



ACC.16™

65th Annual Scientific Session & Expo

Status of Multi-Modality Imaging Training and Multiple Imaging Boards

Gaby Weissman, MD, FACC
Georgetown University
Medstar Heart and Vascular Institute

AT THE
INTERSECTION
OF SCIENCE
& CHANGE

#ACC16

~~THE~~ GUIDE OF THE PERPLEXED



★ **SESSION 770 - Future of Cardiovascular Imaging: A Report From the ACC Think Tank**

📅 April 4, 2016, 2:00 - 3:30 PM	📍 Room S503
	<div>Cardiovascular Imaging</div> <div>Neil J. Weissman</div> <div>Washington, DC</div> <div>Itinerary</div>
2:10 - 2:15 PM	<div>★ 770-09 - Question and Answer</div> <div>○ Add To My Itinerary</div>
2:15 - 2:30 PM	<div>★ 770-10 - Delivery of Value-Based Imaging Services</div> <div>Daniel S. Berman</div> <div>Los Angeles, CA</div> <div>○ Add To My Itinerary</div>
2:30 - 2:45 PM	<div>★ 770-11 - The Cardiovascular Imager of the Future</div> <div>Prem Soman</div> <div>Pittsburgh, PA</div> <div>○ Add To My Itinerary</div>
2:45 - 3:00 PM	<div>★ 770-12 - Innovation and Research in Imaging Technology</div> <div>Kavitha Chinnaiyan</div> <div>Plymouth, MI</div> <div>○ Add To My Itinerary</div>
3:00 - 3:15 PM	<div>★ 770-13 - Maximizing Imaging Information and Outcomes</div> <div>Partho P. Sengupta</div> <div>New York, NY</div> <div>○ Add To My Itinerary</div>
3:15 - 3:30 PM	<div>★ 770-14 - Panel Discussion</div> <div>○ Add To My Itinerary</div>



EDITOR'S PAGE

Acquiring Multiple Parameters From Multiple Tests

The Real Principle of Multimodality Imaging

Thomas H. Marwick, MD, PhD,* Jagat Narula, MD, PhD†

*There is no principle worth the name
if it is not wholly good.*

—Mohandas Gandhi

IMAGING COUNCIL CHAIRMAN'S PAGE

CV Imaging for Fellows in Training: Challenges and Opportunities

Michael W. Cullen, MD,* Howard Julien, MD, MPH,† Neil J. Weissman, MD‡

NEWS AND VIEWS

The Multimodality Imager: Reality or Fantasy?

EDITOR'S PAGE

Training in Multimodality Imaging: Challenges and Opportunities

William A. Zoghbi, MD, FACC,* Jagat Narula, MD, PhD, FACC†

IMAGING COUNCIL CHAIRMAN'S PAGE

Multimodality Imaging: Opportunities and Challenges

Neil J. Weissman, MD,* Prem Soman, MD,† Dipan J. Shah, MD‡

EDITOR'S PAGE

Training in Multimodality Imaging: Challenges and Opportunities

William A. Zoghbi, MD, FACC,* Jagat Narula, MD, PhD, FACC†



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Scholar About 39,700 results (0.08 sec)

- Articles** **Multimodality cardiac imaging**
 O Gaemperli, [PA Kaufmann](#) - Journal of nuclear cardiology, 2010 - Springer
- Case law** For the last three decades myocardial perfusion imaging (MPI) with single photon emission computed tomography (SPECT) has been an excellent tool for guiding clinicians in the management of patients with known or suspected coronary artery disease (CAD). ...
- My library** Cited by 10 Related articles All 7 versions Cite Save
- Any time** **Transcatheter aortic valve implantation: role of multimodality cardiac imaging**
 V Delgado, APT Ma, M Shanks, [et al.](#) *cardiovascular* 2010 - Taylor & Francis

Scholar About 27,600 results (0.09 sec)

- Articles** **Transcatheter aortic valve replacement** [\[PDF\] from google.com](#)
 A Cheung, R Ree - Anesthesiology clinics, 2008 - Elsevier
- Case law** Aortic stenosis is one of the most common valve pathologies found in adults. Aortic valve replacement via a sternotomy and cardiopulmonary bypass is the treatment of choice for patients with symptomatic aortic stenosis with very acceptable risk. However, patients with ...
- My library** Cited by 18 Related articles All 5 versions Cite Save

- Any time** **Transcatheter aortic-valve implantation for aortic stenosis in patients who cannot undergo surgery** [\[PDF\] from lshtm.ac.uk](#)
 MB Leon, CR Smith, M Mack, DC Miller... - ... England Journal of ..., 2010 - Mass Medical Soc
- Background Many patients with severe **aortic** stenosis and coexisting conditions are not candidates for surgical **replacement** of the **aortic valve**. Recently, **transcatheter aortic-valve** implantation (**TAVI**) has been suggested as a less invasive treatment for high-risk patients ...
- Cited by 2916 Related articles All 5 versions Cite Save

- Sort by relevance** **Transcatheter aortic-valve replacement for inoperable severe aortic stenosis** [\[PDF\] from lshtm.ac.uk](#)
 RR Makkar, GP Fontana, H Jilaihawi... - ... England Journal of ..., 2012 - Mass Medical Soc
- Sort by date** Background **Transcatheter aortic-valve replacement** (TAVR) is the recommended therapy for patients with severe **aortic** stenosis who are not suitable candidates for **surgery**. The outcomes beyond 1 year in such patients are not known.
- ☐ include patents
☐ include citations Cited by 599 Related articles All 6 versions Cite Save

detect in vivo early mineralization and osteogenesis in **cardiac** valves, however. ...
 Cited by 262 Related articles All 8 versions Cite Save

Multimodality cardiovascular molecular imaging, Part II
[M Nahrendorf](#), DE Sosnovik, BA French... - ... : **Cardiovascular** ..., 2009 - Am Heart Assoc

Molecular **imaging** has the potential to profoundly im-pact preclinical research and future clinical **cardiovascular** care. In Part I of this 2-part consensus article on **multimodality cardiovascular molecular imaging**, the **imaging** methodology, evolving **imaging** ...

Cited by 108 Related articles All 9 versions Cite Save

[\[HTML\] from ahajournals.org](#)



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Outline

- Definitions
 - What is a multimodality imager
 - What is the goal of MMI training
- The Status - Imaging
 - General Training
- The Status – Advanced Imaging
 - Sub-Subspecialty Training
- Multiple Imaging boards



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Definition - External Authority



