Top Versatile Ingredients to Deliver Comprehensive Care while Minimizing Pill Burden

Presented by Dr. Penny Kendall-Reed, ND

October 22, 2025

Speaker Disclosure

Dr. Penny Kendall-Reed, N.D.

I am a paid advisor to Nestlé Health Science. I have no other conflicts of interest to disclose.

Nestlé Health Science assumes no liability for presenter's information, whether conveyed verbally or in these materials. All presentations represent the opinions of the presenter and do not represent the position or the opinion of Nestlé Health Science. Reference by the presenter to any specific product, process or service by trade name, trademark, or manufacturer does not constitute or imply endorsement or recommendation by Nestlé Health Science.

Seminars, teleconferences and webinars such as this are for educational purposes only and are intended for licensed health care practitioners.

These therapies are not substitutions for standard medical care. Practitioners are solely responsible for the care and treatment provided to their own patients.

Study Design Legend

- Human Study
- In Vitro Study
- Animal Study
- Meta-analysis: May include data from human, animal, and/or in vitro studies

Choosing a Supplement

- Why I choose professional brands vs less expensive versions?
  - Quality of starting raw materials (e.g., Sensoril Ashwagandha)
  - Superior extractions (Setria liposomal glutathione)
  - Consistency of active ingredient from batch to batch
  - Increased bioavailability (BioResponse DIM)
  - Free from additives and fillers
  - Allergens clearly labelled

Choosing a product?

- What makes a product formulations superior?
  - Products designed by practicing doctors: see clinically what is effective or not versus a research paper
  - Diverse group of professionals overseeing final formulations
  - Larger access than most to unique and highly therapeutic active ingredients

Where I start when choosing a supplement

Leading causes of illness

- Chronic stress.
  - 90% of visits to health care practitioners are due to stress or stress related pathologies. *National Institute of Mental Health Dec 2021 (Human)*
  - 83% of all deaths for adults between the age of 21 and 65 are related to unmanaged stress and lifestyle. *National Ag Safety Database – 2022 (Human)*
  - More than 80% of patients with medically unexplained symptoms receive psychosocial treatment by their physician. *American Psychological Association (Human)*

Leading causes of illness

- Inflammation
  - While up to 90% of human disease is related to the activation of the stress system…evidence suggests that excessive inflammation plays a critical role in the pathophysiology of stress-related diseases.

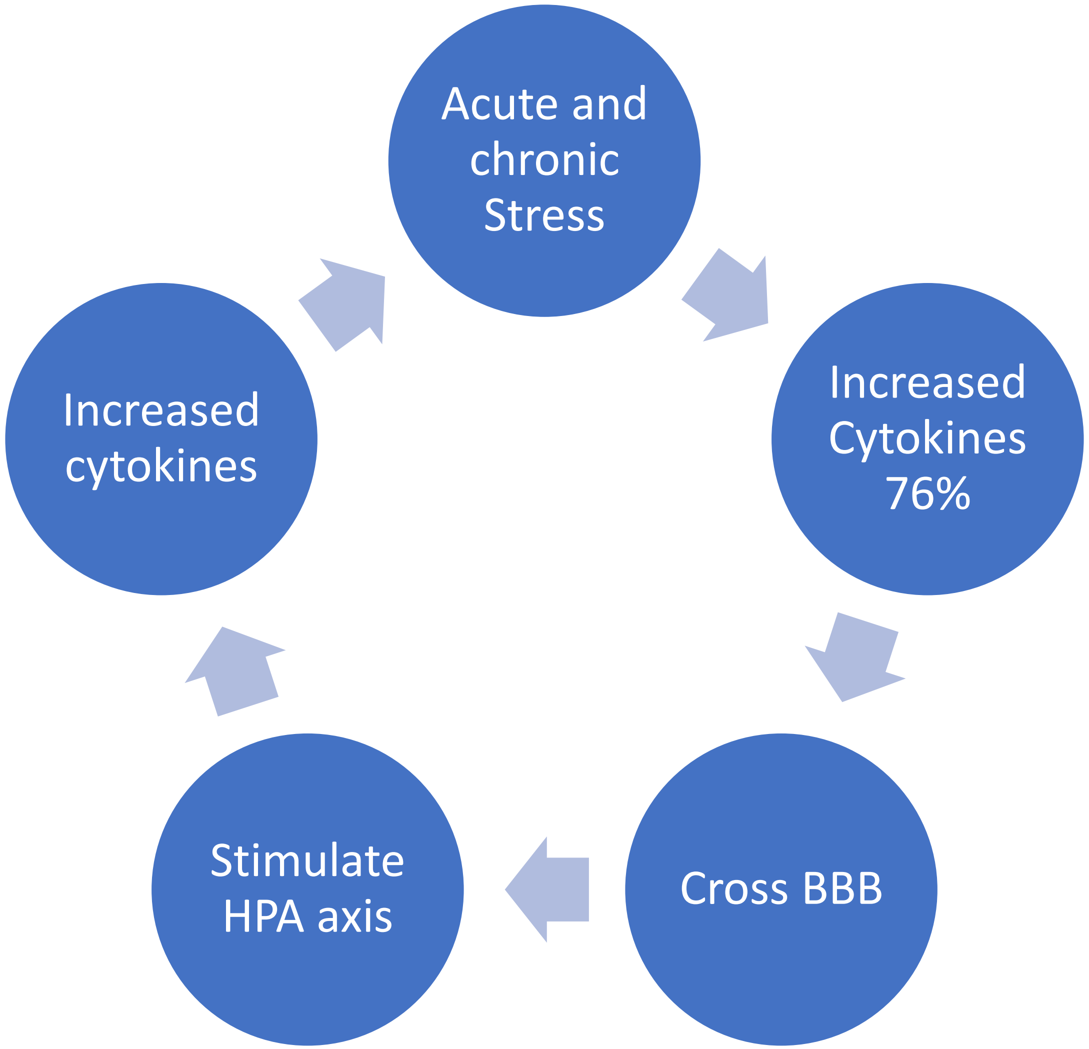
    Front Hum Neurosci 2017. (Human/Animal)

  - Worldwide, 3 out of 5 people die due to chronic inflammatory disease.

    National Library of Medicine Aug 2022 (Human)

  - Chronic inflammation is now recognized as the most significant cause of death worldwide today. *Nature Medicine 2019 (Human)*

Chicken or Egg?



Ailments associated with Stress and Inflammation.

- Anxiety, depression, ADD, ADHD
- Insomnia or sleep disturbances
- IBS and IBD, “multiple food allergies”
- Allergic reactions and asthma
- Depressed immunity, frequent or prolonged colds/flues
- Weight gain, type II diabetes, metabolic syndrome, hypoglycemia
- Infertility, PMS, PCOS
- Cardiovascular disease – increased cholesterol, A-Fib, hypertension
- Arthritis, tendinopathies and myalgia

Centers for Disease Control 2017

Core Ingredients for Almost All Health Issues

- My approach is to address the main issues that underly the cause of disease and what amplifies its symptomology.
- I aim to do this in the most TARGETED way to reduce the number of supplements a patient needs to take.
- Core Ingredients I most often use with my patients:
  1) Lactium & L-theanine
  2) Liposomal Glutathione
  3) NAC

1 Lactium

Clinical studies have shown Lactium can help:

- Promote sensitivity of the hypothalamus and pituitary receptors to cortisol, supporting negative feedback in the HPA axis.
- Moderate cortisol and CRH production during acute and chronic stress.
- Bind to the GABA A1 receptor (calming) and not the PBR receptor (sedating).

