

Melissa (14 year old) "PCOS" (VC) Clinical Case

Therapeutic Plan:

- Weight Loss, Insulin Sensitivity
- Sebum(Oil glands)/acne reduction
- steroid hormone rebalancing(Testosterone, LH, Estrogen/Progesterone- Menstrual symptom reduction)
- Normalize Blood Pressure
- Correct Autoimmune condition with 4R Gut restoration
- Lessen Depression/Anxiety/mood "behavioral" symptoms
- Detoxify/eliminate Bacterial Infection, lingering effects of Gardasil Vaccination
- Strengthen Immune system integrity(immune cells-neutrophils, monocytes)
- Strengthen Cardiorespiratory system overall(CBC counts(platelets, RBC/WBC, MPV, HGB).

1 Day Dietary Plan:

- **Breakfast(6 AM)**- Super-shake(before school): Green Phytonutrient Powerhouse! - 2 handfuls (Spinach, Kale, or Chard), ½ cup berry mixture(blue, raspberries, blackberries), ½ cup canned BPA-Free Pumpkin, ½ cup "canned" coconut milk, 2 tbsp Raw almond butter, 10 drops stevia, 1 serving Maca powder, 1 serving Spirulina powder, + Raw Garden of Life Vegan Protein Powder(22 g Pea Protein + 13 serving RAW Sprouts, 1800 mg Arginine, 850 mg Glycine(hepatic phase II conjugation), 3700 mg Glutamic Acid, 1020 mg Leucine(protein synthesis), 1600 Lysine, 800 mg Threonine(sleep, mood), 830 mg Tyrosine(thyroid- metabolism)- Raw organic Sprouts + berries will shift to Alkaline PH, minimal insulin impact in this shake + phytonutrients + estrogen/endocrine/detox support(Maca, spirulina) + BCAA's(Pea Protein powder- high for plant proteins)
https://www.amazon.com/Garden-Life-Organic-Vitamins-Probiotics/dp/B007SYT7LO/ref=sr_1_12_a_it?ie=UTF8&qid=1508302433&sr=8-12&keywords=pea%2Bprotein%2Bpowder&th=1
- **Snack-(10 AM)**- Cheese N' Crackers w/ 2 swiss chard leaves(¼ for each cracker), shot mustard, roasted bell peppers(in jar with garlic): Grass-fed Pepperjack Cheese slices & Mary's Gone Crackers(brown rice, quinoa, sesame/flax seeds)- No flour, sugar!

Benefits: CLA(fat burner, metabolism), K2(blood coagulation), vitamin A(hormones/skin), vitamin E(oxidative stress), brown rice(complex carbohydrate-stable glucose release, cholesterol lowering(fiber)

- **Lunch- (1-2 PM)**- Black/Pinto/Navy Bean Chili:

Ingredients: ½-1 cup bean mixture, sauteed red onion, beefsteak tomato, tomatillo-Mango Salsa(cilantro, lime juice included), cumin spice, turmeric, ¼ Avocado, Collard Green leaves(as taco shell substitute/wrap)

Benefits: vitamins A, C, E(antioxidant/micronutrient loads!), quercetin(onion), avocado(vitamin E, fat-burner), cumin(metabolism), turmeric(anti-inflammatory)

- **Snack-(5-6 PM)**- 5 Zucchini Pizza Bites(baked in oven-5 minutes), sliced pear, Raw Romano cheese, sundried tomato slices, cooked lentils(1 medium spoon for each bite), red pepper, dulse flakes(iodine-thyroid)

Tomato- vitamin C-key in iron deficiency(Anemia potential), energy production

- **Dinner-(8-9 PM)-** Baked Rosemary Whole Chicken(collagen-bones) Thighs(Free Range), citrus sauteed yellow squash, tangelo, arugula, & sweet apple served with tangy Raw Honey-Basalmic Glaze served on Skewers and “Mashed Buttery Ginger-Cinnamon “Acorn Squash” on the side!

Benefits: Joint inflammation/Autoimmune-collagen(chicken bones), ginger(anti-inflammatory, immunity/respiratory, omega-3 fats(chicken fat, tryptophan-mood/serotonin synthesis, sleep), micronutrients(carotenoids- squash(yellow, acorn), immunity, antiviral, antibacterial(Raw Honey), cinnamon(blood sugar stabilizer), tangelo(vitamin C-collagen production, energy production, blood pressure), apple(pectin fiber).

Strategic Supplementation:

- **HSO Probiotic**(empty stomach every meal 3x/daily), Whole Food Multi(Juice Plus- B complex, minerals, phytonutrients from fruits, veggies, berries blend-capsule form)
- **D3/K2 drops**(6,000 IU D3, 125 mcg) 5 drops daily in morning
- **B12- methylcobalamin**(1,000 mcg daily), B6(P5P)- 100 mg daily
- **glycine(2-5 g/day), 1000 mg NAC, 300 mg Glutathione, 500 mg L- Taurine + BCAA powder**(mix in morning shake + post-exercise)- ammonia detoxification
- **L-Carnitine, Alpha Lipoic Acid(500 mg daily)**- lipolysis, fatty acid oxidation
- **topical Isotretinoin(common brand-Accutane)** Prescription or Clindamycin(reduce facial Oil-sebum production)²¹ - see pharmacist
- **Chromium- 1,000 mcg**(500 mg two daily doses)-Insulin Resistance/glucose stability
- **CoQ10- 300 mg** shown to improve diabetes status, heart health

Stress Slowing(Lifestyle):

-Find 1 enjoyable, relaxing activity to wind down for sleep at nightly(Ex: reading 20 non-stimulating book minutes, listen to favorite band, music cd/itunes/Amazon music App- shift “focus” to Love, Gratitude, Inspire Belief that her “Best her best days are still yet to come” with music, art, leadership podcasts!

