

Why get a stress?

- To evaluate the heart for areas of reversible ischemia
- Good to rule out cardiac source of chest pain, decompensated CHF,

What to do with the results?

- Negative stress means no **reversible ischemia** and implies that symptoms are not due to a cardiac etiology that can be fixed by revascularization
- Positive stress indicates **reversible ischemia** and may be an indication for cardiac cath

Contraindications

- Aortic Stenosis (also HOCM)
- Ongoing Angina
- Patient would not be a candidate for catheterization

Stressing Agents

GXT (aka Exercise)

- Treadmill or other instrument
- No medications
- Various protocols, most involve aerobic activity for about 10 minutes

Dobutamine

- β -1 adrenergic agonist
- Stimulates heart rate and contractility (“whips the heart”)

Adenosine, dipyridimole (DP)

- Vasodilator
- Opens up blood vessels to increase blood flow to the heart, but does not directly stimulate the heart (“opens the throttle”)
- Patients get a flushed feeling
- **Contraindicated** in Reactive Airway Disease (ie. **Asthma**, **COPD**) because of bronchospasm

Combinations of stress and imaging

Exercise – Any imaging

Dobutamine – Echo or nuclear

Adenosine – Nuclear only

Imaging Modalities

EKG

- Continuous tracing of EKG with periodic printouts
- EKG is done on every stress test
- Look for ST depression $>1\text{mm}$
- Immediate result
- **High false positive rate in women**

Echocardiogram

- Echo is done before stress and immediately following stress
- Can get info such as EF and valve morphology (although not as good as a standalone echo)
- Look for **reversible wall motion abnormality** – in rest a wall moves normally but after stress it does not move as well (in proportion to other walls)
- Functional study, does not “see” areas of poor blood flow unless the result is ischemia causing poor wall motion
- Immediate result

Nuclear imaging

- Thallium, myoview, dual-isotope, etc.
- Looks at blood flow to various areas of the heart
- Needs resting images followed by stress images (sometimes need a “washout period”)
- Look for areas of **reversible ischemia** – areas that get good blood flow during rest but do not receive good blood flow during stress
- Radiation exposure
- **Picks up early lesions**
- Delayed results – takes time for imaging, development, and interpretation