Other clinical findings:

- Free from many side effects associated with sedative agents including dependance.
- Decapeptide: smaller molecule means less likely to be recognized by the immune system and cause a problematic response.

Papadopoulos, V. Endocr. Rev. 14, 222–240 1993

Laurent Miclo Emmanuel Perrin. The FASEB Journal June 2001*

Dermatol Res Pract. 2022 May 4;2022:2916317.

Medina, J. H., Peña, Mol. Neurobiol. 6, 377–386 1992

1 Lactium

Results from clinical studies have shown Lactium:

- Improved sleep quality in a study over a 2-week period. *Nutrients Feb 2017 (Human)*
- Reduced blood pressure, especially systolic. *Eur J Nutr*. 2005;44(2):128-132. (Human)
- Reduced emotionally induced digestive complaints. *Eur J Clin Nutr*. 2007;61(4):536-541 (Human)
- Reduced stress induced urticaria. *J of Forman Medical Association Apr 2005 (Human)*
- Reduced acne vulgaris. *Dermatol Res Pract May 2022 (Human/Animal)*

1 L-theanine

Results from clinical studies have shown L-Theanine:

- Increased alpha wave activity.
- Decreased beta wave activity.
- Is a partial agonist for N-methyl-D-aspartate (NMDA) receptor.
- Boosted GABA.
- Reduced sensations of anxiety.

Nutrients 2019; 11(10):2362
J or Functional Foods 2011; 3(3):171-178

1 PKR's Clinical Use: Lactium & L-theanine

- Any ailment that is initiated or aggravated by stress
- Anxiety, depression, PTSD, ADD, ADHD
- Insomnia or sleep disorders
- IBS/IBD
- Nighttime flashes
- Hair loss
- Acne
- Healthy aging
- Wrinkles
- Hives
- Frequent colds

1

PKR's Clinical Use: Dosing

Lactium & L-theanine

- Most often I start with **350 mg Lactium** and **100 mg L-theanine** - **bid** on an empty stomach for 8 weeks.
  - Then reduce to **175 mg Lactium** and **50 mg L-theanine – bid** on an empty stomach (depending on genetics and lifestyle factors in some cases I reduce faster).
  - Then reduce to **175 mg Lactium** and **50 mg L-theanine – qd**
- Depending on genetics I start patients at an even higher dose or remain at a higher dose for a longer period of time (2 bid past 8 weeks)
- I always increase my patients from the lowest dose during times of stress to prevent turning back on of stress genes.

2 Glutathione

Results from clinical studies have shown glutathione:

- Reduced IL-6 , TNF-a, IL-10, TGF-B, IFN-a IL-B
- Restored TH1 cytokine response
- Neutralized ROS
- Conjugated and removed xenobiotics
- Activated NRF2 pathways
- In liposomal form, can protect against gastric degradation and can enhance absorption

Antioxidants 2020; 9(7):624
Int J Mol Sci July 2020

Prog Neurophychoparmacol Biol Psychiatry 2012; 1;37(2):247-51.

2 Glutathione

Results from clinical studies have shown glutathione:

- Administration in a rat model of rheumatoid arthritis was associated with reduced joint inflammation and pain markers *Heliyon Jul 2019 (Animal)*
- Had a protective effect in OA patients, or those with family hx of OA *J Clin Orthop Trauma (Human)*
- Reduced lung inflammation and symptomatology in COPD and other inflammatory lung conditions *Redox Biol Dec 2015 (Animal)*
- Reduced and prevented psoriatic outbreaks *J Clin Aesthet Dermatol Oct 2013 (Human)*
- Increased skin elasticity and regulated melanin *Clin Cosmet Investig Dermatol Apr 2017 (Human)*
- Increased NK cells by 400%, lymphocytes by 60% in 2 weeks *Eur J Clin Nutr Jan 2018 (Human)*

2 PKR's Clinical Use: Glutathione

- Arthritis of all kinds
- Most dermatological conditions
- Any lung condition
- Anti-aging
- Ulcerative colitis
- Lyme disease
- Fibromyalgia
- Supportive cancer care
- Detoxification

3 N-Acetyl Cysteine (NAC)

Results from clinical studies have shown NAC:

- Decreased IL-6, IL-1B, TNF-a, IL-10, IL-4, IL-5, IL-33
- Increased GSH
- Reduced ROS via supporting SOD
- Increased phase II detoxification
- Helped increase production and action of nitric oxide.

NAC is included in the WHO Model List of Essential Medicines

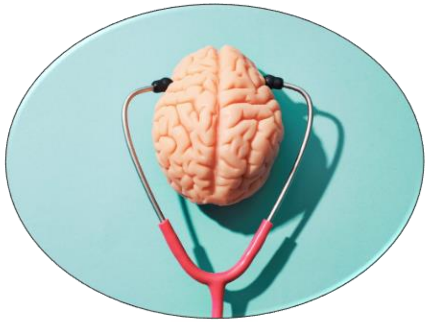
Brain Behav 2018.

Indian J Chest Dis Allied Sci 2011; 53(3):153-62

Curr Neurovasc Res 2016; 13(2):107-14

Inflam Res Jul 2011

3 NAC



Results from clinical studies have shown NAC can support lung and brain health.

- **Lung Health**
  - Reduced the number of aggravations in chronic bronchitis patients by 50% via mucoid reduction. *NeuroSci Biobehav Rev 2015 (Human)*
  - Reduced COPD exacerbations:
    - 600 mg/day effective in patients without obstruction
    - >1200 mg/day required for patients with obstruction
    - Demonstrated a favorable safety profile at both doses *Eur Respir Rev, Sept 2015 (Human)*

- **Brain Health**
  - Facilitated recovery after traumatic brain injury, cerebral ischemia and cerebrovascular vasospasm after subarachnoid hemorrhage. *Brain Behav Mar 2014 (Animal)*
  - Inhibited ROS-dependent activation of mTOR pathways in the brain reducing neurodegenerative diseases. *Neuropath Appl Neurobio 2014 (Animal)*

3 NAC

Results from clinical studies have shown NAC:

- Supported a reduction in cancer aggressiveness, proliferation and increased apoptosis in cancerous cells. *Clin Oncol 2017 (Human)*
- Reduced ROS production in athletes during intense workouts by up to 50%.

  Int J Sport Nutr Excer Metab 2011 (Human)
- Improved insulin sensitivity (via moderating glycolysis) in PCOS patients.

  Fertil Steril Jun 2002 (Human)
- Improved semen quality in infertile men. *J Urol Feb 2009 (Human)*
- Increased immunity in the elderly by increasing the leukocyte glutathione pool.

  Free Radic Biol Med Nov 2008 (Human)

3 PKR's Clinical Use: NAC

- In all inflammatory conditions
- Anti-aging
- Neurological conditions or brain trauma
- Detoxification
- Liver protection
- Supportive cancer care
- PCOS
- Poor sperm quality
- Sports recovery and prevention of injury
- FDA approved for acetaminophen overdoses

3 PKR's Clinical Use: Dosing

NAC

- **NAC 900 mg - bid** on an empty stomach for 8 weeks.
  - **Reduce to 900mg per day** – ongoing.
- I combine with Liposomal Glutathione (refer to slide 19 for dosing).
- I increase the dose if variant for inflammatory or phase II detox genes.
- I am cautious with patients who have SIBO initially.

