

The Integrative Approach to the Thyroid for the ▶ Primary Care Physician

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Objectives

- ▶ 1. Be able to properly explain thyroid physiology to your patients.
- ▶ 2. Identify which thyroid labs to order for an Integrative approach to the thyroid.
- ▶ 3. Be comfortable with making Hashimoto's thyroiditis diagnosis and management.

About Dr. Jen



Board certified in Emergency Medicine and Integrative Medicine

Author: Eat. Sleep. Move. Breathe. A Beginner's Guide to a Healthy Lifestyle

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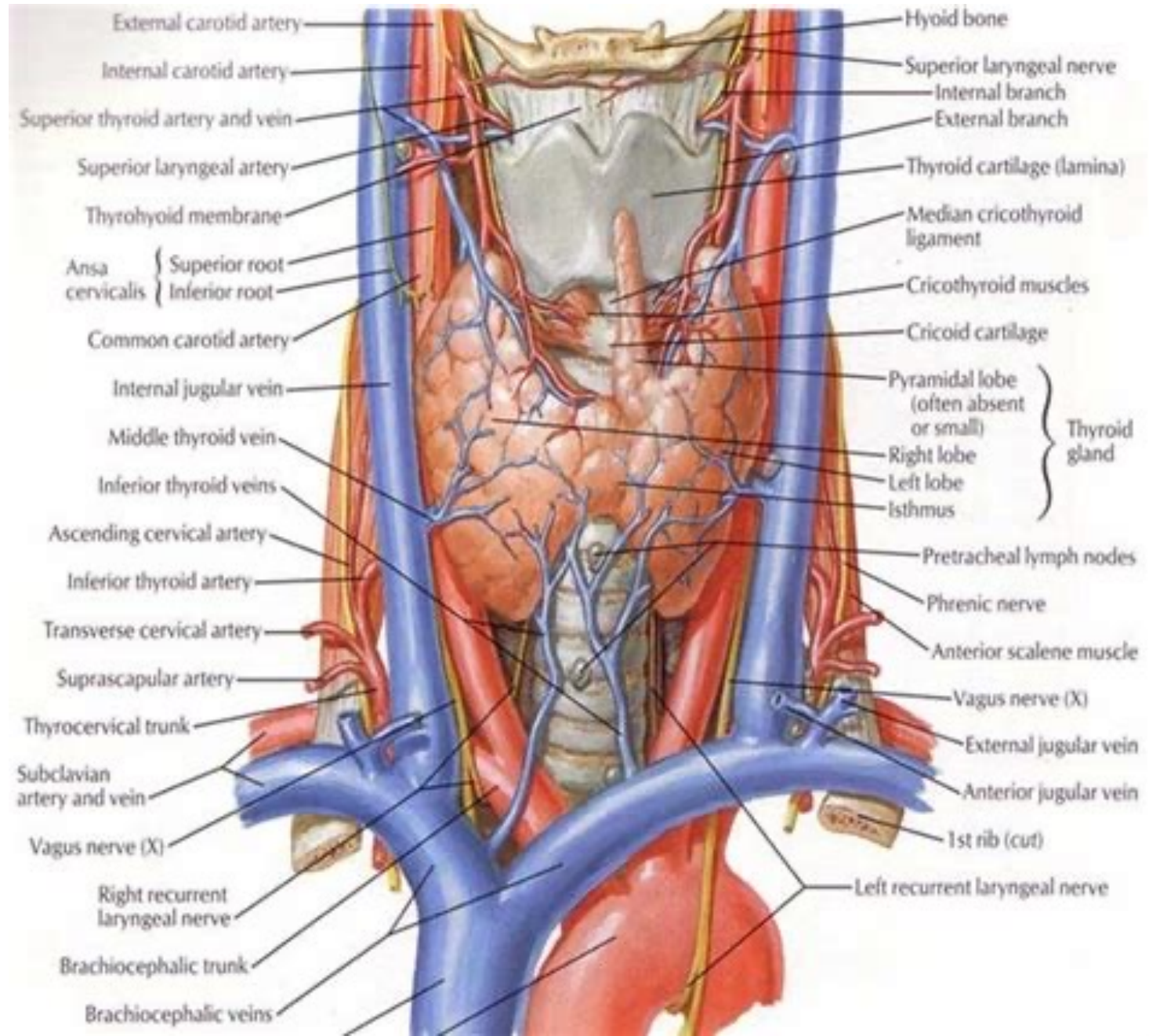
Owner PflegMed and Healthology by Dr. Jen

Wife and mother of four children

My Story

- ▶ Why do I care so much about the thyroid patient?
- ▶ Because I was one!

Thyroid Basic Anatomy



- Hypothalamic pituitary thyroid axis.

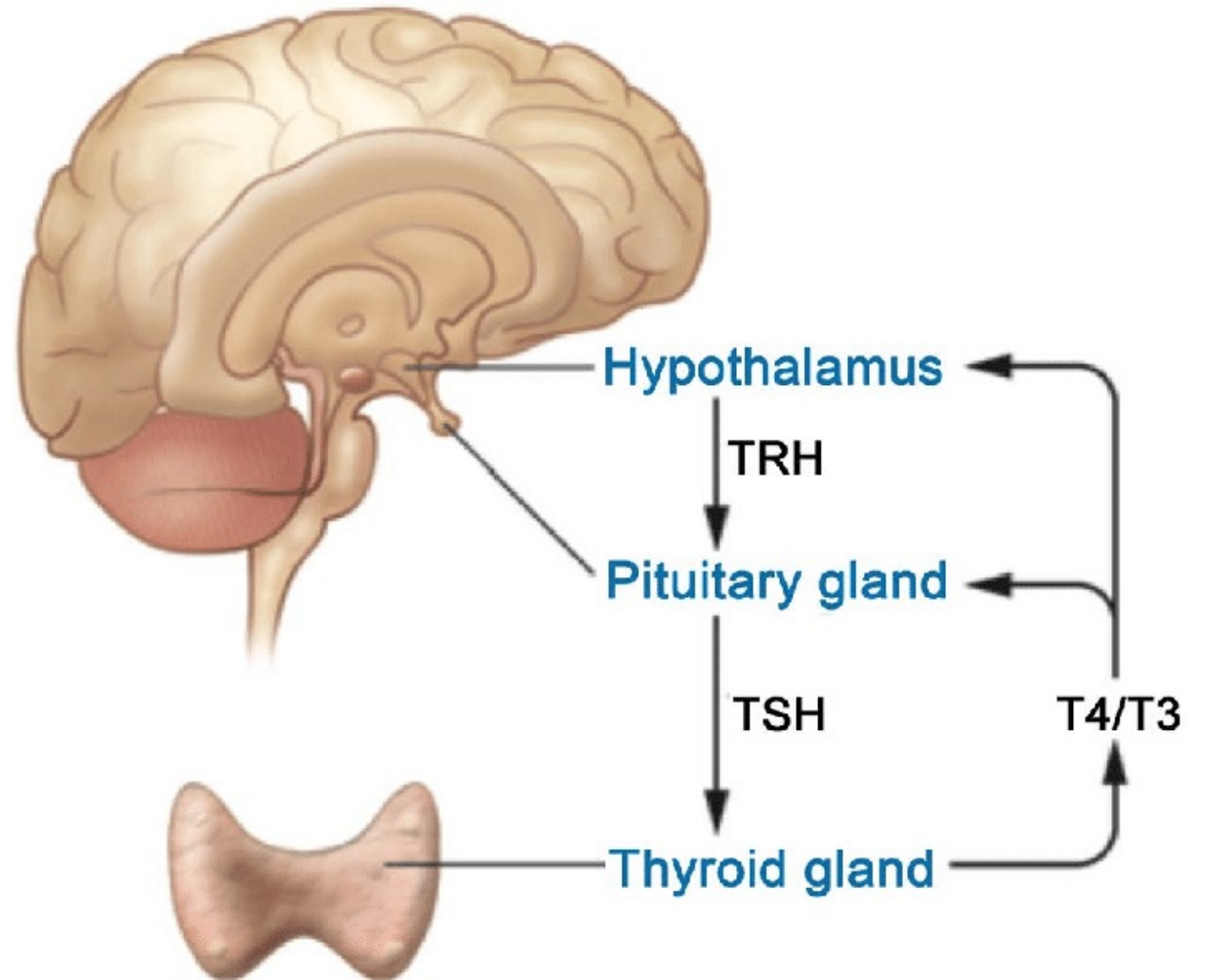
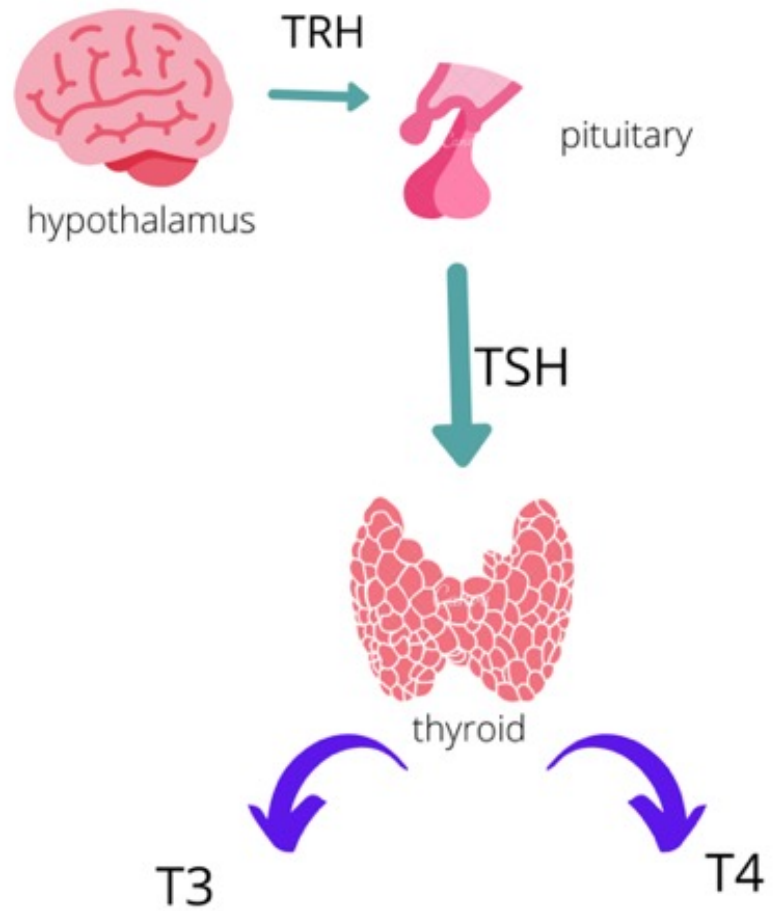


