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# Kidney Cancer Treatment

If you've been diagnosed with kidney cancer, your cancer care team will discuss your treatment options with you. Think carefully about each of your choices. You will want to weigh the benefits of each treatment option against the possible risks and side effects.

## Local treatments

*Local therapies* treat the tumor without affecting the rest of the body. They are more likely to be useful for earlier stage (less advanced) cancers, although they might also be used in some other situations.

- [Surgery for Kidney Cancer](#)
- [Ablation and Other Local Therapy for Kidney Cancer](#)
- [Active Surveillance for Kidney Cancer](#)
- [Radiation Therapy for Kidney Cancer](#)

## Systemic treatments

Kidney cancer can also be treated using drugs, which can be given by mouth or directly into the bloodstream. These are called *systemic therapies* because they can reach cancer cells almost anywhere in the body. Depending on the type of kidney cancer, several different types of drugs might be used.

- [Targeted Drug Therapy for Kidney Cancer](#)
- [Immunotherapy for Kidney Cancer](#)
- [Chemotherapy for Kidney Cancer](#)

## Common treatment approaches

Depending on the [stage of the cancer](#) and other factors, different types of treatment may be combined at the same time or used after one another. Some of these treatments can also be used as palliative treatment when all the cancer cannot be removed. [Palliative treatment](#) is meant to relieve symptoms, such as pain, but it is not expected to cure the cancer.

- [Treatment of Kidney Cancer by Stage](#)

## Who treats kidney cancer?

Doctors on your cancer treatment team might include:

- A **urologist**: a doctor who specializes in treating diseases of the urinary system (and male reproductive system)
- A **radiation oncologist**: a doctor who treats cancer with radiation therapy
- A **medical oncologist**: a doctor who treats cancer with medicines such as chemotherapy, targeted therapy, or immunotherapy

You might have many other specialists on your treatment team as well, including physician assistants (PAs), nurse practitioners (NPs), nurses, psychologists, nutritionists, social workers, and other health professionals.

- [Health Professionals Associated with Cancer Care](#)

## Making treatment decisions

It's important to discuss all treatment options, including their goals and possible side effects, with your doctors to help make the decision that best fits your needs. You may feel that you need to make a decision quickly, but it's important to give yourself time to absorb the information you have learned. Ask your cancer care team questions.

If time permits, it is often a good idea to seek a second opinion. A second opinion can give you more information and help you feel more confident about the treatment plan you choose.

- [Questions to Ask About Kidney Cancer](#)
- [Seeking a Second Opinion](#)

## Thinking about taking part in a clinical trial

Clinical trials are carefully controlled research studies that are done to get a closer look at promising new treatments or procedures. Clinical trials are one way to get state-of-the-art cancer treatment. In some cases they may be the only way to get access to newer treatments. They are also the best way for doctors to learn better methods to treat cancer. Still, they're not right for everyone.

If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials.

- [Clinical Trials](#)

### **Considering complementary and alternative methods**

You may hear about alternative or complementary methods that your doctor hasn't mentioned to treat your cancer or relieve symptoms. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

Complementary methods refer to treatments that are used along with your regular medical care. Alternative treatments are used instead of a doctor's medical treatment. Although some of these methods might be helpful in relieving symptoms or helping you feel better, many have not been proven to work. Some might even be harmful.

Be sure to talk to your cancer care team about any method you are thinking about using. They can help you learn what is known (or not known) about the method, which can help you make an informed decision.

- [Complementary and Integrative Medicine](#)

### **Help getting through cancer treatment**

People with cancer need support and information, no matter what part of their journey they may be on. Knowing all of your options and finding the resources you need will help you make informed decisions about your care.

Whether you are thinking about treatment, getting treatment, or not being treated at all, you can still get supportive care to help with pain or other symptoms. Communicating with your cancer care team is important so you understand your diagnosis, what treatment is recommended, and ways to maintain or improve your quality of life.

Different types of programs and support services may be helpful, and can be an

important part of your care. These might include nursing or social work services, financial aid, nutritional advice, rehab, or spiritual help.

The American Cancer Society also has programs and services – including rides to treatment, lodging, and more – to help you get through treatment. Call our National Cancer Information Center at 1-800-227-2345 and speak with one of our caring, trained cancer helpline specialists.

- [Palliative Care](#)
- [Programs & Services](#)

### **Choosing to stop treatment or choosing no treatment at all**

For some people, when treatments have been tried and are no longer controlling the cancer, it could be time to weigh the benefits and risks of continuing to try new treatments. Whether or not you continue treatment, there are still things you can do to help maintain or improve your quality of life.

Some people, especially if the cancer is advanced, might not want to be treated at all. There are many reasons you might decide not to get cancer treatment, but it's important to talk to your doctors as you make that decision. Remember that even if you choose not to treat the cancer, you can still get supportive care to help with pain or other symptoms.

- [If Cancer Treatments Stop Working](#)

*The treatment information given here is not official policy of the American Cancer Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor. Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask your cancer care team any questions you may have about your treatment options.*

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## **Surgery for Kidney Cancer**

- [Radical nephrectomy](#)

- [Partial nephrectomy \(nephron-sparing surgery\)](#)
- [Regional lymphadenectomy \(lymph node dissection\)](#)
- [Removal of an adrenal gland \(adrenalectomy\)](#)
- [Removal of metastases](#)
- [Risks and side effects of surgery](#)
- [More information about Surgery](#)

Surgery is the main treatment for most kidney cancers and many times it can cure the cancer by itself.

Depending on the stage and location of the cancer and other factors, surgery might be done to remove the entire kidney including the tumor (known as a **radical nephrectomy**) or the cancer alone along with some of the surrounding kidney tissue (known as a **partial nephrectomy**). Sometimes, the adrenal gland (the small organ that sits on top of each kidney) and fatty tissue around the kidney is removed as well. In certain cases, the nearby lymph nodes might also be removed.

Some people whose cancer has spread to other organs may benefit from surgery that takes out the kidney tumor. Removing the kidney might also lessen symptoms such as pain and bleeding.

## Radical nephrectomy

In this operation, the surgeon removes your whole kidney, the attached adrenal gland, nearby lymph nodes, and the fatty tissue around the kidney. Most people do just fine with only one working kidney.

The surgeon can make the incision in several places. The most common sites are the middle of the abdomen (belly), under the ribs on the same side as the cancer, or in the back, just behind the kidney. Each approach has its benefits in treating cancers of different sizes and in different parts of the kidney. Although removing the adrenal gland is a part of a standard radical nephrectomy, the surgeon may be able to leave it behind in some cases where the cancer is in the lower part of the kidney and is far away from the adrenal gland.

