PATIENT CARE PATHWAYS
FOR THE EVALUATION OF CORONARY ARTERY DISEASE
Frontline providers are increasingly responsible for a growing, aging population at risk for coronary artery disease (CAD).

Those who see at-risk patients first may become more involved in disease evaluation and care coordination for appropriate cardiac testing.

The more we can understand about the noninvasive cardiac testing options available, the more we can work together to help improve the quality of care for what matters most—the patient.
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INTRODUCTION

Considering Pathways for Patient Care

Patient evaluation pathways can help determine whether cardiac testing or treatment may be appropriate.

It is important to understand who is at risk for CAD and who may be appropriate for noninvasive cardiac testing or treatment. More than 1 in 3 adults are estimated to have cardiovascular disease—it is the leading cause of death in the United States.¹

This booklet examines several patient pathways that may be considered for the evaluation of CAD. Although the information within includes considerations for testing and treatment, it is not intended to replace clinical judgment. It should not independently be used for patient risk assessment or diagnosis.

Whether you’re a frontline provider² or a cardiology specialist, by following appropriate evaluation pathways, you can help ensure that your patients get the right tests or treatment at the right time.

¹Frontline providers are the first to see patients at risk for CAD and may include primary care physicians (PCPs), obstetrician/gynecologists, internists, hospitalists, nurse practitioners (NPs), physician assistants (PAs), or other referring or ordering providers.
Guideline-based pathways may help support clinical decisions for patient-centered care. According to guidelines from the American Heart Association (AHA) and other leading professional organizations involved with assessing cardiovascular risk, the evaluation of stable patients for suspected CAD follows 2 distinct pathways: one for patients who are asymptomatic, and another for those with symptoms (Figure 1).2

Figure 1. Patient-Centered Pathways for Evaluating CAD2,5-11

Asymptomatic

PCP, NP, PA, or Cardiologist

Global Risk Scoring
• Framingham: 10-year risk of MI or CHD death5
• Pooled cohort: 10-year and lifetime risk of ASCVD6

ECG interpretability and/or exercise capability

WHO TO TREAT?
Modification of Risk Factors
• Lifestyle modifications7
• Management of cholesterol8
• Management of weight and obesity9

WHO TO TEST?
Appropriate Use of Cardiac Testing10,11
• Global risk in asymptomatic patients
• Pretest probability in symptomatic patients
• AUC

Stable Symptomatic
(eg, known or suspected CAD)

ED Physician, Internist, Cardiologist, Hospitalist, NP, or PA

Pretest Probability of CAD2
• Based on sex, age, and symptoms
• Low, intermediate, or high risk

ASCVD = atherosclerotic cardiovascular disease; AUC = appropriate use criteria; CAD = coronary artery disease; CHD = coronary heart disease; ECG = electrocardiogram; ED = emergency department; MI = myocardial infarction; NP = nurse practitioner; PA = physician assistant; PCP = primary care provider.
Table 1. Pretest Probability of CAD by Age, Sex, and Symptoms

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Sex</th>
<th>Typical/Definite Angina Pectoris</th>
<th>Atypical/Probable Angina Pectoris</th>
<th>Nonanginal Chest Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤39</td>
<td>Men</td>
<td>INTERMEDIATE</td>
<td>INTERMEDIATE</td>
<td>LOW</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>INTERMEDIATE</td>
<td>VERY LOW</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>40-49</td>
<td>Men</td>
<td>HIGH</td>
<td>INTERMEDIATE</td>
<td>INTERMEDIATE</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>INTERMEDIATE</td>
<td>LOW</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>50-59</td>
<td>Men</td>
<td>HIGH</td>
<td>INTERMEDIATE</td>
<td>INTERMEDIATE</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>INTERMEDIATE</td>
<td>INTERMEDIATE</td>
<td>LOW</td>
</tr>
<tr>
<td>≥60</td>
<td>Men</td>
<td>HIGH</td>
<td>INTERMEDIATE</td>
<td>INTERMEDIATE</td>
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<tr>
<td></td>
<td>Women</td>
<td>HIGH</td>
<td>INTERMEDIATE</td>
<td>INTERMEDIATE</td>
</tr>
</tbody>
</table>

**HIGH RISK:** >90% **INTERMEDIATE:** 10%-90% **LOW:** <10% **VERY LOW:** <5%

**Evaluation and Risk Assessment**

The first step for all patients is a thorough initial evaluation of medical history, cardiac risk factors, symptoms, stability, and any prior cardiac test results. For symptomatic patients, the initial evaluation may also include a resting electrocardiogram (ECG).

