Day 2: Analyze

SHINE CONFERENCE

with Dr. Ritamarie Loscalzo (MS, DC, CCN, DACBN)

SCIENTIFIC AND HOLISTIC INVESTIGATION OF NUTRITIONAL ENDOCRINOLOGY

Mission Possible

A New Paradigm of Health Care

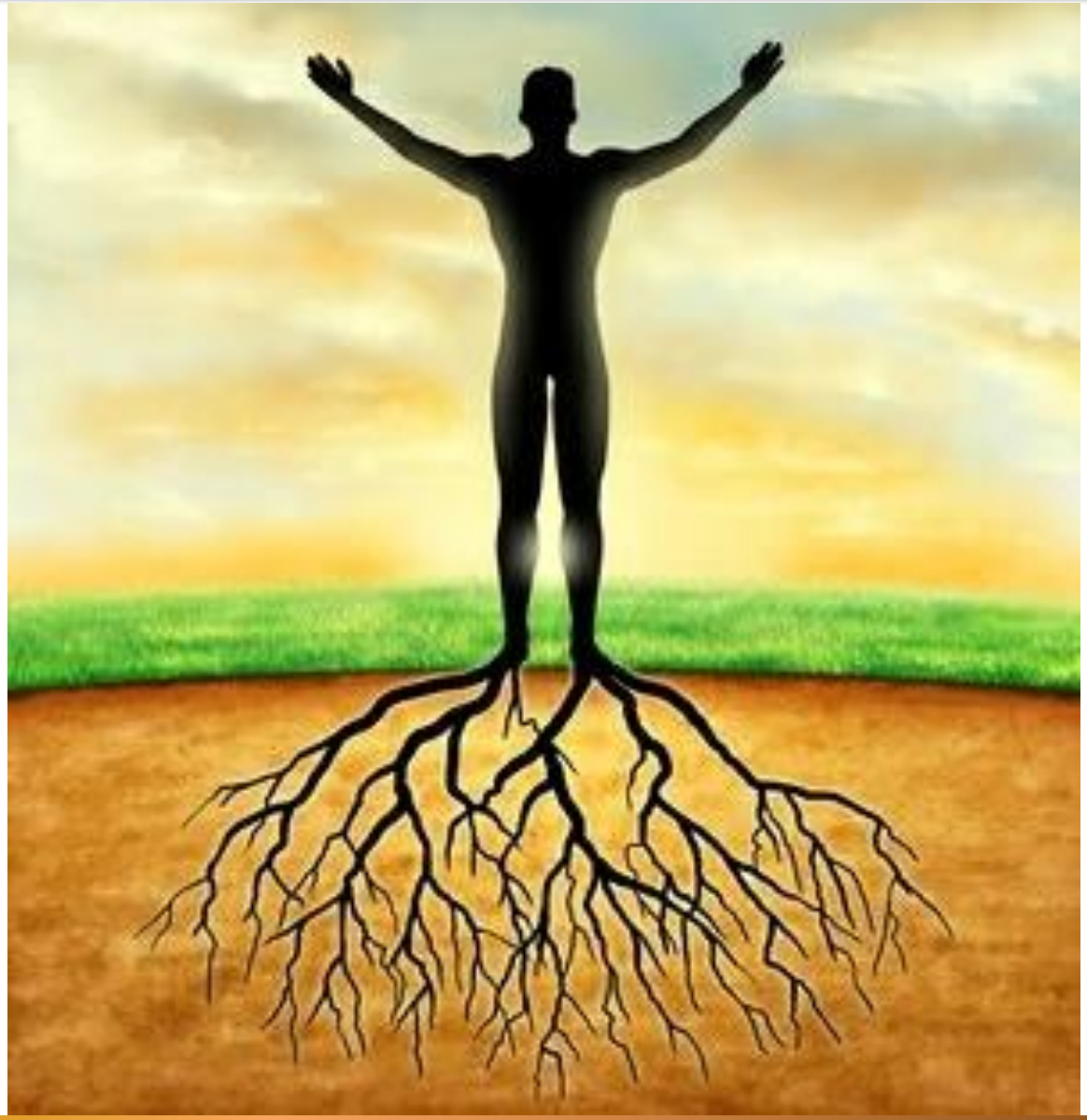
My Mission

Your Mission

Our Mission

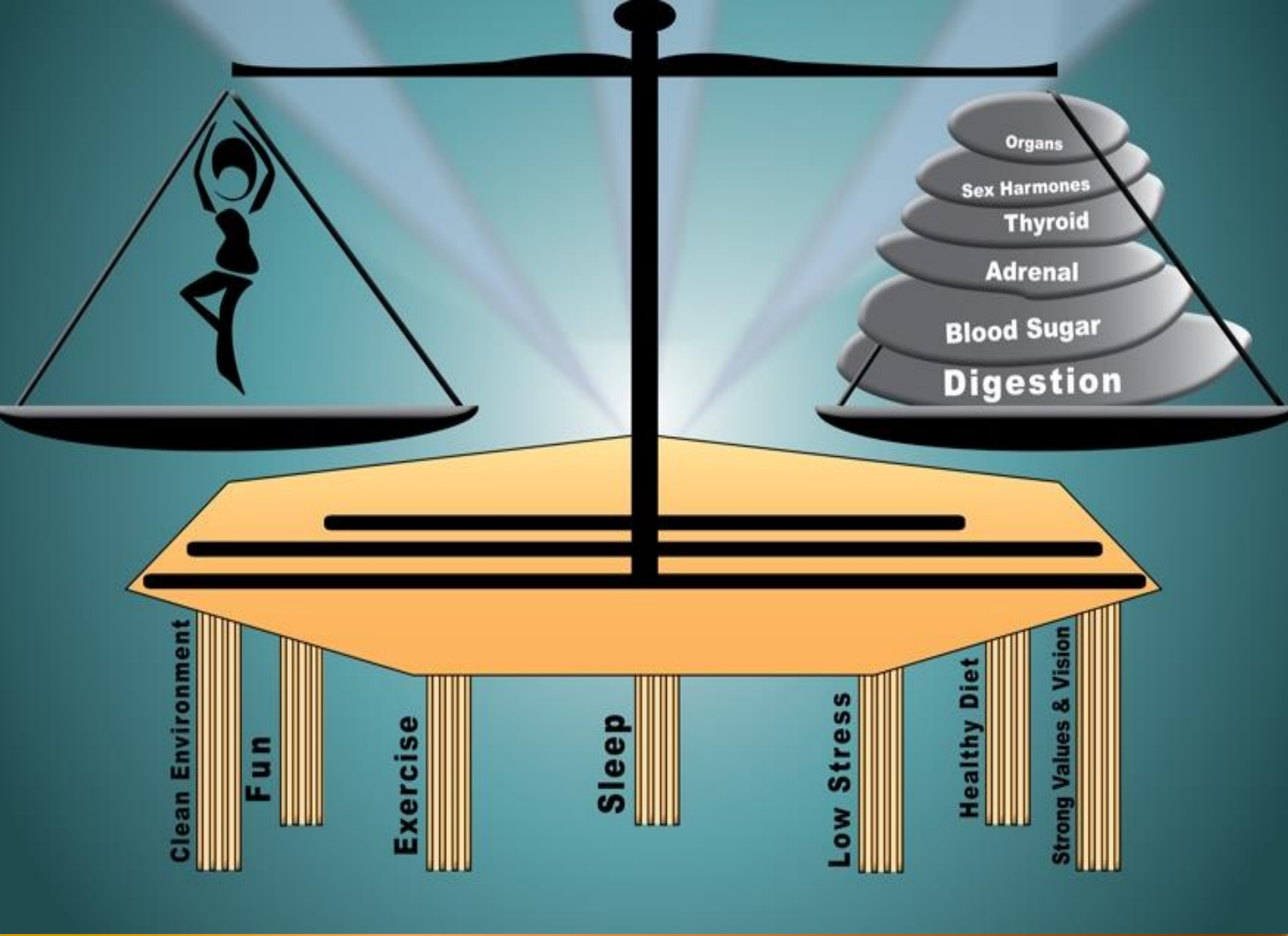
Disease Management

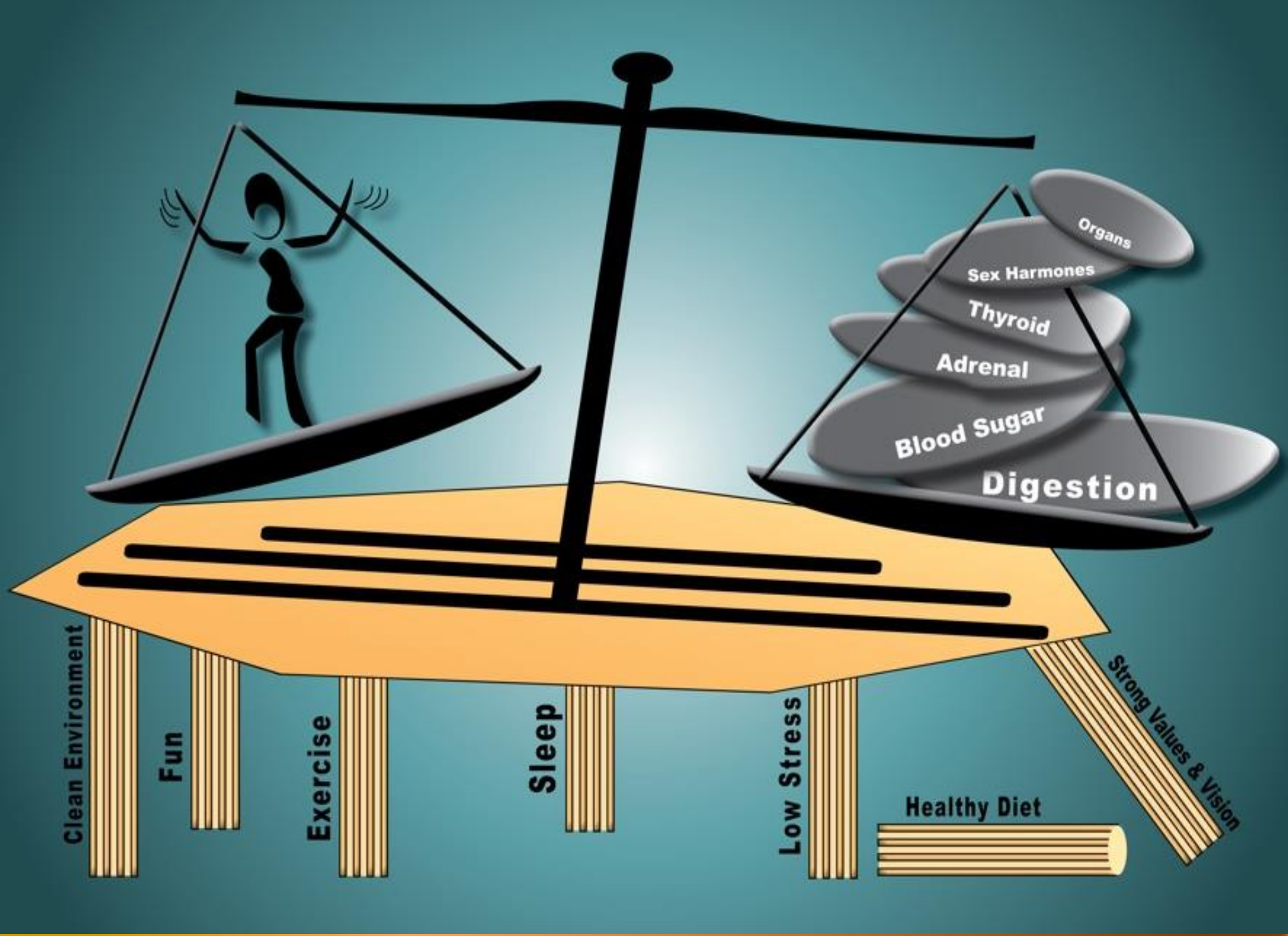
True Health Care

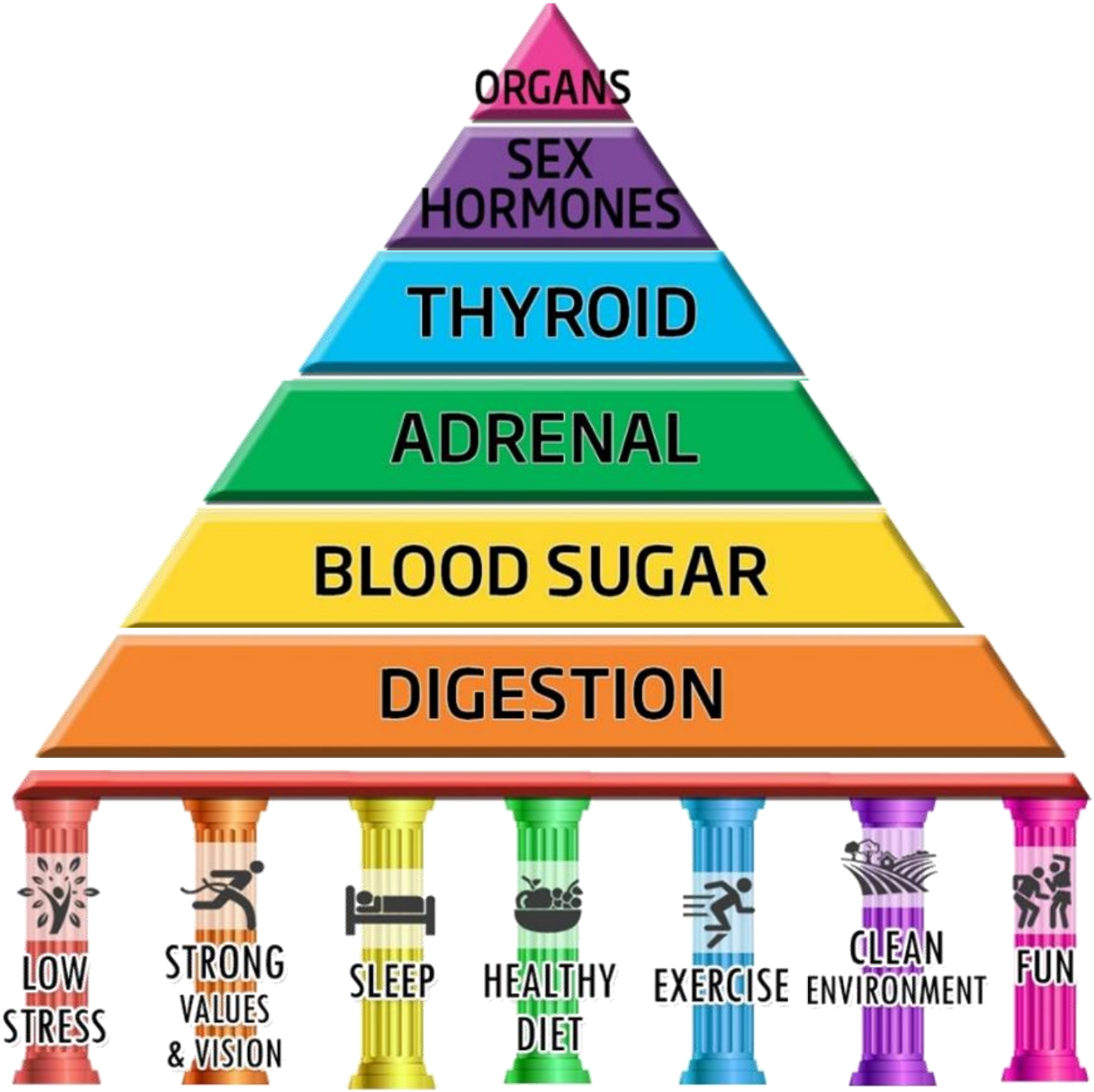


The Power of WHY?

Medical Disclaimer: The information in this presentation is not intended to replace a one-on-one relationship with a qualified health care professional and is not intended as medical advice. It is intended as a sharing of knowledge and information from the research and experience of Dr. Ritamarie Loscalzo, drritamarie.com, and the experts who have contributed. We encourage you to make your own health care decisions based upon your research and in partnership with a qualified health care professional. This presentation is provided for informational purposes only and no guarantees, promises, representations or warranties of any kind regarding specific or general benefits, have been or will be made by Dr. Ritamarie Loscalzo, her affiliates or their officers, principals, representatives, agents or employees. Dr. Ritamarie Loscalzo is not responsible for, and shall have no liability for any success or failure, acts and/or omissions, the appropriateness of the participant's decisions, or the use of or reliance on this information.







