An overview of

Renal Cell Carcinoma

Information about treatment and helpful resources
Support is all around you

Your health care team, loved ones, and the services available through support groups can help answer your questions and provide useful support during a challenging time. This brochure will help you learn about renal cell carcinoma and its treatment—so you can feel confident you have the information you need to make informed decisions about your future.

9 out of 10 people with kidney cancer have renal cell carcinoma, the most common type of kidney cancer.1
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The body is made of hundreds of millions of cells. These cells are constantly dying and being replaced. DNA exists within each cell. It “tells” the cell how to behave. Renal cell carcinoma occurs when DNA within the renal (kidney) cells becomes damaged and the cycle of cell life and death is no longer normal.2

In healthy renal cells, when DNA is damaged the cells either fix the damage or die. In renal cell carcinoma, renal cells with damaged DNA do not stop living when they should. They continue to divide into new cells. As a result, these cells pass on the “bad” instructions contained within the damaged DNA. This creates more abnormal cells. The “out-of-control” growth of these cells and their tendency to metastasize, or spread to other parts of the body, make them “cancer” cells.2

As cancer cells multiply, they often form solid collections of cells called tumors. Tumors can grow in size and interfere with how the body functions. This can cause serious health concerns. Cancer cells may also enter the bloodstream and spread to other parts of the body. This can result in the formation of tumors in organs other than the kidney.2,3

Renal cell carcinoma usually begins as one or more tumors in a single kidney, but sometimes it develops in both kidneys at the same time.1
Example of renal cell carcinoma
It’s not always clear what causes renal cell carcinoma, and your doctor may not be able to give you a definite answer as to why you have developed this condition. However, the traits listed below are risk factors for developing renal cell carcinoma²,4:

• A history of smoking
• Obesity
• Use of diuretics—medications that help the body eliminate excess water
• Certain genetic conditions such as von Hippel-Lindau (VHL) syndrome
• Gender—men are at a higher risk for kidney cancer than women
• Exposure to certain chemicals in the workplace

Even if the cause of your renal cell carcinoma is not identified, your doctor will provide a treatment plan that is appropriate for you.
Doctors may use a combination of the following tests to look for renal cell carcinoma and to establish its extent. Not all tests may be necessary or indicated for all patients. Your doctor will decide what is appropriate for you.

• Physical exam/medical history review — The doctor takes a detailed look at your medical history and general indicators of health status. He or she may also feel your abdomen for possible tumors, or look for other signs of kidney cancer.

• Urine testing — Urine is screened for substances such as blood or cancer cells.

• Blood testing — Blood samples are sent to a lab. The lab measures the number of red and white blood cells and checks for other signs of renal cell carcinoma. For example, high levels of calcium in the blood may mean the cancer has spread to the bones.

• Intravenous pyelogram (IVP) — Dye is injected into a vein. The dye moves through the bloodstream and settles in the ureters (the tubes that carry urine to the bladder from the kidneys) and bladder. This dye highlights the urinary tract on X-rays. This helps your doctor see tumors or other abnormalities.

• Computed tomography (CT) scan — A special device, similar to an X-ray machine, gives detailed images of the kidneys and abnormalities such as tumors. Patients may be asked to drink a fluid which contains a special dye, or dye may be injected into the bloodstream. The dyes may give even clearer CT scans.
• **Magnetic resonance imaging (MRI)**—Radio waves and powerful magnets connected to a computer are used to give detailed images of areas inside the body⁵

• **Ultrasound**—Sound waves are aimed at the kidneys and their echo is recorded and analyzed by a computer. This creates images that doctors can use to see tumors and possibly identify tumor types⁵

• **Biopsy**—A small sample of tissue is collected to check for signs of cancer. The doctor uses a thin needle to penetrate the kidney or other suspicious area and take the sample. The sample is then sent to a lab to be screened for cancer cells⁵

• **Bone scan**—A special liquid is injected into a vein. This liquid travels through your blood to your bones and organs. After 3 or 4 hours, the liquid that has collected in the bones becomes visible on a special camera. This helps your doctor see if the cancer has spread to your bones⁶
The severity of renal cell carcinoma is rated by levels called stages. There are 4 stages for renal cell carcinoma. On average, the higher the stage, the more severe the disease. Doctors determine the stage of renal cell carcinoma based on the size, location, and number of tumors found. Depending on your stage, your treatment may differ.\textsuperscript{7,8}

