

Casual Friday Presents

Respiratory Function

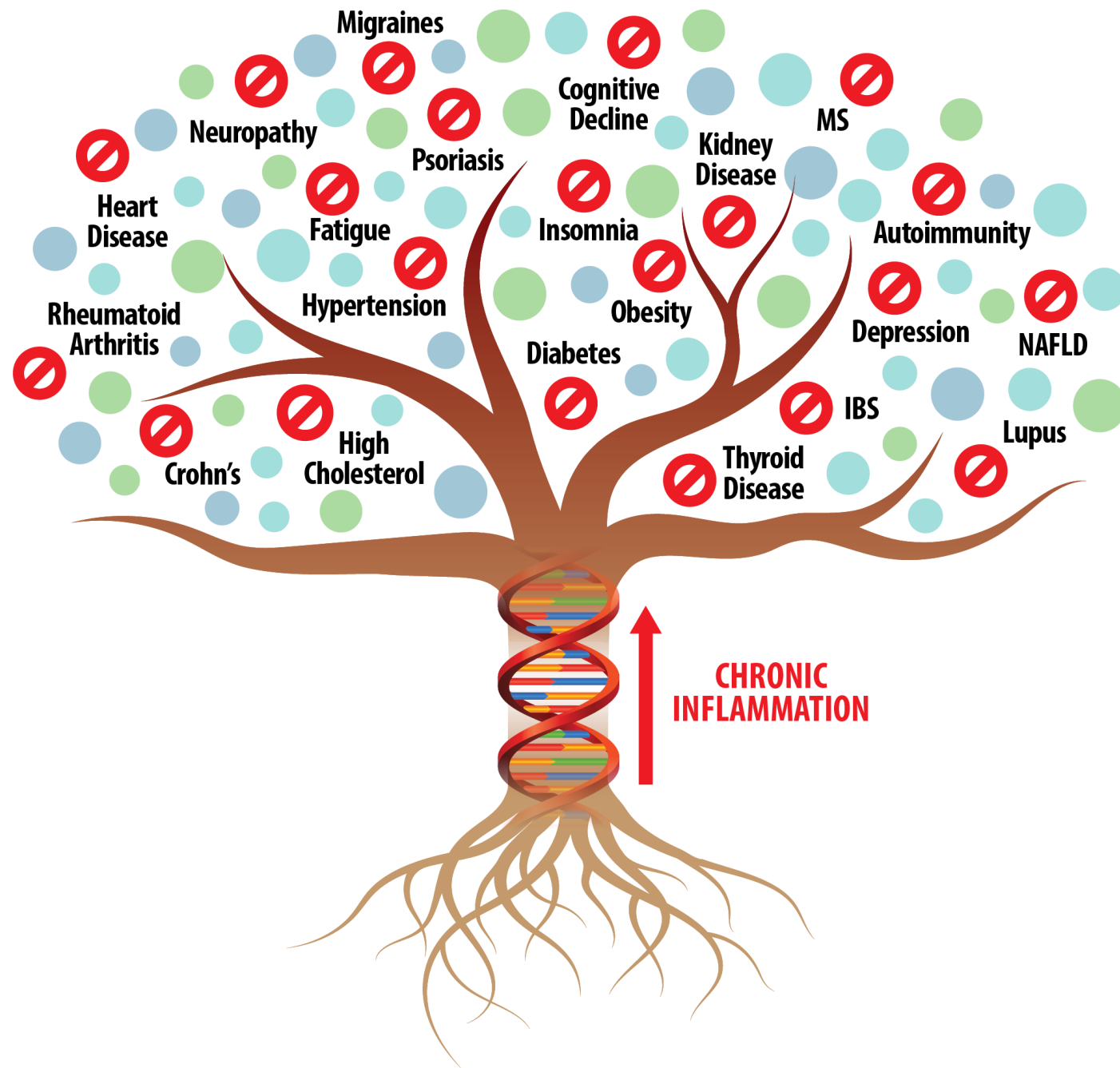
FM Strategies: Physiology, Pathology, Interventions.

