

<b>Patient</b>	Collection Time: 8:40 am	Specimen ID: 16042301545	<b>Provider</b>	Requesting Provider: TONY BOGGESS, DO
	Collection Date: 4/22/2016	Report Type: COMPLETE		NATURAL BALANCE WELLNESS MEDICAL CENTER 1310 S. MAIN ST ANN ARBOR, MI 48104
	Received Date: 4/23/2016	Report Date: 4/26/2016		Client ID: 27-48104-18-0007231

Laboratory Test	Notes	High Risk	Intermediate Risk	Optimal	High Risk Range	Intermediate Risk Range	Optimal Range	Previous Results
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<b>Lipids</b>	Total Cholesterol (mg/dL)			152	≥ 240	200 - 239	< 200	164
	LDL-C Direct (mg/dL)		101		≥ 130 CHD & CHD risk eq. > 100	100 - 129 CHD & CHD risk eq. 70 - 100	< 100 CHD & CHD risk eq. < 70	119
	HDL-C (mg/dL)	46			< 50		≥ 50	52
	Triglycerides (mg/dL)			62	> 199	150 - 199	< 150	86
	Non-HDL-C (mg/dL) (calculated)			106	≥ 160	130 - 159	< 130	112

<b>Inflammation/ Oxidation</b>	Fibrinogen (mg/dL)		485		< 126 or > 517	438 - 517	126 - 437	405
	hs-CRP (mg/L)	7.0			> 2.9	1.0 - 2.9	< 1.0	3.2
	Lp-PLA <sub>2</sub> (ng/mL) <sup>§</sup>			129	> 383	291 - 383	< 291	
	Myeloperoxidase (pmol/L) <sup>§</sup>			< 83	≥ 332	256 - 331	≤ 255	

<b>Lipoprotein Genetics</b>	Apolipoprotein E (T471C, C609T) <sup>§</sup> rs429358, rs7412				Estimated Genotype Frequency: 2/2 (~1-2%), 2/3 (~15%), 2/4 (~1-2%), 3/3 (~55%), 3/4 (~25%), 4/4 (~1-2%)			3/3
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<b>Coagulation Genetics</b>	Factor V Leiden (G1691A) <sup>§</sup> rs6025				Optimal=Non-carrier (Arg/Arg); At Risk=(Arg/Gln or Gln/Gln)			Arg/Arg
	Prothrombin Mutation (G20210A) <sup>§</sup> rs1799963				Optimal=Non-carrier (G/G); At Risk=(G/A or A/A)			G/G
	MTHFR (C677T) <sup>§</sup> rs1801133 (Methylenetetrahydrofolate Reductase)				Estimated Genotype Frequency: C/C (~49.3%), C/T (~39.8%), T/T (~10.9%)			C/C
	MTHFR (A1298C) <sup>§</sup> rs1801131				Estimated Genotype Frequency: C/C (~7-12%), A/C (~30%), A/A (~58-63%)			A/C

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**Provider Notes:**

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<b>Metabolic</b>	1,5-anhydroglucitol (µg/mL)			17.8	< 12.6	12.6 - 16.6	> 16.6	18.1
	25-hydroxy-Vitamin D (ng/mL)		28		≤ 14	15 - 29	30 - 100	24
	Uric Acid (mg/dL)			5.4	≥ 8.0	7.0 - 7.9	2.0 - 6.9	4.9
	TSH (µIU/mL)			1.47	< 0.27 or > 4.20		0.27 - 4.20	1.96
	Homocysteine (µmol/L)			9	> 13	11 - 13	< 11	6
	Vitamin B <sub>12</sub> (pg/mL)			449	< 211	211 - 400	> 400	842
	RBC Folate (ng/mL)			1127	< 700	700 - 750	> 750	1188
	Cotinine (ng/mL)			< 6	> 6		≤ 6	< 6
CoQ10 (µg/mL) <sup>§</sup>		0.72			< 1.11	1.11 - 2.00	> 2.00 Target of therapy for patients on statins is > 2.0 µg/mL.	0.63

TSH is analyzed using reagents from Roche Diagnostics by electrochemiluminescence immunoassay. These values should not be used in conjunction with values from other reagent manufacturers or methodologies.