Definition - External Authority

INTERNAL MEDICINE SUBSPECIALTIES

Advanced Heart Failure and Transplant Cardiology

Cardiovascular Disease

Clinical Cardiac Electrophysiology

Clinical Informatics

Critical Care Medicine

Endocrinology, Diabetes, and Metabolism

Gastroenterology

Geriatric Medicine

Hematology

Hematology and Medical Oncology

Hospice and Palliative Medicine

Infectious Disease

Internal Medicine Pediatrics

Interventional Cardiology

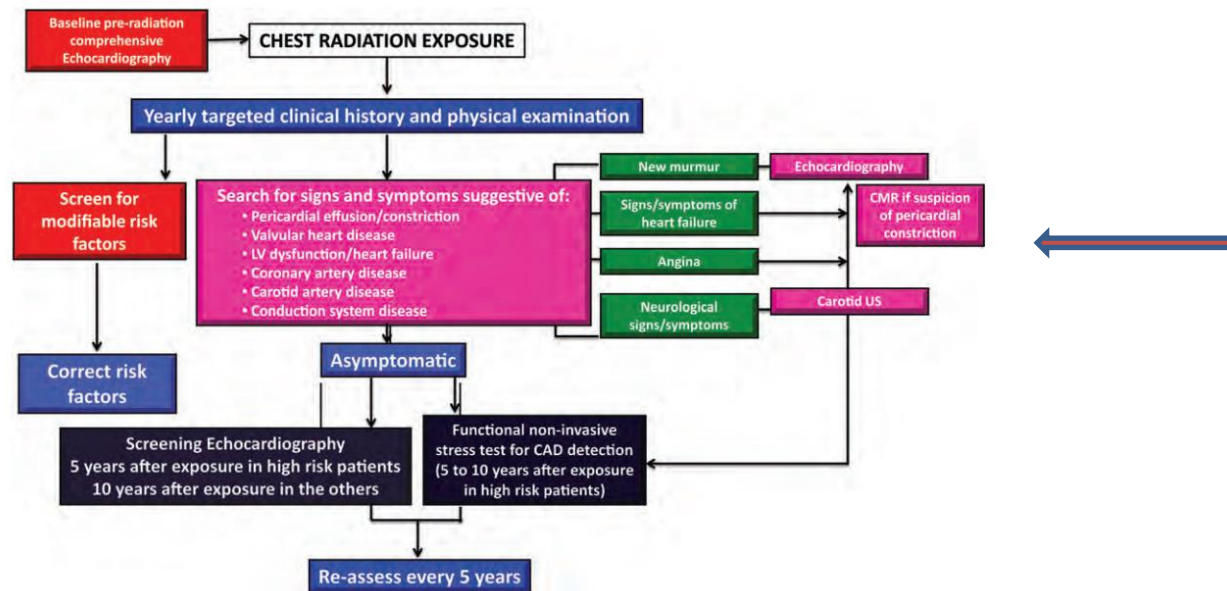


Multimodality Imaging: Opportunities and Challenges

Neil J. Weissman, MD,* Prem Soman, MD,† Dipan J. Shah, MD‡

- The Imaging Council was in agreement that multimodality imaging is the **efficient integration of various methods of cardiovascular imaging to improve the ability to diagnose, guide therapy, or predict outcomes.**
- The effective practice of multimodality imaging **is the ability to identify the best imaging modality for a given clinical scenario, thus reducing the need for multiple or layered imaging.**

Expert consensus for multi-modality imaging evaluation of cardiovascular complications of radiotherapy in adults: a report from the European Association of Cardiovascular Imaging and the American Society of Echocardiography

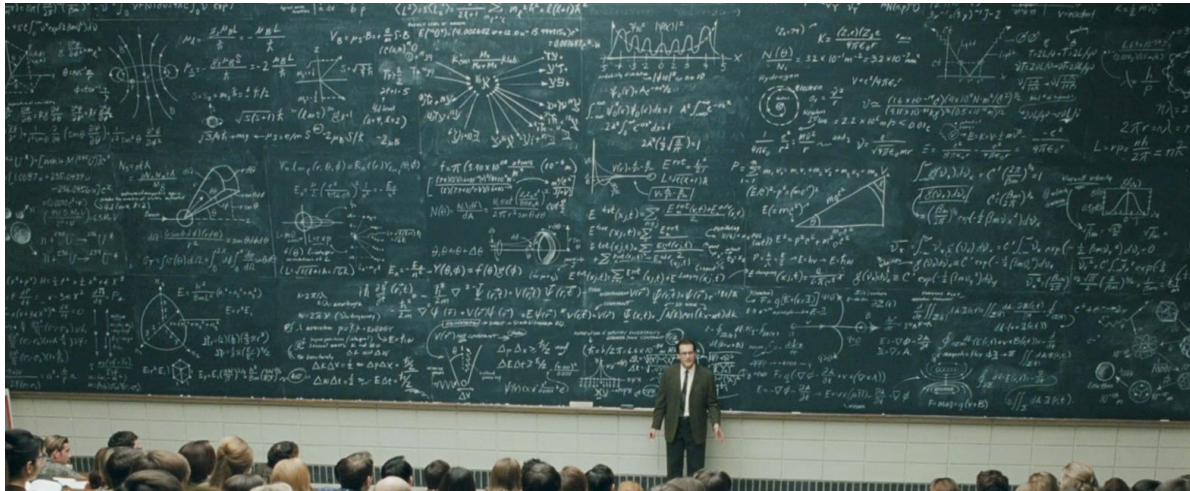


In collaboration with the
European Society of Cardiology Working Groups on Nuclear Cardiology and Cardiac
Computed Tomography and Cardiovascular Magnetic Resonance and the American
Society of Nuclear Cardiology, Society for Cardiovascular Magnetic Resonance,
and Society of Cardiovascular Computed Tomography



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How do we get there?



The Goal of MMI Training

How do we get to an answer that makes sense?

$$1 + 2 + 3 + 4 + \dots$$

$$= -\frac{1}{12}$$



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Goals

- All fellows should be conversant in all imaging modalities (level I in all four modalities)
- For MMI, at least 2 level II if not more
- How many more?
- What should be the expectations for the MMI interested graduate?
 - Should the expectations all be the same for all graduates?



Guidelines for Training in Adult Cardiovascular Medicine

Core Cardiology Training Symposium (COCATS)*

June 27–28, 1994

JOSEPH S. ALPERT, MD, FACC, CHAIRMAN

The Past

Magnetic resonance imaging. Familiarity with the cardiovascular applications and interpretations of magnetic resonance images is essential to the training of a cardiovascular fellow. This imaging modality has many existing uses and considerable potential in noninvasive diagnosis. It is recommended that, where available, the fellow devote 2 months of time to magnetic resonance imaging (MRI). To become conversant enough with this methodology to be proficient with interpretation, a 4-month experience is recommended, and to become experienced enough for development and management of an MRI laboratory, a 1-year comprehensive experience is essential.



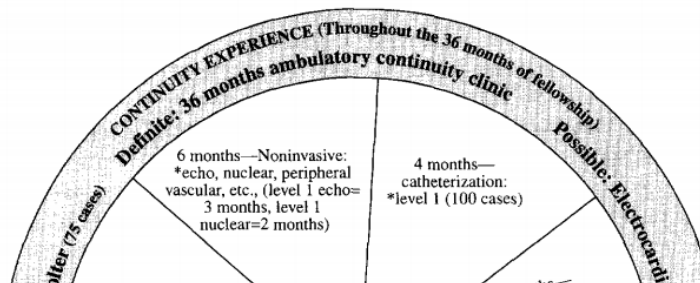
Guidelines for Training in Adult Cardiovascular Medicine

