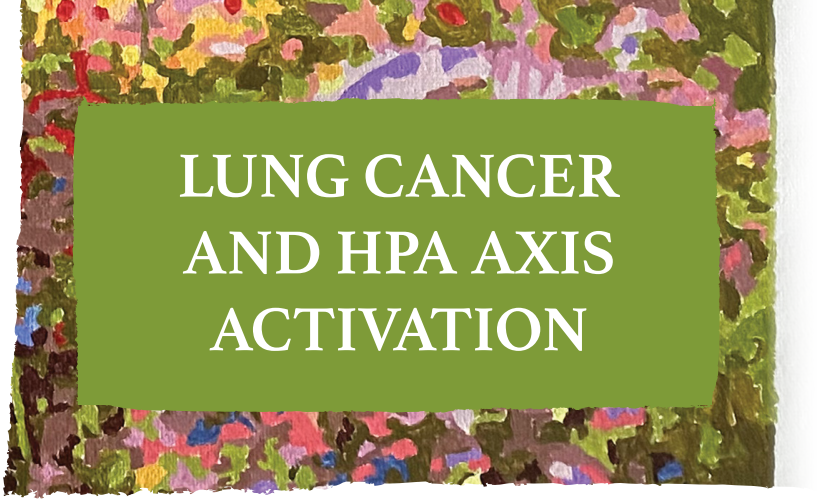
Cleveland's Center for Healing
HYPERION™
Functional Medicine



LUNG CANCER AND HPA AXIS ACTIVATION

The two main types of lung cancer are non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC): non-small cell lung cancer is the most common type of lung cancer, and it grows and spreads more slowly than small cell lung cancer. Small cell lung cancer, a fast-growing cancer that tends to spread quickly, is almost always associated with smoking history. Small cell lung cancers are in a class that identifies it as a neuroendocrine tumor. This means that it develops in the cells of the endocrine system.

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].

In a 2012 study, confirmation was made that stress can stimulate the growth of non-small cell lung cancer, chronic stress can cause changes in the neuroendocrine system[3].

As seen with other cancers, in lung cancer, cortisol contributes to Immunosuppression because of its ability to reduce the body's ability to monitor early-stage cancer, which can help cancer escape the immune system and develop more cancer-causing mutations. Cortisol can cause weight gain and insulin resistance, which are linked to an increased risk of many types of cancer. Prolonged exposure to stressors can cause the body to consistently produce high levels of cortisol, which can wear down cells and potentially increase the risk of cancer or cause existing cancer to spread faster.

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Elevated cortisol levels in the blood can occur with small cell lung cancer and cause a condition called ectopic Cushing syndrome. When cancerous cells produce excess hormones that increase cortisol levels this can occur, even though the tissues that produce the hormone don't normally do so. Ectopic Cushing syndrome affects 1–5% of people with small cell lung cancer, and even fewer with non-small cell lung cancer.

However, many people with lung cancer may experience at least one symptom of Cushing's syndrome, also known as hypercortisolism[4].

In a 2017 study, patients with newly diagnosed lung cancer had poorer sleep quality, higher depression levels, lower salivary melatonin levels, higher cortisol levels, and flatter melatonin and cortisol slopes than did the controls. The fatigue level and cortisol significantly predicted sleep quality. Based on this study, recommendations for the assessment of cortisol and melatonin levels could provide crucial information that may be beneficial for managing symptoms in patients with newly diagnosed lung cancer[5].

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 - Al-Wadei HA, Al-Wadei MH, Ullah MF, Schuller HM. Celecoxib and GABA Cooperatively Prevent the Progression of Pancreatic Cancer In Vitro and in Xenograft Models of Stress-Free and Stress-Exposed Mice. PloS One (2012) 7:e43376. doi: 10.1371/journal.pone.0043376

4 - Heleno CT, Hong SPD, Cho HG, Kim MJ, Park Y, Chae YK. Cushing's Syndrome in Adenocarcinoma of Lung Responding to Osilodrostat. Case Rep Oncol. 2023 Mar 1;16(1):124-128. doi: 10.1159/000527824. PMID: 36876215; PMCID: PMC9978924.

5 - Chang W.P., Lin C.C. Relationships of salivary cortisol and melatonin rhythms to sleep quality, emotion, and fatigue levels in patients with newly diagnosed lung cancer. Eur. J. Oncol. Nurs. 2017 Aug;29:79–84. doi: 10.1016/j.ejon.2017.05.008.

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