GUNDERSEN HEATLH SYSTEM
NUCLEAR MEDICINE DEPARTMENT
PROTOCOL MANUAL

PROCEDURE: **THALLIUM MYOCARDIAL IMAGING**

SECTION: **CARDIOVASCULAR 2.2**

ORIGINAL DATE: **9 - 30 - 99**

DATE REVISED: **3 – 6 - 20**

REVIEWED: **ANNUAL**

Indications	Detection of coronary artery disease
	Classification of left ventricular myocardium perfusion as normal, infarcted, and reversibly ischemic
	Myocardial viability evaluation
Contraindications	
Exam time length	Initial stress acquisition: 1 hour Delayed redistribution/rest acquisition: 30 minutes
Patient Preparation	None
Radiopharmaceutical & Dose	Radiopharmaceutical: Thallium-201 as thallous chloride. Stress / Redistribution Study or Viability- Rest/Redistribution 4.0 mCi
Administration Technique	Stress: Since the injection is made while the patient is exercising, and, therefore, moving, an intravenous line is placed prior to the beginning of exercise. The intravenous line should be placed in the medial (brachial) vein of the antecubital fossa. The radiopharmaceutical is then injected 1 - 1.5 minutes before the anticipated end of the patient's exercise endurance. Rest: **Resting Thallium Imaging below**
Optional Techniques	**Optional Techniques:** 2**4-hour Delay Imaging** Additional resting images may be obtained in patients demonstrating a fixed defect in the initial images: Obtain stress /redistribution or Rest/Redistribution images as described above. If Nuclear Cardiologist orders 24 hour images, they will need to notify the Nuclear Medicine department. Process study in the following order: A. Stress / Redistribution images B. Redistribution / 24hr Delay images

	Resting Thallium Imaging Resting / 4 hr redistribution images may be obtained in patients, if ordered by referring physician. Thallium is injected at rest using above listed dosing guidelines. * 6/20/07- patient may eat pre/post scan as normal-per Dr. Jaeger 30 minutes after injection, acquire resting images*, page Reading Nuclear Cardiologist to view images.* 3-4 hours following the initial injection, redistribution tomographic images are acquired using the same acquisition parameters that were used for the rest acquisition. Process study in the following order: (See note below) A. Rest / Redistribution images B. Redistribution 24hr Delay

Note: The 24-hour pics are automatically scheduled in EPIC.

If we can get ahold of the reading cardiologist to evaluate the images and let us know if we should keep the 24-hour image or delete it that would be good. (try to notify the reading card in advance)

If not, we just go ahead as planned with the 24 hr images.

Rest & Redist Procedure	Rest Study	Redist Study
Minimum time interval between Rest and Delay studies		Redist is done 3 or more Hours post Rest Images
Time interval between tracer injection and imaging	45 Minutes to 1 Hour	Delay is done 4 or more Hours post injection
Camera/Collimator	LEHR	LEHR
Patient position	Supine	Supine
Energy	30%@70keV, 20%@167keV	30%@70keV, 20%@167keV
Matrix	64X64 Zoom of 1.28	64X64 Zoom of 1.28
Pixel size	8.8 mm	8.8 mm
Number of projections	180º, 30 Images Total 90º/Head; 15 Images/ Head	180º, 30 Images Total 90º/Head; 15 Images/ Head
Orbit CW or CCW	CCW	CCW
Orbit type	Circular	Circular
Start Angle	0º	0º
End Angle	-90º	-90º
Time per view	~60 Seconds	~60 Seconds
Gating (Y/N)	May be Done	No
Gating frames	8/Stop	NA
R to R window	+/- 20%	NA
Uniformity and COR	Tc99m / LEHR	Tc99m / LEHR
Prefilter Type	Butterworth	Butterworth
Filter cutoff/power	0.392/10	0.392 / 10
Postfilter Type	Butterworth	Butterworth
Filter cutoff/power	0.392 / 20	0.392/ 10
OSEM Iterations	2	2
# of Subsets for OSEM	10	10
Motion correction	NA	NA
Attenuation correction Y/N	Yes	Yes
Normal database used Y/N	Yes	Yes
Reconstruction filter	Q Recon_Quant	Q Recon_Quant
Screen Caps to make	Gated/Quant/Slices/Dr H	Gated/Quant/Slices/Dr H
Send to FUJI	Gated/Quant/Slices/Dr H	Gated/Quant/Slices/Dr H
Send to Dr. Cardiac	Whole Study	Whole Study

