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Kidney Cancer Early Detection, Diagnosis, and Staging

Know the signs and symptoms of kidney cancer. Find out how kidney cancer is tested for, diagnosed, and staged.

Detection and Diagnosis

Catching cancer early often allows for more treatment options. Some early cancers may have signs and symptoms that can be noticed, but that is not always the case.

- [Can Kidney Cancer Be Found Early?](#)
- [Kidney Cancer Signs and Symptoms](#)
- [Tests for Kidney Cancer](#)

Stages and Outlook (Prognosis)

After a cancer diagnosis, staging provides important information about the extent of cancer in the body and anticipated response to treatment.

- [Kidney Cancer Stages](#)
- [Survival Rates for Kidney Cancer](#)

Questions to Ask About Kidney Cancer

Here are some questions you can ask your cancer care team to help you better understand your cancer diagnosis and treatment options.

- [Questions to Ask About Kidney Cancer](#)

Can Kidney Cancer Be Found Early?

Many kidney cancers are found while they are still just in the kidney, but others are found at a more advanced stage. There are a few reasons for this:

- Sometimes these cancers can grow quite large without causing any pain or other problems.
- Because the kidneys are deep inside the body, small kidney tumors cannot be seen or felt during a physical exam.
- There are no recommended screening tests for kidney cancer for people at average risk.
- [For people at average risk of kidney cancer](#)
- [For people at increased risk of kidney cancer](#)
- [Genetic counseling and testing for people who might be at increased risk of kidney cancer](#)

For people at average risk of kidney cancer

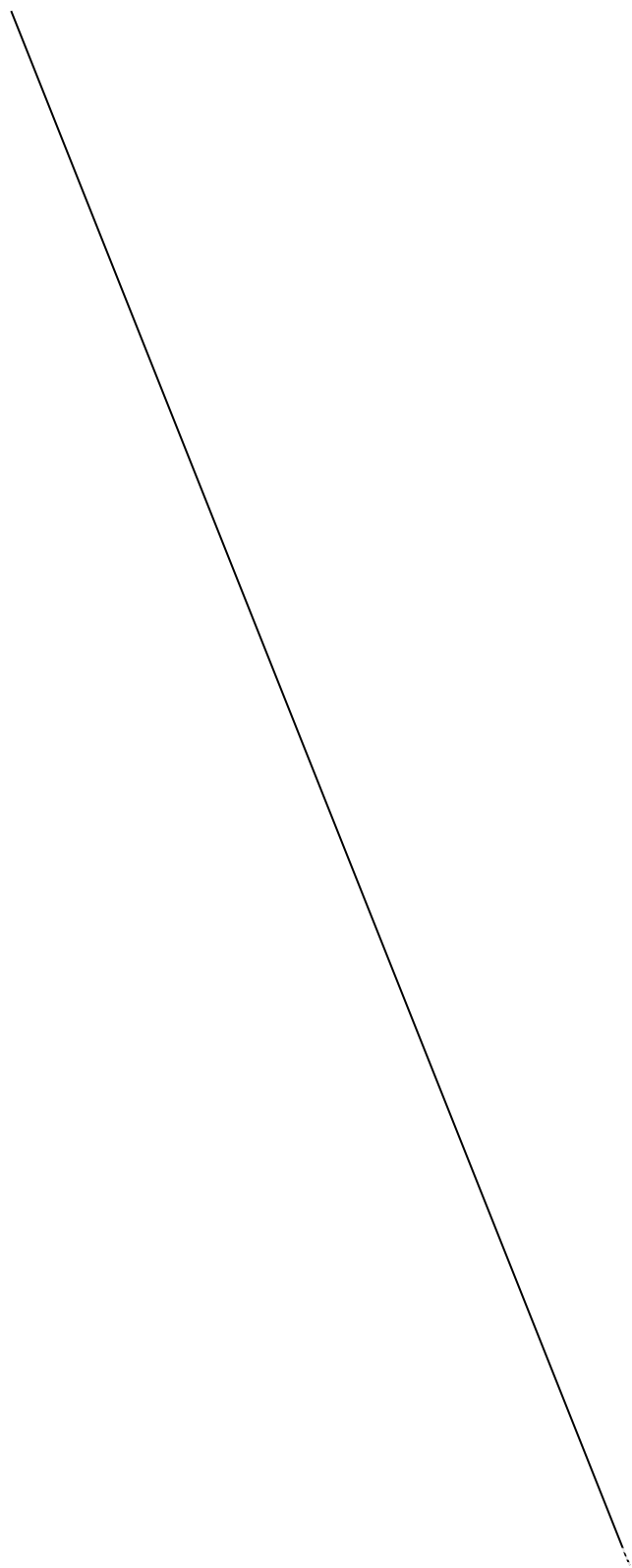
Some tests can find some kidney cancers early, but none of these is recommended to screen for kidney cancer in people at average risk.

