Casual Friday Series

Functional Takes on Thyroid Disease and Patterns

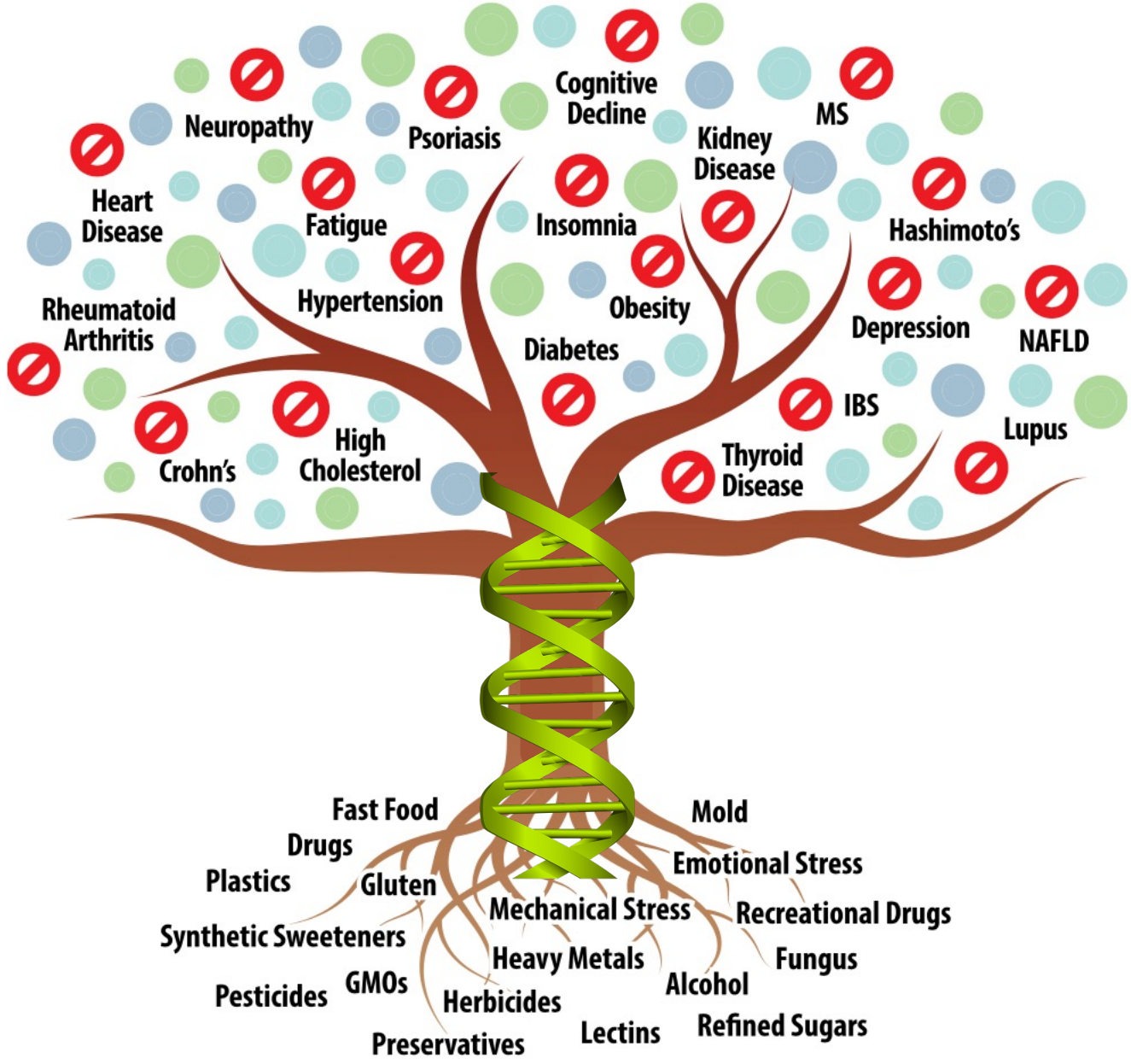
Part 4

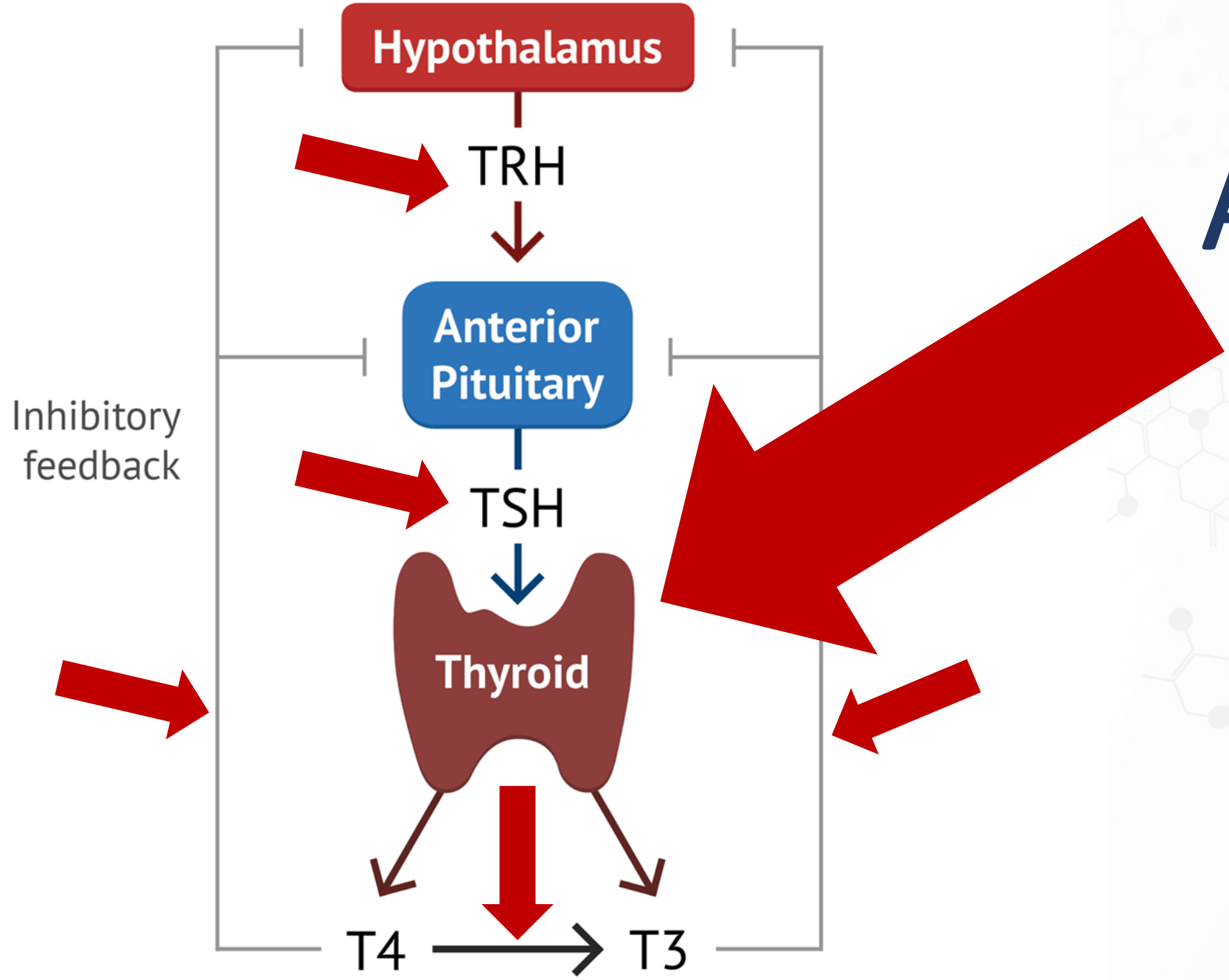
A Biogenetix Clinical Presentation

BIOGENETIX.COM

Disclaimer

- *Information in this presentation is not intended, in itself, to diagnose, treat, reverse, cure, or prevent any disease. While this presentation is based on medical literature, findings, and text, The following statements have not been evaluated by the FDA.*
- *The information provided in this presentation is for your consideration only as a practicing health care provider. Ultimately you are responsible for exercising professional judgment in the care of your own patients.*


