

Kidney tumour: What to do?

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If you or a loved one has been diagnosed with a kidney mass, it's important to remember that not all lesions are actually cancer. Most lesions are found accidentally and early before they can spread elsewhere.

Anatomy: Where are the kidneys?

Kidneys are located at the back of your abdomen close to the spine and are protected from injury by the bottom of your rib cage. Most people have two kidneys, one for each side.

Physiology: What do kidneys do?

Kidneys filter blood and remove waste products from your body as well as water. They measure vital minerals and make sure the body maintains the correct amount by re-absorbing or excreting them. They also make hormones which stimulate red blood cell production (erythropoietin), regulate blood pressure (renin) and maintain calcium levels in the blood (calcitriol).

What is a renal mass?

The word RENAL refers to the kidney itself and is a synonym for kidney. The word MASS is vague and interchangeable with the words lesion, tumour or neoplasm (meaning new growth in Latin). So a renal mass is a lesion that arises from the kidney which could be many things including cancer.

What could a renal mass be?

Generally masses are divided into cancer or non-cancer (benign). An example of a benign tumour is an angiomyolipoma. This is a tumour that may grow locally, but is not a cancer. It is more common in women; the tumour can be at risk of bleeding if it grows past 4 cm.

What does renal cancer mean?

Renal cancer is a growth which starts in the kidney and can spread to other organs besides the one it started in. It can cause pain, other symptoms and, eventually, death.

Cancerous lesions are typically referred to as renal cell carcinoma (RCC). There are different types of RCC, but the most common type (70%) is called conventional RCC.

Presentation: How are renal masses found?

Incidentally found

Most renal masses (60–70%) are found in patients getting testing for other reasons, or incidentally. Most of these lesions are small renal masses that are defined as being less than 4 cm in size (1.5 inches roughly). Of these lesions, 20–30% turn out to be non-cancerous. Overall, most patients these days have no symptoms from the mass itself.

Symptomatic

Symptomatic means there are things a person notices that are actually caused by kidney cancer. Several decades ago, before CT (computed tomography) scans and ultrasound were widely used, kidney cancer would present as bleeding in the urine, a flank bulge or flank pain. Non-specific symptoms would include weight loss, feeling more tired than usual or fever.

Epidemiology: Who gets kidney cancer?

In Canada, there are 5100 new cases of kidney cancer diagnosed a year. It is one of the top 10 most frequently diagnosed cancers in Western countries. The risk is higher, the older you get; it is also more common in men than women. African Canadians have higher risk than Caucasians, and the lowest risk is in Asians. A small percent (2–3%) of renal cancer is due to heredity. Patients in renal failure also have a higher chance of getting kidney cancer, especially those who have been on dialysis for a long time.

Modifiable Lifestyle Risk Factors

Smoking is a known and proven risk factor for kidney cancer. Obesity is also a likely risk factor.

Diagnosis

In most cases, the lesion was found through an ultrasound or computed tomography (CT) scan. To confirm the diagnosis, your doctor will ask you some questions, give you a physical exam, and have you undergo a urinalysis. To see if the cancer has spread elsewhere, an enhanced CT or MRI (magnetic resonance imaging), a scan done with dye injected into a vein, must be performed of the abdomen and pelvis. Additional testing with blood work and chest X-ray are also mandatory. If you have an unusual looking tumour or if you've had cancer in the past, a biopsy of the tumour is often done.

Renal masses are generally removed without a biopsy since most are cancerous. The diagnosis is suspected until it is confirmed by excision of the lesion.

How do we determine the stage?

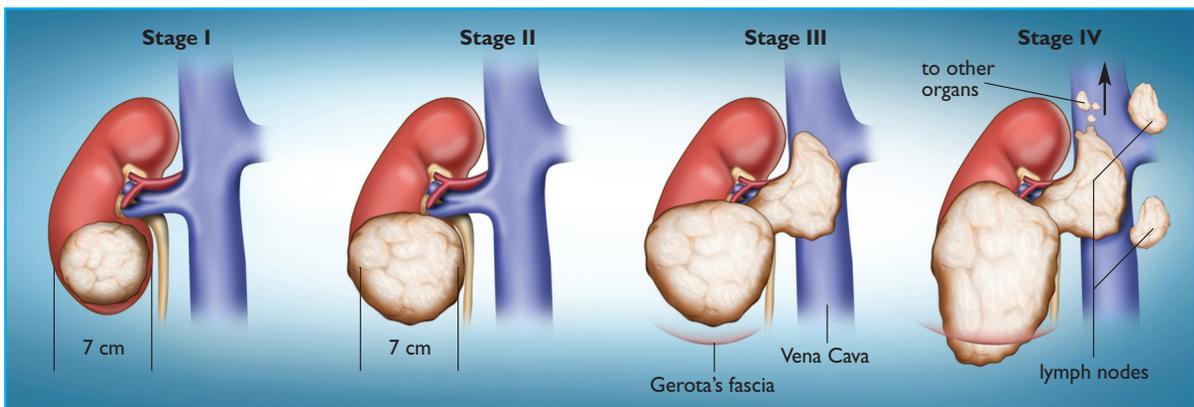
Staging refers to testing that determines the extent of spread of a kidney tumour. Clinical staging refers to the tests mentioned in the diagnosis section, while pathologic staging refers to the extent of the tumour seen under the microscope after the lesion is removed.