Condition Specific Ingredients

- After addressing the primary cause behind 90% of ailments, my treatment plans then focus on condition specific support.
- I look for ingredient combinations with multi-purposes and that are synergistic.
- I avoid ingredient combinations that:
  - Can block one another's actions. I look at the supplement patients put themselves on, i.e., calcium and iron, ashwagandha and saw palmetto.
  - Might be increasing their symptoms. i.e. curcumin for fast phase 1 detoxifiers, methyl folate before stress is treated.

Melatonin

Results from clinical studies have shown melatonin can support brain and immune health.

Brain Health

- Supported greater ease into stage 4 delta wave sleep. *Brain Behav. Immune. 2007; 21:901-912 (Human)*
- Supported anti-oxidant and anti-inflammatory activity in the brain. *Transl Psychiatry. 2021;11(1):339. (Human, Animal, In vitro)*
- Increased BDNF. *Neuropsychopharmacol Rep Sept 2020 (Animal / In vitro)*
- Reduced B-amyloid plaque formation (regulates folding of microtubules). *Curr Neuropharmacol Sept 2010 (Human)*

Immune System

- Regulated the activity of T and B cells. *Science Direct 2019 (Human, Animal, In vitro)*
- Restored bone marrow mesenchymal stem cells suppressing osteoclastic activity. *Br J Pharmachol. 2022 (Animal / In vitro)*
- Reduced systolic blood pressure. *Trials Mar 2021 (Human)*

Melatonin

Results from clinical studies have shown Melatonin:

- May have an anti-metastatic effect and may inhibit angiogenesis in breast cancer cells.

  PloS One Mar 2016 (In vitro)

- Increased apoptosis. *Life Sci July 2019 ((Human, Animal, In vitro)*

- Blocked 4-OH estrogen receptor stimulation. *National Library of medicine FASEB May 1999 (Human)*

In clinical practice, I've observed the following:

- Melatonin is free from many side effects associated with sleeping aids including dependence.
- Melatonin can support falling asleep, but staying asleep often requires additional support.
- When cortisol levels aren't addressed, melatonin can sometimes trigger bad dreams.
- A common question I hear is "Why do some people wake up groggy with melatonin?"

PKR's Clinical Use: Melatonin

- Insomnia
- Night Owl
- Shift workers, travelers
- Neurological disorders
- Anti aging of the brain
- Supportive cancer are
- Osteoporosis
- High blood pressure

PKR's Clinical Use: Dosing

Melatonin

- Anyone over 100 lbs – 3-9 mg at 8 or 8:30 pm.
  - I reduce to 3 mg over time if sleep is the only reason for taking it.

- 4–6-year-olds – 1 mg at 8 pm
- 7–15-year-olds – 1-2 mg at 8 pm.

- I give Melatonin with Lactium + Theanine to prevent vivid dreams.

Resveratrol

- **Cardiac Health -** Clinical studies have shown Resveratrol:
  - Increased HDL *MayLife Sci 2016 (Human / Animal)*
  - Decreased oxidation of LDL, helped prevent arteriosclerosis. *Nutrients May 2016 (In vitro, Human, Animal)*
  - Decreased IL6, IL8, NF-kB, COX2,MCP-1. *Pharmacol Apr 2015 (In vitro)*
- **Aging/Neuro -** Clinical studies have shown Resveratrol:
  - Increased SIRT6 – slows telomere shortening, increased DNA repair and autophagy. *Front Cell Dev Biol Mar 2021 (Human, Animal, In vitro) ,// SciDaily Apr 2019 (Animal) // Sci Rep Mar 2018 (Animal)*
  - Increased BDNF- reduced brain aging, anxiety, depression. *Biomed Res Int 2017 (Animal)*
- **Metabolism -** Clinical studies have shown Resveratrol:
  - Increased AMPK, PGC1-a, moderated PPAR-g – supported obesity, diabetes and hypoglycemia. *In J Mol Sci May 2021 (Animal and In vitro)*

Resveratrol

Results from clinical studies have shown Resveratrol:

- Helped inhibit all carcinogenic stages (initiation, promotion and progression)

  Front Nutr 2016 (In vitro and Animal)

- Had antimicrobial properties – particular affinity for Candida albicans, Campylobacter jejuni and coli. *World J Microbiol 2015 (In vitro)*
- Inhibited MMP3's – reduced the breakdown of collagen in arthritis, tendonitis and joint injuries. *Oxid Med Cell Longev 2019 (In vitro and Animal)*
- Supported liver function – increased SOD2, CAT and GPx

  Nutrients Mar 2021 (Human, In vitro, Animal)

PKR's Clinical Use: Resveratrol

- Cholesterol support
- Neurological disease or brain trauma
- Obesity and difficulty losing weight
- Blood sugar regulation
- Tendonitis, arthritis
- Anti-aging
- Inflammatory conditions

PKR's Clinical Use: Dosing

Resveratrol:

- **100mg BID** empty stomach for 8 weeks.
  - I reduce to **100mg per day** on an empty stomach. I will recommend to come off depending on the condition it is being used for.

PKR's Clinical Pearls:

- I am cautious with patients who have bleeding disorders because in high doses it can thin the blood.
- Trans - Resveratrol is an estrogen receptor agonist. It has been shown to increase and decrease the activity of estrogen, depending on the woman.

Endocrinology. 2000;141(10):3657-3667. *(In vitro)*

- In my clinical practice, I've observed that high doses of resveratrol (around 3000 mg per day) can lead to elevated liver enzymes.

5 HTP

- **Neurological Health -** Results from clinical studies have shown 5 HTP:
  - Is a precursor to serotonin: depression, PMS.
  - Is a precursor to melatonin. Current studies have shown 5 HTP can override IL-6 induced insomnia. *Curr Treat Options Neurol 2018. (Animal and In Vitro)*
- I've observed in clinical practice that 5-HTP may help reduce reward-seeking behaviors in some individuals.
- **Musculoskeletal Health -** Results from clinical studies have shown 5 HTP:
  - Suppressed production of IL-2, IL-4, IL-6, IL-17, TNFa and cyclooxygenase 2. *Arthritis Res Ther Dec 2015 (Animal)*
  - Reduced fibromyalgia symptoms. *Alt Med Rev 1998 (Human)*

5 HTP

Results from clinical studies have shown 5 HTP:

- Can help with weight loss as serotonin plays a role in regulating appetite and satiety via binding in the amygdala and parahippocampal gyrus.

  Brain Behav Jan 2017 (Human and Animal)

- Reduced headaches – it helped regulate vasoconstriction. *Johns Hopkins Medicine (Human)*

- Regulated GI symptoms – 90% of serotonin is made in the GI. Enteric serotonin regulated gut motility, distention and visceral sensitivity. An increase in SERT expression decreased serotonin leading to IBS-C. A decrease in SERT expression increased serotonin leading to IBS-D. *Cureus Aug 2020 (Human, Animal, In Vitro)*

PKR's Clinical Use: 5 HTP

- Depression
- Anxiety
- Insomnia
- Weight loss
- Anorexia/bulimia
- Headaches
- Fibromyalgia
- IBS/IBD
- Addictions – in some look at serotonin genes

PKR's Clinical Use: Dosing

5-HTP

- **100 mg/1-2 BID** with food.

