TEST

Lung gallium scan

A lung gallium scan uses a radioactive tracer to find inflammation, infection, or certain cancers in the chest.

WHAT IT MEASURES
Radioactive gallium uptake in lung and other body tissues

SAMPLE
None; nuclear medicine imaging

FASTING NEEDED?
No, unless your imaging centre gives different instructions

HOW LONG IT TAKES
Injection plus scans over two to four days

RESULTS IN
Usually 1-3 days after final scan; centre turnaround varies

USED FOR
Diagnosing and monitoring selected infections, inflammation, and cancers

MAIN LIMITATION
Gallium uptake is nonspecific and cannot confirm the cause

Overview

A lung gallium scan is a nuclear medicine imaging test. It uses a small amount of radioactive gallium-67, called a tracer, to look for areas of unusual activity in the lungs and elsewhere in the body.

The tracer is injected into a vein. It travels through your bloodstream and can collect in areas with active inflammation, infection, or some types of cancer. A special camera detects the radiation released by the tracer and creates images.

The test is sometimes called gallium-67 scintigraphy. Although the request may be for a "lung" scan, imaging often covers much of the body. This helps the specialist compare the lungs with other tissues and look for activity in more than one place.

Gallium scanning is now used less often than in the past. CT, PET/CT, MRI, or scans using labelled white blood cells may provide clearer or more specific information in some situations.

Why the test is ordered

A lung gallium scan may help investigate unexplained inflammation or infection in the chest. It may also be used to assess certain cancers, particularly some lymphomas, when a more suitable test is unavailable or cannot be performed.

Possible reasons include:

The scan does not identify a particular germ or prove that an abnormal area is cancer. Its findings must be considered alongside your symptoms, examination, blood tests, cultures, and other imaging.

- Looking for active inflammation in conditions such as sarcoidosis
- Investigating a suspected infection when other results are unclear
- Assessing some inflammatory lung diseases
- Checking how selected lymphomas respond to treatment
- Looking for active disease in several parts of the body

Who should have the test

This test is usually reserved for situations in which the result could help answer a specific medical question. It is not a routine screening test for people without symptoms or known risk factors.

Your care team may consider it when another scan has not explained a lung abnormality, when inflammation or infection is suspected, or when gallium imaging is useful for monitoring a known condition.

Tell the nuclear medicine department before the injection if you are pregnant, might be pregnant, or are breastfeeding. Radiation can reach a developing baby, and gallium can enter breast milk. The department will decide whether to postpone the scan, use another test, or give specific breastfeeding instructions.

Children can have gallium scans when needed. The amount of tracer is adjusted according to the child's size and the clinical question.

How to prepare

Most people can eat and drink normally. Follow the instructions from your imaging centre because preparation can change according to which parts of the body will be scanned.

Tell the department about:

Gallium normally moves into the bowel over time. Bowel activity can hide nearby structures, so you may be asked to take a laxative or have an enema before later images, especially when the abdomen or pelvis will be examined. Do not take extra bowel medicines unless the department instructs you to do so.

Wear comfortable clothing and leave jewellery or other metal objects at home when possible. Metal over the chest can interfere with the images.

- Pregnancy or the possibility of pregnancy
- Breastfeeding
- Medicines, supplements, and recent cancer treatments
- Recent surgery, biopsy, infection, or radiotherapy
- Other recent nuclear medicine tests
- Constipation or difficulty using laxatives

What happens during the test

At the first appointment, a healthcare professional injects gallium-67 into a vein, usually in your arm or hand. The injection itself takes only a few minutes. You can generally leave shortly afterward.

Gallium needs time to collect in body tissues. Your first images are commonly taken about 24 hours after the injection. Further images may be needed at 48 to 72 hours, and occasionally later. Your exact schedule may be different.

During imaging, you lie still on a table while a gamma camera records where the tracer has collected. The camera may pass close to your body, but it does not touch you. A whole-body scan commonly takes about 30 to 60 minutes.

Some centres also perform SPECT/CT. SPECT creates three-dimensional tracer images, while CT provides detailed pictures of the body's structures. The combined images can help show exactly where an area of uptake is located.

The scan should not hurt, although lying still may be uncomfortable. Tell the technologist if you have pain, breathing difficulty, or claustrophobia so they can help you remain comfortable.

Understanding your results

A nuclear medicine specialist examines the pattern and intensity of gallium uptake. Some uptake is expected in organs such as the liver, spleen, bone marrow, and salivary glands. Gallium also moves into the bowel as time passes.

Healthy lungs usually show little gallium uptake. Increased uptake may mean that inflammatory cells are active in part or all of the lungs. However, the image alone often cannot show why this is happening.

