



EVOLENT CLINICAL GUIDELINE 079 FOR HEART PET WITH CT FOR ATTENUATION

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| Guideline or Policy Number: Evolut_CG_079 | <u>Applicable Codes</u> | |
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STATEMENT

General Information

It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.

Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.

Special Note

A Heart PET scan for Ischemic evaluation is indicated when all the criteria for MPI are met AND there is likely to be equivocal imaging results because of BMI, large breasts or implants, mastectomy, chest wall deformity, pleural or pericardial effusion, or prior thoracic surgery or results of a prior MPI ^(1,2). (AUC 7) ⁽³⁾

Cardiac PET scanning, when used in conjunction with CT attenuation, includes evaluation of perfusion, function, viability, inflammation, anatomy, and risk stratification for cardiac-related events such as myocardial infarction and death. Maximum diagnostic accuracy of cardiac PET/CT is achieved when images are interpreted in conjunction with other relevant imaging, clinical information, and laboratory data.

[See Legislative Requirements for specific mandates in Washington State](#)

CLINICAL REASONING

All criteria are substantiated by the latest evidence-based medical literature. To enhance transparency and reference, Appropriate Use (AUC) scores, when available, are diligently listed alongside the criteria.

This guideline first defaults to AUC scores established by published, evidence-based guidance endorsed by professional medical organizations. In the absence of those scores, we adhere to a standardized practice of assigning an AUC score of 6. This score is determined by considering variables that ensure the delivery of patient-centered care in line with current guidelines, with a focus on achieving benefits that outweigh associated risks. This approach aims to maintain a robust foundation for decision-making and underscores our commitment to upholding the highest standards of care. ^(4,5,6,7,8)

INDICATIONS FOR HEART PET WITH CT FOR ATTENUATION ^(9,10,11)

Suspected CAD

When neither SE nor MPI have provided or are expected to provide optimal imaging

- **Symptomatic patients without known CAD.** No imaging stress test within the last 12 months. The terms "typical," "atypical," and "non-anginal symptoms" can still be observed in medical records (consult the Diamond Forrester table in the Definitions section). However, the ACC has simplified its terminology to "Less likely anginal symptoms" and "Likely anginal symptoms" (refer to Definitions section) and utilized below.
 - ~~Low or intermediate pretest probability and unable to~~ Less likely anginal symptoms (AUC 4-6)
 - When a patient cannot walk a treadmill
 - When baseline EKG makes standard exercise ~~(SE diversion not test inaccurate (see Definitions section)).~~
 - When a noncardiac explanation is provided for symptoms, no testing is required (AUC 8)
 - ~~High pretest probability (SE diversion not required)~~
 - Likely Anginal Symptoms (typical angina)
 - < 50 years old with ≤ one risk factor if an ECG treadmill test cannot be done. **AUC scores for this bullet point are identical for MPI, stress echo, and ETT (AUC 7). Although the ACC guideline does not specify youth and gender, decisions should be guided by best medical judgment, considering factors such as safety and radiation exposure.
 - ≥ 50 years old (AUC 8)
 - Repeat testing in a patient with new or worsening symptoms and negative result at least one year ago **AND** meets one of the criteria above
- **Asymptomatic patients without known CAD**
 - Previously unevaluated ECG evidence of possible myocardial ischemia including substantial ischemic ST segment or T wave abnormalities (see **Background** section)
 - Previously unevaluated pathologic Q waves (see **Background** section)
 - Unevaluated complete left bundle branch block (AUC 8) ⁽³⁾

Abnormal Calcium Scores (CAC) ^(9,12,13,14,15)

When neither SE nor MPI have provided, or are expected to provide, optimal imaging)

- STABLE SYMPTOMS with a prior Coronary Calcium Agatston Score of > 100. No prior MPI done within the last 12 months ⁽¹⁶⁾
- ASYMPTOMATIC high global CAD risk patient with a ~~calcium score >400, not previously evaluated~~ prior Coronary Calcium Agatston Score of > 100. No prior MPI done within the last 12 months ⁽¹⁶⁾
- ~~SYMPTOMATIC~~ Asymptomatic patient with Coronary Calcium Agatston Score > 400. No prior CAC ≥100 MPI done within the last 12 months

