

# Protocol—Burnout

Assessment		
<b>Health History</b>	<input type="checkbox"/> Personal and/or family history <input type="checkbox"/> Trauma <input type="checkbox"/> Illness <input type="checkbox"/> Hormones (postpartum, menopause, PMS-D) <input type="checkbox"/> Drug/alcohol use or misuse (prescription and recreational)	
<b>Symptoms</b>	<input type="checkbox"/> Weight changes <input type="checkbox"/> Headaches <input type="checkbox"/> Muscle tension <input type="checkbox"/> Fatigue <input type="checkbox"/> Irritability <input type="checkbox"/> Low motivation/interest <input type="checkbox"/> Low libido <input type="checkbox"/> Changes in thinking skills (decision making, complex tasks) <input type="checkbox"/> Depression and anxiety	
<b>Labs</b>	<input type="checkbox"/> Electrolyte levels <input type="checkbox"/> Serum: fasting glucose and insulin or 2-hour glucose challenge test <input type="checkbox"/> Hemoglobin A1c <input type="checkbox"/> CBC <input type="checkbox"/> Lyme disease (EIA, Western Blot) <input type="checkbox"/> Formiminoglutamic acid (FIGLU) and methylmalonic acid (MMA) <input type="checkbox"/> RBC magnesium <input type="checkbox"/> 25-Hydroxyvitamin D <input type="checkbox"/> Organic Acids Test (to assess vitamin and mineral levels, oxidative stress, neurotransmitter levels, oxalates, and dysbiosis)	<input type="checkbox"/> Daily HRV (heart rate variability) <input type="checkbox"/> Cortisol <input type="checkbox"/> Estrogen <input type="checkbox"/> Progesterone <input type="checkbox"/> Homocysteine <input type="checkbox"/> DUTCH (sex hormones, DHEA, 4 pt cortisol) <input type="checkbox"/> LFTs (ALT/GGT) <input type="checkbox"/> Thyroid panel <input type="checkbox"/> Omega-3 index <input type="checkbox"/> Total antioxidant capacity
<b>Other Considerations</b>	Common adverse reactions to foods: Wheat, cow's milk, egg, peanut, tree nut, shellfish, and soy	
<b>Notes:</b>		

## Recommendations

Focus	Nutritional & Lifestyle Recommendations	Notes
<b>Nutrition</b>	<p><b>Foods to include:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Colorful variety of whole organic foods</li> <li><input type="checkbox"/> Vegetables, fruits, healthy fats, nuts, seeds, fatty fish, and pastured poultry</li> <li><input type="checkbox"/> 30-50 grams of fiber</li> <li><input type="checkbox"/> Prebiotic and probiotic foods</li> <li><input type="checkbox"/> Bone broth</li> <li><input type="checkbox"/> Magnesium-rich foods: almonds, cashews, spinach, pumpkin seeds, avocados</li> <li><input type="checkbox"/> B vitamin-rich foods: oysters, mussels, mackerel, organ meats (liver and kidney)</li> </ul> <p><b>Foods to avoid:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Caffeine</li> <li><input type="checkbox"/> Sugar and refined carbohydrates</li> <li><input type="checkbox"/> Processed and packaged foods</li> <li><input type="checkbox"/> Alcohol</li> <li><input type="checkbox"/> Lectins, particularly wheat, rice, spelt, legumes, and soy</li> <li><input type="checkbox"/> Genetically modified foods (eat organic)</li> <li><input type="checkbox"/> Cow's milk</li> </ul>	
<b>Lifestyle</b>	<p><b>Healthy living:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Sleep, rest, sex, social and family connections, relaxation, down time, vacation, meditation, mind/body practices, counseling</li> </ul> <p><b>Physical activity:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Start with finding an activity you enjoy that elevates heart rate most days of the week</li> </ul> <p><b>Improve sleep hygiene:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Go to bed at the same time each night (including weekends)</li> <li><input type="checkbox"/> Aim for 7-9 hours of sleep each night</li> <li><input type="checkbox"/> Consume last food/beverage at least 3 hours before bedtime</li> <li><input type="checkbox"/> If experiencing difficulty staying asleep, consider adding magnesium and melatonin to sleep routine</li> <li><input type="checkbox"/> Monitor screen time</li> <li><input type="checkbox"/> Eliminate all screens at least one hour before bedtime</li> </ul> <p><b>Enjoy nature:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Go for a walk or have a picnic with your family in the park</li> <li><input type="checkbox"/> Consider a walking meditation</li> </ul>	