Functional Lab Testing

- ✓Salivary Cortisol Testing (Adrenals)
- ✓Steroid Hormone Panels - DUTCH and 24-hour urine
- ✓Comprehensive Digestive Analysis
- ✓Immune System Evaluation
- ✓Fatty Acids
- ✓Amino Acids/Neuro
- ✓Organic Acids
- ✓Heavy Metals
- ✓Methylation & Genetics

Adrenal Assessment

- ✓Symptoms (Surveys or Interview)
- ✓Physical Signs (Exam)
- ✓Routine Blood Testing (Indirect)
- ✓Direct Blood Testing of Adrenal Hormones
- ✓Saliva Testing
- ✓Part of 24-Hour Urine Comprehensive Steroid Panel or DUTCH

Routine Blood Screen: Adrenal Analysis

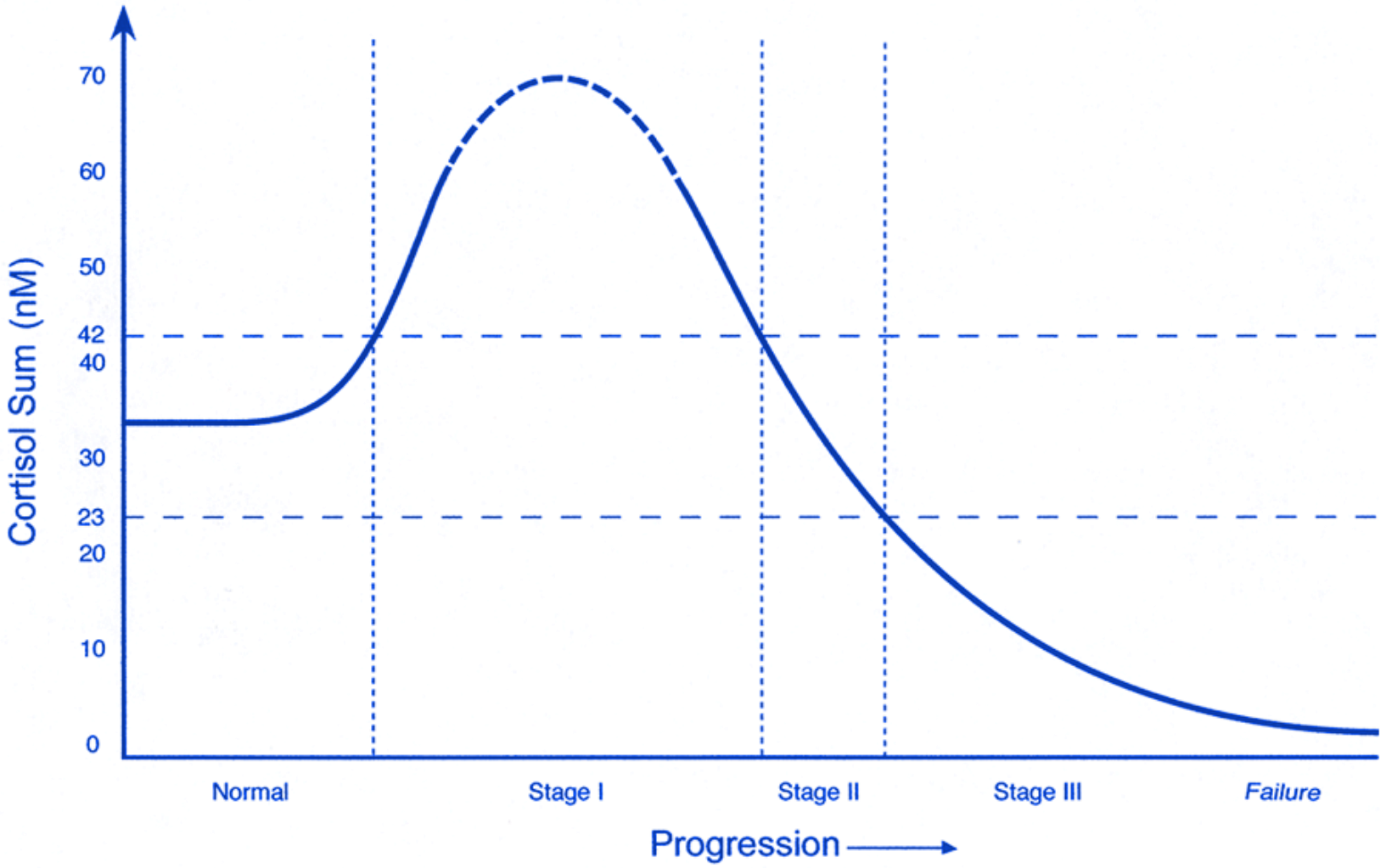
Low Adrenal

- ✓Potassium +
- ✓Sodium -
- ✓Glucose -

Hyperadrenal

- ✓Potassium -
- ✓Sodium +
- ✓Glucose +
- ✓Triglycerides +

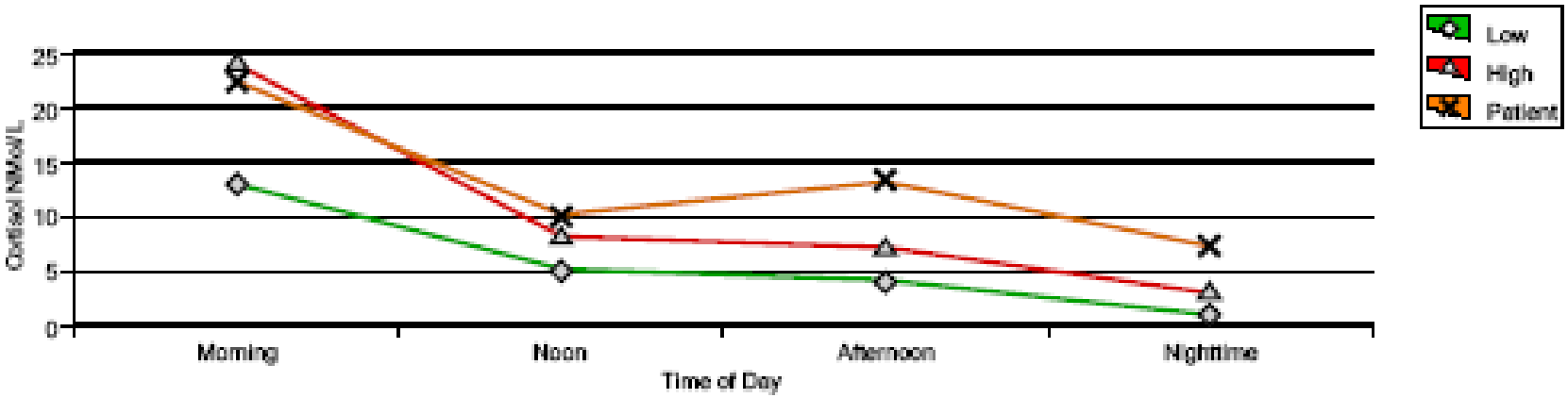
Progression of Stages in Adrenal Exhaustion – per BioHealth



BioHealth Example – Stage 1

Functional Adrenal Stress Profile - 201

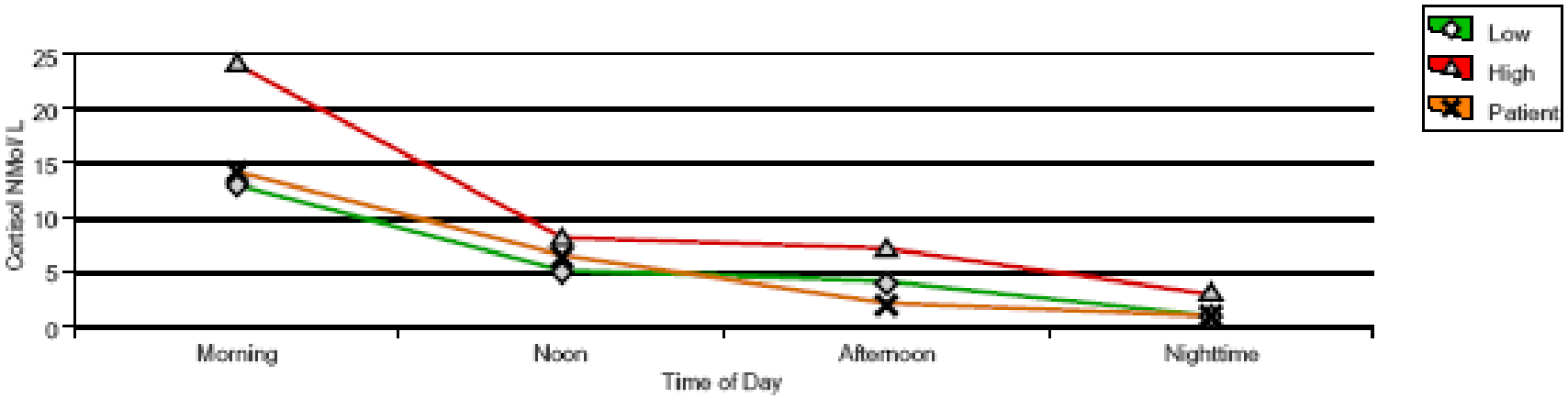
Parameter	Result	Reference Range	Units
Cortisol - Morning (6 - 8 AM)	22.4	13.0 - 24.0	nM/L
Cortisol - Noon (12 - 1 PM)	10.0*	5.0 - 8.0	nM/L
Cortisol - Afternoon (4 - 5 PM)	13.4*	4.0 - 7.0	nM/L
Cortisol - Nighttime (10 PM - 12 AM)	7.3*	1.0 - 3.0	nM/L
Cortisol Sum	53.1*	23.0 - 42.0	nM/L
DHEA-S Average	2.00	2.00 - 10.00	ng/mL
Cortisol/DHEA-S Ratio	26.6*	5.0 - 6.0	Ratio



