

Department of Nuclear Medicine

The department of Nuclear Medicine specialises in diagnostic tests and treatments using radioactive materials (radioisotopes). Nuclear medicine imaging is non-invasive and unique, as it offers both integration of structural and functional details of organs. The major fraction of isotopes used in Clinical Nuclear Medicine is produced at BARC, Mumbai and the remaining is imported. Chemicals labelled with very small amounts of isotope, called radiopharmaceuticals are used for diagnosis and treatment.

Different radiopharmaceuticals are used for different tests. The radiopharmaceuticals are injected into the patients, or administered as a capsule, and after few minutes / hours or days the patients are scanned with a special camera that provides images of radiopharmaceutical accumulation in the body. The special types of cameras used are the Gamma camera and PET-CT scanners with computer assistance to provide detailed images about the region of the body imaged.

In therapy for various ailments both malignant and benign, the radiopharmaceuticals go directly to the organ or diseased tissue being treated, and hence this is also termed targeted molecular therapy. Radiation safety methods are ensured during every procedure and the principle of ALARA (as-low- as- reasonably- achievable) radiation exposure is followed at every point.



Diagnostic services in Nuclear Cardiology:

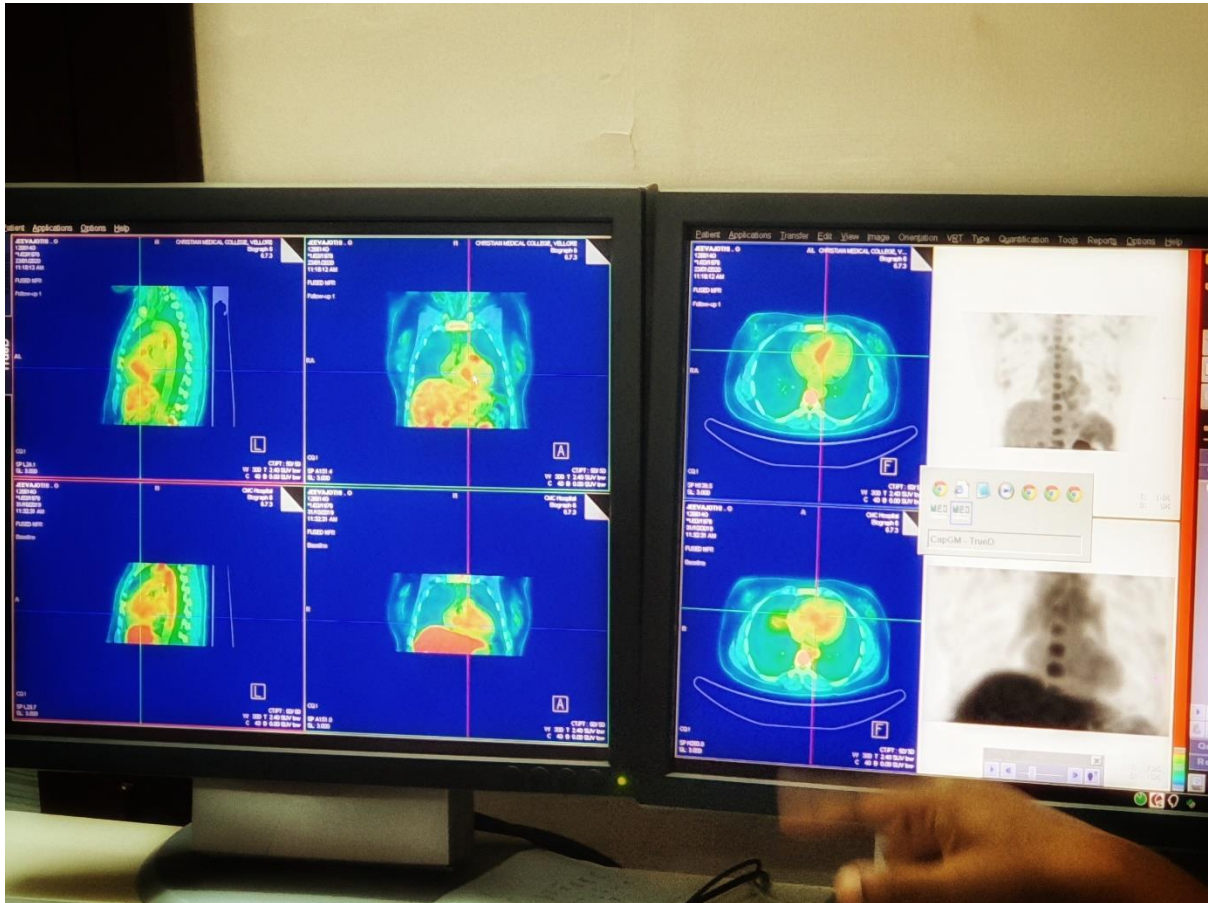
A. Stress /Rest myocardial perfusion SPECT

Radiopharmaceutical: ^{99m}Tc - MIBI (8mCi / 24mCi) ^{99m}Tc - Myoview

Indications:

1. Detect coronary artery disease.
2. Evaluate physiologic significance or sequelae of known or suspected CAD
3. Viability of dysfunctional myocardium

4. Ventricular function (using gated images).
5. Monitor the effects of treatment, including revascularization.
6. Stratify risk



B. Gated RNV/ first pass RNA

Radiopharmaceutical: ^{99m}Tc -labeled RBC.