<table>
<thead>
<tr>
<th>Stage</th>
<th>Definition\textsuperscript{7,8}</th>
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<tbody>
<tr>
<td>I</td>
<td>Tumor is 7 centimeters or smaller and only found in the kidney.</td>
</tr>
<tr>
<td>II</td>
<td>Tumor is larger than 7 centimeters and only found in the kidney.</td>
</tr>
<tr>
<td>III</td>
<td>Tumors/cancerous tissue can be found in the kidney, an adrenal gland, a nearby lymph node, the tissue around the kidney, or major blood vessels of the kidneys.</td>
</tr>
<tr>
<td>IV</td>
<td>Tumors/cancerous tissue can be found in other areas of the body outside the fatty tissue surrounding the kidney, such as the intestines, lymph nodes, pancreas, lungs, or other organs.</td>
</tr>
<tr>
<td>Recurrent cancer</td>
<td>Recurrent renal cell carcinoma is cancer that has returned after it has been treated. The cancer may come back in the kidney, or it may come back in other parts of the body.</td>
</tr>
</tbody>
</table>
Putting tumor size into perspective

5 cm

7 cm

8 cm

Life-size examples
When thinking about tumor size, it may help to compare different measurements with everyday objects.

All images are actual size of objects shown.
When doctors predict someone’s outcome through treatment, their prediction is called a prognosis. In stage IV renal cell carcinoma, a person’s prognostic risk is important. Doctors may use it to help them create your treatment plan.9

Your doctor can figure out your prognostic risk by looking at a set of risk factors and counting how many are present in your condition. Based on how many risk factors you have, your doctor will assign you to 1 of the following 3 prognostic risk groups9:

- Favorable risk
- Intermediate risk
- Poor risk
After looking at the results of your medical tests and assigning a risk group, your doctor can use special guidelines to help identify the best therapy for you.9

<table>
<thead>
<tr>
<th>Factors your doctor may consider to determine prognostic risk7,9-14</th>
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<tbody>
<tr>
<td>Whether you have too much of a certain enzyme called lactate dehydrogenase (LDH) in your bloodstream. High LDH levels can be a sign of tissue damage.</td>
</tr>
<tr>
<td>Having a reduced amount of a protein called hemoglobin in your blood (a condition called anemia). It’s important to have the right amount of hemoglobin because it helps blood carry oxygen throughout the body.</td>
</tr>
<tr>
<td>Having an increased amount of calcium in your bloodstream. This can be a sign that the cancer has spread to the bones.</td>
</tr>
<tr>
<td>A time span of less than 1 year between being diagnosed with renal cell carcinoma and starting treatment. Research has shown this to be an indicator of increased prognostic risk.</td>
</tr>
<tr>
<td>A low score on scales that measure your ability to do everyday activities, such as the Karnofsky Performance Status scale and the Eastern Cooperative Oncology Group (ECOG) scale.</td>
</tr>
<tr>
<td>Having cancer present in areas of the body other than the kidney.</td>
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</tbody>
</table>
Based on your condition, your doctor may choose to treat your renal cell carcinoma with 1 or more of these interventions:

**Surgery**

Nephrectomy, removing part or all of the kidney surgically, is a common treatment for renal cell carcinoma. There are several types of nephrectomy procedures that doctors may perform. Doctors choose a surgical procedure based on the severity of renal cell carcinoma and other health considerations. The following are 4 surgical procedures your doctor may recommend:

- **Simple nephrectomy**—Only the kidney is removed. This is often the most appropriate procedure for people with Stage I renal cell carcinoma.

- **Partial nephrectomy**—Only the portion of the kidney that contains a tumor is removed. This may be the most suitable treatment for patients who only have 1 kidney or renal cell carcinoma in both kidneys, and for patients with small tumors less than 4 centimeters in size.
• **Radical nephrectomy**—The kidney, adrenal gland, and some of the tissue around the kidney are removed. The surgeon may also remove portions of the nearby lymph nodes.