BioHealth – Stage 2

Functional Adrenal Stress Profile - 201

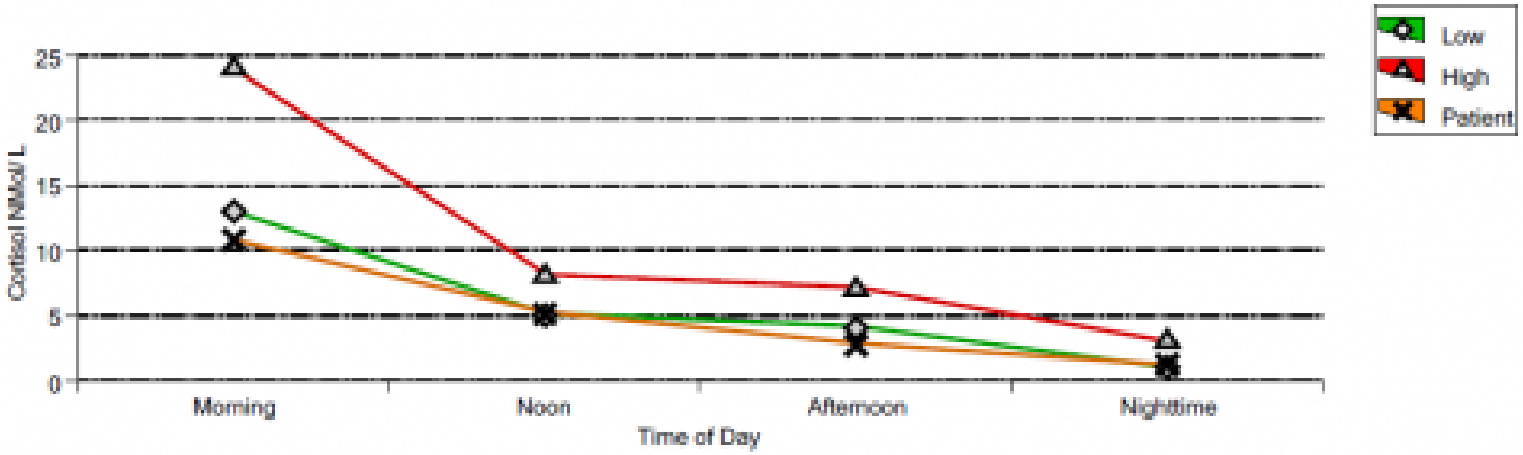
Parameter	Result	Reference Range	Units
Cortisol - Morning (6 - 8 AM)	14.2	13.0 - 24.0	nM/L
Cortisol - Noon (12 - 1 PM)	6.4	5.0 - 8.0	nM/L
Cortisol - Afternoon (4 - 5 PM)	2.0*	4.0 - 7.0	nM/L
Cortisol - Nighttime (10 PM - 12 AM)	1.0	1.0 - 3.0	nM/L
Cortisol Sum	23.6	23.0 - 42.0	nM/L
DHEA-S Average	2.60	2.00 - 10.00	ng/mL
Cortisol/DHEA-S Ratio	9.1*	5.0 - 6.0	Ratio



BioHealth – Stage 3

Functional Adrenal Stress Profile plus V - 205

Parameter	Result	Reference Range	Units
Cortisol - Morning (6 - 8 AM)	**10.8***	13.0 - 24.0	nM/L
Cortisol - Noon (12 - 1 PM)	5.1	5.0 - 8.0	nM/L
Cortisol - Afternoon (4 - 5 PM)	**2.7***	4.0 - 7.0	nM/L
Cortisol - Nighttime (10 PM - 12 AM)	1.2	1.0 - 3.0	nM/L
Cortisol Sum	**19.8***	23.0 - 42.0	nM/L
DHEA-S Average	2.22	2.00 - 10.00	ng/mL
Cortisol/DHEA-S Ratio	**8.9***	5.0 - 6.0	Ratio



dutch
Dried Urine Test for Comprehensive Hormones

Accession # 00212403
Female Sample Report
123 A Street
Sometown, CA 90266

PRECISION ANALYTICAL INC.
SIMPLY · BETTER · TESTING

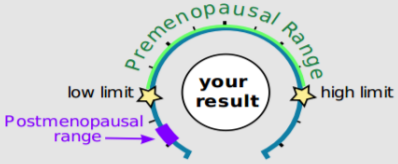
Ordering physician:
Precision Analytical

DOB:1976-01-01
Gender: Female

Collection Times:
2015-08-16 05:00PM
2015-08-16 10:00PM
2015-08-17 06:00AM
2015-08-17 08:00AM

Hormone Testing Summary

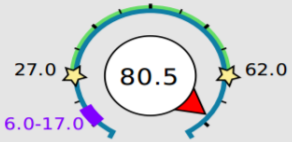
All units are given in ng/mg creatinine



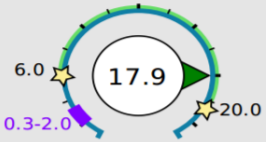
How to read the graphical representation of results

Sex Hormones

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



Total Estrogen
(Sum of 8 Estrogen Metabolites)



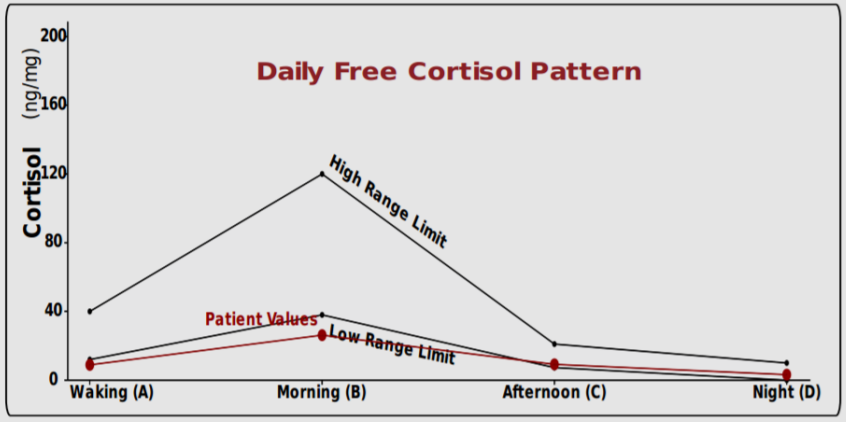
Progesterone
(Serum Equivalent, ng/mL)

Testosterone

Progesterone Serum Equivalent is a calculated value based on urine pregnanediol.
This value may not accurately reflect serum when progesterone is taken by mouth.

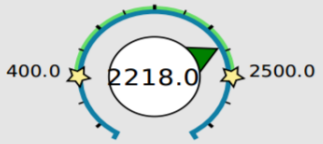
Adrenal Hormones

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

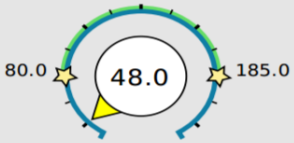


Total DHEA Production

Age	Range
20-40	800-2500
40-60	530-1550
>60	400-1350

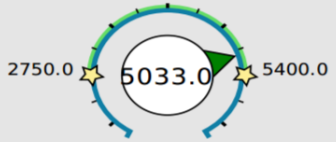


Total DHEA Production
(DHEAS + Etiocholanolone + Androsterone)



24hr Free Cortisol
(A+B+C+D)

cortisol metabolism



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

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

dutch

Dried Urine Test for Comprehensive Hormones

Advanced Adrenal Assessment

Accession # 00212403
Female Sample Report
123 A Street
Sometown, CA 90266

PRECISION ANALYTICAL INC.
SIMPLY · BETTER · TESTING

Ordering physician:
Precision Analytical

DOB:1976-01-01
Gender: Female

Collection Times:
2015-08-16 05:00PM
2015-08-16 10:00PM
2015-08-17 06:00AM
2015-08-17 08:00AM

Category	Test		Result	Units	Normal Range
Creatinine					
	Creatinine A (Waking)	Within range	0.96	mg/ml	0.3 - 3
	Creatinine B (Morning)	Within range	1.71	mg/ml	0.3 - 3
	Creatinine C (Afternoon)	Within range	0.55	mg/ml	0.3 - 3
	Creatinine D (Night)	Within range	0.99	mg/ml	0.3 - 3
Daily Free Cortisol and Cortisone					
	Cortisol A (Waking)	Below range	8.9	ng/mg	12 - 40
	Cortisol B (Morning)	Below range	26.2	ng/mg	38 - 120
	Cortisol C (Afternoon)	Low end of range	9.2	ng/mg	7.3 - 21
	Cortisol D (Night)	Within range	3.2	ng/mg	0 - 10
	Cortisone A (Waking)	Below range	34.0	ng/mg	40 - 100
	Cortisone B (Morning)	Low end of range	108.0	ng/mg	90 - 200
	Cortisone C (Afternoon)	Within range	46.0	ng/mg	32 - 80
	Cortisone D (Night)	Within range	30.0	ng/mg	0 - 42
	24hr Free Cortisol	Below range	48.0	ug	80 - 185
	24hr Free Cortisone	Below range	218.0	ug	220 - 400
Cortisol Metabolites and DHEAS					
	a-Tetrahydrocortisol (a-THF)	Above range	600.0	ng/mg	75 - 265
	b-Tetrahydrocortisol (b-THF)	Within range	1310.0	ng/mg	1050 - 2070
	b-Tetrahydrocortisone (b-THE)	High end of range	3123.0	ng/mg	1550 - 3150
	Metabolized Cortisol (THF+THE)	High end of range	5033.0	ng/mg	2750 - 5400
	DHEAS	Above range	428.0	ng/mg	23 - 350
Melatonin (*measured as 6-OH-Melatonin-Sulfate)					
	Melatonin* (Waking)	Below range	7.4	ng/mg	10 - 50

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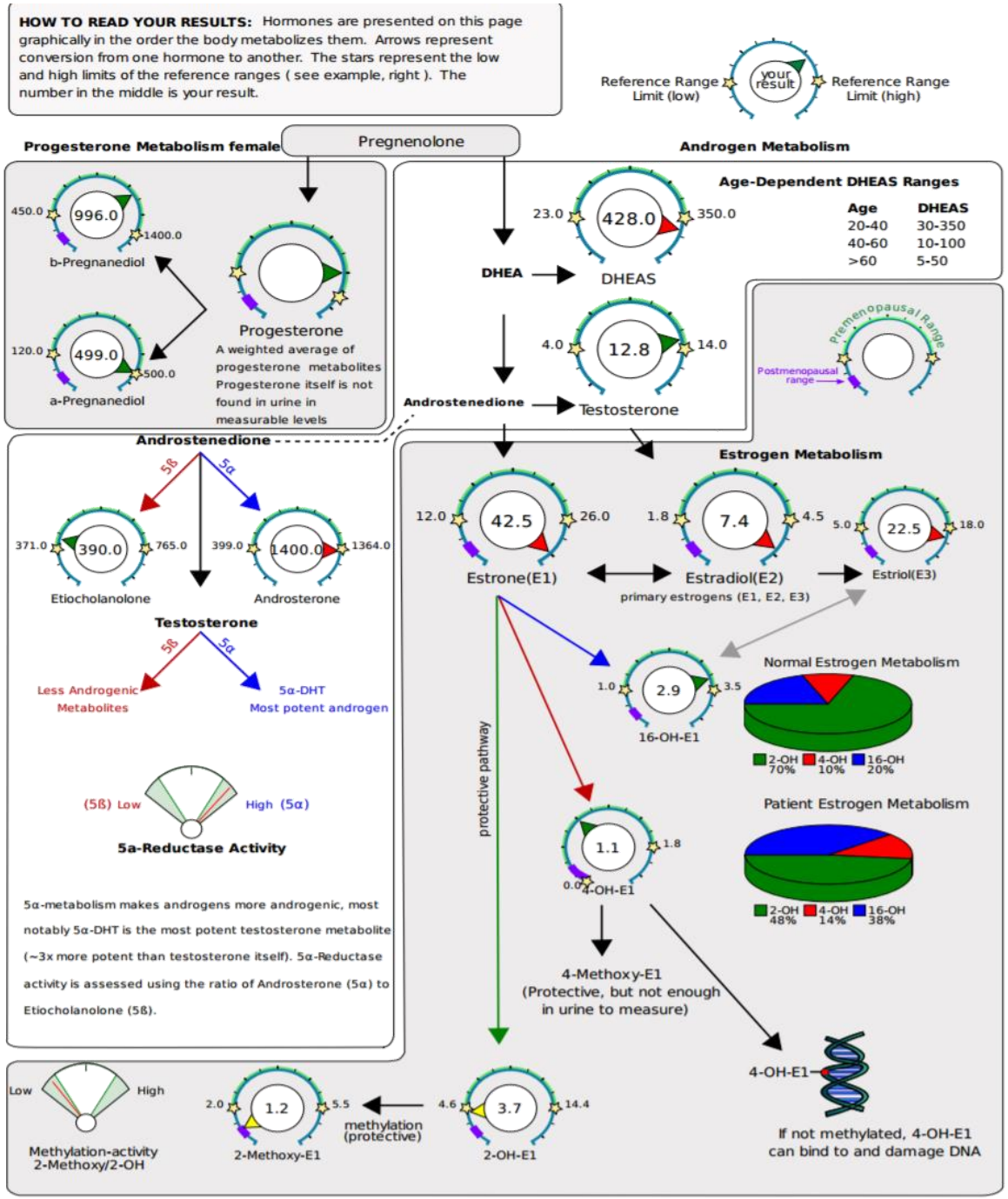
Dried Urine Test for Comprehensive Hormones



dutch
Dried Urine Test for Comprehensive Hormones

Sex Hormones and Metabolites

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Sometown, CA 90266

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Ordering physician:
Precision Analytical

DOB:1976-01-01
Gender: Female

Collection Times:
2015-08-16 05:00PM
2015-08-16 10:00PM
2015-08-17 06:00AM
2015-08-17 08:00AM