Image of Hypothalamic-Pituitary-Thyroid axis: [researchgate.net](https://www.researchgate.net) accessed on Nov 9, 2020



- Negative feedback loop

The physiological effects of thyroid hormones:

- ▶ Increases the basal metabolic rate
- ▶ Depending on the metabolic status, it can induce lipolysis or lipid synthesis.
- ▶ Stimulate the metabolism of carbohydrates
- ▶ Anabolism of proteins. Thyroid hormones can also induce catabolism of proteins in high doses.
- ▶ Permissive effect on catecholamines
- ▶ In children, thyroid hormones act synergistically with growth hormone to stimulate bone growth.
- ▶ The impact of thyroid hormone in CNS is important. During the prenatal period, it is needed for the maturation of the brain. In adults, it can affect mood. Hyperthyroidism can lead to hyperexcitability and irritability. Hypothyroidism can cause impaired memory, slowed speech, and sleepiness.
- ▶ Thyroid hormone affects fertility, ovulation, and menstruation.

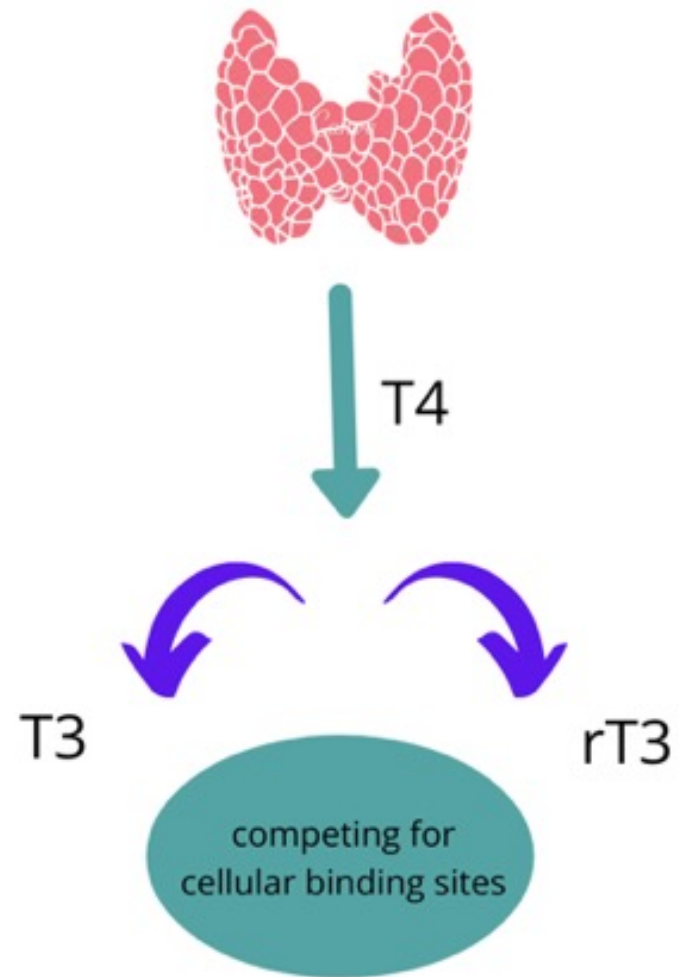
Functions of the thyroid gland and thyroid hormones in the body

- ▶ Affects tissue repair and development
- ▶ Aids in digestion process
- ▶ Controls hormone excretion
- ▶ Regulates vitamin usage
- ▶ Modulates protein synthesis
- ▶ Regulates growth
- ▶ Regulates heat and energy production

The thyroid hormones

- ▶ T4 (thyroxine) about 80% of the thyroid gland's production
- ▶ T3 (triiodothyronine) is converted from T4, this is the active thyroid hormone. The enzyme 5'diodinase is required for this conversion.
- ▶ rT3 is the inactive, stored form (binds to same receptor as T3)
- ▶ T2 (diiodothyronine)

- ▶ rT3
- ▶ Reverse T3



Symptoms of hypothyroidism

- ▶ Who can name 5 symptoms of hypothyroidism?

Symptoms of hypothyroidism

- ▶ Changes in the menstrual cycle
- ▶ Constipation
- ▶ Depression
- ▶ Dry hair and hair loss
- ▶ Dry skin
- ▶ Elevated cholesterol
- ▶ Fatigue
- ▶ Greater sensitivity to cold
- ▶ Hoarse voice

Symptoms of hypothyroidism

- ▶ Joint pain, stiffness, and swelling
- ▶ Problems with memory
- ▶ Muscle aches and stiffness
- ▶ Muscle weakness
- ▶ Puffy face
- ▶ Slow heart rate
- ▶ Swelling of the thyroid gland
- ▶ Unexplained weight gain or difficulty losing weight
- ▶ Carpal tunnel syndrome

What is the most common cause of hypothyroidism?

- ▶ In the world?

What is the most common cause of hypothyroidism?

- ▶ In the world?
- ▶ Iodine deficiency

What is the most common cause of hypothyroidism?

- ▶ In the United States?

What is the most common cause of hypothyroidism?

- ▶ In the United States?
- ▶ Hashimoto's thyroiditis

What are some symptoms of hyperthyroidism?

Symptoms of Hyperthyroidism

- ▶ Nervousness, anxiety, or crankiness
- ▶ Mood swings
- ▶ Fatigue or weakness
- ▶ Sensitivity to heat
- ▶ A swollen thyroid
- ▶ Losing weight suddenly
- ▶ Fast or heartbeat or palpitations
- ▶ More frequent bowel movements
- ▶ Shaking in your hands and fingers (tremor)
- ▶ Sleep problems
- ▶ Thinning skin
- ▶ Fine, brittle hair
- ▶ Changes in menstrual cycle

What about thyroid screening?