Redist & 24 hr delay Procedure	24 Hr delay Study
Minimum time interval between Delay and Re-inj studies	24 hr
Time interval between tracer injection and imaging	30 to 45 Minutes
Camera/Collimator	LEHR
Patient position	Supine
Energy	30%@70keV, 20%@167keV
Matrix	64X64 Zoom of 1.28
Pixel size	8.8 mm
Number of projections	180º, 30 Images Total 90º/Head; 15 Images/ Head
Orbit CW or CCW	CCW
Orbit type	Circular
Start Angle	0º
End Angle	-90º
Time per view	~60 Seconds (per Delay)
Gating (Y/N)	No
Gating frames	NA
R to R window	NA
Uniformity and COR	Tc99m / LEHR
Prefilter Type	Butterworth
Filter cutoff/power	0.392 / 10
Postfilter Type	Butterworth
Filter cutoff/power	0.392 / 10
OSEM Iterations	2
# of Subsets for OSEM	10
Motion correction	NA
Attenuation correction Y/N	Yes
Normal database used Y/N	Yes
Reconstruction filter	Q Recon_Quant
Screen Caps to make	Gated/Quant/Slices/Dr H
Send to FUJI	Gated/Quant/Slices/Dr H
Send to Dr. Cardiac	Whole Study

Rest and Redist:

1. Acquire ‘RGATE’ (Rest) Study.
2. At 4 hour, acquire ‘REDIST’ Study.
3. Use the QGS/QPS Thallium processing option to start data processing (Attn correction should be applied if used).
4. When preparing perfusion report in Myometrix tab, use report templates Thallium, Thallium AC.
    a. Go ‘Back’ to continue processing.
5. When preparing Quantitative Perfusion Polar plots page, manually choose Rest IRNC and Delay IRNC from dropdown list.
6. Myomatrixs,
    a. THALLIUM
    b. THALLIUM AC
7. File, Save and Exit
8. Send to Dr. Cardio

Redist and 24hr Delay

1. Acquire ‘DELAY 24hr’ Study
2. Modify existing patient study name and ID on Xeleris workstation. Example: add “01” to patient ID.
3. After acquisition, go under the Data management tab (middle tab main screen) on Optima Acquisition system and resend patient study to Xeleris workstation.
4. Delete Rest exam. Modify study name to **Tl201 24hr Delay**
5. Use the QGS/QPS Thallium processing option to start data processing.
    a. One Day filter worked fine.
6. When preparing Perfusion reports in Myometrix tab, use report templates Thallium delay, Thallium delay AC.
    a. Go ‘Back’ to continue processing
7. When preparing Quantitative Perfusion Polar plots page, manually choose REDIST IRNC and 24hr Delay IRNC from dropdown list
8. File, Save and Exit
9. Send to Dr. Cardio.

Stress & Delay Procedure	Stress Study	Delay Study
Minimum time interval between Stress and Delay studies		Delay is done 3 hours post Stress injection
Time interval between tracer injection and imaging	Imaging should begin about 10 minutes after the end of the EKG stress study. (It is important that the EKG stress lab is located in close proximity to the nuclear medicine department.) Ten minutes represents a compromise between beginning later which decreases the sensitivity of the study for reversible ischemia and beginning earlier which causes image artifacts secondary to "cardiac creep".	3-4 hours following the initial injection, redistribution/rest tomographic images are acquired using the same acquisition parameters that were used for the stress acquisition.
Camera/Collimator	LEHR	LEHR
Patient position	Supine	Supine
Energy	30%@70keV, 20%@167keV	30%@70keV, 20%@167keV
Matrix	64X64 Zoom of 1.28	64X64 Zoom of 1.28
Pixel size	8.8 mm	8.8 mm
Number of projections	180º, 30 Images Total 90º/Head; 15Images/ Head	180º, 30Images Total 90º/Head; 15 Images/ Head
Orbit CW or CCW	CCW	CCW
Orbit type	Circular	Circular
Start Angle	0º	0º
End Angle	-90º	-90º
Time per view	~60 Seconds	~60 Seconds
Gating (Y/N)	Yes	No
Gating frames	8/Stop	NA
R to R window	+/- 20%	NA
Uniformity and COR	Tc99m / LEHR	Tc99m / LEHR
Prefilter Type	Butterworth	Butterworth
Filter cutoff/power	0.392 / 10	0.392 / 10
Postfilter Type	Butterworth	Butterworth
Filter cutoff/power	0.314 / 20	0.4 / 10
OSEM Iterations	2	2
# of Subsets for OSEM	10	10
Motion correction	NA	NA
Attenuation correction Y/N	Yes	Yes
Normal database used Y/N	Yes	Yes
Reconstruction filter	Q Recon_Quant	Q Recon_Quant
Screen Caps to make	Gated/Quant/Slices/Dr H	Gated/Quant/Slices/Dr H
Send to FUJI	Gated/Quant/Slices/Dr H	Gated/Quant/Slices/Dr H
Send to Dr. Cardiac	Whole Study	Whole Study