Category	Test		Result	Units	Normal Range
Progesterone Metabolism					Premenopausal, luteal range shown.* See below for other ranges. (*unless taking oral Pg)
	b-Pregnanediol	Within range	996.0	ng/mg	450 - 1400
	a-Pregnanediol	High end of range	499.0	ng/mg	120 - 500
Androgen Metabolism					
	DHEAS	Above range	428.0	ng/mg	23 - 350
	Androsterone	Above range	1400.0	ng/mg	399 - 1364
	Etiocholanolone	Low end of range	390.0	ng/mg	371 - 765
	Testosterone	High end of range	12.8	ng/mg	4 - 14
	5a-DHT	Within range	2.1	ng/mg	0 - 8.8
	5a-Androstanediol	Within range	39.6	ng/mg	22 - 66
	5b-Androstanediol	Within range	12.1	ng/mg	6 - 32
	Epi-Testosterone	Within range	14.1	ng/mg	4.5 - 22.3
Estrogen Metabolites					
	Estrone(E1)	Above range	42.5	ng/mg	12 - 26
	Estradiol(E2)	Above range	7.4	ng/mg	1.8 - 4.5
	Estriol(E3)	Above range	22.5	ng/mg	5 - 18
	2-OH-E1	Below range	3.7	ng/mg	4.6 - 14.4
	4-OH-E1	Within range	1.1	ng/mg	0 - 1.8
	16-OH-E1	Within range	2.9	ng/mg	1 - 3.5
	2-Methoxy-E1	Below range	1.2	ng/mg	2 - 5.5
	2-OH-E2	Within range	0.57	ng/mg	0 - 1.2

Normal Ranges	Luteal	Postmenopausal		Follicular	Ovulatory
Estrone (E1)	12-26	3.0-7.0		4.0-12.0	22-68
Estradiol (E2)	1.8-4.5	0.3-0.9		1.0-2.0	4.0-12.0
Estriol (E3)	5-18	1.5-4.0		N/A	N/A
2-OH-E1	4.6-14.4	0.4-2.0		N/A	N/A
4-OH-E1	0-1.8	0-0.3		N/A	N/A
16-OH-E1	1-3.5	0.2-0.6		N/A	N/A
2-Methoxy-E1	2-5.5	0.5-1.4		N/A	N/A
			Oral Pg (100mg)		
a-Pregnanediol	120-500	10.0-50	450-2000	25-100	25-100
b-Pregnanediol	450-1400	50-150	1500-6000	100-300	100-300

Primary hormones (in CAPS) are made by organs by taking up cholesterol ★ and converting it locally to, for example, progesterone. Much less is made from circulating precursors like pregnenolone. For example, taking DHEA can create testosterone and estrogen, but far less than is made by the testes or ovaries, respectively.

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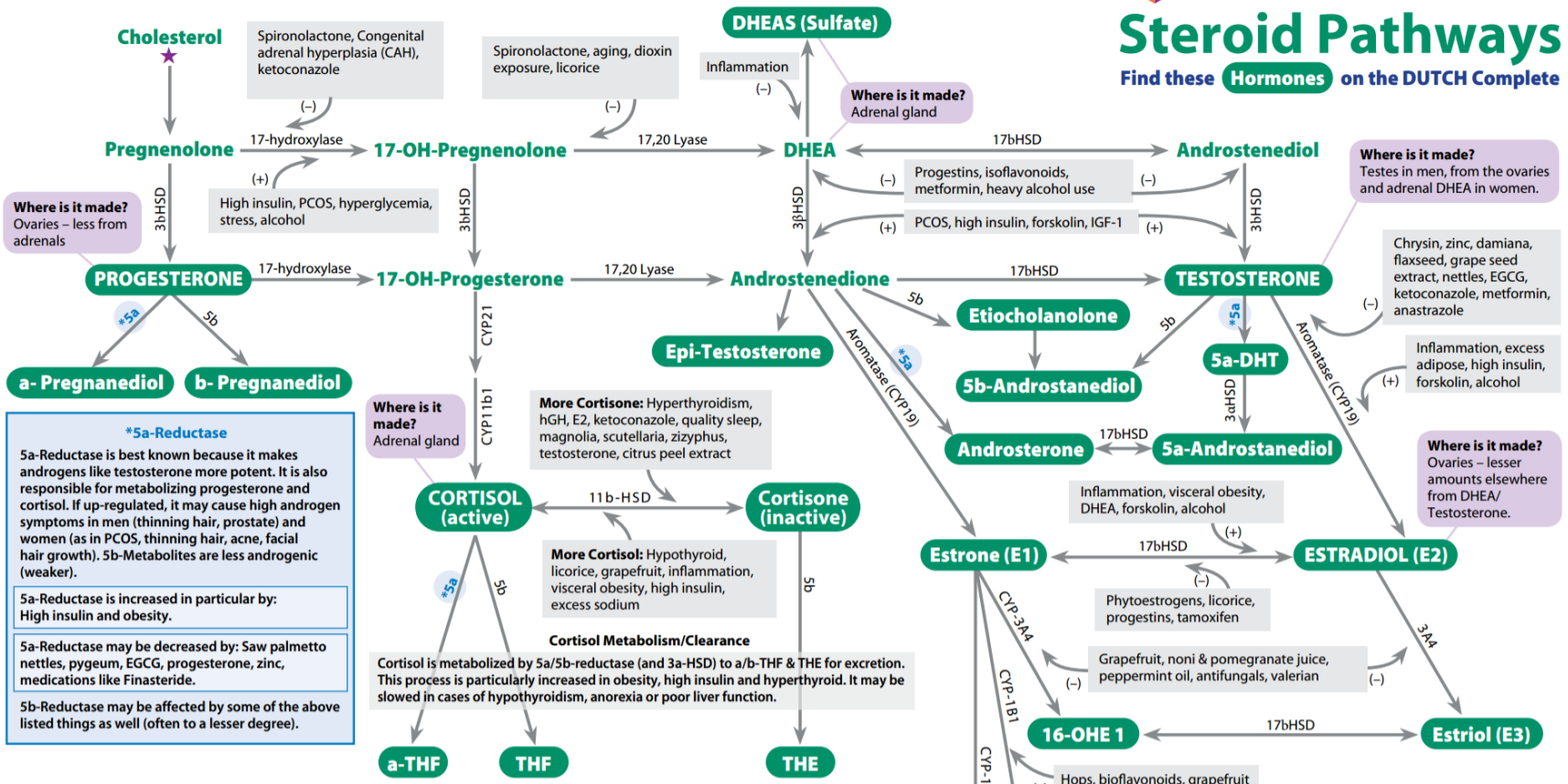
Steroid Pathways

Find these **Hormones** on the DUTCH Complete



*5a-Reductase

5a-Reductase is best known because it makes androgens like testosterone more potent. It is also responsible for metabolizing progesterone and cortisol. If up-regulated, it may cause high androgen symptoms in men (thinning hair, prostate) and women (as in PCOS, thinning hair, acne, facial hair growth). 5b-Metabolites are less androgenic (weaker).

5a-Reductase is increased in particular by: High insulin and obesity.

5a-Reductase may be decreased by: Saw palmetto nettles, pygeum, EGCG, progesterone, zinc, medications like Finasteride.

5b-Reductase may be affected by some of the above listed things as well (often to a lesser degree).

Other factors affecting the production of primary reproductive and adrenal hormones:

- Increased Cortisol: stress, inflammation, Cushing's Disease, obesity
- Decreased Cortisol: glucocorticoid use, opioid use, Addison's Disease, Accutane, chronic marijuana use
- Increased DHEA: PCOS, acute stress, Bupropion (Wellbutrin), Alprazolam (Xanax), ADD meds
- Decreased DHEA: aging, rapid weight loss, Venlafaxine/Mirtazapine, opioids, glucocorticoids, hormonal birth control, antipsychotic meds, estrogens, diabetes meds
- Increased Testosterone: PCOS, HCG, HGH, L-Dopa, Climiphene Citrate (Clomid)
- Decreased Testosterone: obesity, opioids, hormonal birth control, acute illness, aging, high insulin, steroid use
- Increased Estrogens: PCOS, inflammation, pregnancy, DHEA/testosterone supplementation
- Decreased Estrogens: hormonal birth control, ovarian failure (menopause), opioids, anorexia, underweight
- Increased Progesterone: pregnancy, pregnenolone supplementation (increases urine progesterone metabolites, not actual circulating progesterone), Vitex (chaste tree berry)
- Decreased Progesterone: hormonal birth control, stress, high insulin, opioids, NSAID use >10 days, anovulation, luteal phase defect, high prolactin, underweight, hypothyroid, hormonal IUD (Mirena)

Information on this chart is for educational purposes only and is not a suggestion for supplementation with any of the listed items. References available upon request.

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3138 NE Rivergate Street, Suite #301C, McMinnville, OR 97128
Phone:(503)687-2050

24-Hour Urine Steroid Panel

Meridian Valley LAB

http://www.drritamarie.com/go/MeridianValleyUrineHormoneGuide

	Amount Excreted in 24hrs			Adult Reference Range
CREATININE	0.8 gm/24hr			0.5-2.0 gm/24hr
TOTAL VOLUME	1800 mL			

STEROID	Amount Excreted in µg/24hr		Phase	Day	Female µg/24hr
ESTRONE	22.4		Luteal	17-26	3.3 - 44.6 *
			Follicular	27-11	2.0 - 39
			Mid-Cycle	12-16	11.0 - 46
			Post Menopausal		1.0 - 7.0
ESTRADIOL	4.5		Luteal	17-26	1.4 - 12.2 *
			Follicular	27-11	1.0 - 23
			Mid-Cycle	12-16	4.0 - 45
			Post Menopausal		0 - 4
ESTRIOL	7.4		Luteal	17-26	6.1 - 32.4 *
			Follicular	27-11	3.0 - 48
			Mid-Cycle	12-16	20 - 130
			Post Menopausal		0 - 30
Total Estrogens	34.3		Luteal	17-26	10.8 - 89.2 *
			Follicular	27-11	7.0 - 110
			Mid-Cycle	12-16	38 - 221
			Post Menopausal		0 - 41
Estrogen Quotient	0.3		Estriol / (estrone + estradiol)		>1.0
2-OH ESTRONE	< 0.25	LOW	Luteal	17-26	3.8 - 38.1 *
			Post Menopausal		0.2 - 5.4 *
16α-OH ESTRONE	Below Detection Limit		Luteal	17-26	2.1 - 7.9 *
			Post Menopausal		0.15 - 3.5 *
2 / 16α Ratio	Not Calculated		Luteal	17-26	1.8 - 5.5 *
			Post Menopausal		0.6 - 5.0 *
4-OH ESTRONE	< 0.25	LOW	Luteal	17-26	0.8 - 5.9
			Post Menopausal		0.05 - 1.1
2-METHOXYESTRONE	< 0.25	LOW	Luteal	17-26	2.2 - 14.4 *
			Post Menopausal		0.3 - 4.1
2-METHOXYESTRADIOL	< 0.1		Luteal	17-26	0.1 - 2.2 *
			Post Menopausal		0.03 - 0.54

Meridian Valley LAB

http://www.drritamarie.com/go/MVLComprehensiveULTIMATE

Comprehensive ULTIMATE Hormone Profile

Patient Name: Jane Doe HOLD
Accession #: 1500 *Test ID* 419973 *Test Code:* 4100

STEROID	Amount Excreted in µg/24hr		Adult Reference Range Female µg/24hr
PREGNANEDIOL (progesterone metabolite)	590	Luteal Follicular Post Menopausal	1450 - 6140 * 0 - 2500 200 - 1000
DHEA	185		100 - 2000
TESTOSTERONE	7.4		5.0 - 35.0
5α-ANDROSTANEDIOL	90.0	HIGH	3.0 - 35.0
5β-ANDROSTANEDIOL	135.0		13.0 - 180.0
ANDROSTERONE	1547		500 - 3200
ETIOCHOLANOLONE	1491		500 - 5000
PREGNANETRIOL	564		100 -1500
CORTISONE (E)	92		31-209
CORTISOL (F)	50		30-170
TETRAHYDROCORTISONE (THE)	1733		1700-4200
ALLO-TETRAHYDROCORTISOL (5α-THF)	515		400-2100
TETRAHYDROCORTISOL (THF)	696	LOW	900-2600
11β-HYDROXYANDROSTERONE	315	LOW	398-1471
11β-HYDROXYETIOCHOLANOLONE	360		153-827
ALDOSTERONE	15.0		Normal Diet: 6.0-25.0 Low Salt: 17.0-44.0 High Salt: 0.0-6.0
ALLO-TETRAHYDROCORTICOSTERONE (5α-THB)	270		130-600
TETRAHYDROCORTICOSTERONE (THB)	103		30-240
11-DEHYDROTETRAHYDROCORTICOSTERONE (THA)	32	LOW	62-293

Urinary HGH	Amount Excreted in pg/24hr		Adult Reference Range
Human Growth Hormone	2652		1065 - 4722 pg/24hr

Urinary Oxytocin	Amount Excreted in pmol/24hr		Adult Reference Range
Oxytocin	215	Low	250 - 700 pmol/24hr

Urinary Melatonin Analytes	Amount Excreted		Adult Reference Range
Melatonin	33.1		9.1 - 57.3 ng/24hr
6-Sulfatoxymelatonin	5.8	Low	8.3 - 39.7 µg/24hr

Urinary Thyroid	Amount Excreted in ng/24hr		Adult Reference Range ng/24hr
Free T3	396	Low	470 - 1750
Free T4	524		430 - 3200

Urinary Mineral	Amount Excreted in mmol/24h	Adult Reference Range mmol/24hr
Sodium	86	40 - 220
Potassium	41	25 - 150
Sodium/Potassium Ratio	2.1	1.2 - 4.8