For patients who have symptoms suggestive of CAD, the probability of CAD can be estimated based on the patient’s sex, age, and type of symptoms (Table 1). Pretest probability of CAD, exercise capacity, and ECG interpretability are factors that help to determine if a patient should undergo further cardiac testing, as well as which tests may be appropriate.

For patients who are asymptomatic, global risk scoring can be used to estimate 10-year and lifetime risk of a cardiac event, including MI, fatal or nonfatal stroke, or coronary heart disease (CHD) death. The global risk score, along with exercise capacity and interpretability of ECG results, can help inform decisions about further testing or initiating lifestyle modifications or treatments to manage CAD risk factors.
Patient Evaluation Pathways

Medical organizations such as the AHA and American College of Cardiology Foundation (ACCF) have clear guideline-based pathways for patients with known or suspected CAD, from initial presentation to referral for cardiac evaluation. Different evaluation pathways are suggested for patients with ACS or MI and for patients who are indicated for perioperative cardiac evaluation.

Referring providers—those who request imaging tests or send patients to a specialist for further evaluation—may include PCPs, emergency department (ED) physicians, internists, and general cardiologists. NPs and PAs may refer patients for cardiac testing as well. Referring providers should have a solid understanding of which indications may require cardiovascular evaluation.

Patients referred to the nuclear laboratory may require advanced diagnostic imaging tests to determine whether further cardiac testing or treatment is necessary. Ordering providers can specify which imaging tests are appropriate for these patients.

Although every scenario is different and patients are managed on a case-by-case basis, current published guidelines and clinical studies can help frontline providers make more informed decisions for individual patient treatment.

This booklet is meant to be used as a starting point for further reading—for more on cardiac testing and treatment, refer to the published guidelines listed here and in Figures 2 and 3.
Figure 3. CAD Testing Guidelines and Information

WHO TO TEST?

WHEN TO TEST?

HOW TO TEST?

ACCF/AHA Multimodality Appropriate Use Criteria for SIHD¹⁰
ACR/ACC Appropriate Utilization of Cardiovascular Imaging in ED Patients With Chest Pain¹¹
ACR Appropriateness Criteria® for Chronic Chest Pain With a High Probability of CAD²²
ASNC Patient-Centered Imaging Guide (ASNC ImageGuide Registry® for MPI)²³
ASNC Model Coverage Policy for SPECT MPI²⁴
PROMISE Trial²⁵

ACC = American College of Cardiology; ACCF = American College of Cardiology Foundation; ACR = American College of Radiology; AHA = American Heart Association; ASNC = American Society of Nuclear Cardiology; CAD = coronary artery disease; ED = emergency department; SIHD = stable ischemic heart disease; SPECT MPI = single-photon emission computed tomography myocardial perfusion imaging.

Guidelines and Information

To learn more about who to treat, refer to the 2013 Prevention Guidelines⁶-⁹ and the 2012 Guideline for the Diagnosis and Management of Patients With Stable Ischemic Heart Disease (SIHD).²

For further information about when to treat, review the Guideline for Percutaneous Coronary Intervention,¹⁴ as well as the 2013 Guideline on the Treatment of Blood Cholesterol to Reduce Atherosclerotic Cardiovascular Risk in Adults.⁸

Information on how to treat may be helpful from large-scale clinical studies (COURAGE,¹⁵ BARI 2D,¹⁶ FAME 2,¹⁷ FREEDOM,¹⁸ and ISCHEMIA¹⁹), as well as the aforementioned SIHD Guideline² (Figure 2). To determine patient risk and management for CAD, it is important to establish the right test for the right patient at the right time.