- Practice “**Cognitive Reframing**” statements, listen to “**Positive Affirmations CD**” on way to school
- “**Practice**” I feel statements, open communication with mother(Consider origin of disrespectful behavior toward mother, authority figures)

Therapeutic Intervention Time-frame: New Nutrition practice every 2 weeks(monitor/adjust/gather feedback from Melissa & parent); Exercise program adjustment each check-up(2 weeks)- focus on moving more, social enjoyment, movement quality, mental engagement in present activity- will carry into school Academic work

Clinical Condition Pathophysiology:

Conditions to Address- Depression, Anxiety, Migraine, Hypertension, Autoimmune(Specific type not mentioned), Weight Gain, Asthma:

Key Details: Oily Face/Hair, Dry extremities(Hands, legs), Behavioral issues(emotional health), I-Phone Syndrome, several Gardasil Vaccine Shots, prior Ovarian Cyst

Common Symptoms of PCOS: Weight Gain, Oily Skin, High Blood Pressure, Diabetes(High Blood Insulin), Irregular Menstrual cycles, excessive hair growth(Hirsutism)

Reason for “Irregular Menstrual Cycles.” Hormonal Imbalance-”primary cause” Excessive LH hormone(LH-signals ovaries to release egg(ovulate), FSH secretion begins menstrual cycle, followed by Estrogen/Progesterone) production(during and/or Insulin).

Higher than normal Luteinizing Hormone(LH) production in females causes excessive Testosterone(excessive body hair growth-upper lip, chest, stomach common areas)

The following Lab Tests are noteworthy pertaining to Melissa’s condition:

- **CBC(Low MCV, MCH, MCHC, High Platelets, MPV):** MCV, MCH, MCHC all provide insight to “Red Blood Cell(Erythrocyte) size and Hemoglobin content in red blood cells. These Lab values usually relate to Anemia conditions. Mean Platelet Volume(MPV) is the average platelet size. Platelets are “essential” to clot blood and a high or low level can indicate a wide range of clotting disorders.¹
- **Thrombocytopenia-(Low Platelet count)** can be caused by many factors including infections, surgery, toxic chemicals, pregnancy, alcohol, viruses, and Autoimmune conditions. Autoimmune is the most likely cause for Melissa based on her health history report Lupus and Rheumatoid Arthritis are examples of 2 common Autoimmune conditions that can lead to **low platelet count**. This can happen by the body “destroying” its own platelets from the immune system attacking itself. (ITP) Immune Thrombocytopenia is a an autoimmune bleeding disorder where “**blood doesn’t clot**” in the way it is supposed to normally.²
- **Tachycardia(Fast Heart Rate- Highest Pulse Rate-108- July ‘14!):** A heart rate > 100(BPM) beats per minute is called Tachycardia in which there are 3 possible types a person may have Supraventricular-SVT, Sinus, or Ventricular): Sinus has symptoms **Anxiety**, fever, and “**severe emotional distress**” which pertain to Melissa’s condition although Supraventricular(Atrial) Tachycardia is common in women, “**anxious young people,**” and those consuming large volumes of **coffee(caffeinated beverages)- 2 cups breakfast(need to know what “consistent caffeine consumption habits look like daily!”**

Either one of these two types of Tachycardia could be present.³ Melissa’s elevated “pulse measure” and “Low BMR” are connected to “Insulin Resistance” which sets her up for potential Prediabetes/Diabetes that is also linked to High Blood Pressure, Cardiovascular Disease Risk increase, and also Neurological Disorders in her future as time progresses(Alzheimer’s, Dementia...) due to the impact stable blood glucose/Insulin have on brain function, blood flow, and symptoms evidenced in symptoms surrounding “**mood, anxiousness, and depressed mental/emotional state of being.**”

- **Insulin Resistance(Prediabetes):** “ScienceDirect” journal study shows a direct connection among a decrease in Basal Metabolic Rate(BMR) seen in **women with PCOS and Hyperandrogenemia(high Androgen hormone production) and Insulin Resistance!** Ninety-one women(age 24) were assessed for BMI(indirect calorimetry), with regular menstruation, mean BMI, fasting insulin, and fasting glucose/Insulin ratio as statistics. A “statistically significant” outcome was seen in women without IR(1,590 +- 130) vs women with Insulin Resistance(IR- 1,116 +- 106).⁴

Downregulation of BMR(energy needs for daily life) I find to be significant in this case considering **“Weight Gain”** is a key factor at least as a symptom of the primary causes(**Excessive Insulin, LH, Testosterone**) leading to the “Hormonal Imbalances” of PCOS condition with a lowered BMR indicating sub-par metabolic health and a likelihood of chronic sedentary lifestyle for this teenage girl in a season in her life that is a critical one to begin developing/maintaining healthy lifestyle habits to support adolescent/pubertal growth phases of development and healthy sexual organ physiological maturation.