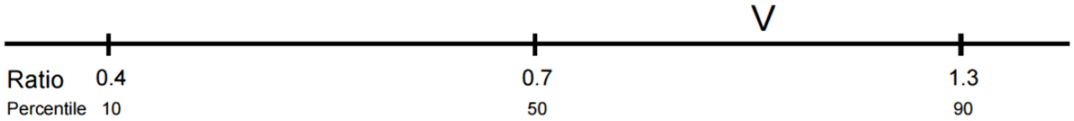
Meridian Valley LAB

Meridian Valley LAB

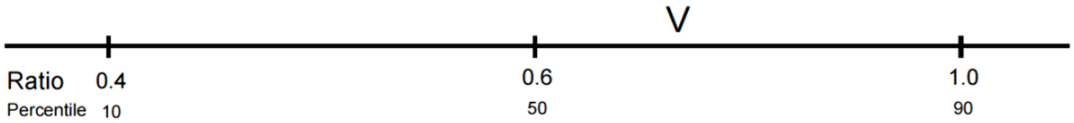
ENZYME ACTIVITY PHENOTYPE ASSESSMENT

5-α-REDUCTASE

Androsterone/Etiocholanolone Ratio: **1.04**



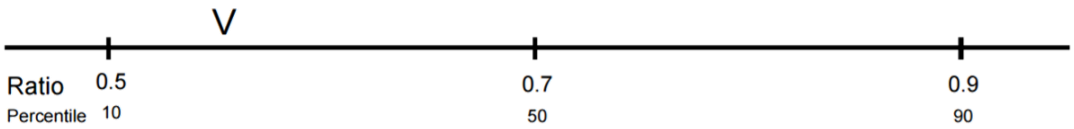
Allo-tetrahydrocortisol/tetrahydrocortisol Ratio: **0.74**



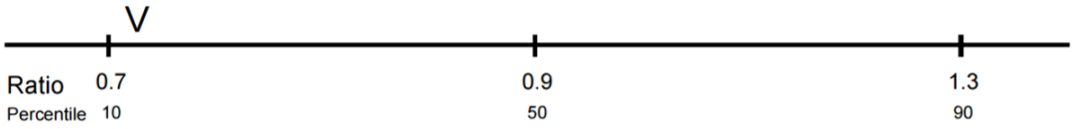
Elevated 5-α-reductase activity is associated with polycystic ovary syndrome and hirsutism in women, benign prostate hypertrophy and premature baldness in men, and obesity and insulin resistance in both genders. Low 5-α-reductase activity may result in reduced conversion of testosterone to DHT and undervirilization in males.

11-β-hydroxysteroid dehydrogenase I &II

Cortisol/Cortisone Ratio: **0.54**



Tetrahydrocortisol+allo-tetrahydrocortisol/Tetrahydrocortisone Ratio: **0.70**



Low ratios are associated with obesity and insulin resistance

Elevated ratios are associated with low-renin hypertension, high dose licorice, and cortisol administration.

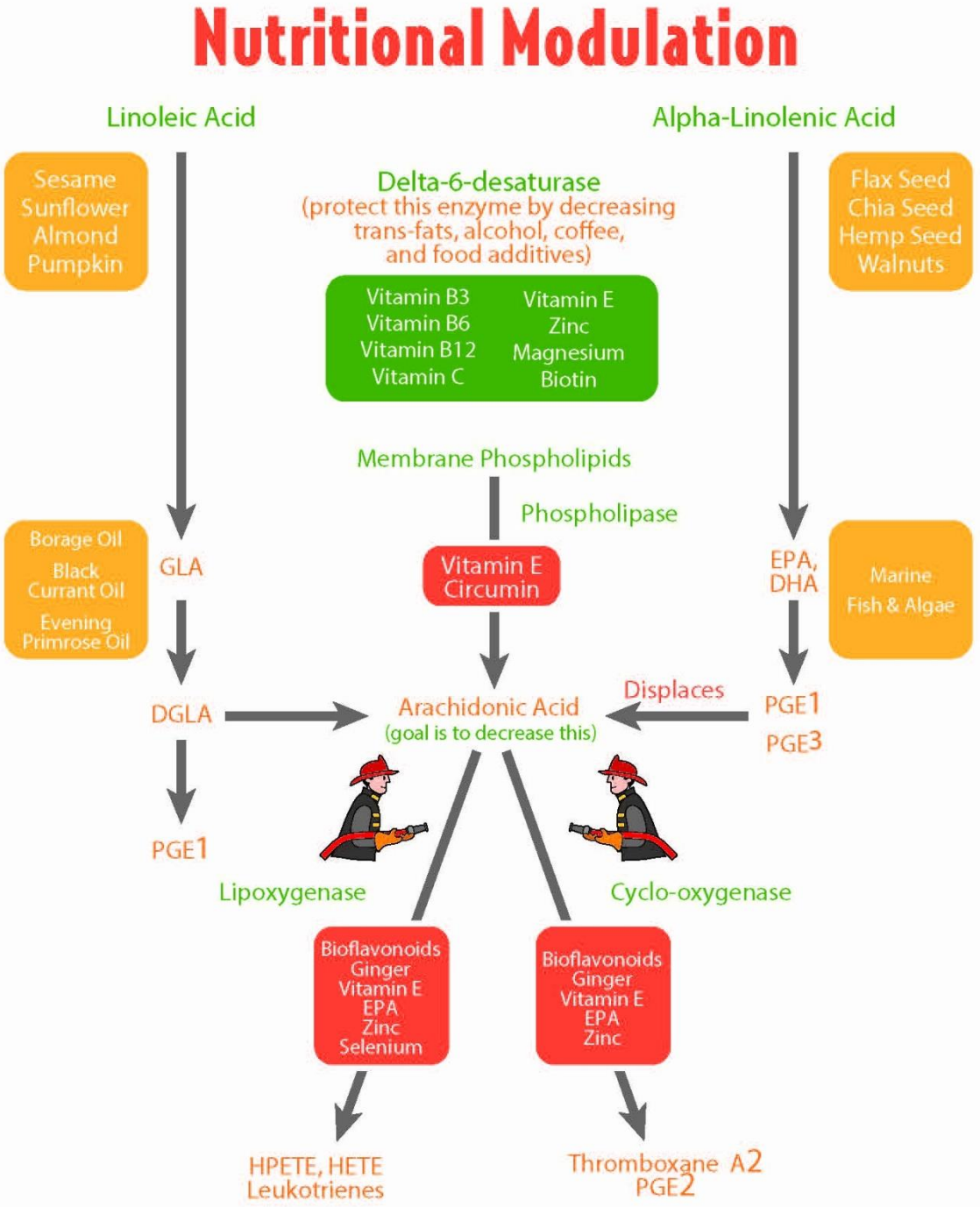
http://www.drritamarie.com/go/MeridianValleyUrineHormoneGuide

Comprehensive Digestive Analysis

- ✓ Symptoms: digestive and outside
- ✓ Physical signs of nutrient deficiencies due to malabsorption
- ✓ Functional assessments
  - ➢ Transit time, HCl challenge
- ✓ Immune system responses
- ✓ Lab testing
  - ➢ Blood chemistry markers
  - ➢ Stool testing
  - ➢ Organic acid testing

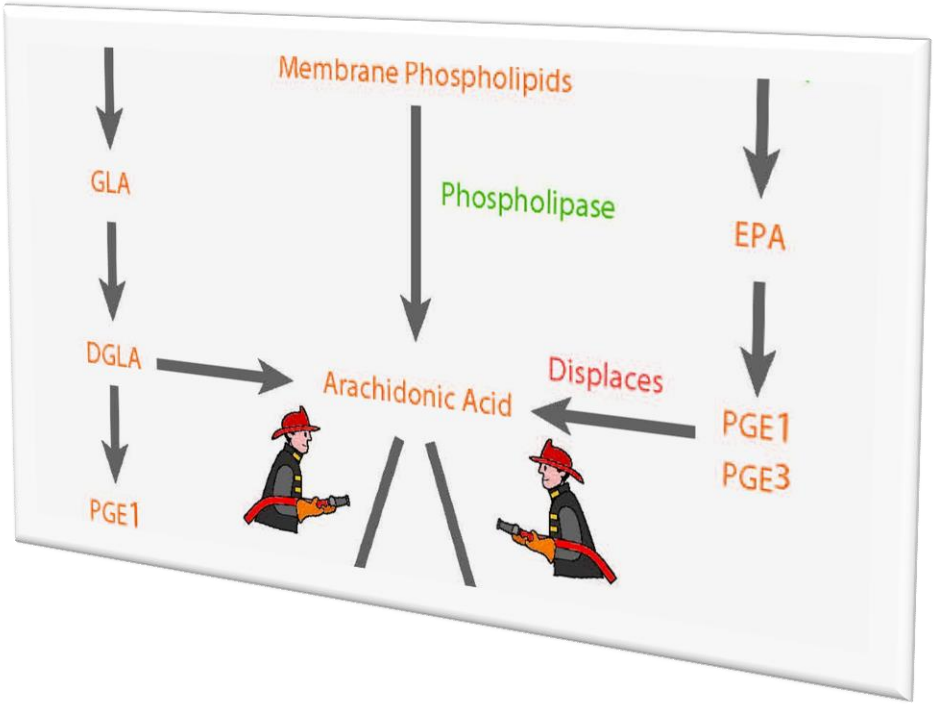
Immune System and Fatty Acids Testing

Inflammatory Cascade



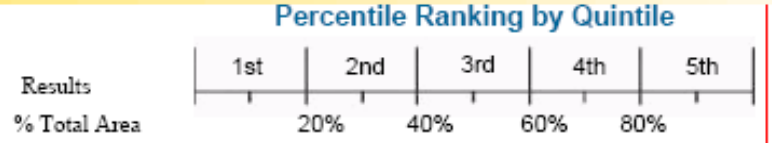
Inflammation Marker: AA/EPA Ratio

- ✓Optimum ratio: 1.5 - 3.0
- ✓Average American: 11
- ✓"Unwell": >10
- ✓High inflammation: >15
- ✓Chronic illness and disease: >=15



0241 Bloodspot Fatty Acid Profile

Methodology: Capillary Gas Chromatography/Mass Spectrometry

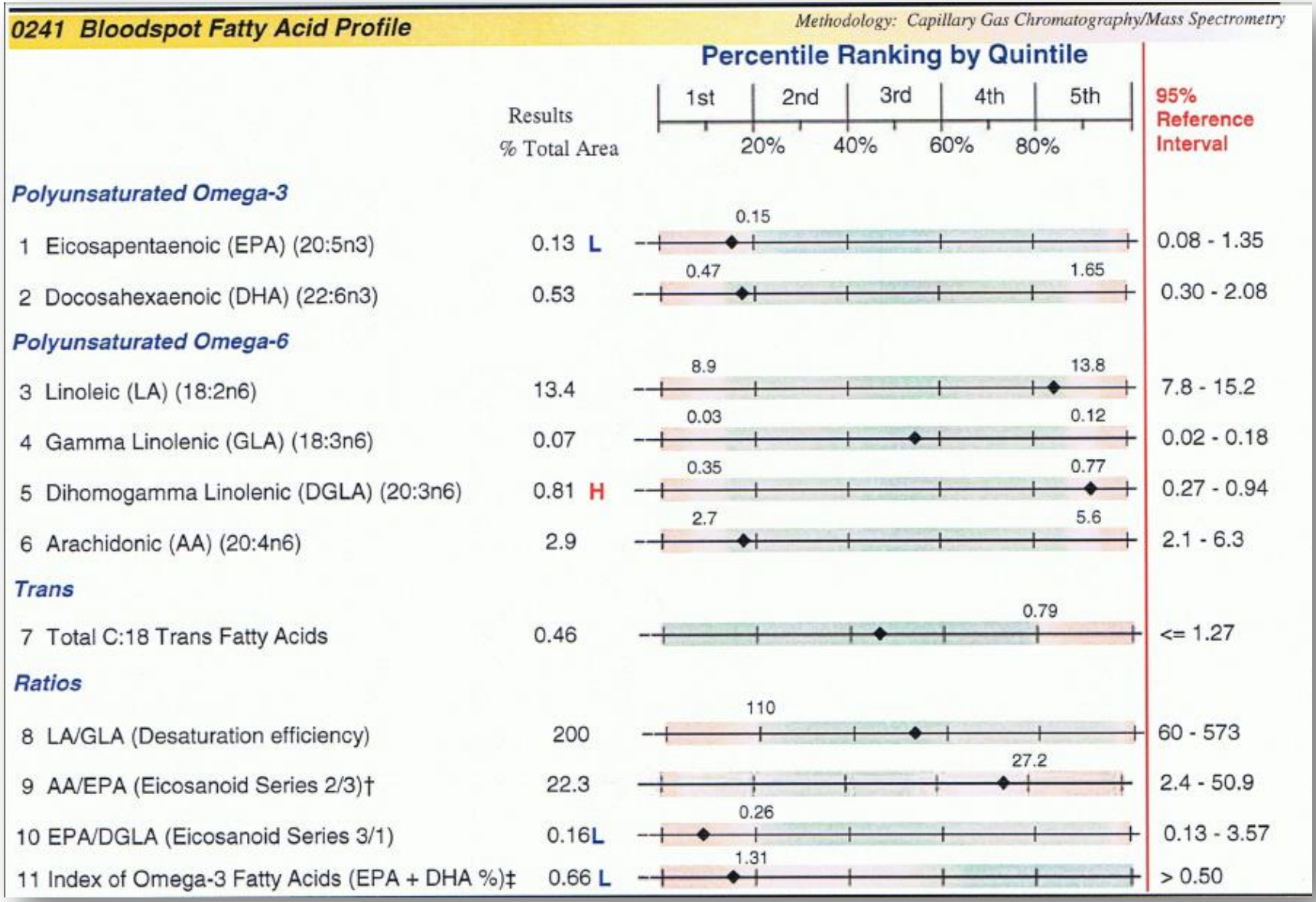


	Results % Total Area		95% Reference Interval
Polyunsaturated Omega-3			
1 Alpha Linolenic (ALA) (18:3n3)	0.25		0.12 - 0.72
2 Eicosapentaenoic (EPA) (20:5n3)	0.26		0.07 - 1.43
3 Docosahexaenoic (DHA) (22:6n3)	0.57	L	0.41 - 2.55
Polyunsaturated Omega-6			
4 Linoleic (LA) (18:2n6)	15.3		10.9 - 19.4
5 Gamma Linolenic (GLA) (18:3n6)	0.08		0.04 - 0.27
6 Dihomogamma Linolenic (DGLA) (20:3n6)	0.62		0.40 - 1.27
7 Arachidonic (AA) (20:4n6)	2.9	L	2.7 - 7.4
Trans			
8 Total C:18 Trans Fatty Acids	0.28		<= 0.86
Ratios			
9 LA/GLA (Desaturation efficiency)	192		53 - 394
10 AA/EPA (Eicosanoid Series 2/3)†	11.3		3.1 - 63.2
11 EPA/DGLA (Eicosanoid Series 3/1)	0.41		0.09 - 2.45
12 Index of Omega-3 Fatty Acids (EPA + DHA %)‡	0.83	L	> 0.63

†Sears, B. *Toxic Fat: When Good Fat Turns Bad.* 1st ed. Nashville, TN: Thomas Nelson; 2008.