Part IV

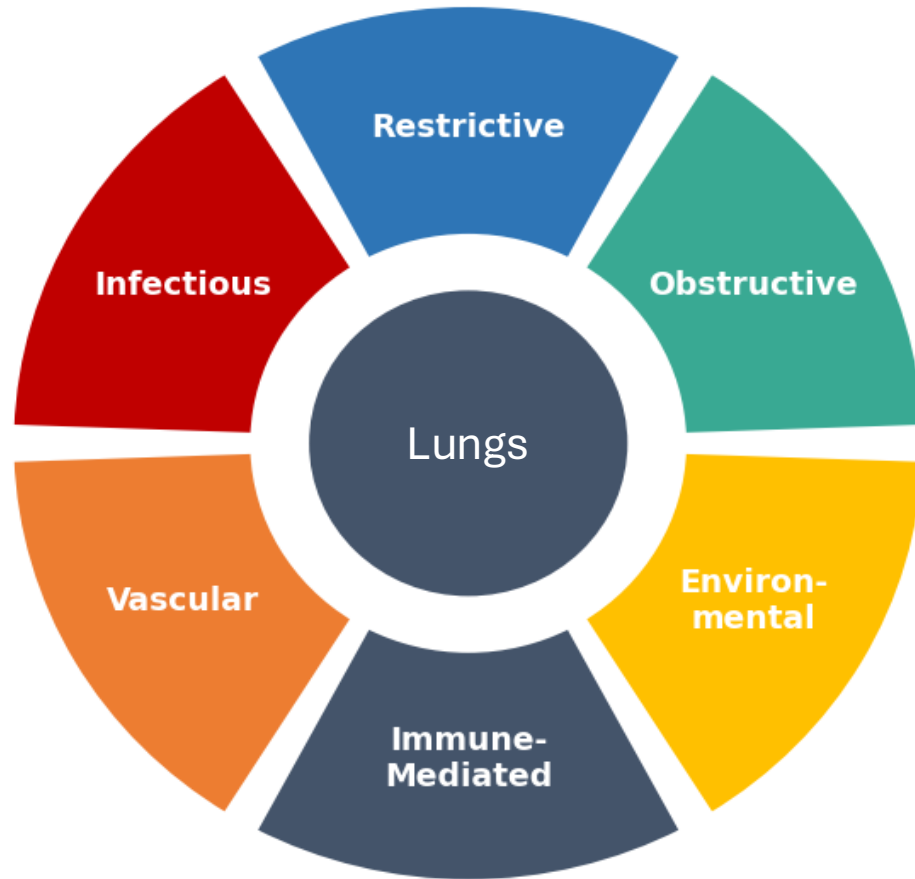
A BIOGENETIX CLINICAL PRESENTATION

biogenetix.com





The Big 6 Pathology Categories



1. Obstructive

Asthma, COPD, Bronchiectasis

2. Restrictive

Fibrosis, Sarcoidosis

3. Infectious

Viral/Bacterial Pneumonia, TB

4. Vascular

Pulm. Hypertension, Pulm. Edema

5. Immune-Med.

Eosinophilic, Autoimmune Pneumonitis

6. Environmental

Mold/CIRS, Occupational, VOCs

The Measurements

Measurement	Restrictive	Obstructive
TLC	↓	↑
RV	↓	↑
FEV ₁	↓	↓
FVC	↓	↓
FEV ₁ / FVC (~80%)	WNL - ↑	↓

Definitions

TLC: total lung capacity

RV: residual volume (volume after max exhale)

FEV₁: forced expiratory volume in 1 second

FVC: forced vital capacity (volume exhaled after TLC)

FEV₁ / FVC ratio: % of FVC exhaled in first second

Barrier systems tend to reflect each other.

- If pharma is not stopping the lung barrier from destroying itself, you're unlikely to impact from there.
- Dig in on the other barrier systems.
- Look for the dysbiotic patterns.
- Find the drivers (environmental and lifestyle).
- Focus on systems management rather than organ management.



Sarcoidosis

Sarcoidosis is a multisystem granulomatous disorder of unknown etiology that primarily affects the lungs and lymphoid organs. Additional organs may become involved over time. Sarcoidosis was first reported in 1877 and remains a concern for clinicians and pathologists. The disease may remain silent, and most patients remain asymptomatic for a prolonged period. Patients may later present with nonspecific symptoms or organ failure. Sarcoidosis is a challenging diagnosis for clinicians, and histopathology remains the gold standard for diagnosis.

*Granulomatous inflammation is a specialized, long-lasting type of chronic inflammation. It occurs when your immune system attempts to "wall off" and isolate foreign invaders or substances it cannot easily destroy. This process creates tightly clustered microscopic nodules of immune cells, which are known as **granulomas**. (NIH)





Pulmonary Fibrosis

→ Injury and healing never complete their cycles.

Sarcoidosis

→ immune system "walls off" something it perceives as foreign, even when no infectious organism can be identified.



Key Epidemiological Stats

- **Lower Disease Risk:** Systematic reviews and meta-analyses show that current smokers have roughly a **39% lower risk** of developing sarcoidosis compared to individuals who have never smoked (Relative Risk 0.61).  ScienceDirect.com +1
- **Ever Smoking:** Individuals who have ever smoked still exhibit a **13% to 45% lower risk** of sarcoidosis diagnosis than never-smokers, depending on the study.  ScienceDirect.com +4
- **Former Smokers:** The odds of developing sarcoidosis for former smokers are generally **statistically similar** to those of never-smokers.  ScienceDirect.com +1

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MCTD/sarcoidosis

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No meds

Symptoms:

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Fatigue

Weight gain

Gut

Hair

Skin

Nails

Joint pain

CBC With Differential/Platelet

Test	Current Result and Flag		Previous Result and Date		Units	Reference Interval
WBC ⁰¹	9.0		7.2	03/20/2025	x10E3/uL	3.4-10.8
RBC ⁰¹	4.49		5.04	03/20/2025	x10E6/uL	3.77-5.28
Hemoglobin ⁰¹	13.5		14.9	03/20/2025	g/dL	11.1-15.9
Hematocrit ⁰¹	42.2		45.9	03/20/2025	%	34.0-46.6
MCV ⁰¹	94		91	03/20/2025	fL	79-97
MCH ⁰¹	30.1		29.6	03/20/2025	pg	26.6-33.0
MCHC ⁰¹	32.0		32.5	03/20/2025	g/dL	31.5-35.7
RDW ⁰¹	13.6		13.0	03/20/2025	%	11.7-15.4
Platelets ⁰¹	205		218	03/20/2025	x10E3/uL	150-450
Neutrophils ⁰¹	47		77	03/20/2025	%	Not Estab.
Lymphs ⁰¹	41		19	03/20/2025	%	Not Estab.
Monocytes ⁰¹	9		4	03/20/2025	%	Not Estab.
Eos ⁰¹	2		0	03/20/2025	%	Not Estab.
Basos ⁰¹	1		0	03/20/2025	%	Not Estab.
Neutrophils (Absolute) ⁰¹	4.3		5.6	03/20/2025	x10E3/uL	1.4-7.0
▲ Lymphs (Absolute) ⁰¹	3.7	High	1.4	03/20/2025	x10E3/uL	0.7-3.1
Monocytes(Absolute) ⁰¹	0.8		0.3	03/20/2025	x10E3/uL	0.1-0.9
Eos (Absolute) ⁰¹	0.2		0.0	03/20/2025	x10E3/uL	0.0-0.4
Baso (Absolute) ⁰¹	0.1		0.0	03/20/2025	x10E3/uL	0.0-0.2
Immature Granulocytes ⁰¹	0		0	03/20/2025	%	Not Estab.
Immature Grans (Abs) ⁰¹	0.0		0.0	03/20/2025	x10E3/uL	0.0-0.1