• **Ablation**—This treatment uses extreme heat or cold to destroy tumor tissue. Ablation procedures that involve heat are called radio frequency ablation (RFA) procedures. Methods that use cold are called cryoablation procedures. To perform these procedures, one or more needles are inserted through the skin and guided into the tumor. Doctors may use a CT or ultrasound machine to help them see the tumor and needles more clearly. Once the needles are inside the tumor, destruction of the cells can be performed. For an RFA procedure, the RFA machine is switched on. Microwaves heat up and destroy the cancerous tissue around the needle. For a cryoablation procedure, the needles are cooled to below-freezing temperatures. This freezes and kills surrounding cancerous tissue.
Multikinase inhibitors

Multikinase inhibitors are medications that may slow or stop the growth of cancer cells. These therapies work by

• Interfering with the cycle that leads to cancer cell growth
• Disrupting the processes that create blood vessels that nourish tumors

Immunotherapy

Immunotherapy treatments are medications that help the body’s immune system fight off cancer cells. These treatments can work by doing any of the following:

• Helping the body create more white blood cells, that help fight off cancer cells
• Weakening cancer cells so they are easier for the body to destroy
• Removing the body’s chemical “roadblocks” that limit the immune system, to allow more cancer cells to be killed

Most cancer therapies can cause side effects. Only your doctor can determine which treatment is right for you.
Until a few years ago, immunotherapy was the only type of treatment for renal cell carcinoma. Now, many doctors only use immunotherapy in certain cases.\textsuperscript{9,18}

**Chemotherapy**

Chemotherapy uses medicines that kill or slow the growth of cancer cells. They are taken by mouth or intravenously. When these medicines enter the bloodstream, they can affect cancer cells throughout the body. Chemotherapy given this way is called systemic chemotherapy.\textsuperscript{20}

Chemotherapy can also be injected directly into the spine, an organ, or other area of the body. This is called regional chemotherapy. It mainly affects the cells closest to the area where the medicine is placed. The way people receive chemotherapy depends on the individual and the stage of cancer being treated.\textsuperscript{20,21}

Doctors may give people with renal cell carcinoma a chemotherapy treatment, although it is less common than in the past.\textsuperscript{8,9,22}
How you receive renal cell carcinoma treatment depends on the therapy your doctor decides will give you the most benefit. Listed below are the 3 most common ways people receive their treatment\textsuperscript{17,21}:

- **Intravenous (IV) infusion**—The medicine is contained in a bag or bottle. A thin tube connects the bag or bottle to a needle that is inserted into a vein. The medicine enters the bloodstream directly.

- **Orally**—The medication comes in the form of pills or tablets that are swallowed.

- **Subcutaneous (SC) injection**—The medicine is injected under the skin with a needle.
Depending on your condition and certain aspects of your lifestyle, an oral, IV, or SC injection therapy might be right for you. Some factors you and your doctor may consider when selecting a treatment include:

- If getting to a treatment center poses an obstacle for you
- How confident you are that you will remember to take pills or tablets each day
- If you prefer to have extra opportunities for face-to-face support from your health care team
- Side effects of treatment options and how they may impact you and your other medical conditions
- Whether treatment is covered by your insurance
Working with your health care team

When making treatment decisions, it may help to discuss what kind of treatment may be best for you. You should talk with your cancer care team, including your doctor and nurse. Also, make sure your other doctors, including your primary care physician, are aware of your cancer treatment.

Remember, you can talk with your health care team at every step of your therapy about:
• Side effects that your treatment may cause
• Ways to manage side effects
• How they think you are responding to your treatment

Questions you may want to ask your doctor before or during renal cell carcinoma treatment

Q What stage is my renal cell carcinoma?
A

Q Has the cancer spread beyond the kidney?
A

Q What are my treatment choices?
A

Q What treatment do you think is best for me and why?
A

Q What results can I expect from treatment?
A

Q What side effects and/or risks are associated with my treatment?
A
Q How will treatment affect my daily life?
A ________________