If the tumor has grown from the kidney through the renal vein (the vein leading away from the kidney) and into the inferior vena cava (the large vein that empties into the heart), the heart may need to be stopped for a short time in order to remove the tumor. The patient is put on cardiopulmonary bypass (a heart-lung machine) that circulates the blood while bypassing the heart. If you need this, a heart surgeon will work with your

urologist during your operation.

### **Laparoscopic nephrectomy and robotic-assisted laparoscopic nephrectomy**

These approaches to the operation are done through several small incisions instead of one large one. If a radical nephrectomy is needed, many doctors and patients now prefer to use these approaches when they can.

**Laparoscopic nephrectomy:** Special long instruments are inserted through the incisions, each of which is about 1/2-inch (1.27cm) long, to remove the kidney. One of the instruments, the laparoscope, is a long tube with a small video camera on the end. This lets the surgeon see inside the abdomen. Usually, one of the incisions has to be made longer in order to remove the kidney (although it's not as long as the incision for a standard radical nephrectomy).

**Robotic-assisted laparoscopic nephrectomy:** This approach uses a robotic system to do the laparoscopic surgery remotely. The surgeon sits at a panel near the operating table and controls robotic arms to operate. For the surgeon, the robotic system may allow them to move the instruments more easily and with more precision than during standard laparoscopic surgery. But the most important factor in the success of either type of laparoscopic surgery is the surgeon's experience and skill. This is a difficult approach to learn. If you are considering this type of operation, be sure to find a surgeon with a lot of experience.

In experienced hands, the technique is as effective as an open radical nephrectomy and usually results in a shorter hospital stay, a faster recovery, and less pain after surgery. This approach may not be an option for tumors larger than about 7 cm (3 inches) across or tumors that have grown into the renal vein or spread to lymph nodes around the kidney.

### **Partial nephrectomy (nephron-sparing surgery)**

In a partial nephrectomy, the surgeon removes only the part of the kidney that contains cancer, leaving the rest of the kidney behind. As with a radical nephrectomy, the surgeon can make the incision in several places, depending on factors like the location of the tumor.

Partial nephrectomy is now the preferred treatment for many people with early-stage kidney cancer. It is often done to remove single small tumors (less than 4 cm or 1½ inches across), and can also be done to remove larger tumors (up to 7 cm or 3 inches across). Studies have shown the long-term results to be about the same as when the

whole kidney is removed. The obvious benefit is that the patient keeps more kidney function.

A partial nephrectomy might not be an option if the tumor is in the middle of the kidney, if it is very large, if there is more than one tumor in the same kidney, or if the cancer has spread to the lymph nodes or distant organs. Not all doctors can do this type of surgery. It should only be done by one with a lot of experience.

### **Laparoscopic partial nephrectomy and robotic-assisted laparoscopic partial nephrectomy**

Many doctors now do partial nephrectomies laparoscopically or using a robot (as described above). But again, this is a difficult operation, and it should only be done by a surgeon with a great deal of experience.

### **Regional lymphadenectomy (lymph node dissection)**

This procedure removes nearby lymph nodes to see if they contain cancer. Some doctors do this when doing a radical nephrectomy. More lymph nodes may be removed if the tumor has features suggesting it is at high risk of spreading.

Most doctors agree that the lymph nodes should be removed if they look enlarged on imaging tests or feel abnormal during the operation. Some doctors also remove these lymph nodes to check them for cancer spread even when they aren't enlarged, to better stage the cancer. Before surgery, ask your doctor if they plan to remove the lymph nodes near the kidney.

### **Removal of an adrenal gland (adrenalectomy)**

Although this is a standard part of a radical nephrectomy, if the cancer is in the lower part of the kidney (away from the adrenal gland) and imaging tests show the adrenal gland is not affected, it might not have to be removed. Just like with lymph node removal, this is decided on an individual basis and should be discussed with the doctor before surgery.

### **Removal of metastases**

In about 1 in 3 people with kidney cancer, the cancer will already have spread (metastasized) to other parts of the body when it is diagnosed. The lungs, lymph nodes, bones, and liver are the most common sites of spread. For some people, surgery may

still be helpful.

### **Attempting a surgical cure**

In rare cases where there is only a single metastasis or if there are only a few that can be removed easily without causing serious side effects, surgery may lead to long-term survival in some people.

The metastasis may be removed at the same time as a radical nephrectomy or later if the cancer [recurs](#)<sup>1</sup> (comes back).

### **Surgery to relieve symptoms (palliative surgery)**

When other treatments aren't helpful, surgically removing the metastases can sometimes relieve pain and other symptoms, although this usually does not help people live longer.

### **Risks and side effects of surgery**

The short-term risks of any type of surgery include reactions to anesthesia, too much bleeding (which might require blood transfusions), blood clots, and infections. Most people will have at least some pain after the operation, which can usually be helped with pain medicines, if needed.

Other possible risks of surgery include:

- Damage to internal organs and blood vessels (such as the spleen, pancreas, aorta, vena cava, large or small bowel) during surgery
- Pneumothorax (unwanted air in the chest cavity)
- Incisional hernia (bulging of internal organs near the surgical incision due to problems with wound healing)
- Leakage of urine into the abdomen (after partial nephrectomy)
- Kidney failure (if the remaining kidney fails to function well)

### **More information about Surgery**

For more general information about surgery as a treatment for cancer, see [Cancer Surgery](#)<sup>2</sup>.



To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)<sup>3</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/survivorship/long-term-health-concerns/recurrence.html](http://www.cancer.org/cancer/survivorship/long-term-health-concerns/recurrence.html)
2. [www.cancer.org/cancer/managing-cancer/treatment-types/surgery.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/surgery.html)
3. [www.cancer.org/cancer/managing-cancer/side-effects.html](http://www.cancer.org/cancer/managing-cancer/side-effects.html)

## References

Correa AF, Lane BR, Rini BI, Uzzo RG. Ch 66 - Cancer of the kidney. In: DeVita VT, Hellman S, Rosenberg SA, eds. *Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

McNamara MA, Zhang T, Harrison MR, George DJ. Ch 79 - Cancer of the kidney. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa: Elsevier; 2020.

National Cancer Institute. Physician Data Query (PDQ). Renal Cell Cancer Treatment – Health Professional Version. 2019. <https://www.cancer.gov/types/kidney/hp/kidney-treatment-pdq>. Updated September 6, 2019. Accessed on November 14, 2019.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: *Kidney Cancer*. V.2.2020. Accessed at: [www.nccn.org](http://www.nccn.org) on November 12, 2019.