To help determine individual patient test selection, the questions of who, when, and how to test for known or suspected CAD are supported by the ACCF/AHA Multimodality Appropriate Use Criteria for SIHD,¹⁰ the American College of Radiology (ACR)/ACC appropriate utilization of cardiovascular imaging in ED patients with chest pain,¹¹ the American Society of Nuclear Cardiology (ASNC) ImageGuide Registry for MPI,²³ the ASNC Model Coverage Policy for SPECT MPI,²⁴ and the PROspective Multicenter Imaging Study for Evaluation of chest pain (PROMISE) trial²⁵ (Figure 3).

Refer to these materials for further information on appropriate patient-centered testing.
ASSESSING RISK

Initial Patient Evaluation

A thorough risk evaluation should be conducted for patients with known or suspected CAD.

The initial evaluation can help give frontline providers a better understanding of each patient’s risk.

As each patient is different, individualized assessment is an integral part of patient-centered care.
Initial Evaluation

As part of an initial evaluation, global risk scores can be used to estimate the risk of a future cardiac event and identify patients who would benefit from treatments aimed at management of risk. Therefore, providers must consider the possibility of overestimating ASCVD risk in Hispanic and Asian American patients and underestimating ASCVD risk when using the equations in American Indian patients.

Framingham Risk Score

The Framingham Risk Score takes into account age, sex, cholesterol levels, blood pressure, treatment for hypertension, diabetes status, and whether the patient is a smoker. Compared with the ASCVD Risk Estimator, the Framingham Risk Score was derived using data from Caucasians exclusively and only assesses the 10-year risk of experiencing an MI or CHD death. It cannot be used to estimate the risk of ASCVD or the lifetime risk of a cardiac event.

Reynolds Risk Score

The Reynolds Risk Score was initially developed to improve the assessment of cardiovascular event risk in women by taking into account additional factors such as family history of MI and high-sensitivity C-reactive protein (hsCRP). The Reynolds Risk Score was subsequently found to improve risk assessment for men.

ASCVD Risk Estimator

The ACC/AHA Task Force on Practice Guidelines developed a risk score based on data from large community-based cohorts that are representative of the US population of Caucasians and African Americans. The Atherosclerotic Cardiovascular Disease (ASCVD) Risk Estimator (also referred to as the Pooled Cohort Equations) provides sex- and race-specific estimates of the 10-year risk and lifetime risk for ASCVD for African American and Caucasian men and women aged 40 to 79 years, taking into account:

- Age
- Total and HDL cholesterol levels
- Systolic blood pressure (including treated or untreated status)
- Diabetes
- Current smoking status

A first ASCVD event is defined as the first occurrence of a nonfatal MI, CHD death, or fatal or nonfatal stroke. Of note, when compared with non-Hispanic Caucasians, the estimated 10-year risk for ASCVD is generally lower in Hispanic American and Asian American populations and higher in American Indian populations; therefore, providers must consider the possibility of overestimating ASCVD risk in Hispanic American and Asian American patients and underestimating ASCVD risk when using the equations in American Indian patients.

Access the ASCVD Risk Estimator on CardiacTesting.com
This score is a composite index that provides an estimate of cardiovascular risk based on results from the exercise stress test, including ST-segment depression, chest pain, and exercise duration.

Exercise time in minutes
- (5 x ST deviation)
- (4 x exercise angina*)

= Duke Treadmill Score
(-25 to 15)

- Low Risk ≥5
- Moderate Risk -10 to 4
- High Risk ≤-11

*0 = No angina
1 = Nonlimiting angina
2 = Exercise-limiting angina

**Figure 4. Duke Treadmill Score**

**Exercise Stress Testing**

Exercise stress testing is the preferred method of stress testing to assess cardiac ischemia and determine the likelihood of CAD and risk for future events.2,28

This noninvasive method not only provides information about exercise-induced chest pain but also measures exercise capacity, hemodynamic response to exercise, and the presence of cardiovascular abnormalities, all of which can be used to predict the risk of a cardiac event. Calculating the Duke Treadmill Score (Figure 4) can help evaluate patient cardiovascular risk.28

**Further Testing**

For patients whose ASCVD Risk Estimator score does not provide sufficient information on whether they would benefit from initiation of a statin, further testing including coronary artery calcium (CAC) scoring, ankle-brachial index (ABI) testing, and hsCRP testing may help clarify risk and inform treatment decision-making.8
CAC Scoring