Q When will treatment begin/end?
A ________________

Q How long will my treatment last?
A ________________

Q Will I need to stay in the hospital?
A ________________

Q How much will the treatment cost?
A ________________

Q Does my insurance company cover my treatment?
A ________________

Q How will I feel during my treatment?
A ________________

Q What can I do to take care of myself during treatment?
A ________________

Q How does my treatment work?
A ________________

Q Will I need additional medications to control side effects?
A ________________

Q How will treatment affect my daily life?
A ________________

Q When will treatment begin/end?
A ________________
If you are having a biopsy, you may want to ask:

**Q** Why do I need a biopsy?
**A**

**Q** How long will it take?
**A**

**Q** Will I be awake during the procedure?
**A**

**Q** Are there risks with this procedure?
**A**

Before having surgery, you may want to ask:

**Q** Why do you recommend this particular operation?
**A**

**Q** What risks are involved with this surgery?
**A**

**Q** Are there long-term consequences associated with this surgery?
**A**

**Q** Do I need to first store blood in case I need a transfusion later?
**A**
Q How long do I need to stay in the hospital?
A

Q When can I resume my everyday activities?
A

Q After the surgery, will I need to have dialysis?
A

Q How can I expect to feel when the operation is over?
A
Your doctor is there to help you achieve the best results with your renal cell carcinoma treatment plan. That’s why, depending on your condition, he or she may recommend you take part in a clinical trial. This is a medical study to test new cancer treatments. Clinical trials help doctors learn about treating renal cell carcinoma and potential new treatments. Enrolling in one gives you the chance to be among the first patients who might benefit from new treatment options.

But remember, like all cancer treatments, the medications available through clinical trials may be associated with certain health risks. It’s important to speak with your doctor about the risks involved with clinical trials. Not all patients in clinical trials receive the treatments being studied or respond well to treatment. Only your doctor can help you decide if a clinical trial is right for you.
It’s important to keep in mind the positive impact your friends and family can have during these challenging times.

Everyone who cares for you would like to contribute to your treatment plan and help you succeed with treatment. By asking for help, you allow them to play a positive role in your life.

**Suggestions for how to reach out**

- Ask for help getting to and from appointments if you feel too sick to drive or go by yourself
- Have someone be a designated “reminder person” to help you keep track of medical appointments or dosing schedules
- Ask for help doing household chores that may become tiring, such as laundry, washing dishes, and other daily cleaning or maintenance activities
- Bring someone to your medical visits to take notes when speaking with members of your health care team. This may help you follow medical instructions more accurately
• Ask for help shopping for groceries if you do not feel well enough to walk for long periods of time. Depending on where you live, some grocery stores may offer delivery service.

• Have someone make phone calls to your health care team and ask questions on your behalf. They can also help with calls to your insurance provider or to the counselors available through cancer-support organizations.

• Ask someone to help you participate in support group events or meetings. They can provide a ride when you don’t feel well enough to drive or get there by yourself. You may also want to check if there are nonprofit organizations or churches in your area that offer free transportation.
Renal cell carcinoma and the potential side effects of treatment can be taxing on the body. Leading a healthy lifestyle may help you ensure your body has the resources it needs to cope. The tips listed below are a great place to begin. However, you should always check with your doctor before making any changes to your routine.

- **Eat healthy and maintain a healthy weight**—Keep a balanced diet that includes fresh fruits, vegetables, whole grains, and high-fiber foods. Avoid foods that are high in fat and salt. Ask your health care team if there are any foods you should avoid based on your treatment.

- **If you smoke, try to stop**—Smoking puts an added strain on your body and may increase any mouth and throat problems. Your doctor may have resources to help.

- **Avoid excess alcohol**—Alcohol can make side effects of certain treatments worse.
• Stay active when able—Depending on your condition, exercise and an active lifestyle may be beneficial. Talk to your doctor to find out what activities are right for you.

• Rest—Allow yourself to rest whenever needed and try to get at least 7 to 8 hours of sleep each night.

• Relax with low-impact activities—Playing a board game with a friend or loved one, meditation, and reading are examples of activities that don’t require a lot of physical strain.

• Speak your mind—Talk about your feelings with your friends and family, or even your health care team. It may help reduce anxiety about your condition.

