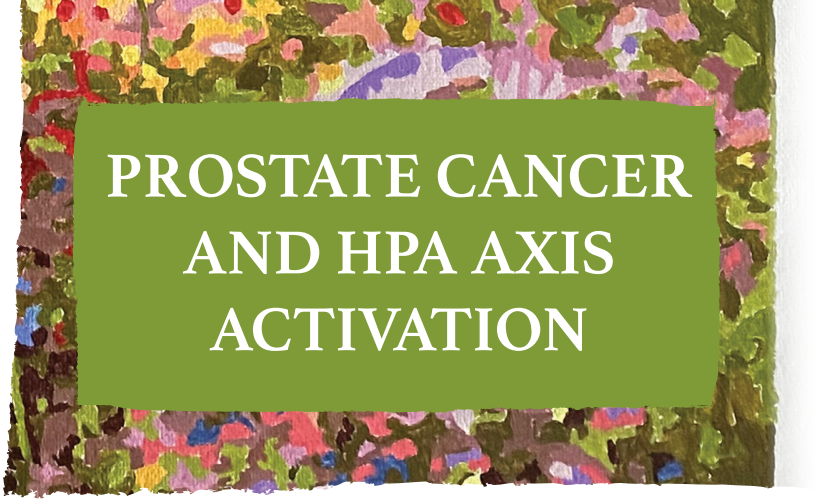
Cleveland's Center for Healing
HYPERION™
Functional Medicine



# PROSTATE CANCER AND HPA AXIS ACTIVATION

Hypothalamic-pituitary-adrenal (HPA) axis dysfunction occurs when there is a change in the body's stress response over time. Chronic stress, from psychosocial stress, over exercise, emotional disturbance, traumatic life events (such as a cancer diagnosis), or poor diet can initiate dysfunction. When the body experiences chronic stress, the HPA axis releases hormones at an accelerated rate, which can desensitize the glands and cause them to stop responding to signals to stop producing needed hormones. When the stress response is activated, your body initiates a "fight or flight" response to help you respond and manage physical and psychological stress.

In 2018 global cancer statistics published documentation that recurrent cancers worldwide are related to endocrine or hormone alterations, these cancers include breast, uterine, thyroid, prostate, ovarian, and pancreatic[1]. Stress hormones promote the occurrence and development of cancers through inducing DNA damage, increasing tumor suppressor degradation so more tumors can grow, and stress hormones regulate the tumor microenvironment where the tumor grows. Chronic stress can also activate the inflammatory response and the interaction between inflammatory cells and cancer cells to increase inflammation in the tumor microenvironment, thereby promoting all stages of tumor growth[2].

Signs of dysregulation in the hypothalamic-pituitary-adrenal (HPA) axis, which can lead to abnormal cortisol secretion have been found in studies in prostate cancer patients who experience more stress, higher depressive symptoms, and lower quality of life. Altered cortisol patterns, such as elevated cortisol in the afternoon, is part of this HPA axis dysregulation. Increased cortisol levels have been linked to a worse prognosis in patients with other types of cancer tumors[3].

Stress can increase cortisol levels, which may be harmful for men with prostate cancer because some tumors respond to cortisol. Stress can also cause the body to release adrenaline, which can worsen symptoms of benign prostatic hyperplasia (BPH). Stress can change the expression of genes associated with cellular proliferation and cancer metastasis coupled with anxiety can cause a rise in PSA, a marker of prostate disease. A 1999 study found that men with high stress levels had PSA levels that were three times higher than normal[4].

Some prostate cancers may have tumors that respond to high cortisol levels because they express the glucocorticoid receptor protein. Cortisol attaches to the glucocorticoid receptor protein in cells, which activates stress in those cells, including cancer cells. Prostate cancer patients have been shown to have higher levels of circulating cortisol which can impact sexual dysfunction in addition to the dysfunction caused hormone treatment for their cancer[5] .


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In a 2013 study, stress promoted prostate cancer in mice. These effects were based on the impact of adrenaline from stress. Behavioral stress inhibited cancer cell death and delayed shrinking of prostate tumors[6].