Comp. Metabolic Panel (14)

Test	Current Result and Flag		Previous Result and Date		Units	Reference Interval
Glucose ⁰¹	82		124	03/20/2025	mg/dL	70-99
BUN ⁰¹	14		12	03/20/2025	mg/dL	8-27
Creatinine ⁰¹	0.83		0.84	03/20/2025	mg/dL	0.57-1.00
eGFR	78		77	03/20/2025	mL/min/1.73	>59
BUN/Creatinine Ratio	17		14	03/20/2025		12-28
Sodium ⁰¹	139		139	03/20/2025	mmol/L	134-144
Potassium ⁰¹	4.0		4.6	03/20/2025	mmol/L	3.5-5.2
Chloride ⁰¹	101		100	03/20/2025	mmol/L	96-106
Carbon Dioxide, Total ⁰¹	22		22	03/20/2025	mmol/L	20-29
Calcium ⁰¹	8.7		9.6	03/20/2025	mg/dL	8.7-10.3
▼ Protein, Total ⁰¹	5.8	Low	6.6	03/20/2025	g/dL	6.0-8.5

Concomitant sarcoidosis and a connective tissue disease: review of the clinical findings and postulations concerning their association

Sarcoidosis is a multisystem granulomatous disease of unknown etiology.¹ To that end, all alternative granulomatous diseases need to be excluded before the diagnosis of sarcoidosis can be secured.^{2,3} These diseases include infections from mycobacteria and fungi,¹ occupational diseases such as chronic beryllium disease,⁴ and lymphoma.¹

Connective tissue diseases are not generally recognized as being a cause of granuloma formation. However, many case reports and very small case series have suggested that there is an association between connective tissue diseases and sarcoidosis. Although no epidemiological analysis of such an association has been undertaken, it is extremely unlikely that a patient would develop both diseases concomitantly given their prevalence. We undertook a retrospective analysis of patients with concomitant sarcoidosis and a connective tissue disease at two medical university centers. It is important to emphasize that we did not perform an epidemiological analysis of the association between sarcoidosis and connective tissue diseases. Rather, we aimed to characterize the clinical presentation and characteristics of patients with a history of both diseases. In addition, we reviewed the medical literature to identify and describe patients who were previously reported to have both conditions.

These data suggest that a significant portion of patients with CTDs and sarcoidosis may actually not have the latter disease. Rather, the CTD may "cause" granulomatous inflammation. Alternate explanations for these findings include that sarcoidosis and/or the connective tissue disease was misdiagnosed in these patients. The diagnosis of a concomitant connective tissue disease and sarcoidosis must be made with extreme caution.



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Fatigue
Weight gain
Gut
Hair
Skin
Nails
Joint pain

Comp. Metabolic Panel (14) (Cont.)

Albumin ⁰¹	4.1	4.6	03/20/2025	g/dL	3.9-4.9
Globulin, Total	1.7	2.0	03/20/2025	g/dL	1.5-4.5
Bilirubin, Total ⁰¹	0.3	0.3	03/20/2025	mg/dL	0.0-1.2
Alkaline Phosphatase ⁰¹	79	90*	03/20/2025	IU/L	49-135
AST (SGOT) ⁰¹	22	21	03/20/2025	IU/L	0-40
ALT (SGPT) ⁰¹	17	18	03/20/2025	IU/L	0-32

* Previous Reference Interval: (Alkaline Phosphatase: 44-121 IU/L)

Test	Current Result and Flag		Previous Result and Date		Units	Reference Interval
Lipids ⁰¹						
▲ Cholesterol, Total ⁰¹	348	High	387	03/20/2025	mg/dL	100-199
▲ Triglycerides ⁰¹	161	High	94	03/20/2025	mg/dL	0-149
HDL Cholesterol ⁰¹	61		72	03/20/2025	mg/dL	>39
VLDL Cholesterol Cal	31		15	03/20/2025	mg/dL	5-40
▲ LDL Chol Calc (NIH)	256	High	300	03/20/2025	mg/dL	0-99
LDL Calc Comment:						
Consider evaluating for Familial Hypercholesterolemia(FH), if clinically indicated.						
▲ T. Chol/HDL Ratio	5.7	High			ratio	0.0-4.4
Please Note: ⁰¹						

LP+Chol/HDL+LDL/HDL+CHD Risk (Cont.)