- How I recommend taking 5-HTP
  - Take on an empty stomach, if it doesn't cause nausea.
  - Tip: Take with a couple of rice crackers or small amount of pure carbohydrate that will not decrease its absorption but can help soothe the stomach.
  - Avoid taking first thing in the morning on an empty stomach.

- I am cautious with the following patients:
  - Who are on pharmaceutical antidepressants.
  - Who code normally for serotonin genes.
  - With low blood pressure.
  - With cardiac fibrosis, right sided heart failure.

DIM

- DIM BioResponse is a microencapsulated version of DIM, clinical studies show it is highly bioavailable. *Cancer Epidemiol Biomarkers Prev. 2008 Oct;17(10):2619-24. (Human and Animal)*

- I use DIM to help moderate phase I and II detoxification

- **Women's health** - Results from clinical studies have shown DIM:
  - Helped decrease endometrial cell life giving less time for endometrial cells to grow on the pelvic wall and cause painful and heavy periods. *Am J of Obs and Gynec Apr 2018 (In vitro and Human)*
  - Helped manage the pain of endometriosis by inhibiting estrogen receptor-alpha signaling. *Clinical Applications of Scientific Innovation Aug 2022 (Human, in vitro)*
  - Helped minimize hormonally related acne, hot flashes, PMS and PMDD symptoms. *J of Obs and Gyne 2018 (Human)*

DIM

Results from clinical studies have shown:

- DIM helped push estrogen away from the 4-OH and 16-OH form, into the 2-OH form. *American Association of Cancer Research Mar 2017 (Human)*
- In tamoxifen-treated breast cancer patients, daily DIM helped shift estrogen metabolism toward favorable pathways and increased SHBG levels.

  American Association of Cancer Research Mar 2017 (Human)
- DIM helped to methylate 4-OH estrogen rendering it less potent.

  Cancer Lett. 2015;356(200):231–243. (Human, In vitro, Animal)
- DIM supported enhanced estrogen metabolism in thyroid cancer patients reducing the risk of further cancer development. *Thyroid Mar 2011 (Human)*
- DIM helped reduce cell proliferation, increased cell cycle arrest and induced apoptosis in breast and prostate cells. *Invest New Drugs 2018. // Am J Transl Res, 2016 (In vitro)*

DIM

Results from clinical studies have shown DIM:

- Helped inhibit androgen-induced androgen receptor (AR) translocation in the nuclei of prostatic cells and showed a stronger affinity in prostatic cancerous cells. *J of Biol Chem June 2003. (In vitro)*
- May influence multiple signaling pathways in colorectal cancer cells altering autophagy and apoptosis. *Int J Mol Sci Jul 2016 (In Vitro)*
- Helped inhibit MDM2 (mouse double minute 2 homolog) a multi-functional oncogenic protein and helped alter the tumor suppressor protein p53 in colorectal cancer cells. *In J Mol Sci July 2020 (In vitro, animal)*

PKR’s Clinical Use: DIM

- PCOS
- Endometriosis
- Supportive care for breast and prostate cancer
- Supportive care for colorectal cancer
- Supportive care for thyroid cancer
- PMS and PMDD
- Phase 1 detoxification
- Acne
- Hot flashes

PKR's Clinical Use: Dosing

DIM

- **100mg BioResponse DIM -** bid empty stomach
  - I increase to **200mg bid** for supportive cancer care or large fibroids.
  - I reduce dosing in half after hormonal stabilization (reduction of symptoms) depending on the condition.

- If CYP1A2 and 3A4 are variant or slow, I use:
  - BioResponse DIM (100 mg), Broccoli Sprout Extract (100mg), HMR Lignans (10mg), Alpha Lipoic Acid (200mg), Milk Thistle (200mg) – bid

What I look for in a Greens Powder

- 40 nutrient-dense raw organically grown superfoods including greens, sprouts, fruits and vegetables
- Superfoods that are juiced and dried within an hour of harvesting for maximal nutrient density and absorption.
- No adrenal stimulants.
- No liver detoxification herbs.

PKR’s Clinical Use: Greens Powder

- Malabsorption issues
- Inflammatory bowel issues
- Post operative strengthening
- Overall wellness
- Kids (husbands) who won't eat vegetables
- Low Fodmap diet

PKR’s Clinical Use: Dosing

Greens Powder

- 1 serving in water daily.
- 2 servings for people recovering from intestinal surgery or bowel resection.
- 2 servings during FMD cycles.

Vitamin D

Vitamin D receptors are found in most cells in the human body, indicating its influence on a wide range of physiological functions. *Bikle DD, Endotext, 2025 (Human)*

Bone health - Results from clinical studies have shown Vitamin D:

- Increased intestinal calcium absorption for bone mineralization. *Nutrients. 2022 Aug 16;14(16):3351. (Human, Animal)*
- Promoted osteoblastic differentiation and matrix calcification. *Nutrients. 2023 Jan 17;15(3):480. (Human, Animal, In vitro)*

Immune system - Results from clinical studies have shown Vitamin D:

- Dampened the inflammatory response of white blood cells. *Nutrients, 2020 (Human, In vitro)*
- Regulated the activity of neutrophils, macrophages, NK cells.
- Regulated differentiation of CD cells and reduced MHC complexes.

Proc Natl Acad Sci USA 2001 (In Vitro, Animal)

- Stimulated the production of cathelicidins and B-defensins to moderated anti-microbial activity. *Epidem and Inf, 2014 (In Vitro, Human)*
- Contributed to acute respiratory distress, when low levels were present. *Nutrients Apr 2020 (Human)*

Vitamin D

Results from clinical studies have shown Vitamin D:

- Is associated with autoimmune conditions, when low levels are present

  J of Invest Med 2011 (Human)

- Suppressed expression of toll-like receptors and thus IL6 and TNFa. *Cytokine 2009 (In vitro)*

- **Affected blood clotting**
  - Decreased platelet reactivity, improved endothelium dysfunction, suppressed overactive anti-coagulant and fibrinolytic activities. *Clin Lab 2007 (Human, Animal, In vitro)*
  - Controlled over 200 genes including those responsible for cellular proliferation, angiogenesis and inflammation reducing the risk of thrombotic disorders.

  Endocrin Rev 2015. (Human, Animal, In vitro)

Vitamin D

Results from clinical studies have shown Vitamin D:

- Interfered with transduction pathways of various growth factors (tyrosine kinases and CDK1s p21 and p27 activity) thereby modulating transcription, cell proliferation, angiogenesis and apoptosis.

Ind J Pharmacol Apr 2011 (Animal, In Vitro)

- Helped induced cell arrest at the G1 phase
- Helped reduce metastasis by 17%. *Harvard Health (Human)*
- Suggested that survival rates from cancer may be associated with dense genetic expression of Vitamin D Receptors (VDR). *Clin Trans Oncol. 2018 (Human)*

Vitamin D

- Low levels of Vitamin D have been shown to be associated with:
  - 69% of those with depression/ Seasonal Affective Disorder have low levels.
  - 14% of those with MDD have low vitamin D
  - Infants who have low levels of Vit D in the first year of their life are more susceptible to psychiatric disorders later in life.

