrast enhanced MRA requires about 20 minutes.

MRA and CTA continue to offer exciting advancements in vascular imaging. The TRA team of interventional radiologists is continually updating its skills to be at the forefront of this leading edge technology.

If you would like more information about MRA /CTA or have questions contact:

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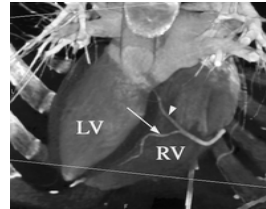


**Normal right coronary arteriogram**

**Above** arrowhead: posterolateral left ventricular branch. Long arrow: right coronary artery. Short arrow: posterior descending artery.

**Posterior coronal volume rendered images**

**Right:** the normal PDA (arrow) coursing in the posterior interventricular groove and the posterolateral left ventricular branch (arrowhead).



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**TRA NEWS**

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