



Joint EACVI HIT/EAPCI young survey/ESC CoT survey: training and education for ‘multimodality imaging in structural interventions’: the rise of a new sub-specialty?

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Over the past decade, there have been significant advances in interventions for structural and valvular heart disease, with multimodality imaging playing a prominent role in patient selection, pre-procedural screening, and/or procedural guidance.^{1,2} This growth in structural interventions emphasizes the need for cardiologists with expertise in advanced imaging. Therefore, the question is whether the current training and education are sufficient in terms of training for imaging in structural interventions, as well as whether the current demand for imaging cardiologists will evolve imaging in structural intervention into a specific sub-specialty in cardiology. The aim of this worldwide survey was to evaluate the needs of young cardiologists with respect to training and education in the field of imaging in interventional cardiology.

Nucleus members of three young European Society of Cardiology (ESC) communities (EACVI Heart Imagers of Tomorrow, EAPCI Young, and ESC Cardiologists of Tomorrow) built an anonymous questionnaire, with final review and approval by the EACVI scientific committee. The questionnaire was distributed to young imaging cardiology fellows—either in their training period or at a stage of early career—through the mailing list of the ESC. The participation period was 2 months (October 2015 to December 2015).

The survey was answered by 276 cardiology imaging fellows from 19 different countries. When they were asked ‘in which imaging

modality, you consider yourself an expert?’, all (100%) of the participants answered with confidence that they consider themselves as experts in transthoracic echocardiography. About one-third of the participants (37.4%) declared their confidence in performing transoesophageal echocardiography including 3D imaging. Proficiency in cardiac magnetic resonance was acknowledged by 8.4% and in computed tomography (CT) as well as in nuclear cardiology by 3.6% of the trainees.

The structural intervention procedure most commonly taking place in the centres of the survey participants was transfemoral aortic valve implantation (TAVI) followed by patent foramen ovale closures and congenital interventions. Regarding ‘availability’ of imaging techniques, the most available was echocardiography (including stress imaging) followed by CT.

When fellows were questioned whether they felt their training in non-invasive cardiology imaging to be adequate to independently assess a patient undergoing TAVI/MitraClip/LAA closure for eligibility, the majority (66%) replied they do not feel confident and they need more training. A significant part of the trainees (79%) also believe that there is not enough training or the necessary teaching of imaging techniques in the field of guiding interventions. Some trainees have already applied or were successful in obtaining a training grant, but the great majority are interested in this opportunity. Finally, the

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majority of trainees responded that 'imaging in interventions' is worth to become a new sub-specialty in cardiology.

Our survey highlighted the importance of multimodality imaging in transcatheter interventions underlying the needs for training and education. Further studies exploring the necessary learning curve, and the gradual recognition of 'interventional imaging' as an entirely separate sub-specialty, are crucial for the future of this branch of multimodality imaging.

At present, there are training guidelines for multimodality imaging, but not for 'interventional imaging'.³ Our survey underscores the need for further training and education in this emerging sub-specialty. Challenges currently faced by fellows who look for 'interventional imaging' training include the availability and variable volume of interventional procedures performed in their centres, including aortic, mitral procedures, defect closures, or complex congenital cases.⁴ This may explain why there are only a small number of centres with sufficient knowledge and experience in these procedures to provide adequate training.

There are tremendous opportunities to help shape the future of training for multimodality imaging in interventions, and this future can largely be shaped by the needs of fellows seeking that training. On the one hand, it is a great time for our generation of trainees, as new subspecialties are rising and cardiology reaches the peak of its technological advance and innovation. On the other hand, the field is relatively new and there is an on-going need of a structured training programme as well as training grants focusing on this specific area of expertise. The European Association of Cardiovascular Imaging encourages the multimodality way of thinking and encourages a strong link with other societies such as the European Association of Percutaneous Interventions. The aim of EACVI is to enhance the training of young cardiologists and offer them unique opportunities to apply the new imaging modalities.⁵

In the near future, certification in this type of imaging will be essential in adding a skill proof for those who want to perform imaging in interventions.^{4,5} Building up the skill of interventional imaging will require dedicated time and a multimodality approach of practicing: trainees will be challenged not only with TAVI, MitraClip, or patent foramen ovale closure but also with even more complex procedures such as congenital cases.

The appropriate duration of such training programme is uncertain. Studies that will evaluate the learning curve of interventional

imaging and comparison between experts in the field with young trainees will be of great value in defining the duration of potential fellowship and the demands of a logbook.

Taking into consideration that 'imaging in interventions' is a rising sub-specialty, short courses will be crucial to achieve that aim. Certainly, the person who is dealing with 'imaging in interventions' will have a great overall knowledge of multimodality imaging and especially echocardiography, representing an 'imaging cardiologist'.^{6,7}

Few countries train sonographers in order to be independent echocardiographers, and physiologists are expected to take part in interventional procedures. This issue though is complex, as the imager who will be specialized for interventions, carries an extra responsibility of directing the interventional cardiologists about the correct positioning of the valve or the closure patch. Therefore, a sonographer will require further training in anatomy, physiology, and imaging in order to be able to undertake the responsibility of a successful intervention as well as to deal with any kind of complications.

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