- Mechanism of action:
  - Numerous receptors on the hypothalamus.
  - Involvement in cell signaling and growth factor signaling.

Issues Ment Health Nurs Jun 2011 (Animal)

PKR's Clinical Use: Vitamin D

- Osteoporosis
- Supportive cancer care
- Regulates/strengthens immune system
- Blood clotting
- Autoimmune disorders
- Hypoparathyroidism *New England Journal of Medicine 2007 (Human)*
- Depression and other mental disorders.

Vitamin D Dosing

Age group	Recommended Dietary Allowance (RDA) per day	Tolerable Upper Intake Level (UL) per day
Infants 0-6 months	400 IU (10 mcg)*	1000 IU (25 mcg)
Infants 7-12 months	400 IU (10 mcg) *	1500 IU (38 mcg)
Children 1-3 years	600 IU (15 mcg)	2500 IU (63 mcg)
Children 4-8 years	600 IU (15 mcg)	3000 IU (75 mcg)
Children and Adults 9-70 years	600 IU (15 mcg)	4000 IU (100 mcg)
Adults > 70 years	800 IU (20 mcg)	4000 IU (100 mcg)
Pregnancy & Lactation	600 IU (15 mcg)	4000 IU (100 mcg)

* Adequate Intake rather than Recommended Dietary Allowance.

Health Canada. (2023, December 18). *Dietary reference intakes tables: Reference values for vitamins*. Government of Canada. Retrieved from https://www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/dietary-reference-intakes/tables/reference-values-vitamins.html

PKR's Clinical Use: Dosing

Vitamin D

- I use higher doses (4000-12000 IU) in the following cases:
  - Supportive cancer care. *UC San Diego Health 2011 (Human)*
  - Dark skinned individuals (melanin absorbs the UVR that initiate Vitamin D synth) *Nutrients Apr 2018 (Human and In Vitro)*
  - IBS/IBD patients. *Int J Prev Med 2019 (Human)*
- Dependent upon Vitamin D genes:
  - Those with fewer Vitamin D receptors require more frequent dosing.
  - Those with poor absorption require higher doses.

Nature July 2020 (Human)

Probiotics

Lab4 Probiotic Consortium:

Lactobacillus acidophilus	CUL60
Lactobacillus acidophilus	CUL21
Bifidobacterium bifidum	CUL20
Bifidobacterium animalis sbsp. lactis	CUL34

Results from clinical research on Lab4 Probiotic Consortium has shown:

- To inhibit the re-growth of opportunistic pathogens, support healthy microbial balance, and reduce the presence of anti-biotic resistant microbes.

Madden, et al. Int Immunopharmacol. 2005 & Plummer, et al. & *Int J Antimicrob Agents*. 2005

- Improvement in Symptom Severity Score tests correlated to improving quality of life in IBS patients.

Alimentary Pharmacology and Therapeutics 2009

Irritable Bowel Syndrome Study 1 – 2009 (IBS Related Outcomes)

Objective of the Double-blind Placebo Controlled Study:

Attenuation of symptoms associated with Irritable Bowel Syndrome (IBS)

Lab4 Probiotic Consortium - 25 BILLION CFU

Lactobacillus acidophilus	CUL60
Lactobacillus acidophilus	CUL21
Bifidobacterium bifidum	CUL20
Bifidobacterium animalis sbsp. lactis	CUL34

Design of the Study:

52 Participants diagnosed with IBS

Administration of a therapeutic dose of **25 billion CFU of Lab4 probiotic consortium each day**

Duration and intervention:
8 weeks long,
with a follow-up every 2 weeks during the study and at 10 weeks

Follow up on:
number of days of GI discomfort, level of discomfort, bowel habit satisfaction and quality of life

Outcome of the study:

22%
DECREASE

Significant decrease in the number of days with intestinal discomfort
22% decrease in days with intestinal discomfort (gas, bloating, pain)

32%
IMPROVEMENT

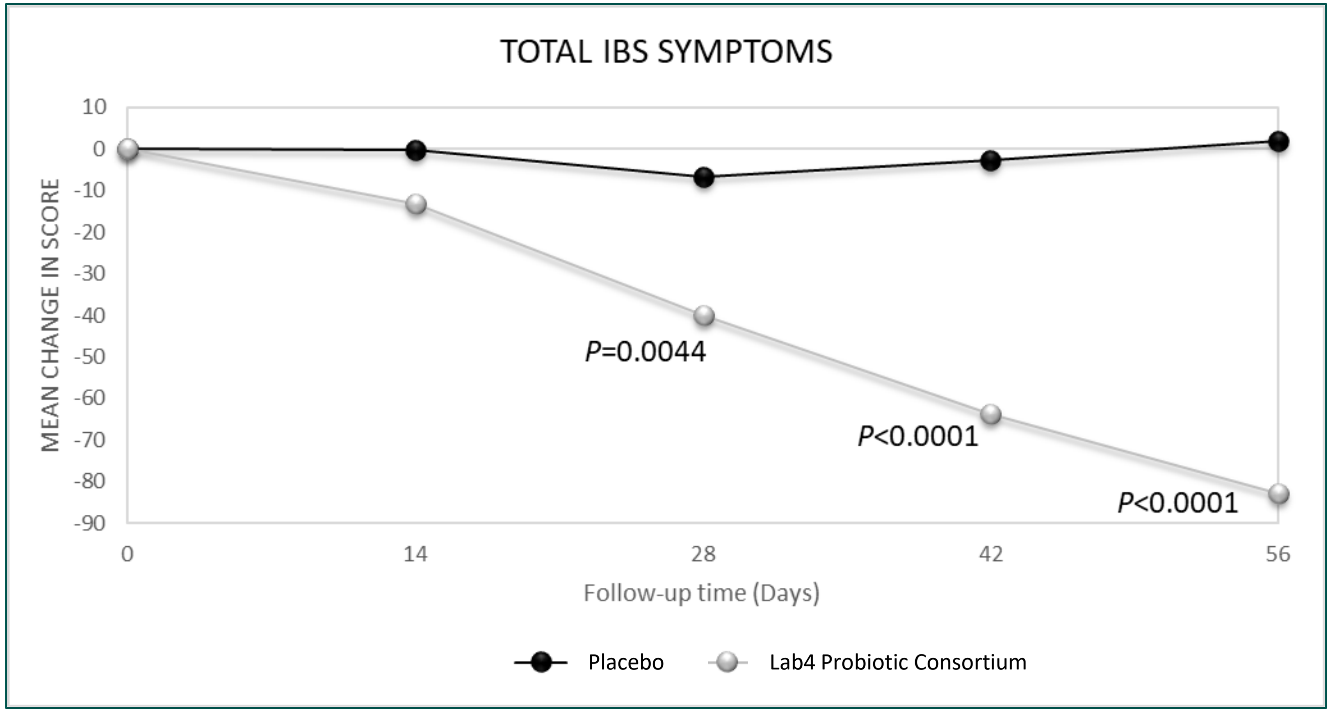
Improved bowel habit satisfaction and overall quality of life
32% improvement in satisfaction with bowel habits

It was determined that participants needed to continue supplementation to support optimal health

Williams EA et al, Aliment Pharmacol Ther 2009, 29:97-103

Irritable Bowel Syndrome Study 2 – 2024 (IBS Related Outcomes)

Female IBS sufferers randomly assigned to take daily either 25 billion Lab 4 Probiotic Consortium or a matching placebo for 8 weeks. IBS symptoms assessed every two weeks during the study period (days 0, 14, 28, 42 and 56).