		T. Chol/HDL Ratio			
				Men	Women
		1/2 Avg.Risk	3.4	3.3	
		Avg.Risk	5.0	4.4	
		2X Avg.Risk	9.6	7.1	
		3X Avg.Risk	23.4	11.0	
▲ Estimated CHD Risk	1.6	High	times avg.		0.0-1.0
The CHD Risk is based on the T. Chol/HDL ratio. Other factors affect CHD Risk such as hypertension, smoking, diabetes, severe obesity, and family history of premature CHD.					
▲ LDL/HDL Ratio	4.2	High	ratio		0.0-3.2



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Thyroid Panel With TSH

Test	Current Result and Flag		Previous Result and Date		Units	Reference Interval
▲ TSH ⁰¹	17.000	High	0.924	03/20/2025	uIU/mL	0.450-4.500
Thyroxine (T4) ⁰¹	6.4				ug/dL	4.5-12.0
T3 Uptake ⁰¹	27				%	24-39
Free Thyroxine Index	1.7					1.2-4.9

Iron and TIBC

Test	Current Result and Flag		Previous Result and Date		Units	Reference Interval
Iron Bind.Cap.(TIBC)	304		346	03/20/2025	ug/dL	250-450
UIBC ⁰¹	198		277	03/20/2025	ug/dL	118-369
Iron ⁰¹	106		69	03/20/2025	ug/dL	27-139
Iron Saturation	35		20	03/20/2025	%	15-55

Hgb A1c with eAG Estimation

Test	Current Result and Flag		Previous Result and Date		Units	Reference Interval
▲ Hemoglobin A1c ⁰¹	6.1	High	5.9	09/05/2024	%	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)	128				mg/dL	

Thyroxine (T4) Free, Direct

Test	Current Result and Flag		Previous Result and Date		Units	Reference Interval
T4,Free(Direct) ⁰¹	0.98		1.95	03/20/2025	ng/dL	0.82-1.77

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DHEA-Sulfate

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
DHEA-Sulfate ⁰¹	27.3		ug/dL	20.4-186.6

Estradiol

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
▲ Estradiol ⁰¹	67.2 High		pg/mL	0.0-54.7
		Adult Female	Range	
		Follicular phase	12.5 - 166.0	
		Ovulation phase	85.8 - 498.0	
		Luteal phase	43.8 - 211.0	
		Postmenopausal	<6.0 - 54.7	
		Pregnancy		
		1st trimester	215.0 - >4300.0	
Roche ECLIA methodology				

Testosterone, Total, LC/MS

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
▲ Testosterone, Total, LC/MS ^{A, 01}	133.4 High		ng/dL	7.0-40.0

Reverse T3, Serum

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
▲ Reverse T3, Serum ^{A, 01}	25.7 High		ng/dL	9.2-24.1

Vitamin D, 25-Hydroxy

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Vitamin D, 25-Hydroxy ⁰¹	50.7	48.3 03/20/2025	ng/mL	30.0-100.0
Vitamin D deficiency has been defined by the Institute of Medicine and an Endocrine Society practice guideline as a level of serum 25-OH vitamin D less than 20 ng/mL (1,2). The Endocrine Society went on to further define vitamin D insufficiency as a level between 21 and 29 ng/mL (2). 1. IOM (Institute of Medicine). 2010. Dietary reference intakes for calcium and D. Washington DC: The National Academies Press. 2. Holick MF, Binkley NC, Bischoff-Ferrari HA, et al. Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. JCEM. 2011 Jul; 96(7):1911-30.				

C-Reactive Protein, Cardiac

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
▲ C-Reactive Protein, Cardiac ⁰¹	4.27 High		mg/L	0.00-3.00

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Homocyst(e)ine

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Homocyst(e)ine ⁰¹	13.5		umol/L	0.0-17.2

Uric Acid

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Uric Acid ⁰¹	6.2		mg/dL	3.0-7.2
Therapeutic target for gout patients: <6.0				

Phosphorus

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Phosphorus ⁰¹	3.5		mg/dL	3.0-4.3

LDH

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
LDH ⁰¹	167		IU/L	119-226

GGT

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
GGT ⁰¹	26		IU/L	0-60

Thyroid Antibodies

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Thyroid Peroxidase (TPO) Ab ⁰¹	<9	26 10/07/2024	IU/mL	0-34
Thyroglobulin Antibody ⁰¹	<1.0	5.7 10/07/2024	IU/mL	0.0-0.9

Thyroglobulin Antibody measured by Beckman Coulter Methodology
It should be noted that the presence of thyroglobulin antibodies may not be pathogenic nor diagnostic, especially at very low levels. The assay manufacturer has found that four percent of individuals without evidence of thyroid disease or autoimmunity will have positive TgAb levels up to 4 IU/mL.

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Magnesium

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Magnesium ⁰¹	2.1		mg/dL	1.6-2.3

Fibrinogen Activity

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Fibrinogen Activity ⁰¹	315		mg/dL	193-507

Progesterone

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Progesterone ⁰¹	0.1		ng/mL	
		Follicular phase	0.1 - 0.9	
		Luteal phase	1.8 - 23.9	
		Ovulation phase	0.1 - 12.0	

Insulin

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Insulin ⁰¹	14.3		uIU/mL	2.6-24.9

Ferritin

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Ferritin ⁰¹	64	93 03/20/2025	ng/mL	15-150

Reticulocyte Count

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Reticulocyte Count ⁰¹	1.7		%	0.6-2.6

Triiodothyronine (T3), Free

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Triiodothyronine (T3), Free ⁰¹	2.6		pg/mL	2.0-4.4