Neuropathy
Psoriasis
Cognitive Decline
MS
Kidney Disease
Heart Disease
Fatigue
Insomnia
Hashimoto's
Hypertension
Obesity
Depression
NAFLD
Rheumatoid Arthritis
Diabetes
IBS
Lupus
Crohn's
High Cholesterol
Thyroid Disease
Fast Food
Mold
Drugs
Emotional Stress
Plastics
Gluten
Mechanical Stress
Recreational Drugs
Synthetic Sweeteners
Heavy Metals
Fungus
Pesticides
GMOs
Herbicides
Alcohol
Lectins
Refined Sugars
Preservatives



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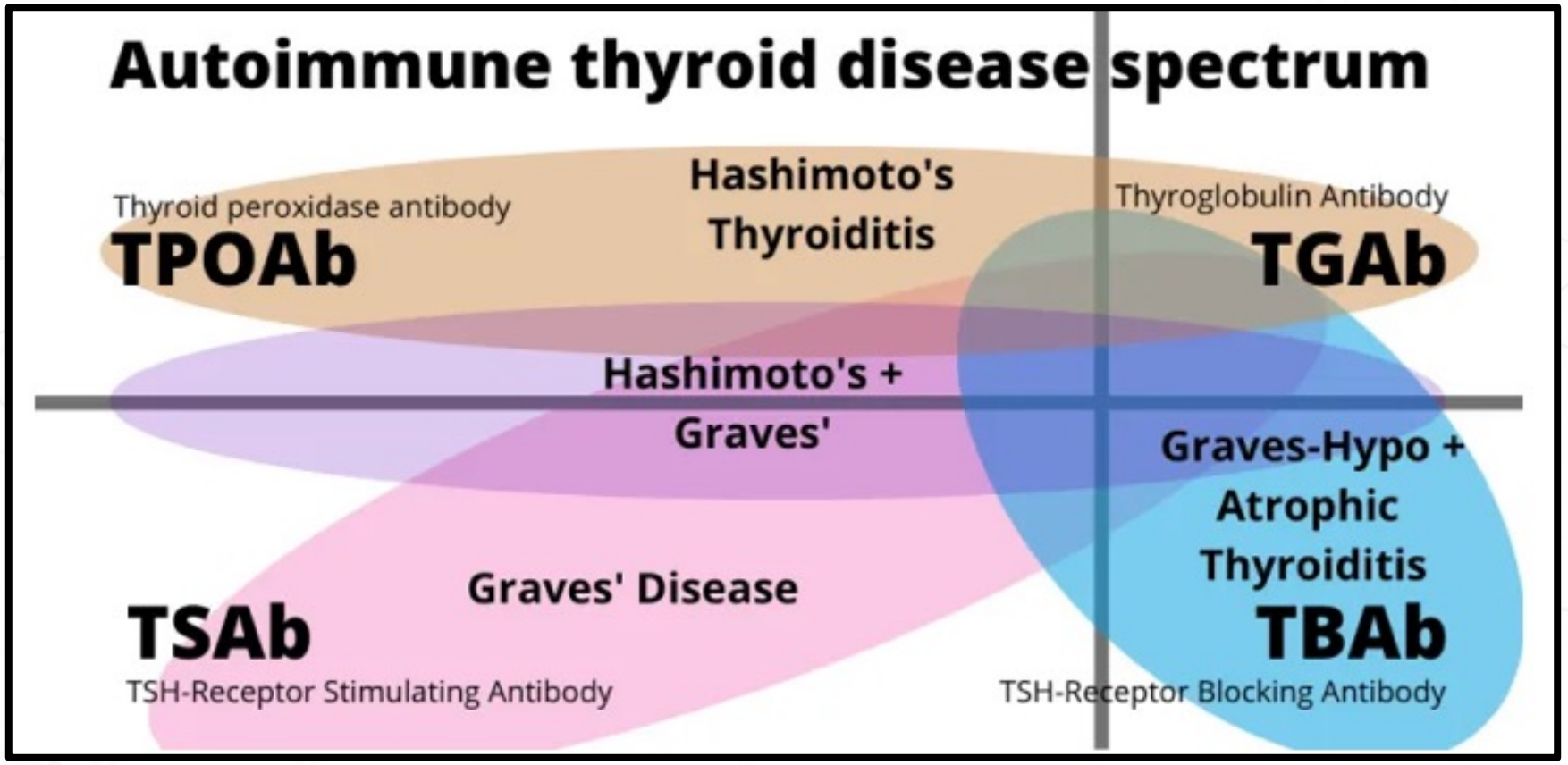
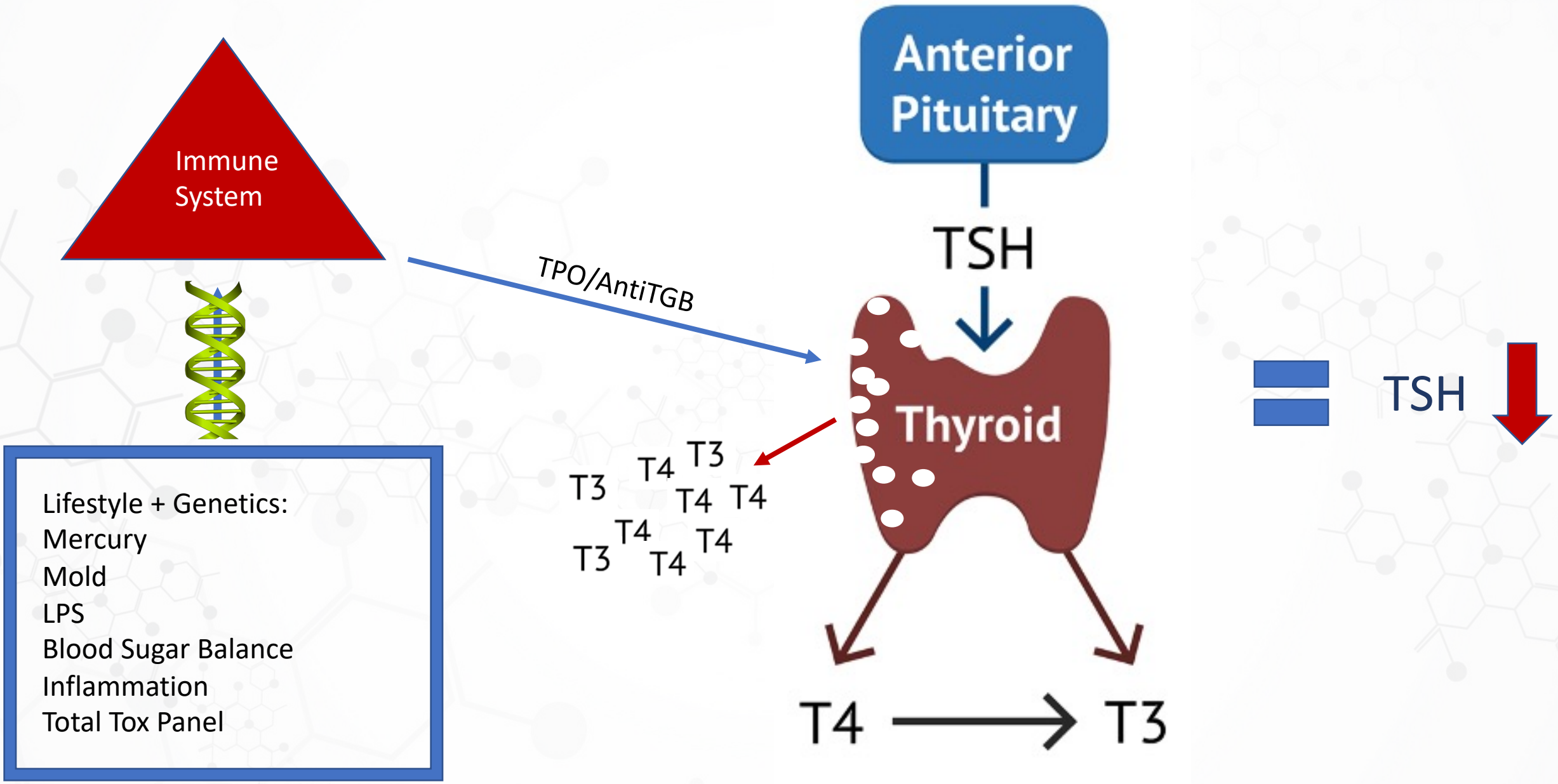
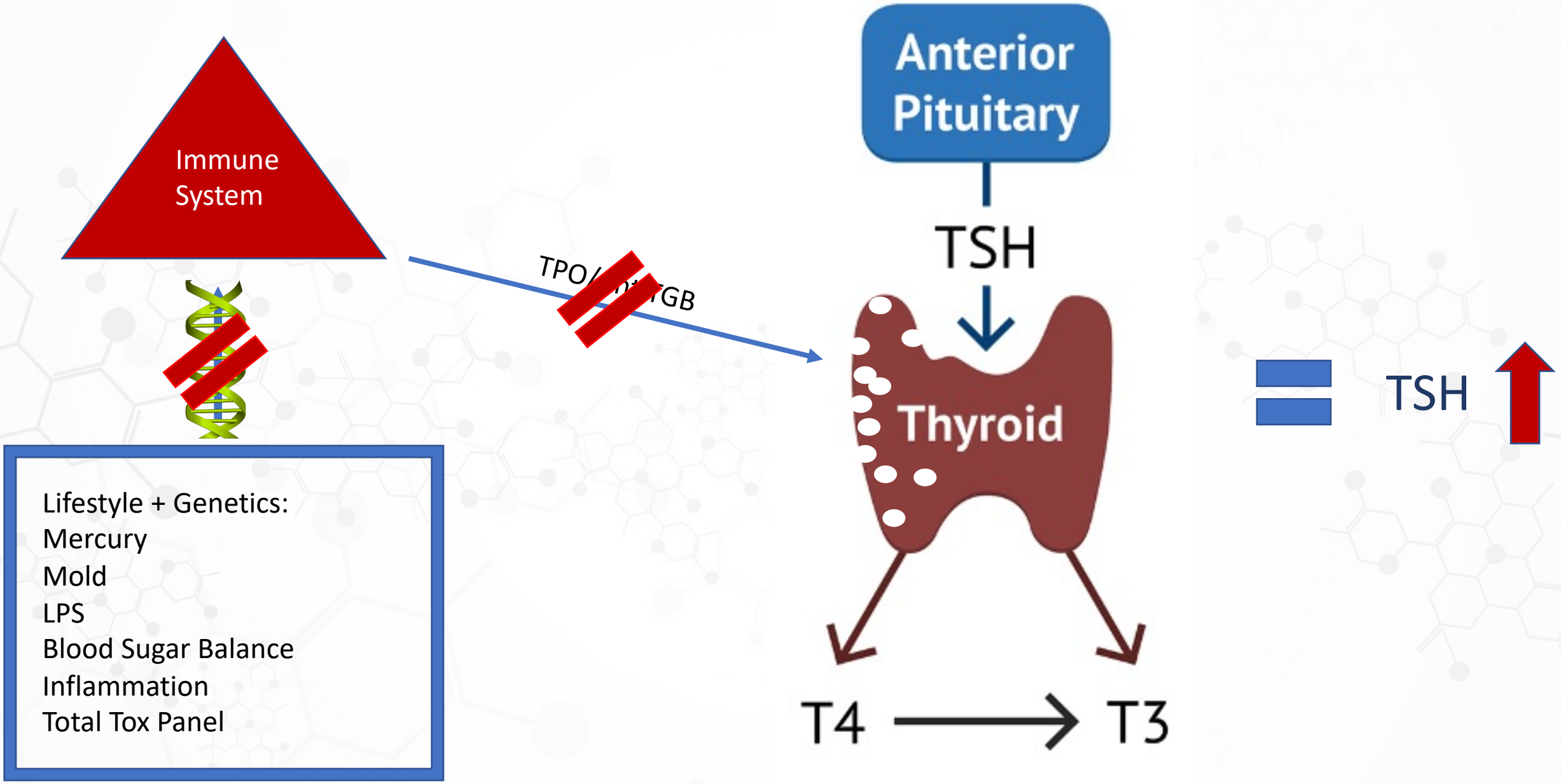


