CA9 PET imaging: **WHAT YOU NEED TO KNOW**

Your guide to noninvasive identification of **clear cell renal cell carcinoma**

Learn how PET imaging may classify clear cell renal cell carcinoma and provide valuable information to guide treatment decisions.

CA9, carbonic anhydrase 9; PET, positron emission tomography.

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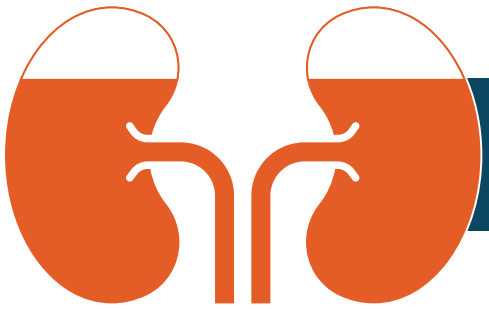
Kidney tumors: from discovery to identification

What are kidney tumors?

A kidney tumor or mass is an abnormal growth which may or may not be cancerous.[1]

Doctors do not typically search for kidney tumors unless symptoms are present. Instead, tumors are often discovered "by chance" during medical imaging for an unrelated health concern.[2]



Up to 75% of cancerous, solid kidney tumors are diagnosed as clear cell renal cell carcinoma (ccRCC).[3]

How are kidney tumors identified?

While CT (computed tomography) and MRI (magnetic resonance imaging) are commonly used in kidney imaging, neither can determine whether a tumor is cancerous or noncancerous. Additionally, they cannot reliably distinguish between ccRCC and other kinds of kidney cancer.[2,4]

What is a CA9 PET scan?

CA9 (carbonic anhydrase 9, pronounced *kar-bon-ik an-hi-drase 9*), also known as CAIX, is a protein that is almost always found in ccRCC. It is generally not found in normal, healthy tissue.[5]

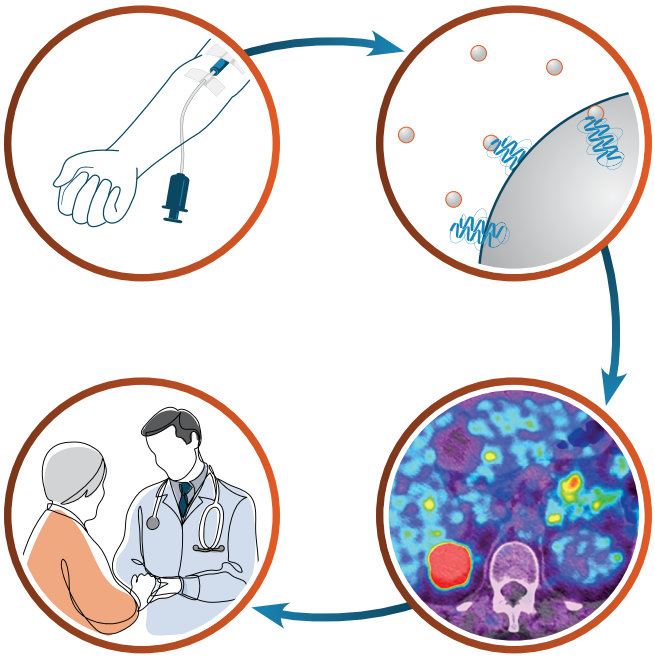
PET (positron emission tomography, pronounced *pah-zuh-tron e-mih-shun tuh-mah-gruh-fee*) imaging uses radioactive tracers which allow doctors to see small, specific details in the body.[6]

Detecting the CA9 protein can help accurately identify kidney tumors as ccRCC and find out if it has spread to other parts of the body.[7]

How CA9 PET scans work

Overview[8]

The tracer is injected into a vein and **travels through the bloodstream**



If the CA9 protein is present in the body, **the tracer will attach to it**

During the test, the tracer emits a signal that is detected by the PET scanner and results in images being created. These images will show **if the tracer has collected anywhere in the body**, which can indicate the presence of **ccRCC**

The images can be used by your care team to diagnose ccRCC and **create a treatment plan**, if necessary

How do CA9 PET scans detect ccRCC?

