UW Health
University of Wisconsin Hospital and Clinics

Division of Nuclear Medicine Procedure / Protocol

MYOCARDIAL SPECT PERFUSION REST and REDISTRIBUTION
FOR USE WITH THALLIUM 201 ONLY

CPT CODE: 78460, 78464
UPDATED: MARCH 2012

Indications: Resting thallium is used in the determination of myocardial viability (the syndrome of dysfunctional hypoperfused myocardium which improves in function after revascularization).

Patient Prep: See the **Myocardial Stress Test Prep Protocol**.

Scheduling: The test will consist of 2-3 appointments.
First appointment (rest only) will be for 60 minutes.
Second appointment (4-6 hrs later) will be for 60 minutes.
Third appointment (24 hrs after first appointment) will be for 60 minutes.

Radiopharmaceutical & Dose:

The rest dose is 3mCi Thallium adjusted per the current age & weight nomogram.
There is no injection the 2nd set of images.
If the 3rd set of images is required a 1mCi redistribution dose will be needed.

Imaging Device: GE Millennium VG or GE Infinia Hawkeye with LEHR collimators.
Please note, that at this time Hawkeye is not being used.

Data Acquisition:

For the Millennium VG, select the following from the Myocardial Folder:

- Select **Rest TL201 ECT** for the rest images
- Select **Rest Redistribution** for the 2nd image.
- Select **Rest TL201 ECT** for the 3rd set of images.
- These images are not gated.

For the Infinia Hawkeye, select USER, then select the following from the UW CARDIAC FOLDER:
Select **One Day TL** for all images.

- Use **Rest** for the 1st images.
- Use **Redistribution** for the 2nd images.
- Use **Rest** for the 3rd set of images.
- Delete the other image (gated) sets; they are not used for this study.
- These images are not gated.

Acquisition Parameters:

The Infinia Hawkeye cameras must be in the "L Mode" configuration.

Infinia Hawkeye	**Rest**	**Stress**	**Redistribution**
Tomo Key Parameters			
Mode	**L**	**L**	**L**
Start Angle	**270**	**270**	**90**
Patient Location	**Feet First Supine**	**Feet First Supine**	**Feet First Supine**
Acquire CT/AC	**No**	**No**	**No**
Image Settings			
Zoom	**1.3**	**1.3**	**1.3**
Matrix	**64 x 64**	**64 x 64**	**64 x 64**
Pan Y	**0**	**0**	**0**
Scan Mode			
Step & Shoot	**Check**	**Check**	**Check**
Seconds	**45**	**35**	**45**
Tomo Corrections			
Energy session	**TL201 (70 & 167)**	**TL201 (70 & 167)**	**TL201 (70 & 167)**
Collimator	**LEHR**	**LEHR**	**LEHR**
COR Correction	**Check**	**Check**	**Check**
Tomo CT/AC Parameters	**Nothing**	**Nothing**	**Nothing**
Tomo Location Parameters			
Mode	**L**	**L**	**L**
Start Angle	**270**	**270**	**270**
Patient Location	**Feet First Supine**	**Feet First Supine**	**Feet First Supine**
Detector Settings			
Detectors 1 and 2	**Check**	**Check**	**Check**
Rotation			
Total Angular Range	**180**	**180**	**180**
View Angle	**3**	**3**	**3**
Direction	**CCW**	**CCW**	**CW**
Workflow			
Release at end of scan	**Check**	**Check**	**Check**
FOV Settings			
Number of FOVs	**1**	**1**	**1**
FOV time multiplier	**1.0**	**1.0**	**1.0**
Rough Overlap	**4**	**4**	**4**
Direction	**Table In**	**Table In**	**Table In**
Table Height			
Select	**Default**	**Default**	**Default**
Tomo Admin Parameters			
Body Part	**Chest**	**Chest**	**Chest**

Millennium VG	**REST TL201 ECT**	**STRESS TL201 ECT**
ECT Tab		
Label	**TL201 Spect**	**TL201 Spect**
Pharmaceutical	**TL201**	**TL201**
Dose	**3.0**	**3.0**
Isotope: **Select**	**TL201**	**TL201**
Heads: **Head 1 and Head 2**	**Check**	**Check**
Head 1		
Collimator	**VP45**	**VP45**
View	**RST_ECT**	**RST_ECT**
Head 2		
Collimator:	**VP45**	**VP45**
View		
Gspect Parameters		
Frames/Cycle:		
Acquisition Mode: **Select**		
ECT Parameters		
Angular Range	**90.0**	**90.0**
Angular Step	**3.0**	**3.0**
Frame Time	**45**	**35**
Velocity	**2.0**	**2.0**
Direction: **CCW**	**Check**	**Check**
ECT Type: **Step & Shoot**	**Check**	**Check**
Stop Conditions		
Select		
Gantry Position	**0.0**	**0.0**
PVC Thresholds		
High%:		
Low%:		
Extended Tab		
Energy Window		
Center	**70.0 167.0**	**70.0 167.0**
Low	**15 10**	**15 10**
High %	**15 10**	**15 10**
Corrections		
Energy	**Check**	**Check**
Linearity	**Check**	**Check**
Sensitivity	**Check**	**Check**
COR	**Check**	**Check**
Home Position		
Factory	**Check**	**Check**
Select	**Thallium**	**Thallium**
Rate: **Normal**	**Check**	**Check**
Frame Size: **Select**	**64**	**64**
Mirror: **Select**	**NO**	**NO**
Transform		
Center X	**0.0**	**0.0**
Center Y	**0.0**	**0.0**
Zoom	**1.28**	**1.28**
Rotation	**0.0**	**0.0**
Patient Position: **Select**	**Supine**	**Supine**
Patient Orientation: **Select**	**Legs In**	**Legs In**