<b>Metabolic</b>	Cortisol (µg/dL)			13.0	Morning hours 7-10 a.m.: 6.2-19.4 Afternoon hours 4-8 p.m.: 2.3-11.9 Other or unknown collection time: 2.3-19.4			3.8
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<b>Renal</b>	Cystatin C (mg/L)			0.73	≥ 1.04	0.96 - 1.03	≤ 0.95	0.76
	Estimated Glomerular Filtration Rate (eGFR, mL/min/1.73m <sup>2</sup> )			142	< 60	60 - 89	> 89	133
	Creatinine, serum (mg/dL)			0.6	> 0.9		0.5 - 0.9	0.7

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Laboratory Test	Notes	Hyper	Optimal	Hypo	Hyper Range	Optimal Range	Hypo Range	Previous Results 7/10/2015
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<b>Sterol Absorption Markers</b>	Campesterol (µg/mL) <sup>s</sup>			1.62	≥ 4.44	2.11 - 4.43	≤ 2.10	1.50
	Campesterol Ratio (10 <sup>2</sup> mmol/mol Cholesterol)			103	≥ 241	115 - 240	≤ 114	88
	Sitosterol (µg/mL) <sup>s</sup>			1.01	≥ 3.18	1.43 - 3.17	≤ 1.42	1.09
	Sitosterol Ratio (10 <sup>2</sup> mmol/mol Cholesterol)			62	≥ 169	76 - 168	≤ 75	62
	Cholestanol (µg/mL) <sup>s</sup>			1.44	≥ 3.48	2.02 - 3.47	≤ 2.01	1.71
	Cholestanol Ratio (10 <sup>2</sup> mmol/mol Cholesterol)			94	≥ 195	117 - 194	≤ 116	104

<b>Sterol Synthesis Markers</b>	Desmosterol (µg/mL) <sup>s</sup>		0.95		≥ 1.28	0.50 - 1.27	< 0.50	0.91
	Desmosterol Ratio (10 <sup>2</sup> mmol/mol Cholesterol)		63		≥ 65	31 - 64	≤ 30	56

Results of the sterol analysis should be used in conjunction with atherogenic lipid and lipoprotein measurements (LDL-P, Apo B and LDL-C) to determine the most appropriate therapy for patients. If the patient has elevated atherogenic lipoproteins, regardless of the sterol concentrations, the first line therapy should be LDL lowering with a statin, or combination therapy (statin plus niacin, fibrate, ezetimibe) if appropriate. Sterol absorption markers may be used to help select the most appropriate combination therapy. Based on the sterol analysis, it is recommended that the following changes in lipid lowering therapy be performed:

- If sterol absorption markers (campesterol and/or sitosterol) are elevated with normal or low desmosterol, sterol absorption inhibition (ezetimibe, colesevelam, plant stanols, etc.) should be considered in combination with a statin to lower atherogenic lipoproteins. For mild elevations of lipoproteins, monotherapy with a sterol absorption inhibitor could be considered if sterol absorption markers are increased.
- If desmosterol is elevated and cholesterol absorption markers are normal or decreased, statin therapy alone or combination therapy (statin plus niacin or fibrate), if appropriate, will be most effective. Sterol absorption inhibition is not recommended.
- If both sterol absorption markers and desmosterol are increased, combination therapy with statin and sterol absorption inhibition will most effectively lower atherogenic lipoproteins.

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	NATURAL BALANCE			
	WELLNESS MEDICAL CENTER 1310 S. MAIN ST ANN ARBOR, MI 48104			
<b>Provider</b>	Client ID: 27-48104-18-0007231			

Laboratory Test	Notes	Moderate to Strong Positive	Weak Positive	Negative	Moderate to Strong Positive Range	Weak Positive Range	Negative Range	Previous Results
								7/10/2015
<b>Celiac Disease</b>	Deamidated Gliadin Peptide Antibody, IgA <sup>+</sup> (U)			19	> 30	20 - 30	< 20	21
	Deamidated Gliadin Peptide Antibody, IgG <sup>+</sup> (U)			18	> 30	20 - 30	< 20	15
	Tissue Transglutaminase (TTG) Antibody, IgA (U/mL)			2	> 10	4 - 10	< 4	2
	Tissue Transglutaminase (TTG) Antibody, IgG (U/mL)			4	> 9	6 - 9	< 6	8

All autoantibodies to tissue transglutaminase (TTG) and deamidated gliadin peptide (DGP) were negative.

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**Diagnosis**

**Glycemic Control**  
Normal

**Comments:** Glucose and hemoglobin A1c are in the normal range and are consistent with normoglycemia.

**Potential Treatment Suggestions:**  
If HbA1C or glucose are abnormal, follow American Diabetes Association (ADA) guidelines

**Underlying Mechanisms**

**Insulin Resistance**

**Comments:** There is evidence of insulin resistance. There is evidence of adipose tissue insulin resistance.

**Potential Treatment Suggestions:**  
If there are features of IR present, consider:  
1. Diet and Lifestyle modification (see Clinical Treatment suggestions)  
2. Metformin  
3. GLP-1 receptor agonists

If there are features of adipose IR present:  
Consider pioglitazone, with caution.