Richie JP. UpToDate. Definitive surgical management of renal cell carcinoma. This topic last updated: Sept 17, 2019. Accessed at <https://www.uptodate.com/contents/definitive-surgical-management-of-renal-cell-carcinoma> on November 12, 2019.

Richie JP and Choueiri TK. Role of surgery in patients with metastatic renal cell carcinoma. Atkins MB, ed. UpToDate. Waltham, MA: UpToDate Inc. <https://www.uptodate.com> (Accessed on January 22, 2020.)

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# Ablation and Other Local Therapy for Kidney Cancer

- [Cryotherapy \(cryoablation\)](#)
- [Radiofrequency ablation \(RFA\)](#)

Whenever possible, [surgery](#) is the main treatment for kidney cancer that can be removed. But for people who are too sick to have surgery or don't want to have surgery, other treatments can sometimes be used to destroy the kidney tumor. These approaches are usually considered for small (no larger than 4 cm or 1½ inches) kidney cancers. There is much less data on how well these treatments work over time than there is for surgery, but they might be helpful for some people.

## Cryotherapy (cryoablation)

Cryotherapy uses extreme cold to destroy the tumor. A hollow probe (needle) is inserted into the tumor either through the skin (percutaneously) or during laparoscopy (see [Surgery for Kidney Cancer](#)). Very cold gases are passed through the probe, creating an ice ball at its tip that destroys the tumor. To be sure the tumor is destroyed without too much damage to nearby tissues, the doctor carefully watches images of the tumor during the procedure (with [ultrasound](#)<sup>1</sup>, [CT](#)<sup>2</sup> or [MRI](#)<sup>3</sup> scans) or measures tissue temperature.

The type of anesthesia used for cryotherapy depends on how the procedure is being done. Possible side effects include bleeding and damage to the kidneys or other nearby organs.

## Radiofrequency ablation (RFA)

Radiofrequency ablation uses high-energy radio waves to heat the tumor. A thin, needle-like probe is placed through the skin and moved forward until the end is in the tumor. Placement of the probe is guided by ultrasound or CT scan. Once it is in place, an electric current is passed through the tip of the probe. This heats the tumor and destroys the cancer cells.

RFA is usually done as an outpatient procedure, using local anesthesia (numbing medicine) where the probe is inserted. You may be given medicine to help you relax as well.

Major complications are uncommon, but they can include bleeding and damage to the kidneys or other nearby organs.

## Hyperlinks

1. [www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/ultrasound-for-cancer.html](http://www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/ultrasound-for-cancer.html)
2. [www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/ct-scan-for-cancer.html](http://www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/ct-scan-for-cancer.html)
3. [www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/mri-for-cancer.html](http://www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/mri-for-cancer.html)

## References

Campbell S, Uzzo RG, Allaf ME, Bass EB, Cadeddu JA, Chang A, et al. Renal Mass and Localized Renal Cancer: AUA Guideline. *J Urol*. 2017; 198:520-529. doi: 10.1016/j.juro.2017.04.100. Epub 2017 May 4.

Correa AF, Lane BR, Rini BI, Uzzo RG. Ch 66 - Cancer of the kidney. In: DeVita VT, Hellman S, Rosenberg SA, eds. *Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

Hines A and Goldberg SN. UpToDate. Radiofrequency ablation and cryoablation for renal cell carcinoma. This topic last updated: Mar 09, 2018. Accessed at <https://www.uptodate.com/contents/radiofrequency-ablation-and-cryoablation-for-renal-cell-carcinoma> on November 12, 2010.

McNamara MA, Zhang T, Harrison MR, George DJ. Ch 79 - Cancer of the kidney. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa: Elsevier: 2020.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: *Kidney Cancer*. V.2.2020. Accessed at: [www.nccn.org](http://www.nccn.org) on November 12, 2019.

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# Active Surveillance for Kidney Cancer

Some small kidney tumors are benign. And most (3 out of 4) small kidney cancers are slow growing. One option for some people with these small kidney tumors (less than 4 cm [about 1½ inches]), may be to give no treatment at first and watch the tumor carefully to see if it grows. This is usually done by [imaging tests](#)<sup>1</sup> (ultrasound, CT or MRI scan) every 3 to 6 months. If it grows quickly or gets larger than 4 cm, the tumor is removed or treated another way.

This approach is most often used for elderly or frail patients as it avoids the risks of treatment, such as surgery or ablation. Watching the tumor closely for a time helps doctors decide which tumors are more likely to be cancer based on their growth. Sometimes, a biopsy is done before deciding to watch the tumor to see if the lump is really cancer.

## Hyperlinks

1. [www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/imaging-radiology-tests-for-cancer.html](http://www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/imaging-radiology-tests-for-cancer.html)

## References

Campbell S, Uzzo RG, Allaf ME, Bass EB, Cadeddu JA, Chang A, et al. Renal Mass and Localized Renal Cancer: AUA Guideline. *J Urol*. 2017; 198:520-529. doi: 10.1016/j.juro.2017.04.100. Epub 2017 May 4.

Correa AF, Lane BR, Rini BI, Uzzo RG. Ch 66 - Cancer of the kidney. In: DeVita VT, Hellman S, Rosenberg SA, eds. *Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

McNamara MA, Zhang T, Harrison MR, George DJ. Ch 79 - Cancer of the kidney. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa: Elsevier; 2020.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Kidney Cancer. V.2.2020. Accessed at: [www.nccn.org](http://www.nccn.org) on November 12, 2019.

Pierorazio PM and Campbell SC. UpToDate. Diagnostic approach, differential

diagnosis, and management of a small renal mass. This topic last updated: Jul 09, 2018. Accessed at <https://www.uptodate.com/contents/diagnostic-approach-differential-diagnosis-and-treatment-of-a-small-renal-mass> on November 12, 2019.

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## Radiation Therapy for Kidney Cancer

- [Possible side effects of radiation therapy](#)
- [More information about radiation therapy](#)

Radiation therapy uses high-energy rays or particles to kill cancer cells.

Radiation is sometimes used to treat kidney cancer if a person is not healthy enough to have [surgery](#) or has only one kidney. Sometimes [other treatments](#) will be tried first instead. When radiation therapy is used to treat kidney cancer, it is usually [external beam therapy \(EBRT\)](#)<sup>1</sup>, which focuses radiation on the cancer from a source outside the body. If radiation is used to treat a single area of cancer spread, for example in the lung, it is usually **stereotactic body radiation therapy** (SBRT), a special type of EBRT.

For people with kidney cancer, radiation therapy is more often used to **palliate**, or ease, cancer symptoms such as pain, bleeding, or problems caused by cancer spread (especially to the bones or brain).