Lab4 Probiotic Consortium - 25 BILLION CFU

Lactobacillus acidophilus	CUL60
Lactobacillus acidophilus	CUL21
Bifidobacterium bifidum	CUL20
Bifidobacterium animalis sbsp. lactis	CUL34

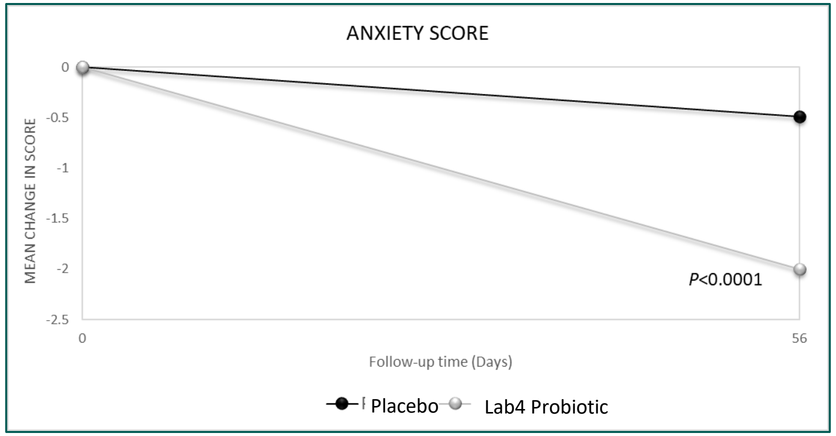
Significant reductions in IBS scores with Probiotic supplementation
Two probiotic studies demonstrated the beneficial effect of Probiotics in the management of IBS

Mullish BH *et al*, Neurogastroenterol Motil. 2024

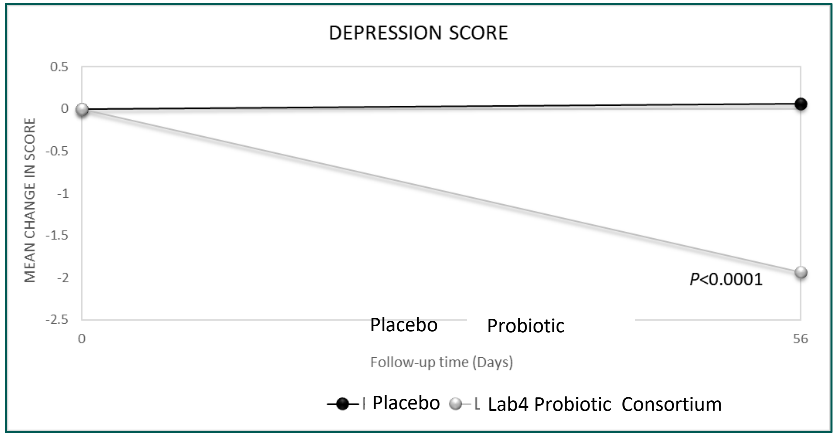
Irritable Bowel Syndrome Study 2 – 2024 (Mental Health Related Outcomes)

Female IBS sufferers randomly assigned to take daily either 25 billion Lab4 Probiotic Consortium or a matching placebo for 8 weeks. The HADS and IBS-BRQ questionnaires were completed at days 0 and 56.

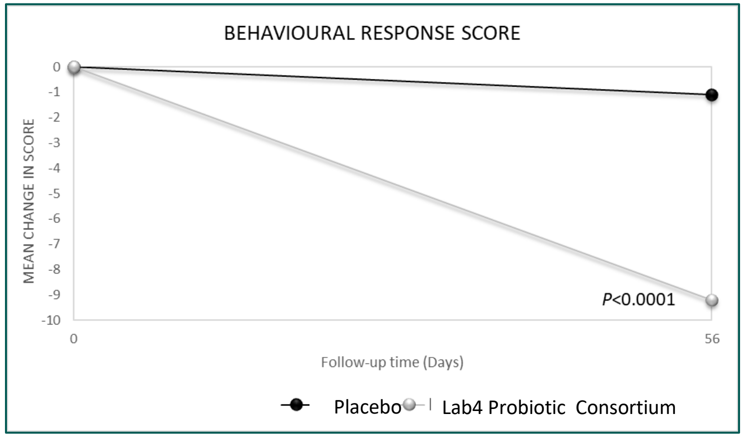
ANXIETY



DEPRESSION



AVOIDANCE BEHAVIOUR



Probiotic supplementation has a beneficial impact on the mental health of IBS sufferers

Mullish BH *et al*, Neurogastroenterol Motil. 2024

PKR Clinical Use: Dosing

Probiotics

- **25 Billion CFU** – 1 time a day with food.
- For those without appendix I consider **500 Billion CFU**,
- Antibiotic use– I recommend **500 Billion CFU**– 1 per day away from antibiotic.
- In acute stages of IBS, I consider reducing the inflammation in the GI tract first before using probiotics – Receptor Recognition Pattern!
- I change dosing according to FUT2 gene – normal = high B12 absorption, very little microbial growth.

Magnesium

Cardiac Health - Results from clinical studies have shown Magnesium:

- Helps with the movement of sodium, potassium and calcium within the cardiac tissue helping to maintain a normal heart rate.
- Is linked to atrial and ventricular tachycardia, when present in low levels

Adv Chronic Kidney Dis. 2018 May;25(3):251-260 (Human, In Vitro, Animal)

- Act as a calcium channel blocker and increased nitric oxide production to reduce blood pressure. *Clin Hypertens 2011 Nov 13 (11):843-7 (Human)*

Magnesium

- **Clinical evidence on Magnesium and Anxiety**
  - Research and results are conflicting as to the efficacy of magnesium and anxiety reduction.
  - Low magnesium levels may induce or attenuate anxiety.
  - Anxious individuals with normal magnesium levels show no significant effect.

Neuropharmacology 2012;62(1):304-312, (Animal and In Vitro) Nutrients 2017 Apr 26;9(5):419 (Human, Animal, and In Vitro)

- **Bone Health -** Results from clinical studies have shown Magnesium:
  - Is a cofactor for the enzymes necessary for the synthesis of bone matrix and stimulates osteoblastic activity.

Bone 2022 Jan Vol 154: 116233 (Human)

Magnesium

- **Muscle -** Results from clinical studies have shown magnesium:
  - Is a cofactor for creatine kinase to generate ATP in muscles reducing myopathy, lactate dehydrogenase and fatigue during exercise.

    Adv Nutr. 2013 May 1;4(3):378S-83S. (Human, In vitro, and Animal)

  - Improved perceived positive impact on muscle performance.

