

# What Causes Kidney Cancer?



**IKCC**  
International  
Kidney Cancer  
Coalition



Like most cancers, kidney cancer is caused by mutations that accumulate over time in your body. Like most other cancers, kidney cancer most often arises in older people and it is mostly a disease seen in adults over 40. There are a number of other risk factors that are important in the development of kidney cancer:

- **Smoking:** Smoking doubles the risk of developing kidney cancer. Quitting at any time, at any age is a great idea. It's never too late.
- **Gender:** Men are twice as likely to be diagnosed with kidney cancer as women.
- **Obesity:** Being very overweight or obese appears to be associated with an increased risk of developing kidney cancer in both men and women.
- **High blood pressure (hypertension):** High blood pressure has been found to be a risk factor for kidney cancer.
- **Kidney stones:** Having kidney stones is associated with a higher risk of developing kidney cancer in men.
- **Occupational exposure to toxic compounds:** People regularly exposed to certain chemicals may have an increased risk of kidney cancer. These include asbestos, lead, cadmium, dry-cleaning solvents, herbicides, benzene or organic solvents and petroleum products, as well as people who work in the iron and steel industries.
- **Long-term dialysis and acquired cystic disease:** Being on dialysis treatment over a long period of time may cause kidney cysts. Kidney cancer may develop from the cells that line these cysts.



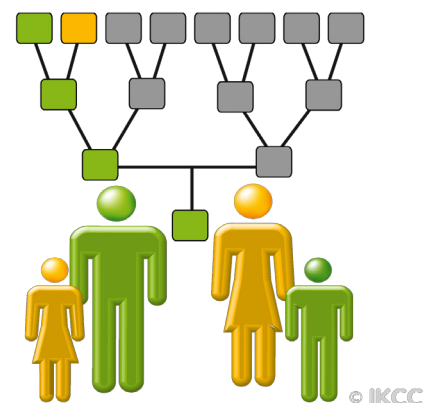
## Is my family at risk of developing kidney cancer?

People who have family members with kidney cancer, especially a sibling, are at increased risk. This can be due to genes that pass down from parent to child. Inherited gene mutations cause only 3-5 % of kidney cancer.

Signs that your kidney cancer might be hereditary include:

- You have more than one tumour in your kidney (multifocal tumours)
- You have tumours in both kidneys (bilateral tumours)
- You have a rarer form of kidney cancer (a non-clear cell renal cell carcinoma)
- Other members of your family have had kidney cancer
- You had your first kidney tumour before you were 50 years old.

If there is a history of kidney cancer in your family, it is important that you tell your doctor so you can be tested. If the test shows that you do have a hereditary type of kidney cancer, other members of your family can be tested so that any sign of cancer could be treated early when it is most curable.



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## Types of hereditary kidney cancer

There are several different types of hereditary kidney cancer. In the future we may have more information about new genes that cause kidney cancer.

- **Von Hippel–Lindau (VHL):** This is caused by a mutation in the *VHL* gene and usually causes clear-cell renal cell carcinoma.
- **Hereditary leiomyomatosis and renal cell cancer (HLRCC):** This is caused by a mutation in the *FH* gene and usually causes papillary type 2 renal cell carcinoma.
- **Hereditary papillary renal cell carcinoma (HPRCC):** This is caused by a mutation in the *MET* gene and usually causes papillary type 1 renal cell carcinoma.
- **Birt–Hogg–Dubé (BHD):** This is caused by a mutation in the *FLCN* gene and usually causes chromophobe renal cell carcinoma or oncocytoma.
- **Renal cell carcinoma with hereditary paraganglioma and pheochromocytoma:** This is caused by mutations in the *SDHB* or *SDHD* gene.
- **Chromosome 3 translocation familial renal cell carcinoma:** This is caused by a chromosome 3 translocation. A chromosome translocation is when part of a chromosome breaks off and attaches to a different chromosome.
- **Tuberous sclerosis complex (TSC):** This is caused by a mutation in the *TSC1* or *TSC2* gene and usually causes a type of kidney cancer called angiomyolipoma. These tumours are benign, but they have a large number of blood vessels which can burst and lead to life-threatening internal bleeding if not treated.

## Kidney cancer in children

In rare cases, children can get kidney cancer, but they usually develop different types of kidney cancer than adults. The most common types of childhood kidney cancer are Wilms tumour and nephroblastoma. However, there have been rare cases of children with renal cell carcinoma or adults with Wilms tumour.



## Good to know!

### Gene

The functional and physical unit of heredity passed from parent to offspring. Genes are pieces of DNA, and most genes contain the information for making a specific protein.

### Multifocal

Cancer in which there is more than one tumour, each of which has arisen from one original (primary) tumour.

### Hereditary

Transmitted from a parent to his/her child by information contained in the genes.

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