**99m-Tc 99mTechnetium-Pyrophosphate  
Imaging Protocol for Cardiac Amyloidosis**

**Indications:**

* Evaluation of cardiac involvement in individuals with known or suspected familial amyloidosis
* Diagnosis of cardiac ATTR amyloidosis in individuals with CMR or echocardiography consistent with cardiac amyloidosis.
* Patients with suspected cardiac ATTR amyloidosis and contraindications to CMR such as renal insufficiency or an implantable cardiac device

**Contraindications:**

There are no contraindications.

**Patient preparation:**

No preparation is required.

**Radiopharmaceutical: (intravenous injection)**

Tc-99m pyrophosphate (99mTc-PYP)- 10-20 mCi

\*\*\* In the event there is a shortage of PYP, alternative radiopharmaceuticals may be used\*\*\*

Tc-99m hydroxymethylene diphosphonate (99mTc-HMDP)- 10-20 mCi

**Injection to Imaging time:**

2-3 hours post injection of radiopharmaceutical for both Planar and SPECT imaging

**Patient Positioning:**

Supine with arms above head

Orientation- Head in

**Camera set up:**

* Collimator (All): Low energy, high resolution (LEHR)
* Energy window: 140 keV (20% window)
* Detector Configuration 90˚ for Planar and SPECT
* Non-gated imaging
* Pixel size 3.5-6.5 mm

**Planar Imaging:**

* Static acquisitions- 750K counts/image.
* Views: anterior, L lateral, and LAO (anterior and L lateral can be acquired
* Simultaneously with 90˚ detector configuration)
* Magnification 1.46
* Matrix 256 x 256

**SPECT imaging:**

* Angular range: 180˚
* Number of views/detectors: 40
* Time per stop: 20 seconds
* Orbit: Non-circular
* Matrix: 128 x 128
* Zoom: 1.46

**Acquisition Procedure:**

*Planar Imaging*

Acquire planar images as described above in Anterior, Left Lateral, and LAO views 2-3 hours post injection of radiopharmaceutical.

*SPECT Imaging*

SPECT imaging will be performed as described above immediately following 3 view planar imaging. SPECT acquisition time is approximately 14-15 minutes, and the patient is encouraged to hold still.

**Processing Procedure:**

*Planar Imaging*

* + Using static display take “snapshots” or “screen saves” all static images.
  + Labeled with correct view and time of acquisition.
  + Draw a circular ROI over the heart on the 2–3-hour planar images.
  + This region will be the “H” (heart) region. This region should not include bone uptake.
  + Careful to use the exact same ROI, place the ROI over the contralateral lung.
  + This region will be the “CL” (background) region.
  + Note the meaning counts for each ROI.
  + Calculate H/CL ratio, as follows:
    - (Mean Heart Counts) ÷ (Mean Contralateral Lung Counts)
  + Additional Information to note/label for each ROI: Maximum Counts /pixel, Standard Deviation, Total counts, Area size of ROI (to assure size of both heart and background ROIs are as close to the same size as possible)

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*SPECT Imaging*

* SPECT imaging can be processed according to the patient’s heart-to-contralateral lung (H/CL) ratio.
  + Ratio <1.5 process as a bone/chest SPECT study with little or no cardiac uptake
  + Ratio >/= 1.5 process as an MPI study because of significant cardiac uptake

\*\*\*\*Iterative reconstruction, Butterworth Filter, 0.5/6\*\*\*\*

* Click on the Reconstruction tab.
* Reconstruction limits and orientation are automatically determined. Review and align/adjust as necessary.
* Center the images
* Adjust crosshairs so that they intersect with the center of the heart.
* Click on Display
* Check images correct display of short, vertical long, and horizontal long axis.
* Select the complete button.
* Cardiac Reconstruction images are complete.
* Save
* Send to PACS system for physician review.