Procedure:

1. For outpatients upon arrival to the nuclear medicine department, females will be asked to change from the waist up into 2 hospital gowns (alternating front and back openings); the brassiere needs to be removed for imaging. This is per the physicians. Male patients have no immediate prep.
2. A nuclear medicine technologist will interview the patient, verifying the patient with 2 forms of identification (i.e. DOB, spelling the name, MR #). A brief description of the test will be given and the patient allowed to ask any questions.
3. The radiopharmaceutical can be directly injected into a vein, making sure to flush the syringe with blood at least once. For inpatients or outpatients with a working IV in place, the radiopharmaceutical shall be injected and flushed with a 0.9% Sodium Chloride 10cc syringe.
4. The patient will be asked to wait in the cardiac waiting room for 15 minutes.
5. The appropriate protocol is selected (see the **Data Acquisition** section) depending on the camera being used.
6. Patients are asked to remove any metal objects from the chest/torso areas as to not interfere with the imaging of the heart.
7. The patient is asked to lie supine on the imaging table with their arms above their head. The imaging technologist will place the patient in the camera and adjust the orbit of the heads so the camera faces do not touch the patient. The patient is instructed to lay still and breathe normally during the pictures. The only exceptions to this are if there is a major shoulder or arm injury impairing movement, or a recent device implantation that restricts the movement of the shoulder. Consult the reading physician of the day if this happens.
8. Upon completion of the images, the patient is assisted up from the table and asked to wait in the cardiac waiting room until the images are reviewed. This is to verify there is no technical data missing and there is no excessive patient movement during the images requiring the pictures to be taken again.
9. The images are then processed per the **Myocardial Processing Protocol**. It may be necessary to have the reading physician of the day review the images before the patient is released to leave.
10. Once it is determined that the patient may leave, in-patients may be sent back to the floor and out-patients may re-dress. A copy of the **Myocardial Dietary Restrictions for Thallium Cardiac Stress Test** is explained and sent with the patient.
11. At the time of the second appointment (resting part of the study), the nuclear medicine technologist will interview the patient, verifying the patient with 2 forms of identification (i.e. DOB, spelling the name, MR #). Female patients will be asked to change from the waist up into 2 hospital gowns (alternating front and back openings); the brassiere needs to be removed for imaging.
12. The appropriate protocol is selected (see the **Data Acquisition** section) depending on the camera being used.
13. Patients are asked to remove any metal objects from the chest/torso areas as to not interfere with the imaging of the heart.
14. The patient is asked to lie supine on the imaging table with their arms above their head. The imaging technologist will place the patient in the camera and adjust the orbit of the heads so the camera faces do not touch the patient. The patient is instructed to lay still, breath normally during the pictures. The only exceptions to this are if there is a major shoulder or arm injury impairing movement, or a recent device implantation that restricts the movement of the shoulder. Consult the reading physician of the day if this happens.
15. Upon completion of the images, the patient is removed from the imaging table and asked to wait in the cardiac waiting room while the images are reviewed. At this time, the images need to be reviewed by the reading physician of the day to determine if the 3rd set of images (24hr images) are needed. If so, proceed to the next step. If the 3rd set of images are not needed, the procedure is not complete.
16. The patient is asked to return at the designated time the following day for the 3rd set of images. There are no food or beverage restrictions for the last set of images.
17. At the time of the third appointment, the nuclear medicine technologist will interview the patient, verifying the patient with 2 forms of identification (i.e. DOB, spelling the name, MR #). Female patients will be asked to change from the waist up into 2 hospital gowns (alternating front and back openings); the brassiere needs to be removed for imaging.

18. If the 24hr images are needed a 1mCi dose of Thallium can be directly injected into a vein, making sure to flush the syringe with blood at least once. For inpatients or outpatients with a working IV in place, the radiopharmaceutical shall be injected and flushed with a 0.9% Sodium Chloride 10cc syringe. Out-patients with peripheral IV's should have the IV discontinued at this time.
19. The appropriate protocol is selected (see the **Data Acquisition** section) depending on the camera being used.
20. Patients are asked to remove any metal objects from the chest/torso areas as to not interfere with the imaging of the heart.
21. The patient is asked to lie supine on the imaging table with their arms above their head. The imaging technologist will place the patient in the camera and adjust the orbit of the heads so the camera faces do not touch the patient. The patient is instructed to lay still, breath normally during the pictures. The only exceptions to this are if there is a major shoulder or arm injury impairing movement, or a recent device implantation that restricts the movement of the shoulder. Consult the reading physician of the day if this happens.
22. Upon completion of the images, the patient is removed from the imaging table and asked to wait in the cardiac waiting room while the images are reviewed.
23. The images are processed per **Myocardial Processing Protocol**. The necessary screen captures are sent to PACS. It may be necessary to have the reading physician of the day review the images before the patient is released to leave.
24. Once it is determined that the patient may leave, in-patients may be sent back to the floor and out-patients may re-dress. A handout with the food and beverage guidelines will be sent with all patients.

Image Processing & PACS:

Display the 4hr and initial images using the **Myocardial Spect Processing Protocol**.
Display the 24hr and initial images again using the **Myocardial Spect Processing Protocol**.

Interpretation: A single resting study may define myocardial viability. Follow-up 4-6 hour or 24-hour imaging improves the sensitivity of detecting viable myocardium in initial defects.

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