‡Harris, WS. Omega - 3 fatty acids and cardiovascular disease: A case for omega-3 index as a new risk factor. Pharmacological Research 2007; 55:217-223.

60 YO Female – Depression & Celiac

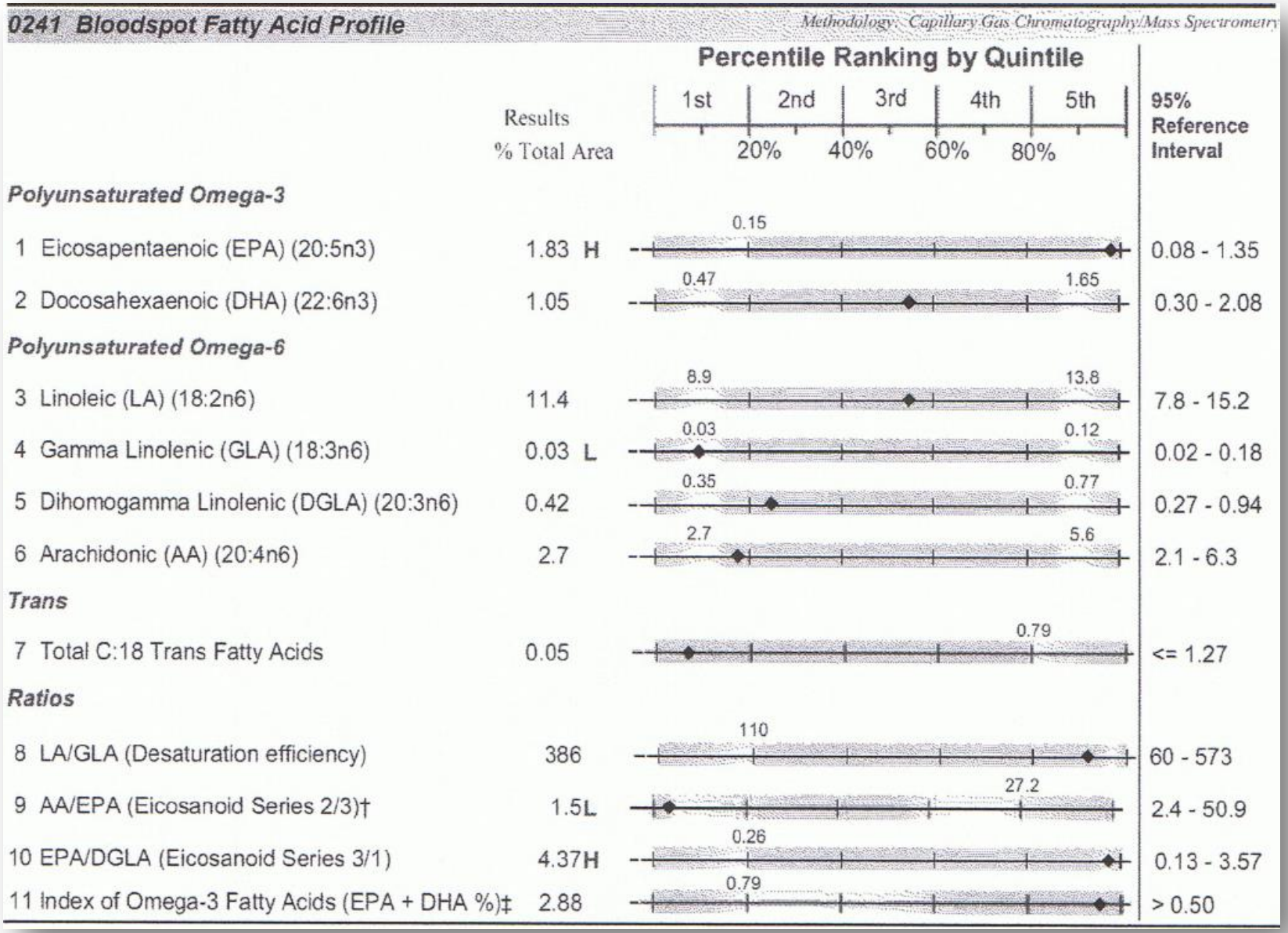


0241 Bloodspot Fatty Acid Profile

Methodology: Capillary Gas Chromatography/Mass Spectrometry

	Results % Total Area	Percentile Ranking by Quintile (1st 2nd 3rd 4th 5th; 20% 40% 60% 80%)	95% Reference Interval
Polyunsaturated Omega-3			
1 Eicosapentaenoic (EPA) (20:5n3)	0.13 L	0.15	0.08 - 1.35
2 Docosahexaenoic (DHA) (22:6n3)	0.53	0.47 – 1.65	0.30 - 2.08
Polyunsaturated Omega-6			
3 Linoleic (LA) (18:2n6)	13.4	8.9 – 13.8	7.8 - 15.2
4 Gamma Linolenic (GLA) (18:3n6)	0.07	0.03 – 0.12	0.02 - 0.18
5 Dihomogamma Linolenic (DGLA) (20:3n6)	0.81 H	0.35 – 0.77	0.27 - 0.94
6 Arachidonic (AA) (20:4n6)	2.9	2.7 – 5.6	2.1 - 6.3
Trans			
7 Total C:18 Trans Fatty Acids	0.46	0.79	<= 1.27
Ratios			
8 LA/GLA (Desaturation efficiency)	200	110	60 - 573
9 AA/EPA (Eicosanoid Series 2/3)†	22.3	27.2	2.4 - 50.9
10 EPA/DGLA (Eicosanoid Series 3/1)	0.16L	0.26	0.13 - 3.57
11 Index of Omega-3 Fatty Acids (EPA + DHA %)‡	0.66 L	1.31	> 0.50

60 YO Female - 4 Months Later

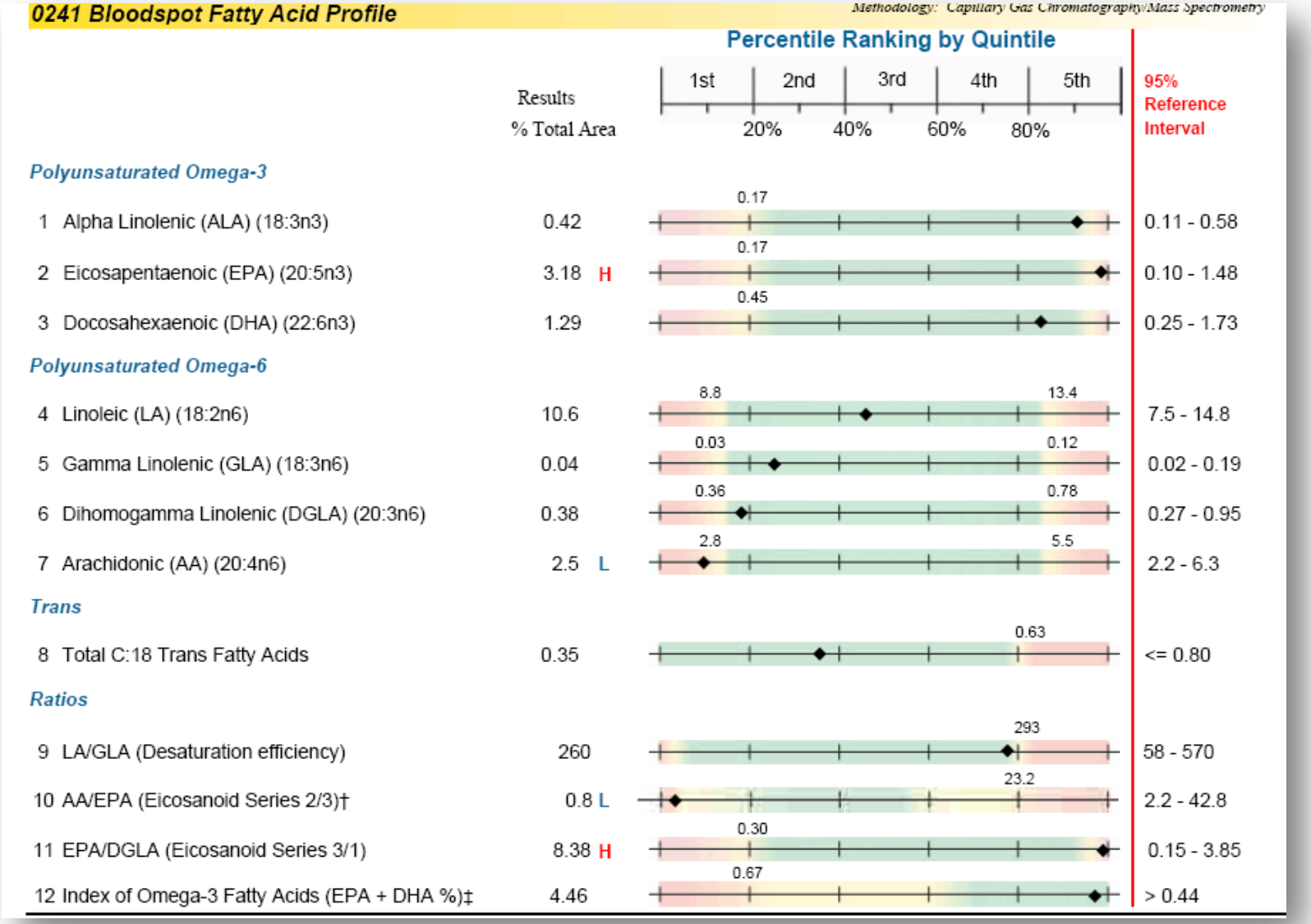


0241 Bloodspot Fatty Acid Profile

Methodology: Capillary Gas Chromatography/Mass Spectrometry

	Results % Total Area	Percentile Ranking by Quintile (1st 2nd 3rd 4th 5th; 20% 40% 60% 80%)	95% Reference Interval
Polyunsaturated Omega-3			
1 Eicosapentaenoic (EPA) (20:5n3)	1.83 H	0.15	0.08 - 1.35
2 Docosahexaenoic (DHA) (22:6n3)	1.05	0.47 – 1.65	0.30 - 2.08
Polyunsaturated Omega-6			
3 Linoleic (LA) (18:2n6)	11.4	8.9 – 13.8	7.8 - 15.2
4 Gamma Linolenic (GLA) (18:3n6)	0.03 L	0.03 – 0.12	0.02 - 0.18
5 Dihomogamma Linolenic (DGLA) (20:3n6)	0.42	0.35 – 0.77	0.27 - 0.94
6 Arachidonic (AA) (20:4n6)	2.7	2.7 – 5.6	2.1 - 6.3
Trans			
7 Total C:18 Trans Fatty Acids	0.05	0.79	<= 1.27
Ratios			
8 LA/GLA (Desaturation efficiency)	386	110	60 - 573
9 AA/EPA (Eicosanoid Series 2/3)†	1.5 L	27.2	2.4 - 50.9
10 EPA/DGLA (Eicosanoid Series 3/1)	4.37 H	0.26	0.13 - 3.57
11 Index of Omega-3 Fatty Acids (EPA + DHA %)‡	2.88	0.79	> 0.50