- **High Neutrophil, Monocyte Count(Autoimmune Disease):** Neutrophils are now receiving notice for role in immunization and effector phases of Autoimmune diseases such as **Lupus and Rheumatoid Arthritis**. Neutrophil cell surface receptors(Integrins, Fc-receptors, chemokine receptors) and intracellular signal transduction pathways(tyrosine kinases) are key cell types to look further at in assessing autoimmune disease pathology and the pharmacological control of these complex conditions. To sum up, Neutrophils are seen in “high numbers” at **autoimmune lesion sites** and cell surface receptors intracellular signaling molecules are involved in autoimmune pathogenesis.⁵
- **Low CO₂(Carbon Dioxide):** This “Low” Co₂ level tells us if the body is maintaining a healthy PH(Acid/base) balance which affects metabolic function overall and control of body fluids/electrolytes(sodium, potassium, chloride, calcium). Low Co₂ could indicate either **respiratory(breathing difficulty)**-need to ask her about this possibility), kidney, or metabolic concerns including High Blood Pressure.⁶
- **High Adipate/Suberate(Fatty Acid Metabolism):** These two “short chain” fatty acids are key contributors to the all important process of **Fatty Acid Oxidation** and typically have a “Very low” amount produced since beta-oxidation is the primary mitochondrial pathway used. Often times in the human body we need a **“carrier”** to get a certain substance or nutrient into a cell or region for a particular “function” to occur in addressing a symptom that pertains to a physiological system! **Carnitine**, an amino acid, is one such carrier in the fatty acid oxidation process and must be present in order for fatty acids to be shuttled into the mitochondria, the energy powerhouse of our cells. Nausea and fatigue are common symptoms and environmental toxins is also something to look for in relation to these elevated levels.⁸ A carnitine supplement would greatly benefit this individual. L-Carnitine will also help with body fat loss(lipid profile) and liver health.
- **High Beta-hydroxybutyrate:** This “ketone body” tends to be produced when **glucose oxidation** is impaired and thus free fatty acids are the primary energy source used by the body. It’s elevation is telling of the need for support in the action of the hormone Insulin so the pathways involving glucose(**carbohydrate metabolism**) can occur properly considering the large impact glucose/insulin stability has on the other body systems(**cortisol, leptin, Testosterone, Estrogen, mood**). **I might recommend Chromium or Vanadium supplementation** if necessary to support improvement in carbohydrate metabolism in addition to B1(thiamine), B3(Niacin), and lipoic acid.⁸
- **High a-KG, Fumarate, Malate:** alpha ketoglutarate, fumarate, and malate are all 3 high telling us there’s something getting in the way of optimal Citric Acid Cycle(Kreb’s Cycle) function and CoQ10, B complex, magnesium, and some amino acids may be needed. Fumarase insufficiencies were seen in rats with hypertension and research shows that a decrease in fumarase in kidney cells caused malate to be lowered as well as Aspartate, Arginine and Nitric

Oxide(NO). Through its **conversion to L-Arginine and NO, malate supplementation increased L-Arginine and Nitric Oxide to modulate blood pressure in hypertension.**⁹

Magnesium plays a key role in many functions including “energy production” and **regulation of heart/blood pressure/cardiac functions** as a key electrolyte that must be in balance with blood calcium, potassium, chloride, and sodium levels.

- **High a-Keto-B-methylvalerate:** As a keto acid of BCAA’s(Leucine, Isoleucine, Valine) that is formed by removing the amine group during the catabolic(breakdown) process, we often see large amounts in inherited disorders such as Maple Syrup Urine Disease(MSUD) as one example of a metabolic pathway disorder involving catabolism pathways.

Pyruvate dehydrogenase is the pivotal enzyme in the ability to utilize cofactors for specific B vitamins(B1, B2, B3, B5, and Lipoic Acid). Again, we see a common theme with Melissa in lack of sufficient B vitamins and/or their absorption plus items **missing(enzymes) that “unlock”(lock and key) the pathways** that are essential to the function of these key vitamins in **energy production, carbohydrate metabolism, and glucose/insulin regulation which relates directly to her “mood, behavior(emotional health),** and other hormones(cortisol, Testosterone-affecting estrogen balance(I call this C-T-E balance/imbalance).

Insulin Resistance(High Blood Insulin) is strongly tied to a cause of high Testosterone(Free T-active form) meaning that the following Lab Tests need to be done to provide more information on which nutritional intervention are “best” to help rebalance her hormones(Free T/Total T, serum Insulin, HbA1c).¹⁰

High Leptin is also a hormonal issue that makes it near impossible for “weight loss” to occur and is often related to high blood insulin causing **further high Testosterone in women(especially seen in PCOS).** Leptin is involved in satiety and hunger regulation by being secreted from fat cells in which leptin resistance means the signal to the brain is not working quite right!

- **a-hydroxybutyrate/High Benzoate(Detoxification indicator):** this elevation means liver function and specifically GSH(Glutathione synthesis) is impaired with another likely enzyme/pathway issue. 1000 mg N-acetylcysteine, 300 mg Glutathione, and 500 mg Taurine are advised in this situation. High Benzoate(common as food preservative in processed food products) reveals Hepatic phase II glycine conjugation pathway impaired and Dysbiosis with bacteria or yeasts in urine, and requires “Glycine” supplementation(2-5 g/day) and 100 mg vitamin B5 to correct.¹²

Gardasil Vaccination: With considering Melissa’s need for detoxification and the Gardasil Vaccine, it’s likely that heavy metals such as Ammonia are elevated and Diphtheria toxin is a possibility containing casein hydrolysate and purified with ammonium sulfate by fractional precipitation and Tetanus toxin is produced from growing Clostridium tetani in a modified medium from “bovine casein.” Formaldehyde is used to “detoxify” when these toxins are present.¹³

Low protein + high lactose amounts in diet have shown to cause behavioral symptoms and even developmental delays or autism with Lactose being a sugar that bacteria utilize in fermentation. One important point to note is how Clostridia bacterial species, unlike Bifidobacteria, produce Ammonia and has been linked to aberrant behaviors in children. Clostridia is also an opportunistic infection, common as

result of vaccines, and these infections tend to surface post-antibiotic treatment since antibiotics destroy good bacteria that colonizing in the gut.¹³

The Gardasil Vaccine is a (HPV) Human papilloma virus vaccine intended for cervical, vulvar, and vaginal cancer protection and has been approved for women ages 9-26 while highly advised for young teen girls as early as age 13!