https://thyroidpatients.ca/2020/04/05/remissions-and-fluctuations-trab/


Anterior Pituitary
TSH
Immune System
TPO/AntiTGB
Thyroid
T3 T4 T3 T4 T4 T3 T4 T4
T4 T3
TSH
Lifestyle + Genetics:
Mercury
Mold
LPS
Blood Sugar Balance
Inflammation
Total Tox Panel


Immune System
TPO/
TGB
Anterior Pituitary
TSH
Thyroid
T4
T3
TSH
Lifestyle + Genetics:
Mercury
Mold
LPS
Blood Sugar Balance
Inflammation
Total Tox Panel

45 yo., anxiety, migraines, fatigue

TSH

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
TSH [01]	0.481		uIU/mL	0.450-4.500

Thyroxine (T4)

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Thyroxine (T4) [01]	6.4		ug/dL	4.5-12.0

T3 Uptake

Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
▼ **T3 Uptake** [01]	**21**	**Low**		%	24-39
Free Thyroxine Index	1.3				1.2-4.9

Triiodothyronine (T3)

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Triiodothyronine (T3) [01]	95		ng/dL	71-180

Thyroid Antibodies

Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
Thyroid Peroxidase (TPO)					
▲ **Ab** [01]	**171**	**High**		IU/mL	0-34
▲ **Thyroglobulin Antibody** [01]	**69.6**	**High**		IU/mL	0.0-0.9

Thyroglobulin Antibody measured by Beckman Coulter Methodology

Thyroid Stim Immunoglobulin

Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
Thyroid Stim					
▲ **Immunoglobulin** [03]	**0.73**	**High**		IU/L	0.00-0.55

Meds: Methimazole

Fe+TIBC+Fer

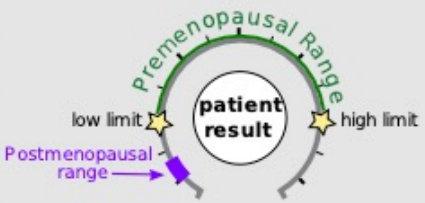
	Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
▲	**Iron Bind.Cap.(TIBC)**	**484**	**High**		ug/dL	250-450
▲	**UIBC** [01]	**458**	**High**		ug/dL	131-425
▼	**Iron** [01]	**26**	**Low**		ug/dL	27-159
■	***Iron Saturation***	***5***	***Alert***		%	15-55
▼	**Ferritin** [01]	**10**	**Low**		ng/mL	15-150

CBC With Differential/Platelet

	Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
	WBC [01]	4.4			x10E3/uL	3.4-10.8
	RBC [01]	4.58			x10E6/uL	3.77-5.28
▼	**Hemoglobin** [01]	**10.9**	**Low**		g/dL	11.1-15.9
	Hematocrit [01]	35.1			%	34.0-46.6
▼	**MCV** [01]	**77**	**Low**		fL	79-97
▼	**MCH** [01]	**23.8**	**Low**		pg	26.6-33.0
▼	**MCHC** [01]	**31.1**	**Low**		g/dL	31.5-35.7
▲	**RDW** [01]	**19.0**	**High**		%	11.7-15.4
	Platelets [01]	399			x10E3/uL	150-450
	Neutrophils [01]	62			%	Not Estab.
	Lymphs [01]	25			%	Not Estab.
	Monocytes [01]	8			%	Not Estab.
	Eos [01]	4			%	Not Estab.
	Basos [01]	1			%	Not Estab.

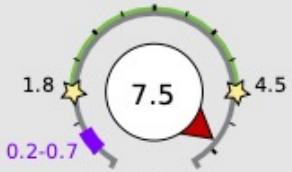
Hormone Testing Summary

Key (how to read the results):

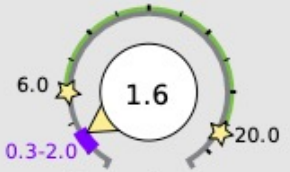


Sex Hormones

See Pages 2 and 3 for a thorough breakdown of sex hormone metabolites



Estradiol(E2)



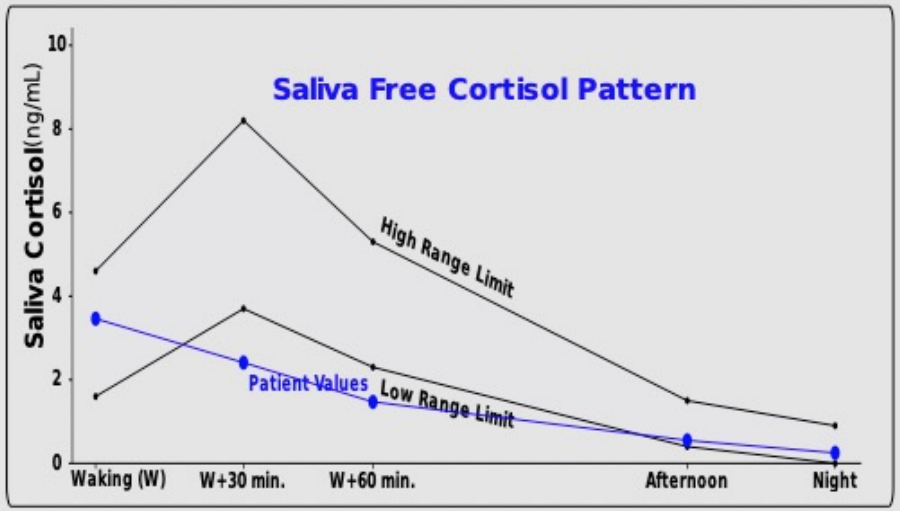
Progesterone
(Serum Equivalent, ng/mL)

Progesterone Serum Equivalent is a calculated value based on urine pregnanediol.