65 YO Female - 9 Months Later



0241 Bloodspot Fatty Acid Profile

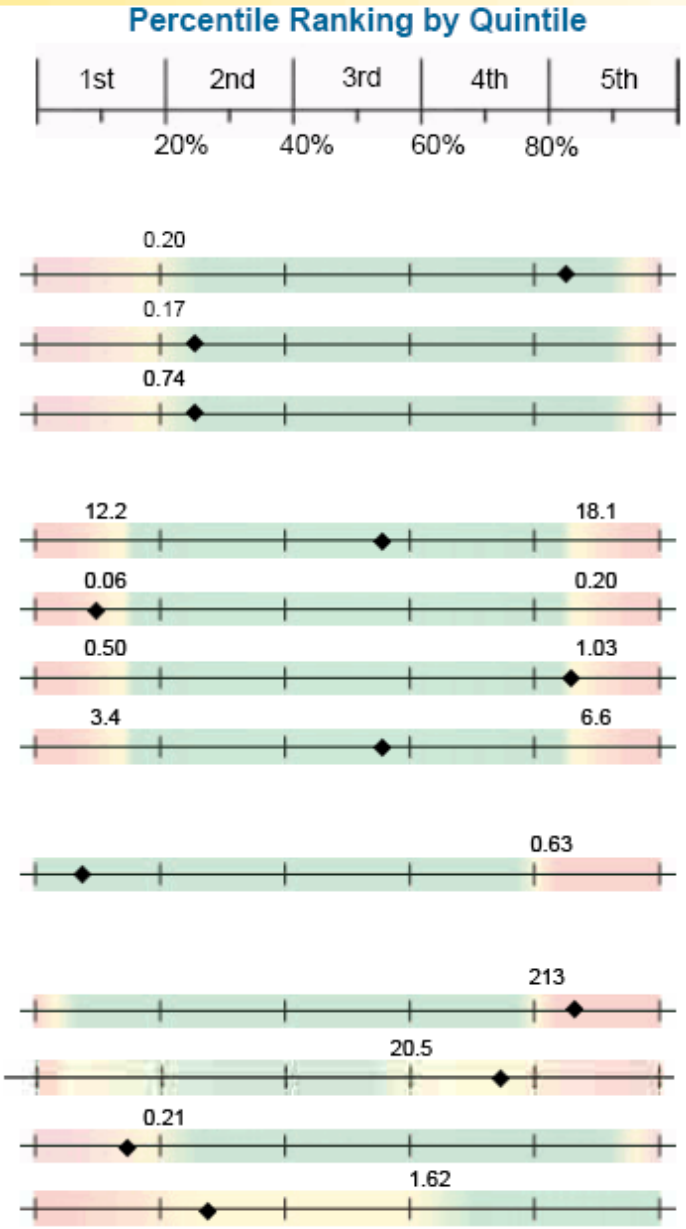
Methodology: Capillary Gas Chromatography/Mass Spectrometry

Percentile Ranking by Quintile: 1st | 2nd | 3rd | 4th | 5th (20% | 40% | 60% | 80%)

		Results % Total Area		95% Reference Interval
Polyunsaturated Omega-3				
1	Alpha Linolenic (ALA) (18:3n3)	0.42		0.11 - 0.58
2	Eicosapentaenoic (EPA) (20:5n3)	3.18	H	0.10 - 1.48
3	Docosahexaenoic (DHA) (22:6n3)	1.29		0.25 - 1.73
Polyunsaturated Omega-6				
4	Linoleic (LA) (18:2n6)	10.6		7.5 - 14.8
5	Gamma Linolenic (GLA) (18:3n6)	0.04		0.02 - 0.19
6	Dihomogamma Linolenic (DGLA) (20:3n6)	0.38		0.27 - 0.95
7	Arachidonic (AA) (20:4n6)	2.5	L	2.2 - 6.3
Trans				
8	Total C:18 Trans Fatty Acids	0.35		<= 0.80
Ratios				
9	LA/GLA (Desaturation efficiency)	260		58 - 570
10	AA/EPA (Eicosanoid Series 2/3)†	0.8	L	2.2 - 42.8
11	EPA/DGLA (Eicosanoid Series 3/1)	8.38	H	0.15 - 3.85
12	Index of Omega-3 Fatty Acids (EPA + DHA %)‡	4.46		> 0.44

0241 Bloodspot Fatty Acid Profile

Methodology: Capillary Gas Chromatography/Mass Spectrometry



	Results % Total Area		95% Reference Interval
Polyunsaturated Omega-3			
1 Alpha Linolenic (ALA) (18:3n3)	0.43		0.12 - 0.72
2 Eicosapentaenoic (EPA) (20:5n3)	0.20		0.07 - 1.43
3 Docosahexaenoic (DHA) (22:6n3)	0.87		0.41 - 2.55
Polyunsaturated Omega-6			
4 Linoleic (LA) (18:2n6)	15.2		10.9 - 19.4
5 Gamma Linolenic (GLA) (18:3n6)	0.06	L	0.04 - 0.27
6 Dihomogamma Linolenic (DGLA) (20:3n6)	0.98		0.40 - 1.27
7 Arachidonic (AA) (20:4n6)	5.3		2.7 - 7.4
Trans			
8 Total C:18 Trans Fatty Acids	0.27		<= 0.86
Ratios			
9 LA/GLA (Desaturation efficiency)	261	H	53 - 394
10 AA/EPA (Eicosanoid Series 2/3)†	26.7	H	3.1 - 63.2
11 EPA/DGLA (Eicosanoid Series 3/1)	0.20	L	0.09 - 2.45
12 Index of Omega-3 Fatty Acids (EPA + DHA %)‡	1.06		> 0.63

Omega-3 and Omega-6 Ratios

ALA: 2.2 grams per day

EPA/DHA: 0.65 grams per day

http://www.drritamarie.com/go/USDASearch

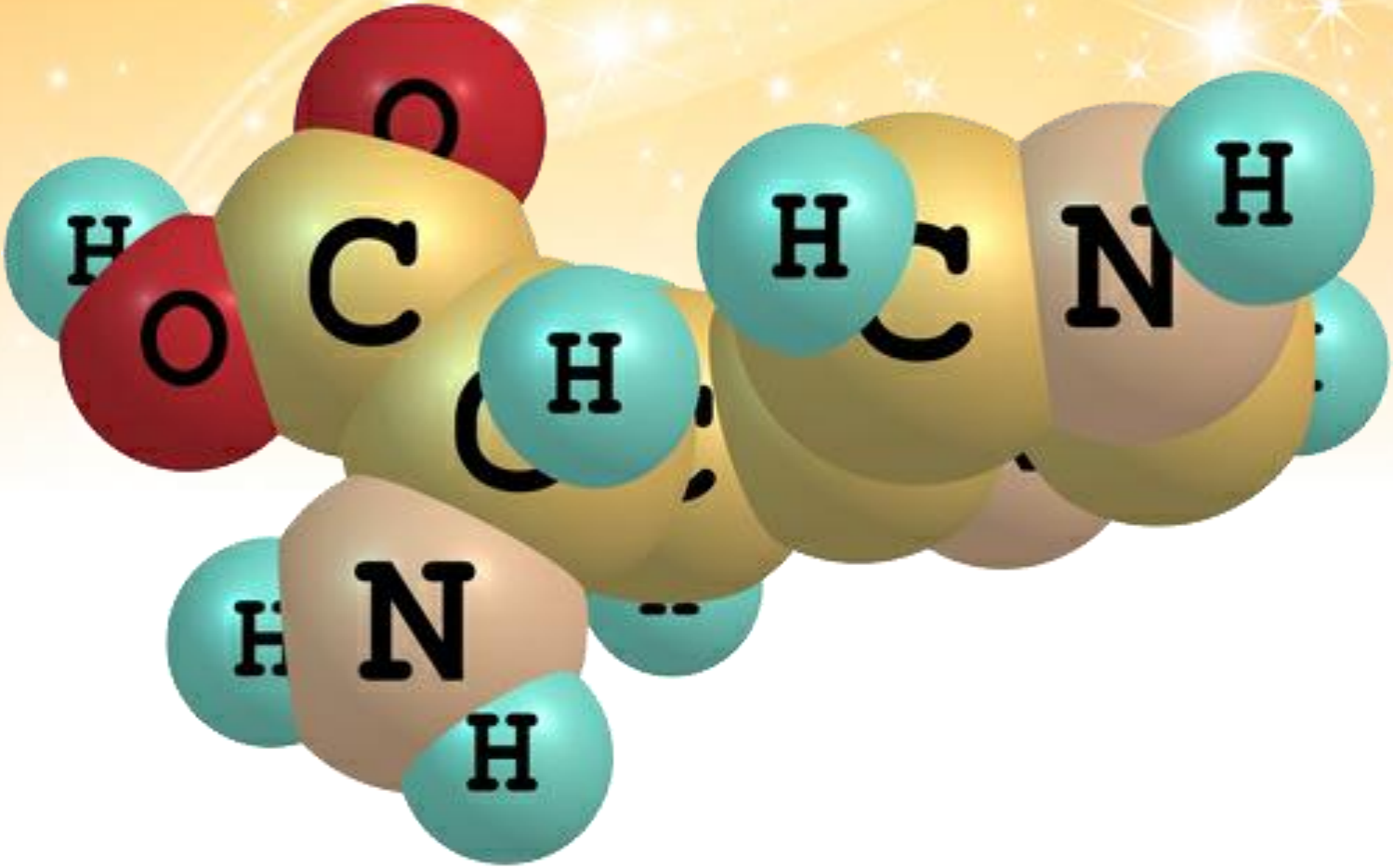
n-3 is Omega 3 Alpha Linolenic Acid ; n-6 is Linoleic Acid

Seeds		Total n-3 FA (g)	Total n-6 FA (g)	n-6/n-3 Ratio
Flax seeds	1 oz.	1.8	0.4	0.2
Hemp Seeds	1 oz.	2.8	8.4	3
Chia Seeds	1 oz.	5	1.6	0.32
Pumpkin seeds, shelled	1 oz.	0.1	5.4	107.8
Poppy seeds	1 oz.	0.1	8.6	96.0
Sesame seeds	1 oz.	0.1	6.7	67
Sunflower Seeds	1 oz.	0.1	8.5	85

Fish		Total n-3 FA (g)	Total n-6 FA (g)	n-6/n-3 Ratio
Salmon	3 oz.	0.273 .251 EPA .948 DHA	0.14	.1

For people who don't eat fish, recommended intake of ALA is 10 grams per day. (1 ounce Chia, 2 ½ Tablespoons, is 5 grams)

Amino Acid Testing



Why Measure Amino Acids?

- ✓Assess protein intake and sufficiency
- ✓Determine adequacy of stomach acid
- ✓Assess pancreatic enzyme status
- ✓Evaluate neurotransmitter imbalance
- ✓Determine hormone adequacy
- ✓Evaluate healing and immune issues
- ✓Assess vitamin and mineral status

Organic Acids Test: Great Plains

- ✓ Intestinal Microbial Overgrowth
- ✓ Oxalate Metabolites
- ✓ Glycolytic Metabolites
- ✓ Krebs Cycle Metabolites
- ✓ Neurotransmitter Metabolites
- ✓ Folate Metabolism
- ✓ Ketones and Fatty Acid Oxidation
- ✓ Nutritional Markers
- ✓ Detoxification Indicators
- ✓ Amino Acid Metabolites
- ✓ Bone Metabolites

The Great Plains Laboratory, Inc.

Health, Metabolism & Nutrition

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72 MARKERS

Organic Acids Test: Genova Diagnostics

- ✓ Fatty Acids Oxidation
- ✓ Carbohydrate Metabolism
- ✓ Energy Production
- ✓ B Complex Vitamin Markers
- ✓ Neurotransmitter Metabolism
- ✓ Detoxification Indicators
- ✓ Dysbiosis Markers

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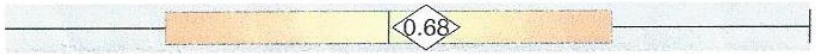
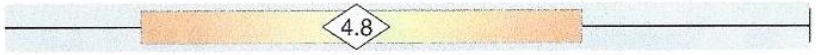
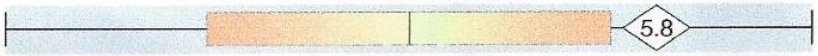
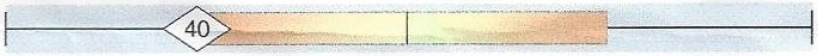
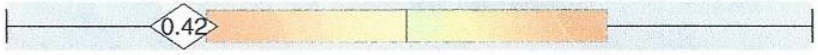
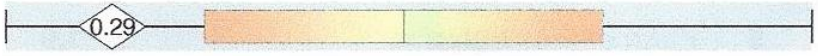
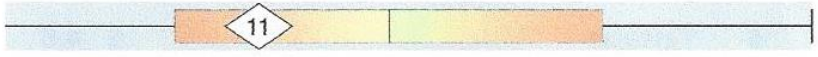
46 MARKERS

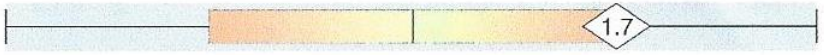
Organic Acids Test - Nutritional and Metabolic Profile