**Beta Cell Functionality/Strain**

**Comments:** There is some evidence of hyperinsulinemia, suggesting beta cell strain. The intermediate Proinsulin/C-peptide ratio suggests there may be some beta cell dysfunction.

**Potential Treatment Suggestions:**  
If there is evidence of beta cell strain, dysfunction or failure, consider GLP-1 receptor agonists, SGLT-2 inhibitors or DPP4 inhibitors, as these may be particularly beneficial.

**NOTE: If Anti-GAD positive and glucose and HbA1c are in the diabetic range, consider insulin. Sulfonylureas and/or insulin may be considered for the treatment of diabetes but should NOT be used in the setting of prediabetes or insulin resistance because of potential for hypoglycemia.**

\*Medications and fasting status may have an effect on test results. There are no medications specifically FDA approved for the treatment of pre-diabetes or insulin resistance.

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\*Ranges of ferritin used for assessment of insulin resistance and diabetes risk differ from reference ranges used for diagnosis of conditions specifically related to iron nutrient status, such as iron deficiency or hemochromatosis.

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								7/10/2015
<b>Glycemic Control</b>	Glucose (mg/dL)			99	> 125	100-125	70 - 99	84
	HbA1c (%)			5.2	≥ 6.5	5.7 - 6.4	≤ 5.6	5.2
	Estimated Average Glucose (mg/dL) (calculated)			102.5	≥ 139.9	116.9 - 139.8	≤ 116.8	102.5
	Fructosamine (µmol/L)			252	> 346	302 - 346	< 302	266
	Glycation Gap			-0.71	> 0.77	0.45 - 0.77	< 0.45	-0.97
	Postprandial Glucose Index			5.6	> 7.9	6.0 - 7.9	< 6.0	5.5
<b>Insulin Resistance</b>	Leptin (ng/mL)	79			> 43	20 - 43	< 20	67
	Leptin:BMI Ratio	2.83			> 1.17	0.66 - 1.17	< 0.66	2.30
	Adiponectin (µg/mL)		12		< 10	10 - 14	> 14	12
	Free Fatty Acid (mmol/L)			0.33	> 0.70	0.60 - 0.70	< 0.60	0.52
	Ferritin (ng/mL) *		71		> 108	61 - 108	< 61	44
	α-hydroxybutyrate (µg/mL) <sup>§</sup>			3.5	> 5.7	4.5 - 5.7	< 4.5	3.0
	Oleic Acid (µg/mL) <sup>§</sup>			24	> 79	60 - 79	< 60	46
	Linoleoyl-GPC (µg/mL) <sup>§</sup>			12.4	< 10.5	10.5 - 13.0	> 13.0	16.1
HOMA-IR (calculated)	6.3			> 4.2	2.6 - 4.2	< 2.6	1.4	
<b>Beta Cell Function</b>	Insulin (µU/mL)	26			≥ 12	10 - 11	3 - 9	7
	Proinsulin (pmol/L)		14		> 16	8 - 16	< 8	14
	C-peptide (ng/mL)		3.5		> 4.6	3.1 - 4.6	1.0 - 3.0	1.6
	Proinsulin:C-peptide Ratio		4.0		> 4.9	3.6 - 4.9	< 3.6	8.4
	Anti-GAD (IU/mL)			< 5	> 5 Positive		≤ 5 Negative	< 5

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Electrolytes	Result	Flag	Reference Interval
Na+ (mmol/L)	140		133 - 145
K+ (mmol/L)	4.4		3.5 - 5.3
Cl- (mmol/L)	104		98 - 110
CO <sub>2</sub> (mmol/L)	27		19 - 31
Anion Gap (calculated)	8		6 - 18
Calcium (mg/dL)	9.4		8.8 - 10.5
Magnesium (mg/dL)	2.1		1.6 - 2.4
Phosphorus (mg/dL)	3.6		2.7 - 4.5

Others	Result	Flag	Reference Interval
Albumin (g/dL)	4.4		3.7 - 5.1
% Albumin (calculated)	64		54 - 71
Globulin (g/dL) (calculated)	2.4		1.9 - 3.5
Albumin:Globulin Ratio (calculated)	1.82		1.15 - 2.50
Total Protein (g/dL)	6.9		6.1 - 8.0
CK (U/L)	37		26 - 192