The tracer used in CA9 PET scans is called girentuximab (pronounced *jeer-en-tux-ih-mab*). It specifically targets the CA9 protein and helps visualize its presence in the body.[7]

Locating CA9 with a PET scan can help[7]:

- Provide new information that may help your medical team make a diagnosis
- Identify ccRCC throughout the body
- Help guide treatment decisions or spare unnecessary operations or biopsy

As part of your diagnosis and treatment plan, you may still undergo other forms of imaging, such as:

- CT: Uses x-rays to show size and shape of organs and is often used to see if tumors have grown, spread, or returned[9]
- MRI: Uses radio waves and strong magnets to create images of soft tissue, including tumors[10]
- Bone scan: Uses an imaging tracer to locate cancer that has spread to the bones[11]

Girentuximab (the tracer used for CA9 PET scans) has been used for the past 20 years in many clinical studies and is well researched. Clinical studies show that girentuximab is well tolerated with an acceptable safety profile.[12,13]

What to expect before a CA9 PET scan

A CA9 PET scan will require **2 separate visits** to your center. On your first visit, you will be given the tracer. On your second visit (about 5 days later), the PET scan will be performed.[7,14]

When you arrive for your appointment, your care team will prepare you for your scan. Below are some of the steps you can expect during your visit.

Before the tracer is given

Your health care team will give you specific instructions on how to prepare for your scan. Generally, you should avoid strenuous exercise prior to the scan.[8]

It is important to stay well hydrated before and after your injection. Drink ample amounts of water throughout the day to encourage frequent urination.[8]

Tracer administration

The tracer will be slowly injected into a vein[15]

- After the injection, you will need to rest in a chair[8]
- You will be asked to wait about 1 hour for the tracer to make its way through your body[8]

After receiving the CA9 PET tracer

Once the tracer has been injected, your body will have some radioactivity.[16] Your care team will give you instructions for your safety and the safety of others. It is important to strictly follow the guidance that your care team provides.

Things you SHOULD do for 1 week following tracer administration*	
✔	Avoid crowded public places
✔	Observe rigorous bathroom hygiene
✔	Limit contact (within 3 ft) with others
✔	Limit contact with pregnant women and children

Things you SHOULD NOT do for 1 week following tracer administration*	
✘	Sleep in the same bed as your partner
✘	Take new medication without consulting your doctor

Increase your fluid intake and urinate frequently for 1 day following the injection.

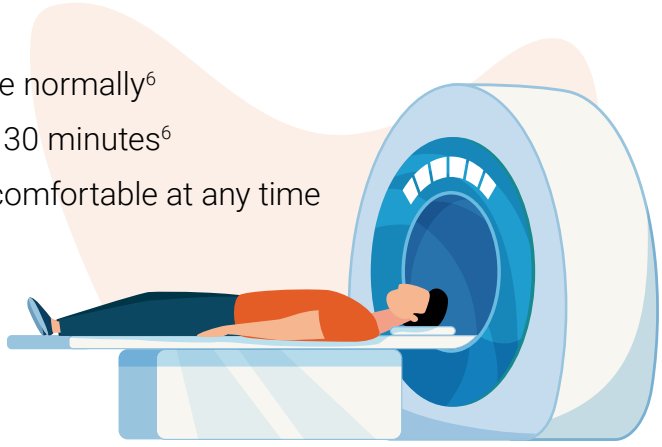
*This checklist is for general reference and should not be considered comprehensive.

You will receive additional, more specific guidelines from your care team on appropriate care for yourself and those around you prior to leaving the hospital or clinic. These instructions must be followed for 1 week after the injection.

During the PET/CT scan

About 5 days after the tracer injection, you will return for the PET/CT scan.[7]

- You will be asked to lie down for the scan[6]
- You will be asked to lie still for the scan and breathe normally[6]
- Scanning time may vary, but it usually takes about 30 minutes[6]
- Please tell your care team if you feel anxious or uncomfortable at any time



Answers to frequently asked questions

What do I need to tell my doctor before I receive the tracer?

You will receive specific instructions from your care team before you are given the tracer. However, there is some general information you should discuss with your doctor prior to this, including:

- Your medical history, especially if you have had kidney problems[16]
- If you are breastfeeding, pregnant, or think you might be pregnant[8]
- If you take any medications or have any allergies[8]
- If you are prone to claustrophobia, as PET scans could trigger symptoms[8]

Are there any side effects?

All tracers can have side effects, some of which may need medical attention.

Tell your doctor if you notice anything that may be making you feel unwell, or:

- If you are using or going to use other medicines (even if these are homeopathic medicines, dietary supplements, and/or vitamins)
- If you are admitted or treated in a hospital
- If you suddenly have concerns about your health

In the event of a reaction, call 911 or visit your nearest Emergency Room immediately.

To report an adverse reaction please **visit MedWatch at www.fda.gov/medwatch or call 1-800-FDA-1088**. You may also report adverse reactions to Telix Pharmaceuticals (US) Inc. by calling 1-844-455-8638 or emailing pharmacovigilance@telixpharma.com.

Find support for you and your loved ones

Support groups and organizations can help people navigate their diagnosis and treatment journeys. Support is often available for caregivers as well. Visit these organizations for information and assistance.

