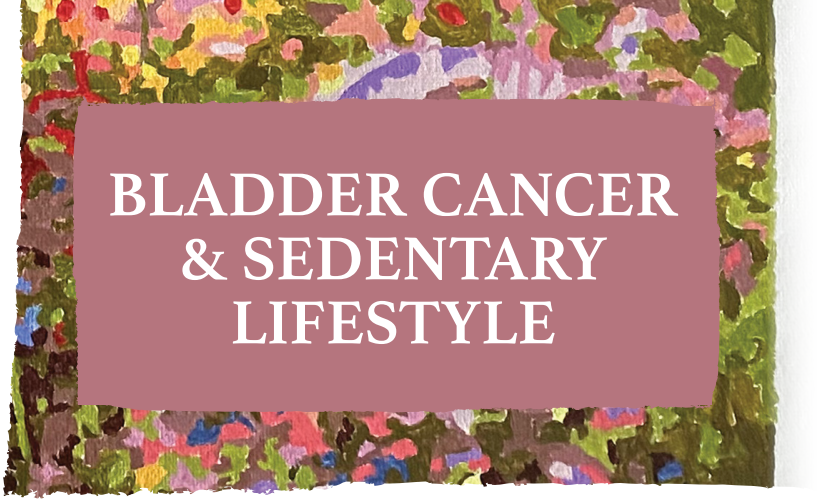
Healing Cancer at the Root
HYPERION
Functional Medicine



# BLADDER CANCER & SEDENTARY LIFESTYLE

Tobacco use, cigarette smoking, and chemical exposures are the leading risk factors for bladder cancer. These risks can be reviewed under the root of Environmental Toxin Exposures. In addition, research has demonstrated a statistically significant relationship between metabolic syndrome and the risk of bladder cancer. Risk factors for metabolic syndrome include obesity, insulin resistance, elevated cholesterol, and hypertension[1].

An estimated 30–40% of cancers can be prevented through changes in lifestyle and environmental risk factors associated with cancer incidence. These risk factors can be changed, and because of the considerable potential to reduce the global burden of cancer through interventions targeting these risk factors associated with a sedentary lifestyle, patients need to be made aware of what they can do. Despite this knowledge that has been made available, there remains limited awareness that these associations exist.

As discussed under the root of Sedentary Lifestyle, **insulin and insulin-like growth factor** are endocrine hormones with important roles in glucose metabolism, and lead to cancer cell proliferation, cancer cell's ability to avoid destruction, and blood vessel formation of tumors. Overstimulation of insulin and insulin -like growth factor biomarkers and their signaling pathways have been associated with increased risk of malignancies. It is well established that excess body fat, particularly abdominal fat, is positively correlated with insulin resistance. When there are consistently high levels of blood glucose, excess insulin is secreted from the pancreas and commonly results in hyperinsulinemia increasing promotion of tumor growth[2].

**Hyperion Functional Medicine orders detailed lab testing for all cancer patients to identify and treat insulin resistance, hyperinsulinemia, resulting metabolic syndrome, and inflammation.**

Bladder cancer tumors can be enhanced by a hypoxic or decreased oxygen environment where the tumor grows[3]. Hypoxia, or oxygen deficiency, is a common feature of bladder tumors and can be a poor prognostic factor for the disease. During tumor growth, cancer cells can experience intermittent hypoxia because the vascular network doesn't develop as quickly as the cancer cells. Mitochondria play a multifaceted role in supporting the survival, proliferation and metastatic potential of bladder cancer cells. Altered mitochondrial energy metabolism, cancer cell resistance to destruction, and mitochondrial DNA mutations all contribute to the progression of bladder cancer[4]. Engaging in endurance and resistance exercises, as well as maintaining an active lifestyle, can improve the functioning of mitochondria and has been shown to decrease the risk of cancer[5].


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Metabolic dysfunction plays a role in many types of cancers. Disruption of glucose metabolism is associated with higher cancer recurrence rates and reduced survival. Health benefits from exercise during and after cancer treatment improve survival[6].

In cancer, the term "mitochondrial dysfunction" refers to mitochondrial impairment leading to abnormal metabolic reprogramming of cellular energy functions characterized by accelerated glucose uptake and lactate production. It was discovered by the Nobel Laureate Otto Warburg one hundred years ago[7]. Physical activity can help improve mitochondrial function and lower the risk of cancer growth and proliferation.

Tumor cells in cancer are assisted by mitochondria that have been damaged leading to reprogramming of their functions. This reprogramming increases energy needed for cancer cells survival by switching to a specialized form of metabolism known as the "Warburg Effect" for growing the tumor. These results of reprogramming favor tumor progression, blood vessel growth for the tumor, and suppression of the immune system.

What is important for patients to think about, if you have these risk factors, and you are under treatment for your cancer with radiation, chemotherapy, immunotherapy, or other targeted treatments, how well will any treatment plan for your type of cancer work to decrease cancer growth or cure your cancer if you don't address underlying cancer roots?

CANCER ROOTS
Collaborating for a Cure

*In partnership with* healingstrong


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