A routine **urine test (urinalysis)**, which is sometimes part of a medical checkup, might find small amounts of blood in the urine of some people with early kidney cancer. But blood in the urine can also have other causes, including urinary tract or bladder infections, bladder cancer, and benign (non-cancerous) kidney conditions such as kidney stones. Sometimes people with kidney cancer don't have blood in their urine until the cancer is quite large or has already spread to other parts of the body.

[Imaging tests](#)¹ such as computed tomography (CT) scans and magnetic resonance imaging (MRI) can often find small kidney cancers. But these tests can be time consuming and expensive. Ultrasound is less expensive and can also detect some early kidney cancers. But it's not clear that the benefits of screening for kidney cancer with any of these tests would outweigh the possible downsides. Another issue with these types of tests is that they can't always tell benign tumors from small kidney cancers. This could mean that a person might need to get other types of tests, such as a biopsy, even if it turns out they don't have kidney cancer.

Often, kidney cancers are found by accident when imaging tests are done for some other reason. These cancers usually are not causing pain or other symptoms when they are found. The survival rate for these kidney cancers is very high because they are usually found at a very early stage.

For people at increased risk of kidney cancer



have one of these conditions, but it does not mean that you have (or definitely will get) kidney cancer. For more information on genetic testing, see [Genetic Testing for Cancer Risk](#)³.

Hyperlinks

1. www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests.html
2. www.cancer.org/cancer/types/kidney-cancer/causes-risks-prevention/risk-factors.html
3. www.cancer.org/cancer/understanding-cancer/genes-and-cancer/genomic-genetic-testing.html

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Kidney Cancer Signs and Symptoms

Early kidney cancers often don't cause any signs or symptoms, but larger or more advanced ones might. Some possible signs and symptoms of kidney cancer include:

- Blood in the urine (hematuria)
- Low back pain on one side (not caused by injury)
- A mass (lump) on the side or lower back
- Fever that is not caused by an infection and that doesn't go away
- [Fatigue](#)¹ (feeling very tired)
- [Loss of appetite](#)²
- [Weight loss](#)³
- [Anemia](#)⁴ (low red blood cell counts)

These signs and symptoms can be caused by kidney cancer (or another type of cancer), but more often they are caused by other, benign (non-cancerous) diseases. For example, blood in the urine is most often caused by a bladder or urinary tract infection or a kidney stone. Still, if you have any of these symptoms, see a doctor so that the cause can be found and treated, if needed.

Hyperlinks

1. www.cancer.org/cancer/managing-cancer/side-effects/fatigue.html
2. www.cancer.org/cancer/managing-cancer/side-effects/eating-problems/poor-appetite.html
3. www.cancer.org/cancer/managing-cancer/side-effects/eating-problems/weight-changes.html
4. www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts/anemia.html

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Last Revised: May 1, 2024

Tests for Kidney Cancer

Kidney cancer (also known as renal cell cancer, or RCC) might be found because of [signs or symptoms](#) a person is having, or it might be found because of lab tests or imaging tests a person is getting for some other reason.

The actual diagnosis of kidney cancer is made by looking at a sample of kidney cells in the lab or sometimes by how the kidney looks on an imaging test.

If you think you have possible signs or symptoms of kidney cancer, it's important to see a doctor.

- [Medical history and physical exam](#)
- [Blood tests](#)
- [Urine tests](#)
- [Imaging tests to look for kidney cancer](#)
- [Kidney biopsy](#)

Medical history and physical exam

If you have any signs or symptoms that suggest you might have kidney cancer, your doctor will want to take your complete **medical history** to check for possible risk factors and to learn more about your symptoms.

A **physical exam** can provide information about possible signs of kidney cancer and other health problems you might have. For example, the doctor may be able to feel an abnormal mass (lump) when they examine your abdomen (belly).