Liver	Result	Flag	Reference Interval
ALT / GPT (U/L)	13		< 34
AST / GOT (U/L)	18		< 33
ALP (U/L)	62		< 16 years: 62 - 356 16 - 20 years: 37 - 119 21 - 90 years: 35 - 125 > 90 years: 37 - 129
Total Bilirubin (mg/dL)	0.3		Up to 1.2

Autoimmune	Result	Flag	Reference Interval
Rheumatoid Factor (IU/mL)	10		≤ 14
Immunoglobulin IgA (mg/dL)	143		66 - 433
Immunoglobulin IgE (ng/mL)	7		Children aged 1-5 yrs < 144 Children aged 6-9 yrs < 216 Children aged 10-15 yrs < 480 Adults < 240
Immunoglobulin IgG (mg/dL)	775		635 - 1741
Immunoglobulin IgM (mg/dL)	208		45 - 281
Antibody to Cyclic Citrullinated Peptide (anti-CCP) (U/mL)*	< 8.0	L	Positive: ≥ 17.0 Negative: <17.0
Anti-nuclear Antibodies (ANA) Screen	Negative		Negative

Renal	Result	Flag	Reference Interval
Creatinine, serum (mg/dL)	0.6		0.5 - 0.9
BUN (mg/dL)	16		6 - 20
BUN:Creatinine Ratio (calculated)	24		< 11 years: 14 - 34 11 - 15 years: 10 - 30 16 - 20 years: 9 - 25 21 - 70 years: 10 - 27 > 70 years: 10 - 29

Complement	Result	Flag	Reference Interval
Complement C3 (mg/dL)	152		87 - 200
Complement C4 (mg/dL)	36		16 - 61

Bone	Result	Flag	Reference Interval
PTH, Intact (pg/mL)	33		15 - 65

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Anemia	Result	Flag	Reference Interval
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Iron (µg/dL)	59		37 - 145
Direct TIBC (µg/dL)	417		250 - 450
Methylmalonic Acid (µmol/L) <sup>§</sup>	0.15		≤ 0.40
Transferrin Saturation (%) (calculated)	14	L	15 - 50
Ferritin (ng/mL)	71		13 - 150

Thyroid	Result	Flag	Reference Interval
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TSH (µIU/mL)	1.47		0.27 - 4.20
T4 (µg/dL)	8.2		4.5 - 11.7
T4, free (ng/dL)	1.18		0.93 - 1.70
T3 (ng/dL)	142		80 - 200
T3, free (pg/mL)	3.8		> 19 yrs - 2.0 - 4.4
Reverse T3 (ng/dL) <sup>§</sup>	11		8 - 24
Anti-Thyroglobulin Antibody (IU/mL) <sup>†</sup>	89		< 115
Anti-Thyroid Peroxidase Antibody (IU/mL)	< 10		< 34

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Requesting Provider:  
**TONY BOGGESS, DO**  
 NATURAL BALANCE  
 WELLNESS MEDICAL CENTER  
 1310 S. MAIN ST  
 ANN ARBOR, MI 48104

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Male and Female Hormones	Result	Flag	Reference Interval
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Dehydroepiandrosterone sulfate (µg/dL)	114		15 - 19 yrs: 65 - 368 20 - 24 yrs: 148 - 407 25 - 34 yrs: 99 - 340 35 - 44 yrs: 61 - 337 45 - 54 yrs: 35 - 256 55 - 64 yrs: 19 - 246 65 - 74 yrs: 9 - 205 > 74 yrs: 12 - 154
Estradiol (pg/mL)	46.0		Follicular phase: 12.4 - 233.0 Ovulation phase: 41.0 - 398.0 Luteal phase: 22.3 - 341.0 Postmenopause: < 138.0 1 <sup>st</sup> trimester pregnancy: 154.0 - 3243.0 2 <sup>nd</sup> trimester pregnancy: 1561.0 - 21280.0 3 <sup>rd</sup> trimester pregnancy: 8525.0 - >30000.0
FSH (mIU/mL)	5.1		Follicular phase 3.5 - 12.5 Ovulation phase 4.7 - 21.5 Luteal phase 1.7 - 7.7 Postmenopause 25.8 - 134.8
LH (mIU/mL)	10.6		Follicular phase 2.4 - 12.6 Ovulation phase 14.0 - 95.6 Luteal phase 1.0 - 11.4 Postmenopause 7.7 - 58.5
Progesterone (ng/mL)	0.46		Follicular phase: 0.2 - 1.5 Ovulation phase: 0.8 - 3.0 Luteal phase: 1.7 - 27 Postmenopause: 0.1 - 0.8
Human sex hormone-binding globulin (nmol/L)	55		20 - 130
Testosterone (ng/dL)	24		12 - 82
Free Testosterone (ng/dL) (calculated)	0.31		0.06 - 0.92
Dihydrotestosterone (ng/dL) <sup>§</sup>	7		Adult: 4 - 22 Prepubertal: < 3
Insulin-like Growth Factor 1 (ng/mL)	197		14 - 15 Years 107 - 487 16 - 17 Years 108 - 463 18 - 19 Years 108 - 440 20 - 25 Years 106 - 398 26 - 30 Years 101 - 353 31 - 35 Years 94 - 315 36 - 40 Years 86 - 283 41 - 45 Years 78 - 256 46 - 50 Years 68 - 235 51 - 55 Years 60 - 217 56 - 60 Years 54 - 203 61 - 65 Years 48 - 193 66 - 70 Years 43 - 186 71 - 75 Years 40 - 183 76 - 80 Years 39 - 184 81 - 85 Years 37 - 189 86 - 90 Years 37 - 197
Pregnenolone (ng/dL) <sup>§</sup>	25		Adult: < 151 Prepubertal: 20 - 140
Prolactin (ng/mL)	9.45		4.79 - 23.30