Inconclusive CAD Evaluation and Obstructive CAD remain a Concern

When neither SE nor MPI have provided, or are expected to provide, optimal imaging)

- Exercise stress ECG with low-risk Duke treadmill score (≥ 5) (see **Background** section) but patient's current symptoms indicate ~~an intermediate or high pretest probability (SE diversion not required for high pretest probability)~~ increasing likelihood of disease
- Exercise stress ECG with an intermediate Duke treadmill score (~~SE diversion not required for symptoms consistent with high pretest probability~~ AUC 8) ⁽³⁾
- Inconclusive/borderline coronary computed tomography angiography (CCTA) or SPECT nuclear stress testing (e.g., 40 - 70% lesions) (AUC 9) ⁽³⁾
- Cardiac PET stress-rest perfusion and metabolic activity study (with ¹⁸F-FDG PET) is appropriate in patients with ischemic cardiomyopathy to determine myocardial viability prior to revascularization following an inconclusive SPECT ^(9,17) (AUC 9) ⁽³⁾
- Non-diagnostic exercise stress test with physical inability to achieve target heart rate (THR) (~~SE diversion not required~~)
- An intermediate evaluation by prior stress imaging
- Coronary stenosis of unclear significance on previous coronary angiography ⁽⁹⁾ (AUC 8) ⁽³⁾

Follow-Up Of Patient's Post Coronary Revascularization (PCI or CABG)

When neither SE nor MPI have provided, or are expected to provide, optimal imaging ⁽⁹⁾

- **Asymptomatic, follow-up stress imaging** at a minimum of 2 years post coronary artery bypass grafting (CABG), or percutaneous coronary intervention (PCI), (whichever is later), is appropriate only for patients with:
 - High risk: diabetes with accelerated progression of CAD, CKD, PAD, prior brachytherapy, ISR, or SVG intervention.

- a history of silent ischemia or
- a history of a prior left main stent

OR

- For patients with high occupational risk (e.g., associated with public safety, airline and boat pilots, bus and train drivers, bridge and tunnel workers/toll collectors, police officers, and firefighters)

New, recurrent, or worsening symptoms post coronary revascularization, treated medically or by revascularization is an indication for stress imaging, if it will alter management (~~SE diversion not required~~ for typical anginal symptoms or symptoms documented to be similar to those prior to revascularization if no imaging stress test within the last 12 months. (AUC 8))

Follow-Up Of Known CAD⁽⁹⁾

When neither SE nor MPI have provided, or are expected to provide, optimal imaging

- **Follow-up of asymptomatic or stable symptoms** when last invasive or non-invasive assessment of coronary disease showed hemodynamically significant CAD (ischemia on stress test or $FFR \leq 0.80$ or significant stenosis in a major vessel ($\geq 50\%$ left main coronary artery or $\geq 70\%$ LAD, LCX or RCA)), over two years ago, without intervening coronary revascularization is an appropriate indication for stress imaging in patients if it will alter management

Special Diagnostic Conditions Requiring Coronary Evaluation

When neither SE nor MPI have provided, or are expected to provide, optimal imaging

- **Unevaluated ACS**

- Prior acute coronary syndrome (as documented in MD notes), without subsequent invasive or non-invasive coronary evaluation within the last 12 months
- Has ventricular wall motion abnormality demonstrated by another imaging modality and myocardial perfusion imaging is being performed to determine if the patient has myocardial ischemia. No imaging stress test within the last 12 months
- The addition of Coronary CTA to the PETCT study may be considered for patients facing complex coronary interventions, suspected global myocardial ischemia, necessitating correlation between anatomy and perfusion⁽¹⁷⁾ (AUC 7)

- **Heart Failure**

- Newly diagnosed systolic heart failure or diastolic heart failure, with *reasonable suspicion of cardiac ischemia (prior events, risk factors)*, unless

invasive coronary angiography is immediately planned or adequate stress imaging has been done within the last 12 months ^(10,18,19) **(AUC 9)** ⁽³⁾

- Suboptimal Revascularization

- To diagnose microvascular dysfunction in patients with persistent stable anginal chest pain with suspected ischemia and nonobstructive coronary artery disease (INOCA), as documented in provider notes (no MPI diversion required) ⁽¹³⁾.