Interestingly, fainting after vaccination injection is common in adolescents. Thromboembolic disorders have been reported with Gardasil treatment in addition to symptoms of fever(temp increase), nausea, and dizziness. Blood clotting would be my main concern in relation to the heart. Pertaining to her skin condition **rashes, hives, and itching** have been documented from vaccination as well.¹⁴

The FDA stands behind its "safety"(21,000 girl study conducted pre-FDA approval). Despite ~ 94% of adverse events occurring from Gardasil vaccination treatment being labeled as "Non-serious" in JAMA published article(over 12,000 total reports), Syncope(fainting-loss of consciousness) is one of the symptoms associated with Gardasil and according to the **American Heart Association can suggest heart abnormalities/palpitations, can be caused by Tachycardia**, and is recommended to have an ECG(Electrocardiogram) test performed to determine cause of syncope in young adults. Blood Pressure fluctuations is an important sign to notice and those who are dehydrated should increase water, sodium from natural sources.¹⁵

Nutritional Intervention Order:

- **Stabilize Blood Glucose/Insulin**
- **Leptin Resistance**
- **Rebalance Steroid Hormones(Lower Testosterone/LH to normalize Menstrual Symptoms):**
- **Supplement Tyrosine**(boost T3-cell metabolism)
- **Chromium, Berberine(1-2 g/day), Alpha Lipoic Acid(600-1,200 mg/day), Magnesium supplementation**(topical/transdermal)- Insulin Resistance
- **Liquid Carlson's Fish Oil(3x/day- ~ 4g DHA/EPA combined)(1,300 mg/1 tsp serving)-** can drink straight or add on food! -There have been testimonials of complete reversal of behavioral symptoms in children/adolescents from fish oil intervention(lowers inflammation. Boosts cognition, weight loss)
- **"TRX/Bodyweight/Kettlebell" HIIT Strength/Circuit** Functional Exercise(**30 min, 3X weekly**) + 2 days **group Sport Activity**(rec center with friends, school with classmates) Social Health benefit, teenage female more likely to stay "compliant" and develop a "lifestyle" beyond a few weeks/months if enjoying time with friends/peers her age(significant!)
- **Intermittent Fasting(IF)** protocol: **"skip breakfast" Eat 1st meal(~2 hrs.) after waking in morning**(monitor hunger cues- some people don't do good with this strategy, good for "leptin sensitivity, growth hormone, and negative energy balance without dieting!)
- **DIM/Indole-3 carbinol, Methylcobalamin B12, Milk Thistle**(estrogen metabolism increase from DIM, dietary lignans, and milk thistle formula via c-2 hydroxylation)¹⁶
- **Add Pink Himalayan/Celtic Salts(cell hydration benefit)** to Food meals($\frac{1}{4}$ - $\frac{1}{2}$ tsp)
- **Potassium dense foods(nerve impulse transmission, muscle contraction, cardiac function)-** major mineral-4,700 mg/day(easy to find at local grocers)- avocado, banana, mango, tomato, spinach, lima beans, oranges, sunflower seeds, almonds.¹⁷

Nutritional Intervention Outcomes, Time Frame:

I fully expect to hear positive feedback in areas of the following: (Skin symptoms/mood, weight loss(Insulin Resistance), hormonal balance Tests- 2-4 weeks(moderate), 4-8 weeks(significant)

- **Improved Insulin Sensitivity**(confirmed by HbA1c, serum Insulin tests)
- **Leptin Sensitivity- evidenced by Fat Loss-BIA Analysis/Skinfold measurement-** Hormone specific body fat regions- Belly fat= High Cortisol; Chest/Pectoralis Fat= Testosterone/Estrogen imbalance(expectation- 5-10 lb weight loss/1-2% Fat Mass reduction/week for 1st month) - 40 lb weight loss total to get in "Healthy Weight Category for 5' 1" height(weight loss outcomes dependant upon numerous lifestyle factors, can be higher in beginning for Obese individual with nutritional intervention + Cardiovascular Circuit Exercise + Strategic Supplementation + **Sleep Quality**(habit compliance key especially in beginning)
- **Reduced Acne, less oily face,skin/excess hair**
- **Better mood, more positive outlook on life, less anxious, healthier communication with mother**(results not always "measurable" via blood tests- I get greater satisfaction when clients experience these "behavioral/relationship/Stress/Depression" outcomes- takes more "effort" on their part, shows they're "Emotionally engaged!" - Hard to place timetable on this)
- **Lower Free/Total Testosterone, LH, normalize Steroid Hormones w/Estrogen, Progesterone for Healthy Menstrual Cycles**
- **CBC(Heart health/Respiration):** Normal Platelets(very important!), WBC, RBC, HGB, MCH/MCHC, MPV
- **Lowered(Normal) Neutrophils, Monocytes-** improved Autoimmune health status, remove trigger foods(IgG Test)
- **Blood Pressure/PH balance:** increase to "normal" status Carbon Dioxide(CO2)-(add alkaline foods/leafy greens to meals,) new Blood Pressure Tests(want to see lowered Systolic BP < 120)
- **Detoxification(Ammonia removal):** Glycine, Glutathione, Glutamine, L-Arginine amino acids(BCAA's)¹⁹

Medication Monitoring: No medications on record, Metformin is a possibility although would like to see if we can correct Insulin naturally without medications knowing her age, importance to instill "Building Health via Healthy Eating" principle as a foundation for her future.