Core Cardiology Training Symposium (COCATS)*

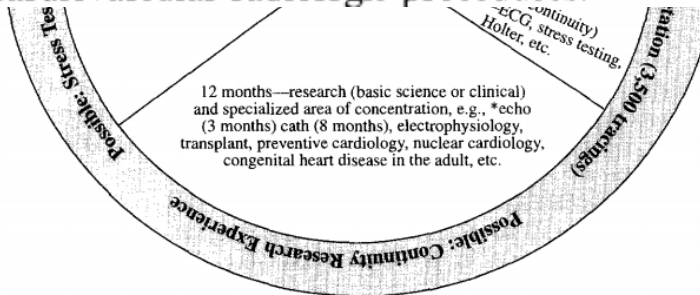
June 27–28, 1994

JOSEPH S. ALPERT, MD, FACC, CHAIRMAN

The Past



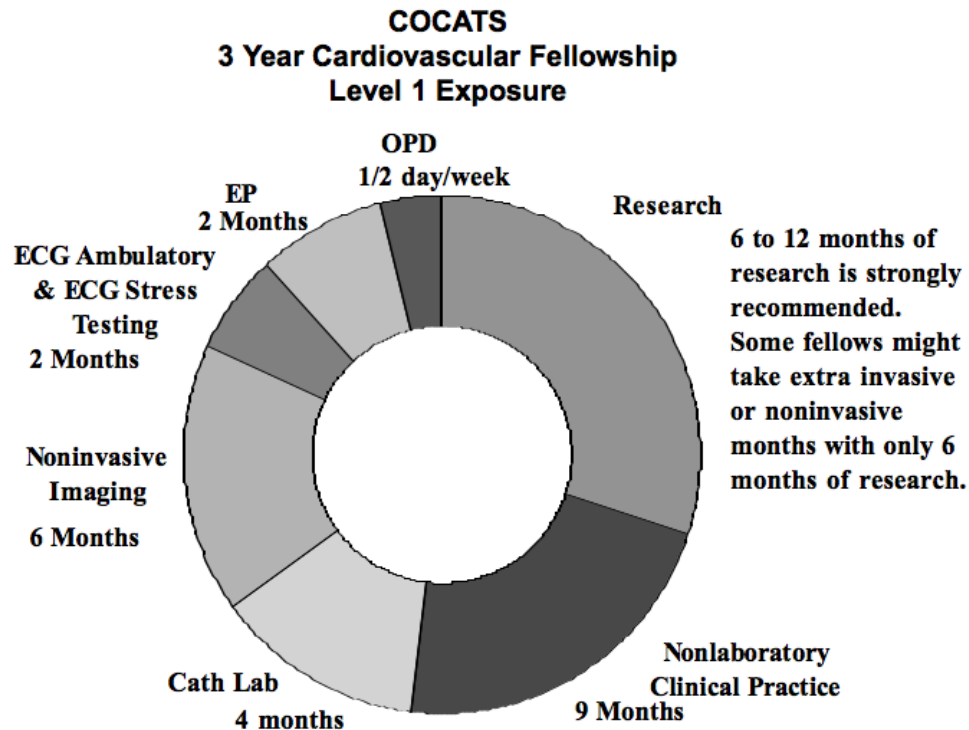
Radiology. The interpretation of cardiovascular X-ray films, with particular reference to vascular structures and special cardiovascular radiologic procedures.



ACC Revised Recommendations for Training in Adult
Cardiovascular Medicine Core Cardiology Training II
(COCATS 2)

(Revision of the 1995 COCATS Training Statement)

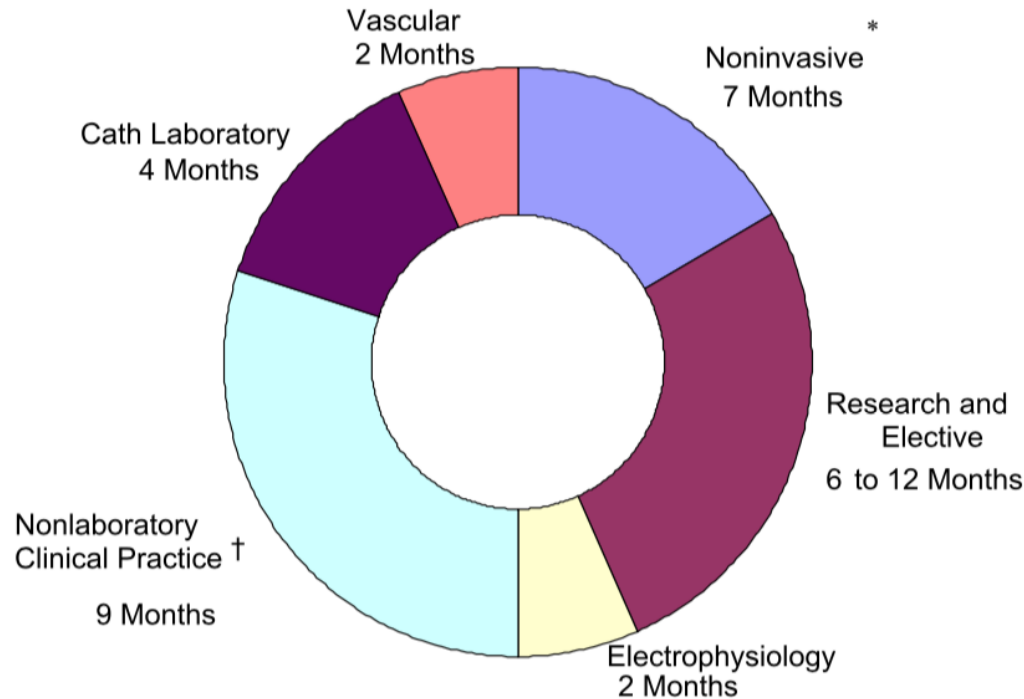
The Past



**ACCF 2008 Recommendations for Training
in Adult Cardiovascular Medicine Core
Cardiology Training (COCATS 3)
(Revision of the 2002 COCATS Training Statement)**

George A. Beller, MD, MACC, *Co-Chair*
Robert O. Bonow, MD, FACC, *Co-Chair*
Valentin Fuster, MD, PhD, FACC, *Co-Chair*

The Past



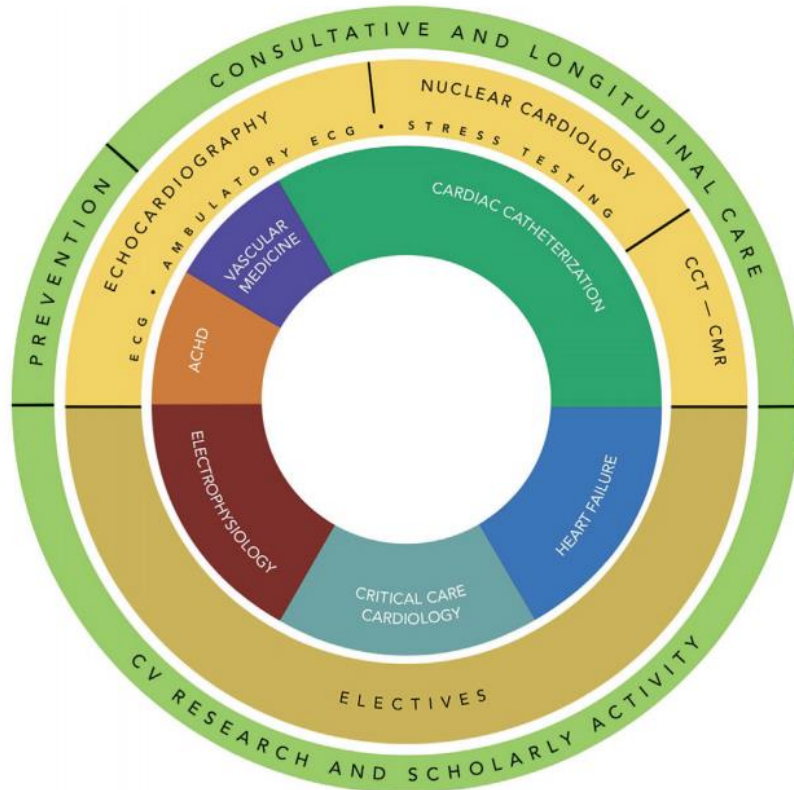
Training in Multiple Imaging Modalities

The recent emergence of other noninvasive imaging modalities, especially cardiovascular magnetic resonance and computed tomography angiography, is having a profound impact on the practice of cardiology and the fellowship training experience. The cardiovascular medicine specialist is increasingly expected to provide expertise in 2 or more of the imaging techniques. It is understandable, then, that trainees will desire the opportunity to gain exposure to multiple imaging modalities during their fellowship experience. To the degree possible, the training program should strive to meet these needs by offering a “multimodality” imaging experience. This might include an appreciation for each technique’s uses and clinical indications, strengths and limitations, safety issues, and the guidelines and appropriateness criteria, when available.

