HEALTH BASICS

PET medications

PET medications are radioactive tracers and supporting drugs used to create specific medical images.

WHAT IT IS
Radioactive tracers and supporting drugs used during PET imaging

WHERE IT COMES UP
Before or during a PET or PET/CT scan

WHY IT MATTERS
Helps images show metabolism, receptors, or blood flow

WHAT IT IS NOT
Not a disease or diagnosis

WHO TO ASK
Nuclear medicine or radiology team

HOW IT IS CHECKED
PET images, often combined with CT or MRI

Overview

PET stands for positron emission tomography . It is an imaging test that maps activity inside your body. A PET scan requires a prescription radioactive substance called a radiopharmaceutical , often described as a tracer.

The tracer is usually injected into a vein. Some tracers may be swallowed or inhaled. The scanner detects energy released as the tracer breaks down. A computer then creates images showing where the tracer collected.

Different tracers answer different medical questions. For example, they may show glucose use, blood flow, abnormal protein deposits, or certain receptors on cells. Common examples include:

"PET medications" can also mean nonradioactive drugs used to support the scan. During some heart PET studies, for example, a medicine such as regadenoson increases blood flow to simulate the effect of exercise.

These substances help produce images. They are not a disease, and receiving one does not by itself mean that you have a particular diagnosis.

- Fludeoxyglucose F 18, usually called FDG, which follows glucose use
- Piflufolastat F 18, which targets prostate-specific membrane antigen
- Gallium Ga 68 dotatate, which targets somatostatin receptors
- Florbetapir F 18, which binds to amyloid deposits in the brain
- Rubidium Rb 82 or nitrogen N 13 ammonia for heart blood-flow imaging

How it works

PET tracers contain a small amount of a radioactive form of an element. This radioactive part releases particles called positrons . When positrons meet electrons in the body, they produce energy that the scanner detects.

The tracer is attached to, or acts like, a substance used by the body. FDG is similar to glucose. Tissues that use more glucose may take up more FDG and appear more active on the scan.

Higher uptake does not always mean cancer or another disease. Normal organs can take up a tracer, and infection, inflammation, healing tissue, exercise, or recent medical treatment can also affect the image.

Other tracers work by attaching to a particular target. A PSMA tracer, for example, attaches to a protein often found in prostate cancer cells. A positive area still needs to be interpreted alongside your medical history and other test results.

PET is often combined with computed tomography, called PET/CT , or magnetic resonance imaging, called PET/MRI . CT or MRI provides detailed pictures of body structures, while PET shows biological activity.

A CT contrast agent or MRI contrast agent may be given separately. It is not the PET tracer and has its own benefits, preparation instructions, and risks.

PET tracers lose radioactivity over time. Your body also removes many tracers through urine. The imaging service may give you short-term instructions about drinking fluids, using the toilet, or limiting close contact with certain people.

Why it matters for your health

The chosen medication determines what a PET scan can show. A tracer suitable for one question may not provide useful information about another.

PET imaging may help clinicians:

The scan is only one part of an assessment. PET findings are compared with symptoms, examination findings, laboratory tests, previous images, and sometimes biopsy results.

Preparation can affect image quality. With an FDG scan, food, exercise, blood glucose, and insulin can change where the tracer collects. Heart stress studies may be affected by caffeine or certain medicines. Preparation for other tracers may be different.

For this reason, instructions from one type of PET scan should not be applied to another. The imaging service should tell you what to eat or drink and whether any medication timing needs to change.

- Find areas that need closer assessment
- Determine how far a diagnosed cancer has spread
- Check how a condition responds to treatment
- Assess blood flow or metabolism in the heart
- Study patterns of brain activity or protein deposits
- Plan surgery, radiation therapy, or another procedure

What can go wrong

A PET medication can sometimes produce an unclear or misleading image. This does not necessarily mean that the equipment or tracer failed.

False-positive and false-negative findings can occur. A false positive looks abnormal even though the suspected condition is not present. A false negative misses activity that is present. Inflammation, infection, small areas of disease, blood glucose levels, movement, and recent surgery or treatment can contribute.