Drug-Nutrient-Herb Interactions:

Metformin may lower DHEA although no strong interactions stated in research with DHEA.¹⁸ Monitoring every 2 weeks if medications are introduced. Will consult mother on if medications are desired or not for potential treatment plans.

Lab Tests Advised:

- **Serum Insulin, HbA1c**(Insulin Resistance, Leptin Resistance, Obesity)
- **Serum Total/Free Testosterone/LH/Estrogen-** PCOS menstrual symptoms show High T, LH cause of menstrual symptoms
- **Thyroid Panel- TSH, Total/Free T4, T3, rT3, Thyroglobulin Antibodies**
- **Stool Analysis**(Clostridium bacterial infection suspicion), Dysbiosis
- **IgG Food Intolerance Test**(likely many on this list with SAD)
- **Serum MMA(Methylmalonic Acid-B12 status)-** depression, anxiety, potential Pernicious Anemia

- **Antinuclear Antibody Test**- present in most Lupus(SLE) and most autoimmune conditions(Rheumatoid Arthritis, Sjogrens), Anti-DNA Antibody may differentiate/rule out Lupus if positive, **Antiphospholipid Antibody-blot clot formation association**-²⁰ CBC abnormal tests-possible Anemia
- **Vitamin (25 OHD)**- depression symptoms, key in steroid hormone synthesis, Testosterone, nerve cell transmission, integumentary system function(skin symptoms)
- **Iron Panel(serum Ferritin, TIBC, transferrin saturation)**- suspected Anemia(IDA)

Potential Referrals: Gastroenterologist, Neurologist, Immunology specialist, Dermatologist, Clinical/Child/School Psychologist/Certified Family Therapist/Counselor

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“Post- Chemotherapy Breast Cancer BC Case”

Therapeutic Plan: Reverse Autoimmunity, restore “normal” Adrenal Hormone(Cortisol, Aldosterone), Liver, Kidney(Urinary), & Cardiac Blood Markers(increase RBC, HCT), strengthen immune system, improve oxygenation, reduce ankle swelling, & normalize PH(Alkaline shift)

1 Day Dietary Plan:

- Breakfast(6 AM)- Super-shake(loaded with phytonutrients/greens powder, Maca, berries, chlorella, 20g 100% Grass-fed Whey Protein Powder(High in Glutathione!)- Antioxidant Loads, clean protein(amino acid absorption-high Glutathione, leucine, BCAA's).
- Snack-(10 AM)- zucchini pizza bites, sundried California tomatoes, Raw romano(italian) cheese, sliced sauteed pear, 1 spoon cooked lentils per bite! (sauteed zucchini or yellow squash(4-8 rounds-baked in oven brushed w/x-virgin olive oil-ask me about brand names(harvest Date, glass bottle) - Lentils high in "protein" to address likely muscular weakness/frailty "post-chemotherapy" treatment, zucchini/squash high in Folate, b vitamins
- Lunch- (1-2 PM)- Andouille Sausage, avocado, & sauteed Poblano Pepper Collard Wrap w/sauerkraut, 1 fermented sliced pickle spear, topped with Homemade Mango, Cilantro, Vine ripened Tomato salsa! - Grass-fed sausage(magnesium-energy, muscle relaxer, electrolyte balance w/sodium, potassium, calcium, phosphorus), mineral absorption(zinc- endocrine functions(androgens, skin), poblano(vitamin C-iron absorption/RBC), cilantro- medicinal herb/adrenals, mango(antioxidants-A, E), sauerkraut, pickles(probiotics-immune boost)
- Snack-(5-6 PM)- Homemade Red Pepper Hummus(chickpeas high in protein) served with Mary's Gone Crackers or Homemade Sesame Seed, Chia, whole flax seed(ground in vitamix, coffee grinder)-no flour used, pink himalayan salt, distilled vinegar- FlaxSeed shows increased urinary lignan excretion, improved 2/16 hydroxyestrone ratio(estrogen metabolism metabolites)- most dense lignan source in plants
<http://ajcn.nutrition.org/content/79/2/318.full>
- Dinner-(8-9 PM)- Oven Baked Free-Range Rosemary Lemon Chicken Thighs, over bed of Red Quinoa, apricot- radish-radicchio chutney, shredded arugula, bok choy, and mustard green medley with tangy honey-basilamic citrus sauce(lemon oil, tangerine, Raw honey, sprinkle bee pollen) served with ½ cup(small) serving butternut/spaghetti squash

Strategic Supplementation:

- **HSO Probiotics, whole food greens/micronutrient + Raw Glutathione/SOD included-** restore immunity, counter radicals, shift PH towards Alkalinity(normalize PH)- SOD counter Radicals(Hydroxyl, Peroxyl)
- **Adrenal Formulation(Adaptogens-Ashwagandha, Rhodiola Rosea, Maca**(physical endurance, rebalance estrogen w/ other androgens)- Clinically Formulated for Adrenal insufficiency(increase cortisol production); possible cortisone treatment(referred out)
- **Magnesium(topical) spray(4-5 sprays= 66 mg elemental magnesium-** adjust sprays to needed dosage, level of deficiency- rebalance electrolytes/blood pressure, pain reduction(uric acid), **muscular relaxation(ankle Edema)-anti-inflammatory**
- **Iron Supplement**(if test reveals low ferritin), CoQ10- improve blood flow/blood vessel circulation
- **1000 mcg B12 drops(methylcobalamin)- energy production, nerve impulse transmission**
- **D3/K2(5 drops daily- ~6000 IU D3, 125 mcg K2:** benefits- D3- calcium absorption, cancer preventive, skin, steroid hormones(androgens); K2- circulation, vascular health
- **Liver Amino support formula(Parrillo Brand)-** Inositol, PABA, Choline, Defatted Liver, Peptide Bonded)

