Stress echo: more method than madness

Stress echocardiography has become universally accepted as a fundamental tool for the modern diagnosis of coronary artery disease. It provides easy, fast, user-friendly and extensively validated diagnostic and prognostic information on myocardial ischaemia and viability. This information can be easily coupled with resting echo information and allows an integrated, on-line, cost effective, bedside evaluation of the cardiology patient. Thereby, it is no surprise that obvious economic and logistic considerations are making stress echocardiography the dominant imaging technique in a cost-conscious environment. However, the subjective and qualitative interpretation of echo images remains the Achilles’ heel of stress echocardiography. As eloquently stated by Varga et al. in this issue ‘in the absence of quality control, with simple 2D echocardiography and a drug costing a few Euros, every physician can become a stress echocardiographer. The combination of unrestricted access and the subjective, qualitative nature of reading, creates enormous potential for “stress echocardiographic disease” and sets the stage for a transition of the technique from established technology to a phase of discredit and backlash’.

This concern with the ‘human factor’ modulating the quality of stress echo diagnostic activity was first focused on 10 years ago, when Picano et al. showed that a learning curve of >100 stress echo studies, read with expert supervision, is necessary to optimize the diagnostic yield of the stress echo technique. Such concerns have been recently magnified by reports on inter-institutional variability in stress echo reading, which appeared to be substantial when no previous agreement on reading criteria was explicitly spelled out.

The present paper by Varga et al. demonstrates, with a simple and convincing study design, that ‘eye-education’ through short-term, high intensity joint reading sessions may improve substantially stress echo reading accuracy and inter-observer agreement among beginners. This paper again emphasizes the relevance of the ‘human factor’ in stress echo reading and sets the standard for obvious, albeit frequently forgotten, criteria that should be followed before implementing stress echo in the daily life of a cardiological division.

Variability in stress echo reading can be substantially reduced if one is aware of the sources of variability, which are physician-related, technology-related, stress-related and patient-related. Variability will be decreased as technology improves image quality, especially in segments of borderline endocardial definition, as happens with native second harmonic imaging technology.

Variability will be higher with stress polluting image quality; and therefore with exercise more so than with dobutamine, and with dobutamine more so than with dipyridamole. Variability will also be more substantial in patients with acoustically hostile windows, such as obese or pneumopathic patients.

The principal source of variability remains, however, in the eyes of the reader. The physician should be trained in a large volume stress echo lab, possibly with exposure to all major stresses (exercise, dipyridamole, dobutamine) and should develop ‘conservative’ reading criteria, ignoring minor degrees of hypokinesia, especially when restricted to one segment such as the postero-basal or basal infero septal segment. In these segments, ‘hypokinesia’ is a normal variant under most stresses and finding widely overlapping between normal and diseased populations.

In the training phase, it is wise to test one’s initial performance in patients who have recently undergone coronary angiography, so that the matching between dyssynergic territories and stenotic coronary arteries can be directly verified. After exposure to a high-volume stress echo lab, the physician should begin to accumulate his or her own experience with a stepwise approach, starting from innocuous and simple stresses and moving on to more technically demanding ones. It is wise to start with low dose tests for ischaemia; to start with safer and easier vasodilator tests and later progress to adrenergic stresses; to start with pharmacological stress, and then progress to physical exercise stress echocardiography, recalling that — from the technical viewpoint — ‘dipyridamole is the elementary school, dobutamine the secondary school, and exercise the university in stress echo cursus studiorum’.

Following these simple, obvious rules, the monster of the subjective reading of stress echo will be decapitated, and the technique will play an essential role.
in the present cost-conscious climate in an accurate, diligent, reproducible and reliable fashion. The cure for ‘stress echo folly’ is at hand.

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Cost-effective treatment of acute coronary syndromes—
IIB or not IIB?

See page 1253 for the article to which this Editorial refers

There has been a dramatic growth in medical care costs in most western countries over the past 25 years; cardiology has been one of the prime contributors. Within the spectrum of coronary heart disease, acute coronary syndromes account for a considerable portion of these human and economic costs. Worldwide hospitalizations for unstable angina and non-Q wave myocardial infarction are estimated to be in excess of two million patients annually, and approximately one million patients in Europe suffer from acute coronary syndromes. In the United States, acute coronary syndrome is the leading cause of admission to coronary care units; approximately 10–12% of these patients develop a myocardial infarction, and 2–5% die within 30 days of experiencing unstable angina or non-Q wave myocardial infarction.

The last decade has been witness to a phenomenal expansion of therapies used in the treatment of patients with acute coronary syndromes. These therapeutic advances include routine use of improved antiplatelet and antithrombotic agents, such as the glycoprotein IIB/IIIa blockers and low molecular weight heparins.

The use of coronary intervention procedures in patients with acute coronary syndromes has also greatly expanded, for example, from 1987 to 1992 the number of catherization and revascularization procedures performed in US Medicare patients increased by 45% and 70%, respectively[1]. Medical costs arise in a complex manner and their prediction is difficult; however, treatment-related factors (such as the decision to pursue a coronary intervention) can clearly drive up healthcare costs by more than 100%.

At the same time as healthcare costs were rising, studies from the field of outcomes research reported that considerable geographic variation in the practice of medicine existed, without demonstrable justification or differences in patient outcomes[2]. In particular, studies of aggressive revascularization have generally failed to show a reduction in myocardial infarction or death in patients with unstable coronary syndromes[3,4].

These developments have provided strong incentive for government, business and private consumers to call for increased accountability in medicine. In particular, while physicians in the past were free ‘to