- Viability

- Reduced LVEF $\leq 50\%$ requiring myocardial viability assessment to assist with decisions regarding coronary revascularization. (Diversion from PET not required when LVEF less than or equal to 40%) ^(18,19,20) **(AUC 9)** ⁽³⁾

- Ischemia and Nonobstructive Coronary Artery Disease (INOCA)

- To diagnose microvascular dysfunction in patients with persistent stable anginal chest pain with suspected ischemia and nonobstructive coronary artery disease (INOCA), as documented in provider notes (no MPI diversion required).

- Arrhythmias

- Ventricular arrhythmias
 - Sustained ventricular tachycardia (VT) > 100 bpm, ventricular fibrillation (VF), or exercise-induced VT, when invasive coronary arteriography is not the immediately planned test ⁽²¹⁾
 - Non-sustained VT, multiple episodes, each ≥ 3 beats at ≥ 100 bpm, frequent PVC's (defined as greater than or equal to 30/hour on remote monitoring) without known cause or associated cardiac pathology, when an exercise ECG cannot be performed

- Anti-arrhythmic Drug Therapy

- Class IC antiarrhythmic drug
 - In the intermediate and high global risk patient prior to initiation of Class IC antiarrhythmic drug initiation (Propafenone or Flecainide)
 - Annually for intermediate and high global risk patients ~~(SE diversion not required)~~ taking Class IC antiarrhythmic drug (Propafenone or Flecainide) ⁽²²⁾ **(AUC 7)** ⁽³⁾

- Coronary Anomaly and Aneurism

- Assessment of hemodynamic significance of one of the following documented conditions: ⁽²³⁾
 - Anomalous coronary arteries ⁽²⁴⁾
 - Muscle bridging of coronary artery ^(9,25)
- Coronary aneurysms in Kawasaki's disease ⁽²⁶⁾ or due to atherosclerosis

- **Radiation**
 - Following radiation therapy to the anterior or left chest, at 5 years post initiation and every 5 years thereafter [\(27\)](#)
- ~~To diagnose microvascular dysfunction in patients with persistent stable anginal chest pain with suspected ischemia and nonobstructive coronary artery disease (INOCA), as documented in provider notes (no MPI diversion required).~~ **Cardiac Sarcoidosis** ^(28,29,30)
 - May be approved as a combination study with MPI for the evaluation and treatment of sarcoidosis. ⁽³¹⁾
 - Evaluation and therapy monitoring in patients with sarcoidosis, after documentation of suspected cardiac involvement by echo or ECG, when CMR has not been performed
 - Evaluation of suspected cardiac sarcoid, after CMR has shown equivocal or negative findings in the setting of a high clinical suspicion ⁽³⁰⁾
 - Evaluation of CMR findings showing highly probable cardiac sarcoidosis, when PET could serve to identify inflammation and the consequent potential role for immunosuppressive therapy ⁽³⁰⁾ **(AUC 9)** ⁽³⁾
 - Initial and follow-up PET in monitoring therapy for cardiac sarcoid with immunosuppressive therapy, typically about 4 times over 2 years
- **Infective Endocarditis**
 - In suspected infective endocarditis with moderate to high probability (i.e., staph bacteremia, fungemia, prosthetic heart valve, or intracardiac device), when TTE and TEE have been inconclusive with respect to diagnosis of infective endocarditis or characterization of paravalvular invasive complications ^(32,33,34)
- **Aortitis**
 - For diagnosis and surveillance of Aortitis, PET/CT or PET/MRI[‡] hybrid imaging ⁽³⁵⁾
 - [‡]**NOTE:** If PET/MR study is requested, there is no specific CPT Code for this imaging study and a Health Plan review will be required.