If symptoms or the results of the physical exam suggest you might have kidney cancer, you will probably need to have certain tests. These might include lab tests, imaging tests, or biopsies of the kidney.

If kidney cancer is found, more tests might then be needed to help determine the [stage](#) (extent) of the cancer.

Blood tests

Lab tests can't show for sure if a person has kidney cancer, but they can sometimes give the first hint that there may be a kidney problem.

If cancer has already been diagnosed, blood tests are also done to get a sense of a person's overall health and to help tell if the cancer might have spread to other areas. They also can help show if a person is healthy enough to have surgery.

Complete blood count (CBC): This test measures the levels of different cells in the blood, which are often abnormal in people with kidney cancer. [Anemia](#)¹ (having too few red blood cells) is very common. Less often, a person may have too many red blood cells (called **polycythemia**). People with kidney cancer sometimes have high levels of blood platelets or of neutrophils, which are a type of white blood cell. Blood counts are also important to make sure a person is healthy enough for [surgery](#)².

Blood chemistry tests: These tests are often done in people who might have kidney cancer, because the cancer can affect the levels of certain chemicals in the blood. For example, high levels of calcium, lactate dehydrogenase (LDH), or liver enzymes are sometimes found. Levels of other chemicals, such as alkaline phosphatase, are also routinely tested. Blood chemistry tests also measure kidney function, which is especially important if certain imaging tests or if surgery is planned.

Urine tests

Your urine may be tested if your doctor suspects a kidney problem.

Urinalysis: This test looks at the levels of different chemicals and proteins in a urine sample. The samples can also be checked for red or white blood cells and other substances that can't be seen with the naked eye. Many people with kidney cancer will have blood in their urine, sometimes in very small amounts. Other parts of this test can help show how well the kidneys and some other organs are working.

Urine cytology: If an imaging test (see below) shows that a person has a tumor in the renal pelvis (the middle part of the kidney, which is attached to the ureter), a test called **urine cytology** might be done. This test looks for cancer cells in the urine.

Imaging tests to look for kidney cancer

Imaging tests use x-rays, magnetic fields, sound waves, or radioactive substances to create pictures of the inside of your body. Imaging tests might be done for a number of reasons, such as:

- To look for tumors in people who have symptoms or abnormal test results that might be from kidney cancer
- To help guide a needle biopsy (see below)
- To learn how far a kidney cancer has spread
- To help determine if treatment is working
- To look for possible signs of cancer coming back (recurring) after treatment

Unlike most other types of cancer, doctors can sometimes diagnose kidney cancer with a fair amount of certainty using only imaging tests, without needing a biopsy (removing a sample of the tumor). But this isn't always the case, and often people need a biopsy to make sure their diagnosis is correct.

Computed tomography (CT) scan

A [CT scan](#)³ uses x-rays to make detailed cross-sectional images of your body. A CT scan of the abdomen (belly) can provide precise information about the size, shape, and location of a kidney tumor. CT scans can also show if a cancer has spread to nearby lymph nodes or to other parts of the body, such as the lungs.

A special type of CT scan, known as **CT angiography**, might sometimes be done to get a better look at the blood vessels around the kidney.

CT-guided needle biopsy: If a kidney biopsy is needed, this test can also be used to guide a biopsy needle into the mass (lump) to get a sample to check for cancer.

When a CT is done to look at the kidneys, an IV (intravenous) contrast dye is often needed to make certain areas stand out better on the scan. This could cause problems in people whose kidneys aren't working well in the first place, so another type of imaging test, such as an ultrasound or MRI, might be done instead. Your kidney function will be checked with a blood test before you get a CT scan with IV contrast.

Magnetic resonance imaging (MRI)

[MRIs](#)⁴ use radio waves and strong magnets to create detailed images of the body. MRIs

aren't usually the first imaging test done to look for kidney cancer, but they may be done:

- If a person can't get the contrast dye for a CT scan because they have an allergy to it or they don't have good kidney function.
- If there's a chance that the cancer has grown into major blood vessels in the abdomen, like the inferior vena cava. (MRIs provide a better picture of blood vessels than CT scans.)
- To look at abnormal areas in the brain and spinal cord that might be due to cancer spread.

A special type of MRI, known as **MR angiography**, might sometimes be done to get a better look at the blood vessels around the kidney.

