

## Fees\*

\$450 Physicians

\$225 Fellows/Residents

\$190 Technologists

\* Fee includes: syllabus, continental breakfasts, lunches and refreshment breaks. Payment must be received prior to admittance to the course.

Purchase orders are not accepted. Cancellation policy: for full refund cancellation must be made at least 30 days in advance of course.

Register online at [www.ccfme.org/BestInPractice09](http://www.ccfme.org/BestInPractice09)

## Faculty Disclosure

The Cleveland Clinic Foundation Center for Continuing Education has implemented a policy to comply with the current Accreditation Council for continuing Medical Education Standards for Commercial Support requiring resolution of all faculty conflicts of interest. Faculty declaring a relevant commercial interest will be identified in the activity syllabus.

## Americans with Disabilities Act

The Cleveland Clinic Foundation Center for Continuing Education fully intends to comply with the legal requirements of the Americans with Disabilities Act. If you need assistance, please notify Lisa Clough at 216.444.7760 or [cloughl@ccf.org](mailto:cloughl@ccf.org) at least two weeks prior to the activity.

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## Accreditation Statement

The Cleveland Clinic Foundation Center for Continuing Education is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

The Cleveland Clinic Foundation Center for Continuing Education designates this educational activity for a maximum of 13.25 AMA PRA Category 1 Credit(s)™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Participants claiming CME credit from this activity may submit hours to the American Osteopathic Association Council on Continuing Medical Education for Category 2 credit.

The Cleveland Clinic Foundation Center for Continuing Education designates this educational activity for a maximum of 14.5 total ASRT credits

## Travel Information

### Accommodations

Homewood Suites

25725 Central Pkwy., Beachwood OH

216.464.9600

[www.homewoodsuites.com](http://www.homewoodsuites.com)

Clarion Hotel

26300 Chagrin Blvd., Beachwood OH

216.831.5150

[www.clarionhotel.com](http://www.clarionhotel.com)

Residence Inn

3628 Park East Dr., Beachwood OH

216.831.3030

[www.residenceinn.com](http://www.residenceinn.com)

### Driving Directions from Airport

- Take I-480 East
- Take left fork onto I-271 North/422 East
- Continue on I-271 North
- Exit #29/Chagrin Blvd.
- Turn left onto Chagrin Blvd.
- Turn right onto Enterprise Dr.
- Turn right onto Science Park Dr.

### Parking

Free parking is available in the CCAC

### Transportation

Hopkins International Airport (CLE)

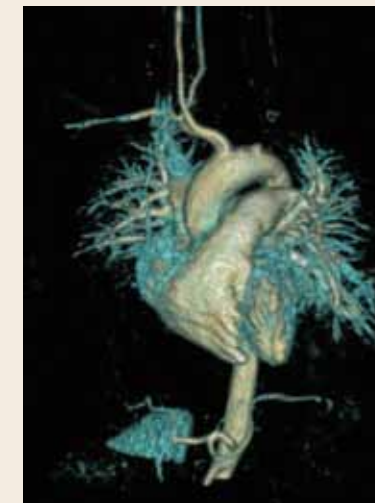
Distance: 22 miles northeast to CCAC

Time by taxi: 30 minutes



The Cleveland Clinic Foundation  
Center for Continuing Education  
9500 Euclid Avenue KK31  
Cleveland, OH 44195

Best in Practice: Improving MR Imaging  
Cleveland Clinic Administrative Campus  
Building 3, Lower Level Auditorium  
3050 Science Park Drive | Beachwood, OH



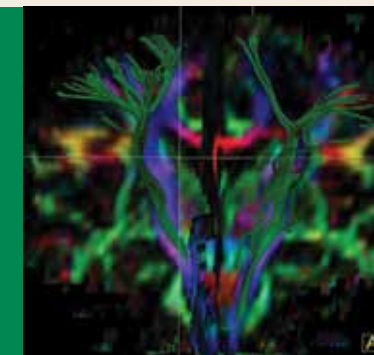
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Best in Practice:  
Improving MR Imaging

October 2-3, 2009



Learn MRI physics with an emphasis on practical applications in Musculoskeletal, Abdominal/Body, Neurologic, Pediatric, Breast, and Cardiovascular MR Imaging and MR Angiography.

Imaging Institute

## Course Overview

Cleveland Clinic Administrative Campus (CCAC)  
Building 3, Lower Level Auditorium  
3050 Science Park Drive, Beachwood, OH 44122

This program is open to all physicians, physician trainees, and technologists, and is sponsored by Cleveland Clinic's Imaging Institute.

This two-day program is designed to address the needs of physicians, trainees and technologists with an interest in the fundamental principles and clinical applications of MRI. Concepts will be presented through a series of lectures, clinical examples and applications. Training will focus on the basics of MRI physics, with clinical examples and advanced applications drawn from Musculoskeletal and Abdominal/Body MR imaging. We will also explore practical problem solving and applications in the areas of Neurologic, Pediatric, Breast and Cardiovascular MR imaging.