Injection infiltration , also called extravasation, happens when some tracer enters tissue around the vein instead of staying in the bloodstream. This may cause soreness and can affect how the scan is interpreted. Tell the imaging team if the injection site becomes painful, swollen, or wet.

Medication or preparation problems can reduce image quality. Taking insulin at an unsuitable time before an FDG scan, exercising shortly beforehand, or having caffeine before certain heart scans may interfere with the intended result. Do not stop prescribed medicine unless the imaging service gives you specific instructions.

Reactions to the PET tracer or another injected substance can occur. A reaction may involve rash, itching, swelling, dizziness, or breathing difficulty. PET/CT contrast, PET/MRI contrast,

and heart stress medicines can cause reactions separate from the radioactive tracer.

Heart stress medicines can cause flushing, headache, shortness of breath, dizziness, or chest discomfort during the test. You are monitored while these medicines are working.

PET uses ionizing radiation. The amount and type of exposure depend on the tracer and whether CT imaging is also performed. Pregnancy and breastfeeding may change whether the test proceeds, how it is performed, or what instructions are needed afterward.

Tell staff immediately if you develop chest pain, severe breathing difficulty, facial or throat swelling, or feel as though you may collapse. If these symptoms begin after you leave, seek emergency help. Mild or lasting soreness at an injection site can usually be discussed with the imaging service through routine follow-up.

What you can do

Before the appointment, find out the exact type of PET scan and tracer planned. The appointment letter or imaging service may provide this information.

Useful steps include:

Do not change medication timing based only on general internet advice. If a medicine must be paused, the imaging service should explain which medicine, when to stop it, and when to restart it.

There is no home test that checks whether a PET medication worked. The radiologist or nuclear medicine physician assesses the images. Your referring clinician then discusses what the report means in the context of your care.

Contact the service routinely if instructions are unclear, you took something you were told to avoid, or you cannot follow the fasting plan safely. It may be possible to adjust the preparation or appointment rather than canceling without advice.

- Give the team a current list of medicines, supplements, and allergies
- Ask whether you need to fast or avoid caffeine or exercise
- Ask specifically how to manage diabetes medicines and insulin
- Mention pregnancy, possible pregnancy, or breastfeeding before receiving anything
- Report recent infections, vaccinations, surgery, chemotherapy, or radiation treatment
- Follow instructions about fluids, toilet use, and contact with others
- Keep the tracer name and scan date in your health record

Common questions

Is the PET tracer a treatment?

Usually not. The tracers used for diagnostic PET imaging are intended to create images, not treat a condition. Some radioactive medicines are used as treatments, but these are separate procedures with different doses and safety instructions.

Will the tracer make me feel radioactive?

You cannot feel radioactivity. The tracer's activity decreases naturally, and your body removes part of it. Follow the service's instructions about fluids and temporary contact precautions.

Can I take my usual medicines before the scan?

Many medicines can be continued, but the answer depends on the tracer, the reason for the scan, and your health conditions. Ask for instructions specific to your appointment. Never stop insulin, heart medicine, seizure medicine, or another important treatment without a clear plan.

Why is my blood glucose checked before an FDG scan?

Glucose and FDG compete for uptake into tissues. A high blood glucose level may make the scan harder to interpret. The team may check it before giving FDG and decide whether the scan can proceed.

Does an abnormal PET result confirm a diagnosis?

Not by itself. Tracer uptake can have several causes. The result must be interpreted with the rest of your medical information, and further imaging or a biopsy may sometimes be needed.

Can I be around children after the scan?

The imaging service may recommend temporarily limiting close or prolonged contact with young children or pregnant people. The instructions depend on the tracer and local radiation-safety procedures.

Sources

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- U.S. Food and Drug Administration. PYLARIFY (piflufolastat F 18) Injection: Prescribing Information

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- U.S. Food and Drug Administration. AMYVID (Florbetapir F 18 Injection): Prescribing Information
- U.S. Food and Drug Administration. LEXISCAN (Regadenoson Injection): Prescribing Information