Nuclear Cardiac Guidance

Understanding the Exam

Nuclear cardiac studies diagnose coronary function or perfusion abnormalities caused by heart disease.

There are two types of myocardial perfusion studies: single photon emission computed tomography (SPECT) and positron emission tomography (PET). Myocardial perfusion studies need nuclear images and an electrocardiogram (EKG/ECG) to assess the heart at rest and stress. Cardiologists compare the images to look for perfusion defects, seen in patients with earlier myocardial infarcts or ischemia.

Some clients perform CT imaging with PET studies. These clients can choose the PET CT procedure to update the report's procedure statement. Worksheets also have the Amyloid procedure for clients performing SPECT studies to check for amyloid in the heart.

Technologists perform multigated acquisition scans (MUGA) to collect functional information, like cardiac output and ejection fraction. Cardiologists use this information to gauge heart function.

Performing and Approving Users

Action	User	Required Credentials
Performed by	Nuclear Medicine Technologist	• Certified Nuclear Medicine Technologist (CNMT). • Certified by the Nuclear Medicine Technology Certification Board (NMTCB). • Nuclear Cardiology Technologist Certification (NCT). • Certified by the Nuclear Medicine Technology Certification Board (NMTCB). • Radiology Technologist (RT (N)). • Certified by the American Registry of Radiologic Technologists (ARRT).
Read by	Cardiologist	Typically, board-certified in internal medicine and at least one cardiac subspecialty by: • The American Board of Internal Medicine (ABIM). • Or the American College of Cardiology (ACC).

Facility Types

The following facility types perform nuclear cardiac studies:

- Community hospitals
- Outpatient imaging centers
- Public health facilities

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- University-affiliated teaching hospitals and medical institutions
- Government and private research institutes
- Medical imaging facilities
- Private physician offices

Viewer

Nuclear post-processing software uploads nuclear data to Studycast as a secondary capture. Review snapshots of the processed data, the gated data, and the 3D images in the Studycast Viewer. Analyze patient heart motion by looking at the raw data cine sent to Studycast. View the 3D images and bullseye to check for wall motion abnormalities.

Worksheet

Measurements and Observations

This section has the three standard tabs and three study-type-specific tabs.

Tab Type	Tabs
Study-Specific	• Stress Test or Resting EKG/ECG • Nuclear Imaging Protocol • Rest/Stress or Rest
Standard	• Report Images • Report Attachments • Report Recipients

Protocol

The worksheet has three protocols: SPECT, PET, and MUGA. Select a protocol to adjust the worksheet to accommodate the imaging technique.

The PET protocol makes the following changes to the worksheet:

- Adds **MBF/MFR** and **Coronary Artery Calcium Score** sections to the **Rest/Stress** tab.
- Adds the following calculations to the **Perfusion Evaluation**:
    - SS%
    - SR%
    - SD%

The MUGA protocol makes the following changes to the worksheet:

- Limits and renames the **Stress Test** tab to **Resting EKG/ECG**.
- Replaces the **BP/HR** section on the **Nuclear Imaging Protocol** tab with the **Views Obtained** section.
- Removes the **Reversal Agent** and **Stress** sections from the **Rest/Stress** tab.

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Calculated values

Find calculated values in Studycast Help.

My Choices Form Options

Find My Choices options on the Nuclear Cardiac My Choices Form.

Import Measurements

Some testing equipment and imaging devices output measurement and study data in XML format. The **Import Measurements** batch action transfers the file values to fields in a Studycast worksheet. For more information, see Studycast Help.

Report

Use the **Display IDiagram images on report** option to include or exclude function or perfusion diagrams on the final report. This option is on the **Rest/Stress** or **Rest** tab. Users can toggle the diagrams on a per-study basis.

Accreditation

Studycast reports meet requirements from:

- Intersocietal Accreditation Commission (IAC)
- American College of Radiology (ACR)
- American Society of Nuclear Cardiology (ASNC)

Demo Path

Use this demo path when training after covering the basic worksheet orientation.

All trainees

Understand a facility's nuclear cardiac study workflow before walking through the worksheet. Know that, along with images, studies may include EKG and stress test results data. Before walking a client through the worksheet, understand:

- The facility's nuclear cardiac study workflow.
- Studies may include EKG/ECG and stress test result data along with the images.

There may be variations in who enters the nuclear cardiac study information. In most cases, the following users document a nuclear cardiac study:

- **Nuclear Technologist**: Uploads the post-processed nuclear images to Studycast. Document measurements and observations on the **Stress Test** and **Nuclear Protocol** tabs.
- **EKG/ECG Technician or Nurse**: Attaches the EKG/ECG to the study.

