

Risk Factor Information for Kidney and Renal Pelvis Cancers

How to Use this Factsheet

This risk factor summary was developed to serve as a general fact sheet. It is an overview and should not be considered exhaustive. For more information on other possible risk factors and health effects being researched, please see the References section.

A risk factor is anything that increases a person's chance of developing cancer. Some risk factors can be controlled while others cannot. Risk factors can include *hereditary conditions, medical conditions or treatments, infections, lifestyle factors, or environmental exposures*. Although risk factors can influence the development of cancer, most do not directly cause cancer. An individual's risk for developing cancer may change over time due to many factors, and it is likely that multiple risk factors influence the development of most cancers. Knowing the risk factors that apply to specific concerns and discussing them with your health care provider can help to make more informed lifestyle and health care decisions.

For cancer types with environmentally-related risk factors, an important factor in evaluating cancer risk is the route of exposure. This is particularly relevant when considering exposures to chemicals in the environment. For example, a particular chemical may have the potential to cause cancer if it is inhaled, but that same chemical may not increase the risk of cancer through skin contact. In addition, the dose and duration of time one might be exposed to an environmental agent is important in considering whether an adverse health effect could occur.

Gene-environment interactions are another important area of cancer research. An individual's risk of developing cancer may depend on a complex interaction between their genetic makeup and exposure to an environmental agent (for example, a virus or a chemical contaminant). This may explain why some individuals have a fairly low risk of developing cancer as a result of an environmental factor or exposure, while others may be more vulnerable.

Key Statistics

The kidneys are a pair of critical organs located towards the back of the abdomen. The kidneys' functions include filtering blood and producing urine, which is delivered to the bladder through long thin tubes called ureters. The renal pelvis is the name for the part of the ureters that connects to the kidneys. Cancer of the kidneys and renal pelvis is among the 10 most common cancers in both men and women. The lifetime risk for developing kidney cancer is about 1 in 63 or 1.6%.² The American Cancer Society estimates 61,560 individuals will be diagnosed with kidney and renal pelvis cancers in the U.S. in 2015: 38,270 men and 23,290 women.^{1, 2} In Massachusetts, kidney and renal pelvis cancers accounted for approximately 3.1% of all cancers diagnosed between 2007 and 2011.⁶ Kidney and renal pelvis cancers are twice as common in men as women and the incidence is highest over the age of 50.^{1, 10} Since the 1990s, the incidence rate in the U.S. has been rising

Risk Factor Information for Kidney and Renal Pelvis Cancers

slowly.² This may be due, at least in part, to the development of new imaging tests and increased availability of screening.^{2,8}

Types of Kidney and Renal Pelvis Cancers

The term "cancer" is used to describe a variety of diseases associated with abnormal cell and tissue growth. Cancers are classified by the location in the body where the disease originated (the primary site) and the tissue or cell type of the cancer (histology).

Kidney and renal pelvis tumors can be either malignant (cancerous) or benign (non-cancerous). Kidney and renal pelvis cancers involve a number of tumor types located in various areas of the kidney and renal system. Renal cell carcinoma (RCC) affects the main part of the kidney. This is by far the most common type of kidney and renal pelvis cancer, accounting for about 90% of all diagnoses.² There are several subtypes of renal cell carcinoma, including clear cell RCC, papillary RCC, chromophobe RCC, and collecting duct RCC. Transitional cell carcinoma (also called urothelial carcinoma) occurs in the renal pelvis where the kidney meets the ureter. Less common kidney and renal pelvis cancers include Wilms' tumor and renal sarcoma.

Established Risk Factors

Hereditary Conditions

Individuals with the following hereditary conditions have a greater risk for developing kidney and renal pelvis cancers:^{1,4}

- Von Hippel-Lindau disease (VHL)
- Hereditary non-VHL clear cell renal cell carcinoma
- Birt-Hogg-Dube syndrome
- Hereditary papillary renal cell cancer (HPRCC)
- Hereditary leiomyomatosis and renal cell cancer (HLRCC)
- Tuberous Sclerosis Complex (TSC)
- Other inherited conditions

However, these conditions account for only a small portion of the overall diagnoses.

Medical Conditions

Patients with advanced kidney disease, especially those needing dialysis (a treatment used to remove toxins from the body if the kidneys do not work properly), have a higher risk of RCC. This risk appears to increase the longer an individual is on dialysis.^{4,10}

Lifestyle Factors

Smoking has been identified as a major risk factor for kidney and renal pelvis cancers. It is estimated that smokers are twice as likely as non-smokers to develop kidney and renal pelvis cancers. Studies have shown that the increase in risk is related to the amount

Risk Factor Information for Kidney and Renal Pelvis Cancers

smoked.^{1,2,4,10} If you would like information about quitting smoking, contact the Massachusetts DPH Tobacco Cessation and Prevention Program at 1-800-Quit-Now or 1-800-784-8669.

Obesity has also been identified as a risk factor for RCC.^{2, 10} Some studies estimate that obesity is a factor in about 30% of these diagnoses.¹ Choosing a diet high in fruits and vegetables may lower the risk of renal cell carcinoma.² Long-term use of phenacetin, once a popular non-prescription pain reliever, has been linked to an increase in the risk for kidney and renal pelvis cancer.^{4, 10} However, this is no longer considered to be a significant risk factor as this medication has not been available in the U.S. for over 20 years.⁴

Possible Risk Factors

Medical Conditions

The risk of kidney and renal pelvis cancer is higher in people with hypertension (high blood pressure). However, it is not clear whether the increased risk is due to the condition itself or the medications used to treat it, such as diuretics or antihypertensive drugs (or both).^{2, 10}

Environmental Exposures

Many studies have suggested that occupational exposure to certain substances may increase the risk for RCC. Some of these substances include, cadmium, some herbicides, benzene, and organic solvents, particularly trichloroethylene.^{2, 4, 10} In addition, high levels of arsenic in drinking water may increase the risk of kidney cancer.¹

Other Risk Factors That Have Been Investigated

Lifestyle Factors

A causal link between non-phenacetin containing analgesics (pain relievers) that are used widely today, such as acetaminophen and aspirin, and kidney and renal pelvis cancers has not been established.^{4, 10}

Kidney and Renal Pelvis Cancers in Children

Wilms' tumor is almost always found in children, most often in those under 6 years of age, and is extremely rare among adults.³ It accounts for approximately 1% of all kidney and renal pelvis cancers¹ and about 5% of all childhood cancers.^{3, 5} Between the years 2000-2009, renal cancers accounted for 3.6% of all childhood cancers in Massachusetts and Wilms' tumor accounted for 89% of these cases.⁷ This cancer is slightly more common among African Americans than other races and among girls than boys.³ The causes of Wilms' tumor are not known, but certain birth defect syndromes and other genetic risk factors (such as family history or genetic mutations) may be associated with this cancer.^{3, 5} Most children who develop Wilms' tumor, however, do not have any known birth defects or

Risk Factor Information for Kidney and Renal Pelvis Cancers

inherited gene changes.^{3,5} In addition, no environmental risk factors, either before or after a child's birth, have been shown to be associated with Wilms' tumor.³

For More Information / References

Much of the information contained in this summary has been taken directly from the following sources. This material is provided for informational purposes only and should not be considered as medical advice. Persons with questions regarding a specific medical problem or condition should consult their physician.

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