CLINICAL PRACTICE GUIDELINES FOR HYPOTHYROIDISM IN ADULTS:
COSPONSORED BY THE AMERICAN ASSOCIATION OF CLINICAL
ENDOCRINOLOGISTS AND THE AMERICAN THYROID ASSOCIATION

Table 8 Recommendations of Six Organizations Regarding Screening of Asymptomatic Adults for Thyroid Dysfunction	
Organization	Screening recommendations
American Thyroid Association	Women and men >35 years of age should be screened every 5 years.
American Association of Clinical Endocrinologists	Older patients, especially women, should be screened.
American Academy of Family Physicians	Patients ≥60 years of age should be screened.
American College of Physicians	Women ≥50 years of age with an incidental finding suggestive of symptomatic thyroid disease should be evaluated.
U.S. Preventive Services Task Force	Insufficient evidence for or against screening
Royal College of Physicians of London	Screening of the healthy adult population unjustified

<https://www.endocrinepractice.org/action/showPdf?pii=S1530-891X%2820%2943030-7>

CLINICAL PRACTICE GUIDELINES FOR HYPOTHYROIDISM IN ADULTS: COSPONSORED BY THE AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS AND THE AMERICAN THYROID ASSOCIATION

- ▶ Screening Guidelines for Thyroid Disease: Who Should be Tested?
- ▶ • USPSTF: No data for routine screening in primary care; identify at risk pts with hx, PE, use TSH
- ▶ • ATA: Screen >35 and every five years, more often if risk factors • ACP: Screen women >50 with one or more symptoms
- ▶ • AACE: TSH in childbearing women
- ▶ • ACOG: Consider signs/symptoms of postpartum thyroid disease
- ▶ • AAFP: No routine screening if asymptomatic and <60

Basic Screening Lab Work

- ▶ TSH with reflex fT4 (free T4)

Basic Lab Work- Thyroid

- ▶ T4 Thyroxine
 - ▶ T3 Triiodothyronine
 - ▶ (99.9% of T4 and 99.5% of T3 circulating is bound)
 - ▶ Bound means inactive
-
- ▶ This is why we measure Free T4 and Free T3

Basic Lab Work: Measurement of Thyroid Hormones

- ▶ T4: thyroxine and T3: triiodothyronine → 99.99% T4 and 99.5% T3 circulate bound to proteins
- ▶ 70-80% bound to thyroxine binding globulin (TBG)
- ▶ 15-20% bound to albumin
- ▶ 8-10% bound to transthyretin
- ▶ Bound T4 and T3 are inactive and should not be used as the sole measures of thyroid function
- ▶ Illnesses and medications greatly alter T4/T3 bound to protein

From AACE Endocrine Practice

- ▶ “Most recently, the United States Preventive Services Task Force did not endorse screening for thyroid dysfunction based on a lack of proven benefit and potential harm of treating those with thyroid dysfunction, which is mostly subclinical disease.”
- ▶ “We recommend that thyroid dysfunction should be frequently considered as a potential etiology for many of the nonspecific complaints that physicians face daily. The application and success of safe and effective interventions are dependent on an accurate diagnosis. We, therefore, advocate for an aggressive case-finding approach, based on identifying those persons most likely to have thyroid disease that will benefit from its treatment.”

Recommended Lab Work- Thyroid Antibodies

- ▶ Thyroid Peroxidase (TPO) and Tg Ab
- ▶ Hashimoto's Disease: predictor of hypothyroidism progression from subclinical to overt
- ▶ Thyroid Stimulating Immunoglobulin (TSI) and Thyroid Binding Inhibitor Immunoglobulin (TBII) comprise TSH receptor Abs (TRAb)
- ▶ Graves' Disease

Functional Lab Work

- ▶ Complete thyroid panel if H&P indicated (remember all the signs/symptoms of hypo/hyperthyroidism!)
- ▶ Vitamin D testing
- ▶ GI effects stool testing
- ▶ Salvia Cortisol testing
- ▶ OAT and Mycotoxin urine testing

Why Vitamin D testing?

- ▶ First, we live in Ohio ☹️
- ▶ Second, lots of research linking low Vitamin D to autoimmune thyroid disease and even thyroid cancer.
- ▶ Nettore IC, Albano L, Ungaro P, Colao A, Macchia PE. Sunshine vitamin and thyroid. Rev Endocr Metab Disord. 2017 Sep;18(3):347-354. doi: 10.1007/s11154-017-9406-3. PMID: 28092021; PMCID: PMC5543192.
- ▶ Lontiris MI, Mazokopakis EE. A concise review of Hashimoto thyroiditis (HT) and the importance of iodine, selenium, vitamin D and gluten on the autoimmunity and dietary management of HT patients. Points that need more investigation. Hell J Nucl Med. 2017 Jan-Apr;20(1):51-56. doi: 10.1967/s002449910507. Epub 2017 Mar 20. PMID: 28315909.
- ▶ Kim D. The Role of Vitamin D in Thyroid Diseases. Int J Mol Sci. 2017 Sep 12;18(9):1949. doi: 10.3390/ijms18091949. PMID: 28895880; PMCID: PMC5618598.

THYROID LABS

These should be tested as part of a full thyroid workup if you are symptomatic:

- TSH
- Free T4
- Free T3
- Vit D (25-OH)
- TPO Antibodies
- Thyroglobulin Antibodies
- Reverse T3

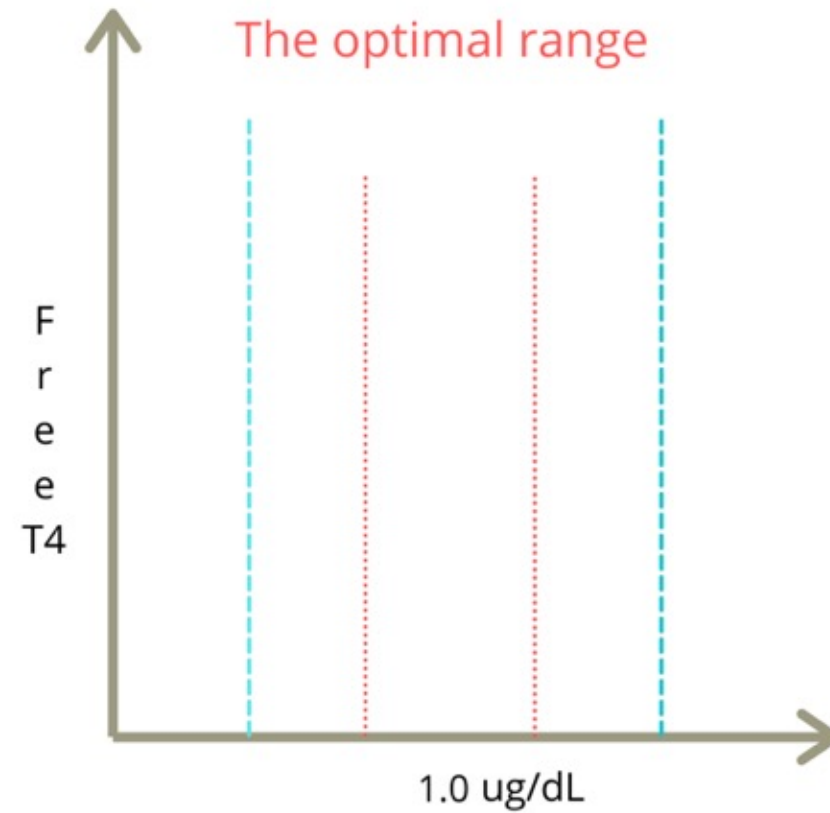
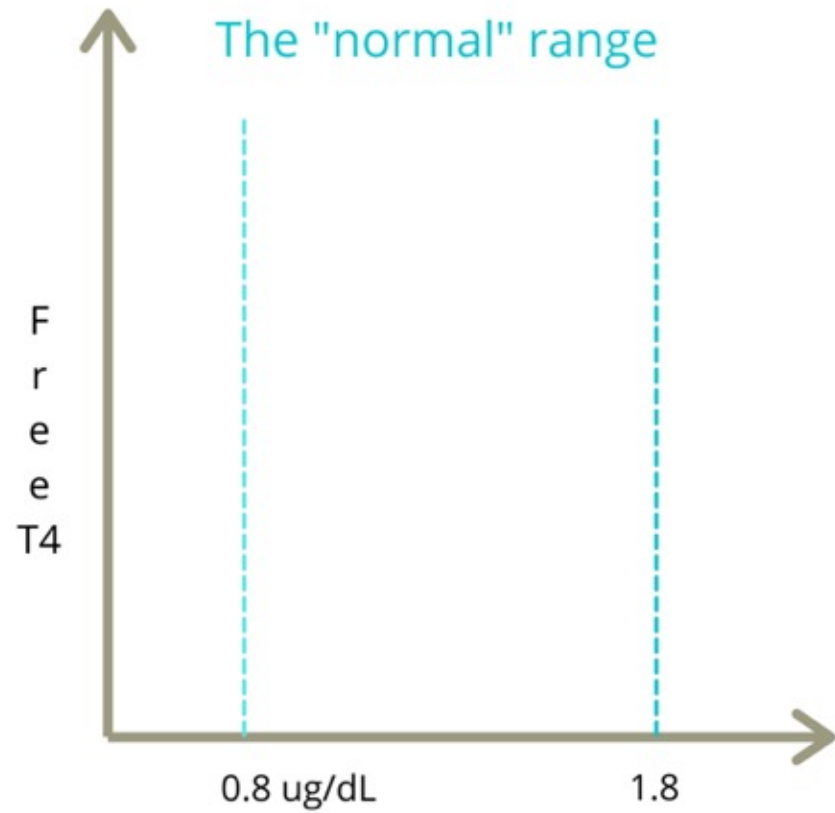
May add on if indicated:

- Serum Iodine, Selenium, Zinc
- Hormones
- EBV panel
- Thyrotropin receptor antibody (TRAb)
- TSI (Thyroid-Stimulating Immunoglobulin)

Helpful Functional tests:

- Saliva cortisol
- GI effects
- OAT/Mycotoxin/GPL-Tox

What about being optimal?