Testosterone

Adrenal Hormones

See pages 4 and 5 for a more complete breakdown of adrenal hormones



Total DHEA Production

Age	Range
20-39	1300-3000
40-59	750-2000
>60	500-1200

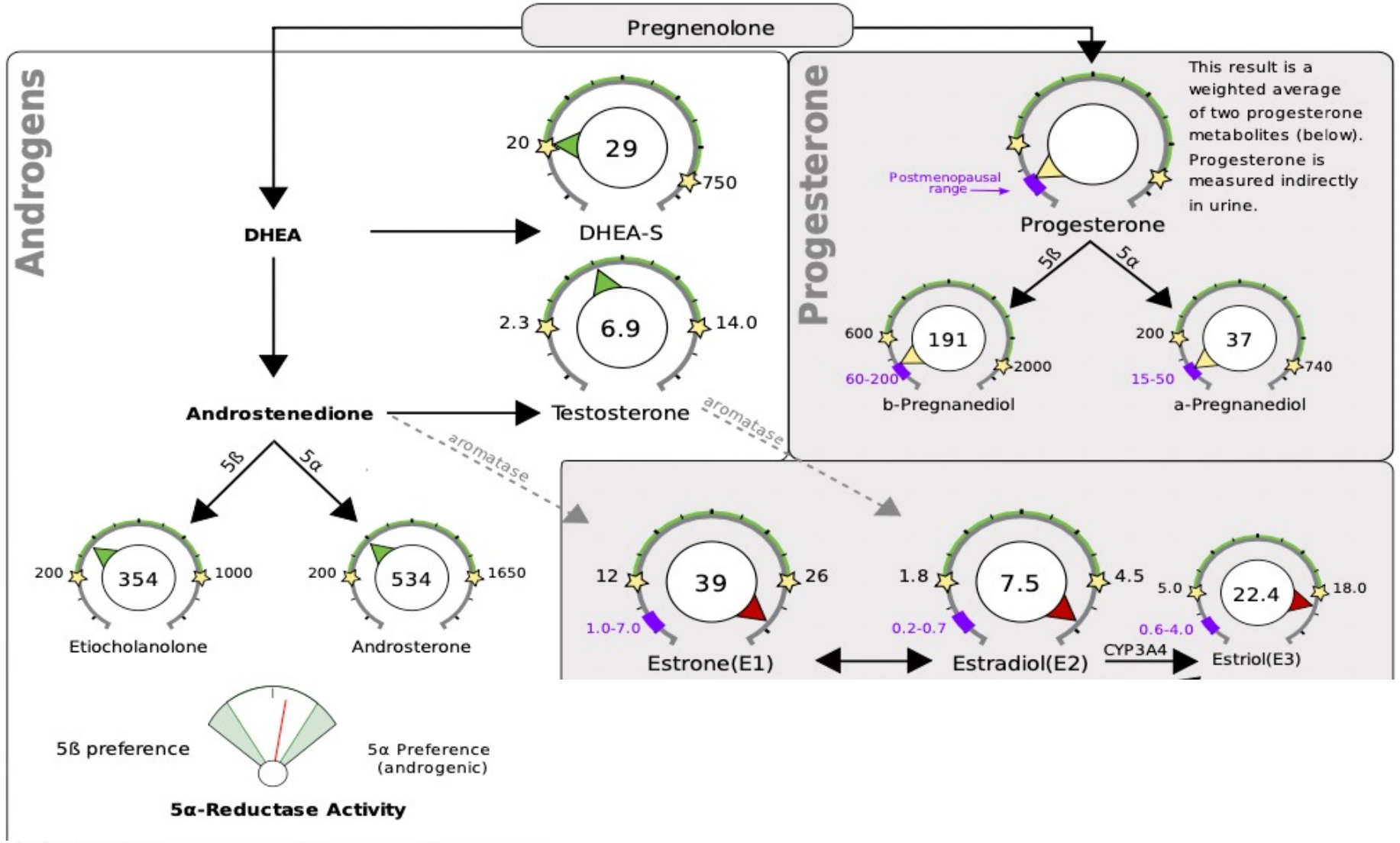
Total DHEA Production
(DHEAS + Etiocholanolone + Androsterone)

Saliva Cortisol Total
(Sum of 5 values)

cortisol metabolism

Metabolized Cortisol (THF+THE)
(Total Cortisol Production)

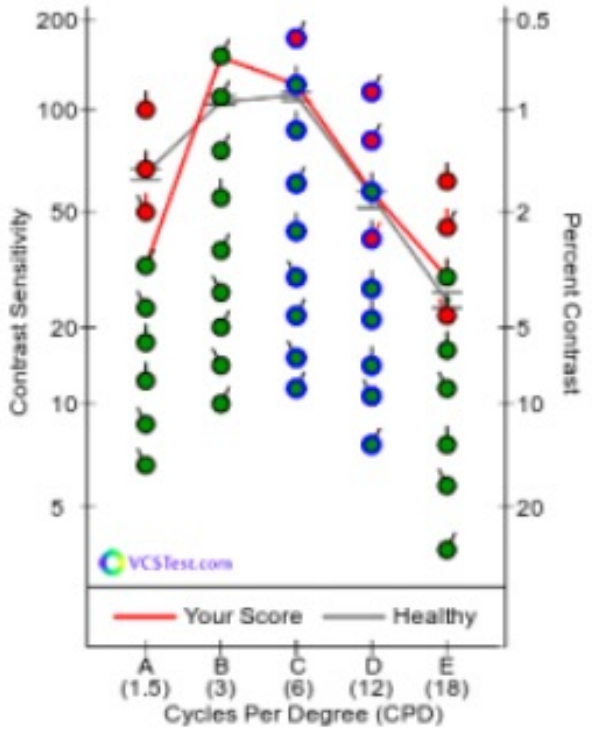
Free cortisol best reflects tissue levels. Metabolized cortisol best reflects total cortisol production.


Pregnenolone
Androgens
DHEA
20
29
750
DHEA-S
2.3
6.9
14.0
Testosterone
Androstenedione
aromatase
aromatase
5ß
5α
200
354
1000
Etiocholanolone
200
534
1650
Androsterone
5ß preference
5α Preference
(androgenic)
5α-Reductase Activity
Progesterone
This result is a weighted average of two progesterone metabolites (below). Progesterone is measured indirectly in urine.
Postmenopausal range
Progesterone
5ß
5α
600
191
2000
60-200
b-Pregnanediol
200
37
740
15-50
a-Pregnanediol
12
39
26
1.0-7.0
Estrone(E1)
1.8
7.5
4.5
0.2-0.7
Estradiol(E2)
CYP3A4
5.0
22.4
18.0
0.6-4.0
Estriol(E3)