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<sup>§</sup>This test was developed and its performance characteristics determined by True Health Diagnostics LLC. It has not been cleared or approved by the U.S. Food & Drug Administration (FDA). The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. This laboratory is certified under CLIA-88 as qualified to perform high complexity clinical laboratory testing.



**Patient**

**Specimen**

Collection Time:	Specimen ID:
8:40 am	16042301545
Collection Date:	Report Type:
4/22/2016	COMPLETE
Received Date:	Report Date:
4/23/2016	4/26/2016

**Provider**

Requesting Provider:  
**TONY BOGGESS, DO**  
 NATURAL BALANCE  
 WELLNESS MEDICAL CENTER  
 1310 S. MAIN ST  
 ANN ARBOR, MI 48104

Client ID:  
 27-48104-18-0007231

CBC with Automated Differential / Platelet	Result	Flag	Reference Interval
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Erythrocyte Sedimentation Rate (ESR) (mm/hour)	14		< 50 years: < 20 ≥ 50 years: < 30
WBC (x10 <sup>3</sup> /μL)	6.4		4.0 - 10.5
RBC (x10 <sup>6</sup> /μL)	4.4		3.8 - 5.1
Hemoglobin (g/dL)	12.9		11.5 - 15.0
Hematocrit (%)	39		34 - 44
MCV (fL)	89		80 - 98
MCH (pg)	30		27 - 34
MCHC (g/dL)	33		32 - 36
RDW (%)	12.6		11.7 - 15
Platelets (x10 <sup>3</sup> /μL)	381		140 - 415

Lab Notes: CBC: Degeneration of sample noted. Unable to report Differential and possibly some CBC components. Evaluate with caution as cellular morphology of all cell lines may be compromised. Clinical correlation is recommended. Results confirmed by microscopic evaluation. CBC: Platelet clumps present. Evaluate results with caution. Results confirmed by microscopic evaluation. **F2-Isoprostanes HDL** unable to perform: No urine received. NOTE: The method for the LpPLA2 assay has been changed. A new baseline establishment is recommended.

To schedule time with a Clinical Health Consultant, please call 1-877-443-5227 or visit us online at [www.truehealthdiag.com](http://www.truehealthdiag.com)

<b>Patient</b>	

<b>Specimen</b>	Collection Time: 8:40 am	Specimen ID: 16042301545
	Collection Date: 4/22/2016	Report Type: COMPLETE
	Received Date: 4/23/2016	Report Date: 4/26/2016

<b>Provider</b>	Requesting Provider: TONY BOGGESS, DO NATURAL BALANCE WELLNESS MEDICAL CENTER 1310 S. MAIN ST ANN ARBOR, MI 48104
	Client ID: 27-48104-18-0007231

Tumor Markers	Result	Flag	Reference Interval	Flag	Previous Results 7/10/2015
AFP (ng/mL) <sup>†</sup>	3.2		< 8.4		3.0
CEA (ng/mL) <sup>†</sup>	0.4		Non-smoker < 5.1 ng/mL, Smoker < 6.6 ng/mL		0.6

Lab Notes: CBC: Degeneration of sample noted. Unable to report Differential and possibly some CBC components. Evaluate with caution as cellular morphology of all cell lines may be compromised. Clinical correlation is recommended. Results confirmed by microscopic evaluation. CBC: Platelet clumps present. Evaluate results with caution. Results confirmed by microscopic evaluation. **F2-Isoprostanes HDL** unable to perform: No urine received. NOTE: The method for the LpPLA2 assay has been changed. A new baseline establishment is recommended.

