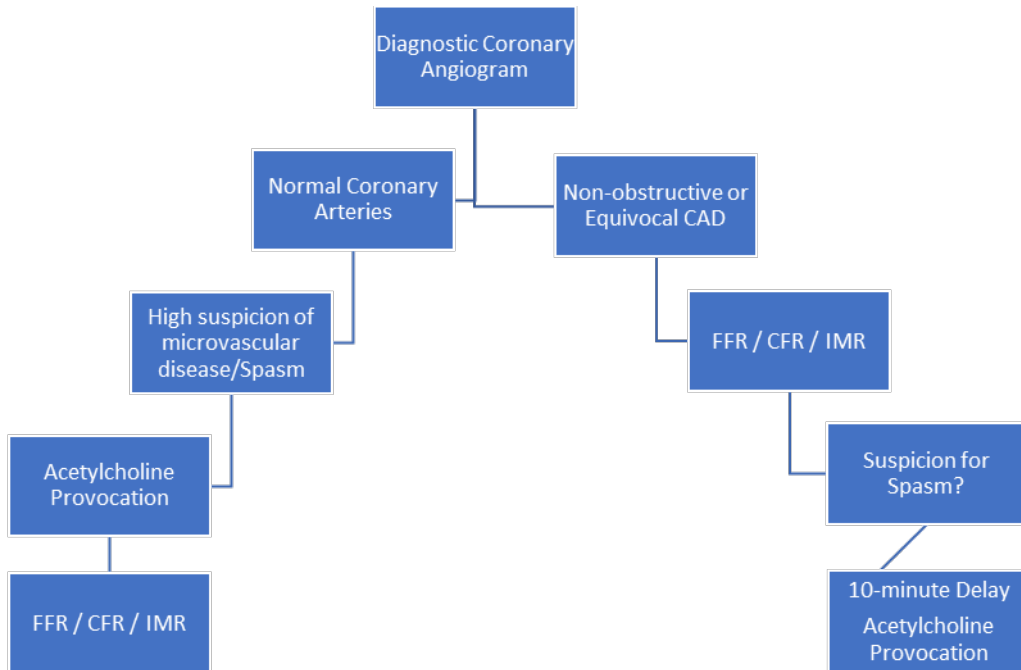


CORONARY VASOSPASM CHALLENGE, ADULT, INPATIENT AND OUTPATIENT PATHWAY

Updated: October 1, 2022

Clinical Algorithm:



Clinical Pathway Summary

CLINICAL PATHWAY NAME: Coronary Vasospasm Challenge

PATIENT POPULATION AND DIAGNOSIS: New or existing diagnosis of chest pain with concern for coronary vasospasm or coronary microvascular disease, for adult patients, outpatient or inpatient.

APPLICABLE TO: SHWM BW

BRIEF DESCRIPTION: Comprehensive invasive assessment of epicardial and microvascular coronary physiology for the assessment of chest pain syndromes in patients with coronary artery disease, coronary vasospasm, or coronary microvascular disease.

OPTIMIZED EPIC ELEMENTS (if applicable): NA

IMPLEMENTATION DATE: 10/1/22

LAST REVISED: 10/1/22

Clinical Pathways Clinical Approach

TREATMENT AND MANAGEMENT:

Preparation considerations:

- All vasoactive medications i.e., calcium channel blockers (CCB), nitrates, should be held at least 24-48 hours prior to procedure if vasoreactivity testing will be performed.
- Caffeine should be held 24 hours prior to procedure.
- Consideration of nitroglycerin only for radial access (or femoral access) to avoid longer acting systemic effects of verapamil. If previous radial artery spasm, favor femoral access.