Category	Test		Result	Units	Normal Range
Nutritional Organic Acids					
Vitamin B12 Marker (may be deficient if high) - (Urine)					
	Methylmalonate (MMA)	Within range	1.4	ug/mg	0 - 2.5
Vitamin B6 Markers (may be deficient if high) - (Urine)					
	Xanthurenate	Within range	0.26	ug/mg	0.12 - 1.2
	Kynurenate	Within range	1.66	ug/mg	0.8 - 4.5
Glutathione Marker (may be deficient if low or high) - (Urine)					
	Pyroglutamate	Within range	46.3	ug/mg	28 - 58
Biotin Marker (may be deficient if high) - (Urine)					
	b-Hydroxyisovalerate	Within range	4.6	ug/mg	0 - 12.5
Gut Marker (potential gut putrefaction or dysbiosis if high) - (Urine)					
	Indican	Above range	116.6	ug/mg	0 - 100
Neuro-related Markers					
Dopamine Metabolite - (Urine)					
	Homovanillate (HVA)	Above range	14.8	ug/mg	3 - 11
Norepinephrine/Epinephrine Metabolite - (Urine)					
	Vanilmandelate (VMA)	Within range	4.0	ug/mg	2.2 - 5.5
Neuroinflammation Marker - (Urine)					
	Quinolinate	Within range	6.8	ug/mg	0 - 9.6
Additional Markers					
Melatonin (*measured as 6-OH-Melatonin-Sulfate) - (Urine)					
	Melatonin* (Waking)	Within range	45.6	ng/mg	10 - 85
Oxidative Stress / DNA Damage, measured as 8-Hydroxy-2-deoxyguanosine (8-OHdG) - (Urine)					
	8-OHdG (Waking)	Within range	1.15	ng/mg	0 - 5.2

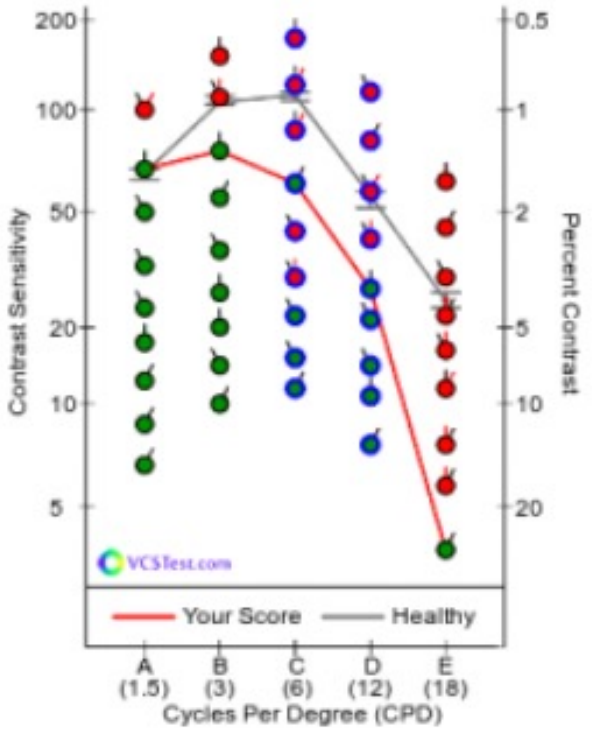
VCS RESULTS: POSITIVE · TOTAL SCORE: 60/90 (67%) · BIOTOXIN SCORE: 23/36 (64%)

Left Eye

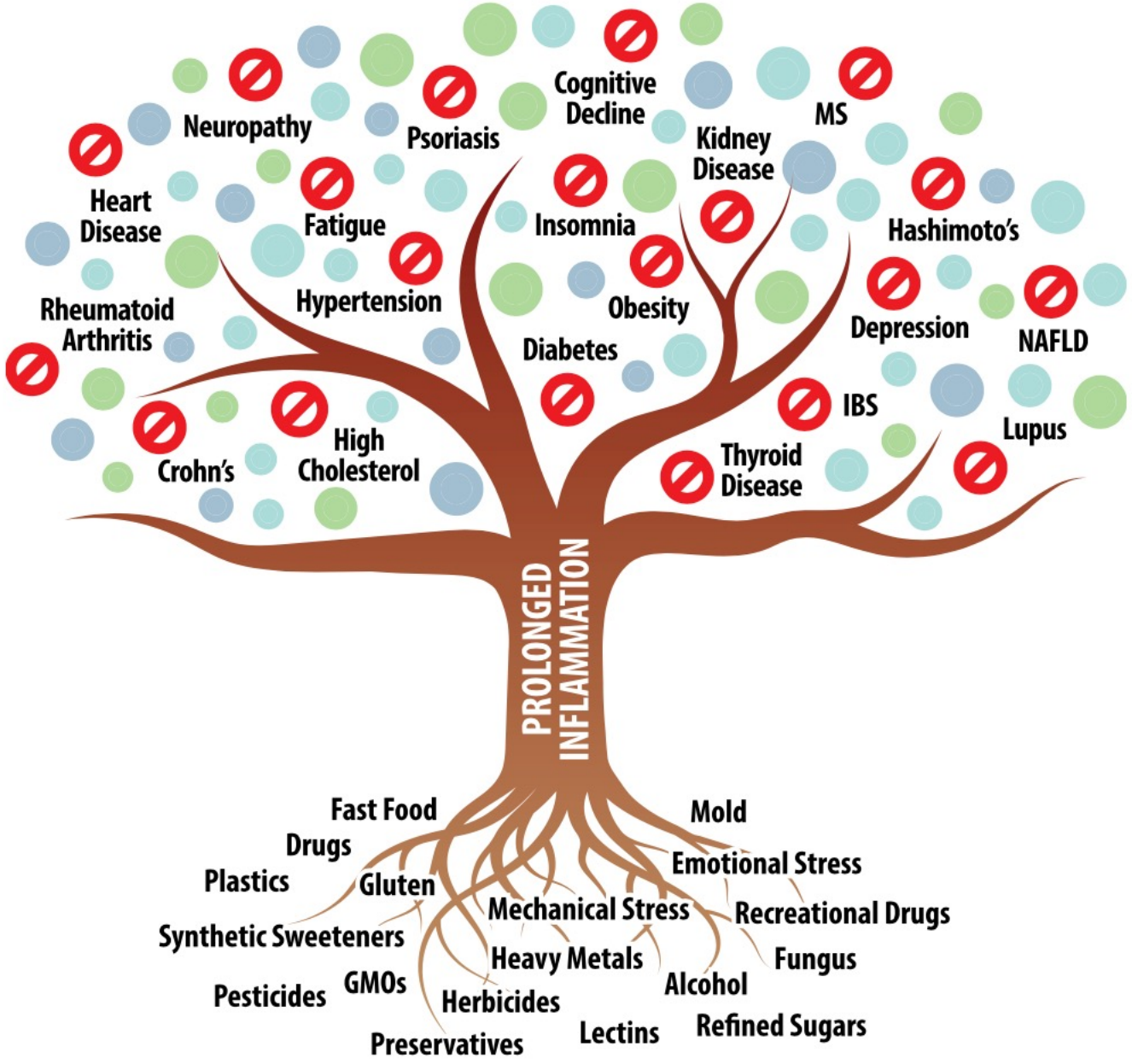


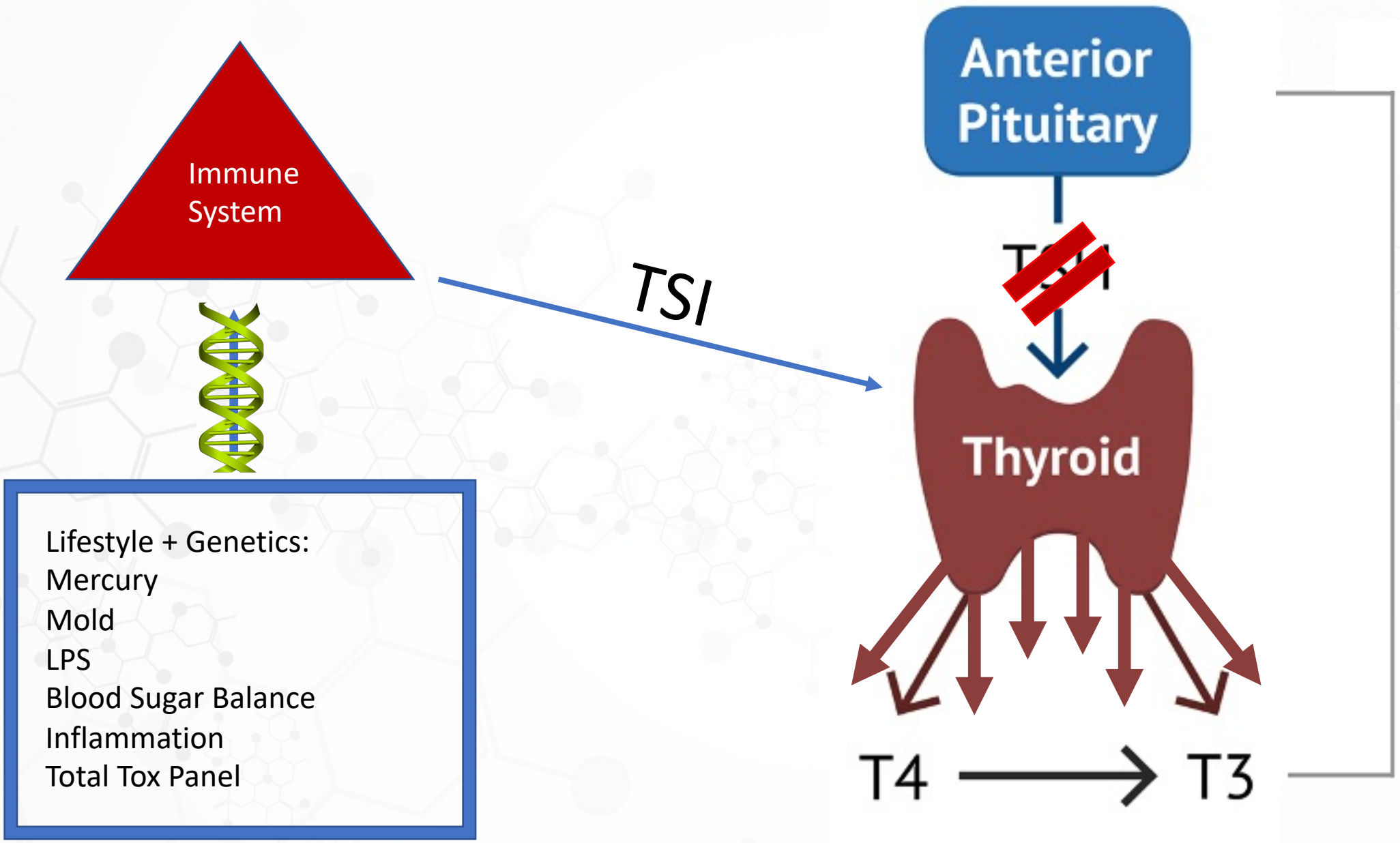
Total Score: 35/45 (78%)
Biotoxin Score: 14/18 (78%)