Each person’s needs may be different. Always be sure to follow your doctor’s advice about what is appropriate for you and ask questions if you are unsure.
Cancer resources

Below and on the following pages are some organizations that may have information or other helpful resources for patients or their caregivers. Pfizer is not responsible for any content provided by these independent organizations.

Kidney Cancer Association® (KCA)

- A support group consisting of patients, families, and health care professionals who have experience with renal cell carcinoma
- Practical advice for living with your condition
- Information to help you connect with others in the same situation

To contact the KCA
- Call 1-847-332-1051
- Visit www.kidneycancer.org

National Cancer Institute® (NCI)

- Facts about renal cell carcinoma, treatment options, and clinical trials
- Information about paying for treatment
- Tips for finding support groups
- Information about selecting the right hospice or home care

To contact the NCI
- Call 1-800-422-6237
- Visit www.cancer.gov

The National Comprehensive Cancer Network® (NCCN)

- Guidelines that doctors use to choose treatment
- Listings of clinical trials that are currently enrolling
- Listings of cancer-oriented hospitals

To contact the NCCN
- Call 1-215-690-0300
- Visit www.nccn.com
Cancer Support Community®

- 50 Cancer Support Community affiliates, including Gilda’s Clubs and Wellness Communities
- Online support groups

To contact the Cancer Support Community
- Call 1-888-793-9355
- Visit www.cancersupportcommunity.org

American Cancer Society® (ACS)

- Information and resources for cancer patients, caregivers, and survivors
- Find support programs and services in your area
- Updates on cancer research and clinical trials
- Information about cancer treatment therapies and side effects

To contact the ACS
- Call 1-800-227-2345
- Visit www.cancer.org

CancerCare®

- Advice and counseling about coping with renal cell carcinoma
- Information about your condition
- Free financial counseling

To contact CancerCare
- Call 1-800-813-4673
- Visit www.cancercare.org
Cancer Hope Network

• Support services for people living with cancer
• Helps patients connect one-on-one with cancer survivors

To contact the Cancer Hope Network
• Call 1-877-467-3638
• Visit www.cancerhopenetwork.org

CaringBridge®

• Provides customizable Web sites for people with serious illness
• Friends and family members can offer to help with challenges listed on a person’s Web site
• Allows loved ones to post inspirational messages and stay up-to-date about health status

To contact CaringBridge
• Call 1-651-789-2300
• Visit www.caringbridge.org

Cancer.Net™

• Provides doctor-approved cancer information
• Offers practical advice for coping with cancer
• Includes valuable information for caregivers

To contact Cancer.Net
• Call 1-888-651-3038
• Visit www.cancer.net
LIVESTRONG™ — the Lance Armstrong Foundation

- Offers one-on-one support for anyone affected by cancer
- Provides resources to help patients transition to life during and after a cancer diagnosis
- Brings evaluated, sustainable programs to local organizations

To contact LIVESTRONG
- Call 1-866-673-7205
- Visit www.LIVESTRONG.org

Today’s Caregiver (online magazine)

- Provides articles and advice about common caregiver-related issues
- Web site has state-by-state listings of caregiver resources
- Offers a free weekly newsletter

To contact Today’s Caregiver
- Call 1-800-829-2734
- Visit www.caregiver.com

Family Caregiver Alliance® (FCA)

- Offers free information and publications for caregivers
- Hosts caregiver workshops and training sessions
- State-by-state listings of caregiver-related programs and resources

To contact the FCA
- Call 1-800-445-8106
- Visit www.caregiver.org
As you continue with your renal cell carcinoma treatment, it may help to keep a journal for yourself or post a blog online for others to read. These are ways to share your experience. You may find that a journal is useful during medical appointments. It can help you review and explain your symptoms to your doctor. Many people with a serious illness are able to connect with others who are facing similar issues through online blogging communities.

The questions and topics listed below may be useful when starting a journal or blog entry:

- **How am I feeling today?**
- **What side effects or symptoms are present today?**
- **Things to remember for my next appointment**
- **What has been educational or inspirational today?**

**References:**
Glossary of common cancer terms

As you learn about renal cell carcinoma, you may come across terms that are not familiar to you. The following is a list of cancer terms. Your doctor may use these or you may see them in informational materials.