It's important for cancer patients who are healing to identify their level of stress, possibly levels of cortisol via testing, and to find stress reduction techniques to lead to a decreased level of cortisol.

**Any cancer diagnosis is going to lead to stress associated with that diagnosis and an elevation in patients' cortisol levels.**

**Understand what Symptoms of Elevated Cortisol are:**

1. Elevated cortisol can cause rapid weight gain in the belly, but also in the face and chest. Cortisol affects levels of ghrelin and leptin. Ghrelin is referred to as the "hunger hormone" as it induces hunger. Leptin, on the other hand, will cause you to feel full or satiated. Cortisol lowers leptin while increasing ghrelin, leading to weight gain, especially in the abdominal area
2. Easy bruising and slow healing are also signs of elevated cortisol. Elevated cortisol affects the immune system.
3. Muscle weakness can occur and be noticed in the upper arms and thighs.
4. Chronic fatigue is a common symptom of elevated cortisol.
5. Cortisol has effects on the gastrointestinal system because it slows movement through the stomach and leads to bloating and indigestion. It can also lead to diarrhea. It negatively impacts the G.I. microbiome.
6. Increase in blood pressure can occur.
7. Bone loss can lead to Osteoporosis, increasing your risk of fractures.
8. Mood changes such as depression and anxiety, mood swings and sadness also tend to occur more frequently.
9. Cortisol influences our circadian rhythm, not just as a player in the stress response. Cortisol is released in large amounts in the morning but levels at night will be the lowest. The duration of stress can increase cortisol chronically and this can affect the circadian rhythm leading to fatigue, sleep difficulties and more. Chronic insomnia or frequent nighttime waking is a symptom.
10. Other biological changes can include elevated blood sugars, muscle pain, or muscle tension.


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## Ways you can balance your cortisol levels in addition to continuing your oncology treatments

1. What you eat can not only impact your cancer, but also your cortisol levels, eating foods such as processed meats, high sugar foods, caffeine and alcohol, which provide little nutritional value, have been associated with more psychiatric symptoms and can increase cortisol levels. MD Anderson Center lists foods, like cookies, cakes, sugary drinks, white bread, and pasta as foods to avoid, they cause blood sugar levels to rise rapidly. The body then produces insulin to bring blood sugar levels back down, which can lead to a crashing period that affects other hormones, including cortisol . The resulting chronic elevation in insulin, known as hyperinsulinemia, over time, also drives cancer growth and metastasis.
2. Caffeine is known to increase cortisol, limiting caffeine intake is recommended to reduce elevated cortisol levels.
3. Relaxation techniques, like deep breathing exercises, yoga, mindful meditation, and prayer all will help reduce cortisol levels. In functional medicine we typically recommend regular meditation twice a day for 20 minutes. Reducing stress levels will help suppress the release of cortisol. Getting into a daily habit using these tools can help bring cortisol levels down.
4. Getting enough sleep is critical, sleep is the time for cellular healing in the body. Many times, elevated cortisol disrupts sleep. Typically, you find you wake up at 3 o'clock in the morning and can't go back to sleep. This is a sign of elevated cortisol as cortisol starts to rise early in the morning to get us ready for the day. It's already elevated, its effects are compounded. There are supplements that can assist patients in bringing their elevated cortisol levels down at night in addition to relaxation techniques. Adaptogenic herbs such as Ashwaganda and Rhodiola, Adaptogen's help the body adapt to stress. Holy basil tea is another action. Magnesium can also help patients relax.
5. In the warmer weather, spend as much time outside as possible: get your bare feet on the ground and practice grounding/earthing, here's a link to learn more about its effects on inflammation and healing:

Oschman JL, Chevalier G, Brown R. The effects of grounding (earthing) on inflammation, the immune response, wound healing, and prevention and treatment of chronic inflammatory and autoimmune diseases. J Inflamm Res. 2015 Mar 24;8:83-96. doi: 10.2147/JIR.S69656. PMID: 25848315; PMCID: PMC4378297.