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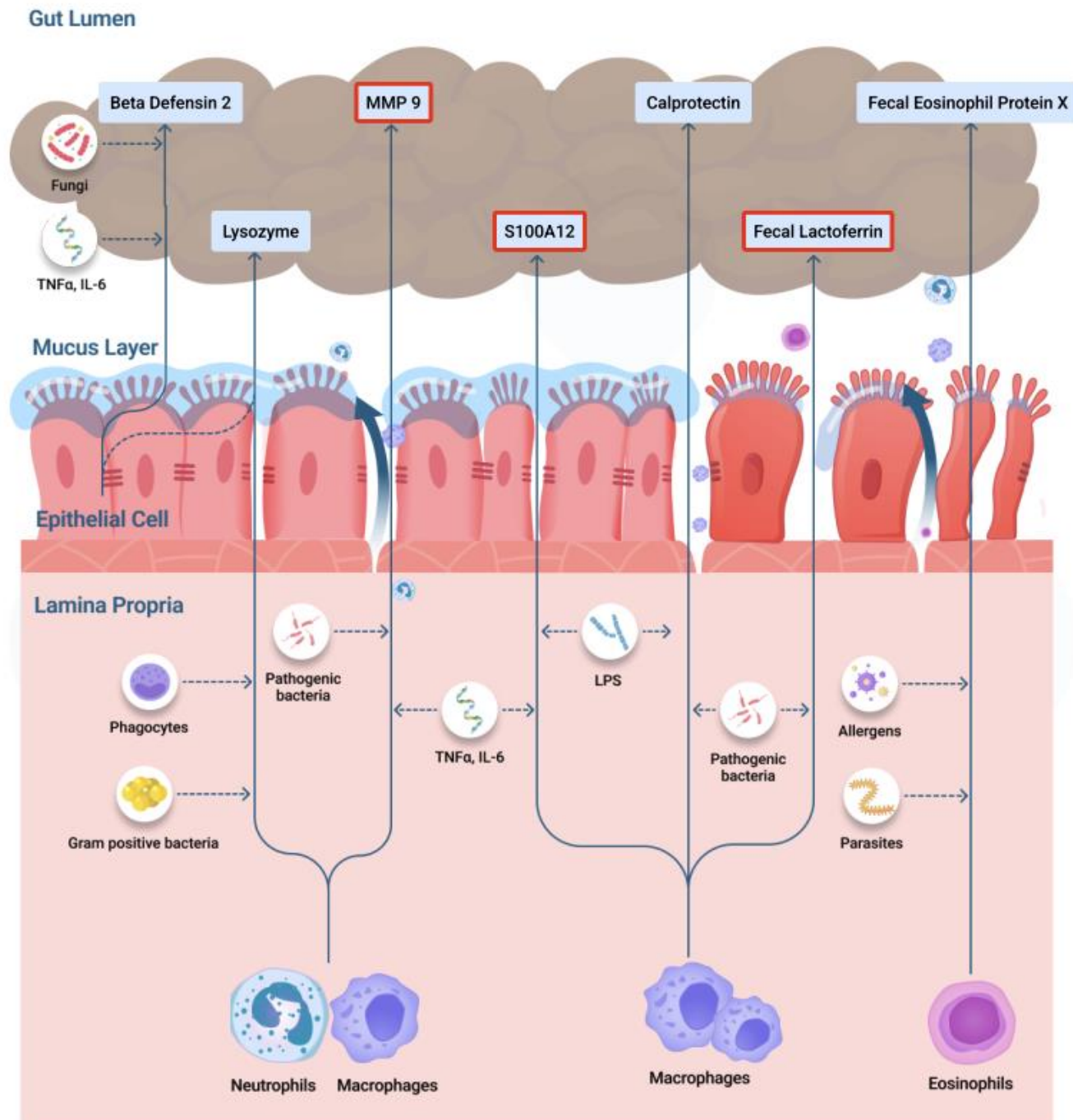
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DIGESTION AND IMMUNE BALANCE

Test Name	Current	Ref Range	Prev	Comments
Pancreatic Elastase 1	213.0H	≥200.0		
Fecal Immunochemical Test (FIT)	0.2	≤10.0		
Fecal Zonulin	319.1 H	25.1-160.8		Zonulin, a regulatory protein involved in intestinal permeability, is a marker for "leaky gut." It is produced by intestinal epithelial cells and hepatocytes in response to gut microorganisms, gluten, and other environmental triggers, regulating the integrity of tight junctions in the gut lining. Elevated fecal zonulin levels are associated with metabolic syndrome, obesity, Crohn's disease, and increased gut permeability. High levels indicate disrupted tight junctions, resulting in symptoms such as bloating, diarrhea, food sensitivities, and fatigue. Zonulin is a key marker of gut dysbiosis and systemic metabolic disorders.
pH	6.9	6.1-7.8		
sIgA	736.4	426.0-1450.0		

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MALABSORPTION

DIETARY FIBER	Current	Ref Range	Prev	Comments
Meat Fiber	NOT DETECTED	-		
Vegetable Fiber	DETECTED	-		Vegetable fibers in stool may indicate improper digestion, inadequate chewing, or digestive enzyme insufficiency, all of which can compromise nutrient absorption. Consuming vegetable fiber benefits gut health by promoting regular bowel movements and supporting healthy microbiota. However, undigested fibers can result in symptoms like bloating, abdominal discomfort, or irregular stools. Encouraging thorough chewing and mindful eating helps optimize digestion, thereby improving nutrient uptake and reducing the risk of weight gain, obesity, and related metabolic disorders.
FAT MALABSORPTION	Current	Ref Range	Prev	Comments
Total Fecal Fat	12.8	2.9-37.5		
Total Fecal Triglycerides	1.6	0.3-2.5		
Long Chain Fatty Acids	4.3	0.9-28.1		
Total Cholesterol	0.5	0.5-5.3		
Total Phospholipids	1.8	0.3-6.4		

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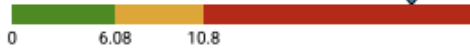
Gut

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Joint pain

High (>95th percentile)					
TEST NAME	CURRENT RESULT	PREVIOUS RESULT	CURRENT RESULT	PREVIOUS RESULT	REFERENCE
 Aflatoxin G1	8.41				≤6.53 ng/g
 Aflatoxin G2	21.11				≤10.8 ng/g
 Fumonisin B3	28.64				≤10.8 ng/g
 Gliotoxin	237.49				≤207.87 ng/g
 Barium*	6.59				≤5.59 ug/g
 Cesium*	10.64				≤10.3 ug/g
 Bisphenol A (BPA)*	7.77				≤5.09 ug/g

* Indicates NHANES population data reference ranges.

