

Recommendations for Training in Performance and Interpretation of Stress Echocardiography

Committee on Physician Training and Education of the

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Stress echocardiography has emerged as a clinically useful procedure in the management of patients with ischemic heart disease and other conditions. However, the accuracy of this test relies on the ability of those who carry out the technical aspects of the test and depends critically on proper interpretation of the images. Appreciation of wall motion abnormalities is generally acknowledged as one of the most difficult skills to

master in echocardiography. There is consensus that this is also one of the most difficult skills to teach. Appreciating stress-induced changes in wall motion, which sometimes are subtle, requires a significant commitment to initial training in this skill and its maintenance.^{1,2} This document provides recommendations for physician training in stress echocardiography. (J Am Soc Echocardiogr 1998;11:95-6.)

FELLOWS IN TRAINING

It is recommended that all current cardiovascular trainees become familiar with stress echocardiographic techniques using both exercise and pharmacologic interventions. Persons who wish to be responsible for the conduct and interpretation of stress echocardiography should begin this training once they have achieved Level 2 training (i.e., 300 examinations and 6 months of training in basic echocardiography). Training should include all aspects of stress echocardiography, such as patient selection, electrocardiographic interpretation, symptom interpretation, and the mechanics of acquiring echocardiograms during stress protocols. Special attention should be paid to recognition of artifacts and avoidance of technical pitfalls. Direct "hands-on" supervision of exercise stress and/or infusion of pharmacologic agents in 50 patients is recommended.

Specific training in stress echocardiography is to be undertaken upon demonstration of proficiency in the assessment of wall motion in the resting state (includ-

ing identification and quantitation of wall motion abnormalities and ventricular function) to the satisfaction of the training supervisor. Training in identification of wall motion abnormalities induced by ischemia can then begin. In general this training should be done in laboratories that perform a minimum of 40 stress echocardiograms per month. The training supervisor in such a laboratory should have Level 3 training,³ experience with independent interpretation of over 200 stress echo studies, and should maintain the skills suggested below.

The following recommendations are based on published data and the authors' observation of many students.^{1,2} The trainee should provide primary interpretation of at least 100 stress echocardiographic studies under supervision before beginning independent interpretation (see table). This is a minimum number and does not provide for exposure to all the variations of stress echocardiographic results and complications. This number is usually necessary but may not be sufficient to adequately obtain this skill. The training supervisor should be the judge of the level achieved by the trainee.

This basic competency in interpretation of stress echocardiography usually can be accomplished during formal structured experience in an established echocardiographic laboratory during fellowship training. In most instances, dedicated training sufficient to be classified as Level 3 (total of 12 months) is

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Table 1 Summary of recommendations for training in stress echocardiography

	Fellows in training	Postfellowship training	Maintenance of skills
Qualifications for training	<ul style="list-style-type: none"> • Level 2 training + ability to interpret resting wall motion.* 	<ul style="list-style-type: none"> • Level 2 training or equivalent. • Current active practice of echocardiography.* 	Not applicable.
Conditions for training	<ul style="list-style-type: none"> • Laboratory performing 40 stress echo studies per month. • Supervisor with Level 3 training and experience with more than 200 stress echo studies. 	<ul style="list-style-type: none"> • Laboratory performing 40 stress echo studies per month. • Supervisor with Level 3 training and experience with more than 200 stress echo studies. 	Not applicable.
Number of cases recommended	<ul style="list-style-type: none"> • Participation in <u>performance</u> of at least 50 exercise echo and/or pharmacologic stress echo studies. • <u>Interpretation</u> of a least 100 stress echo studies with supervision as above. 	<ul style="list-style-type: none"> • Participation in <u>performance</u> of at least 50 exercise echo and/or pharmacologic stress echo studies. • <u>Interpretation</u> of 100 stress echo studies under supervision as above. 	Interpretation of 15 stress echo studies per month.

*See text.

anticipated for those who wish to make stress echocardiography a major clinical activity.³

POSTFELLOWSHIP TRAINING

Training for persons not currently in formal training programs should be based on the timing of the most recent formal echocardiographic training, the duration of practice and current activity as an echocardiographer, and dedication to learning these skills. It is recommended that only those persons with active echocardiographic experience and ongoing maintenance of these skills be candidates for training in stress echocardiography. Background equivalent to Level 2 echocardiographic training should be required (6 months dedicated echocardiographic training and interpretation exceeding 300 studies within 1 year, 100 of which were performed for wall motion analysis).³ The additional expertise for interpretation of stress echocardiograms may be obtained through a combination of on-site visits to an active laboratory and overreading of the trainee's interpretations by an established stress echocardiographer (see above and Table). Stress echocardiograms interpreted by the trainee should not be used for clinical decision making regarding patient management until at least 100 stress echocardiograms have been carried out in the laboratory and read under supervision.^{1,2}

CALIBRATION OF SKILLS

Assessment of accuracy of the studies is recommended by comparison with coronary anatomy or other stress imaging, such as radionuclide perfusion.

Accuracy should fall within the range published in the literature by clinical laboratories for appropriate patient groups. When these requisites are met, the laboratory and physician can be considered trained for routine performance and interpretation of stress echocardiograms if the training supervisor agrees that an adequate level of skill has been achieved.

LEVEL OF ACTIVITY TO MAINTAIN PROFICIENCY

There are no data that establish the level of activity necessary to maintain proficiency in performance or interpretation of stress echocardiography. The consensus of this panel is to recommend that a minimum of 15 stress echo studies per month be primarily interpreted to maintain proficiency. Laboratories performing such a low volume of stress studies should employ a limited diversity of equipment to maximize their efficiency and minimize technical variations. Only one form of exercise testing (treadmill, bicycle, etc.) and one form of pharmacologic stress testing (dobutamine, dipyridamole, etc.) should be used in low-volume settings for this reason as well.

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