

# Clinical advances in nuclear cardiology

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Li D. Clinical advances in nuclear cardiology. *Curr Res Cardiol* 2021;8(2): 1.

## DESCRIPTION

Nuclear cardiology studies use non-invasive techniques to assess myocardial blood flow, assess the pumping function of the heart, and visualize the size and location of a heart attack. Myocardial perfusion imaging is the most widely used nuclear cardiology techniques. Nuclear cardiology has grown significantly in recent years due to developments in hardware, software, and image tracers. Along with these technical developments, the role of functional information provided by nuclear engineering has been increasingly recognized in clinical cardiology to improve patient outcomes. This brief overview discusses the principles of nuclear cardiology and its clinical applications, with an emphasis on the role of Myocardial Perfusion Scan (MPS).

Nuclear cardiology is widely used to measure ventricular function by measuring LVEF, but it has relatively poor spatial and temporal resolution, and preparation and exploration times are relatively long (Although it is used occasionally for research purposes) and a ventricular mass cannot be obtained. The use of gated perfusion Single Photon Emission Computed Tomography (SPECT) has enabled the development of 3-D solutions for global and regional ventricular function and is now widely used, particularly in the United States. For these nuclear cardiology techniques, the need for repeated doses of radionuclides in follow-up studies is problematic, especially for investigations where radiation exposure must be justified in the context of competing technologies and pressure from the general public to limit radiation exposure.

## Nuclear cardiology test

Nuclear cardiology tests measure blood flow to the heart muscle. Doctors use these tests to diagnose and evaluate coronary artery disease and cardiac

ischemia (decreased blood flow and oxygen supply to the heart muscle). These tests are also known as cardiac blood flow imaging tests or cardiac nucleus stress scans.

As one of the few cardiac centers offer two types of nuclear cardiology exams: cardiac SPECT (single photon emission/computed tomography) and cardiac PETCT (positron emission tomography/computerized axial tomography). Both tests begin with an intravenous injection of radioactive chemicals (radionuclides) into the bloodstream. Radionuclides emit gamma rays that are captured by imaging devices including a gamma camera and an attached CT scanner. The resulting image is called a nuclear scan or PET scan, which will help your doctor assess blood flow to the heart muscle and assess how well your heart is working.

Additional images and measurements are taken during cardiac PETCT, including the following: structural (or anatomical) images of the coronary arteries, a level or measurement of calcium deposits in the coronary arteries, a measurement of blood flow to muscle tissue cardiac. This will help your doctor determine if you have disease in more than one of your coronary arteries. During a nuclear stress test, doctors place a radioactive dye called a tracer into a vein, usually in your hand or arm. Several different tracers can be used. The dye travels through the blood vessels to the heart. Imaging scans identify the radioactive dye and use it to develop images of your heart muscle. Scans show how well your heart is.

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**Received date:** September 01, 2021; **Accepted date:** September 15, 2021; **Published date:** September 22, 2021



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