

NM Gated Blood Pool Scan

Consumer Information

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What is a Nuclear Medicine (NM) Gated Blood Pool Scan?

A Nuclear Medicine (NM) Gated Blood Pool Scan is an imaging test which involves labelling the red blood cells in your blood with a radiopharmaceutical and then measuring the amount of blood in the heart during different parts of the heart beat. The images are acquired on a gamma camera. The filling and emptying of the heart chambers can be measured in a NM Gated Blood Pool Scan. It is called a "Blood Pool" scan because it is an analysis of the amount of radioactive blood pooling in the heart chambers at different times of an average cardiac cycle. The scan is termed "Gated" because it is a study that is performed in time with the heart rhythm or heart beat. The data in between 2 heart beats (1 cardiac or heart cycle) are divided into a number of sections, usually 8. The computer "gates" the data sorting it into one of the 8 arbitrary sections of the cardiac cycle, making a very short movie of the heart pumping.

The labelling of the blood with a radioactive agent is usually achieved using one of 3 methods – see Question 3 below. Once this is done the patient's blood will emit ionising radiation in the form of gamma rays (See *Nuclear Medicine*). A gamma camera is then positioned in front of the heart to capture the images from the radioactivity from the blood within the heart chambers. The scan is timed according to the rhythm of the patient's heart. After multiple heartbeats over a few minutes, the data on the amount of radioactive blood entering and exiting the heart chambers during 1 cardiac cycle are collected. By summing together the data on the amount of blood in each chamber of the heart at different periods of the cardiac cycle, a moving picture of the patient's heart beating can then be generated which allows an assessment of the size and function of the heart.

This test is mainly requested by a cardiologist (a specialist heart doctor) or an oncologist (a specialist doctor treating cancer) when administering chemotherapy that may be toxic to the heart.

How do I prepare for an NM Gated Blood Pool Scan?

There are no preparations required for this test. Any metallic accessories, e.g. necklaces, will need to be removed prior to scanning.

However, it is important that you let staff at the hospital or radiology practice where you are having the scan done know if you are (or think you could be) **pregnant** or are **breast feeding**.

This study may not be suitable for pregnant women because of the radiation dose to the growing foetus. Please discuss this with your doctor.

Women who are breastfeeding and people who are the primary or sole carer for small children may need to make special preparations for after the test, to stop breastfeeding for a short time, and to avoid close contact with young children. This is due to the small amount of radioactivity your body may release for a while after the test. Talk to your referring doctor or the nuclear medicine practice where you will have the test for details. The Australian Radiation Protection and Nuclear Safety Agency has [recommendations](#) about breastfeeding and close contact with children after nuclear medicine tests.

What happens during an NM Gated Blood Pool Scan?

Your blood is labelled with a radiopharmaceutical usually with one of the 3 methods described below. The "in vivo" method is the most simple but the "in vitro" method gives slightly better blood labelling. Each technique has its advantages but the end result is similar.

- **The "in vivo" method:** You are given an injection of a small amount of a medication (stannous pyrophosphate) into a vein in your arm to prepare the blood for labelling; this makes it receptive to the radiopharmaceutical. About 15 to 20 minutes later a second medication which is radioactive (^{99m}Tc pertechnetate) is also injected into the vein in your arm. Another 5 minutes later the imaging is performed by positioning a gamma camera in front of the heart.
- **The "in vitro" method:** a cannula or thin plastic tube is inserted into a vein in your arm. The medication that prepares the blood for labelling (stannous pyrophosphate) is then administered via this tubing. About 15 to 20 minutes later about 10 ml of blood is removed through this tubing. The blood is then labelled in the laboratory. About 10 minutes later the patient's labelled blood is injected back through the same tubing.
- **The "in vitro" method:** A cannula or thin plastic tube is inserted into a vein in your arm. A sample of blood is then taken through the tubing for labelling in the laboratory. About 20 minutes later the blood is injected back through the same tubing.

The method of imaging with the gamma camera is no different between the 3 methods of blood labelling.

Before the scan begins, 3 electrocardiogram (or ECG) leads will be placed on your chest and

connected to a heart monitor. This is to time the imaging according to your heart rhythm.

Depending on why you are having the scan, up to 3 or more scans are performed by placing the camera in different positions in front of the heart.

Are there any after effects of an NM Gated Blood Pool Scan?

There should be no side effects associated with the whole process. You will remain radioactive for a short time. The amount of residual radioactivity will reduce quickly with time due to the physical half-life of the isotope and the clearance from the body in urine.

If you are breastfeeding or caring for young children, see the "how do I prepare" section for more information about special precautions you may need to take.

How long does an NM Gated Blood Pool Scan take?

The red cell labelling process will take about 20 to 30 minutes. The scanning will take between 5 - 20 minutes, depending on the number of scans performed.

What are the risks of an NM Gated Blood Pool Scan?

There are no specific risks associated with this study.

The test involves a small dose of radiation from the radiopharmaceutical injected into your vein. See [Radiation risk for medical imaging in adults and children](#).

What are the benefits of an NM Gated Blood Pool Scan?

This is a reliable and accurate method of measuring the performance of the heart. This test is most commonly used by cardiologists on patients with heart disease. Oncologists who administer chemotherapy drugs which have potentially harmful effects on the heart also commonly use this test to monitor the effects of the chemotherapy treatment.

Who does the NM Gated Blood Pool Scan?

The medications involved in the labelling of the blood are usually given by the nuclear medicine technologist or nuclear medicine specialist.

The preparation of the blood in the second method of labelling, the scanning process and the processing of the data are performed by the nuclear medicine technologist. The interpretation of the study is

performed by the nuclear medicine specialist who will also usually explain the test to you beforehand.

Where is an NM Gated Blood Pool Scan done?

This study should be available in most public and private hospitals and private radiology or nuclear medicine practices with nuclear medicine services.

When can I expect the results of my NM Gated Blood Pool Scan?

The time that it takes your doctor to receive a written report on the test or procedure you have had will vary, depending on:

- the urgency with which the result is needed
- the complexity of the examination
- whether more information is needed from your doctor before the examination can be interpreted by the radiologist
- whether you have had previous X-rays or other medical imaging that needs to be compared with this new test or procedure (this is commonly the case if you have a disease or condition that is being followed to assess your progress)
- how the report is conveyed from the practice or hospital to your doctor (in other words, email, fax or mail)

Please feel free to ask the private practice, clinic, or hospital where you are having your test or procedure when your doctor is likely to have the written report.

It is important that you discuss the results with the doctor who referred you, either in person or on the telephone, so that they can explain what the results mean for you.

Please note:

This information is of a general nature only and is not intended as a substitute for medical advice. It is designed to support, not replace, the relationship that exists between a patient and his/her doctor. It is recommended that any specific questions regarding your procedure be discussed with your family doctor or medical specialist

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