Is Hashimoto's thyroiditis more common in men or women?

Is Hashimoto's thyroiditis more common in men or women?

- ▶ Women
- ▶ Hashimoto's affect women 10 times more
- ▶ In general, 80% of all individuals affected by autoimmune disease are women.
- ▶ This is thought to be to variation of sex chromosomes and hormonal changes
- ▶ Triggers can also be poor diet, lifestyles choices, increased stress, climate, lack of sleep, and viruses.

Hashimoto's and Gut Health

Hashimoto's and Gut Health

- ▶ **Alterations of the Gut Microbiota in Hashimoto's Thyroiditis Patients**
- ▶ **Conclusions:** “Characterization of the gut microbiota in HT patients confirmed that HT patients have altered gut microbiota and that gut microbiota are correlated with clinical parameters, suggesting that microbiome composition data could be used for disease diagnosis. Further investigation is required to understand better the role of the gut microbiota in the pathogenesis of HT.”

Hashimoto's and Gut Health

- ▶ Alterations and Mechanism of Gut Microbiota in Graves' Disease and Hashimoto's Thyroiditis
- ▶ "Our data suggested that *Bacillus*, *Blautia*, and *Ornithinimicrobium* could be used as potential markers to distinguish GD and HT from the healthy population and that "ABC transporter" metabolic pathway may be involved in the pathogenesis of GD and HT."

Hashimoto's and Gut Health

- ▶ **Molecular estimation of alteration in intestinal microbial composition in Hashimoto's thyroiditis patients**
- ▶ "The comparative analysis of diversity and richness indices revealed diversification of gut microbiota in HT as compared to control. The statistical data elucidate the alterations in phyla of HT patients which was also affirmed at the family level."

Hashimoto's and Gut Health

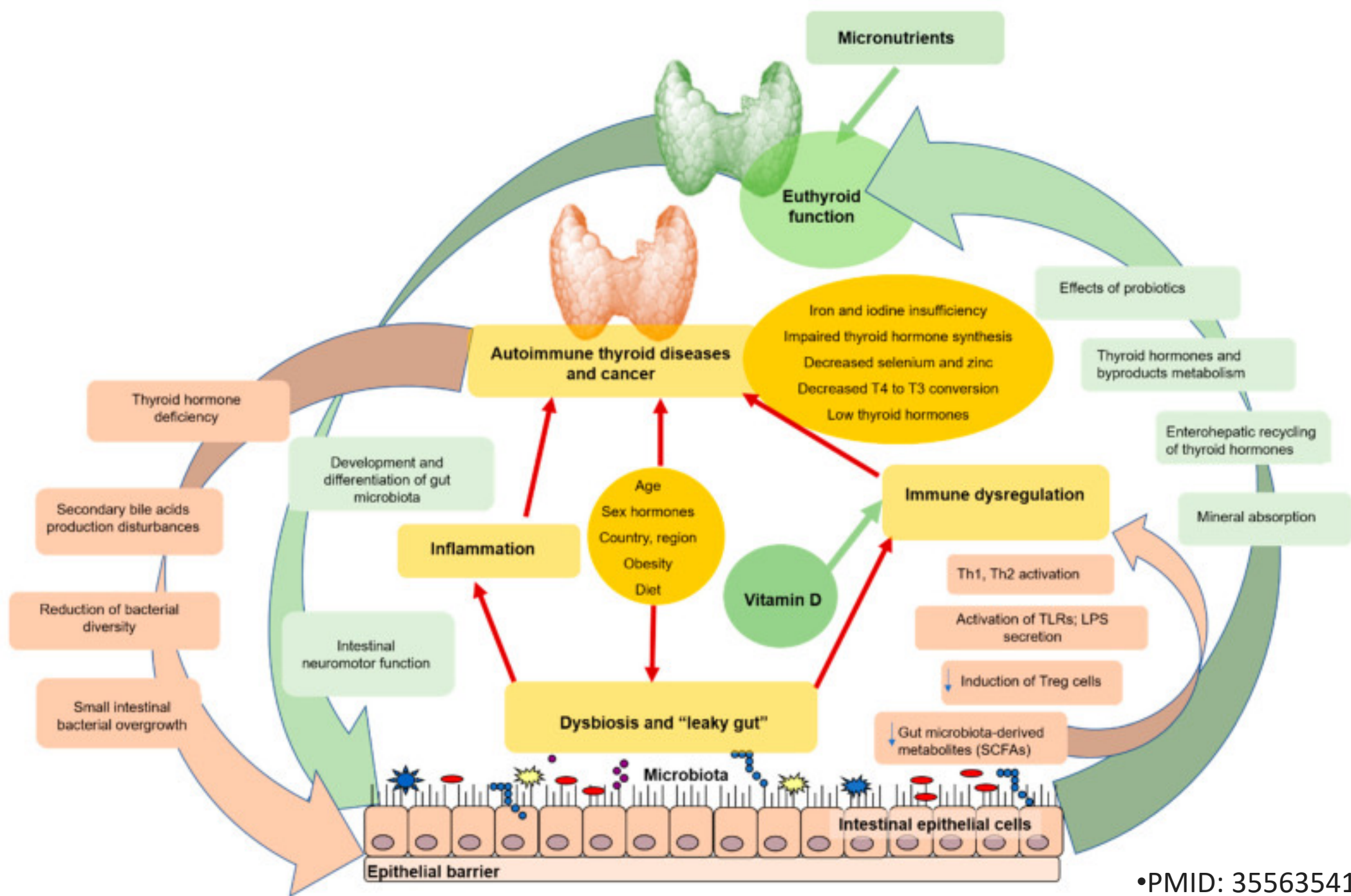
- ▶ Gut microbiota and Hashimoto's thyroiditis
- ▶ “The whole thyroid peripheral homeostasis may be sensitive to microbiota changes but there is also evidence that the genesis and progression of autoimmune thyroid disorders may be significantly affected from a changing intestinal microbial composition or even from overt dysbiosis”

Hashimoto's and nutrition

- ▶ **Nutritional Management of Thyroiditis of Hashimoto**
- ▶ "We share some novel insights into the role of vitamin D and melatonin for preserving thyroid function during chronic inflammation in autoimmune predisposed subjects. A comprehensive overview is provided on anti-inflammatory nutrients and ecological diets, including foods for cleansing and detoxification, which represent strategies to prevent relapses and achieve overall improvement of life quality. In conclusion, data from biomedical and clinical studies provide evidence that an appropriate dietary and lighting regimen could significantly improve the function of the thyroid gland and reduce the reactivity of autoantibodies in TH. Compliance with nutritional guidelines may help TH patients to reduce the need for medicines."

Gut health and gluten

- ▶ **Gliadin, zonulin and gut permeability: Effects on celiac and non-celiac intestinal mucosa and intestinal cell lines**
- ▶ “Based on our results, we concluded that gliadin activates zonulin signaling irrespective of the genetic expression of autoimmunity, leading to increased intestinal permeability to macromolecules.”



Celiac Disease & Non-Celiac Gluten Sensitivity

Celiac disease and non-celiac gluten sensitivity (NCGS) each occur in response to gluten. Celiac disease is an autoimmune condition, and though less common, causes enterocyte damage and significant systemic symptomatology. NCGS is a non-immune mediated reaction to gluten without enterocyte destruction, but with global symptoms nonetheless.

Celiac Disease

People with celiac disease have class II HLA-DQ2 or HLA-DQ8 gene mutations which may underlie their susceptibility to developing this autoimmune condition. The autoimmunity is mediated by variety of immunoglobulins, high levels of which are consistently found in serum:

- endomysial antibodies (IgA EMA)
- tissue transglutaminase antibodies (IgA tTG or IgG tTG)
- deamidated gliadin peptide antibodies (IgA DGP or IgG DGP)

The definitive diagnosis for celiac disease is biopsy showing enterocyte degeneration, flattening of villi and non-functional crypts.