Ultrasound

[Ultrasound](#)⁵ uses sound waves and their echoes to create pictures of organs in the body. It can help find a kidney mass and show if it is solid or filled with fluid. (Solid masses are more likely to be tumors.) Different ultrasound patterns can also help doctors tell the difference between some types of benign and malignant (cancerous) kidney tumors.

Ultrasound-guided needle biopsy:

increased calcium or alkaline phosphatase level.

Kidney biopsy

For most other types of cancer, a biopsy is needed to confirm the diagnosis. During a [biopsy](#)⁸, small pieces of a suspicious area are removed and checked in the lab for cancer cells.

But if kidney cancer is suspected, imaging tests can often provide enough information for a surgeon to decide if surgery is needed. The diagnosis is then confirmed when part or all of the kidney is removed and is looked at in the lab.

There are some situations in which a kidney biopsy might be needed:

usually grow and spread slowly and tend to have a good prognosis (outlook).

- **Grade 4** renal cell cancers look very different from normal kidney cells. These cancers tend to have a worse prognosis.

The kidney cancer's grade is one of the factors in deciding on a treatment.

Hyperlinks

1. www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts/anemia.html
2. www.cancer.org/cancer/types/kidney-cancer/treating/surgery.html
3. www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/ct-scan-for-cancer.html
4. www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/mri-for-cancer.html
5. www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests/ultrasound-for-cancer.html
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9. www.cancer.org/cancer/types/kidney-cancer/treating/active-surveillance.html
10. www.cancer.org/cancer/types/kidney-cancer/treating/ablation.html
11. www.cancer.org/cancer/types/kidney-cancer/about/what-is-kidney-cancer.html

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Kidney Cancer Stages

After someone is diagnosed with kidney cancer, doctors will try to figure out whether it has spread, and if so, how far. This process is called **staging**. The stage describes how much cancer is in the body. It helps determine how serious the cancer is and how best to treat it. Doctors also use a cancer's stage when talking about survival statistics.

- [How is the kidney cancer stage determined?](#)
- [Kidney cancer stages](#)
- [Prognostic systems for advanced kidney cancer](#)

How is the kidney cancer stage determined?

The stages of kidney cancer range from I (1) through IV (4).

- The lower the number, the less the cancer has spread.
- A higher number, such as stage IV, means cancer has spread more.

Although other factors can also be important, cancers with similar stages tend to have a similar outlook and are often treated in much the same way.

The stage of a kidney cancer can be determined in 2 ways:

The **clinical stage** is based on the results of physical exams, imaging tests, and any biopsies that have been done (see [Tests for Kidney Cancer](#)). The clinical stage can be helpful in determining treatment options.

If surgery is done, the **pathological stage** (also called the **surgical stage**) can be

determined. This is based on the information above, as well as what is learned about the cancer by examining tissue removed during the operation.

