

# Cancers of the Kidney: A Growing Concern in Modern Medicine

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## Description

Kidney cancer is a significant health concern that has been steadily increasing in incidence worldwide. According to the World Health Organization (WHO), renal cancer accounts for approximately 2%-3% of all adult malignancies, making it one of the top ten most common cancers globally. The rise in cases over the past few decades can be attributed to various factors, including improved diagnostic techniques, an aging population and lifestyle changes. Despite advancements in treatment, kidney cancer remains a formidable challenge for healthcare professionals, necessitating ongoing research and awareness. The kidneys are two bean-shaped organs located in the back of the abdomen, responsible for filtering waste from the blood and producing urine. Kidney cancer typically begins in the cells of the kidney, with the most common type being Renal Cell Carcinoma (RCC), which accounts for about 90% of all kidney cancers. One of the most concerning aspects of kidney cancer is its asymptomatic nature in the early stages. Often, the disease is only detected when it has progressed to a more advanced stage, making treatment more challenging. Common symptoms, when they do occur, include blood in the urine, persistent pain in the side or back, unexplained weight loss and fatigue. However, these symptoms are not unique to kidney cancer, which can complicate early diagnosis.

## Risk factors and prevention

Several risk factors have been identified for kidney cancer. Smoking is one of the most significant, doubling the risk of developing the disease. Obesity is another critical factor, with studies showing a strong correlation between higher Body Mass Index (BMI) and an increased risk of RCC. Hypertension (high blood pressure) is also linked to a higher likelihood of kidney cancer, though the exact mechanisms are still under investigation. Genetic factors play a role as well, particularly in cases of hereditary conditions such as von Hippel-Lindau disease, which predisposes individuals to kidney cancer. Family history of the disease can also increase the risk, although sporadic cases, where there is no family history, are more common. Preventive measures for kidney cancer are somewhat limited. Lifestyle changes such as quitting smoking, maintaining a healthy weight and managing blood pressure can significantly reduce the risk. Regular check-ups and monitoring are essential for individuals with a family history of kidney cancer or those with genetic

predispositions. Early detection remains one of the most effective strategies in combating this disease. The treatment landscape for kidney cancer has evolved significantly over the past few decades. Traditionally, surgery was the primary treatment option, with radical nephrectomy (removal of the entire kidney) being the most common approach. However, with advancements in medical technology, partial nephrectomy, where only the tumor and a small margin of surrounding tissue are removed, has become increasingly popular, particularly for smaller tumors.

This approach preserves more of the kidney's function and is associated with better long-term outcomes. In cases where surgery is not viable, or the cancer has metastasized (spread to other parts of the body), other treatment options are considered. Drugs such as sunitinib, pazopanib and axitinib have shown efficacy in slowing disease progression and improving survival rates. Immunotherapy, which harnesses the body's immune system to fight cancer, has also become a cornerstone of treatment, with drugs like nivolumab and pembrolizumab offering hope for patients with advanced disease. Despite these advancements, challenges remain. Kidney cancer is known for its resistance to traditional chemotherapy and radiation therapy, limiting treatment options. Moreover, the heterogeneity of the disease, with varying genetic and molecular profiles among patients, complicates the development of universal treatment protocols. Personalized medicine, where treatment is tailored to the individual's genetic makeup, holds promise but is still in the early stages of implementation.

## Future of kidney cancer research

The future of kidney cancer treatment lies in ongoing research and clinical trials aimed at better understanding the disease's biology and developing more effective therapies. The advent of precision medicine, which uses genetic information to guide treatment decisions, is expected to play a significant role in the coming years. Researchers are also exploring combination therapies, where multiple treatment modalities are used together to improve outcomes. Public awareness and education are also critical in the fight against kidney cancer. Many cases are still diagnosed at advanced stages, where treatment options are limited and the prognosis is poorer. Encouraging regular medical check-ups, especially for those at higher risk and promoting healthy lifestyle choices can contribute to early detection and prevention. While kidney cancer remains a challenging

disease with significant morbidity and mortality, advancements in diagnosis, treatment and research offer hope for the future. Continued efforts in these areas, along with increased public awareness, are essential in reducing the burden of kidney cancer and improving outcomes for patients worldwide.