TRAINING STATEMENT

ACC 2015 Core Cardiovascular Training Statement (COCATS 4) (Revision of COCATS 3)

The Present



COCATS 4 Task Force 4: Training in Multimodality Imaging

- Level I in all noninvasive training modalities in **7 months**
 - Every cardiovascular trainee should learn the principles underlying echocardiographic, nuclear, CCT, and CMR imaging modalities, including their respective advantages, limitations, and potential risks.
- Level II in more than 2 imaging modalities typically requires additional training beyond the standard 3-year fellowship
- The future of cardiac imaging will include enhanced integration across modalities of critical information regarding cardiac structure, function, physiology, and pathology. This deeper integration will facilitate **patient-centric imaging**.

MMI Months?

- Training programs are encouraged to embrace these concepts and offer opportunities for fellows at all levels of training to **concurrently assess the findings generated by more than 1 imaging modality**, allowing them to experience firsthand how these can yield complementary information.



COCATS 4 (cont.)

- Most trainees should develop independent competency (Level II) in echocardiography
- Selected fellows ... may develop independent competency (Level II) in an additional imaging modality (nuclear, CCT, or CMR)
- Level II competency in more than 2 modalities typically requires additional training beyond the standard 3-year cardiovascular fellowship.
- An especially adept and committed fellow ...may accomplish competency in 3 modalities during the standard fellowship through flexible rotations



MMI Training Principles:

The fine print

TABLE 1 Key Principles for Training in Multimodality Noninvasive Cardiovascular Imaging

1. Cardiovascular imaging techniques are key components in the evaluation of patients with known or suspected heart and vascular disease, and every cardiology trainee should have a basic understanding of their proper use in patient care.
2. Noninvasive cardiovascular imaging modalities are increasingly complex and expensive, making appropriate use of the technologies essential for the high-quality, efficient, and cost-effective practice of clinical cardiology.
3. All cardiovascular trainees should understand the basic principles underlying echocardiographic, nuclear cardiology, CCT, and CMR, along with their limitations and potential risks.
4. All cardiovascular trainees should achieve competence in evidence-based application of noninvasive cardiovascular imaging and selection of the most appropriate imaging modality for common clinical conditions. A guiding educational principle is that utilization of noninvasive imaging for a given clinical situation should not be aligned with or committed to a specific or single modality but should instead involve selection of the optimum test to address the clinical situation at hand, within the setting of available technical resources and professional expertise.
5. Every standard 3-year cardiovascular fellow should understand the distinguishing concepts of echocardiography, nuclear cardiology, CCT, and CMR as the basis for Level I competency in all 4 modalities. Programs can provide this training through on-site facilities, off-site collaboration with other programs, and access to audiovisual resources and courses organized by subspecialty organizations.
6. Concurrent training across multiple imaging modalities is encouraged when possible. Topics common to multiple modalities (e.g., radiation physics, image processing) can be grouped to avoid duplication or repetition.
7. Trainee competency is the primary determinant of sufficient training, rather than the time, exposure, or volume of imaging studies performed or interpreted. All cardiovascular trainees should become competent in integrating the results of noninvasive imaging with other components of clinical evaluation to manage patients with cardiovascular disease. Correlation of findings across multiple imaging modalities should be emphasized to enhance the understanding of the strengths and weaknesses of each modality. Common workstations that display images generated by multiple imaging modalities are useful for this purpose.
8. All cardiovascular trainees should be able to identify complex settings in which consultation with a specialist in advanced cardiovascular imaging can help in selecting the imaging approach that addresses the clinical questions most accurately and efficiently.
9. All standard 3-year cardiovascular fellows should gain a deep understanding of appropriate use criteria (AUC) and be encouraged to link all logged procedures to the corresponding AUC.
10. Programs should offer opportunities to facilitate Level II training in 1 or more modalities, which are to be selected on the basis of each fellow's aptitude, interests, and career goals. More advanced competency beyond Level II typically requires additional training beyond the standard 3-year cardiovascular fellowship.
11. Satisfactory acquisition of the knowledge and skills corresponding to Level II competency should be measured and documented by recognized methods, such as by meeting the criteria for the examinations offered by the National Board of Echocardiography and the Certification Board of Nuclear Cardiology and Cardiac Computed Tomography.
12. Cardiology programs should strongly consider providing standard 3-year cardiovascular fellows with independent competency (Level II) in echocardiography during the standard 3-year fellowship.
13. Advanced training in multimodality cardiovascular imaging (beyond that obtained during the general fellowship) results in a higher level of competency and the ability to both direct an MMI center and train others in noninvasive cardiovascular imaging.
14. As medical school and residency training provides more advanced imaging training and a wider array of modalities is introduced in the future, fellows in cardiology should be progressively better prepared to understand, utilize, and perform cardiac imaging.



MMI Training Principles:

The Highlights

- All trainees should understand the basics of echo, nuclear, CCT, and CMR
- A guiding educational principle is that utilization of ... imaging ... should not be aligned with ...a single modality but should instead involve selection of the optimum test to address the clinical situation at hand
- Concurrent training across multiple imaging modalities is encouraged when possible
- Correlation of findings across multiple imaging modalities should be emphasized
- Programs should strongly consider providing ... independent competency (Level II) in echocardiography during the standard 3-year fellowship



Implementing Multimodality Imaging in the Future

Y. Chandrashekar, MD,^a Vasken Dilsizian, MD,^b Christopher M. Kramer, MD,^c Thomas Marwick, MBBS, PhD, MPH,^d
James K. Min, MD,^e Leslee Shaw, PhD,^f William A. Zoghbi, MD,^g Jagat Narula, MD, PhD^h

TABLE 3 What Should a MMI Trainee Be Able to Do Competently?

1. Add demonstrable “clinical value” to patient care with imaging.
2. Provide high-quality interpretation of imaging data expertly and expeditiously.
3. Understand the strengths and weaknesses of imaging modalities in great detail and competently use them in day-to-day practice.
4. Understand prognosis and outcome data with imaging results.
5. Advise on need for imaging and best imaging strategy (efficient, cost effective, and safe) to answer the clinical question.
6. Discuss and substitute the right imaging test or modality for inappropriately ordered testing in consultation with the referring clinician.
7. Perform high-quality imaging consistent with current guidelines and appropriate use criteria and avoid duplication.
8. Provide an “outcome-based strategy” for diagnostic testing.