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# Omega 3 and Omega 6 Fatty Acids Profile

<b>Patient</b>	Collection Time: 8:40 am	Specimen ID: 16042301545	<b>Provider</b>	Requesting Provider:	
	Collection Date: 4/22/2016	Report Type: COMPLETE		TONY BOGGESS, DO NATURAL BALANCE WELLNESS MEDICAL CENTER 1310 S. MAIN ST ANN ARBOR, MI 48104	
	Received Date: 4/23/2016	Report Date: 4/26/2016		Client ID: 27-48104-18-0007231	

Laboratory Test	Notes	High Risk	Intermediate Risk	Optimal	High Risk Range	Intermediate Risk Range	Optimal Range	Previous Results
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<b>Index</b>	HS-Omega-3 Index® (RBC EPA+DHA) <sup>a</sup>		4.0		< 4.0%	4.0% - 8.0%	> 8.0%	4.0
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**Comments:**

**Your HS-Omega-3 Index is below the target range of 8%.**

The HS-Omega-3 Index is the EPA+DHA content of RBC membranes. Increasing the intake of EPA+DHA by 1/2 to 1 gram (500 - 1,000 mg) per day, from either oily fish or fish oil supplements, should significantly improve the index. The exact amount of EPA+DHA needed will vary person to person. A re-check should be done in 3 - 4 months.

Omega-3 Fatty Acids			
Fatty Acids	Range	Current	Previous
Omega-3 Total	0.1% - 14.1%	<b>6.8%</b>	6.8%
Alpha-Linolenic (ALA) <sup>§</sup>	0.1% - 0.4%	0.2%	0.2%
Docosapentaenoic (DPA) <sup>§</sup>	0.6% - 4.1%	2.6%	2.5%
Eicosapentaenoic (EPA) <sup>§</sup>	0.1% - 2.5%	0.5%	0.6%
Docosahexaenoic (DHA) <sup>§</sup>	0.1% - 8.4%	3.5%	3.4%

Omega-6 Fatty Acids			
Fatty Acids	Range	Current	Previous
Omega-6 Total	28.6% - 44.5%	<b>35.6%</b>	36.4%
Arachidonic (AA) <sup>§</sup>	10.5% - 23.3%	16.1%	15.9%
Linoleic (LA) <sup>§</sup>	4.6% - 21.3%	11.9%	12.7%

Other Fatty Acids			
Fatty Acids	Range	Current	Previous
cis-Monounsaturated Total	11.5% - 20.5%	<b>14.7%</b>	15.1%
Saturated Total	36.6% - 42.0%	<b>42.1%</b>	41.0%
Trans Total	<0.1% - 1.8%	<b>0.8%</b>	0.7%

**Content of EPA and DHA (mg/3 oz serving) in Fish<sup>1</sup>**

Higher Omega-3	EPA	DHA	EPA+DHA
Herring, Pacific	1056	751	1807
Anchovy (canned in oil, European, drained solids)	649	1099	1748
Herring, Atlantic	773	939	1712
Salmon, Atlantic <sup>2</sup>	468	1227	1695
Salmon, Coho <sup>2</sup>	462	903	1365
Tuna, Bluefin	309	970	1279
Herring, Atlantic (pickled)	717	464	1181
Mackerel (canned, drained solids)	369	677	1046
Salmon, Sockeye	353	690	1043
Salmon, Chum (canned)	402	597	999
Salmon, Pink (canned, total can contents)	275	569	844
Sardines (canned in oil, Atlantic, drained solids w/bone)	402	433	835

Intermediate Omega-3	EPA	DHA	EPA+DHA
Swordfish <sup>3</sup>	108	656	764
Rainbow Trout (farmed) <sup>4</sup>	220	524	744
Tuna, White (canned in water, w/out salt) <sup>3</sup>	198	535	733
Sea Bass	175	473	648
Pollock, Atlantic	77	383	460
Oysters (farmed, eastern) <sup>4</sup>	195	179	374
Crab, King (cooked, moist heat)	251	100	351
Walleye	94	245	339
Crab, Dungeness (cooked, moist heat)	239	96	335
Flat Fish (flounder/sole)	143	112	255
Clams (cooked, moist heat)	117	124	241
Shrimp (mixed, cooked, moist heat)	115	120	235
Tuna, Light (canned, w/out salt)	40	190	230