Prior To Elective Non-Cardiac Surgery

When neither SE nor MPI have provided or are expected to provide optimal imaging}

- An intermediate or high-risk surgery with of one or more risk factors (see below), **AND** documentation of an inability to walk (or < 4 METs) **AND** there has not been an imaging stress test within 1 year ^(36,37,38)

- **Risk factors:** history of ischemic heart disease, history of congestive heart failure, history of cerebrovascular disease, preoperative treatment with insulin, and preoperative serum creatinine > 2.0 mg/dL.
- **Surgical Risk:**
 - **High risk surgery:** Aortic and other major vascular surgery, peripheral vascular surgery, anticipated prolonged surgical procedures associated with large fluid shifts and/or blood loss
 - **Intermediate risk surgery:** Carotid endarterectomy, head and neck surgery, intraperitoneal and intrathoracic surgery, orthopedic surgery, prostate surgery
 - **Low risk surgery:** Endoscopic procedures, superficial procedure, cataract surgery, breast surgery
- Planning for any organ or stem cell transplantation is an indication for preoperative stress imaging, if there has not been a conclusive stress evaluation, CTA, or heart catheterization within the past year, at the discretion of the transplant service ⁽³⁹⁾

Post Cardiac Transplant

SE diversion not required ⁽⁴⁰⁾

- Annually, for the first five years post cardiac transplantation, in a patient not undergoing invasive coronary arteriography

LEGISLATIVE REQUIREMENTS

State of Washington ⁽⁴¹⁾

Health Technology Clinical Committee 20211105A

Number and coverage topic:

20211105A – Noninvasive Cardiac Imaging for Coronary Artery Disease

HTCC coverage determination:

Noninvasive cardiac imaging is a covered benefit with conditions.

HTCC reimbursement determination:

Limitations of coverage: The following noninvasive cardiac imaging technologies are covered with conditions:

- **Stress echocardiography for:**
 - **Symptomatic adult patients (≥18 years of age) at intermediate or high risk of Coronary Artery Disease (CAD), or**

- Adult patients with sarcoidosis, after documentation of cardiac involvement by echocardiography, known CAD who have new or worsening symptoms.
- Single Positron Emission Tomography (SPECT) for:
 - Patients under the same conditions as stress echocardiography when stress echocardiography is not technically feasible or clinically appropriate.
- Positron Emission Tomography (PET) for:
 - Patients under the same conditions as SPECT, when SPECT is not technically feasible or clinically appropriate.
- Coronary Computed Tomographic Angiography (CCTA) for:
 - Symptomatic adult patients (≥18 years of age) at intermediate or electrocardiography (ECG), in place of high risk of CAD, or
 - Adult patients with known CAD who have new or worsening symptoms.
- CCTA with Fractional Flow Reserve (FFR) for:
 - Patients under the same conditions as CCTA, when further investigation of functional significance of stenoses is clinically indicated.

Non-covered indicators:

N/A

Notes:

- Out of scope/data not reviewed for this decision:
 - Asymptomatic individuals, follow up of prior abnormal cardiac imaging studies, myocardial viability, preoperative evaluation
 - Patients presenting for evaluation of cardiac pathologies other than CAD
- This determination supersedes the following previous determinations:
 - Coronary Computed Tomographic Angiography for detection of Coronary Artery Disease (20081114A)
 - Cardiac Nuclear Imaging (20130920A)

CODING AND STANDARDS

Coding

CPT Codes

78459, 78491, 78492, +78434, 78429, 78430, 78431, 78432, 78433

Applicable Lines of Business

| | |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | CHIP (Children’s Health Insurance Program) |
| <input checked="" type="checkbox"/> | Commercial |
| <input checked="" type="checkbox"/> | Exchange/Marketplace |
| <input checked="" type="checkbox"/> | Medicaid |
| <input type="checkbox"/> | Medicare Advantage |

BACKGROUND

General Overview ^(1,42)

A PET study is a diagnostic test used to evaluate blood flow to the heart. During the test, a small amount of radioactive tracer is injected into a vein. A special camera, called a gamma camera, detects the radiation released by the tracer to produce computer images of the heart. Combined with a medication, the test can help determine if there is adequate blood flow to the heart during activity versus at rest. The medication simulates exercise for patients unable to exercise on a treadmill or stationary cycle.