### Possible side effects of radiation therapy

[Side effects of radiation therapy](#)<sup>2</sup> depend on where it is aimed and can include skin changes (similar to sunburn) and hair loss where the radiation passes through the skin, nausea, diarrhea, or tiredness. Often these go away after a short while. Radiation may also make side effects from some other treatments worse.

### More information about radiation therapy

To learn more about how radiation is used to treat cancer, see [Radiation Therapy](#)<sup>3</sup>.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)<sup>4</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/managing-cancer/treatment-types/radiation/external-beam-radiation-therapy.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/radiation/external-beam-radiation-therapy.html)
2. [www.cancer.org/cancer/managing-cancer/treatment-types/radiation/effects-on-different-parts-of-body.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/radiation/effects-on-different-parts-of-body.html)
3. [www.cancer.org/cancer/managing-cancer/treatment-types/radiation.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/radiation.html)
4. [www.cancer.org/cancer/managing-cancer/side-effects.html](http://www.cancer.org/cancer/managing-cancer/side-effects.html)

## References

Atkins MB. UpToDate. Overview of the treatment of renal cell carcinoma; This topic last updated: Aug 26, 2019. Accessed at <https://www.uptodate.com/contents/overview-of-the-treatment-of-renal-cell-carcinoma> on November 12, 2019.

Correa RJM, Louie AV, Staehler M, Warner A, Gandhidasan S, Ponsky L, et al. Stereotactic Radiotherapy as a Treatment Option for Renal Tumors in the Solitary Kidney: A Multicenter Analysis from the IROCK. *J Urol*. 2019;201:1097-1104. doi: 10.1097/JU.000000000000111.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Kidney Cancer. V.2.2020. Accessed at: [www.nccn.org](http://www.nccn.org) on November 12, 2019.

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# Targeted Drug Therapy for Kidney Cancer

- [When might targeted drugs be used?](#)
- [Targeted drugs used to treat kidney cancer](#)

- [More information about targeted therapy](#)

As researchers learn more about the changes in cells that cause cancer, they have developed drugs that target some of these changes. These targeted drugs are different from standard [chemotherapy](#) drugs. They sometimes work when standard chemo drugs don't, and they often have different side effects.

Targeted drugs are proving to be especially important in kidney cancer, where chemotherapy has not been shown to be very effective.

## When might targeted drugs be used?

### Treating advanced kidney cancer

All of the targeted drugs below can be used to treat advanced kidney cancers. They can often shrink or slow the growth of the cancer for a time, but it doesn't seem that any of these drugs can actually cure kidney cancer.

Targeted drugs are most often used one at a time. If one doesn't work, another can be tried. It's not yet known if any one of these drugs is clearly better than the others, if combining them might be more helpful than giving them one at a time, or if one sequence is better than another. Studies are being done to help answer these questions.

### Adjuvant therapy after surgery

The targeted drug sunitinib (Sutent) can also be used after [surgery](#) in people with a high risk of the cancer returning, to help lower the risk that the cancer will come back. This is known as **adjuvant therapy**.

## Targeted drugs used to treat kidney cancer

Most of the targeted drugs used to treat kidney cancer work by blocking angiogenesis (growth of the new blood vessels that feed cancers) or important proteins in cancer cells (called **tyrosine kinases**) that help them grow and survive. Some targeted drugs affect both.

### Drugs that target tumor blood vessel growth (angiogenesis)

### ***Sunitinib (Sutent)***

Sunitinib acts by blocking both angiogenesis and growth-stimulating proteins in the cancer cell itself. Sunitinib does this by blocking several tyrosine kinases that are important for cell growth and survival. This drug is taken as a pill daily, typically for 4 weeks on and 2 weeks off. Some doctors might recommend taking it 2 weeks on and 1 week off to reduce side effects.

Sunitinib can be used in people with advanced kidney cancer, as well as in people with a high risk of the cancer returning after [surgery](#), to help lower the risk that the cancer will come back. This is known as **adjuvant therapy**.

The most common side effects are nausea, diarrhea, changes in skin or hair color, mouth sores, weakness, and low white and red blood cell counts. Other possible effects include tiredness, high blood pressure, congestive heart failure, bleeding, hand-foot syndrome, and low thyroid hormone levels.

### ***Sorafenib (Nexavar)***

Sorafenib blocks several tyrosine kinases, similar to the ones blocked by sunitinib. It attacks both blood vessel growth and other targets that help cancer cells grow. It is taken as a pill twice a day.

The most common side effects seen with this drug include fatigue, rash, diarrhea, increases in blood pressure, and redness, pain, swelling, or blisters on the palms of the hands or soles of the feet (hand-foot syndrome).

### ***Pazopanib (Votrient)***

Pazopanib is a drug that blocks several tyrosine kinases involved in cancer cell growth and the formation of new blood vessels in the tumor. It is taken as a pill once a day.

Common side effects include high blood pressure, nausea, diarrhea, headaches, low blood cell counts, and hair color change. It can cause lab test results of liver function to become abnormal, but it rarely leads to severe liver damage that could be life threatening. Problems with bleeding, clotting, and wound healing can occur, as well. In rare cases it can also cause a problem with the heart rhythm or even a heart failure. If you are taking this drug, your doctor will monitor your heart with EKGs as well as check your blood tests for liver or other problems.

### ***Cabozantinib (Cabometyx)***



Cabozantinib is a drug that blocks several tyrosine kinases, including some that help form new blood vessels.

- It might be used first to treat people with [intermediate or poor risk advanced kidney cancer](#)<sup>1</sup>
- It might be used first with the [immunotherapy](#) drug, nivolumab, in people with advanced kidney cancer
- It might be used in people with advanced kidney cancer after someone has already tried another drug that blocks angiogenesis or after immunotherapy treatments.

It is taken as a pill once a day and has shown to help people live longer in certain cases.

Common side effects include diarrhea, fatigue, nausea and vomiting, poor appetite and weight loss, high blood pressure, hand-foot syndrome, and constipation. Less common but more serious side effects can include serious bleeding, blood clots, very high blood pressure, severe diarrhea, and holes forming in the intestines.

### ***Lenvatinib (Lenvima)***

Lenvatinib is a kinase inhibitor drug that helps block tumors from forming new blood vessels, as well as targeting some of the proteins in cancer cells that normally help them grow. It can be used along with everolimus (see below) after at least one other treatment has been tried. The combination has been shown to help some people live longer. It can also be used with the [immunotherapy drug](#) pembrolizumab as a first treatment in people with advanced kidney cancer. Lenvatinib is taken as capsules once a day.