Moderate (75th-95th percentile)					
TEST NAME	CURRENT RESULT	PREVIOUS RESULT	CURRENT RESULT	PREVIOUS RESULT	REFERENCE
 Diacetoxyscirpenol (DAS)	3.74				≤4.27 ng/g
 Fumonisin B1	4.54				≤6.13 ng/g
 Patulin	10.25				≤11.6 ng/g
 Thallium*	0.27				≤0.43 ug/g
 2-Hydroxyethyl Mercapturic Acid (HEMA)*	3.44				≤4.75 ug/g

* Indicates NHANES population data reference ranges.

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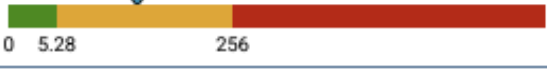
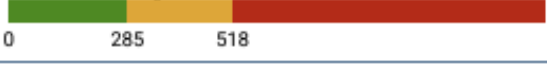
Gut

Hair

Skin

Nails

Joint pain

Moderate (75th-95th percentile)					
Environmental Toxins					
TEST NAME	CURRENT RESULT	PREVIOUS RESULT	CURRENT RESULT	PREVIOUS RESULT	REFERENCE
 Butylparaben*	0.95				≤4.39 ug/g
 Diethyl phosphate (DEP)*	4.41				≤15.7 ug/g
 Dimethyldithiophosphate (DMDTP)*	1.11				≤6.12 ug/g
 Mono-2-ethylhexyl phthalate (MEHP)*	2.96				≤8.47 ug/g
 N-Acetyl (2-Cyanoethyl) Cysteine (NACE)*	116.43				≤256 ug/g
 N-Acetyl (2-Hydroxypropyl) Cysteine (NAHP)*	237.64				≤403 ug/g
 N-Acetyl (Propyl) Cysteine (NAPR)*	19.86				≤46.1 ug/g
 Phenyl glyoxylic Acid (PGO)*	313.43				≤518 ug/g
 Tiglylglycine (TG)	0.15				≤3.24 ug/g
 Triclosan (TCS)*	98.57				≤358 ug/g

* Indicates NHANES population data reference ranges.

A1C Chart Based on ADAG Formula

A1C-Derived Average Glucose (ADAG) Study;
eAG in mg/dl = (28.7* hba1c)-46.7 or
eAG in mmol/l = (1.59 x HbA1c)-2.59