Implementing Multimodality Imaging in the Future

Y. Chandrasekhar, MD,^a Vasken Dilsizian, MD,^b Christopher M. Kramer, MD,^c Thomas Marwick, MBBS, PhD, MPH,^d
James K. Min, MD,^e Leslee Shaw, PhD,^f William A. Zoghbi, MD,^g Jagat Narula, MD, PhD^h

- Core Philosophy:
- 2 levels of imagers
 - Large mass of multimodality imagers
 - Day to day front line imaging
 - Handle 3-4 modalities
 - Smaller mass of imagers with a higher level of training
 - Level III in one or more modalities



Months** of Required Training

- Echo
 - 3/6/9
- Nuclear
 - 2/4/12*
- CCT
 - 1/2/6*
- CMR
 - 1/3/12*
- Time in training (mo)
 - Level I
 - $3+2+1+1 = 7$
 - Level I+II* (echo)
 - $6+2+1+1=10$
 - Level II
 - $6+4+2+3 = 15$
 - $6+X+Y = Z (<15)$
 - Level III
 - $9+12+6+12 = 39$

- * Level III # based on COCATS3
- ** Competencies, not months



Implementing Multimodality Imaging in the Future

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James K. Min, MD,^e Leslee Shaw, PhD,^f William A. Zoghbi, MD,^g Jagat Narula, MD, PhD^h

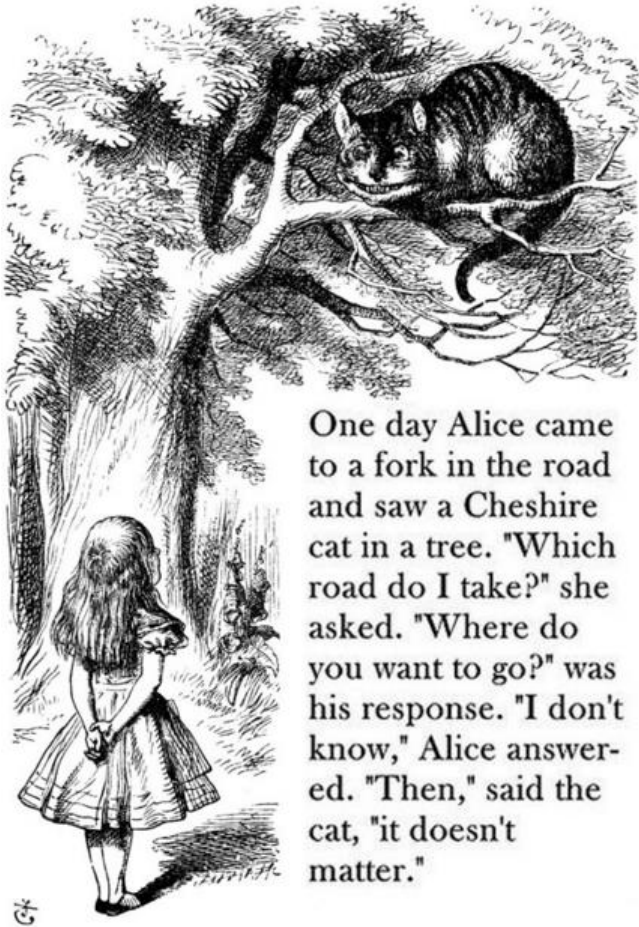
- The main current limitation to transitioning fellows into MMI, in our view, is the unrealistic length of training that is expected of them

Implementing Multimodality Imaging in the Future

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James K. Min, MD,^e Leslee Shaw, PhD,^f William A. Zoghbi, MD,^g Jagat Narula, MD, PhD^h

**TABLE 2 One Template for MMI Training Within a 3-Year Program:
Career Goal-Specific MMI Training (Months for Level II)**

Modality	Level	Cumulative Duration			
		MMI Pathway			
		Traditional Pathway	Total	Dedicated	Shared
Echocardiography	2	6	6	4	2
Nuclear	2	4-6	4	2	2
CMR	2	3-6	3	2	1
Cardiac CTA	2	2	2	1	1
Total training		15	15 spread over 12	9	6



One day Alice came to a fork in the road and saw a Cheshire cat in a tree. "Which road do I take?" she asked. "Where do you want to go?" was his response. "I don't know," Alice answered. "Then," said the cat, "it doesn't matter."

- What is/are the goal/possible goals of MMI training for cardiovascular disease fellowship trainees?
- Is it the same for all trainees?

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What is out there?



[< Back To Public](#)

Accreditation Council for Graduate Medical Education (ACGME) - Public

List of Programs by Specialty

List of programs within a particular specialty for current academic year and those newly accredited programs with future effective dates (Year ending June 30th, 2016)

Specialty

Interventional cardiology



Include Programs with a Pre-Accreditation status in report

☐ Yes

Run Report



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A List

Interventional Cardiology Programs Academic Year 2015-2016 United States



List of accredited programs within this specialty and those newly accredited programs with future effective dates

Program Number / Name	Address	Program Director	Accreditation Status	Effective Date	Core/Related Program	Core/Related Specialty
[1523512113] Albany Medical Center Program	Albany Medical Center Mail Code 17 47 New Scotland Avenue Albany NY, 12208 Ph: 5182625076 Fax: 5182625082 brozowm@mail.amc.edu	Augustin DeLago MD	Continued Accreditation	01/15/2016	[1403531248] Albany Medical Center Program Dr. Raymond P Smith MD smithR4@mail.amc.edu	Internal medicine
[1524121059] Albert Einstein Healthcare Network Program	Albert Einstein Medical Center 5501 Old York Road Levy Building, 3rd Floor, Room 3232 Philadelphia PA, 19141 Ph: 2154565955 Fax: 2154567926 morrisd@einstein.edu	Sean F Janzer MD	Continued Accreditation	01/15/2016	[1404111369] Albert Einstein Healthcare Network Program Dr. Glenn Elger MD medicine@einstein.edu	Internal medicine
[1524112061] Allegheny Health Network Medical Education Consortium (AGH) Program	Allegheny General Hospital Division of Interventional Cardiology 320 East North Avenue, 4 Fl, Snyder Pavilion Pittsburgh PA, 15212 Ph: 4123596270 Fax: 4123596292 cbowers3@wpahs.org	David M Lasorda DO	Continued Accreditation	01/15/2016	[1404111381] Allegheny Health Network Medical Education Consortium (AGH) Program Dr. James B. Reilly MD, MS	Internal medicine
[1525613114] Aurora Health Care Program	Aurora Sinai Medical Center 945 N 12th St, PO Box 342 Milwaukee WI, 53201 Ph: 4142197190 Fax: 4142197676 rebecca.young@aurora.org	Tanvir Bajwa MD	Continued Accreditation	01/15/2016	[1405621446] Aurora Health Care Program Dr. Richard Battoli MD rebecca.young@aurora.org	Internal medicine
[1524821068] Baylor College of Medicine Program	Baylor College of Medicine Section of Cardiology 1709 Dryden, MS-BCM620, Ste 5.90 Houston TX, 77030 Ph: 7137980284 Fax: 7137980277	Nasser Lakkis MD, MS	Continued Accreditation	01/15/2016	[1404821422] Baylor College of Medicine Program Dr. Richard Hamill MD rhamill@bcm.edu	Internal medicine
[1524823067] Baylor College of Medicine/St Luke's Episcopal Hospital Program	Baylor St. Luke's Medical Center 6720 Bertner (MC 1-133) Houston TX, 77030 Ph: 8323558676 Fax: 8323558374 mjones@stlukeshealth.org	Richard D Fish MD	Continued Accreditation	01/15/2016	[1404821422] Baylor College of Medicine Program Dr. Richard Hamill MD rhamill@bcm.edu	Internal medicine



Is there a canonical list for Imaging?