PET perfusion studies illustrate myocardial blood flow by demonstrating tracer uptake. PET metabolic evaluation studies are used to demonstrate inflammation produced by infiltrative disease such as sarcoidosis, but also enhance the detection of viable (hibernating) myocardium. Hybrid PET-CT scanning combines anatomical information with blood flow assessment and is useful for assessing viable myocardium, especially in CHF patients with an uncertain diagnosis, global ischemia, or in patients with multivessel diffuse coronary artery disease as opposed to focal stenotic lesions.

AUC Score

A reasonable diagnostic or therapeutic procedure care can be defined as that for which the expected clinical benefits outweigh the associated risks, enhancing patient care and health outcomes in a cost-effective manner. ⁽⁴⁾

- Appropriate Care - Median Score 7-9
- May be Appropriate Care - Median Score 4-6
- Rarely Appropriate Care - Median Score 1-3

Definitions

- Coronary application of PET includes evaluation of stable patients without known CAD, who fall into two categories ^(9,10,11)

- **Asymptomatic**, for whom global risk of CAD events can be determined from coronary risk factors, using calculators available online (see Websites for Global Cardiovascular Risk Calculators section).
- **Symptomatic**, for whom we estimate the pretest probability that their chest-related symptoms are due to clinically significant ($\geq 50\%$) CAD (below)

The 3 Types of Chest Pain or Discomfort

- ~~Typical Angina (Definite) is defined as including all 3 characteristics:~~
 - ~~Substernal chest pain or discomfort with characteristic quality and duration~~
 - ~~Provoked by exertion or emotional stress~~
 - ~~Relieved by rest and/or nitroglycerine~~
- ~~Atypical Angina (Probable) has only 2 of the above characteristics~~
- ~~Nonanginal Chest Pain/Discomfort has only 0 - 1 of the above characteristics~~
- The medical record should provide enough detail to establish the type of chest pain:
 - Likely Anginal symptoms encompass chest/epigastric/shoulder/arm/jaw pain, chest pressure/discomfort occurring with exertion or emotional stress and relieved by rest, nitroglycerine or both.
 - Less-Likely Anginal symptoms include dyspnea, or fatigue not relieved by rest/nitroglycerin, as well as generalized fatigue or chest discomfort with a time course not indicative of angina (e.g., resolving spontaneously within seconds or lasting for an extended period unrelated to exertion).
- Risk Factors for Coronary disease include (but not limited to): diabetes mellitus, smoking, family history of premature CAD is estimated from (men age less than 55, females less than 65), hypertension, dyslipidemia.
- Beginning 2023, the classification terms for angina were updated within the ACC’s Multimodality Appropriate Use Criteria for the Detection and Risk Assessment of Chronic Coronary Disease to Less Likely Anginal Symptoms and Likely Anginal Symptoms. Previously, the document referred to “Typical Angina”, “Atypical Angina” and “Non-Anginal” symptoms, defined by the Diamond Forrester Table below, recognizing that in some cases multiple additional coronary risk factors could increase pretest probability. We still provide this information for your reference ^(9,10,11):

Diamond Forrester Table ^(43,44)

| Age (Years) | Gender | Typical/ Definite Angina Pectoris | Atypical/ Probable Angina Pectoris | Nonanginal Chest Pain |
|-------------|--------|-----------------------------------|------------------------------------|-----------------------|
| ≤ 39 | Men | Intermediate | Intermediate | Low |

| | | | | |
|-------|-------|--------------|--------------|--------------|
| | Women | Intermediate | Very low | Very low |
| 40-49 | Men | High | Intermediate | Intermediate |
| | Women | Intermediate | Low | Very low |
| 50-59 | Men | High | Intermediate | Intermediate |
| | Women | Intermediate | Intermediate | Low |
| ≥ 60 | Men | High | Intermediate | Intermediate |
| | Women | High | Intermediate | Intermediate |

Very low: < 5% pretest probability of CAD, usually not requiring stress evaluation