Very Optimal

Pre Diabetes

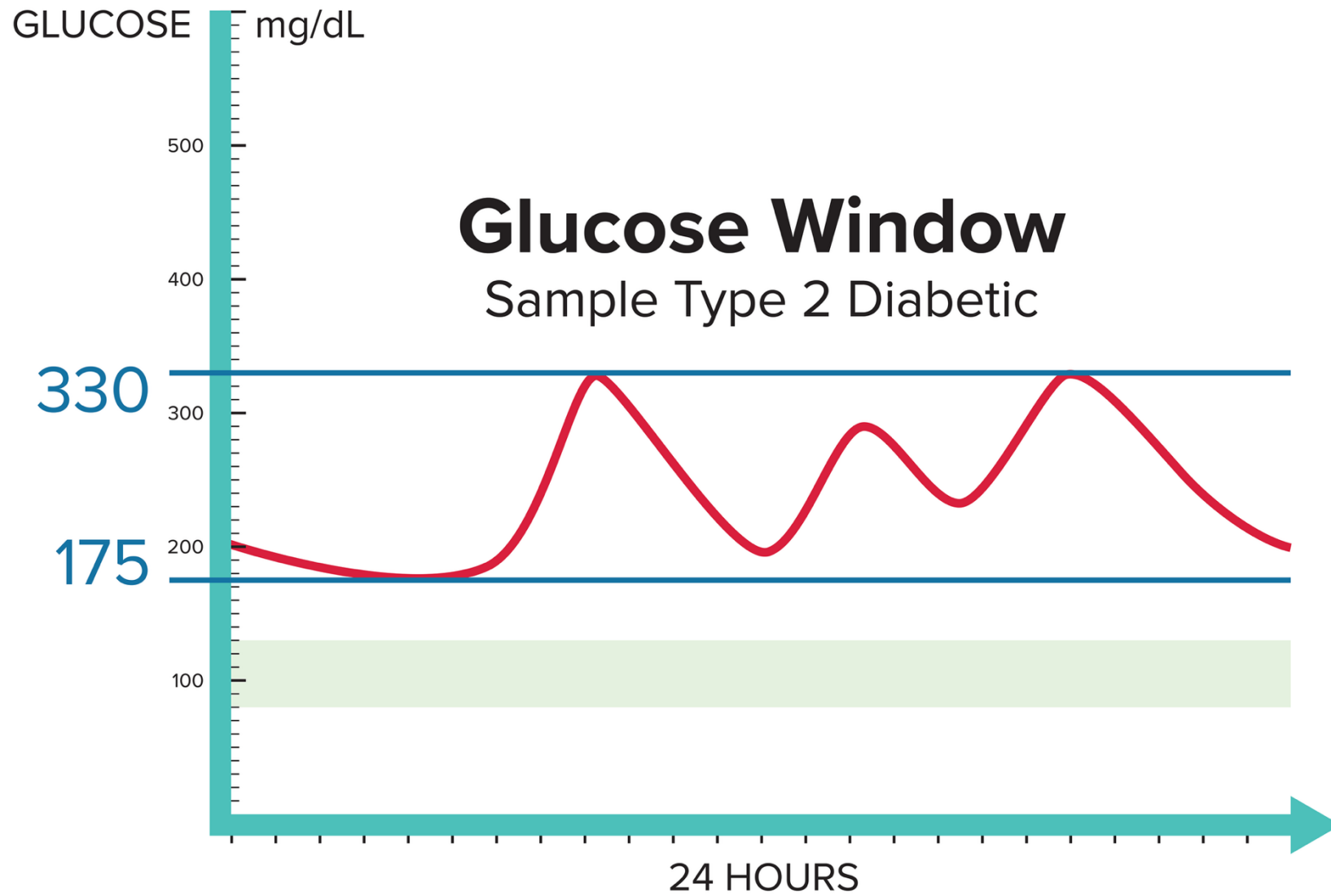
Optimal

Diabetes

Normal

Dangerous

A1C	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1
mg/dl	68	71	74	77	80	82	85	88	91	94	97	100
mmol/l	3.8	3.9	4.1	4.3	4.4	4.6	4.7	4.9	5.1	5.2	5.4	5.6
A1C	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2	6.3
mg/dl	103	105	108	111	114	117	120	123	125	128	131	134
mmol/l	5.7	5.8	6.0	6.2	6.3	6.5	6.7	6.8	6.9	7.1	7.3	7.4
A1C	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5
mg/dl	137	140	143	146	148	151	154	157	160	163	166	169
mmol/l	7.6	7.8	7.9	8.1	8.2	8.4	8.5	8.7	8.9	9.0	9.2	9.4
A1C	7.6	7.7	7.8	7.9	8.0	8.5	9.0	9.5	10	11	12	13
mg/dl	171	174	177	180	183	197	212	226	240	269	298	326
mmol/l	9.5	9.7	9.8	10	10.2	10.9	11.8	12.5	13.3	14.9	16.5	18.1



Report

Enteric Barrier

Lorène J.