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- **Reading Physician**: Documents measurements/observations on the **Rest/Stress** tab. Generates findings and conclusions and approves the study.

Some technologists prefer to enter information upon completion of the stress test. Others prefer to enter information upon completion of the nuclear imaging.

It is helpful while showing the worksheet to show which information:

- Generates the finding statements.
- Only shows in the **Summary** box on the report.

Verifying Physician

There is a use case where one physician signs off on the EKG interpretation and another physician on the image interpretation. The Verifying Physician functionality can meet this need.

Stress Test Tab

Enter stress test information on the Stress Test tab. This information can be:

- The resting, peak, and recovery EKG/ECG.
- The duration of the exercise.
- Test symptoms.
- The reason for stopping.

To show the **Stress Test** tab:

1. Document a rhythm for **Resting EKG/ECG**, **Peak EKG/ECG**, and an arrhythmia.
2. Enter "Chest Pain" as a reason for stopping in the **Exercise** section.
3. Show the following fields and explain their calculations:
   - Max APHR.
   - 90% of Max APHR (Target).
   - % of Max APHR.
4. The **Max Achieved** field populates with the highest heart rate from the stress stages on the **Nuclear Imaging Protocol** tab by default.
   - There is a worksheet option to populate this field from the highest HR from all stages or only the last stage.
5. Enter "Positive by ECG criteria" in the **Stress Impression** section.
6. Generate the findings to show how the EKG/ECG information affects the statements.
7. Preview the report. Show which information displays in the **Stress Test Summary**.

Nuclear Imaging Protocol Tab

The technologist enters blood pressure (BP), heart rate (HR), and radiopharmaceutical dose and injection information on this tab.

To show the **Nuclear Imaging Protocol** tab:

1. Enter the following information in the **Rest Radio** and **Stress Radio** sections:
    - Radiopharmaceutical.
    - Dose.
    - Injection date/time.
    - Image acquisition date/time.

Note: If completing documentation while administering the dose and getting the images, use the Now button to enter the current date and time.

2. Enter BP and HR information at rest and each stress stage.
3. Generate the findings statements. Show the radiopharmaceutical and injection statements.
4. Preview the report. Show how the information entered on this tab displays in the **Stress Test Summary**.

Rest/Stress Tab

Technologists enter rest, stress, function, and perfusion information on this tab.

To show the **Rest/Stress** Tab:

1. Enter **LV Vol Rest** and **LV Vol Stress** values. Show that Studycast calculates the ratio. The **TID** observation populates based on this ratio.
    - If the LV Volumes are empty, users can enter the **TID** observation and ratio.
2. Click the **Function Evaluation** and **Perfusion Evaluation** diagrams. Show how the selections affect the finding statements.
3. Generate the conclusions.
4. Show how to remove and reorder the statements.
5. Preview the report.

If Training a Technologist

Explain the default values for the worksheet. Default values can change based on client needs.

Field	Default Value
Study Quality	Excellent
Protocol	SPECT
Procedure	Myocardial Perfusion SPECT
Test Type	Exercise Treadmill
Informed Consent	Checked

Open the report. Show how the following fields affect the procedure statement on the report:

- Study Quality.

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- Protocol.
- Procedure.
- Test Type.
- Informed Consent.
- CTDI.
- DLP.

Patient's Previous Studies

The nuclear cardiac study type lets users include previous studies in the report. Selecting a previous study generates findings and conclusions statements. These statements can include a comment if entered. The client may want to use the prior interpretation as a comment to include it in the conclusions.

Demoing Import Measurements

1. Select **Import Measurements** in the bottom left. Import a sample XML file.
2. Show the study data in the **Apply Measurements** window.
3. Explain the **Regenerate findings statements** option. Show viewing and editing differences from the **Edit Findings** screen.
4. Show how the worksheet fields have been updated from the imported data.

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SWOT Analysis

Strengths	Weaknesses
• Ability to document SPECT, PET, and MUGA studies from the same worksheet • Ability to document PET studies with or without CT • Ability to document stress or rest studies • Ability to document function and perfusion from diagram (choose from 17 or 20 segment bullseye diagram) • Ability to map in study information from XML report imported manually •	• No nuclear post-processing available
Opportunities	**Threats**
• Expand supported reports for manual import of measurements • Nuclear post processing software is robust. We leave that functionality to the experts.	• Some clients are looking for software that allows them to post-process the images, or plug-ins to allow for post-processing. Competitors offering this will have an advantage with those customers.

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