Common side effects include diarrhea, fatigue, joint or muscle pain, loss of appetite, nausea and vomiting, mouth sores, weight loss, high blood pressure, and swelling in the arms or legs. Less common but more serious side effects can include serious bleeding, blood clots, very high blood pressure, severe diarrhea, holes forming in the intestines, and kidney, liver, or heart failure.

### ***Bevacizumab (Avastin)***

Bevacizumab is an IV drug that works by slowing the growth of new blood vessels. It may help some people with kidney cancer when used with [interferon-alfa](#).

More common side effects include high blood pressure, tiredness, and headaches. Less

common but possibly serious side effects include bleeding, blood clots, holes forming in the intestines, heart problems, and slow wound healing.

### ***Axitinib (Inlyta)***

Axitinib is a drug that inhibits several tyrosine kinases involved in the formation of new blood vessels. It can be used by itself after at least one other treatment has been tried, or it can be used with certain [immunotherapy](#) drugs, like pembrolizumab or avelumab, as the first treatment for people with advanced kidney cancer. Axitinib is taken as a pill twice a day.

Common side effects include high blood pressure, fatigue, nausea and vomiting, diarrhea, poor appetite and weight loss, voice changes, hand-foot syndrome, and constipation. High blood pressure requiring treatment is fairly common, but in a small number of patients it can get high enough to be life-threatening. It can also cause problems with bleeding, clotting, and wound healing. In some patients, lab test results of liver function can become abnormal. Axitinib may also cause the thyroid gland to become underactive, so your doctor will watch your blood levels of thyroid hormone while you are on this drug.

### ***Tivozanib (Fotivda)***

Tivozanib is a drug that blocks several tyrosine kinases involved in cancer cell growth and the formation of new blood vessels in the tumor. This drug is taken as a pill daily, typically for 3 weeks on and 1 week off.

It might be used in people with advanced kidney cancer after someone has already tried two or more other systemic drugs such as chemotherapy, targeted therapy, or immunotherapy.

Common side effects include high blood pressure, diarrhea, nausea, poor appetite, cough, mouth sores, feeling tired, and voice changes. Less common but more serious side effects can include heart problems, life threatening high blood pressure, blood clots, bleeding, poor wound healing, abnormal thyroid tests, and damage to the kidney.

### ***Belzutifan (Welireg)***

Belzutifan is a type of drug known as a *HIF inhibitor*. It blocks a protein called hypoxia-inducible factor 2 alpha (HIF-2a), which is involved in both cancer cell growth and the formation of new blood vessels in tumors. This drug is taken as pills, typically once a day.

Belzutifan can be used:

- In people with [von Hippel-Lindau \(VHL\) disease](#)<sup>2</sup> who have kidney cancer and don't need surgery right away.
- In people with advanced kidney cancer that has already been treated with a different targeted drug and with an immune checkpoint inhibitor (a type of [immunotherapy](#) drug).

Common side effects of this drug include low red blood cell counts (anemia), feeling tired and/or dizzy, nausea, headache, increased blood sugar levels, and changes in lab tests showing the drug might be affecting the kidneys. Less common but more serious side effects can include very low red blood cell counts (severe anemia), which might require blood transfusions, and low oxygen levels in the body, for which you might need oxygen therapy or even be admitted to the hospital.

## Drugs that target the mTOR protein

### ***Temsirolimus (Torisel)***

Temsirolimus works by blocking a protein known as *mTOR*, which normally helps cells grow and divide. This drug has been shown to be helpful against advanced kidney cancers that have a poorer prognosis because of certain factors and may help some people live longer. It is given as an intravenous (IV) infusion, typically once a week.

The most common side effects of this drug include skin rash, weakness, mouth sores, nausea, loss of appetite, fluid buildup in the face or legs, and increases in blood sugar and cholesterol levels. Rarely, more serious side effects have been reported.

### ***Everolimus (Afinitor)***

Everolimus also blocks the mTOR protein. It is used to treat advanced kidney cancers after other drugs such as sorafenib or sunitinib have been tried. It can be used by itself or along with lenvatinib (see above) after at least one other treatment has been tried. Everolimus is taken as a pill once a day.

Common side effects of this drug include mouth sores, an increased risk of infections, nausea, loss of appetite, diarrhea, skin rash, feeling tired or weak, fluid buildup (usually in the legs), and increases in blood sugar and cholesterol levels. A less common but serious side effect is lung damage, which can cause shortness of breath or other problems.

## More information about targeted therapy

To learn more about how targeted drugs are used to treat cancer, see [Targeted Cancer Therapy](#)<sup>3</sup>.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)<sup>4</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/types/kidney-cancer/detection-diagnosis-staging/staging.html](http://www.cancer.org/cancer/types/kidney-cancer/detection-diagnosis-staging/staging.html)
2. [www.cancer.org/cancer/types/kidney-cancer/causes-risks-prevention/risk-factors.html](http://www.cancer.org/cancer/types/kidney-cancer/causes-risks-prevention/risk-factors.html)
3. [www.cancer.org/cancer/managing-cancer/treatment-types/targeted-therapy.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/targeted-therapy.html)
4. [www.cancer.org/cancer/managing-cancer/side-effects.html](http://www.cancer.org/cancer/managing-cancer/side-effects.html)

## References

Atkins MB. *UpToDate*. Overview of the treatment of renal cell carcinoma; This topic last updated: Aug 26, 2019. Accessed at <https://www.uptodate.com/contents/overview-of-the-treatment-of-renal-cell-carcinoma> on November 22, 2019.

Correa AF, Lane BR, Rini BI, Uzzo RG. Ch 66 - Cancer of the kidney. In: DeVita VT, Hellman S, Rosenberg SA, eds. *Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

McNamara MA, Zhang T, Harrison MR, George DJ. Ch 79 - Cancer of the kidney. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa: Elsevier; 2020.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: *Kidney Cancer*. V.2.2020. Accessed at: [www.nccn.org](http://www.nccn.org) on November 22, 2019.

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# Immunotherapy for Kidney Cancer

- [Immune checkpoint inhibitors](#)
- [Cytokines](#)
- [More information about immunotherapy](#)

Immunotherapy is the use of medicines to boost a person's own immune system to recognize and destroy cancer cells more effectively. Several types of immunotherapy can be used to treat kidney cancer.

## Immune checkpoint inhibitors

An important part of the immune system is its ability to keep itself from attacking normal cells in the body. To do this, it uses “checkpoints,” which are proteins on immune cells that need to be turned on (or off) to start an immune response. Kidney cancer cells sometimes use these checkpoints to avoid being attacked by the immune system. But these drugs target the checkpoint proteins, helping to restore the immune response against the cancer cells.