Stress Slowing(Lifestyle):

- **Unplug all Technological devices 1-2 hrs pre-bedtime, wear orange glasses that block blue light at night, dim all lights(1-2 hrs prior to sleep), and read on kindle device or listen to calming, relaxing music/podcasts to wind down- address optimal cortisol nighttime levels, GH production, insulin sensitivity, REM sleep, circadian sleep/wake rhythms**
- **Have 1 “Crucial Conversation” you feel will alleviate any Stress build-up or anxiety created from Coping with Cancer Experience with a Loved one, significant other, friend**
- **Increase “blood flow”, oxygenation to tissues w/ (SMR) Self-Myofascial Release, Yoga/balance movements(light intensity) focused on movement quality, deep breathing, full ROM(range of motion)- ankle swelling reduction(Pain Threshold awareness)- Be present mentally in moment-(Mind-Body benefit)**

Therapeutic Intervention Timeframe: We will add New Nutritional Practices, Strategic Supplements, Lifestyle(Stress) changes as needed every 2 weeks assessing and monitoring inner health status referred back to Lab Markers, symptoms, and Nutrient Deficiencies looking at “whole physiologic systems” and their “function” as a unit. My goal is to help BC develop Skills to sustain a Lifestyle of Prevention not only from future Cancer while also All Chronic Conditions for Life.

Clinical Condition Pathophysiology:

- **Low RBC, HCT- (Possible Anemia)-** Hypoxic Cancer cells are resistant to cancer therapies(chemotherapy). (HIF-1) Hypoxia Inducible Factor 1 is a major player in cell response to “low oxygen” and regulates gene expression in cancer cell biology. Tumors containing < 1% oxygen concentration are termed “hypoxic” causing a stressful environment leading to necrosis/apoptosis; however; cancer cells are able to adapt to these environments and progress their tumors.¹

Since “Chemotherapy” damages the bone marrow(red blood cell production, platelets,...), it’s the therapy itself, not the cancer, that is the primary cause to low red blood cell count(seen commonly in post-chemo cancer patients as signs of Anemia associated with symptoms of chronic fatigue, rapid heart rate, pale skin, dizziness, poor concentration, and headaches due to lack of oxygenation getting to the brain(brain like the heart both rely heavily on proper blood flow!) Although “Cell growth factors” can help stimulate red blood cell(erythrocyte) production(epoetin), these come with side effects and can take up to 8 weeks to work. Bone marrow suppression(myelosuppression) is possible and since her body may not be “keeping up” with RBC production(every 120 days) due to the chemo or radiation therapy likely given as cancer treatment that kills them. Any blood loss makes Anemia symptoms worse. Iron deficiency is likely with her low Hematocrit test meaning an Iron Panel should be tested.²

- **Adrenal Insufficiency/Addison’s- (Low Sodium, High Potassium, High Bun/Creatinine, Low Albumin)-** Albumin(main constituent of serum protein~50 %) is a key indicator in liver disease/function with its role in nutrient transport, waste removal, and a cause in edema(swelling). Her serum level is well below the optimal 4.1 listed by UNC and could indicate excess waste not being eliminated by her liver(liver dysfunction) with connections to diarrhea,

inadequate “iron intake,” and low calcium.³ Increase in BUN/creatinine is likely from kidney damage, not enough fluids, or drug intake causing poor kidney function. Excessive protein is unlikely with cancer patients(usually opposite-low protein intake) but possible as a symptom as well). Adequate fluids(water, natural electrolyte beverages) need to be addressed.⁴ Hypochlorhydria is likely also.

I’m not certain if “serum” or “urinary” sodium is the test result provided, however, serum levels are more greatly impacted by fluid balance changes, body water, and functional concerns(adrenal cortex hormones- Ex: aldosterone) than by a change in sodium/salt balance whereas “urinary” sodium is better measure of sodium/salt balance.

Important that aldosterone decrease(result of adrenal hypofunction) can cause impacts “sodium metabolism” by increasing renal “sodium excretion” and combined with High serum potassium and decrease in serum chloride are a perfect storm combined with edema, fatigue(chemotherapy) and Anemia related tests outcomes(low RBC, HCT) for Congestive Heart Failure(CHF-common in hyponatremia) and/or Kidney Disease/Nephritis).

The swelling is suspected with impaired sodium reabsorption from insufficient glucocorticoids/mineralocorticoids). Increased BUN also indicates “dehydration” along with high serum potassium.⁵ Salivary Cortisol needs to be tested in addition to serum Chloride(<100= adrenal hypofunction paired with low sodium, high potassium, edema).

One of the assessment questions I always ask my clients is about the “Tastes, flavors, and aromas” they naturally gravitate towards. In other words, what foods do they “crave” typically when “Stressed” or at various times of day. Come would call these “cheat” foods. If she craves “Salty” foods as many people do(I like salty too!) this will be an important piece of information to note to help me guide her properly!

- **Liver Enzymes(ALP, AST, ALT) + Bilirubin(liver)**- ALT, AST are “extremely high” along with all 3 major liver enzymes being High indicates general liver dysfunction with specific symptoms of adrenal hypofunction, many types of cancer, renal dysfunction, tissue damage, liver cirrhosis, and hepatitis as possibilities in need of treatment and nutritional intervention.

