

## Protocol for Stress Echocardiography

1. Echocardiographic imaging must be performed on current-generation two-dimensional equipment with digital capability using Microsonics, Freeland, or equivalent software providing a quad-screen display and a closed cine loop. Doppler ultrasound and color flow techniques may provide additional useful information and should be included.

2. All stress testing should achieve 100 percent of predicted maximal heart rate unless medically contraindicated or prevented either by conditioning, symptoms, or concurrent medication; such as, B-blockers, calcium channel blockers (spec. diltiazem or verapamil), or digitalis preparations. These medications should be discontinued for at least 48 hours prior to testing in order to attain maximal stress and only after consulting with the attending physician.

The blood pressure and pulse recorded at various stages and actual electrocardiographic tracings must be submitted. Tracings (modified to accommodate the echo window) must include a rhythm strip, 12-lead electrocardiogram recorded at rest (supine and standing), and during hyperventilation while standing, once during each stage of exercise, at peak exercise, and every minute during recovery for at least 5 minutes or until tracings return to baseline level. Computer-generated, sample cycle electrocardiographic tracings are unacceptable in lieu of the standard tracings.

3. Echocardiographic imaging should include four different views, usually parasternal long- and short-axis and apical four- and two-chamber views. For exercise testing, images must be acquired at rest and within 60 seconds of completion of the exercise. **Actual time of acquisition of the immediate post exercise imaging must be noted.** For pharmacologic testing, images must be acquired at rest, during the low-dose stages, and following the maximum dose.

4. Atropine may be required in order to attain an adequate heart rate either during exercise or pharmacologic (dobutamine) testing.

5. Additional testing modalities, including radionuclide, may be required.

The use of the airman's full name, date of birth, and social security number on all correspondence and reports will aid the agency in locating the proper files. No consideration can be given for Authorization for Special Issuance of a Medical Certificate until all the required data have been received. All information shall be forwarded preferably in **one mailing** to:

Aeromedical Certification Division  
Mike Monroney Aeronautical Center  
Federal Aviation Administration  
P.O. Box 26080  
Oklahoma City, OK 73126  
ATTN: Special Issuances Branch (AAM-320)