The CAC score is a measurement of coronary atherosclerotic burden (Figure 5 shows the disease progression) detected by cardiac computed tomography (CT). Several studies have shown a linear relationship between the score and global risk, coronary events, and abnormal results from single-photon emission computed tomography myocardial perfusion imaging (SPECT MPI) procedures (see page 21 for more on SPECT). Patients with CAC scores ≥300 or who are at or over the 75th percentile of calcium distribution for age, sex, and race may benefit from initiation of statin therapy to reduce the risk for a cardiac event. CAC scoring may also be considered in asymptomatic patients who have an intermediate risk for CHD based on global risk scores to further refine their risk for future cardiac events.

ABI and hsCRP

Using Doppler measurement of blood pressure in all 4 extremities, the ABI is calculated by dividing the highest lower-extremity value by the highest upper-extremity value. The hsCRP is a blood marker of inflammation. Both ABI and hsCRP can help clarify patients’ risk for future cardiac events.
Figure 5. Progression of Atherosclerosis\textsuperscript{37,38}

1. Healthy artery

2. Plaque\textsuperscript{a} forms in the lining of the artery

3. Plaque collects, restricting arterial blood flow

4. Plaque ruptures, forming blood clots and limiting blood flow

\textsuperscript{a}Made up of calcium, fat, cholesterol, and other substances in the blood.
Is Cardiac Imaging Appropriate?

For patients who may need further cardiac testing to diagnose CAD or determine risk, it is important to determine which test is most appropriate.

Appropriate use criteria (AUC) may help support clinical decision-making for the selection of advanced diagnostic cardiac imaging tests.39
Multimodality AUC

Consistent with the call for patient-centered cardiac imaging to improve quality of care and outcomes, the ACCF initiated a process to determine the appropriateness of various types of cardiac imaging tests in common clinical situations and patient types (AUC ratings are listed in Figure 6). Physician judgment and practice experience may be needed in certain cases where appropriateness is not clear.

In 2013, the ACCF and AHA partnered with key specialty and subspecialty societies to align on the appropriate use of 7 invasive and noninvasive testing modalities for the detection of SIHD and risk assessment across 80 common patient presentations:

1. Exercise ECG
2. Stress radionuclide imaging (RNI), including SPECT and positron emission tomography (PET)
3. Stress echocardiography (echo)
4. Stress cardiovascular magnetic resonance (CMR) imaging
5. CAC scoring
6. Coronary computed tomography angiography (CCTA)
7. Invasive coronary angiography

An appropriate imaging study is one in which the expected incremental information, combined with clinical judgment, exceeds the expected negative consequences by a sufficiently wide margin for a specific indication that the procedure is generally considered acceptable care and a reasonable approach for the indication.

From the ACCF/AHA Multimodality AUC

*Negative consequences of cardiovascular imaging include the risks of the procedure (ie, radiation or contrast exposure) and the downstream impact of poor test performance, such as delay in diagnosis (false negatives) or inappropriate diagnosis (false positives).
Figure 6. AUC Ratings for Cardiac Imaging Tests Based on the ACCF/AHA Multimodality AUC

**APPROPRIATE**
- Benefits generally outweigh risks
- Generally an effective option
- Dependent on physician judgment and patient-specific preferences

**MAY BE APPROPRIATE**
- Variable evidence regarding the risk-benefit ratio
- Potentially an effective option
- Dependent on clinical variables, physician judgment, and patient preferences

**RARELY APPROPRIATE**
- Lack of evidence that benefits clearly outweigh risks
- Rarely an effective option
- Exceptions should have documentation of clinical reasons

ACCF = American College of Cardiology Foundation; AHA = American Heart Association; AUC = appropriate use criteria.
**PREOPERATIVE CARDIAC ASSESSMENT**

- **Preoperative assessment?**
  - **YES** → **Noncardiac surgery indications**
  - **NO**

**PRIOR EVALUATION OR KNOWN CAD**

- **Prior procedure?**
  - **YES** → **Cardiac rehab evaluation**
    - **YES** → **Referral to cardiac rehab indications**
    - **NO** → **PCI or CABG**
      - **YES** → **Post-revascularization indications**
      - **NO** → **Prior test**
        - **YES** → **Prior testing or procedure indications**

- **NO**

**NO PRIOR EVALUATION OF CAD**

- **Symptomatic (ischemic equivalent)?**
  - **YES** → **Symptomatic indications**
  - **NO**

- **Other CV conditions?**
  - **YES** → **Indications for other CV conditions**
  - **NO**

- **Exercise prescription?**
  - **YES** → **Indication for exercise prescription**
  - **NO**

- **Asymptomatic (without ischemic equivalent)?**
  - **YES** → **Asymptomatic indications**


*Refer to the published guidelines for further information on test appropriateness for specific patient indications.