Low: 5 - 10% pretest probability of CAD

Intermediate: 10% - 90% pretest probability of CAD

High: > 90% pretest probability of CAD

- ECG Stress Test Alone versus Stress Testing with Imaging
 - Prominent scenarios suitable for an ECG stress test **WITHOUT** imaging (i.e., exercise treadmill ECG test) require that the patient can exercise for at least 3 minutes of Bruce protocol with achievement of near maximal heart rate **AND** has an interpretable ECG for ischemia during exercise: ⁽⁹⁾
 - The (symptomatic) low or intermediate pretest probability patient who can exercise and has an interpretable ECG ⁽⁹⁾
 - The patient who is under evaluation for exercise-induced arrhythmia
 - The patient who requires an entrance stress test ECG for a cardiac rehab program or for an exercise prescription
 - For the evaluation of syncope or presyncope during exertion ⁽⁴⁵⁾
 - [When exercise cannot be performed, pharmacologic stress can be considered.](#)
- Duke Exercise ECG Treadmill Score ⁽⁴⁶⁾
 - Calculates risk from ECG treadmill alone:
 - The equation for calculating the Duke treadmill score (DTS) is: $DTS = \text{exercise time in minutes} - (5 \times \text{ST deviation in mm or } 0.1 \text{ mV increments}) - (4 \times \text{exercise angina score})$, with angina score being 0 = none, 1 = non-limiting, and 2 = exercise-limiting-
 - The score typically ranges from - 25 to + 15. These values correspond to low-risk (with a score of $\geq + 5$), intermediate risk (with scores ranging from - 10 to + 4), and high-risk (with a score of $\leq - 11$) categories
- An uninterpretable baseline ECG includes: ⁽¹⁰⁾

- ST segment depression 1 mm or more; (not for non-specific ST- T wave changes)
- Ischemic-looking T waves; at least 2.5 mm inversions (excluding V1 and V2)
- LVH with repolarization abnormalities, pre-excitation pattern such as WPW, ventricular paced rhythm, or left bundle branch block
- Digitalis use with associated ST segment abnormalities
- Previously unevaluated pathologic Q waves (in two contiguous leads) defined as the following:
 - > 40 ms (1 mm) wide
 - > 2 mm deep
 - > 25% of depth of QRS complex
- Global Risk of Cardiovascular Disease
 - **Global risk** of CAD is defined as the probability of manifesting cardiovascular disease over the next 10 years and refers to **asymptomatic** patients without known cardiovascular disease. It should be determined using one of the risk calculators below. A high risk is considered greater than a 20% risk of a cardiovascular event over the ensuing 10 years. **High global risk by itself generally lacks scientific support as an indication for stress imaging.** There are rare exceptions, such as patients requiring IC antiarrhythmic drugs who might require coronary risk stratification prior to initiation of the drug.
 - **CAD Risk—Low**
 - 10-year absolute coronary or cardiovascular risk less than 10%
 - **CAD Risk—Moderate**
 - 10-year absolute coronary or cardiovascular risk between 10% and 20%
 - **CAD Risk—High**
 - 10-year absolute coronary or cardiovascular risk of greater than 20%

Websites for Global Cardiovascular Risk Calculators* (47,48,49,50,51)

| Risk Calculator | Websites for Online Calculator |
|---|---|
| Framingham Cardiovascular Risk | https://reference.medscape.com/calculator/framingham-cardiovascular-disease-risk |
| Reynolds Risk Score Can use if no diabetes | http://www.reynoldsriskscore.org/ |

| | |
|---|---|
| Unique for use of family history | |
| Pooled Cohort Equation | http://clinicalcalc.com/Cardiology/ASCVD/PooledCohort.aspx?example |
| ACC/AHA Risk Calculator | http://tools.acc.org/ASCVD-Risk-Estimator/ |
| MESA Risk Calculator With addition of Coronary Artery Calcium Score, for CAD-only risk | https://www.mesa-nhlbi.org/MESACHDRisk/MesaRiskScore/RiskScore.aspx |

*Patients who have already manifested cardiovascular disease are already at high global risk and are not applicable to the calculators.