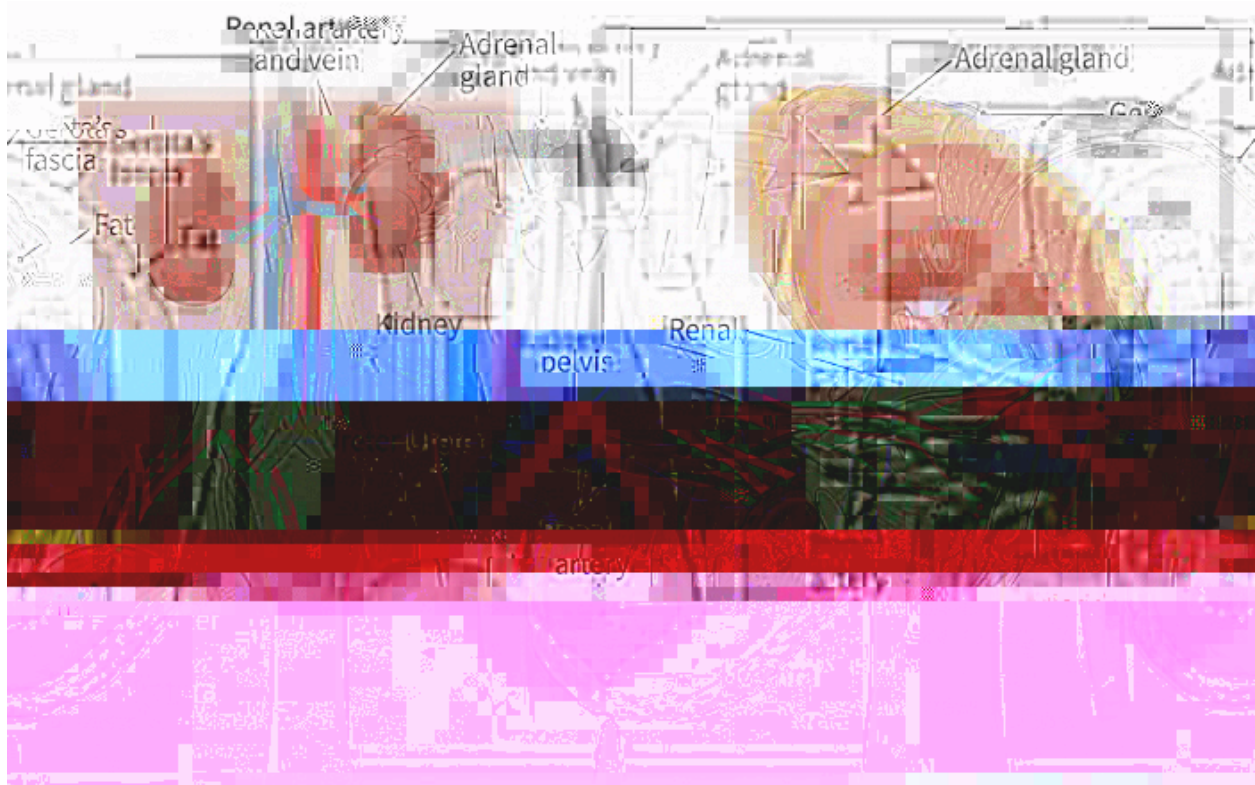
The clinical and pathological stages for kidney cancer are the same, but it's possible that the stage might change after surgery is done. For example, surgery might show that the cancer has spread farther than what was seen on imaging tests. If this is the case, the pathological stage might be higher than the clinical stage.

The staging system most often used for kidney cancer is the American Joint Committee on Cancer (AJCC) **TNM** system. The TNM system is based on 3 key pieces of information:

- The size and extent of the main (primary) **tumor (T)**: How large is the tumor? Has it has grown into nearby areas?
- The spread to nearby lymph **nodes (N)**: Has the cancer spread to nearby lymph nodes?
- The spread (**metastasis**) to distant sites (**M**): Has the cancer spread to other organs such as the bones, brain, or lungs?

cava.

- **Inferior vena cava:** The large vein that carries blood from the lower parts of the body back up to the heart.



Stage	Stage grouping	Stage description*
I	T1 N0 M0	The main tumor is no more than 7 centimeters (7 cm; a little less than 3 inches) across and is only in the kidney (T1). The cancer

III	N0 or N1 M0	

The two systems that are commonly used are the **Memorial Sloan Kettering Cancer Center (MSKCC)** model and the **International Metastatic Renal Cell Carcinoma Database Consortium (IMDC)** criteria.

These two systems use 5 or 6 factors to put people into low-, intermediate-, and high-risk groups.

The factors in the MSKCC system include:

- High blood lactate dehydrogenase (LDH) level
- High blood calcium level
- Anemia (low red blood cell count)
- Less than a year from diagnosis to the need for systemic treatment ([targeted therapy](#)², [immunotherapy](#)³, or [chemotherapy](#)⁴)
- Poor performance status (a measure of how well a person can do normal daily activities)

The factors in the **IMDC** system include:

- High neutrophil count
- High blood platelet cell count
- High blood calcium level
- Anemia (low red blood cell count)
- Less than a year from being diagnosed to needing systemic treatment (targeted therapy, immunotherapy, or chemotherapy)
- Poor performance status (a measure of how well a person can do normal daily activities)

For each system, people with:

Hyperlinks

1. www.cancer.org/cancer/diagnosis-staging/staging.html
2. www.cancer.org/cancer/types/kidney-cancer/treating/targeted-therapy.html
3. www.cancer.org/cancer/types/kidney-cancer/treating/immunotherapy.html
4. www.cancer.org/cancer/types/kidney-cancer/treating/chemotherapy.html

References

American Joint Committee on Cancer. Ch. 60 - Kidney. In: *AJCC Cancer Staging Manual*. 8th ed. New York, NY: Springer; 2017.