**ACCF** = American College of Cardiology Foundation; **AHA** = American Heart Association; **AUC** = appropriate use criteria; **CABG** = coronary artery bypass graft; **CAD** = coronary artery disease; **CV** = cardiovascular; **PCI** = percutaneous coronary intervention.
Using the Multimodality AUC

For these “multimodality” AUC, each imaging test is rated for each indication, based on current understanding of the technical capabilities of the procedures examined, evidence base, and clinical experience. For patients who may have multiple clinical indications, a flowchart that places conditions into a hierarchy can be used to help assess test appropriateness (Figure 7).

Legislation Relevant to AUC: 
What Referring and Ordering Providers Should Know

Since their introduction, AUC have been used to help guide clinical decision-making for patient-centered, appropriate use of various cardiac imaging tests.

The Protecting Access to Medicare Act (PAMA) of 2014 set forth a mandate for the development or endorsement of AUC by national professional medical societies or other provider-led entities.

Medicare reimbursement for advanced diagnostic imaging services in the outpatient setting (including advanced cardiac imaging services such as MPI, CT, and CMR) will require:

• Consultation of applicable AUC
• Identification of AUC that were used to order the test selection
• Documentation showing that the test ordered is consistent with AUC used

According to PAMA, for outlier ordering professionals, prior authorization will be required for imaging services. Properly documenting the use of AUC will be important to help providers meet PAMA requirements.

Learn more about the Centers for Medicare & Medicaid Services (CMS) federal mandate at CardiacTesting.com
For more than 40 years, noninvasive RNI has been used to evaluate myocardial perfusion.\textsuperscript{40}

As the most commonly used imaging modality in nuclear cardiology, SPECT MPI plays an essential role in the diagnosis and management of CAD.\textsuperscript{40,41}
The Most Widely Used Nuclear Imaging Modality

Although there are several noninvasive cardiac imaging modalities available that may be appropriate for each patient indication, here we'll focus on the most widely used imaging procedure in nuclear cardiology—SPECT MPI.\textsuperscript{40,41} SPECT increases the diagnostic accuracy of traditional exercise stress tests and can help guide clinical management decisions for at-risk patients.\textsuperscript{40} Gated SPECT MPI can provide functional information about wall motion abnormalities to help detect extensive CAD. Normal SPECT MPI results are consistently associated with good prognosis and low-risk outcomes.\textsuperscript{2,40}

Figure 8. SPECT MPI Scans

These scans show the heart at stress and rest. Color indicates areas of perfusion where the radiotracer has entered the myocardium. Areas that appear lighter in color at rest and darker during stress indicate areas of stress-induced ischemia, where blood flow is blocked. The reversibility bull’s-eye scan shows the extent that an abnormality is reversible on rest imaging.\textsuperscript{40,42}

Images courtesy of Kim Allan Williams, MD.
The Basics of SPECT MPI

During a SPECT scan, the radiotracers thallium (TI-201) or technetium (Tc-99m sestamibi or Tc-99m tetrofosmin) can be used to track myocardial blood flow and reveal regional differences in tracer uptake during stress (either exercise or pharmacologic) compared with rest (Figure 8). The presence, extent, and severity of stress-induced perfusion abnormalities revealed by SPECT MPI can help detect CAD, assess the risk of cardiac events, and inform clinical decisions.