FELLOWSHIPS

Training & Certification » Fellowships

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FELLOWSHIPS

1-3 Month Fellowships

6 Month Fellowships

1 Year Plus Fellowships

Introductory Training

Advanced Imaging Training Program Database

Imaging Section

+ Imaging Section Membership

+ About Us

+ Meetings

Advanced Imaging Training Program Database

The Cardiovascular Imaging Section of the American College of Cardiology has compiled the following imaging training program database as a service to advanced cardiovascular imaging programs and interested applicants. As the number of available positions may vary from year to year, ACC will survey programs for updates annually.

If you would like your program added to this list, please contact Stefan Lefebvre at slefebvre@acc.org.

Northeast

Click the plus signs below to learn more about each state's training programs.

+ Connecticut

+ Massachusetts

+ New Jersey

+ New York

+ Pennsylvania

South

Midwest

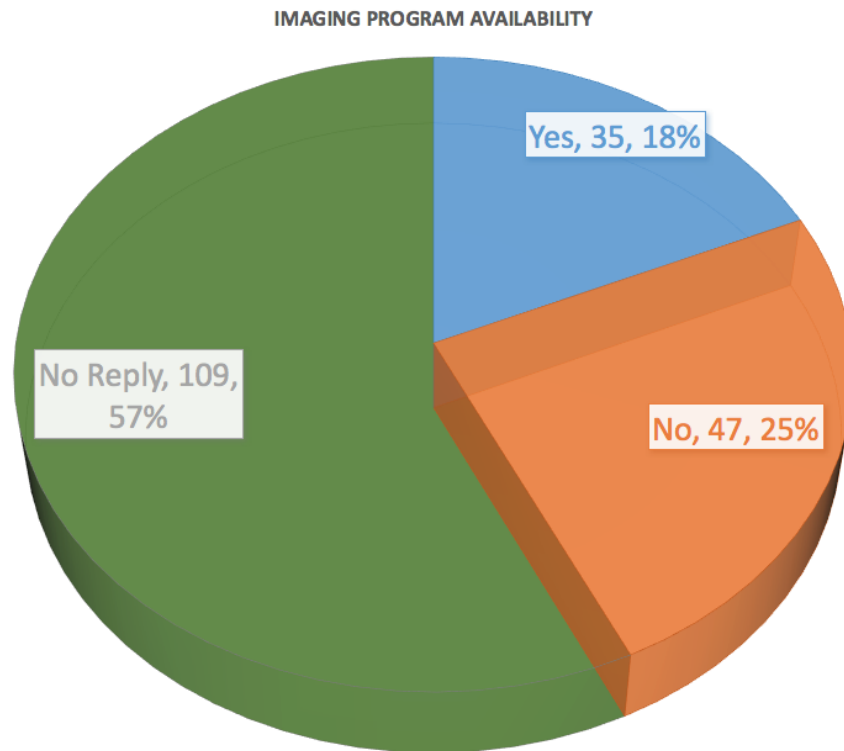
West



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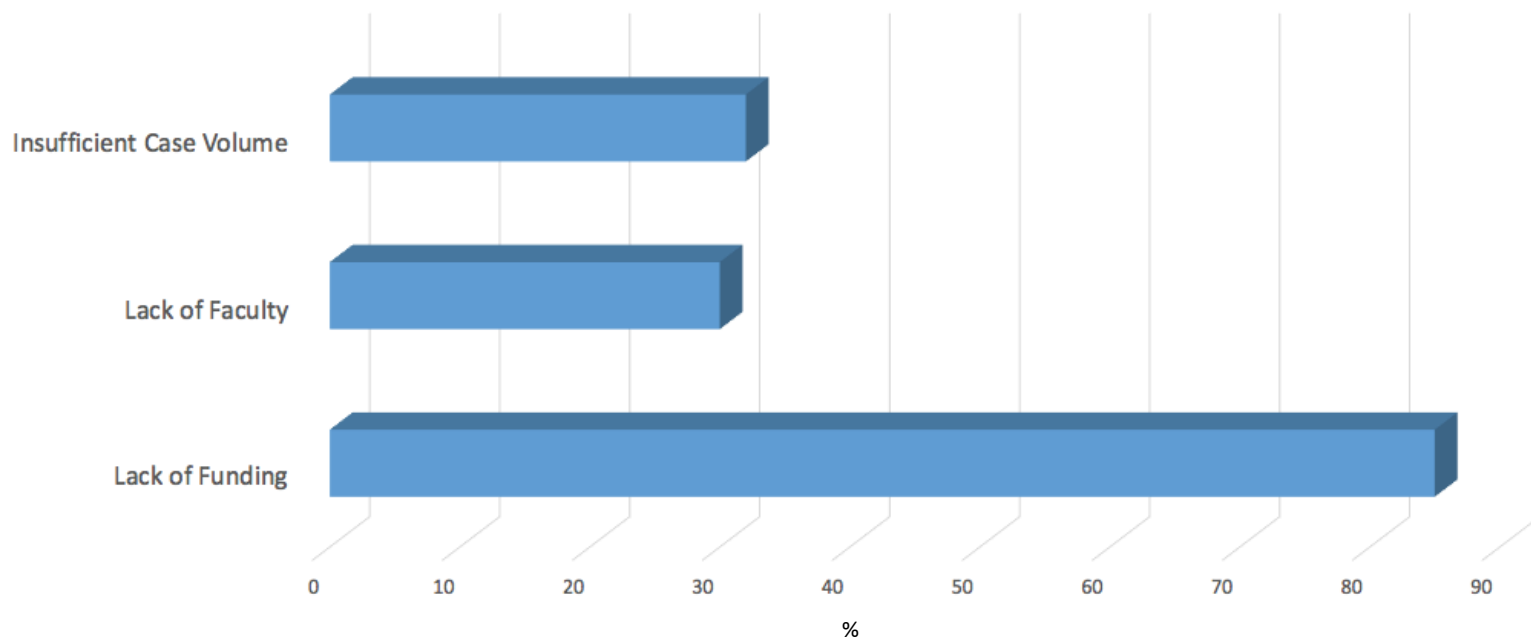
Current State of Advanced Cardiovascular Imaging Training in the United States

Nishant R. Shah, MD, MPH, MSc
Michael W. Cullen, MD
Michael K. Cheezum, MD
Howard Julien, MD, MPH
Chittur A. Sivaram, MBBS
Prem Soman, MD, PhD