Intestinal Symptoms

- chronic diarrhea
- nutrient deficiencies
- weight loss

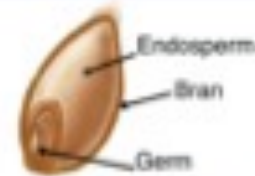
Non-intestinal Symptoms

- anemia
- osteoporosis
- depression
- dermatitis herpetiformis

Complications

A diagnosis of celiac disease is associated with a multitude of possible complications including:

- neurological dysfunction
- small intestinal bacterial overgrowth (SIBO)
- microscopic colitis
- osteoporosis
- nutrient deficiencies
- intestinal lymphoma
- infertility
- autoimmune diseases (RA and Hashimoto's)



Gluten

is comprised of the proteins gliadin and glutenin and is produced along with starches in the endosperm of wheat, rye and barley.

Intestinal Symptoms

- abdominal pain
- bloating
- constipation
- diarrhea

Non-intestinal Symptoms

- joint & muscle pain
- skin rash
- anemia
- depression

Non-Celiac Gluten Sensitivity

Non-celiac gluten sensitivity is a diagnosis of exclusion, characterized by a non-immune mediated reaction to gluten. Biopsy is also not diagnostic as the villi and epithelium appear normal. NCGS is a functional digestive disorder resulting in gastrointestinal and extra intestinal symptoms.



Working Etiologies

The reason for the rising prevalence of NCGS is not definitively known. Most likely, it is a combination of increased wheat consumption, the hybridized gluten content of wheat, and rising glyphosate residues in conventional grain products. Combined with poor diet these factors contribute to microbiome disruption, intestinal inflammation, and gluten intolerance.

What is intestinal permeability or leaky gut?

Autoimmunity

Genetics

Susceptibility to autoimmunity is influenced by genetic factors including defects in specific chromosomal loci, genetic mutations, and epigenetic alterations. The resultant altered patterns of genetic expression are associated with a growing number of autoimmune diseases.



Hormonal Imbalances

The majority of autoimmunity occurs in females while low testosterone in men has been shown to precede onset.

Triggers

With the failure of immune tolerance and/or repeated or acute exposure to environmental triggers, immunity to non-self antigens can elaborate into a self-directed immune process. Many types of non-self antigens can trigger this type of response including dietary sources, bacterial, parasitic, viral, or mold/fungal infections.



Toxicants

Mold



Diet (Gluten)



Bacteria



Parasite



Virus



GALT serves as a containment system that prevents potentially harmful intestinal antigens from reaching circulation, and induces tolerance against luminal antigens through IgA secretion and induction of T-regulatory-cell activity communicated through the lymph system.

GALT

is composed of immune inductive sites including Peyer's Patches, and isolated lymphoid follicles (ILF). Together Peyer's Patches and ILF generate intestinal IgA responses to mucosal challenges.

Peyer's Patches

Isolated Lymphoid Follicle

Intestinal Permeability & Altered Immunity

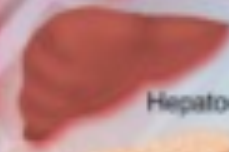
Tight junctions are dynamic structures that regulate intestinal permeability. Tight junction dysfunction allows for increased paracellular antigen transport and seems to be a primary defect in many autoimmune diseases.



Multiple Sclerosis
Destruction of myelin



Autoimmune Hepatitis
Hepatocellular inflammation



Type 1 Diabetes
Destruction of insulin-producing beta cells



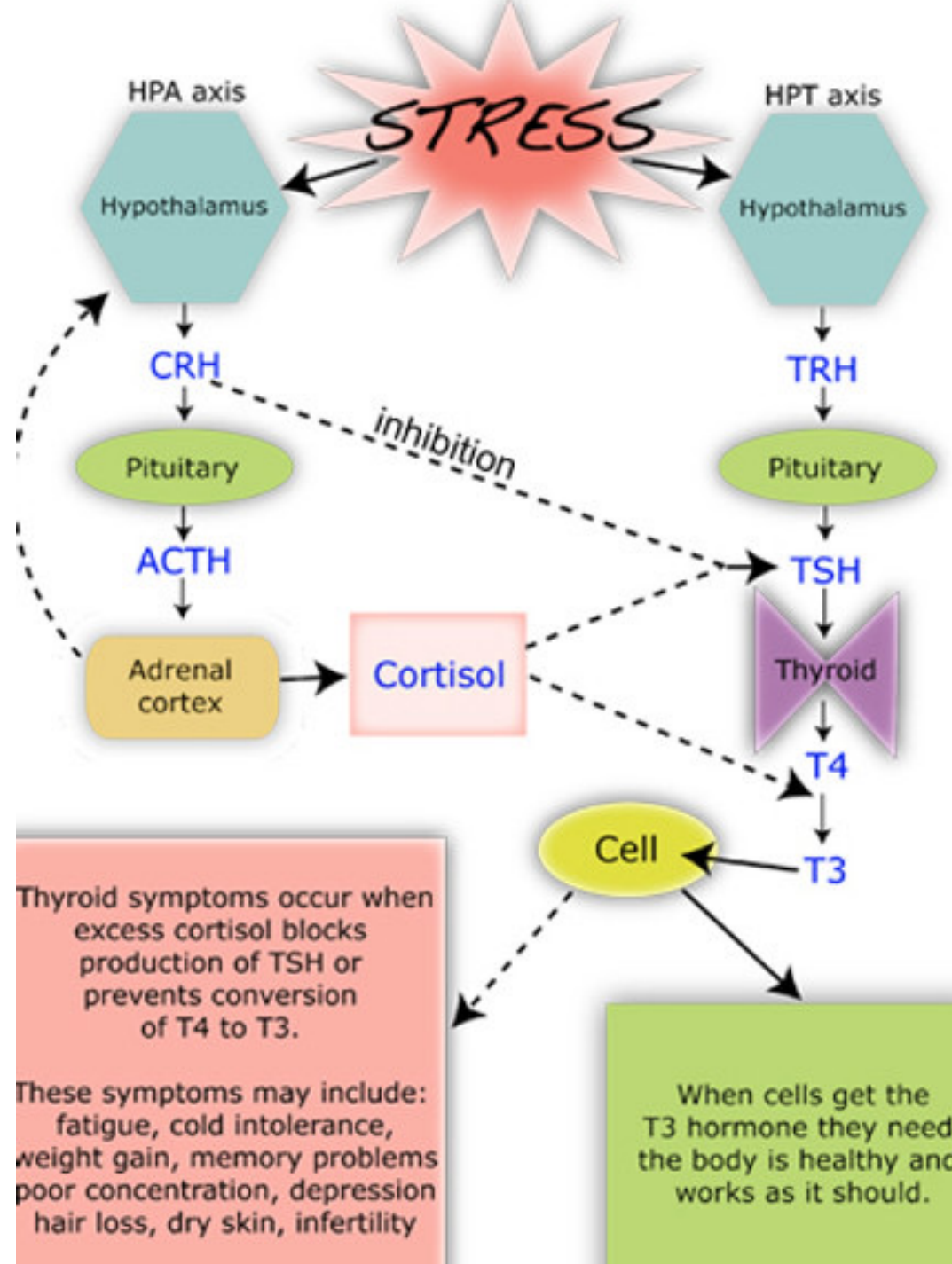
Ankylosing Spondylitis
Chronic inflammation of axial skeleton.



IgA Nephropathy
Inflammation of glomeruli



What about cortisol and the thyroid?



What are the nutrients the thyroid needs?

- ▶ To make thyroid hormone: nutrients: iodine, since, Vitamins E, B2, B3, B6, C and antioxidants
- ▶ Inhibit T4 stress, infections, trauma, radiation, medications, fluoride (agonistic to iodine), toxins- pesticides, mercury, radium, lead, malnutrition (celiac)
- ▶ For T4 → T3 conversion: Selenium • Zinc • Vitamin A • Vitamin E
- ▶ Factors that increase conversion of T4 to RT3 -stress, trauma, low calories diet, inflammation (cytokines), toxins, infections, liver/kidney dysfunction, certain medications.
- ▶ T3 and rT3 compete for binding sites.
- ▶ Factors that improve cellular sensitivity to thyroid hormones- vitamin A , exercise, Zinc

My patient has Hashimoto's thyroiditis!?

What do I do now?