American Cancer Society
1-800-227-2345
www.cancer.org

ClinicalTrials.gov
Email: register@clinicaltrials.gov
www.clinicaltrials.gov

Cancer*Care*
1-800-813-4673
Email: info@cancercare.org
www.cancercare.org

National Comprehensive Cancer Network
1-215-690-0300
Email: cupo@nccn.org
www.nccn.org

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CA9 PET scans can help accurately identify kidney tumors as ccRCC

You may have many important questions about kidney masses or clear cell renal cell carcinoma (ccRCC).

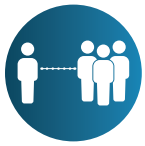
Get helpful resources today.

Kidney tumors or masses are abnormal growths which may or may not be cancerous.[1]

A **CA9 PET** scan can determine if your kidney tumor is **ccRCC**. It uses a special PET scanning technology called a tracer to detect the CA9 protein.[6]

If the kidney tumor has the CA9 protein, it will likely be diagnosed as ccRCC.[7]

Getting a CA9 PET scan takes a few days. The tracer is slowly injected into a vein at a hospital or clinic.[15] Then you will return a few days later for the PET scan.[7,14] This usually takes about 30 minutes.[6]



Once the tracer has been injected, your body will have some radioactivity. For your safety and the safety of others, **avoid public places and close contact with other people for 1 week following the injection**.

Your care team will help explain the test results and any next steps. **Tell them if you feel anxious, uncomfortable, or have any health concerns.**

References: 1. Cleveland Clinic. Kidney tumor. Accessed February 21, 2025. https://my.clevelandclinic.org/health/diseases/24321-kidney-tumor **2.** Cleveland Clinic. Clear cell renal cell carcinoma. Accessed February 21, 2025. https://my.clevelandclinic.org/health/diseases/22273-clear-cell-renal-cell-carcinoma **3.** Metin M, Aydın H, Karaoğlanoğlu M. Renal cell carcinoma or oncocytoma? The contribution of diffusion-weighted magnetic resonance imaging to the differential diagnosis of renal masses. *Medicina (Kaunas).* 2022;58(2):221. **4.** Cleveland Clinic. Renal cell carcinoma. Accessed February 21, 2025. https://my.clevelandclinic.org/health/diseases/24906-renal-cell-carcinoma **5.** Stillebroer AB, Mulders PFA, Boerman OC, Oyen WJG, Oosterwijk E. Carbonic anhydrase IX in renal cell carcinoma: implications for prognosis, diagnosis, and therapy. *Eur Urol.* 2010;58(1):75-83. **6.** Mayo Clinic. Positron emission tomography scan. Accessed February 21, 2025. https://www.mayoclinic.org/tests-procedures/pet-scan/about/pac-20385078 **7.** Hekman MCH, Rijpkema M, Aarntzen EH, et al. Positron emission tomography/computed tomography with ^{89}Zr-girentuximab can aid in diagnostic dilemmas of clear cell renal cell carcinoma suspicion. *Eur Urol.* 2018;74(3):257-260. **8.** Cleveland Clinic. PET scan. Accessed February 21, 2025. https://my.clevelandclinic.org/health/diagnostics/10123-pet-scan **9.** Mayo Clinic. CT scan. Accessed February 21, 2025. https://www.mayoclinic.org/tests-procedures/ct-scan/about/pac-20393675 **10.** Mayo Clinic. MRI. Accessed February 21, 2025. https://www.mayoclinic.org/tests-procedures/mri/about/pac-20384768 **11.** Mayo Clinic. Bone scan. Accessed February 21, 2025. https://www.mayoclinic.org/tests-procedures/bone-scan/about/pac-20393136 **12.** Divgi CR, Bander NH, Scott AM, et al. Phase I/II radioimmunotherapy trial with iodine-131-labeled monoclonal antibody G250 in metastatic renal cell carcinoma. *Clin Cancer Res.* 1998;4(11):2729-2739. **13.** Brouwers AH, Buijs WCAM, Mulders PFA, et al. Radioimmunotherapy with [^{131}I]cG250 in patients with metastasized renal cell cancer: dosimetric analysis and immunologic response. *Clin Cancer Res.* 2005;11(19 suppl):7178s-7186s. **14.** Chen K-T, Seimbille Y. New developments in carbonic anhydrase IX-targeted fluorescence and nuclear imaging agents. *Int J Mol Sci.* 2022;23(11):6125. **15.** Johns Hopkins Medicine. Positron emission tomography (PET). Accessed February 21, 2025. https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/positron-emission-tomography-pet **16.** Calais J, Eulau SM, Gardner L, et al. Incorporating radioligand therapy in clinical practice in the United States for patients with prostate cancer. *Cancer Treat Rev.* 2023;115:102524.

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