A Modality by Many Names

You may have heard SPECT MPI referred to as one of the following terms:

- Nuclear stress test
- Noninvasive cardiac testing
- Cardiac nuclear scan
- Radionuclide imaging (RNI)

**SPECT MPI** = single-photon emission computed tomography myocardial perfusion imaging.
When Is a SPECT Stress Test Appropriate According to the ACCF/AHA Multimodality AUC?10

**APPROPRIATE**

For symptomatic patients
- With intermediate to high risk for CAD
- With uninterpretable ECG

In postrevascularization (percutaneous coronary intervention [PCI] or coronary artery bypass graft [CABG])
- Only if symptomatic, or if revascularization was incomplete and additional revascularization is feasible

With other cardiovascular conditions
- Newly diagnosed heart failure (systolic or diastolic)
- Arrhythmia with ventricular tachycardia, frequent premature ventricular contractions (PVCs), or ventricular fibrillation
- Arrhythmia prior to therapy with high global CAD risk
- Syncope and intermediate or high global CAD risk

For follow-up testing: new or worsening symptoms
- With normal or abnormal exercise ECG
- With nonobstructive CAD on angiography or normal prior stress imaging study result
- With obstructive CAD on CCTA or invasive coronary angiography
- With abnormal calcium score

For preoperative evaluation before noncardiac surgery
- In patients with poor or unknown functional capacity prior to kidney or liver transplant, or vascular surgery with ≥1 clinical risk factor

**MAY BE APPROPRIATE**

For asymptomatic patients
- With a high global CAD risk
- With an uninterpretable ECG or inability to exercise

In postrevascularization (PCI or CABG)
- Prior left main coronary stent
- ≥2 years after PCI
- ≥5 years after CABG

With other cardiovascular conditions
- Arrhythmias with infrequent PVCs or new-onset atrial fibrillation
- Syncope with low global CAD risk

For follow-up testing
- Within 90 days of abnormal or uncertain stress imaging study result
- Asymptomatic or stable symptoms with last study ≥2 years ago; abnormal calcium score
- New or worsening symptoms and abnormal prior stress imaging study result
- With intermediate to high global CAD risk with last study ≥2 years ago

For preoperative evaluation before noncardiac surgery
- In patients with poor or unknown functional capacity with ≥1 clinical risk factor prior to intermediate-risk surgery
Advances in SPECT MPI

RARELY APPROPRIATE

For symptomatic patients
- With low risk for CAD and interpretable ECG

For asymptomatic patients
- With low global CHD risk
- With intermediate global CHD risk but interpretable ECG and ability to exercise

In postrevascularization (PCI or CABG)
- <2 years after PCI
- <5 years after CABG

For follow-up testing
- Asymptomatic or stable symptoms with last test <2 years ago

For preoperative evaluation before noncardiac surgery
- Prior to low-risk surgery
- In asymptomatic patients with normal prior test result or revascularization <1 year ago
- In patients with moderate to good functional capacity or no clinical risk factors

For evaluation prior to exercise prescription or cardiac rehabilitation, except in patients with heart failure

Advances in SPECT camera technology, image acquisition, and processing software have made it possible to improve image quality and lower radiation exposure to patients and staff.

New SPECT cameras can acquire images in a fraction of the time of older cameras and can detect signals from lower doses of radiotracers. New software can process images taken during shorter acquisition times or with lower radiotracer doses while maintaining image resolution.
CARE COORDINATION

Working Together for the Patient

Patients with heart disease are often managed by multiple providers for a range of medical conditions.

Provider communication and coordination are essential to achieving patient-centered care.
Provider Communication

Communication between the referring or ordering provider and cardiac imaging specialist can aid in making informed decisions regarding patient management. Coordination with the specialist may help your patients understand what is needed before and after the cardiac imaging test.

Figure 9 highlights the importance of communication between referring or ordering providers and specialists in the nuclear laboratory.

For each patient scenario, ongoing communication is necessary in order to coordinate appropriate patient-centered care.