Lower Omega-3	EPA	DHA	EPA+DHA
Halibut, Atlantic and Pacific	68	132	200
Northern Lobster (cooked, moist heat)	99	66	165
Scallops (cooked, steamed)	61	88	149
Catfish <sup>2</sup>	51	88	139
Haddock	43	93	136
Cod, Pacific	36	100	136
Cod, Atlantic	3	131	134
Mahi-Mahi (dolphin fish)	22	96	118
Tilapia	4	110	114
Orange Roughy	5	21	26

<sup>1</sup>From the USDA Nutrient Database. Values are for fish cooked with dry heat unless otherwise noted.  
<sup>2</sup>This value averages EPA+DHA from farmed and wild fish.  
<sup>3</sup>Because of the possibility for mercury contamination, the FDA and Environmental Protection Agency recommend that these fish (along with king mackerel and tilefish) not be consumed by women who are already or are trying to become pregnant, nursing mothers, and children under the age of two. For all other people, the intake of these fish should be limited to 6 oz. per week (or 12 oz. per week for albacore tuna).  
<sup>4</sup>Although there has been some concern regarding the presence of small amounts of environmental pollutants in some types of farmed fish, the overall health benefit from the omega-3 fatty acids present in these fish has been calculated to far outweigh the risks (JAMA, 2006;296:1885-1899).

<sup>a</sup>The HS-Omega-3 Index cutpoints are based on Harris and von Shacky, Preventive Medicine 2004;39:212-220.  
<sup>§</sup>This test was developed and its performance characteristics determined by True Health Diagnostics LLC. It has not been cleared or approved by the U.S. Food & Drug Administration (FDA). The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. This laboratory is certified under CLIA-88 as qualified to perform high complexity clinical laboratory testing.

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<b>Patient</b>	Collection Time:	Specimen ID:	<b>Specimen</b>	Requesting Provider:	<b>Provider</b>
	8:40 am	16042301545		TONY BOGGESS, DO	
	Collection Date:	Report Type:		NATURAL BALANCE	
	4/22/2016	COMPLETE		1310 S. MAIN ST	
	Received Date:	Report Date:		ANN ARBOR, MI 48104	
	4/23/2016	4/26/2016		Client ID:	
				27-48104-18-0007231	

### Comments:

LDL cholesterol is above optimal. Please refer to guidelines from the National Cholesterol Education Program Adult Treatment Panel (NCEP:ATPIII) for treatment guidelines related to elevated LDL cholesterol. Also see: Implications of recent clinical trials for the National Cholesterol Education Program Adult Treatment Panel III Guidelines; Coordinating Committee of the National Cholesterol Education Program.

C-reactive protein is increased and fibrinogen is in the intermediate range. hsCRP and fibrinogen are acute phase reactants. Consider repeat analysis of hsCRP in 2-4 weeks to establish baseline value. If hsCRP remains elevated, then lifestyle changes, including weight reduction, smoking cessation, and regular exercise, should be the initial approach. A diet rich in soy protein, viscous fiber, and almonds has been shown to have hsCRP-lowering effects comparable to that of lovastatin 20 mg/day. Drug therapy, to include statins, should be directed toward underlying, treatable cardiovascular risk factors. Increased fibrinogen has been consistently associated with risk of cardiovascular events in multiple studies. A meta-analysis of 6 prospective epidemiological studies found increased fibrinogen levels to be associated with subsequent myocardial infarction and stroke. Individuals with levels in the upper tertile were found to have a relative risk of future cardiovascular disease 2.3-fold higher than that of individuals with levels in the lowest tertile. Fibrinogen levels are reduced by smoking cessation and exercise. The fibrates have significant fibrinogen-lowering effects but, at the present time, it is unknown whether reduction of fibrinogen levels will alter clinical outcomes.

Elevated fasting insulin. If a fasting insulin level is elevated, it reflects hyperinsulinemia but fasting levels can be normal when levels following a glucose load are elevated. Insulin is elevated postprandially in proportion to the carbohydrate content in the meal. Elevated fasting insulin levels have been related to atherosclerosis risk. The combination of elevated fasting insulin, apolipoprotein B levels, and small LDL size identifies a very high-risk group for the development of ischemic heart disease.

Vitamin D (25(OH)D) concentration is in the intermediate range. Decreased vitamin D has been associated with hypertension, inflammation, and the metabolic syndrome. More recently, low serum 25(OH)D has been associated with increased incidence of cardiovascular events and all cause mortality.