## Course Objectives

Upon completion of this activity, the participant will be able to:

- Explain spin echo and gradient echo sequence families.
- Describe the principles of signal acquisition for each type of sequence.
- Distinguish the advantages and disadvantages of multi-echo acquisitions.
- Describe common k-space trajectories with spin echo and gradient echo sequences.
- Contrast the tradeoffs among bandwidth, spatial resolution, and contrast resolution for image quality assessment.
- Recognize the importance of surface coil technology in specific applications for abdominal/body and musculoskeletal MRI.
- Recognize the potential for NSF in patients with severe renal dysfunction, and understand the typical protocols employed to avoid complications.
- Associate the importance of quadrature coils and multi-element arrays in increasing signal generation and integration of parallel acquisition techniques.
- Explain the techniques used to minimize or eliminate motion artifacts.
- Describe image optimization techniques for pediatric imaging.
- Identify the advantages of 3 Tesla imaging.
- Recognize the differences among SMASH, SENSE, and GRAPPA parallel acceleration techniques.
- Describe the effect of contrast agent dose, relaxivity, and timing of data acquisition on image quality and artifacts in contrast-enhanced MRA.
- Describe image optimization techniques for dynamic cine and myocardial viability imaging cardiac applications.

# Best in Practice: Improving MR Imaging | October 2-3, 2009

## Agenda

### October 2, 2009

7:00 am	Continental Breakfast and Registration
8:00 am	Welcome <i>Scott Flamm, MD</i>
8:10 am	T1 Recovery, T2 Relaxation, and T2* Dephasing <i>Randy Setser, DSc</i>
9:00 am	Spatial Localization: Phase and Frequency Encoding, Slice Selection <i>Stephen Jones, MD, PhD</i>
9:50 am	Break
10:10 am	MRI Safety: Patient Preparation and Monitoring <i>Phyllis DeSantis, RN</i>
10:40 am	MRI Safety: Implants, SAR, and Heating <i>Paul Ruggieri, MD</i>
11:10 am	GRE & SE Imaging; T1 & T2 Sequences <i>Stephen Jones, MD, PhD</i>
12 noon	Lunch
1:00 pm	Clinical: Musculoskeletal <i>Josh Polster, MD</i>
1:50 pm	K-space: Trajectories and Effect on Contrast; Defects in k-space <i>Joseph Veniero, MD, PhD</i>
2:40 pm	Break
3:00 pm	SNR and Image Quality: Bandwidth, Spatial Resolution, Contrast Resolution <i>Craig Lisicki, RT (R)(MR)</i>
3:30 pm	Clinical: Abdominal/Body <i>Joseph Veniero, MD, PhD</i>
4:20 pm	Contrast Agents & NSF <i>Scott Flamm, MD</i>
4:50 pm	Adjourn

### October 3, 2009

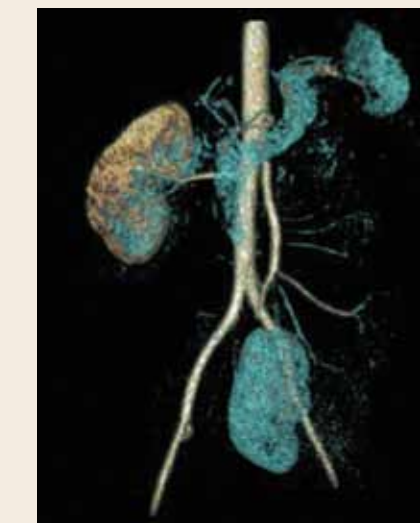
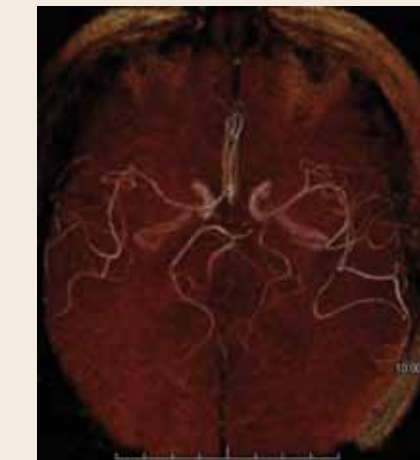
7:00 am	Continental Breakfast and Registration
8:00 am	Welcome <i>Scott Flamm, MD</i>
8:10 am	Coils <i>Cyndi Yurkschatt, RT (R)(MR)</i>
8:40 am	Clinical: Neuro <i>Michael Phillips, MD and Paul Ruggieri, MD</i>
9:30am	Break
9:50am	Artifacts: Chemical shift, motion, susceptibility, zipper, truncation, wrap, etc. <i>Joseph Veniero, MD, PhD</i>
10:40am	Clinical: Pediatrics <i>Janet Reid, MD</i>
11:10am	Imaging at 3 Tesla <i>Joseph Veniero, MD, PhD</i>
11:40pm	Lunch
12:45pm	Parallel Acquisition: techniques, benefits and tradeoffs <i>Scott Flamm, MD</i>
1:15pm	Clinical: Breast <i>Laura Shepardson, MD</i>
1:45pm	Break
2:05pm	Flow and MRA <i>Randy Setser, DSc.</i>
2:55pm	Clinical: Cardiac <i>Scott Flamm, MD</i>
3:45pm	Adjourn

*Time for questions and answers are included in each presentation.*

## Faculty

Activity Director:  
Scott D. Flamm, MD

Cleveland Clinic Faculty:  
Phyllis DeSantis, RN  
Stephen Jones, MD  
Craig Lisicki, RT (R)(MR)  
Michael Phillips, MD  
Josh Polster, MD  
Janet Reid, MD  
Paul Ruggieri, MD  
Randy Setser, DSc  
Laura Shepardson, MD  
Joseph Veniero, MD, PhD  
Cyndi Yurkschatt, RT (R)(MR)



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Imaging Institute