    J Strength Cond Res 2022 Aug1;36(8):2198-2203 (Human)

- **Metabolism -** Results from clinical studies have shown:
  - Low intracellular magnesium lowered tyrosine kinase activity decreasing insulin receptor sensitivity. More significant effects are seen in people with low magnesium. *Diabetologia. 1995 Nov;38(11):1262-70 (Animal)`*

PKR's Clinical Use: Magnesium

- Exercise
- Neurological conditions with muscle myopathy
- Cardiac conditions.
- PMS
- Leg cramping
- Osteoporosis
- General muscle wellness.

PKR's Clinical Use: Dosing

Magnesium Citrate

- **300mg per day**
- I increase to **450mg per day** for more intense exercise, muscle cramps or PMS cramping.

- I am cautious of prescribing too high of a dose as it can cause nausea, loose bowels, irregular heartbeat, hypotension and muscle weakness.

L-Glutamine

GI Health - results from clinical studies have shown L-Glutamine:

- Helped normalized the effects of TH2 immune response lowering cytokine production and intestinal inflammation. *Clin Immunol Dec 1999 (Animal, In vitro)*
- Reduced intestinal colonization and bacterial overgrowth of pathogens. *J Mol Sci Oct 2019 (Animal, In Vitro)*
- Can be an essential nutrient for lymphocyte proliferation, macrophage and neutrophil activity. *Nutrients Nov 2018 (Human, Animal, In Vitro)*
- Is a major fuel for GI cells, which helped treat and prevent leaky gut. *Int J Mol Sci May 2017 (Human, Animal, and In vitro)*
- Aids in repair of peptic ulcers from H.pylori. *National Institutes of Health (Human, In vitro, and Animal)*

L-Glutamine

Brain Health - Results from clinical studies have shown:

- L-Glutamine is a precursor to production of glutamate (excitatory) and GABA (inhibitory) *Neuron Glia Biol Nov 2010 (Human, In Vitro, and animal)*
- If glucose in unavailable, brain increases glutamine metabolism for energy. *Neuron Glia Biol Nov 2010 (Human, In vitro, and Animal)*
- Disruption in glutamine-glutamate cycle can results in bipolar disorder, anxiety, depression, addictions, epilepsy and Reye's syndrome. *Neuron Glia Biol Nov 2010 (Human, In vitro, and Animal)*
- Low glutamate levels in the brain as a result of aging, genetics or brain injury greatly accelerate brain atrophy.
- Most of the damage from even mild brain trauma is due to the disrupted glutamine-glutamate cycle and an abnormal increase in glutamate levels.

Nephrol Dial Transplant Aug 2018 (In Vitro and Animal)

L-Glutamine

Results from clinical studies have shown:

- L-Glutamine helped maintain correct pH. If pH is too acidic, glutamine is directed to the kidneys to release bicarbonate ions to correct acidosis.
- If pH is too alkaline, glutamine is sent to the liver to release hydrogen ions to correct alkalosis.

Biochem Mol Biol Educ Sept 2004 (Animal and In Vitro)

- <u>Muscle Health</u>
    - Promoted muscle cell growth and protein synthesis.
    - After a workout cellular glutamine can drop by 50% and plasma by 30%.

LSU Master's Theses 2015. (Human)

    - Improved muscle hydration and muscle recovery from workouts, trauma and burns.

J of Nutr Sept 2001.(Human and Animal)

L-Glutamine

Sugar Cravings - Results from clinical studies have shown:

- L-Glutamine reduced fimicutes bacteria that increases ghrelin.
  - Those with increased fimicutes have higher risk and prevalence of type II diabetes.

Science Direct 2nd ed 2014 (Human)

- L-Glutamine helped to stabilize blood sugar levels and reduce HgA1C.

J of Nutr May 2011 (Human)

- Glutamate helped blocked ionotropic glutamate receptors at the basal part of taste buds that send craving signals to the brain.

Adv Nutr Jul 2016 (Animal and In Vitro)

PKR's Clinical Use: Dosing

L-Glutamine:

- For GI disorders – 3-5 grams BID with food until healing.
- For Brain Health – 2-5 grams per day, unless post trauma exists then I increase to BID.
- For muscle repair post workout – 10 grams with food.
- For muscle repair post trauma - 10 grams BID with food.
- For sugar cravings – 2-5 grams in water, swish in mouth for 30 seconds and swallow. Repeat as frequently as needed.

- If I notice a patient experiencing excitation, I add in 500 mg GABA or reduce glutamine dose.

Anti-Microbial: Oregano

Clinical evidence has shown:

- Oregano essential oils have antibacterial, antiviral, antifungal and antioxidant properties *J. Essent. Oil Bear. Plant. 2016;19:553–567 (In vitro)*
- Oregano essential oils inhibited the tricarboxylic acid cycle pathway and its key enzymes. *Foods. 2022 Jan 30;11(3):403. (In vitro)*
- Oregano can be effective against streptococcus mutans, the main oral bacteria. *BMC Complementary Medicine and Therapies, 2023;23(61) (In Vitro)*
- Oregano can be effective against Staphylococcus aureus, inhibiting the replication of MRSA. *Industrial Crops and Products 2019; vol 139, 111498 (In Vitro)*

Anti-Microbial: Clove

Clinical evidence has shown Clove:

- Contains high levels of eugenol and phenolic compounds that are antibacterial, antifungal and insecticidal properties. *J Microbial 2001;32:123-126 (In vitro)*
- Essential oils inhibit the growth of molds, yeasts and bacteria.

  J. Food Microbiol 2006;107:180-185 (In vitro)
- Has phenolic compounds that can denature proteins and react with cell membrane phospholipids changing their permeability and inhibiting several gram-negative and gram-positive bacteria, as well as yeasts.

  Appl microbiol 2003;94:240-247 (In Vitro)

Anti-Microbial: Wormwood

Clinical evidence has shown wormwood:

- Contains flavonoids such as luteolin, rutin, isorhamnetin and scopoline, which are potent antibacterial, antifungal and anti-oxidant agents, particularly against staphylococci, micrococcus luteus and bacillus spps as well as candida spp. *BMV Complement Altern med 2019 Oct;19:288 (In vitro and Animal)*
- Has phenolic compounds that have a strong antibacterial effect, especially against salmonella enteritidis and klebsiella species.

Antioxidants 2023 Feb;12(3):596 (In vitro)

Anti-Microbial: Ginger & EPO

Clinical evidence has shown ginger:

- Is anti-inflammatory and can lower TNFa, IL8, CRP in IBS/IBD patients.
- Reduced inflammation, also helped to enhance the normal microbial flora in IB/IBD patients.
- Can have anti-oxidant and hepatic protectant properties while using other microbials.

Pharma Research- Mod Chin Med 2024 Vol 12, 100457 (Animal)

- **Clinical evidence on EPO has shown:**
  - Fatty acids serve as precursors to the production of the anti-inflammatory eicosanoids.

Antioxidants (Basel). 2018 Aug 14;7(8):108.

PKR's Clinical Use: Anti-Microbials

- Microbial infections.
- Preventative in low doses against parasitic infections when travelling.
- Yeast infections.
- Mouth ulcers or cankers.
- Chronic constipation or diarrhea.