Results may describe uptake as focal, meaning concentrated in one area, or diffuse, meaning spread through a larger area. The report may also compare the findings with earlier scans or with CT images.

There is no single numerical reference range for a lung gallium scan. Interpretation varies with the imaging equipment, timing, laboratory or imaging-centre methods, age, sex, pregnancy status, medicines, and clinical context.

What affects the results

Several factors can change where gallium appears without a laboratory or imaging error.

Normal bowel activity is a major issue. Gallium enters the bowel after the injection and may overlap with structures in the lower chest or abdomen. Constipation can make this activity more prominent.

The timing of the images also matters. A finding that is unclear after 24 hours may become easier to identify on delayed imaging. Images taken too early may contain more activity in the bloodstream and soft tissues.

Other influences include:

Do not stop prescribed medicines to improve the scan. Tell the department what you take and when treatment started.

- Recent surgery, biopsy, radiotherapy, or injury causing local inflammation
- Infection or inflammation elsewhere in the body
- Cancer treatment, corticosteroids like prednisone or hydrocortisone , antibiotics like amoxicillin or doxycycline , or other treatments changing disease activity
- Movement during the scan, which can blur small areas
- Metal objects over the chest
- Reduced kidney function, which can alter early tracer clearance

- A recent nuclear medicine study leaving another tracer in the body

Accuracy and limitations

Gallium uptake is not specific to one disease. Infection, non-infectious inflammation, healing tissue, and some cancers can all produce increased uptake. This means the scan can show an abnormal area when the suspected condition is not actually present.

The test can also miss disease. Small abnormalities may be below the camera's resolution. Some infections and tumours take up little gallium, while treatment started before the scan may reduce uptake. Activity in the heart, liver, breast tissue, bowel, or bone marrow can hide nearby findings.

How often the scan correctly finds or excludes disease varies greatly with the condition being investigated, the timing of the images, and whether SPECT/CT is used. There is no single accuracy figure that applies to every lung gallium scan.

A chest CT is usually better for showing detailed lung structure. FDG PET/CT often provides clearer imaging for many cancers and some inflammatory conditions. A labelled white blood cell scan may be more useful for certain infections. Cultures or a biopsy may be needed to identify a specific organism or determine exactly what abnormal tissue represents.

Risks and complications

The injection may cause a small bruise, tenderness, or brief bleeding. Some people feel faint during blood draws or injections.

Gallium-67 exposes you to ionising radiation. The tracer remains in the body for several days, but the amount of radiation falls over time as it decays and leaves through urine and stool. Drinking fluids and urinating regularly may help clear it, if you have not been told to restrict fluids.

Allergic reactions are rare. Seek emergency help for trouble breathing, swelling of the face or throat, or a widespread rapidly developing rash after the injection.

Contact the imaging department promptly if increasing pain, redness, or swelling develops around the injection site. This is not usually an emergency, but it should be assessed.

Follow any instructions about close contact with pregnant people or young children. Breastfeeding precautions are specific to the tracer and dose, so use the written instructions from the nuclear medicine department.

What happens next

A nuclear medicine specialist sends a report to the healthcare professional who requested the test. Routine follow-up may involve discussing whether the scan was normal, comparing it with CT or previous images, or deciding whether more testing is needed.

An abnormal scan does not by itself establish a diagnosis. Depending on the findings, the next step might be blood tests, sputum testing, CT, PET/CT, bronchoscopy, or biopsy. Sometimes no further test is needed if the gallium findings fit well with information already available.

Do not wait for a routine results appointment if you develop severe breathing difficulty, blue or grey lips, new confusion, or severe chest pain. These symptoms require urgent or emergency assessment regardless of the scan result.

Common questions

Can I drink coffee before a lung gallium scan?

Usually, yes. Fasting is not normally required, so coffee is generally allowed unless your imaging centre has given different instructions. Follow any fluid restrictions you already have for a heart or kidney condition.

Does the time of day matter?

The exact clock time matters less than the number of hours since the injection. Attend each appointment at the scheduled time because the distribution of gallium changes over several days.

Can I exercise beforehand?

Ordinary activity is unlikely to affect the scan substantially. Avoiding strenuous exercise may be sensible if it worsens your symptoms, but gallium scanning does not usually require the exercise restrictions used for some PET scans.

Will I be radioactive afterward?

A small amount of radiation remains in your body for several days. It decreases naturally and as the tracer leaves your body. The department may give temporary precautions for close contact, travel, or breastfeeding.

Can I drive after the scan?

Most people can drive after the injection and imaging. If you receive medicine for anxiety or discomfort, arrange transport and follow the department's instructions.

Why do I need to return more than once?

Gallium takes time to collect in abnormal tissue and to clear from the bloodstream. Later images may separate true tissue uptake from normal background or bowel activity.

Sources

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