Stage I: the tumour is less than 7 cm and confined to the kidney

Stage II: the tumour is larger than 7 cm and confined to the kidney

Stage III: the tumour has spread to one or more local lymph nodes; or the tumour is in the vein leaving the kidney going towards the heart; or the tumour has spread to the fat around the kidney or the adrenal gland.

Stage IV: the kidney cancer has spread past the fat surrounding it, or has spread to other organs or distant lymph nodes



How do we determine the grade?

Once a tumour is removed, the pathologist (a doctor trained in making diagnoses based on tissue samples) gives the tumour a grade. Grading for kidney cancer is generally from 1–4 on what is referred to as a “Fuhrman Grade.” Grade 1 is the type that looks most similar to benign tissue, while Grade 4 is the most worrisome score.

Typically stage and grade will give your doctor a good sense of how often to follow up after treatment and on the likelihood of the cancer returning.

How is kidney cancer treated?

Surgery is the basic treatment. Kidney tumours are very resistant to radiation and traditional chemotherapy. Generally, the surgery is either a radical nephrectomy (removing the entire organ because of cancer) or partial nephrectomy (removing only part of the kidney).

The surgical approach is usually through an open incision near the ribs or through laparoscopic (keyhole) surgery.

Radical nephrectomy

Radical nephrectomy involves surgical removal of the entire kidney with its surrounding fat and traditionally, the adjacent adrenal gland. In the past, radical nephrectomy was considered the standard treatment and today continues to be an important option for patients with localized kidney cancer. It remains the standard surgery for patients with stage II tumours (>7 cm). It is also used in patients with smaller tumours that are not good candidates for a partial nephrectomy (removal of the tumour and a small amount of normal kidney tissue).

Radical nephrectomy can be performed via a traditional open approach involving an incision of about 10 cm either near or along a lower the rib or through the abdomen. Radical nephrectomy can also be performed through a laparoscopic approach (keyhole surgery).

The decision to use an open or laparoscopic approach depends on many factors including: tumour size, tumour location, and factors related to your overall medical condition. If possible, the laparoscopic approach is beneficial; it is less painful, has a shorter hospital stay, less blood loss, and better cosmetic results. Control of the cancer is equal in both approaches.

Depending on the stage or aggressiveness of the tumour, your doctor may decide to remove nearby lymph nodes or the adrenal gland (located next to the kidney) at the time of the radical nephrectomy.

Partial nephrectomy

Partial nephrectomy is the standard treatment for smaller kidney tumours (< 4 cm) in patients who have a single kidney, multiple tumours or are at risk of long-term kidney failure. It can also be used in well individuals with tumours <4 cm. This surgery removes the tumour and a small amount of surrounding kidney tissue. This surgery is not suitable for everyone and several factors must be considered including: your tumour size, location, invasiveness and your overall health.

In carefully selected patients, results of cancer control are equivalent when removing only part of the kidney compared to removing the entire kidney (radical nephrectomy). Partial nephrectomy offers benefits over radical nephrectomy in that it is able to preserve a greater amount of kidney tissue and therefore kidney function. Similar to radical nephrectomy, partial nephrectomy can be performed through either an open or a laparoscopic approach.

Ablative therapies

Other possible treatments for small tumours involve either burning or freezing the kidney tumour. This is considered a minimally invasive therapy and requires placing a needle through the skin into the tumour.

Imaging techniques, such as ultrasound or CT scanning, help to identify the tumour and place the needle. Ablative therapies are typically used for smaller tumours (<3 cm). Various methods of ablation are available; the most common are radiofrequency ablation (burning) and cryoablation (freezing). The benefit of these therapies are that compared to surgery, they are associated with less complications, cause less pain, and do not typically require an overnight stay in the hospital. These treatment strategies are ideal for patients with significant other medical problems that may be at greater risk for undergoing a more traditional surgical treatment. The chances of a tumour coming back after ablative therapies are higher than after surgical treatment, but still low at about 10%.

Active surveillance

Because we understand kidney tumours and have better techniques in imaging and biopsy, we now recommend simply following many of these tumours, with no intervention. With active surveillance, we do not actively treat the tumor, but instead we monitor it carefully with repeat imaging at regular intervals. These intervals are often shorter at the beginning and are extended as we become comfortable that the tumour is not growing rapidly.