Integrative Approaches to Thyroid management

- ▶ Heal the gut
- ▶ Reduce Inflammation and Stress
- ▶ Remove Triggers
- ▶ Proper Sleep

Heal the gut

- ▶ Recommend a gluten free diet
- ▶ A grain free diet might even be considered
- ▶ Fix any dysbiosis in the gut (Candida overgrowth, SIBO, parasites)
- ▶ Replace digestive enzymes, probiotics, prebiotics if needed
- ▶ Repair the gut lining with botanicals, diet

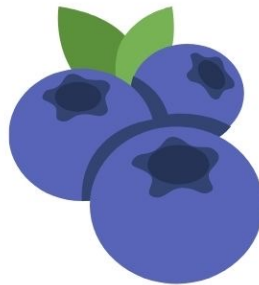
Heal the gut

- Nutrition is a game changer!



"Let food be thy medicine,
and let medicine be thy food."

Hippocrates



Heal the gut

- Books you can recommend:
- Deep Nutrition by Dr Catherine Shanahan
- Whole 30
- Paleo
- Against all Grain

EXAMPLE MEAL PLANS

CAN SUBSTITUTE LOW CARB VEGGIES.
GET CREATIVE, EAT LEFTOVERS AND HAVE FUN!

	WEEK 1	WEEK 2	WEEK 3	WEEK 4
MON	B: KETO TOAST WITH ALMOND BUTTER L: SALAD WITH SALMON D: TACO NIGHT! GRAIN FREE CHIPS DAIRY FREE CHEESE	B: EGGS WITH VEGGIES L: PEANUT BUTTER & EGG WHITE WRAP D: CHICKEN AND STIRFRIED VEGETABLES	B: SMOOTHIE BOWL L: TURKEY ROLL UPS, CARROTS D: LAMB BURGERS WITH CAULIFLOWER RICE AND MUSHROOMS	B: SMOKED SALMON WITH KETO BREAD L: CURRY CHICKEN ON CALI RICE D: HAM AND GREEN BEANS
TUE	B: PROTEIN PANCAKE AND SAUSAGE L: EGG SALAD D: SALMON CAKES	B: PROTEIN SHAKE L: LEFT OVER STIRFRIED CHICKEN & VEGETABLES D: "CHEESY CHICKEN" AND BROCCOLI	B: OATMEAL WITH NUT BUTTER L: SALAD WITH SALMON D: STEAK, GREEN BEANS, CAULIFLOWER RICE	B: EGGS WITH LEFTOVER HAM L: CHICKEN WITH STIR FRIED VEGETABLES D: ROAST WITH VEGETABLES
WED	B: HARD BOILED EGGS, BERRIES L: ROASTED POTATOES D: SPAGETTI SQUASH AND MEAT SAUCE	B: LOW CARB TOAST WITH ALMOND BUTTER L: BUFFALO CHEESY CHICKEN D: TACO NIGHT! GRAIN FREE CHIPS DAIRY FREE CHEESE	B: DEVILED EGGS L: STEAK WRAP WTH EGG WRAP AND VEGGIES D: CHICKEN THIGHS AND ROASTED SWEET POTATO FRIES	B: HARD BOILED EGGS, BERRIES L: KETO BREAD WITH NUT BUTTER D: SPAGETTI SQUASH AND MEAT SAUCE
THU	B: OATMEAL WITH NUT BUTTER L: SALAD WITH SALMON D: STEAK, GREEN BEANS, CAULIFLOWER RICE	B: HARD BOILED EGGS, BERRIES L: CHICKEN CURRY SALAD D: CHICKEN CABOB WITH ONIONS/PEPPERS	B: PROTEIN PANCAKE AND SAUSAGE L: EGG SALAD D: SALMON CAKES	B: OATMEALN AND NUT BUTTER L: SALMON SALAD D: STEAK AND ROASTED CARROT FRIES
FRI	B: SMOOTHIE BOWL L: TURKEY ROLL UPS, CARROTS D: LAMB BURGERS WITH CAULIFLOWER RICE AND MUSHROOMS	B: BANANA ICE CREAM SMOOTH L: TACO SALAD D: GRILLED SALMON WITH ROASTED CARROTS	B: BACON AND EGGS L: SALMON CAKE SALAD WITH SPROUTS D: CURRY CHICKEN WITH VEGGIES	B: BANANA ICE CREAM SMOOTHIE L: SPAGETTI SQUASH, GROUND MEAT, EVOO D: EGG ROLL IN A BOWL

Reduce Inflammation and Stress

- ▶ Supplements can have a role here
- ▶ Healing the gut and nutrition will also help
- ▶ LDN is very helpful (Low dose naltrexone)
- ▶ Peptides can play a role
- ▶ Stress and environmental triggers can also cause inflammation
- ▶ Diseases that promote inflammation (Example: diabetes)
- ▶ Breathwork and meditation

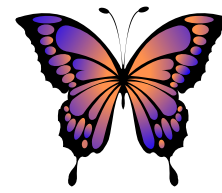
Remove triggers

- ▶ Stress, elevated cortisol and the HPA axis: meditation, breath work, adaptogens
- ▶ Viruses
- ▶ Parasites
- ▶ Heavy Metals

Proper sleep

- ▶ Adequate and proper sleep is important
 - ▶ sleep studies rule out sleep apnea
 - ▶ environmental
- ▶ Supplements can have a role here
 - ▶ L-theanine, melatonin, progesterone, magnesium

Daily Habits:



- Epsom salt baths
- Dry brushing
- Castor Oil Packs
- Infrared sauna
- Meditation
- Breath work (4-7-8 breath)
- Yoga
- Movement (walking)
- Gratitude journal
- Drinking plenty of filtered water

Integrative Approaches to Thyroid management

- ▶ Heal the gut
- ▶ Reduce Inflammation and Stress
- ▶ Remove Triggers
- ▶ Proper Sleep

Going to a case study!

Thyroid Case study: Dec 2021

- ▶ SUBJECTIVE

- ▶ Reason for visit:

- ▶ Swinging b/t hashimoto's -hyper and hypo

- ▶ Endocrine wants to do radioactive iodine, but also has her on levo 50 mcg daily, even though her FT4 is high

- ▶ Labs:

- ▶ On 50 mcg of levo for two weeks.

- ▶ FT4 6.2

- ▶ THY ab 47

- ▶ TPO 79

- ▶ Amalgams: no Root Canals: no Implants: no Lyme concern: no Mold concern: no Emotional trauma: yes

- ▶ PLAN

- ▶ Peptides:

- ▶ *Thymosin alpha-1 SQ once a day

- ▶ *BPC 157 PO once a day for 30 days

- ▶ Will change and recheck in 4 weeks

Case study

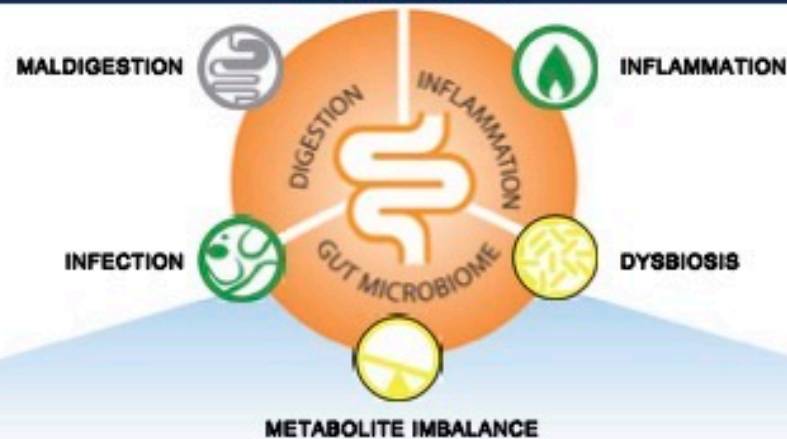
- ▶ Nutrition:
- ▶ 7 day core restore program. Strict gluten and dairy free. Try grain free
- ▶ Supplements:
- ▶ Omega-3
- ▶ Magnesium 200 mg in the evening before bed
- ▶ L-theanine 100-200 mg as needed for anxiety (max 400 mg daily)
- ▶ Turvani turmeric
- ▶ Lemon balm tea (organic) 4 times a day
- ▶
- ▶ Stop Ashlyn-
- ▶ Will start luteal phase progesterone 100 mg nightly day 14- 28 of your cycle.
- ▶ Stop Levothyroxine
- ▶
- ▶ The Body Keeps the Score: about EMDR: consider
- ▶ Labs:
- ▶ GI effects- off probiotic for one week
- ▶ Will check your hormones after 3 months
- ▶ Needs Prolactin level