For SPECT MPI tests, ASNC has published imaging guidelines with more detailed information on how to properly prepare your patients for testing.43
Figure 9. Delivering Patient-Centered Care

**Patients**
- Unstable (eg, UA, MI, known or suspected CAD)
- Stable symptomatic (eg, known or suspected CAD)
- Stable asymptomatic (eg, follow-up previous MI, revascularization)
- Stable inpatient (eg, preoperative evaluation)

**Referring or Ordering Providers**
- ED physician
- ED physician
  - Internist
  - Cardiologist
  - Other referring/ordering provider
- Internist
  - Cardiologist
  - Other referring/ordering provider
- Hospitalist
  - Cardiologist
  - Surgeon
  - Other referring/ordering provider

**Specialists**
- Cardiologist
- Nuclear Cardiologist
- Radiologist
- Imaging Specialist

**Coordinated Care Requires Ongoing Communication**

**Appropriate Patient-Centered Care**
- Cardiac catheterization, revascularization
- Risk factor modification/medication
- Normal results, no treatment

**Abbreviations**
- CAD = coronary artery disease
- ED = emergency department
- MI = myocardial infarction
- UA = unstable angina
Considerations for the SPECT MPI Test

Determining the Test

- **Consult** AUC and/or communicate with a cardiac imaging specialist to determine the most appropriate test for each patient

- **Discuss** test options with patients, covering risks and benefits

Preparing the Patient

- **Forward** prior testing results and medical history to the nuclear laboratory because these factors may impact which protocol is used

- **Ensure** the correct patient weight is recorded for accurate selection of radiotracer dose and test protocol

- **Share** your assessment of patient exercise capacity with the cardiac imaging specialist. Patients who cannot exercise adequately may need a pharmacologic stress test

- **Help** your patients understand the test preparation requirements to avoid rescheduling a test
Reviewing the Results

- **Request** a summary of patient test results from the nuclear laboratory, along with any recommendations for further testing.

- **Discuss** next steps and patient treatment strategies with the cardiologist before reviewing results with your patients.

Cardiac Testing Communication Tips

- **Reach out** to the cardiac imaging specialist or cardiologist with any questions or concerns you may have about your patients—a quick phone call may save time in the long run.

- **Coordinate** with the specialist to ensure your patients have the information they need for their cardiac imaging experience.

- **Ask** any questions you may have about the test results to help your patients understand the next steps.
Informed patients are more likely to be prepared for their cardiac imaging tests.

Research has shown that patients who are informed about the benefits and risks of specific tests and procedures are more likely to postpone or decline invasive procedures.2
Preparing Your Patients for a SPECT MPI Test

A comprehensive dialogue with your patients will help them understand and properly prepare for the test.2

Explain why the test is being performed and how the test results may be used to make decisions about their care.2

Go over risks and benefits of the test. For an appropriate test, benefits will typically outweigh radiation risks.10

Identify medications that your patients may need to abstain from that could interfere with the scheduled procedure.43

Clarify fasting requirements—patients may need to fast and avoid caffeine prior to a pharmacologic stress test.43

Check that your patients know the location of the testing facility, how to prepare for the test, and what they can expect on the day of the test.

Encourage your patients to contact the testing facility with any specific questions.

Patients seek health information from a variety of sources, but education from a frontline provider may be most helpful. Reviewing results with your patients may help explain next steps and motivate patients to follow your directions.

Questions Your Patients May Ask About SPECT MPI46

ABOUT THE TEST
• What is this test?
• How is it performed?
• Will the test tell me if I have heart disease?
• Will the test tell me about my risk of a having a heart attack?

ABOUT THE BENEFITS
• How will the test help me?
• What will you learn from the test results?
• How will this test help you make decisions about my care?

ABOUT APPROPRIATE USE
• Is this the most appropriate test for me?
• Are there any alternative tests?
• If my results are normal, does it mean I should not have taken the test?

ABOUT THE POTENTIAL RISKS
• How much radiation is used for the test? How does it compare with the amount of radiation I am normally exposed to in other aspects of my life?
• Is the radiation from this test harmful?
• Does radiation from a SPECT MPI test increase my cancer risk?
For more than 20 years, Astellas has offered practical resources to help providers make decisions focused on patient-centered care. Our educational materials are designed to increase understanding of cardiac testing and encourage communication between providers—all to help each patient get the right cardiac test at the right time.

The Cardiac Testing Educational Series is intended to be a starting point for further reading.

For the latest information in cardiovascular care, go to CardiacTesting.com
Shared Understanding of Cardiovascular Care

Astellas is committed to bringing you the latest information on cardiac testing, so your entire care team can be better equipped to help what matters most—the patient.

Go to CardiacTesting.com to learn more about patient pathways for cardiovascular care.