Naig Le G

Dejong ⁴

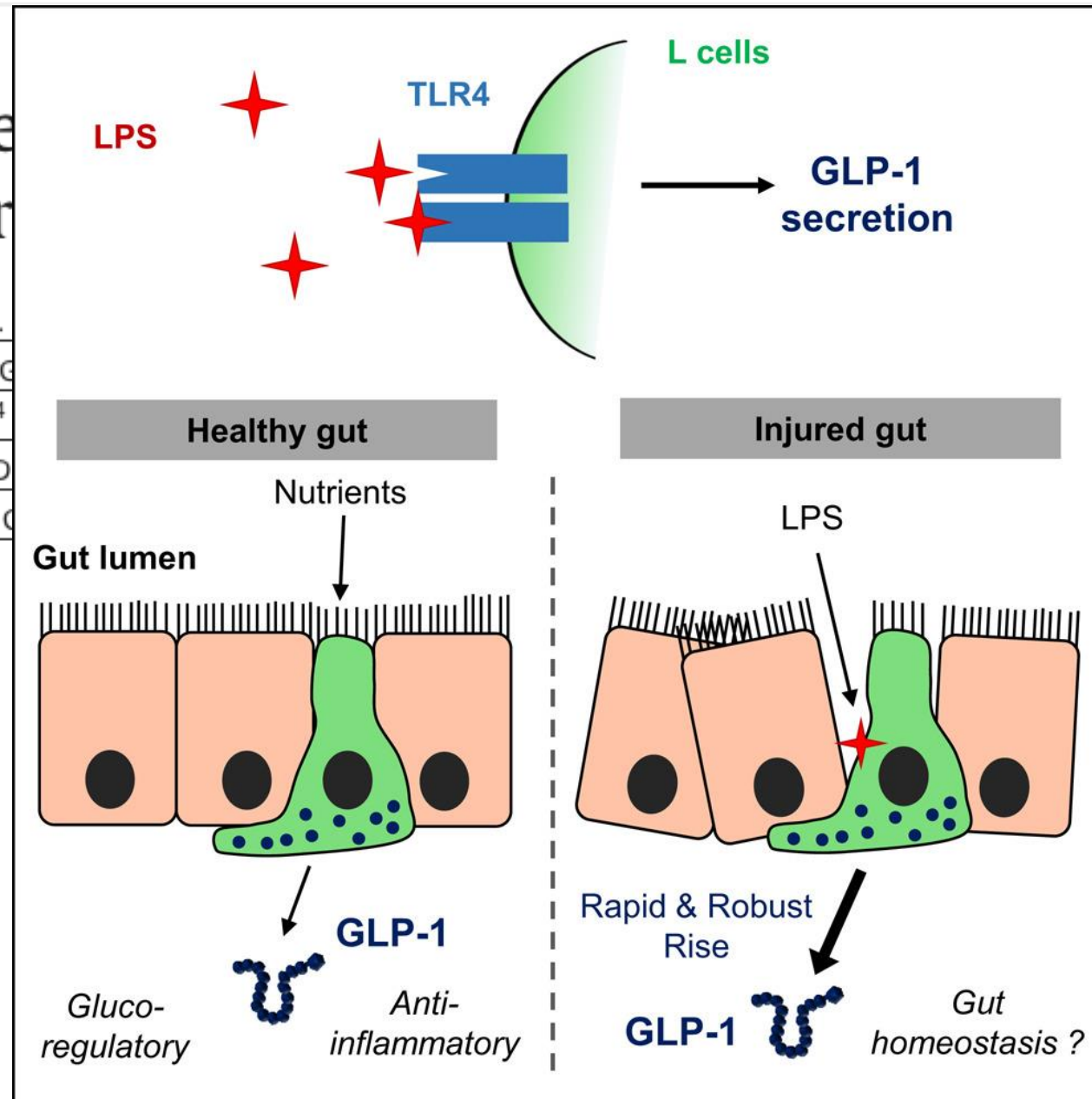
Valérie D

Jacques C

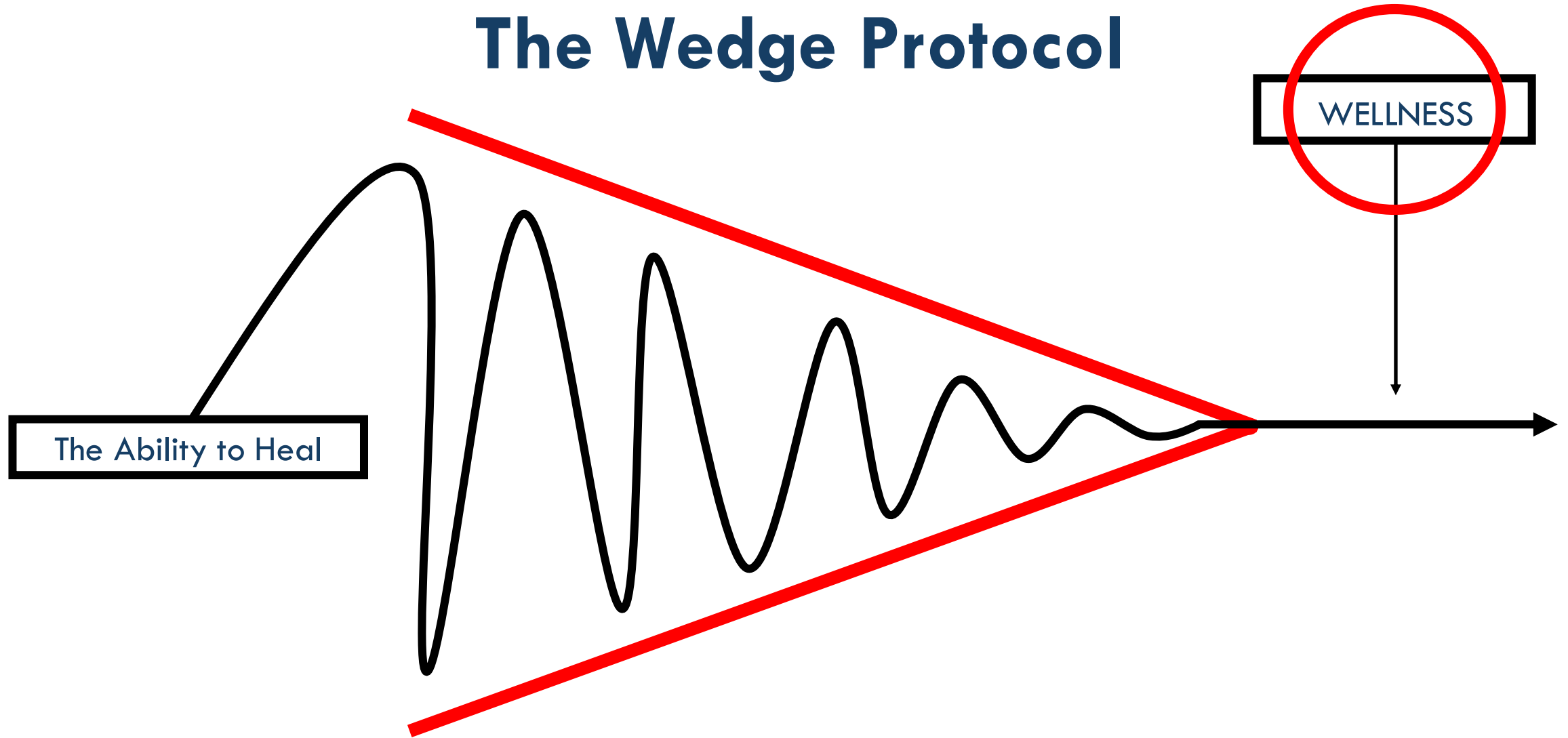
Gut n

H.C.

dard ^{1 2 3},



The Wedge Protocol



Case #1

66yo female

5'2" 152 lbs.

Dx:

RA

PreDM2

Hypothyroidism

MCTD/sarcoidosis

Rx:

No meds

Symptoms:

Lungs

Fatigue

Weight gain

Gut

Hair

Skin

Nails

Joint pain

Suggestions:

Phase 1 –

21-day MCP c/binder pro.

GI RESQ 1 dose per day.

Phase 2 –

GI RESQ Protocol 1x daily

Curcumin + 1 per meal

QuercenX 1 per meal

Glucostatic Balance 2 per meal

Berberine ALA 1 per meal

*Paleo style diet – P for Progress.

*Update blood labs at 60 days.

*Update stool at 4 months.

→ Air Dr., Carpets cleaned, New Pillows, clean water, etc.



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