### PD-1 inhibitors

**Pembrolizumab (Keytruda)** and **Nivolumab (Opdivo)** are drugs that target PD-1, a protein on immune system cells (called *T cells*) that normally help keep these cells from attacking other cells in the body. By blocking PD-1, these drugs boost the immune response against kidney cancer cells. This can often shrink some tumors or slow their growth.

- For people whose cancer has been removed by [surgery](#), but are at a higher risk of it coming back, pembrolizumab can be given for one year after surgery. It can also be given this way to people who have surgery to remove the main tumor along with surgery to remove a distant area(s) of cancer spread.
- Pembrolizumab can be used with the [targeted drug](#) axitinib as the first treatment for people with advanced kidney cancer.
- Pembrolizumab can also be used with the [targeted drug](#) lenvatinib as a first treatment in people with advanced kidney cancer.
- Nivolumab can be used for people whose advanced kidney cancer starts growing again after targeted drug treatments and has shown to help people live longer.
- For patients with [intermediate or poor risk advanced kidney cancer](#)<sup>1</sup> who have not

received any treatment, nivolumab can be given with ipilimumab (a CTLA-4 inhibitor) for 4 doses followed by nivolumab alone. This combination has been shown to help people live longer. Ipilimumab is discussed below.

- For people with advanced kidney cancer, nivolumab might be used with the targeted drug cabozantinib as the first treatment. This combination has shown to help people live longer.

Nivolumab is given as an intravenous (IV) infusion every 2, 3 or 4 weeks. Pembrolizumab is given every 3 or 6 weeks as an IV infusion.

### ***Possible side effects of PD-1 inhibitors***

Side effects of PD-1 inhibitors can include fatigue, cough, nausea, itching, skin rash, loss of appetite, constipation, joint pain, and diarrhea. See below for possible severe side effects of all checkpoint inhibitors.

### **PD-L1 inhibitors**

**Avelumab (Bavencio)** targets PD-L1, a protein related to PD-1 that is found on some tumor cells and immune cells. Blocking the PD-L1 protein can help boost the immune response against cancer cells. This can often shrink some tumors or slow their growth.

Avelumab can be used with the targeted drug axitinib as the first treatment for people with advanced kidney cancer. It is given every 2 weeks as an IV infusion.

### ***Possible side effects***

The most common side effects of the combination avelumab with axitinib include fatigue, diarrhea, high blood pressure, skin rash or blistering, cough, shortness of breath, or abdominal pain. See below for possible severe side effects of all checkpoint inhibitors.

### **CTLA-4 inhibitors**

**Ipilimumab (Yervoy)** is another drug that boosts the immune response, but it has a different target. It blocks CTLA-4, another protein on T cells that normally helps keep them in check.

For patients with intermediate or poor risk advanced kidney cancer who have not received any treatment, ipilimumab can be given with nivolumab (a PD-1 inhibitor) for 4

doses followed by nivolumab alone.

Ipilimumab is given as an intravenous (IV) infusion, usually once every 3 weeks for 4 treatments.

### ***Possible side effects of CTLA-4 inhibitors***

The most common side effects from ipilimumab include fatigue, diarrhea, skin rash, and itching. See below for possible severe side effects of all checkpoint inhibitors.

### **Possible serious side effects of all checkpoint inhibitors**

More serious side effects occur less often, but are possible. These drugs work by removing the brakes on the body's immune system. Sometimes the immune system starts attacking other parts of the body, which can cause serious problems in the lungs, intestines, liver, hormone-making glands (like the thyroid), kidneys, or other organs. In some people these side effects can be life threatening.

It's very important to report any new side effects during or after treatment to your health care team right away. If serious side effects do occur, you may need to stop treatment and take high doses of corticosteroids to suppress your immune system.

## **Cytokines**

Cytokines are small proteins that boost the immune system in a general way. Man-made versions of cytokines, such as interleukin-2 (IL-2) and interferon-alpha, are sometimes used to treat kidney cancer in very specific cases. Both cytokines can cause kidney cancers to shrink in a small percentage of patients.

### **Interleukin-2 (IL-2)**

In the past, IL-2 was commonly used as first-line therapy for advanced kidney cancer, and it may still be helpful for some people. But it can cause serious side effects, so many doctors only use it for people who are healthy enough to tolerate the side effects and for cancers that aren't responding to targeted drugs or other types of immunotherapy.

Giving high doses of IL-2 seems to offer the best chance of shrinking the cancer, but this can cause serious side effects, so it is not used in people who are in poor overall health. Special care is needed to recognize and treat these side effects. Because of

this, high-dose IL-2 is only given in the hospital at certain centers that are experienced with giving this type of treatment. IL-2 is given through a vein (IV).

The possible side effects of high-dose IL-2 include:

These side effects are often severe and, rarely, can be fatal. Only doctors experienced in the use of these drugs should give this treatment.

### **Interferon-alfa**

Interferon has less serious side effects than IL-2, but it does not seem to be as effective when used by itself. It is more often used in combination with the targeted drug bevacizumab (Avastin). Interferon is given as a subcutaneous injection (under the skin) usually three times a week.

Common side effects of interferon include flu-like symptoms (fever, chills, muscle aches), fatigue, and nausea.

- Extreme fatigue
- Low blood pressure
- Fluid buildup in the lungs
- Trouble breathing
- Kidney damage
- Heart attacks
- Intestinal bleeding
- Diarrhea or abdominal pain
- High fever and chills
- Rapid heart beat
- Mental changes

### **More information about immunotherapy**

To learn more about how drugs that work on the immune system are used to treat cancer, see [Cancer Immunotherapy<sup>2</sup>](#).

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects<sup>3</sup>](#).



## Hyperlinks

1. [www.cancer.org/cancer/types/kidney-cancer/detection-diagnosis-staging/staging.html](http://www.cancer.org/cancer/types/kidney-cancer/detection-diagnosis-staging/staging.html)
2. [www.cancer.org/cancer/managing-cancer/treatment-types/immunotherapy.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/immunotherapy.html)
3. [www.cancer.org/cancer/managing-cancer/side-effects.html](http://www.cancer.org/cancer/managing-cancer/side-effects.html)

## References

Atkins MB. UpToDate. Overview of the treatment of renal cell carcinoma; This topic last updated: Aug 26, 2019. Accessed at <https://www.uptodate.com/contents/overview-of-the-treatment-of-renal-cell-carcinoma> on November 22, 2019.

Correa AF, Lane BR, Rini BI, Uzzo RG. Ch 66 - Cancer of the kidney. In: DeVita VT, Hellman S, Rosenberg SA, eds. *Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

Hudes G, Carducci M, Tomczak P, et al. Temsirolimus, interferon alfa, or both for advanced renal-cell carcinoma. *N Engl J Med*. 2007;356:2271-2281.