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Survival Rates for Kidney Cancer

Survival rates can give you an idea of what percentage of people with the same type and stage of cancer are still alive a certain amount of time (usually 5 years) after they were diagnosed. They can't tell you how long you will live, but they may help give you a better understanding of how likely it is that your treatment will be successful.

- [What is a 5-year relative survival rate?](#)
- [Where do these numbers come from?](#)

Keep in mind that survival rates are estimates and are often based on previous outcomes of large numbers of people who had a specific cancer, but they can't predict what will happen in any particular person's case. These statistics can be confusing and may lead you to have more questions. Ask your doctor how these numbers might apply to you.

What is a 5-year relative survival rate?

A **relative survival rate** compares people with the same type and stage of kidney cancer to people in the overall population. For example, if the **5-year relative survival rate** for a specific stage of kidney cancer is 80%, it means that people who have that cancer are, on average, about 80% as likely as people who don't have that cancer to live for at least 5 years after being diagnosed.

Where do these numbers come from?

The American Cancer Society relies on information from the Surveillance, Epidemiology, and End Results (SEER) database, maintained by the National Cancer Institute (NCI), to provide survival statistics for different types of cancer.

The SEER database tracks 5-year relative survival rates for kidney cancer in the United States, based on how far the cancer has spread. The SEER database, however, does not group cancers by [AJCC TNM stages](#) (stage 1, stage 2, stage 3, etc.). Instead, it groups cancers into localized, regional, and distant stages:

- **Localized:** There is no sign that the cancer has spread outside of the kidney.
- **Regional:** The cancer has spread outside the kidney to nearby structures or lymph nodes.
- **Distant:** Includes cancers that have spread to distant parts of the body such as the

lungs, brain, or bones.

5-year relative survival rates for kidney cancer

Based on people diagnosed with cancers of the kidney (or renal pelvis) between 2013 and 2019. or renal pelvis) between 13 yoo /GS70m0 0tween

SEER*Explorer: An interactive website for SEER cancer statistics [Internet]. Surveillance Research Program, National Cancer Institute. Accessed at <https://seer.cancer.gov/explorer/> on February 23, 2023.

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Questions to Ask About Kidney Cancer

It's important to have honest, open discussions with your cancer care team. They want to answer all your questions, so that you can make informed treatment and life decisions. For instance, consider these questions:

- [When you're told you have kidney cancer](#)
- [When deciding on a treatment plan](#)
- [During treatment](#)
- [After treatment](#)

When you're told you have kidney cancer

- What [type of kidney cancer](#)¹ do I have?
- Where is the cancer located?
- Has the cancer spread beyond where it started?
- What is the [stage](#) of the cancer, and what does that mean for me?
- Will I need other [tests](#) before we can decide on treatment?
- Do I need to see any other doctors or health professionals?
- Is there a chance I have an inherited condition that increased my risk of kidney cancer? Should I consider genetic testing?
- If I'm concerned about the costs and insurance coverage for my diagnosis and

treatment, who can help me?

When deciding on a treatment plan

- What are my [treatment options](#)²?
- What do you recommend and why?
- Does my cancer need to be treated right away, or can it be [watched closely](#)³ ?
- How much experience do you have treating this type of cancer?
- Should I get a [second opinion](#)⁴? How do I do that? Can you recommend a doctor or cancer center?
- What would the goal of treatment be?
- How quickly do we need to decide on treatment? What should I do to be ready for treatment?
- How long will treatment last? What will it be like? Where will it be done?
- What risks or side effects are there to the treatments you suggest? Are there things I can do to reduce the side effects?
- How might treatment affect my daily activities? Can I still work full time?
- What are the chances the cancer will recur (come back) with these treatment plans?

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- If I start to feel overwhelmed, depressed, or distressed, can you suggest a mental health professional I can see?
- What if I need some social support during treatment?

After treatment

- Do I need to follow a special diet after treatment?
- Are there any limits on what I can do?
- What symptoms should I watch for?
- What type of [follow-up](#)⁶ will I need after treatment?
- How often will I need to have follow-up exams and imaging tests?

How will we know if the cancer has come back? /G tests?|||58.25j 0 g 1 0 0 1 95.6F2 12 in0 0 wi,s

