St John Macomb Hospital Clinical Decision Unit Stress Test Guidelines

Once the decision has been made that a patient requires an urgent stress test in the CDU, it is important that we choose the correct test in order to prevent delays in patient care and optimize our ability to risk stratify our chest pain patients. When discussing the stress tests if it is in quotations, then that is how it appears in ecare. The HEART score has been included on the last page for reference to help with risk stratification of chest pain patients in the emergency department. Below I have also included some information on the different types of stress tests, how they work, and important contraindications to consider.

When choosing which stress test to order the first question we should ask ourselves is: **Q1. Does the patient have a LBBB, pacemaker/AICD, prior re-vascularization, known poor EF (<50%), or known multiple wall motion abnormalities?** If the answer to any of these is yes then the patient should have a persantine stress test ordered. From the CDU Chest Pain order set click "CDU Stress Test W/Nuclear" and then select **Persantine Stress Test** (do not uncheck the nuc med portion of the study which is auto selected and required). Because the Lexiscan is very expensive, the persantine is our nuclear test of choice

If the answer to Q1 is no, then we need to ask ourselves **Q2: Can the patient exercise** (can they walk for more than 5 minutes on flat ground or up two flights of stairs without needing to stop)

If the answer to Q2 is yes, then the patient should have an **exercise stress** test ordered. The vast majority of our patients should have a "STRESS Echo" or stress nuclear ordered (this is done by selecting "CDU Stress Test with Nuclear" and then "ECG Stress Exercise with Nuclear Scan"). We also have the option to order a "STRESS Exercise Regular" (no ECHO). The only time this should be ordered is when the patient has a stone cold normal ECG and has a low risk for ACS. I would argue that most of these patients could be sent home for outpatient follow up from the emergency department after serial troponins.

If the answer to Q2 is no, then the patient should have a "Stress Echo DOBUTamine" or "Persantine Stress Test" with nuclear ordered.

Important CDU Stress Testing Policies
1. The patient needs a working IV
2. NPO for at least 4 hours
3. Hold all beta blockers and nitrates for stress tests if possible.
4. No caffeine for at least 12 hours (24 hours preferred).
5. BP appropriate: <160/90. Please give all home anti-hypertensives (excluding BB and nitrates). In our CDU Chest pain order set hydralazine,

lisinopril, amlodipine, and clonidine are listed as options for us to select with special instructions to give prior to stress test if BP is elevated.

6. **Potassium**: If > 3.1 the stress test can be performed without re-draw IF it has been replaced. If <3.1 the stress test WILL NOT be performed until it has been replaced and redrawn. Please replace and re-order K level!
7. Sodium: If < 130 the stress will not be performed. 130-135 will depend on cause/chronicity/treatment. If >135 the stress will be performed.
8. Magnesium: Please make sure we replace when <1.5. Cardiologists prefer >1.8.
9. Two sets of negative troponins in eCare are required. At least 3 hours apart are required for low risk patients and 6-8 hours for moderate/high risk.
10. If ordered, CTA chest and/or duplex US must be complete prior to stress to rule out DVT/PE.
11. If known aortic stenosis is present, an ECHO must be performed before a stress test to evaluate the stenosis.

In general all stress tests are contraindicated if there is hemodynamic instability (severe hypertension or hypotension), uncontrolled cardiac arrhythmias (including high degree heart blocks), significant electrolyte abnormalities, acute pericarditis/myocarditis, PE, aortic dissection or any other serious acute illness.

Stress ECHO: Good for patients with non-specific ECG changes, ability to exercise, no prior re-vascularization, and a good/unknown EF. Multiple wall motion abnormalities and morbid obesity decrease the sensitivity of the test. This test is looking at wall motion abnormalities both at rest and after stress. If there is a new wall motion abnormality with stress that was not there at rest, then this points toward an inducible ischemic change.

Dobutamine Stress: Dobutamine is a catecholamine that increases HR and contractility. This has the same contraindications as listed for stress echo.

Nuclear Stress: This includes persantine and lexiscan (and formerly adenosine which is no longer used at our facility). Both of these studies use chemicals that vasodilate the coronary arteries. Lexiscan uses regadenoson and persantine uses dipyridamole for vasodilation. Vasodilation is only part of this type of stress testing. There is also a radionuclide that is injected into the patient and its uptake into the myocardium is monitored via SPECT (single photon emission computed tomography). The uptake of this tracer is monitored both at rest and "under stress" (with chemical induced coronary artery vasodilation). If there is an area of myocardium with a relatively lower uptake after the vasodilation has occurred, that was not present at rest, then this points to an inducible ischemic change. Please note that active bronchospasm is a contraindication to this type of stress because these chemicals can worsen bronchospasm (in fact a patients active bronchospasm really should be treated prior to any stress test). Also be aware that Aggrenox (which is aspirin/dipyridamole) is a contraindication to lexiscan (it would need to

be held for 48 hours). These patients can get a persantine. Again, lexiscan is very expensive and therefore the persantine is preferred.

HEART ❤️

HEART score for chest pain patients			
History	Highly suspicious	2	
	Moderately suspicious	1	
	Slightly suspicious	0	
ECG	Significant ST-deviation	2	
	Non specific repolarisation disturbance / LBTB / PM	1	
	Normal	0	
Age	≥ 65 years	2	
	> 45 and < 65 years	1	
	≤ 45 years	0	
Risk factors	≥ 3 risk factors or history of atherosclerotic disease*	2	
	1 or 2 risk factors	1	
	No risk factors known	0	
Troponin	≥ 3x normal limit	2	
	> 1 and < 3x normal limit	1	
	≤ 1x normal limit	0	
		Total	

*Risk factors for atherosclerotic disease:

Hypercholesterolemia	Cigarette smoking
Hypertension	Positive family history
Diabetes Mellitus	Obesity