McDermott DF, Regan MM, Clark JI, et al. Randomized phase III trial of high dose interleukin-2 versus subcutaneous interleukin-2 and interferon in patients with metastatic renal cell carcinoma. *J Clin Oncol*. 2005;23:133-141.

McNamara MA, Zhang T, Harrison MR, George DJ. Ch 79 - Cancer of the kidney. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa: Elsevier; 2020.

Motzer RJ, Tannir NM, McDermott DF et al. Nivolumab plus Ipilimumab versus Sunitinib in Advanced Renal-Cell Carcinoma. *N Engl J Med*. 2018 Apr 5;378(14):1277-1290. doi: 10.1056/NEJMoa1712126. Epub 2018 Mar 21.

National Cancer Institute. Physician Data Query (PDQ). Renal Cell Cancer Treatment – Health Professional Version. 2019. <https://www.cancer.gov/types/kidney/hp/kidney-treatment-pdq>. Updated September 6, 2019. Accessed on November 22, 2019.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Kidney Cancer. V.2.2020. Accessed at: [www.nccn.org](http://www.nccn.org) on November 22, 2019.

Topalian SL, Hodi FS, Brahmer JR, et al. Safety, activity, and immune correlates of anti-PD-1 antibody in cancer. *N Engl J Med*. 2012;366:2443-2454.

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## Chemotherapy for Kidney Cancer

- [Possible side effects of chemotherapy](#)
- [More information about chemotherapy](#)

Chemotherapy (chemo) uses anti-cancer drugs that are given into a vein (IV) or taken by mouth (as pills). These drugs enter your blood and reach nearly all areas of the body, which makes this treatment potentially useful for cancer that has spread (metastasized) to organs beyond the kidney.

Because kidney cancer cells usually do not respond well to chemo, chemo is not a standard treatment for kidney cancer. Some chemo drugs, such as cisplatin, 5-fluorouracil (5-FU), and gemcitabine have been shown to help a small number of patients. Still, chemo is often only used for kidney cancer after [targeted drugs](#) and/or [immunotherapy](#) have already been tried.

Doctors give chemotherapy in cycles, with each period of treatment followed by a rest period to allow the body time to recover. Chemo cycles generally last a few weeks.

### Possible side effects of chemotherapy

Chemo drugs attack cells that are dividing quickly, which is why they often work against cancer cells. But other cells in the body, such as those in the bone marrow (where new blood cells are made), the lining of the mouth and intestines, and the hair follicles, also divide quickly. These cells are also likely to be affected by chemo, which can lead to certain side effects.

The side effects of chemo depend on the type of drugs, the amount taken, and the length of treatment. Possible side effects can include:

- Hair loss
- Mouth sores
- Loss of appetite
- Nausea and vomiting
- Diarrhea or constipation
- Increased chance of infections (due to low white blood cell counts)
- Easy bruising or bleeding (due to low blood platelet counts)
- Fatigue (due to low red blood cell counts)

These side effects usually go away after treatment is finished. There are often ways to prevent or lessen them. For example, drugs can be given to help prevent or reduce nausea and vomiting. Specific chemo drugs may each cause specific side effects. Ask your health care team about the side effects your chemo drugs may cause.

## More information about chemotherapy

For more general information about how chemotherapy is used to treat cancer, see [Chemotherapy](#)<sup>1</sup>.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)<sup>2</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/managing-cancer/treatment-types/chemotherapy.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/chemotherapy.html)
2. [www.cancer.org/cancer/managing-cancer/side-effects.html](http://www.cancer.org/cancer/managing-cancer/side-effects.html)

## References

Atkins MB. UpToDate. Overview of the treatment of renal cell carcinoma; This topic last updated: Aug 26, 2019. Accessed at <https://www.uptodate.com/contents/overview-of-the-treatment-of-renal-cell-carcinoma> on November 12, 2019.

Correa AF, Lane BR, Rini BI, Uzzo RG. Ch 66 - Cancer of the kidney. In: DeVita VT, Hellman S, Rosenberg SA, eds. *Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

National Cancer Institute. Physician Data Query (PDQ). Renal Cell Cancer Treatment –

Health Professional Version. 2019. <https://www.cancer.gov/types/kidney/hp/kidney-treatment-pdq>. Updated September 6, 2019. Accessed on November 12, 2019.

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## Treatment of Kidney Cancer by Stage

- [Stages I, II, or III](#)
- [Stage IV](#)
- [Recurrent cancer](#)

The type of treatment(s) your doctor recommends will depend on the [stage](#)<sup>1</sup> of the cancer and on your overall health. This section sums up the options usually considered for each stage of kidney cancer.

### Stages I, II, or III

Stage I and II cancers are still contained in the kidney. Stage III cancers either have grown into nearby large veins or have spread to nearby lymph nodes.

These cancers are usually removed with [surgery](#) when possible. There are two common approaches:

- Partial nephrectomy (removing part of the kidney). This is often the treatment of choice in tumors up to 7 cm (a little less than 3 inches) if it can be done.
- Radical nephrectomy (removing the entire kidney).

The lymph nodes near the kidney may be removed as well, especially if they are enlarged.

If the cancer has grown into nearby veins (as with some stage III cancers), your surgeon may need to cut open these veins to remove all of the cancer. This may require putting you on bypass (a heart-lung machine), so that the heart can be stopped for a short time to remove the cancer from the large vein leading to the heart.

After surgery, some people at high risk of the cancer returning might be helped by

getting the [targeted drug](#) sunitinib (Sutent) for about a year, which can help lower this risk. Another option for people who have had surgery but are at a higher risk of the cancer coming back, is one year of the [immunotherapy drug](#) pembrolizumab. Treatment given after surgery is known as **adjuvant therapy**. [Clinical trials](#)<sup>2</sup> are also looking at other adjuvant treatments for kidney cancer. Ask your doctor if you are interested in learning more about adjuvant therapies being studied in clinical trials.

If you can't have kidney surgery because of other serious medical problems, you might benefit from [other local treatments](#) such as cryotherapy or radiofrequency ablation. Radiation therapy may be another option. These treatments are generally only given when surgery can't be done. Although these types of treatments can have outcomes similar to surgery as far as the chances of the cancer spreading to other parts of the body, some studies show the cancer might be more likely to come back in the same area.

[Active surveillance](#) is another option for some people with small kidney tumors. With active surveillance, the tumor is watched closely (with CTs or ultrasounds) and only treated if it grows.

Some stage III cancers cannot be completely removed by surgery or treated with radiation. In these cases, the cancers might be treated with [targeted therapy drugs](#) alone or in combination with [immunotherapy](#).