ApoE genotype is 3/3. Apolipoprotein E2 and E3 patients respond well to statin drugs, such as atorvastatin, pravastatin, or lovastatin. Omega-3 fatty acid supplementation has been shown to benefit apoE2 and apoE3 patients. If the patient also has insulin resistance, a low carbohydrate or Mediterranean diet may be appropriate. Therapy should be individualized.

This patient has the normal or wild-type genotype for the MTHFR C677T (C/C) polymorphism and is heterozygous for MTHFR A1298C (A/C). The A1298C A/C genotype may result in reduced activity of MTHFR, potentially leading to diminished production of L-methylfolate, the active form of folate. Reduced levels of L-methylfolate lead to decreased production of neurotransmitters, reduced conversion of homocysteine to methionine, and reduced S-adenosylmethionine (SAME) concentrations. CNS neurochemical deficiency along with buildup of homocysteine and decreased availability of methyl groups from SAME may increase an individual's risk for developing cardiovascular disease. Additionally, this may predispose an individual to certain psychiatric disorders and/or memory and attention deficits. Patients with the MTHFR A1298C polymorphism may consider supplementation with the active L-methylfolate in combination with vitamin B12 (methylcobalamin). Increased homocysteine levels may reflect other conditions (B-vitamin deficiencies, renal disease, etc.) which should be evaluated prior to initiating supplementation.

The Cotinine value is associated with exposure to nicotine. If not an active smoker, High Risk Cotinine levels suggest significant exposure to, but are not limited to, second hand smoke, use of tobacco products, or smoking cessation products.

Elevated C-peptide levels may result from increased  $\beta$ -cell activity observed in hyperinsulinism, from renal insufficiency, and obesity. Correlation was also found between higher C-peptide levels and increasing hyperlipoproteinaemia and hypertension.

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	8:40 am	16042301545
	Collection Date:	Report Type:
	4/22/2016	COMPLETE
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	4/23/2016	4/26/2016

<b>Provider</b>	Requesting Provider:
	TONY BOGGESS, DO
	NATURAL BALANCE WELLNESS MEDICAL CENTER
	1310 S. MAIN ST ANN ARBOR, MI 48104
Client ID:	27-48104-18-0007231

### Comments:

All SNP genotyping tests performed at True Health Diagnostics, Richmond, VA use Biosearch Technologies BHQplus chemistry and are greater than 99% accurate. As with all PCR-based tests, this method is subject to rare interference by factors such as inhibitors and low quality or quantity of DNA. If present, the interference usually yields no result, rather than an inaccurate one. Very infrequent mutations or polymorphisms occurring in primer or probe binding regions may also affect testing and could produce an erroneous result. True Health Diagnostics recommends patients and physicians discuss genetic counseling options when reviewing the implications of genetic test results. Note: Non-carrier = Wildtype.

<sup>†</sup>Tumor markers are analyzed using reagents from Roche Diagnostics by electrochemiluminescence immunoassay. These values should not be used in conjunction with values from other reagent manufacturers or methodologies. An elevated value suggests increased risk for cancer associated with each particular tumor marker antigen, and cannot be interpreted as absolute evidence of the presence or absence of malignant disease. Clinical correlation is needed. Refer to guidelines for appropriate patient follow up. AFP results are not interpretable for pregnant females.

<sup>‡</sup> Anti-Thyroglobulin Antibody is analyzed using reagents from Roche Diagnostics by electrochemiluminescence immunoassay. These values should not be used in conjunction with values from other reagent manufacturers or methodologies.

<sup>¥</sup>Anti-CCP results were obtained with the Elecsys Anti-CCP electrochemiluminescence immunoassay. Results from assays of other manufacturers cannot be used interchangeably.

<sup>‡</sup>Celiac disease antibody screening results were obtained with INOVA QUANTA Lite™ reagents and other methods may not yield interchangeable values (concentrations do not correlate to endpoint titers).

<sup>††</sup>The comments, videos, and other educational information provided by True Health Diagnostics are intended to be general in nature and are NOT a substitute for professional medical advice. The treatment options offered by the DPMP Potential Treatment Algorithm are not a replacement for professional medical judgment and the treatment options may cause other side effects or present other serious medical risks.

All tests were analyzed by True Health Diagnostics LLC, 737 N. 5th Street, Suite 103, Richmond, VA 23219, CAP 7224971, CLIA 49D1100708, 1-877-443-5227 unless otherwise noted.

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### End of Report

ATTN PATIENT: Please contact True Health Diagnostics at 1-877-443-5227 to set an appointment with your Clinical Health Consultant to discuss your diet and exercise needs at no charge.