**Adrenal glands (uh-DREE-nul):** A pair of small glands; one sits above each kidney. These glands create hormones to help control vital functions such as heart rate, blood pressure, and how the body processes food.10

**Angiogenesis (an-jee-o-JEN-eh-sis):** The development of new blood vessels. The development of new blood vessels that tumors require for growth is called tumor angiogenesis.10

**Hypertension (HY-per-TEN-shun):** Blood pressure that is too high.10

**Intravenous therapy (IV) (IN-truh-VEE-nus):** Treatment that is provided through a blood vessel.10

**Karnofsky Performance Status (KPS) (karn-OFF-skee):** A standard measure of the ability of people with cancer to perform ordinary tasks.10

**Kidneys (KID-nees):** A pair of organs located in the abdomen. The kidneys filter waste materials from the bloodstream and create urine to carry the waste out of the body.10

**Lactate dehydrogenase (LACK-tate dee-HI-DROJ-en-ace):** An enzyme found in the blood and other body tissues involved in energy production in cells.10

**Lymph nodes (limf nodes):** Small ball-shaped organs located throughout the body that filter out foreign particles and help produce the white blood cells that help the body fight infection.10

**Metastasis (meh-TAS-tuh-sis):** The spreading of cancer to areas other than where it began.10
Metastatic renal cell carcinoma (mRCC) (meh-tuh-STA-tik): Renal cell carcinoma that has spread from the kidney to other parts of the body.¹⁰

Overall survival rate: The percentage of patients who are alive for a certain length of time after being diagnosed with or beginning treatment for cancer. Overall survival is often used to measure the benefits of treatments that are being researched.¹⁰

Pancreas (PAN-kree-us): An organ located at the back of the abdomen. The pancreas produces juices that help digest food. It also creates insulin, a chemical that helps balance the amount of sugar in the blood.¹⁰

Prognosis (prog-NO-sis): A medical opinion about the likely outcome of a condition.¹⁰

Progression-free survival (PFS): The length of time during and after treatment that a patient lives with a disease that does not worsen. PFS is sometimes used in clinical studies to measure the benefits of treatment.¹⁰

Proliferation (proh-LIH-fuh-RAY-shun): The rapid division of cells to form new cells.¹⁰

Renal arteries (REE-nuhl AR-tuh-rees): A pair of major blood vessels that carry blood to the kidneys, the adrenal glands, and ureters.¹⁰

Renal cell carcinoma (RCC) (REE-nuhl cell KAR-sih-NOH-muh): The most common type of kidney cancer.¹⁰

Tumor (TOO-mer): A mass of cells.¹⁰

Ureters (YER-eh-ters): The tubes that carry urine to the bladder from the kidneys.¹⁰

von Hippel-Lindau syndrome (VHL syndrome) (vahn HIP-uhl LIN-dow): A disorder in which blood vessels do not form correctly in the brain, eyes, adrenal glands, spinal cord, or other areas of the body. This syndrome is rare and inherited. People with VHL syndrome have a higher risk of developing renal cell carcinoma.¹⁰

Wedge resection (wej ree-SEK-shun): Surgical removal of a triangle-shaped slice of tissue. This procedure is sometimes used to take out a tumor and some of the healthy tissue surrounding it.¹⁰
Use the space below to record information that you may want to keep close at hand during your treatment.

My primary care doctor’s information
Name: _____________________ Phone #:_______________ E-mail:__________________

My oncologist’s information
Name: _____________________ Phone #:_______________ E-mail:__________________

My nurse’s information
Name: _____________________ Phone #:_______________ E-mail:__________________

Contact information for my cancer center/hospital
Name of facility: _____________________________ Phone #:________________
E-mail:________________________ Address:_______________________________________

Contact information for my pharmacy
Name of pharmacy: _____________________________ Phone #:________________
E-mail:________________________ Address:_______________________________________

My transportation contact
Name: _____________________ Phone #:_______________ E-mail:__________________

Important instructions from my doctor
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

My current medicines
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________