Right Eye



Total Score: 25/45 (56%)
Biotoxin Score: 9/18 (50%)


Neuropathy
Psoriasis
Cognitive Decline
MS
Kidney Disease
Heart Disease
Fatigue
Insomnia
Hashimoto's
Hypertension
Obesity
Depression
NAFLD
Rheumatoid Arthritis
Diabetes
IBS
Lupus
Crohn's
High Cholesterol
Thyroid Disease
PROLONGED INFLAMMATION
Fast Food
Mold
Drugs
Emotional Stress
Plastics
Gluten
Mechanical Stress
Recreational Drugs
Synthetic Sweeteners
Heavy Metals
Fungus
Pesticides
GMOs
Alcohol
Herbicides
Lectins
Refined Sugars
Preservatives


Immune System
TSI
Anterior Pituitary
Thyroid
T4
T3
Lifestyle + Genetics:
Mercury
Mold
LPS
Blood Sugar Balance
Inflammation
Total Tox Panel

Diagnostics

- Blood + Ab
- Dutch
- Stool
- Total Tox

Intervention

- Building Blocks
- Drivers
- Detoxifiers

Results

- Subjective
- Objective
- Predictable
- Sustainable

62 yo female, hypothyroid, diabetic, depression, neuropathy, anxiety, fatigue, HBP…14 meds

Thyroid Panel With TSH

Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
▼ **TSH** [01]	**0.134**	**Low**		uIU/mL	0.450-4.500
Thyroxine (T4) [01]	9.5			ug/dL	4.5-12.0
T3 Uptake [01]	33			%	24-39
Free Thyroxine Index	3.1				1.2-4.9

Iron and TIBC

Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
Iron Bind.Cap.(TIBC)	369			ug/dL	250-450
UIBC [01]	316			ug/dL	118-369
Iron [01]	53			ug/dL	27-139
▼ **Iron Saturation**	**14**	**Low**		%	15-55

Hgb A1c with eAG Estimation

Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
▲ **Hemoglobin A1c** [01]	**6.4**	**High**		%	4.8-5.6
Please Note: [01]					
	Prediabetes: 5.7 - 6.4 Diabetes: >6.4 Glycemic control for adults with diabetes: <7.0				
Estim. Avg Glu (eAG)	137			mg/dL	

C-Reactive Protein, Cardiac

Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
▲ **C-Reactive Protein, Cardiac** [01]	**16.24**	**High**		mg/L	0.00-3.00
			Relative Risk for Future Cardiovascular Event		
			Low		<1.00
			Average		1.00 - 3.00
			High		>3.00

Homocyst(e)ine

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Homocyst(e)ine [01]	11.5		umol/L	0.0-17.2

Reverse T3, Serum

Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
▲ **Reverse T3, Serum** [A, 01]	**25.3**	**High**		ng/dL	9.2-24.1

LDH

	Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
▲	**LDH** [01]	**264**	**High**		IU/L	119-226

GGT

	Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
▲	**GGT** [01]	**85**	**High**		IU/L	0-60

Triiodothyronine (T3)

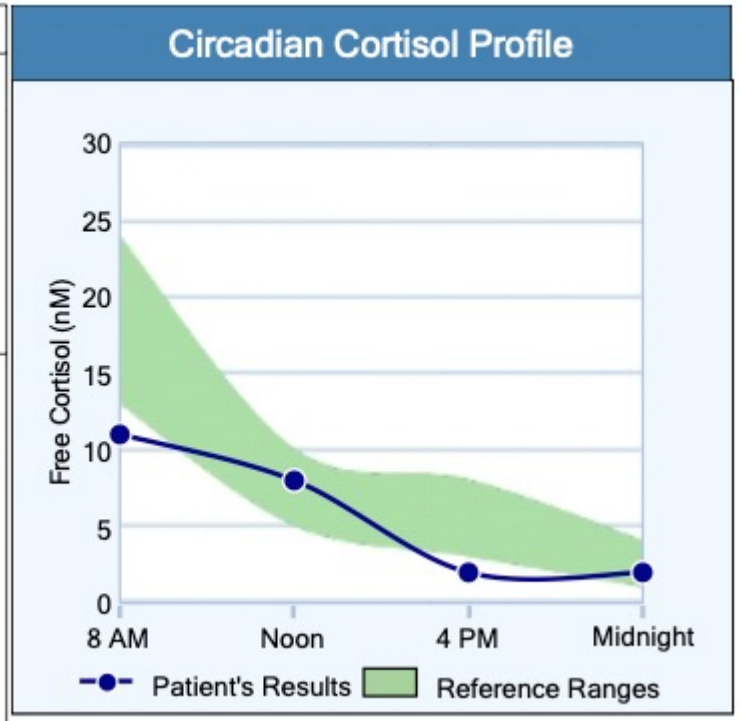
Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Triiodothyronine (T3) [01]	95		ng/dL	71-180

Thyroid Antibodies

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Thyroid Peroxidase (TPO) Ab [01]	<8		IU/mL	0-34
Thyroglobulin Antibody [01]	<1.0		IU/mL	0.0-0.9
	Thyroglobulin Antibody measured by Beckman Coulter Methodology			

ASI - Adrenal Stress Index (Original) - Saliva

Test	Description	Result		Ref Values
TAP	**Cortisol rhythm (saliva)**			**Adults:**
	06:00 - 08:00 AM	11	Low	13-24 nM
	11:00 - 1:00 PM	8	Normal	5-10 nM
	04:00 - 05:00 PM	2	Low	3-8 nM
	10:00 - Midnight	2	Normal	1-4 nM
	Total Cortisol Output:	**23**		**22-46 nM**
	The Total Cortisol Output is the sum of all cortisol values. Elevated values may indicate hypercortisolism or exogenous exposure, and low values suggest adrenal hypofunction.			



Test	Description	Result	Ref Values
DHEA	**Dehydroepiandrosterone [DHEA + DHEA-S] (saliva)**	2 Low	Adults: 3-10 ng/ml

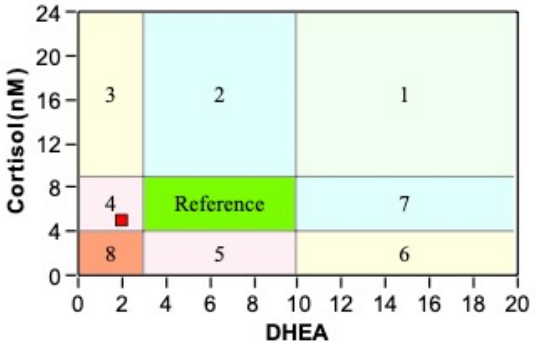
According to the general adaptation syndrome theory originally described by endocrinologist Hans Selye, there are three primary phases to the stress response: 1) alarm reaction, 2) resistance, and 3) exhaustion. Alternately, the stress response may be assessed as a series of stages (or "zones") according to the relative production of cortisol and DHEA. To assess this cortisol-DHEA correlation, the DHEA value is graphed against the average of the noon and afternoon cortisol values, allowing the patient to be characterized according to the zone into which he or she falls.