If diagnostic angiography shows normal coronary arteries proceed with provocative testing with acetylcholine if suspicion for coronary vasospasm.

or

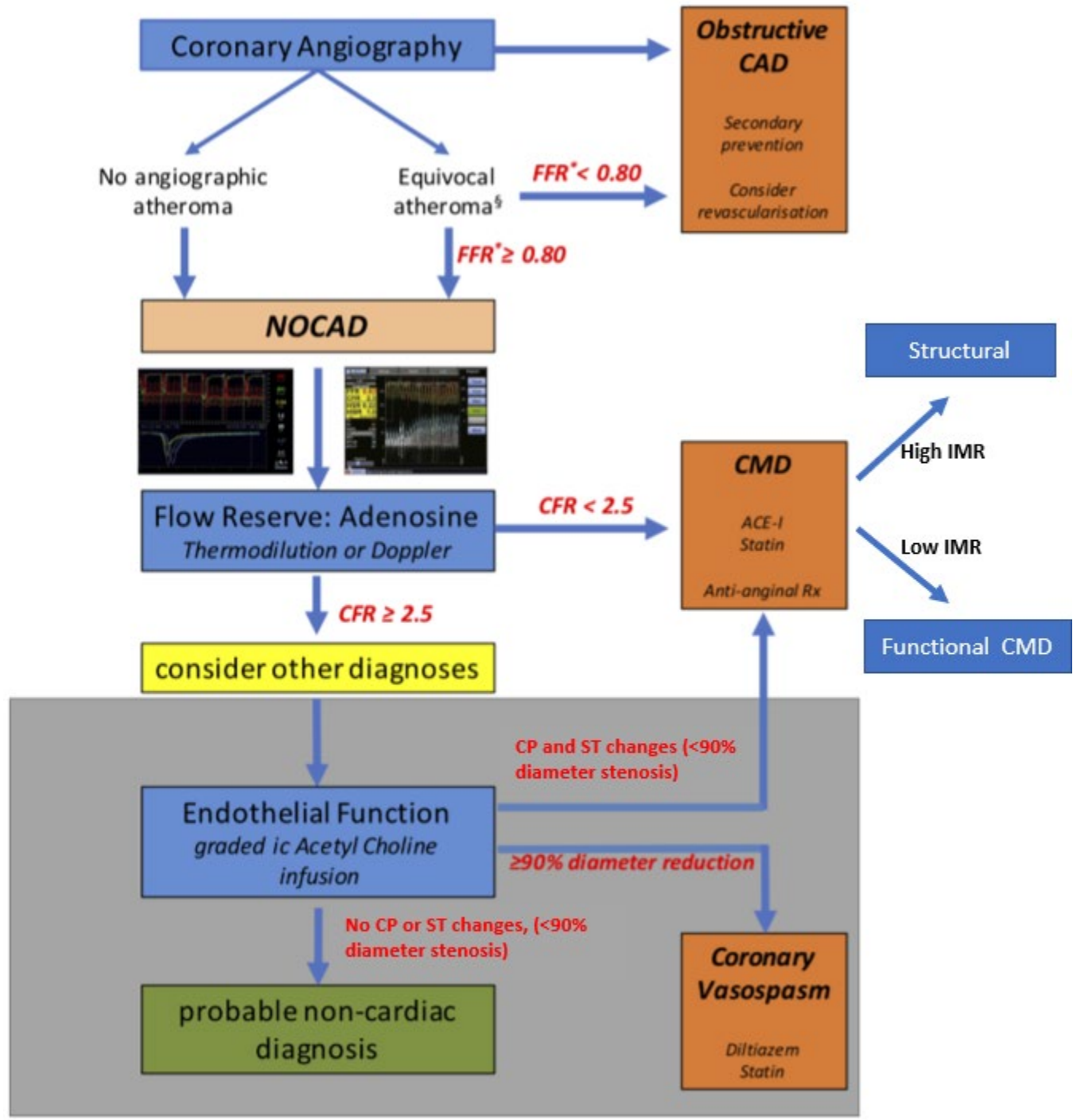
If there is non-obstructive or angiographically indeterminate coronary artery disease (CAD) then proceed with lesion assessment with resting free cycle ratio (RFR) and/or fractional flow reserve (FFR). Due to the requirement for vasodilation with intracoronary nitroglycerin prior to RFR/FFR delay acetylcholine provocation for at least 10 minutes after nitroglycerin.