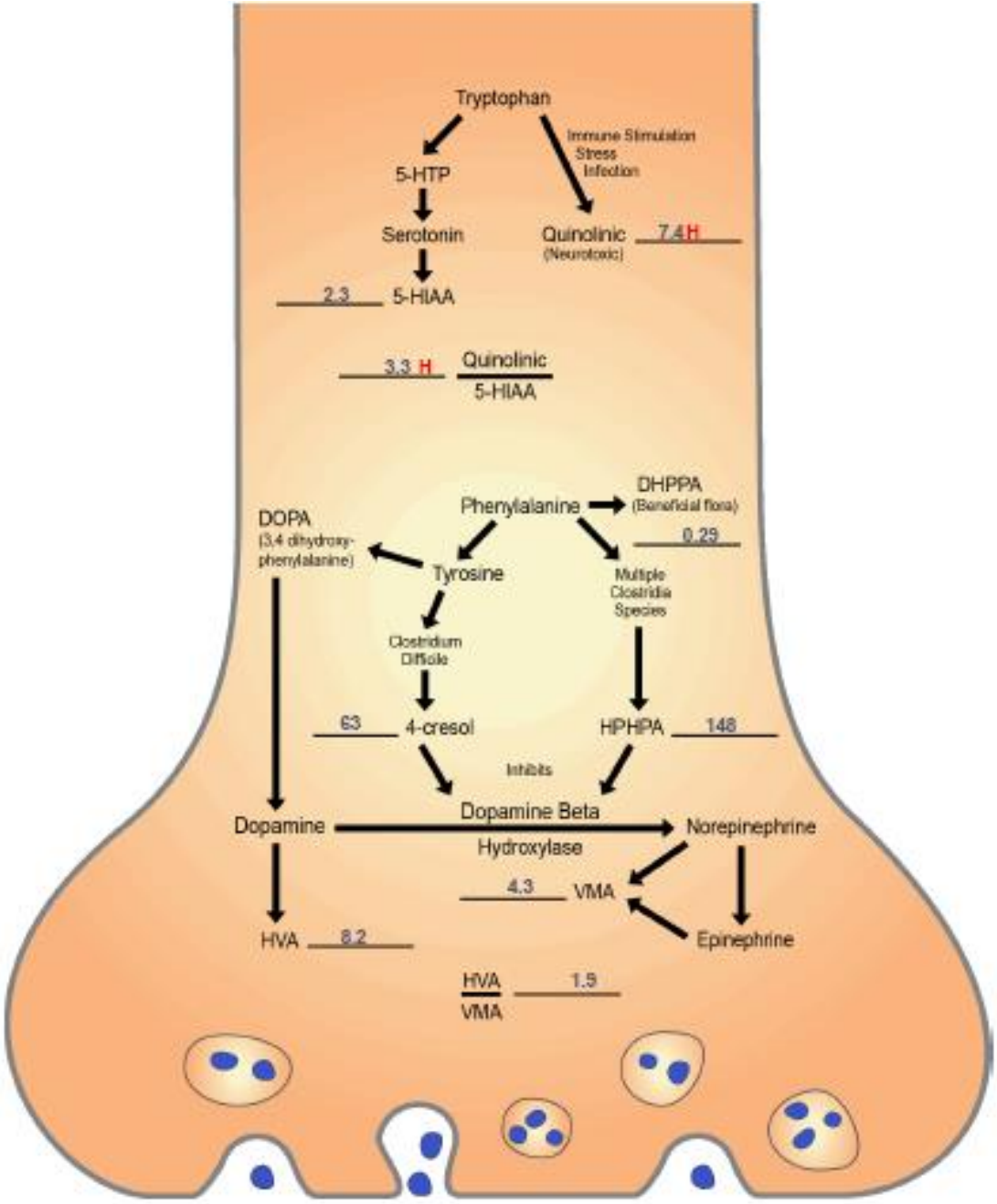
	Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)		Patient	Reference Population - Females Age 13 and Over
Malabsorption and Bacterial Markers					
10	2-Hydroxyphenylacetic	0.06 - 0.66	H	1.1	
11	4-Hydroxyphenylacetic	≤ 19	H	26	
12	4-Hydroxybenzoic	≤ 1.3		0.68	
13	4-Hydroxyhippuric	0.79 - 17	H	22	
14	Hippuric	≤ 613		500	
15	3-Indoleacetic	≤ 11		4.8	
16	Succinic	≤ 9.3	H	11	
17	HPHPA (Clostridia Marker)	≤ 208		167	
18	4-Cresol (C. difficile)	≤ 75		0.62	
19	DHPPA (Beneficial Bacteria)	≤ 0.38		0.29	

Organic Acids Test - Nutritional and Metabolic Profile

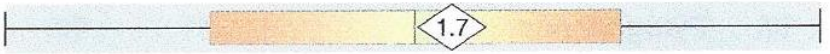
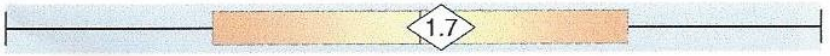
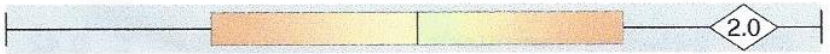
	Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)		Patient	Reference Population - Females Age 13 and Over
Oxalate Metabolites					
20	Glyceric	0.77 - 7.0		5.8	
21	Glycolic	16 - 117		40	
22	Oxalic	6.8 - 101		89	
Glycolytic Cycle Metabolites					
23	Lactic	≤ 48		7.6	
24	Pyruvic	≤ 9.1		4.4	
25	2-Hydroxybutyric	0.03 - 1.8		0.42	
Krebs Cycle Metabolites					
26	Succinic	≤ 9.3	H	11	
27	Fumaric	≤ 0.94	H	1.4	
28	Malic	0.06 - 1.8		0.29	
29	2-Oxoglutaric	≤ 35		11	
30	Aconitic	6.8 - 28	H	36	
31	Citric	≤ 507	H	1 040	

Organic Acids Test - Nutritional and Metabolic Profile

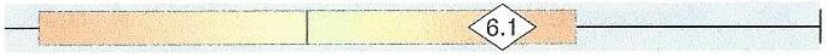
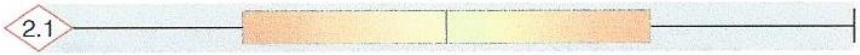
	Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)		Patient	Reference Population - Females Age 13 and Over
Neurotransmitter Metabolites					
32	Homovanillic (HVA) *(dopamine)*	0.80 - 3.6	H	7.0	
33	Vanillylmandelic (VMA) *(norepinephrine, epinephrine)*	0.46 - 3.7		2.9	
34	HVA / VMA Ratio	0.16 - 1.8	H	2.4	
35	5-Hydroxyindoleacetic (5-HIAA) *(serotonin)*	≤ 4.3		1.5	
36	Quinolinic	0.85 - 3.9	H	6.8	
37	Kynurenic	0.17 - 2.2		1.7	
38	Quinolinic / 5-HIAA Ratio	0.42 - 2.0	H	4.7	

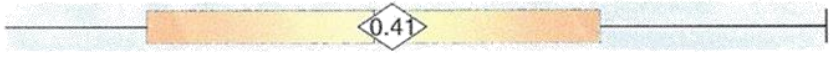
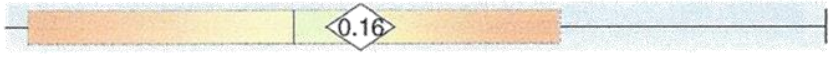
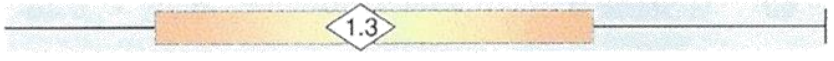


Organic Acids Test - Nutritional and Metabolic Profile

	Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)		Patient	Reference Population - Females Age 13 and Over
Ketone and Fatty Acid Oxidation					
41	3-Hydroxybutyric	≤ 3.1		1.7	
42	Acetoacetic	≤ 10		1.2	
43	4-Hydroxybutyric	≤ 4.8		2.0	
44	Ethylmalonic	0.44 - 2.8		1.7	
45	Methylsuccinic	0.10 - 2.2		2.0	
46	Adipic	0.04 - 3.8		1.5	
47	Suberic	0.18 - 2.2	H	4.6	
48	Sebacic	≤ 0.24	H	0.36	

Organic Acids Test - Nutritional and Metabolic Profile

Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)			Patient	Reference Population - Females Age 13 and Over
Nutritional Markers					
Vitamin B12					
49 Methylmalonic *	≤ 2.3			2.0	
Vitamin B6					
50 Pyridoxic (B6)	≤ 34		H	47	
Vitamin B5					
51 Pantothenic (B5)	≤ 10			6.1	
Vitamin B2 (Riboflavin)					
52 Glutaric *	0.04	- 0.36	H	2.4	
Vitamin C					
53 Ascorbic	10	- 200	L	2.1	
Vitamin Q10 (CoQ10)					
54 3-Hydroxy-3-methylglutaric *	0.17	- 39		32	
Glutathione Precursor and Chelating Agent					
55 N-Acetylcysteine (NAC)	≤ 0.28			0.12	
Biotin (Vitamin H)					
56 Methylcitric *	0.19	- 2.7		1.6	

	Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)		Patient	Reference Population - Females Age 13 and Over
Amino Acid Metabolites					
60	2-Hydroxyisovaleric	≤ 0.42		0.08	
61	2-Oxoisovaleric	≤ 2.1		0.59	
62	3-Methyl-2-oxovaleric	≤ 0.87		0.41	
63	2-Hydroxyisocaproic	≤ 0.48		0.04	
64	2-Oxoisocaproic	≤ 0.37		0.16	
65	2-Oxo-4-methiolbutyric	≤ 0.16		0.13	
66	Mandelic	≤ 0.21	H	0.34	
67	Phenyllactic	≤ 0.20	H	0.31	
68	Phenylpyruvic	0.20 - 1.9		0.66	
69	Homogentisic	≤ 0.36		0.13	
70	4-Hydroxyphenyllactic	≤ 0.80	H	1.1	
71	N-Acetylaspartic	≤ 3.0		1.3	
72	Malonic	≤ 9.7		1.8	
73	3-Methylglutaric	≤ 0.76	H	0.79	
74	3-Hydroxyglutaric	≤ 6.2		2.1	
75	3-Methylglutaconic	≤ 4.5		2.4	

Labs for Organic Acids

Practitioner Only:

- ✓ Genova Diagnostics
  https://www.gdx.net

Direct Access:

- ✓ Great Plains:
  http://www.greatplainslaboratory.com
- ✓ Direct Labs:
  http://www.directlabs.com
- ✓ Accesa Labs:
  http://www.accesalabs.com

Toxic and Essential Minerals

Not all methods are created equal!

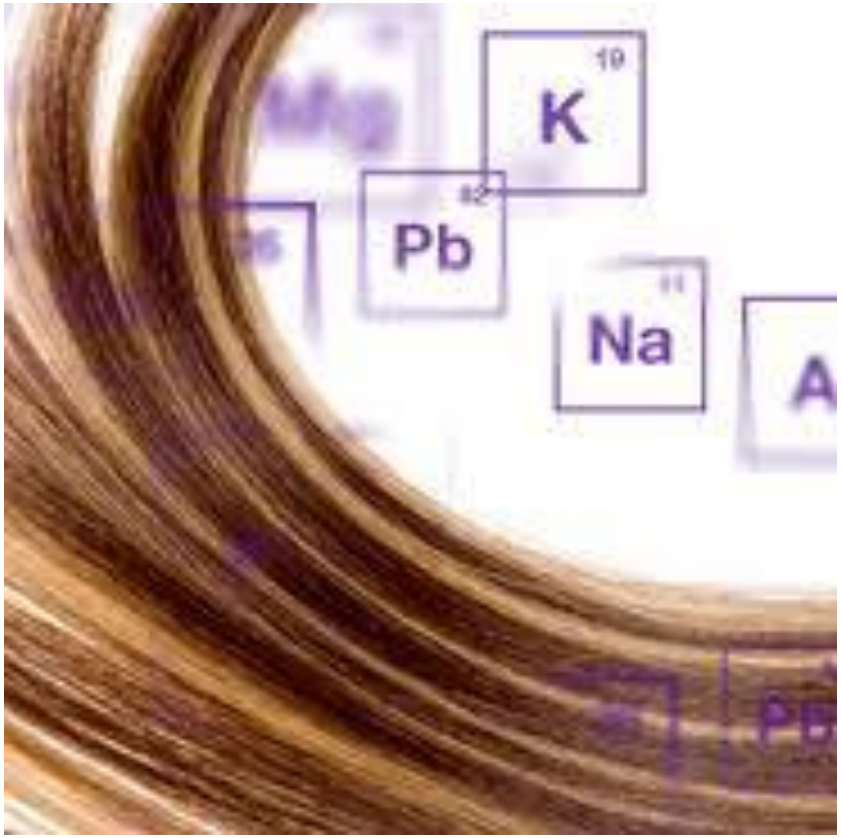
- ✓ **Blood Chemistry** and electrolyte indicators
- ✓ **Blood Levels** of minerals
- ✓ **Blood Cells:** Essential elements
- ✓ **Hair Testing:** Toxics
- ✓ **Taste Testing:** Not universally accepted, although good evidence for validity
- ✓ **Stool Testing:** Controversial
- ✓ **Urine Testing:**
  - ➢ Chelation challenge for toxics
  - ➢ Unchallenged
- ✓ **Loading:** Pre- and post-urine test based on a loading dose

Routine Blood Test Indicators as an Indicator of Mineral Status

- ✓ **Calcium:** Not a good measure of overall status
- ✓ **Potassium:** Not a good indicator of tissue status
- ✓ **Sodium:** Reliable
- ✓ **Chloride:** Reliable
- ✓ **Phosphorus:** Reliable
- ✓ **Iron:** Reliable
- ✓ **Molybdenum:** Indirect – uric acid low suggests molybdenum low
- ✓ **Selenium:** Indirect per thyroid T4-to-T3 ratios
- ✓ **Zinc:** Indirect via alkaline phosphatase

Hair Testing for Toxic Elements

- ✓ U.S. EPA
- ✓ 300-page review
- ✓ 400 studies of hair in 1979
- ✓ “Hair is a meaningful and representative tissue for biological monitoring for most of the toxic metals."



“Toxic Trace Metals in Human and Mammalian Hair and Nails", EPA-600 4.79-049, August 1979, US Environmental Protection Agency, Research and Development.

Fecal Metals Testing

- ✓ Used by **Dr. Amy Yasko** in combination with other tests
- ✓ Good for evaluating **ability to excrete**
- ✓ Good for monitoring **heavy metal detox**
- ✓ Performed by **Doctor's Data**

Mineral Testing Resources

- ✓ **Red Blood Cell, Urine, Hair:**
  - ➢ Great Plains
  - ➢ Doctor's Data
  - ➢ Genova Diagnostics
  - ➢ Trace Elements
- ✓ **Feces:**
  - ➢ Doctor's Data
- ✓ **Taste Test Kits:**
  - ➢ http://www.drritamarie.com/go/MineralTests