Figure 2 shows your Cortisol-DHEA correlation was in:

Zone 4 - Depressed DHEA

Zone 4 reflects normal cortisol values with depressed DHEA values. In some cases, reduced DHEA production results from prolonged exposure to stressors. In these cases, the steroid precursor pregnenolone may be limited due to ongoing demand for adrenal hormone production. With continued exposure to stressors, adrenal hormone output may continue to decrease.

Figure 2: Cortisol-DHEA Correlation



CORTISOL-DHEA CORRELATION SPECTRUM
1. Acute stress response: high cort, DHEA
2. Cortisol elevation
3. High cortisol, low DHEA
4. Depressed DHEA
5. Depressed cortisol
6. Low cortisol, high DHEA
7. DHEA elevation
8. Adrenal hypofunction: low cort, DHEA

Test	Description	Result	Ref Values
MB2S	**Total salivary sIgA**	< 5 Low	Borderline Low: 5-9 mg/dL Normal: 10-20 mg/dL Borderline High: 21-25 mg/dL

Depressed sIgA may be associated with chronic stress, allergies, upper respiratory tract infections, and/or selective IgA deficiency. Consider serum immunoglobulin testing to rule out IgA deficiency.

General Information About sIgA
1. Secretory IgA (sIgA) is the predominant antibody found on mucosal membranes throughout the body. 2. sIgA exists as a dimer of two individual IgA combined with a secretory component that helps protect sIgA from enzymatic degradation. 3. One main function of sIgA is immune exclusion, binding to antigens and preventing their adherence and admittance into the body. Typically, sIgA moderates the mucosal inflammatory response.

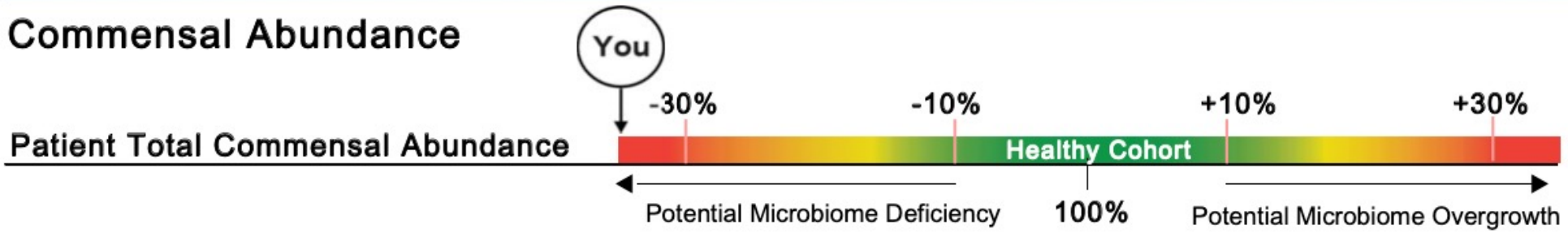
Functional Imbalance Scores

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

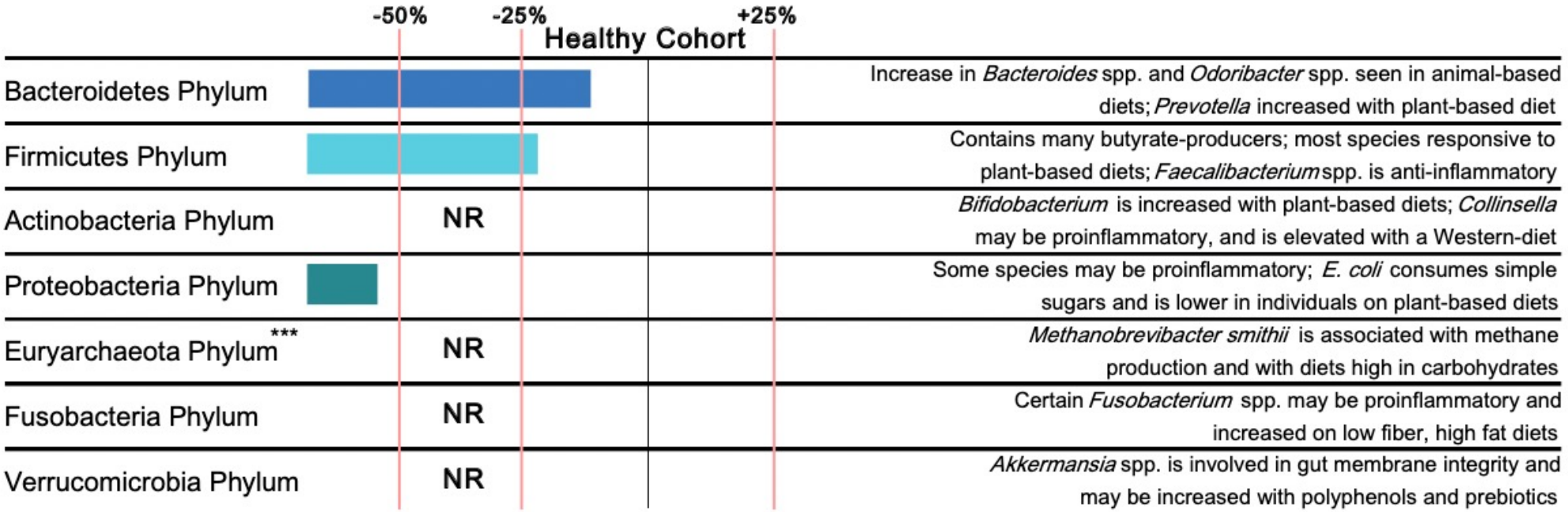
	Need for Digestive Support	Need for Inflammation Modulation	Need for Microbiome Support	Need for Prebiotic Support	Need for Antimicrobial Support
	MALDIGESTION	INFLAMMATION	DYSBIOSIS	METABOLIC IMBALANCE	INFECTION
	0	7	5	2	0
Biomarkers	Products of Protein Breakdown △ Pancreatic Elastase ● Fecal Fats ●	Calprotectin △ Secretory IgA △ Eosinophil Protein X ● Occult Blood ●	Total Abundance ▼ Reference Variance △ IAD/Methane Score ● PP Bacteria/Yeast ●	Beta-glucuronidase △ Total SCFA's ● n-Butyrate Conc. ● SCFA (%) ●	Total Abundance ▼ Parasitic Infection ● Pathogenic Bacteria ● PP Bacteria/Yeast ●
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) • *Saccharomyces boulardii*