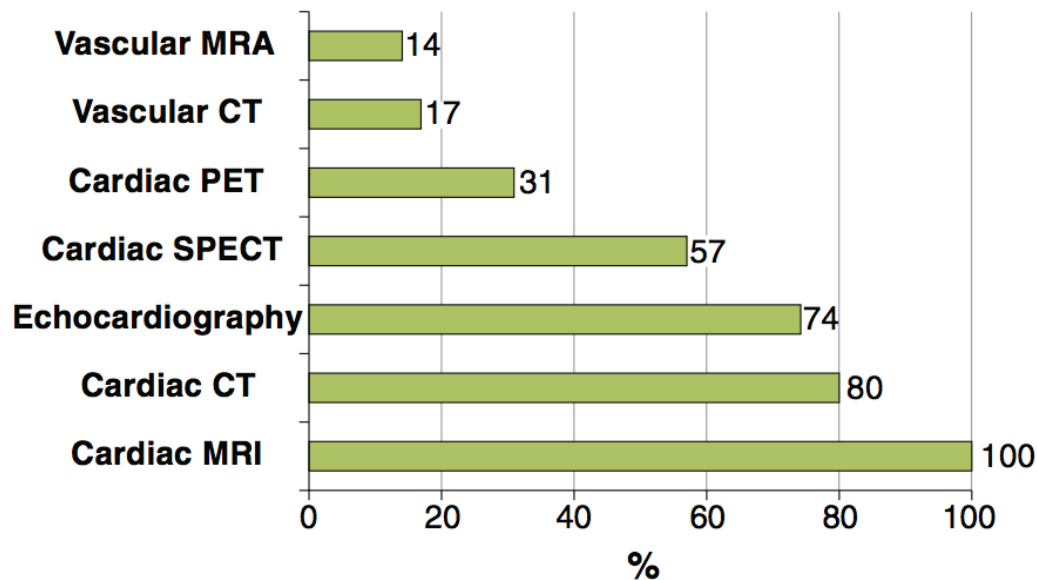
Current State of Advanced Cardiovascular Imaging Training in the United States

Reason for Lack of Imaging Program



Current State of Advanced Cardiovascular Imaging Training in the United States

% Institutions Offering Modality (n = 35)

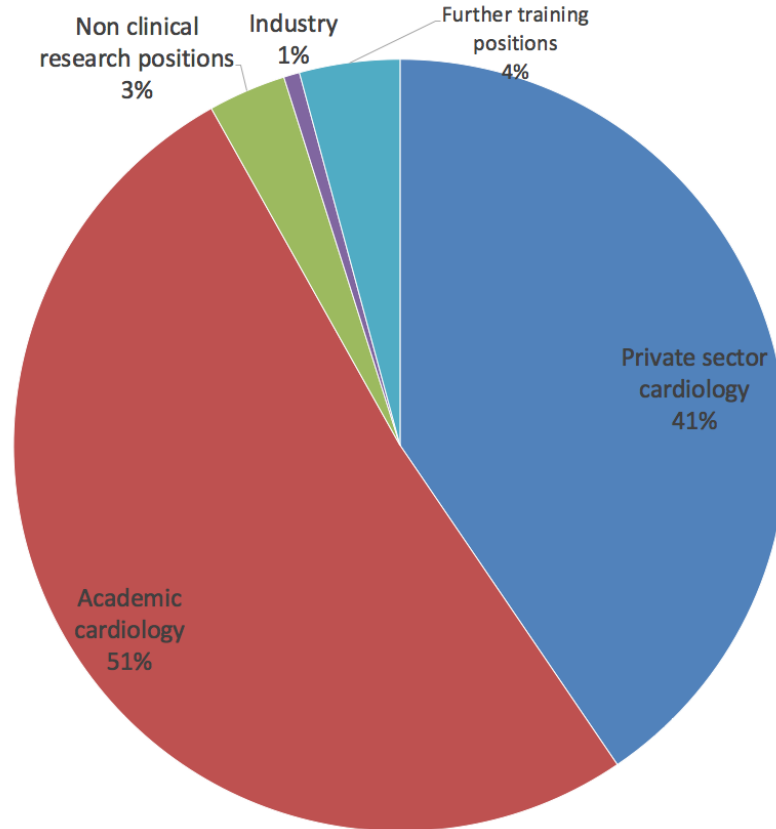




- What happens to the MMI trainee in the “real world”?