Indications:

First-pass cardiac scans:

1. Calculate left and right ventricular ejection fractions.
2. Assess wall motion abnormalities.

3. Quantitate left-to-right cardiac shunts.

Gated cardiac blood pool imaging:

1. Focal and global wall motion abnormalities.

2. Ventricular function:

3. Ejection fraction,

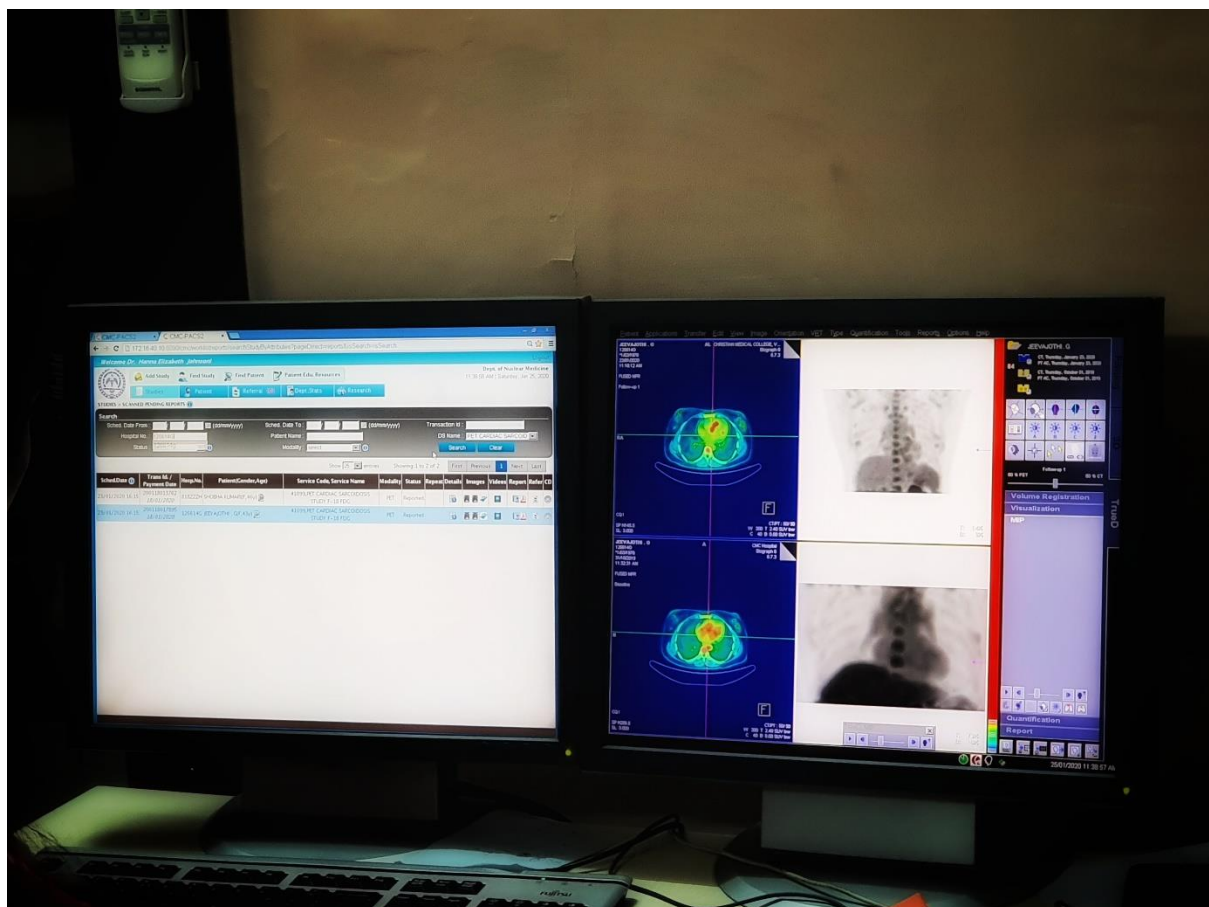
4. Cardiac volumes,

5. Cardiac output,

6. Diastolic function.

7. Cardiotoxic effects of chemotherapy

8. Valvular regurgitation.



C. Cardiac Amyloidosis Study

Radiopharmaceutical: $^{99m}\text{TcTPP}$

Indication:

1. To diagnose and assess the location and extent of cardiac amyloidosis
2. To differentiate between AL and ATTR

D. PET Cardiac Viability

Radiopharmaceutical: ^{18}F FDG & $^{99m}\text{TcMIBI}$

Indication: To identify areas of perfusion-metabolism mismatch, thereby determining the viable myocardium that will benefit from re-vascularisation procedures.

E. PET cardiac sarcoidosis

Radiopharmaceutical: $^{99m}\text{TcMIBI}$ & ^{18}F -FDG

Indications:

1. Patients with histologic evidence of extra CS and abnormal screening for CS
2. Patients with an unexplained, new onset of significant conduction system disease
3. Patients with Idiopathic Sustained Ventricular Tachycardia
4. Patients with proven CS