Commensal Microbiome Analysis

Commensal Abundance

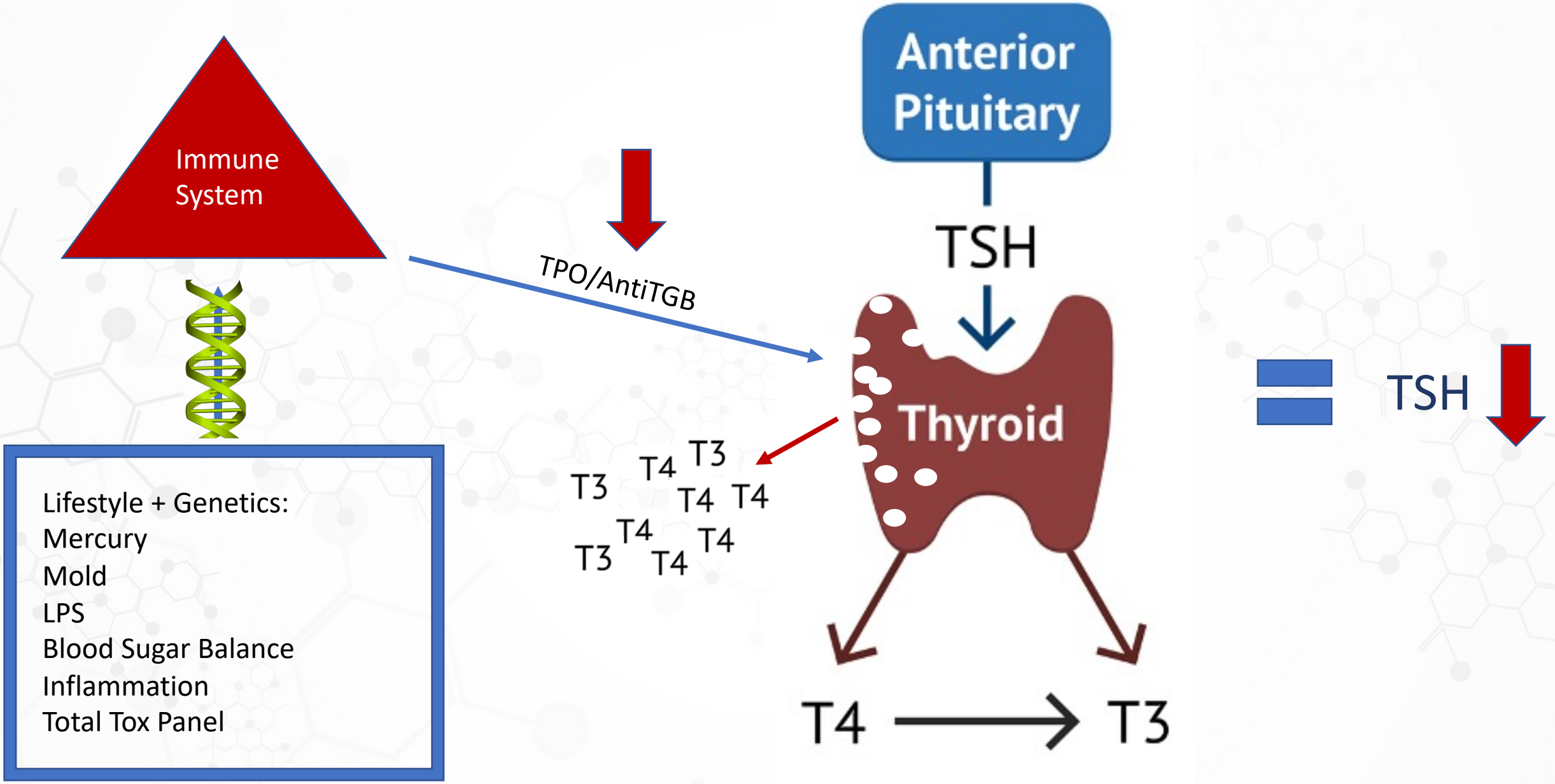


Relative Commensal Abundance



Toxins Summary

		Current	Previous Result
Environmental Toxins	Organochlorine pesticides		
	Organophosphate pesticides	Dimethyldithiophosphate (DMDTP) 🔴, Dimethylthiophosphate (DMTP) 🟡	
	Other pesticides/herbcides	Glyphosate 🟡	
	Phthalate Metabolites	Mono-ethyl phthalate (MEtP) 🟡	
	Parabens		
	Acrylic Metabolites	N-acetyl-S-(2-carbamoylethyl)-cysteine (NAE) 🔴	
	Other Metabolites		
	Alkylphenol	Bisphenol A (BPA) 🔴	
	Volatile Organic Compounds (VOCs)	N-acetyl phenyl cysteine (NAP) 🟡	
	Urine Creatinine		
Mycotoxins V2	Aflatoxin		
	Other	Patulin 🟡	
	Trichothecenes		
	Urinary Creatinine		
Heavy Metals	Heavy Metals (Creatinine)	Gadolinium 🔴	


Immune System
Anterior Pituitary
TSH
TPO/AntiTGB
Thyroid
T3 T4 T3 T4 T4 T3 T4 T4
T4 → T3
TSH
Lifestyle + Genetics:
Mercury
Mold
LPS
Blood Sugar Balance
Inflammation
Total Tox Panel

Diagnostics

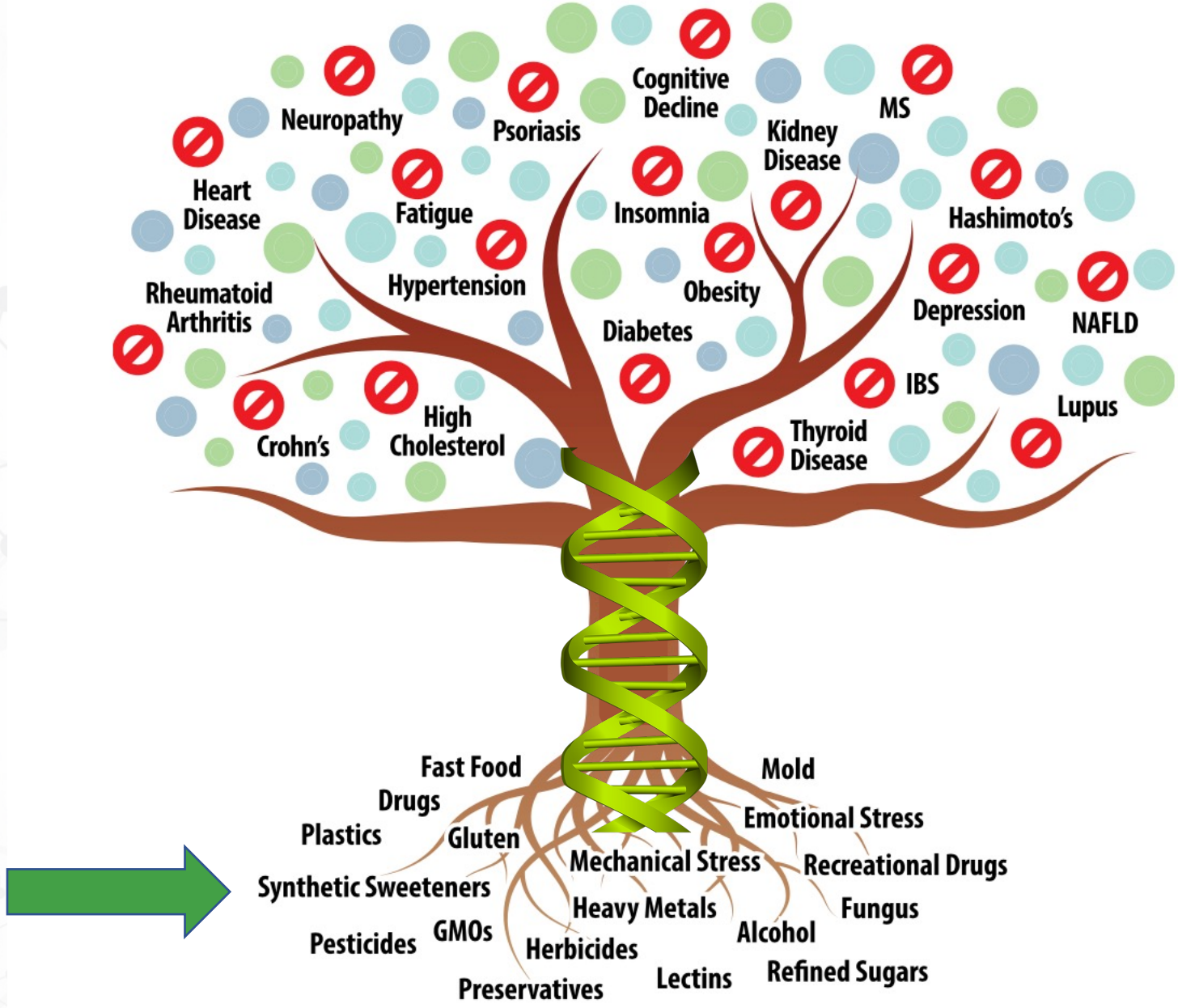
- Blood + Ab
- Dutch
- Stool
- Total Tox

Intervention

- Building Blocks
- Drivers
- Detoxifiers

Results

- Subjective
- Objective
- Predictable
- Sustainable


Neuropathy
Psoriasis
Cognitive Decline
MS
Kidney Disease
Heart Disease
Fatigue
Insomnia
Hashimoto's
Hypertension
Obesity
Depression
NAFLD
Rheumatoid Arthritis
Diabetes
IBS
Lupus
Crohn's
High Cholesterol
Thyroid Disease
Fast Food
Mold
Drugs
Emotional Stress
Plastics
Gluten
Mechanical Stress
Recreational Drugs
Synthetic Sweeteners
Heavy Metals
Fungus
Pesticides
GMOs
Herbicides
Alcohol
Lectins
Refined Sugars
Preservatives

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