Informal Survey of Imaging Programs

Positions
Taken By
Graduating
Fellows



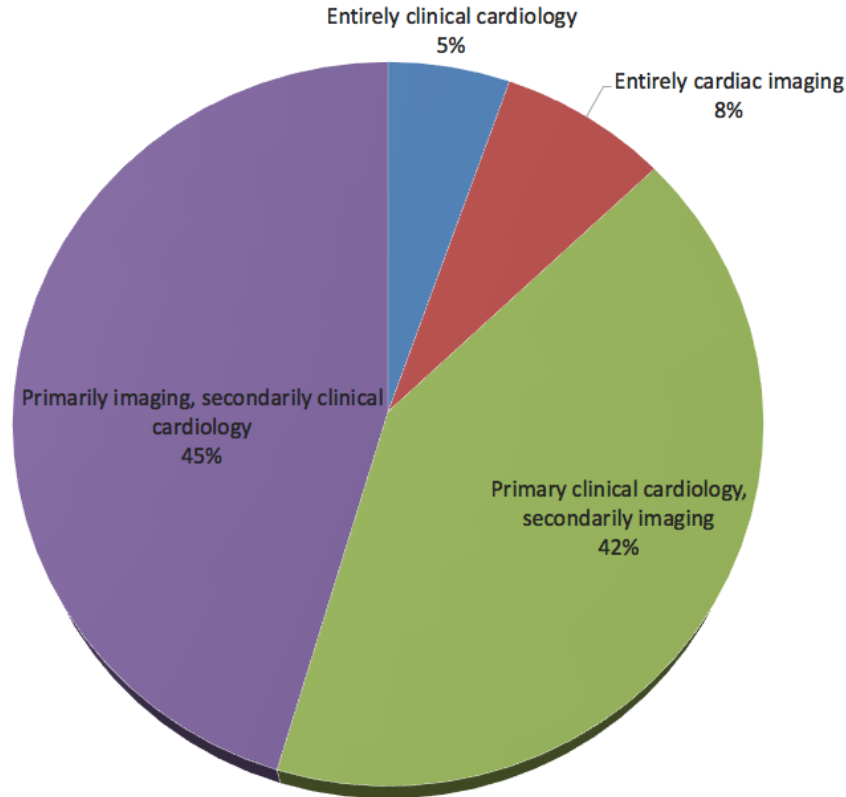
19/51 (37%)
programs
responded

180 trainees
over 5 years



Informal Survey of Imaging Programs

Positions Taken After Imaging Fellowship

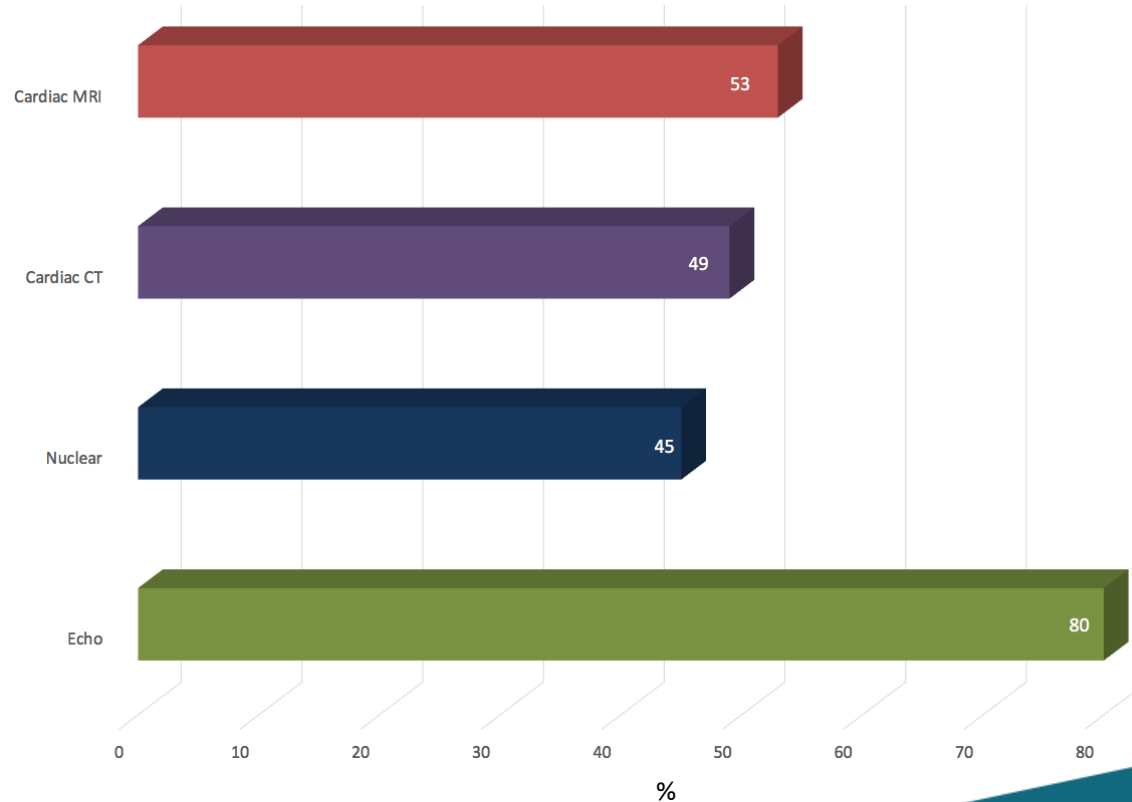


180 trainees over 5 years

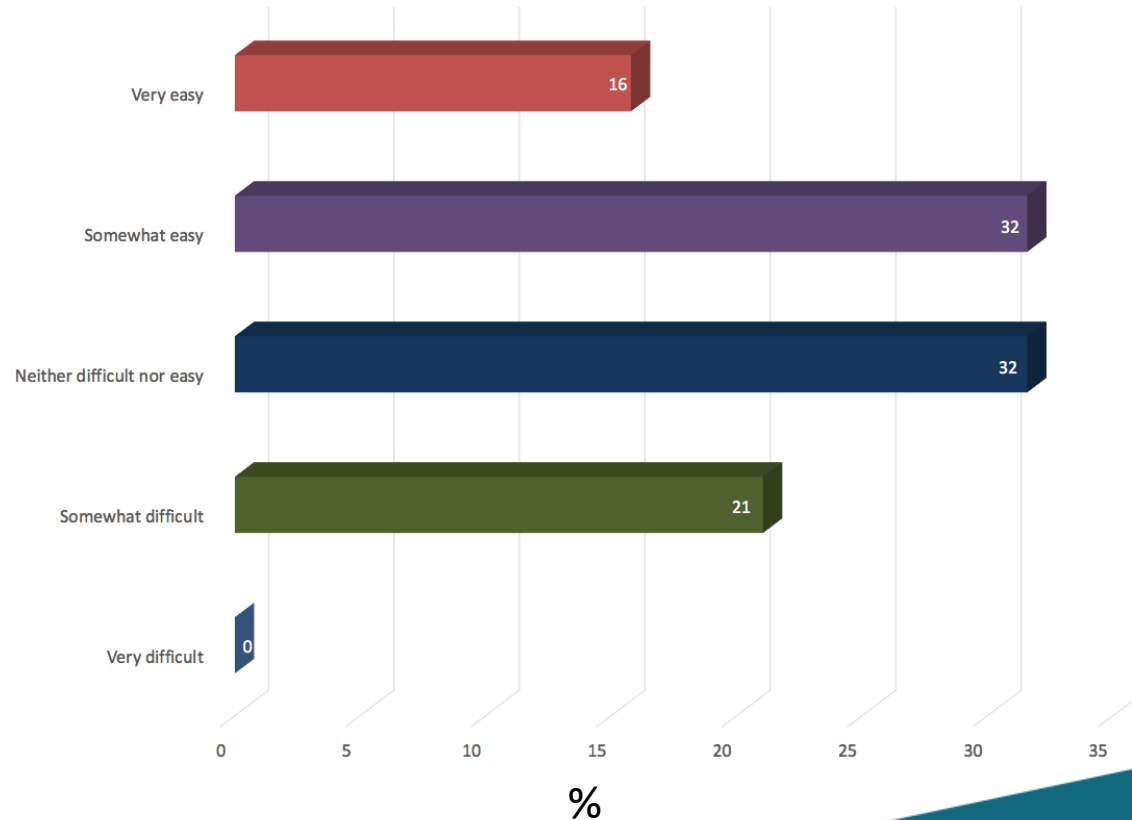


Informal Survey of Imaging Programs

Level II (+) Training required per Imaging Modality



Overall for graduates from the advanced imaging program, how would you rate the difficulty for them to have found the position that they wanted (that encompassed the elements that they preferred that it would):



(19 programs)



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Multiple Imaging Boards

- Examination of Special Competence in Adult Echocardiography
 - \$995-1195
- Certification Board of Nuclear Cardiology
 - \$995-1195
 - \$50 multimodality discount
- Certification Board Of Cardiovascular Computed Tomography
 - \$950-1150
 - \$50 multimodality discount
- European CMR Exam
 - €325-450
- Maintaining CME in multiple imaging specialties
- National/ international imaging meetings
 - ASE, ASNC, SCCT, SCMR

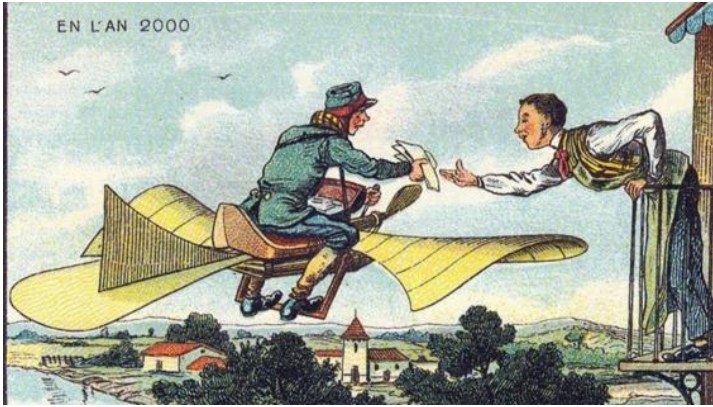


Questions

- The goals of the three year general training for the cardiac imager?
 - MMI vs. single modality specialist
 - What is MMI (2,3,4 modalities)? Are all MMI graduates the same?
- What paths can be offered in training depending of the goals of the trainee?
 - Multimodality months? Length of training? Degree of expertise?
- The goals of dedicated cardiac imaging training programs?
 - Wide variety in programs and offerings
 - Multi modality to sub sub specialty (e.g. interventional echo)
- Funding of cardiac imaging training programs?
- The job market
 - What are the needs?
 - What skills are required by the graduate?



The Coming Years?



19th Century French Artists Predicted The World Of The Future In This Series Of Postcards