6. The Grounded Documentary (Steven Kroschel)--free on Youtube. He is a filmmaker for National Geographic and runs a wildlife rescue in Haines, Alaska. He tested it on his whole town. --Heal For Free.
7. Websites: http://earthinginstitute.net. Under the research tab you will find placebo-controlled studies on the benefits of grounding/earthing. You can also look under the FAQ tab at the about where to buy earthing products. It will send you to a different website from which you can order products.
8. http://www.intuition-physician.com. This is the website for Laura Koniver MD. She is an integrative physician and earthing expert and does web-based classes. She reviews articles for tvarious topics regarding the benefits of ground/earthing. She also sells grounding products. She is featured in the two documentaries above.
9. People: James Oschman PhD (cell biologist, and pioneer scientist in the field of energy medicine. Did some of the original research on the benefits of grounding. Also wrote the book: energy medicine: the scientific basis). Clint Ober--Brought a lot of momentum to considering the benefits of earthing. Co-wrote the book Earthing: The Most Important Health Discovery Ever? With Stephen Sinatra MD (integrative cardiologist and also expert on grounding) and Martin Zucker.
10. Joseph Mercola also talks about earthing

Because cortisol has a very significant impact on cancer and progression, we need to help our cancer patients bring their cortisol levels down. In Hyperion Functional Medicine, we offer adrenal testing to look specifically at your cortisol levels over a 24-hour period and diagnose high levels of cortisol as indicated. Patients with sleep disruptions, and anxiety driven by high levels of cortisol usually benefit initially from supplements that have a strong influence on cortisol levels, meditation is also very helpful, and instruction on methods to improve sleep are offered. Your appointments in the Hyperion phase 1 oncology program with a certified health coach and a psychotherapist can offer you tools to help manage these cortisol levels and associated symptoms as well offering tools to optimize your cancer treatment journey.

**Reduction of cortisol levels will positively impact your cancer healing journey.**

*In partnership with* healingstrong


1 - Bray F., Ferlay J., Soerjomataram I., Siegel R.L., Torre L.A., Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J. Clin. 2018;68:394–424. doi: 10.3322/caac.21492

2 - Dai S, Mo Y, Wang Y, Xiang B, Liao Q, Zhou M, Li X, Li Y, Xiong W, Li G, Guo C, Zeng Z. Chronic Stress Promotes Cancer Development. Front Oncol. 2020 Aug 19;10:1492. doi: 10.3389/fonc.2020.01492. PMID: 32974180; PMCID: PMC7466429.

3 - Figueira JA, Sarafim-Silva BAM, Gonçalves GM, Aranha LN, Lopes FL, Corrente JE, Biasoli ÉR, Miyahara GI, Bernabé DG. Predisposing factors for increased cortisol levels in oral cancer patients. Compr Psychoneuroendocrinol. 2022 Jan 6;9:100110. doi: 10.1016/j.cpnec.2022.100110. PMID: 35755918; PMCID: PMC9216328.

4 - Stone AA, Mezzacappa ES, Donatone BA, Gonder M. Psychosocial stress and social support are associated with prostate-specific antigen levels in men: results from a community screening program. Health Psychol. 1999 Sep;18(5):482-6. doi: 10.1037//0278-6133.18.5.482. PMID: 10519464.

5 - Fabre B, Grosman H, Gonzalez D, Machulsky NF, Repetto EM, Mesch V, Lopez MA, Mazza O, Berg G. Prostate cancer, high cortisol levels and complex hormonal interaction. Asian Pac J Cancer Prev. 2016;17:3167–71.

6 - Hassan S, Karpova Y, Baiz D, Yancey D, Pullikuth A, Flores A, Register T, Cline JM, D'Agostino R Jr, Danial N, Datta SR, Kulik G. Behavioral stress accelerates prostate cancer development in mice. J Clin Invest. 2013 Feb;123(2):874-86. doi: 10.1172/JCI63324. Epub 2013 Jan 25. PMID: 23348742; PMCID: PMC3561807.

7 - https://www.mdanderson.org/cancerwise/8-foods-that-impact-stress