Case study- Follow up Jan 2022

- ▶ SUBJECTIVE
- ▶ Changes/Improvements:
 - ▶ Lost 15 lbs since going grain free/gluten free/dairy free
 - ▶ Did stop the levo when she got the labs
 - ▶ Only one migraine since she changed her diet.
- TSH <0.01
- FREE T4 5.0
- T3, FREE. 7.2
- T3, REVERSE 32
- PROLACTIN 6.6
- TSH RECEPTOR AB (TRAb) 5.79 range (< 2.0). (indicator for Grave's)
- TSI 214 (range <140)
- ▶ ANA positive- SLE nucleal homogenous

- ▶ PLAN
- ▶ Start Methimazole 5 mg every other day
- ▶ Peptides:
 - ▶ *Thymosin alpha-1 SQ once a day
 - ▶ *BPC 157 PO once a day for 30 days
- ▶ Your Lab work:
 - ▶ TSH <0.01 FREE T4 5.0 T3, FREE. 7.2T3, REVERSE 32PROLACTIN 6.6TSH RECEPTOR AB (TRAb) 5.79 range (< 2.0). (indicator for Grave's) TSI 214 (range <140)
- ▶ Supplements:
 - ▶ Omega-3
 - ▶ Magnesium 200 mg in the evening before bed
 - ▶ L-theanine 100-200 mg as needed for anxiety (max 400 mg daily)
 - ▶ Turvani turmeric
 - ▶ Lemon balm tea (organic) 4 times a day
- ▶ Pause on the progesterone until we get your hormone results.
- ▶ Pause on probiotic for now and restart after protocol

Results Overview







Functional Imbalance Scores

Key < 2 : Low Need for Support 2-3 : Optional Need for Support 4-6 : Moderate Need for Support 7-10 : High Need for Support

	Need for Digestive Support	Need for Inflammation Modulation	Need for Microbiome Support	Need for Prebiotic Support	Need for Antimicrobial Support
	MALDIGESTION	INFLAMMATION	DYSBIOSIS	METABOLITE IMBALANCE	INFECTION
	3	0	4	4	1
Biomarkers	Products of Protein Breakdown ▼ Pancreatic Elastase ● Fecal Fats ●	Secretory IgA ▲ Calprotectin ● Eosinophil Protein X ● Occult Blood ●	PP Bacteria/Yeast ▲ Reference Variance ▲ IAD/Methane Score ● Total Abundance ●	Total SCFA's ▼ n-Butyrate Conc. ▼ SCFA (%) ● Beta-glucuronidase ●	PP Bacteria/Yeast ▲ Parasitic Infection ● Pathogenic Bacteria ● Total Abundance ●
Therapeutic Support Options	• Digestive Enzymes • Betaine HCl • Bile Salts • Apple Cider Vinegar • Mindful Eating Habits • Digestive Bitters	• Elimination Diet/ Food Sensitivity Testing • Mucosa Support: Slippery Elm, Althea, Aloe, DGL, etc. • Zinc Carnosine • L-Glutamine • Quercetin • Turmeric • Omega-3's • GI Referral (If Calpro is Elevated)	• Pre-/Probiotics • Increase Dietary Fiber Intake • Consider SIBO Testing • Increase Resistant Starches • Increase Fermented Foods • Meal Timing	• Pre-/Probiotics • Increased Dietary Fiber Intake • Increase Resistant Starches • Increase Fermented Foods • Calcium D-Glucarate (for high beta-glucuronidase)	• Antibiotics (if warranted) • Antimicrobial Herbal Therapy • Antiparasitic Herbal Therapy (if warranted) • <i>Saccharomyces boulardii</i>

GI effects

GI effects

2200 GI Effects™ Comprehensive Profile - Stool							
Methodology: GC-FID, Automated Chemistry, EIA	Result	QUINTILE DISTRIBUTION					Reference Range
		1st	2nd	3rd	4th	5th	
Digestion and Absorption							
Pancreatic Elastase 1 †	>500						>200 mcg/g
Products of Protein Breakdown (Total*) (Valerate, Isobutyrate, Isovalerate)	2.3						1.8-9.9 micromol/g
Fecal Fat (Total*)	20.5						3.2-38.6 mg/g
Triglycerides	4.6 H						0.3-2.8 mg/g
Long-Chain Fatty Acids	12.5						1.2-29.1 mg/g
Cholesterol	1.9						0.4-4.8 mg/g
Phospholipids	1.5						0.2-6.9 mg/g
Inflammation and Immunology							
Calprotectin †	<16						<=50 mcg/g
Eosinophil Protein X (EPX)†	0.1						<=2.7 mcg/g
Fecal secretory IgA	815						<=2,040 mcg/mL
Gut Microbiome Metabolites							
Metabolic							
Short-Chain Fatty Acids (SCFA) (Total*) (Acetate, n-Butyrate, Propionate)	23.2 L						>=23.3 micromol/g
n-Butyrate Concentration	4.7						>=3.6 micromol/g
n-Butyrate %	20.3						11.8-33.3 %
Acetate %	53.9						48.1-69.2 %
Propionate %	26.0						<=29.3 %
Beta-glucuronidase	880						368-6,266 U/g

*Total value is equal to the sum of all measurable parts.

†These results are not represented by quintile values.

Tests were developed and their performance characteristics determined by Genova Diagnostics. Unless otherwise noted with ♦, the assays have not been cleared by the U.S. Food and Drug Administration.

Gastrointestinal Microbiome (PCR)**							
Commensal Bacteria (PCR)	Result CFU/g stool	QUINTILE DISTRIBUTION 1st 2nd 3rd 4th 5th					Reference Range CFU/g stool
Bacteroidetes Phylum							
<i>Bacteroides-Prevotella</i> group	3.5E8						3.4E6-1.5E9
<i>Bacteroides vulgatus</i>	1.2E10 H						<=2.2E9
<i>Barnesiella</i> spp.	<DL						<=1.6E8
<i>Odonobacter</i> spp.	1.8E8 H						<=8.0E7
<i>Prevotella</i> spp.	2.7E7 H						1.4E5-1.6E7
Firmicutes Phylum							
<i>Anaerotruncus colihominis</i>	1.0E7						<=3.2E7
<i>Butyrivibrio crossotus</i>	1.0E5						5.5E3-5.9E5
<i>Clostridium</i> spp.	2.0E9						1.7E8-1.5E10
<i>Coprococcus eutactus</i>	4.9E6						<=1.2E8
<i>Faecalibacterium prausnitzii</i>	8.6E9 H						5.8E7-4.7E9
<i>Lactobacillus</i> spp.	1.3E9						8.3E6-5.2E9
<i>Pseudoflavonifractor</i> spp.	3.2E8 H						4.2E5-1.3E8
<i>Roseburia</i> spp.	5.5E9						1.3E8-1.2E10
<i>Ruminococcus</i> spp.	9.9E8						9.5E7-1.6E9
<i>Veillonella</i> spp.	3.4E7						1.2E5-5.5E7
Actinobacteria Phylum							
<i>Bifidobacterium</i> spp.	1.9E9						<=6.4E9
<i>Bifidobacterium longum</i>	3.4E7						<=7.2E8
<i>Collinsella aerofaciens</i>	<DL L						1.4E7-1.9E9
Proteobacteria Phylum							
<i>Desulfovibrio piger</i>	<DL						<=1.8E7
<i>Escherichia coli</i>	8.6E6						9.0E4-4.6E7
<i>Oxalobacter formigenes</i>	7.6E6						<=1.5E7
Euryarchaeota Phylum							
<i>Methanobrevibacter smithii</i>	8.2E6						<=8.6E7
Fusobacteria Phylum							
<i>Fusobacterium</i> spp.	1.2E4						<=2.4E5
Verrucomicrobia Phylum							
<i>Akkermansia muciniphila</i>	<DL L						>=1.2E6
Firmicutes/Bacteroidetes Ratio							
<i>Firmicutes/Bacteroidetes</i> (F/B Ratio)	36						12-620

The gray-shaded portion of a quintile reporting bar represents the proportion of the reference population with results below detection limit.

Commensal results and reference range values are displayed in a computer version of scientific notation, where the capital letter "E" indicates the exponent value (e.g., 7.3E6 equates to 7.3 x 10⁶ or 7,300,000).