- Definitions of Coronary Artery Disease ^(10,11,14)
 - Percentage stenosis refers to the reduction in diameter stenosis when angiography is the method and can be estimated or measured using angiography or more accurately measured with intravascular ultrasound (IVUS).
 - Coronary artery calcification is a marker of risk, as measured by Agatston score on coronary artery calcium imaging. Its incorporation into global risk can be achieved by using the MESA risk calculator.
 - Ischemia-producing disease (also called hemodynamically or functionally significant disease, for which revascularization might be appropriate) generally implies at least one of the following:
 - Suggested by percentage diameter stenosis $\geq 70\%$ by angiography; intermediate lesions are 50 – 69% ⁽⁹⁾
 - For a left main artery, suggested by a percentage stenosis $\geq 50\%$ or minimum lumen cross-sectional area on IVUS ≤ 6 square mm ^(10,52)
 - FFR (fractional flow reserve) ≤ 0.80 for a major vessel ⁽⁵²⁾
 - Demonstrable ischemic findings on stress testing (ECG or stress imaging), that are at least mild in degree
 - A major vessel would be a coronary vessel that would be amenable to revascularization if indicated. This assessment is made based on the diameter of the vessel and/or the extent of myocardial territory served by the vessel.
 - FFR (fractional flow reserve) is the distal to proximal pressure ratio across a coronary lesion during maximal hyperemia induced by either

intravenous or intracoronary adenosine. Less than or equal to 0.80 is considered a significant reduction in coronary flow.

- Newer technology that estimates FFR from CCTA image is covered under the Evolent Clinical Guideline 062-1 for Fractional Flow Reserve CT.
- Anginal Equivalent ^(10,45)
 - Development of an anginal equivalent (e.g., shortness of breath, fatigue, or weakness) either with or without prior coronary revascularization should be based upon the documentation of reasons to suspect that symptoms other than chest discomfort are not due to other organ systems (e.g., dyspnea due to lung disease, fatigue due to anemia), by presentation of clinical data, such as respiratory rate, oximetry, lung exam, etc. (as well as d-dimer, chest CT(A), and/or PFTs, when appropriate), and then incorporated into the evaluation of coronary artery disease as would chest discomfort. Most syncope per se is not an anginal equivalent.

Acronyms / Abbreviations

ADLs: Activities of daily living
BMI: Body mass index
CABG: Coronary artery bypass grafting
CAC: Coronary artery calcium
CAD: Coronary artery disease
CCTA: Coronary computed tomography angiography
CMR: Cardiac magnetic resonance imaging
CT(A): Computed tomography (angiography)
DTS: Duke Treadmill Score
ECG: Electrocardiogram
FFR: Fractional flow reserve
IVUS: Intravascular ultrasound
LBBB: Left bundle-branch block
LVEF: Left ventricular ejection fraction
LVH: Left ventricular hypertrophy
MESA: Multi-Ethnic Study of Atherosclerosis
MET: Estimated metabolic equivalent of exercise
MI: Myocardial infarction
MPI: Myocardial perfusion imaging
MR(I): Magnetic resonance (imaging)
PCI: Percutaneous coronary intervention
PET: Positron emission tomography
PFT: Pulmonary function test
PVCs: Premature ventricular contractions
SE: Stress echocardiography
TEE: Transesophageal echocardiography
THR: Target heart rate

TTE: Transthoracic echocardiography
 VF: Ventricular fibrillation
 VT: Ventricular tachycardia
 WPW: Wolff-Parkinson-White

POLICY HISTORY

Summary

| Date | Summary |
|-----------|---|
| July 2024 | <ul style="list-style-type: none"> ● <u>Formatting change</u> ● <u>Addition of clinical reasoning statement with AUC scoring described</u> ● <u>AUC scores added to bullet points</u> ● <u>Change in definition to symptomatic patients as per ACC AUC guidelines including likely and less likely anginal symptoms</u> ● <u>Calcium score – asymptomatic patient with high global risk statement added</u> ● <u>References updated</u> ● <u>WA legislative requirement added</u> |
| May 2023 | <ul style="list-style-type: none"> ● Removed time limitation “within past two years” for further evaluation inconclusive prior CAD evaluation ● Added coronary stenosis of unclear significance on previous coronary angiography ● Added indication for evaluation of ischemia and nonobstructive coronary artery disease (INOCA) ● Clarified indication for PET/MPI combination study for evaluation of cardiac sarcoidosis ● Added statement on clinical indications not addressed in this guideline |

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by [NIAEvolent Specialty](#) Clinical Guideline [Review](#) Committee

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