Leaky gut and conditions involving intestinal mucosa/malabsorption syndromes are something to consider with GI tract/digestion as a beginning origin place for all of these other symptoms/conditions leading up to cancer. ALP elevations indications usually a “bone” or osteo condition(bone repair, growth), autoimmune is possible through compromised gut integrity, and more likely considering High Bilirubin test is Biliary Obstruction and specifically “common bile duct obstruction.”(factors- ALP significantly higher than ALT(162 vs 124) and Bilirubin > 1.2(2.3).⁵⁽¹²¹⁻¹²²⁾

- **Low CO₂(PH Balance-Acidic Diet)**- Low CO₂ ties back into the serum potassium in some way due to revealing of an “acidic” diet(pasta, breads mentioned) since potassium is body’s primary intracellular PH buffer(90% inside cell) with very little found outside cells and its crucial roles in osmotic pressure, cardiac function(blood), respiration rate increase(breathing), sodium-potassium pump, and acid-base balance. A key note is that the human kidney will not “conserve potassium” continuing its excretion(removal) leading to serious problems in kidney/heart functions if we do not take in enough potassium dense foods daily!⁵⁽⁶⁰⁻⁶¹⁾

We should take a look at the synergistic effects of all electrolytes involved in fluid regulation/PH(sodium, potassium, magnesium, calcium, chloride) together to gain a full picture of system functionality. Serum/urinary Calcium should be tested for comprehensive view in relation to Potassium/CO₂(bicarbonate). Uric Acid is an additional test that could be valuable since Edema is present, acidic PH is likely, reduced tissue oxidation and xanthine oxidase activity leads to uric acid being produced(Gout- joint pain, extremities). Suspect high C-reactive protein(inflammatory marker) if Uric Acid test is high.

- **Low Vitamin D**(Anti-cancerous)- In multiple cancer types, vitamin D levels have shown to become “severely depleted” by chemotherapy treatment 400% greater likelihood of depletion vs non-chemotherapy patients(Colon cancer= <15 ng/ml) and a drop from 21.3 to 14.7 ng/ml seen in ~97% of chemotherapy patients in “Breast Cancer” based on Roswell Park Cancer Institute research.

To address this, 6 months of 2000 IU D supplementation rose levels just to 29 ng/ml in chemo patients(insufficient) while high-dose 1x weekly 50,000 IU D increased it by 24.3 ng/ml bringing levels to sufficient status. Clearly “aggressive D3 supplementation is paramount in chemotherapy recovery to avoid further complications of a wide variety with this pivotal hormone and its numerous system roles in human physiology including its Anti-cancerous effects. Mechanisms of why chemotherapy causes this to occur include less absorption through subclinical mucositis or increased D metabolism via CYP3A4 enzyme activation.⁶

- **2/16 Estronex Test:** Primary metabolites of estrone and estradiol are hydroxylated at C-2 and C-16 positions although 2-hydroxyestrone has very moderate anti-estrogenic effect with little to no biological activity compared to 16 alpha-hydroxyestrone and estriol as estrogen agonists which as a “significant factor” in estrogen specific tumors found in “endometrial and breast cancers” are seen elevated.

I3C, DIM and sulfur supplements + ground flaxseed and soy show the ability to modulate the 2:16 ratio although some side effects may occur requiring further research. These compounds are found in vegetables of the brassica family(brussels sprouts, cabbage, broccoli) which are beneficial in elimination of estrogen metabolites through glucuronidation improvement. She was wondering about Glutathione’s role in cancer. Glutathione S Transferase enzyme is upregulated by sulfur which also provide a benefit of less damage to vital DNA by reducing 8-OH 2-deoxyguanosine, a marker for oxidative stress.⁷ Levels of 2,16 should be above 2 so her level is a bit low but in hyperimmune conditions such as Lupus(SLE) and Rheumatoid Arthritis 16-alpha hydroxyestrone is elevated showing inappropriate estrogen activity.⁷

I’d like to add briefly that a supposed vitamin B-17 is not valid or scientifically based confirmed by Dr. Weil, someone I consider credible and solidly rooted in evidence-based Nutrition Science. I would not take this as it clearly was not thought of highly enough to be included in our 4 month Vitamins/Minerals course in Human Nutrition under the topic of B Vitamins extensively covered. There are more product salesmen and bloggers on the internet than ever before and sadly people get tripped up by these marketers every single day. All the more imperative to be careful who you “listen” to and whose advice you follow. Choose carefully is my best advice.

<https://www.drweil.com/vitamins-supplements-herbs/vitamins/do-you-need-vitamin-b17/>

Nutritional Intervention Order:

- **#1 Link in Clinical Chain of Events! Address Autoimmune Condition-#1 reason for Adrenal Insufficiency- causes Low Aldosterone, Cortisol, ACTH Production)-** IgG Food Sensitivity Test) Eliminate “Red Flag” Inflammatory Foods that are likely “Triggers” of Autoimmunity(corn, wheat, soy-big 3) + conventional corn-fed dairy; B Complex/Mineral Supplementation(immune strength-cofactors)
- **Restore GI Health w/Pre/Probiotics, Betaine HCL w/Pepsin/Bitters, Digestive Enzymes**(high dose-clinically formulated-sufficient amounts of Proteases, Amylase, Lipase, a-Galactosidase, Cellulase
- **“Add in” Alkaline Foods**(Green Leafy vegetables, legumes, raw nuts, seeds, fresh/dried herbs, spices)**“Cut Out” All Acidic Foods**(Big 3, dairy, conventional Animal foods, processed/packaged food items, processed grains(All gluten containing foods), fruit juice(eat whole fruits- juicing strips fiber, sugar/fructose hit to bloodstream quickly)
- **Liver Detoxification Strategy: Glutathione Supplementation** w/sulfur, NAC, riboflavin, niacinamide, Carnitine(enhances chemotherapy treatment by negative feedback inhibition making cancer cells weaker from GSH intervention, Antioxidant, Detoxification, & Immune Strengthening Actions
- **Address Adrenal Insufficiency(Addison’s Disease)- Low Aldosterone/Cortisol hormones-cause of Hyponatremia/Hyperkalemia(Palpitations, Nausea, Fatigue):** “Add In” natural Salts moderately to each meal daily(pink himalayan, celtic(most sodium dense)- $\frac{1}{4}$ - $\frac{1}{2}$ tsp per meal), raw dulse + Salty Raw Cheeses(Raw Blue Cheese/Roquefort Sheep Cheese, Raw Pecorino Romano...) Probiotics, CLA, K2, vitamin A added benefits from these cheeses! -Add Pink Himalayan Salt to “Post-exercise” Supershake(loaded with phytonutrients/greens powder, Maca, berries, chlorella, 100% Grass-fed Whey Protein Powder(High in Glutathione!) ; Corticosteroids(cortisone) treatment- (referred to physician)
- **Vitamin D3/K2 Supplementation**(D3-Cancer preventive, immunity; K2(clotting, musculoskeletal/tissue inflammation)
- **Rebuild Immune System, counter Radicals** w/ “Antioxidants, “Micronutrient Loads” in Medicinal Meals + Super-shakes

Nutritional Intervention Outcomes, Time Frame: Outcomes expected progressively over time with Autoimmune symptom reduction, stable energy, PH shift, Liver/Kidney/Blood Pressure/Cardiac markers normalizing timeframe of 2-6 weeks. Cortisol/Aldosterone production depending upon current levels are hard to predict although expect to see full recovery in 2-3 months.

- **Autoimmune Symptom Reversal(reduced adrenal fatigue- normalized cortisol test), immunology Panel- insufficient cortisol inhibits slowing Immune Inflammatory Response/protection from viruses, bacteria, foreign invaders!**
<https://www.niddk.nih.gov/health-information/endocrine-diseases/adrenal-insufficiency-addisons-disease>
- **Strong Immunity, Greater “Stable” Energy throughout the day**
- **Improved Liver Function- Normalized Bilirubin Test, Albumin, Liver Enzymes(ALP, AST, ALT)**
- **Eliminate Diarrhea(GI symptoms)- tied to low adrenal hormones (Improved Digestion outcome)**
- **PH shift(PH strip Test) to Ideal Blood PH(7.35-7.45)- normal CO2 Test**
- **Ankle Swelling Reduction(1-10 Pain Threshold Report)**

- **Normal Blood Pressure: Sodium/Potassium levels- improved oxygenation, no palpitations, better deep breathing/respiration(cardiorespiratory exercise, restore electrolyte balance)- Normalized RBC, HCT markers**
- **Increased Estronex Test levels(> 2) 16 OH Estrogen ratio**

Medication Monitoring:

Although no known herb-nutrient interactions are noted from “Doxorubicin,” the following Contraindications may occur and should be monitored for:

Contraindications

- **Hypersensitivity**
- **Active infection**
- **Severe hepatic impairment**
- **Baseline neutrophil count less than 1500/mm³**
- **Recent heart attack (myocardial infarction [MI]) or severe myocardial insufficiency**
- **Prior treatment max dose of doxorubicin, daunorubicin, idarubicin, or other anthracyclines**
- **Cardiomyopathy, congestive heart failure (CHF), impaired cardiac function**
- **Intramuscular/subcutaneous (IM/SC) administration**

I need a record of all pharmaceuticals/medications/therapies administered by primary physician and medical/hospital staff to ensure ability to minimize any unnecessary side effects which may occur. We will monitor every 2 weeks following weekly visits for the first month.

Lab Tests Advised:

- **Serum Iron(Ferritin), HGB(Hemoglobin), MCH, MCV-** combined with low HCT, RBC indicates IDA Anemia, hypoxia and vitamin C depletion.
- **Globulin- (protein electrophoresis** indicates specific globulin as cause of increase/decrease levels if test is out of range), indicates digestive insufficiency(hypochlorhydria w/increased BUN, low albumin), may indicate hepatitis/cirrhosis, or autoimmune fractions from infectious or inflammatory processes.⁵⁽⁹⁶⁻⁹⁸⁾ Will be able to see A/G ratio since Albumin is already known(confirmed liver dysfunction, dehydration).
- **Serum Chloride-** suspected decreased level with low serum sodium, high serum potassium(adrenal hypofunction) in addition to hypochlorhydria(low serum iron, increase globulin, and chloride<100(chloride- one of main HCL producing elements)
- **IgG Food Sensitivity Test-** determine which foods she may be reacting to causing “Autoimmune” reaction, potential “leaky gut”
- **Serum Phosphorus, RBC Magnesium-** Phosphorus not as tightly regulated as calcium, regulated by PTH, strong kidney effect(bone resorption-inverse relationship w/ calcium, digestive marker(low levels tied to hypochlorhydria; high phosphorus in edema, kidney dysfunction, high soda beverage intake); deficiency common in bone disorders, High with dehydration, Addison’s disease, affects calcium, phosphorus, vitamin D levels.

- **Uric Acid**- suspected High level w/ Edema symptom, poor tissue oxygenation(Dietary causes- Shellfish, pork, organ meats, legumes).
- **Salivary Cortisol**- confirm adrenal hypofunction, assess which times of day are low/high determining lifestyle/ "Strategic supplementation" and sleep/wake adjustments to be made

Referrals: Cancer Specialist(Oncologist)/Immunologist, Endocrinologist, Hepatologist

References:

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