## Stage IV

Stage IV kidney cancer means the cancer has grown outside of the kidney or has spread to other parts of the body such as distant lymph nodes or other organs.

Treatment of stage IV kidney cancer depends on how extensive the cancer is and on the person's general health. In some cases, [surgery](#) may still be a part of treatment.

In rare cases where the main tumor appears to be removable and the cancer has only spread to one other area (such as to one or a few spots in the lungs), surgery to remove both the kidney and the metastasis (the outside area of cancer spread) may be an option if a person is in good enough health. In certain cases, removing the area of spread can help people live longer. For some people who have the main tumor removed along with a few areas of distant cancer spread, adjuvant treatment with the [immunotherapy drug](#) pembrolizumab for one year, might be considered. Radiation, instead of surgery, might also be an option to treat the area of cancer spread.

If the main tumor is still there, and the cancer has spread extensively elsewhere,

removing the tumor in the kidney is not recommended in most cases, as it had been in the past. This is based on recent information that shows removal of the kidney in this case does not help people live longer. The first treatment choice would be systemic therapy, which might consist of two immunotherapy drugs, a targeted therapy drug with an immunotherapy drug, or a targeted therapy drug alone. It's not clear if any one of these therapies or any particular sequence is better than another, although the combinations of ipilimumab along with nivolumab, axitinib with pembrolizumab, and cabozantinib with nivolumab appears to be most helpful for people with advanced kidney cancer.

Because advanced kidney cancer is very hard to cure, [clinical trials](#)<sup>3</sup> of new combinations of targeted therapies, immunotherapy, or other new treatments are also options.

For some people, palliative treatments such as [radiation therapy](#) may be the best option. A special form of radiation therapy called **stereotactic radiosurgery** can be very effective in treating brain metastases. Surgery or radiation therapy can also be used to help reduce pain or other symptoms of metastases in some other places, such as the bones. You can read more about palliative treatment for cancer in [Palliative \(Supportive\) Care](#)<sup>4</sup> or in [Advanced Cancer, Metastatic Cancer, and Bone Metastasis](#)<sup>5</sup>.

Having your [pain controlled](#)<sup>6</sup> can help you maintain your quality of life. Medicines to relieve pain do not interfere with your other treatments, and controlling pain will often help you be more active and continue your daily activities.

## Recurrent cancer

Cancer is called **recurrent** when it come backs after treatment. Recurrence can be local (near the area of the initial tumor) or it may be in distant organs. Treatment of kidney cancer that comes back (recurs) after initial treatment depends on where it recurs and what treatments have been used, as well as a person's health and wishes for further treatment.

### Local recurrence

For cancers that recur after initial surgery, further surgery might be an option. If surgery cannot remove the area of recurrence, treatment with two immunotherapy drugs, a combination of an immunotherapy drug plus a targeted therapy drug, or in some cases, a targeted therapy drug alone may be recommended. Clinical trials of new treatments are an option as well.

## Distant recurrence

Kidney cancer that recurs in distant parts of the body is treated like a stage IV cancer. Your options depend on which, if any, drugs you received before the cancer came back and how long ago you received them, as well as on your health.

For cancers that progress (continue to grow or spread) during treatment with targeted therapy or immunotherapy, another type of targeted therapy or immunotherapy may be helpful. Recurrent cancers can sometimes be hard to treat, so you might also want to ask your doctor about [clinical trials](#)<sup>7</sup>.

For some people with recurrent kidney cancer, palliative treatments such as radiation therapy may be the best option. Controlling symptoms such as [pain](#)<sup>8</sup> is an important part of treatment at any stage of the disease.

For more information see [Understanding Recurrence](#)<sup>9</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/types/kidney-cancer/detection-diagnosis-staging/staging.html](http://www.cancer.org/cancer/types/kidney-cancer/detection-diagnosis-staging/staging.html)
2. [www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html](http://www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html)
3. [www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html](http://www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html)
4. [www.cancer.org/cancer/managing-cancer/palliative-care.html](http://www.cancer.org/cancer/managing-cancer/palliative-care.html)
5. [www.cancer.org/cancer/managing-cancer/advanced-cancer.html](http://www.cancer.org/cancer/managing-cancer/advanced-cancer.html)
6. [www.cancer.org/cancer/managing-cancer/side-effects/pain.html](http://www.cancer.org/cancer/managing-cancer/side-effects/pain.html)
7. [www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html](http://www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html)
8. [www.cancer.org/cancer/managing-cancer/side-effects/pain.html](http://www.cancer.org/cancer/managing-cancer/side-effects/pain.html)
9. [www.cancer.org/cancer/survivorship/long-term-health-concerns/recurrence.html](http://www.cancer.org/cancer/survivorship/long-term-health-concerns/recurrence.html)

## References

Correa AF, Lane BR, Rini BI, Uzzo RG. Ch 66 - Cancer of the kidney. In: DeVita VT, Hellman S, Rosenberg SA, eds. *Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019.

McDermott DF, Regan MM, Clark JI, et al. Randomized phase III trial of high dose interleukin-2 versus subcutaneous interleukin-2 and interferon in patients with metastatic renal cell carcinoma. *J Clin Oncol*. 2005;23:133-141.

McNamara MA, Zhang T, Harrison MR, George DJ. Ch 79 - Cancer of the kidney. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa: Elsevier: 2020.

Mejean A, Thezenas S, Chevreau C, Bensalah K, Geoffrois L, Thiery-Vuillemin A, et al. Cytoreductive nephrectomy (CN) in metastatic renal cancer (mRCC): Update on Carmena trial with focus on intermediate IMDC-risk population. *J Clin Oncol*. 2019; 37\_suppl, abstr 4508.

National Cancer Institute. Physician Data Query (PDQ). Renal Cell Cancer Treatment – Health Professional Version. 2019. <https://www.cancer.gov/types/kidney/hp/kidney-treatment-pdq>. Updated September 6, 2019. Accessed on November 22, 2019.

National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: *Kidney Cancer*. V.2.2020. Accessed at: [www.nccn.org](http://www.nccn.org) on November 22, 2019.

Richie JP and Choueiri TK. UpToDate. Role of surgery in patients with metastatic renal cell carcinoma. This topic last updated: Jul 03, 2019. Accessed at <https://www.uptodate.com/contents/role-of-surgery-in-patients-with-metastatic-renal-cell-carcinoma> on Jan 28, 2020.

Rini BI, Escudier B, Tomczak P, et al. Comparative effectiveness of axitinib versus sorafenib in advanced renal cell carcinoma (AXIS): A randomised phase 3 trial. *Lancet*. 2011;378:1931-1919.

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