## Recommendations cont.

Focus	Nutritional & Lifestyle Recommendations	Notes
<b>Lifestyle cont.</b>	<b>Guided imagery:</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Try yoga or deep breathing practice daily</li> <li><input type="checkbox"/> Mindfulness-based stress reduction (MBSR)</li> </ul>	
<b>Targeted Nutrients and Nutritional Bioactives</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Vitamin C<sup>1–3</sup></li> <li><input type="checkbox"/> B vitamins,<sup>4–6</sup> including methylated B<sub>12</sub> and methyltetrahydrofolate</li> <li><input type="checkbox"/> Omega-3 fatty acids from fish oil<sup>7–10</sup></li> <li><input type="checkbox"/> L-theanine<sup>11,12</sup></li> <li><input type="checkbox"/> L-tyrosine<sup>13,14</sup></li> <li><input type="checkbox"/> L-lysine + L-arginine<sup>15,16</sup></li> <li><input type="checkbox"/> Asian ginseng root (<i>Panax ginseng</i>)<sup>17–20</sup></li> <li><input type="checkbox"/> Magnesium<sup>21–24</sup></li> <li><input type="checkbox"/> Multivitamin<sup>25,26</sup></li> <li><input type="checkbox"/> <i>Rhodiola rosea</i><sup>27–33</sup></li> <li><input type="checkbox"/> Zinc<sup>34,35</sup></li> <li><input type="checkbox"/> <i>Withania somnifera</i><sup>36,37</sup></li> <li><input type="checkbox"/> 5-HTP<sup>38–41</sup></li> </ul>	

## References

- Das D et al. Effect of vitamin C on adrenal suppression by etomidate induction in patients undergoing cardiac surgery: a randomized controlled trial. *Ann Card Anaesth*. 2016;19(3):410-417.
- Liakakos D et al. Inhibitory effect of ascorbic acid (vitamin C) on secretion following adrenal stimulation in children. *Clin Chim Acta*. 1975;65(3):251-255.
- Peters EM et al. Vitamin C supplementation attenuates the increases in circulating cortisol, adrenaline and anti-inflammatory polypeptides following ultramarathon running. *Int J Sports Med*. 2001;22(7):537-543.
- Stough C et al. Reducing occupational stress with a B-vitamin focused intervention: a randomized clinical trial: study protocol. *Nutr J*. 2014;13(1):122.
- Howe C et al. Dietary B vitamin intake is associated with lower urinary monomethyl arsenic and oxidative stress marker 15-F2t-isoprostane among New Hampshire adults. *J Nutr*. 2017;147(12):2289-2296.
- Onuki M et al. Effect of pantethine on the function of the adrenal cortex. 2. Clinical experience using pantethine in cases under steroid hormone treatment. *Horumon To Rinsho*. 1970;18(11):937-940.
- Noreen E et al. Effects of supplemental fish oil on resting metabolic rate, body composition, and salivary cortisol in healthy adults. *J Int Soc Sports Nutr*. 2010;7:31.
- Delarue J et al. Fish oil prevents the adrenal activation elicited by mental stress in healthy men. *DMJ*. 2003;29(30):289-295.
- Deacon G et al. Omega 3 polyunsaturated fatty acids and the treatment of depression. *Crit Rev Food Sci Nutr*. 2017;57(1):212-223.
- McCabe D et al. The impact of essential fatty acid, B vitamins, vitamin C, magnesium and zinc supplementation on stress levels in women: a systematic review. *JBI Database System Rev Implement Rep*. 2017;15(2):402-453.
- Kimura K et al. L-Theanine reduces psychological and physiological stress responses. *Biol Psychol*. 2007;74(1):39-45.
- Miodownik C et al. Serum levels of brain-derived neurotrophic factor and cortisol to sulfate of dehydroepiandrosterone molar ratio associate with clinical response to L-theanine as augmentation of antipsychotic therapy in schizophrenia and schizoaffective disorder patients. *Clin Neuropharmacol*. 2011;34(4):155-160.
- Thomas J et al. Tyrosine improves working memory in a multitasking environment. *Pharmacol Biochem Behav*. 1999;64(3):495-500.
- Banderet L et al. Treatment with tyrosine, a neurotransmitter precursor, reduces environmental stress in humans. *Brain Res Bull*. 1989;22(4):759-762.
- Smriga M et al. Oral treatment with L-lysine and L-arginine reduces anxiety and basal cortisol levels in healthy humans. *Biomed Res*. 2007;28(2):85-90.
- Jezova D et al. Subchronic treatment with amino acid mixture of L-lysine and L-arginine modifies neuroendocrine activation during psychosocial stress in subjects with high trait anxiety. *Nutr Neurosci*. 2005;8(3):155-160.
- Flanagan S et al. The effects of a Korean ginseng on hypo-pituitary-adrenal and oxidative activity induced by intense work stress. *J Med Food*. 2018;21(1):104-112.
- Zheng A et al. Effect of the combination of ginseng, oriental bezoar and glycyrrhiza on autonomic nervous activity and immune system under mental arithmetic stress. *J Nutr Sci Vitaminol (Tokyo)*. 2008;54(3):244-249.
- Kim HG et al. Antioxidant effects of Panax ginseng C.A. Meyer in healthy subjects: a randomized, placebo-controlled clinical trial. *Food Chem Toxicol*. 2011;49(9):2229-2235.
- Choi J et al. Ginseng for health care: a systematic review of randomized controlled trials in Korean literature. *PLoS One*. 2013;8(4):e59978.
- Wienecke E et al. Long-term HRV analysis shows stress reduction by magnesium intake. *MMW Fortschr Med*. 2016;158(Suppl 6):12-16.
- Rajizadeh A et al. Effect of magnesium supplementation on depression status in depressed patients with magnesium deficiency: a randomized, double-blind, placebo-controlled trial. *Nutrition*. 2017;35:56-60.
- Dmitrašinović G et al. ACTH, cortisol and IL-6 levels in athletes following magnesium supplementation. *J Med Biochem*. 2016;35(4):375-384.
- Littenberg B et al. Role of magnesium supplementation in the treatment of depression: a randomized clinical trial. *PLoS One*. 2017;12(6):e0180067.
- George A et al. Efficacy and safety of Eurycoma longifolia (Physta®) water extract plus multivitamins on quality of life, mood and stress: a randomized placebo-controlled and parallel study. *Food Nutr Res*. 2018;62.
- Camfield D et al. The effects of multivitamin supplementation on diurnal cortisol secretion and perceived stress. *Nutrients*. 2013;5(11):4429-4450.
- Cropley M et al. The effects of Rhodiola rosea L. extract on anxiety, stress, cognition and other mood symptoms. *Phytother Res*. 2015;29(12):1934-1939.
- Concerto C et al. Exploring the effect of adaptogenic Rhodiola Rosea (golden root extract) on neuroplasticity in humans. *Complement Ther Med*. 2018;41:141-146.
- Ballmann C et al. Effects of short-term Rhodiola Rosea (golden root extract) supplementation on anaerobic exercise performance. *J Sports Sci*. 2018;1-6.
- Darbinyan V et al. Rhodiola rosea in stress induced fatigue—a double blind cross-over study of a standardized extract SHR-5 with a repeated low-dose regimen on the mental performance of healthy physicians during night duty. *Phytomedicine*. 2000;7(5):365-371.