The Firmicutes/Bacteroidetes ratio (F/B Ratio) is estimated by utilizing the lowest and highest values of the reference range for individual organisms when patient results are

Interpretation At-a-Glance									
Commensal Bacteria	Patient Results Out of Reference Range	Genova Diagnostics Commensal Bacteria Clinical Associations*							
		IBS	IBD	Metabolic Syndrome	Chronic Fatigue	Auto-immune	Type 2 Diabetes	High Blood Pressure	Mood Disorders
Bacteroidetes Phylum									
Bacteroides-Prevotella group		↑	↑	↑	↑	↑	↑	↑	↑
Bacteroides vulgatus	H	↑			↑	↑		↑	↑
Barnesiella spp.									
Odonibacter spp.	H								
Prevotella spp.	H	↑		↑	↑	↑		↑	↑
Firmicutes Phylum									
Anaerotruncus colihominis		↑	↑	↑	↑	↑	↑	↑	↑
Butyrivibrio crossotus									
Clostridium spp.									
Coprococcus eutactus		↑			↑	↑		↑	↑
Faecalibacterium prausnitzii	H	↑				↑			↑
Lactobacillus spp.									
Pseudoflavonifractor spp.	H	↑	↑	↑	↑	↑	↑	↑	↑
Roseburia spp.			↓						
Ruminococcus spp.		↑↓	↓	↓	↓	↑↑	↑↑	↑↑	↑↑
Veillonella spp.		↑	↑	↑	↑	↑	↑		↑
Actinobacteria Phylum									
Bifidobacterium spp.									
Bifidobacterium longum									
Collinsella aerofaciens	L	↑↑	↑↑	↓	↑↑	↑↑	↑↑	↑↑	↑↑
Proteobacteria Phylum									
Desulfovibrio piger									↑
Escherichia coli		↑	↑	↑	↑	↑	↑	↑	↑
Oxalobacter formigenes		↑		↑	↑				↑
Euryarchaeota Phylum									
Methanobrevibacter smithii		↑				↑			↑
Fusobacteria Phylum									
Fusobacterium spp.		↑	↑	↑	↑	↑	↑	↑	↑
Verrucomicrobia Phylum									
Akkermansia muciniphila	L	↓	↓	↓	↓	↓	↓	↓	↓

*Information derived from GDX results data comparing a healthy cohort to various clinical condition cohorts. The chart above showing a comparison of patient results to clinical conditions is meant for informational purposes only; it is not diagnostic, nor does it imply that the patient has a specific clinical diagnosis or condition.

The arrows indicate Genova's clinical condition cohort test results falling below ↓ or above ↑ the reference range that is greater than that of Genova's healthy cohort.

↑↓ Indicates Genova's clinical condition cohort test results falling below and above the reference range that are greater than that of Genova's healthy cohort.

Cells with bolded arrows indicate Genova's clinical condition cohort had more test results falling above versus below ↑↑ or more below versus above ↓↓ the reference range compared to that of Genova's healthy cohort.

- ▶ GI effects:
- ▶ Low SCFAs- more fiber and prebiotics
- ▶ *Phytobre
- ▶ Akkermansia muciniphila is low, phytobre will help with that also
- ▶ Dysbiosis: Pseudomonas aeruginosa and yeast (candidiasis)
- ▶

▶ **Candida/ Dysbiosis treatment**

- ▶ Week 1 • *Candidid Forte: 2 capsules two times a day (before meals) • *Intestin-ol: 1 softgel capsule two times a day (before meals) • *Ortho Spore IG (3 capsules once a day) (before meals) • *Glutashield (one scoop a day) (with meals) Weeks 2–3 • Candidid Forte: 2 capsules three times a day • Intestin-ol: 1 softgel capsule three times a day • Ortho Spore IG (3 capsules once a day) • Glutashield (one scoop a day) Week 4–5 (Either continue Weeks 2–3 dosing or as listed below) • Candidid Forte: 3 capsules three times a day • Intestin-ol: 1 softgel three times a day • Ortho Spore IG (3 capsules once a day) • Glutashield (one scoop a day)
Nutrition: Continue current- great job!

Case study- Follow up April 2022

SUBJECTIVE

Changes/Improvements:

- ▶ Palpitation haven't gotten any better. Doesn't think they are caffeine

- ▶ Migraines are by far better now.

Plan:

- ▶ Need to prioritize sleep and stress reduction- walking with your dog.

- ▶ Methimazole 5 mg every third day

- ▶ Will recheck your labs --> 6 weeks --> call the office if you don't hear from us for guidance.

- ▶ Start progesterone 100 mg days 14- 28 of your cycle

- ▶ www.retrainingthebrain.com DNRS or EMDR

- ▶ In the mean time you can do a few reiki sessions

Case study- Follow up April 2022

Your Lab work:

3/22

TSH <0.005 FREE T4 1.13 T3, FREE 3.3 PROGESTERONE <0.2. ESTRADIOL 255. TESTOSTERONE, TOTAL 18 DHEA-SULFATE 116. RHEUMATOID FACTOR <14

1/22

TSH <0.01. FREE T4 5.0 T3, FREE. 7.2. T3, REVERSE 32 PROLACTIN 6.6. TSH RECEPTOR AB (TRAb) 5.79 range (< 2.0). (indicator for Grave's) TSI 214 (range <140)

Supplements:

Omega-3

Magnesium 200 mg in the evening before bed

L-theanine 100-200 mg as needed for anxiety (max 400 mg daily)

Turvani turmeric

Lemon balm tea (organic) 4 times a day

Liver Aid - 2 capsules daily for 2 months

Restart

Probiotic

Prebiotic

Nutrition: Still grain free

Continue Daily Habits:

Case study- Follow up July 2022

- ▶ SUBJECTIVE

- ▶ Changes/Improvements:

- ▶ Coaching is keeping her busy, taking grad credit hours.

- ▶

- ▶ getting a headache/migraine day 16 of cycle

- ▶

- ▶ Plan:

- ▶

- ▶ Lab work- in 8 weeks

- ▶

- ▶ Start progesterone 100 mg days 14- 28 of your cycle

- ▶

- ▶ www.retrainingthebrain.com DNRS

- ▶

- ▶ Supplements:

- ▶ Omega-3

- ▶ Magnesium 200 mg in the evening before bed

- ▶ L-theanine 100-200 mg as needed for anxiety (max 400 mg daily)

- ▶ Turvani turmeric

- ▶ Lemon balm tea (organic) 4 times a day

- ▶ Probiotic

- ▶ Prebiotic

- ▶ *EstroDIM daily

Case study- Follow up July 2022

- ▶ Your Lab work:
- ▶ 6/22
- ▶ TSH 1.98
- ▶ FREE T4 1.05
- ▶ T3, FREE 2.55
- ▶ TSI 0.84
Thyrotropin receptor 2.27
TPO 38
Thyroglob antibody 6
- ▶ After this stopped methimazole
- ▶
- ▶ 3/22
- ▶ TSH <0.005 FREE T4 1.13 T3, FREE 3.3 PROGESTERONE <0.2 ESTRADIOL 255 TESTOSTERONE, TOTAL 18 DHEA-SULFATE 116 RHEUMATOID FACTOR <14
- ▶ 1/22
- ▶ TSH <0.01 FREE T4 5.0 T3, FREE. 7.2 T3, REVERSE 32 PROLACTIN 6.6 TSH RECEPTOR AB (TRAb) 5.79 range (< 2.0). (indicator for Grave's) TSI 214 (range <140)
- ▶ Nutrition: Still grain free

Case study- Follow up Oct 2022

SUBJECTIVE

- ▶ Doing well, having a lot of stress so feeling fatigued but no palpitations, no weight gain.
 - ▶ Taking estrodim, days 14-28 days to see if it's helping with the headaches
 - ▶ PLAN
 - ▶ Plan: Nutrition: Continue Current
 - ▶ Supplements:
 - ▶ Omega-3
 - ▶ Magnesium 200 mg in the evening before bed
 - ▶ L-theanine 100-200 mg as needed for anxiety (max 400 mg daily)
 - ▶ Turvani turmeric
 - ▶ Lemon balm tea (organic) 4 times a day
 - ▶ Probiotic
 - ▶ Prebiotic
 - ▶ EstroDIM daily
 - ▶ Add thyroid aid 3 capsules daily
 - ▶
 - ▶ Recheck in 6-8 weeks
- ▶ Labs:
 - ▶ 9/22
 - ▶ fT3 2.62
 - ▶ fT4 1.18
 - ▶ TSH 3.03

When in doubt listen to your patient

- ▶ Yes, they want guidance that you will be able to give but they also want you to listen and brainstorm with them.
- ▶ Medications and supplements can only get you so far.
- ▶ So many things can we fixed with nutrition and lifestyle changes:
 - ▶ The Four Pillars of Health
 - ▶ Eat. Sleep. Move. Breathe
- ▶ Schedule appointments every 8 weeks until you figure out and optimize their health and thyroid.
- ▶ Gut Health Program: <https://www.healthologybydrjen.com/guthealthy>

Questions?

- ▶ If anyone has questions about the Integrative Medicine fellowship- please reach out to me! I'm here all weekend 😊
- ▶ I was working and a mom of 3 at that time when I completed it!



Thank you!

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