In assessing your suitability for surveillance, you will often undergo biopsy so that we have a better understanding of the biology of the tumour. If there are concerning changes in the tumor, we can then proceed to active treatment. The benefit of this approach is that it can delay or avoid treatment in those who do not need it. On the other hand, the close monitoring allows us to identify tumours that may be more aggressive and to treat them when it is necessary. Many of these tumours grow slowly and will never significantly affect lifespan. Ideal candidates for this treatment strategy are patients with small, non-aggressive tumours or patients who have multiple medical problems that place them at greater risk for undergoing other active treatment strategies (surgery, ablative therapy).

Treatment of advanced (metastatic) kidney cancer

Kidney cancer is much more serious when the tumour spreads beyond the kidney. When kidney cancer has spread, you will often have symptoms and present with blood in your urine, pain, weight loss, diminished energy and other signs of being generally unwell.

If the cancer spreads, it most commonly does so through the bloodstream leading to new cancer spots in the lungs, liver, bone and other organs. Unfortunately one in five patients who are diagnosed with kidney cancer will present at an advanced stage. There is still a benefit in removing the tumour if you are still active and not bedridden, even if the tumour has spread. You may get an additional eight to 11 months of survival.

Surgery alone is inadequate and some form of drug therapy is needed. In the past, the mainstay of treatment for metastatic renal cell carcinoma was immunotherapy. These drugs boost your immunity to fight the cancer. Although some dramatic responses occurred, less than 10% of patients benefited from this approach. More recently, newer drugs have been developed to attack the tumour's ability to create its own blood supply. These drugs are called tyrosine kinase inhibitors or mTOR inhibitors. All of these drugs benefit specific patients. The exact combination that is used is based on the individual patient. Usually they are now administered by pills and have a very different side effect profile as compared to traditional chemotherapy.

Some additional therapies, including more surgery or radiotherapy, may benefit certain patients. Isolated disease that has spread to the liver, lung, or one other organ can be removed with a metastatectomy. However, the success of this surgery is variable, but usually low. Radiation treatment decreases pain and further growth of some kidney cancers that have spread to the bone, or are pressing on nerves.

Follow-up

The Canadian Kidney Cancer Forum reached an agreement on how to follow patients after surgery depending on the stage of the disease resected. This hopes to minimize radiation and unnecessary testing, but still maintain vigilance if there is a high chance of the tumour recurring. The table below summarizes their recommendations.

Table I.

	Months Post-op									
	3	6	12	18	24	30	36	48	60	72
pT1										
Hx & PE			x		x		x	x	x	x
Blood test			x		x		x	x	x	x
CXR			x		x		x	x	x	x
CT or U/S abd					x				x	
pT2										
Hx & PE		x	x	x	x	x	x	x	x	x
Blood test		x	x	x	x	x	x	x	x	x
CXR		x	x	x	x	x	x	x	x	x
CT or U/S abd			x				x		x	
pT3										
Hx & PE		x	x	x	x	x	x	x	x	x
Blood test		x	x	x	x	x	x	x	x	x
CXR		x	x	x	x	x	x	x	x	x
CT abd		x	x	x	x		x		x	
pTxN+										
Hx & PE	x	x	x	x	x	x	x	x	x	x
Blood test	x	x	x	x	x	x	x	x	x	x
CXR	x	x	x	x	x	x	x	x	x	x
CT abd	x	x	x	x	x	x	x	x	x	x

Hx & PE: history and physical examination
 Blood test: include complete blood count, serum chemistries, and liver function tests
 CXR: can be alternated with chest CT
 CT abd: can be alternated with abdominal ultrasound in pT1-2N0 patients
 * -if patient is symptomatic or abnormal blood test, earlier radiologic investigations may be indicated
 -follow-up beyond 72 months, refer to text for more details

pT1 and pT2 refer to pathologic (p) stage and are the same as Stage I and II. pT3 means the tumour spread outside of the kidney to the adrenal, or into the fat or the vein. pTxN+ refers to patients who had a positive lymph node and any T stage.

Remember this:

- Kidney cancer is now found sooner due to increased imaging for other reasons.
- Most patients have disease that is organ confined.
- Tumours are treated through surgery or ablative technologies (heating or freezing).
- Each approach has different pros and cons; discuss these with your doctor.
- Most patients have a good outcome and their disease usually does not return.

For more information:

Kidney Cancer Canada

<http://www.kidneycancer canada.ca/for-patients-and-caregivers/treatment-access-information/drugs-approved-by-health-canada-for-kidney-cancer/>

Canadian Cancer Society

<http://www.cancer.ca>

National Cancer Institute

<http://www.cancer.gov/cancertopics/pdq/treatment/renalcell/Patient/page2>

National Comprehensive Cancer Network

http://www.nccn.org/professionals/physician_gls/pdf/kidney.pdf

National Kidney and Urologic Diseases Information Clearinghouse

<http://kidney.niddk.nih.gov/kudiseases/pubs/yourkidneys/>