

### What is a PET scan?

PET stands for *positron emission tomography*. A PET scan is a type of nuclear imaging test that produces three-dimensional images of the heart. A PET scan can detect whether parts of the heart muscle are still alive and working properly after a heart attack. It can also see if there are blockages in the arteries of the heart or whether there is evidence of a prior heart attack.

During a PET scan, a tiny amount of radioactive material, known as a tracer, is injected into you. The tracer emits a certain type of energy called gamma rays that can be detected by a special camera. Different tracers are used depending on what is being measured. *Rubidium-82* is commonly used when the test is measuring whether your heart receives enough blood and oxygen, and *fluorine-18* is the tracer for tests to determine whether parts of your heart muscle are still alive and working properly.

### Who might have a PET scan?

PET scans are generally used in women with symptoms suggestive of heart disease such as chest pain or shortness of breath, or those at risk for heart disease who had previous abnormal tests such as an ECG. PET scans produce much clearer images of the heart than nuclear stress testing even in women who are obese or who have large breasts. PET imaging is the best test for determining whether damaged heart muscle is still alive in patients with severe damage to the lower left chamber (ventricle) of their heart. PET scans are less widely available than other noninvasive imaging tests such as echocardiography or nuclear tests.

### Who should not have a PET scan?

If you are pregnant or breastfeeding, you should not have any kind of radiation procedure including a PET scan. If you have been diagnosed with inflammation of the heart muscle (myocarditis), recent lung infection, a birth defect causing a pinched or narrow aorta, severe narrowing of the aortic valve, or severe congestive heart failure, you should also not have a

PET scan.

### **How do I prepare for a PET scan?**

You should not smoke, eat, or drink anything for four to six hours before the test. You may be asked to avoid caffeine for up to 24 hours before the test. If you have diabetes, you should discuss dietary concerns for the day of the test with your healthcare provider to control your blood sugar levels. Talk to your doctor about any medications or dietary supplements that you are taking because they may affect the accuracy of the test. You may have to stop taking or reduce the dosage of certain medications before the test.

### **What does a PET scan entail?**

You will strip from the waist up and wear a hospital gown. You will lie on a bed that slides into the scanner – a doughnut-shaped machine with a large hole in the middle. You may feel the needle prick when the intravenous (IV) line is inserted into your arm to administer the tracer. It may take 20 to 40 minutes for the tracer to move through the body and be absorbed by the heart. During this time, you will rest quietly. You will then place your arms above your head and the bed will be moved into the scanner and resting pictures will be taken. The machine is more open than an MRI, but some people may feel claustrophobic or experience discomfort in holding their arms over their head during the scan. The nurse or technician will make sure you are as comfortable as possible. A chemical that mimics the effects of exercise on the heart will then be injected into the IV followed by another injection of tracer. Another set of pictures will be taken. Healthy heart muscle will absorb more of the tracer and show up brighter on the PET scan. Damaged areas of the heart will absorb less of the tracer and will appear fainter. A PET scan takes about 60 to 90 minutes.

### **What happens after a PET scan?**

You can resume your normal routine after the test. You should drink plenty of fluids to flush the tracer from your body. If you had a chemical stress PET, you may experience some minor side effects from the medication including nausea, heart palpitations, numbness in the arms or legs, flushing, chest pain, or headaches. The results should be ready about 3 days later.

### **What does a negative (normal) PET indicate?**

Because PET imaging is not widely available, there are few studies that have followed people over time to see how they fare after a normal test. So far, it seems that women with a negative (normal) PET scan have a similar low risk of having a heart attack or dying from heart disease as women with a normal echo or nuclear stress test.

### **What does a positive (abnormal) PET indicate?**

If your heart is not getting enough blood and oxygen, the PET scan will show a defect in the area of the heart that is affected. This means you are at a higher risk for dying or having a heart attack than someone with a normal scan. The risks increase with larger defects or if you have defects in more than one area of the heart.<sup>1</sup> Your doctor will discuss whether you need to undergo further testing or any procedures. In heart disease patients with severe damage to the left side of their heart, PET scans detect whether the damaged parts of the heart are still alive. If there are still signs of life in the damaged areas of the heart, restoring blood flow through angioplasty or stenting or bypass surgery will reduce your risk of having a heart attack or dying from heart disease.<sup>2</sup> If the tissue is dead, then there is no point in undergoing an unnecessary procedure.

### **Are PET scans accurate in women?**

PET scans produce a better quality picture of the heart than regular nuclear stress tests even in women who are obese or have large breasts. PET imaging appears to be equally accurate in men and women.

### **Does a PET scan have any risks or limitations?**

PET imaging cannot be combined with exercise stress, but it may be done in combination with chemicals that mimic the effects of exercise on the heart. PET scans require technical

expertise, so the results may vary depending on who performed the test. PET scans involve some exposure to radiation. The amount of radiation you are exposed to during cardiac diagnostic tests is considered safe. The benefits of the test far outweigh any potential risks, and the technicians are trained to minimize your radiation exposure. For information on radiation safety, see [National Institutes for Health Radiation Fact Sheet](#) .

### References

1. Marwick TH, Shan K, Patel S, Go RT, Lauer MS. Incremental value of rubidium-82 positron emission tomography for prognostic assessment of known or suspected coronary artery disease. *Am J Cardiol.* Oct 1 1997;80(7):865-870.
2. Rohatgi R, Epstein S, Henriquez J, et al. Utility of positron emission tomography in predicting cardiac events and survival in patients with coronary artery disease and severe left ventricular dysfunction. *Am J Cardiol.* May 1 2001;87(9):1096-1099, A1096.

[SEO](#) by [AceSEF](#)