1. Coronary vasoreactivity testing for endothelial dependent vasomotor function

- a. Assess endothelial dependent vasomotor function with sequential boluses of intra-coronary acetylcholine (ACh)

- b. Ensure defibrillator pads in place.
- c. ACh will be reconstituted by Pharmacy and sent to Cardiac Cath Lab.
- d. Perform gradual injections of 2mL of ACh over 2 minutes delivered via the guide catheter*, slowly flushed in with 5cc saline
 - i. For left coronary arteries, use 2 μ g, 20 μ g, and 100 μ g, this is the most common artery tested for vasoreactivity and will be the starting reconstitutions prepared by pharmacy.
 - ii. For right coronary artery, use 2 μ g, 20 μ g, and 50 μ g, this artery is rarely assessed and 50ug dosage would need to be requested from pharmacy if required for procedure.
 - iii. Monitor for heart block, asystole, and hemodynamic instability. Higher risk for arrhythmias with right coronary assessment.
- e. During ACh infusion evaluate for the presence of 1) chest pain or 2) ischemic EKG changes
 - i. Document ST-segment shift in the EKG (12-lead snapshot in MacLab)
- f. After each infusion wait 30 seconds and then perform Pd (distal pressure)/Pa (aortic pressure) and coronary cine angiography to evaluate for:
 - i. Epicardial vasospasm
 - ii. Slow flow suggestive of microvascular spasm
- g. After administration of moderate dose ACh, perform coronary flow reserve (CFR)/index of microvascular resistance (IMR)
- h. At conclusion OR in the setting of hemodynamic instability, intolerable chest pain, or persistent arrhythmia, administer 200-400mcg of intra-coronary nitroglycerin via the guide catheter.
- i. Interpretation:
 - i. Chest pain and/or ischemic EKG changes during ACh infusion without epicardial vasospasm: Microvascular vasospasm due to endothelial dysfunction.
 - 1. Also supported by abnormal CFR/IMR with moderate dose Ach.
 - ii. Chest pain, ischemic EKG changes, and > 90% epicardial vasospasm on angiography: Epicardial coronary vasospasm due to endothelial dysfunction
 - 1. Also supported by significantly abnormal Pd/Pa compared to baseline.

2. Diagnostic Flow Sheet Interpretation



Therapy Recommendations:

1. MVA (Microvascular angina) (CFR <2.5, IMR >25)
 - a. Consider Aspirin, statin, ACE-I (angiotensin converting enzyme inhibitor).
 - b. PRN SL Nitroglycerin
 - c. First line: Beta blocker
 - a. Second Line: Non-DHP (dihydropyridine) CCB (i.e. diltiazem or verapamil) where beta blocker not effective or not tolerated.
 - b. Third line (add in therapy)
 - i. DHP CCB (amlodipine or nifedipine) – only if combined with beta blocker
 - ii. Ranolazine
2. Microvascular vasospasm
 - a. Consider Aspirin, statin, ACE-I.
 - b. PRN SL Nitroglycerin
 - c. First Line: Non-DHP CCB (i.e. diltiazem or verapamil) where beta blocker not effective or not tolerated.
 - d. Second line (add in therapy)
 - i. Long acting nitrates
 - ii. Ranolazine
3. VSA (Vasospastic angina)- Epicardial vasospasm
 - a. Consider Aspirin, statin
 - b. PRN SL Nitroglycerin
 - c. First Line: CCB (diltiazem or verapamil)
 - d. Second Line (add in therapy)
 - i. Long-acting nitrates (in addition to CCB)
 - e. Avoid beta blockers and triptan medications as these can provoke spasm.
4. Mixed MVA/VSA
 - a. Consider Aspirin, statin, ACE-I
 - b. PRN SL Nitroglycerin
 - c. First line: CCB (diltiazem or verapamil)

For all Patients: Lifestyle recommendations (diet, exercise, smoking cessation, weight loss). Medications should be up titrated to maximal tolerated dose or until symptoms resolved before going to next line therapy.

Pathway Information

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EXPERT IMPROVEMENT TEAM (EIT): Interventional Cardiology Expert Improvement Team

CLINICAL PRACTICE COUNCIL (CPC): Cardiovascular Health CPC

CPC APPROVAL DATE: January 12, 2023

OTHER TEAM(S) IMPACTED: (Pharmacy)

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