PKR's Clinical Use: Dosing

Anti-Microbial Combination:

Use	Ingredients	Dose
For Acute Infection	Oregano (190mg), Clove Leaf Essential Oil (90mg), Ginger root Essential oil (90mg), Wormwood Leaf Essential Oil (90mg), Evening Primrose Seed Oil (40mg),	BID with food
For Chronic Infection	Oregano (95mg), Clove Leaf Essential Oil (45mg), Ginger root Essential oil (45mg), Wormwood Leaf Essential Oil (45mg), Evening Primrose Seed Oil (20mg)	- BID with food for 1 month - Reduce to 1 per day for 2 to 3 months.
For Prevention	Oregano (95mg), Clove Leaf Essential Oil (45mg), Ginger root Essential oil (45mg), Wormwood Leaf Essential Oil (45mg), Evening Primrose Seed Oil (20mg)	Once or twice a day depending on destination of travel.

I take note of GI spasms, loose stools, cramping, change in odour of stool.

Adrenal Gland

- In 1920's adrenal cortex extract was often recommended for use in those with Addison's disease (typified adrenocortical insufficiency)

Med Hypotheses. 2021 Nov;158:110731. (Human)

- 1940's it was used for hypo adrenal syndrome and hypoglycemia.

Br Med J. 1966;2(5518):847–853. (Human)

- Now it has been used for a variety of conditions from low blood pressure and fatigue to depression and allergies.
- Can be free of adrenal hormones (epinephrine, cortisol and DHEA)

Nat Rev Endocrinol 17, 421–434 (2021). (Human, In vitro, Animal)

Glandular

- Prepared by lyophilizing - a freeze-drying technique followed by vacuum sealing that leaves active ingredients intact.
- Glandulars contain a variety of nutrients including proteins, growth factors, and co-factors normally present in the gland in order to heal the glands and temporarily provides tasks the gland normally does.

- Full Adrenal glandular
  - Adrenal cortex – long term fatigue, salt cravings.
  - Adrenal medulla – fatigue oscillating with "go-go-go", or fatigue after a long period of high functioning.

Semin Immunol 2017 (Animal and In vitro) // Integr Med 2014 (Animal and In vitro)

PKR's Clinical Use: Adrenal Glandular

- Hypo Adrenal
- Nonresponsive or minimally responsive hypothyroidism

- OBP <+5
- Lightheaded on standing
- Sleeping straight through but exhausted
- Increased edema and weight gain
- Thirsty

PKR’s Clinical Use: Dosing

Adrenal support combination

- Bovine adrenal (175 mg), bovine spleen (175 mg), vitamin C (166mg), vitamin B6 (16.6mg), licorice (15 mg) - bid with food, breakfast and lunch.
  - I watch over the next week for reduction in lightheadedness, increase in energy.
  - If slow change in above symptoms, I keep it at this dose until OBP is +10.
  - If no change in symptoms:
    - I double the dose bid until OBP returns to +10
    - Then I reduce to initial dose bid for 2 weeks, then qd, then off.
- If the patient gets too stimulated or hyper, I reduce initial dose. qd

Cartilage and Joint Support Combination:

Musculoskeletal Health - BioCell hydrolyzed collagen (BBC)

- **Clinical evidence has shown BBC:**
  - Contains collagen type I and II, GAS, CS and HA naturally. *RxList Nov 2011*
  - Protects connective tissue and functional recovery from exercise. *Cell Signaling Dec 2014 (Human)*
  - Decreased CK, CRP and LDH in young adults (mean age 29.3) post heavy workouts. *Integr Med Jun 2015 (Human)*
  - Can significantly reduce pain and increase mobility and ease of daily activities in OA patients. *J Agric Food Chem Apr 2012 (Human)*

Cartilage and Joint Support Combination:

BioCell hydrolyzed collagen (BBC)

- In a preclinical study, it showed that BBC protects skin against the negative effects of UVB exposure reducing wrinkles, increasing skin elasticity and HA content, and protects against trans epidermal water loss and matrix MMP enzymes content.

J of Functional Foods 2020 (Mice)

- Studies have shown BBC may have chemotactic properties for fibroblasts increasing their restoration and output.

Exp Ther Med Jul 2020 (In vitro)

- Clinical studies have shown BBC can reduce the visible signs of facial aging. *Clin Interv Aging Jul 2012 (Human)*

Cartilage and Joint Support Combination:

Clinical evidence has shown Devil's Claw:

- Is an anti inflammatory with a potential therapeutic role in supporting stomach and bowel health.
- Contain flavonoids and phytosterols that contribute to its choleretic and potentially anti-spasmodic effects, supporting its traditional use as a digestive tonic.
- Reduced gastric and intestinal inflammation in IBD patients.

Aliment Pharmacol Ther Feb 2002 (In vitro)

- Reduced TNFa, with a significant reductions in the joints, skin and bowel.

Curr Med Chem 2009 (In vitro, Animal)

PKR’s Clinical Use: Cartilage and Joint Support

- Arthritis
- Tendonitis
- IBS/ IBD
- Connective tissue disorders
- Post operative repair
- Recovery and prevention from intense workouts
- Anti-aging of skin/ Psoriasis/ Eczema
- MMP3 variant or hetero
- COL1A1 normal or hetero
- Plantar fasciitis
- Fibromyalgia

PKR's Clinical Use: Dosing

Cartilage and Joint Support Combination

- Glucosamine sulfate (750 mg), BioCell Collagen (200 mg), L-Proline (250 mg), L-Lysine (200 mg), Silica (7.5 mg), Devil's claw Root Extract (50 mg), Turmeric Root Extract (50 mg), bid on an empty stomach for 6-8 weeks.
  - Then I reduce to once per day unless severe OA, or connective tissue disorder such as Ehlers-Danlos syndrome.

PKR's clinical pearls:

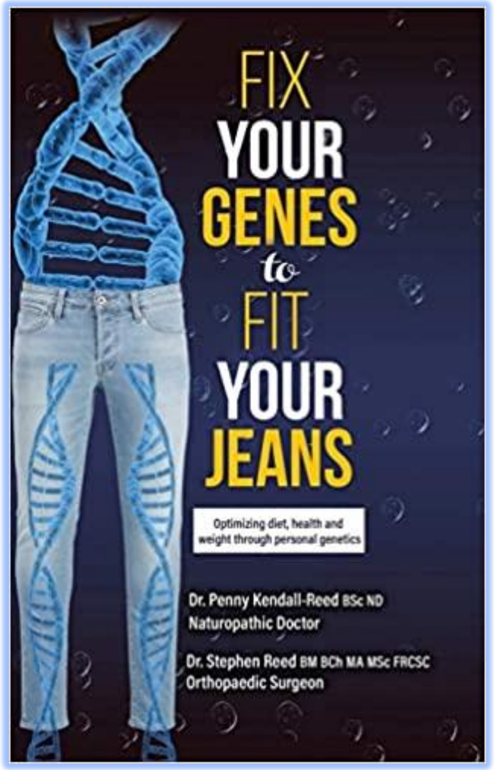
- Keep in the fridge
- I pay attention to the CYP1A2 gene as this recommendation contains curcumin. It is okay for Normals.

Subscribe to our HCP Newsletter

Scan barcode or [Click Here] to subscribe to our HCP Newsletter

You will receive information on our exciting new products, promotions, and **educational events.**

Thank you!



Fix Your Genes to Fit Your Jeans is the newest book
by Dr. Penny Kendall-Reed ND and her husband, Dr. Stephen Reed MD.
Now available at Amazon, Indigo Chapters and other retailers.