## References cont.

31. Spasov AA et al. A double-blind, placebo-controlled pilot study of the stimulating and adaptogenic effect of Rhodiola rosea SHR-5 extract on the fatigue of students caused by stress during an examination period with a repeated low-dose regimen. *Phytomedicine*. 2000;7(2):85-89.
32. Shevtsov VA et al. A randomized trial of two different doses of a SHR-5 Rhodiola rosea extract versus placebo and control of capacity for mental work. *Phytomedicine*. 2003;10(2-3):95-105.
33. Olsson EM et al. A randomized, double-blind, placebo controlled, parallel-group study of the standardized extract shr-5 of the roots of Rhodiola rosea in the treatment of subjects with stress-related fatigue. *Planta Med*. 2009;75(2):105-112.
34. Li Z et al. Association of total zinc, iron, copper and selenium intakes with depression in the US adult. *J Affect Disord*. 2018;228:68-74.
35. Tahmasebi K et al. Association of mood disorders with serum zinc concentrations in adolescent female students. *Biol Trace Elem Res*. 2017;178(2):180-188.
36. Choudhary D et al. Body weight management in adults under chronic stress through treatment with ashwagandha root extract: a double-blind, randomized, placebo-controlled trial. *J Evid Based Complementary Altern Med*. 2017;22(1):96-106.
37. Chandrasekhar K et al. A prospective, randomized double-blind, placebo-controlled study of safety and efficacy of a high-concentration full-spectrum extract of ashwagandha root in reducing stress and anxiety in adults. *Indian J Psychol Med*. 2012;34(3):255-262.
38. Jangid P et al. Comparative study of efficacy of L-5-hydroxytryptophan and fluoxetine in patients presenting with first depressive episode. *Asian J Psychiatr*. 2013;6(1):29-34.
39. Birmaher B et al. Neuroendocrine response to 5-hydroxy-L-tryptophan in prepubertal children at high risk of major depressive disorder. *Arch Gen Psychiatry*. 1997;54(12):1113-1119.
40. Cowen PJ et al. Decreased plasma tryptophan levels in major depression. *J Affect Disord*. 1989;16(1):27-31.
41. Shaw K et al. Tryptophan and 5-hydroxytryptophan for depression. *Cochrane Database Syst Rev*. 2002;(1):CD003198.

This template protocol is for your informational and educational purposes only. It does not constitute medical advice. As a health care practitioner, you may use this protocol as you deem appropriate in your independent professional judgment and should make any and all changes that you believe are appropriate, or disregard this protocol in its entirety. Neither Metagenics Institute nor its affiliates shall be responsible for any course of action that is selected for any patient or individual based on your or another individual's use of this protocol.