SpectraCell Laboratories
Science + Health + Solutions

CardioMetabolic Test Report

Angela L. Taylor

Date Collected: 6/10/2016

SpectraCell Laboratories
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CardioMetabolic Test Summary

Account Number	278507	Name	Taylor, Angela L.	Batch Number	B6853
Angela Taylor		Gender	F	Accession	Q02348
5801 Roland Ave.		DOB	3/7/1971	Date Received	6/11/2016
Baltimore, MD 21210				Date Reported	6/27/2016
United States					

Results

Test	Normal	Abnormal	Flag**	Units	Ref Range
Insulin	3.9			µIU/mL	< 21.0
Glucose	90			mg/dL	70 - 105
HOMA-IR	0.9				< 3.0
Hemoglobin A1c	5.1			%	<5.6
eAG	100			mg/dL	< 117
C-Peptide	0.77			ng/mL	0.70 - 7.10
Adiponectin *	19.2			µg/mL	5.5 - 37.0
Leptin	3.9			ng/mL	< 25.0
CRP-hs	0.14			mg/L	<3.00
Triglycerides	46			mg/dL	30 - 150
HDL	73			mg/dL	>40
Type 2 Diabetes Risk Assessment	LOW				LOW
Cholesterol		240	B	mg/dL	<200
LDL		150	H	mg/dL	40 - 130
Non-HDL Cholesterol		167	H	mg/dL	<160
Lipoprotein(a)	4.3			mg/dL	6.0 - 29.9
Apolipoprotein B		121	H	mg/dL	40 - 100
Apolipoprotein A1	189			mg/dL	> 115
Homocysteine	7.5			µmol/L	<11.0
VLDL Particles	10			nmol/L	<85
Total LDL Particles		1073	H	nmol/L	<900
Total HDL Particles	8538			nmol/L	>7000
Remnant Lipoprotein	47			nmol/L	<150
Dense LDL III		369	H	nmol/L	<300

Reference values and result evaluation assume a fasting sample was received. If the patient was not fasting, please interpret results accordingly.
**Flags: H = Out of Range High; L = Out of Range Low; B = Borderline

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CardioMetabolic Test Summary

Account Number	278507	Name	Taylor, Angela L.	Batch Number	B6853
Angela Taylor		Gender	F	Accession	Q02348
5801 Roland Ave.		DOB	3/7/1971	Date Received	6/11/2016
Baltimore, MD 21210				Date Reported	6/27/2016
United States					

Results

Test	Normal	Abnormal	Flag**	Units	Ref Range
Dense LDL IV	96			nmol/L	<100
Buoyant HDL 2b	2623			nmol/L	>1500
Non-HDL Particles		1083	H	nmol/L	<1000
Cardio Metabolic Risk Assessment		MODERATE	B		LOW
OmegaCheck	6.0			% by wt	≥ 5.5
Arachidonic Acid/EPA Ratio		6.4	H		< 5.0
Omega-6/Omega-3 Ratio		7.1	H		< 4.5
Omega-3 Total	6.0			% by wt	
EPA		1.5	L	% by wt	> 2.0
DPA	1.1			% by wt	> 1.0
DHA		3.4	L	% by wt	> 4.0
Omega-6 Total	42.8			% by wt	
Arachidonic Acid		9.6	H	% by wt	< 9.0
Linoleic Acid		30.8	H	% by wt	< 20.0

Reference values and result evaluation assume a fasting sample was received. If the patient was not fasting, please interpret results accordingly.
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CardioMetabolic Test Report

Patient Name:	Taylor, Angela L.	BMI:	18	Batch Number:	B6853
Patient DOB:	3/7/1971	Gender:	F	Accession Number	Q02348
Physician	Angela Taylor			Date Received:	6/11/2016
				Report Date:	6/27/2016

Test		Lipoprotein Particle Numbers (nmol/L) *	Patient Results	Reference Value
VLDL Particles	nmol/L	0 43 85 128 170	10	<85
Total LDL Particles	nmol/L	0 450 900 1350 1800	1073	<900
Total HDL Particles	nmol/L	14000 10500 7000 3500 0	8538	>7000
Non-HDL Particles	nmol/L	0 500 1000 1500 2000	1083	<1000
Remnant Lipoprotein	nmol/L	0 75 150 225 300	47	<150
Dense LDL III	nmol/L	0 150 300 450 600	369	<300
Dense LDL IV	nmol/L	0 50 100 150 200	96	<100
Buoyant HDL 2b	nmol/L	3000 2250 1500 750 0	2623	>1500

Test		Lipid Panel (mg/dL)	Patient Results	Reference Value
Cholesterol	mg/dL	0 100 200 300 400	240	<200
Triglycerides	mg/dL	0 75 150 225 300	46	30 - 150
HDL	mg/dL	100 75 50 25 0	73	>40
LDL	mg/dL	0 65 130 195 260	150	40 - 130
Non-HDL Cholesterol	mg/dL	0 80 160 240 320	167	<160

Test		Vascular Inflammation and Biomarkers	Patient Results	Reference Value
CRP-hs	mg/L	0.00 1.50 3.00 4.50 6.00	0.14	<3.00
Lipoprotein(a)	mg/dL	0.0 15.0 30.0 45.0 60.0	4.3	6.0 - 29.9
Apolipoprotein A1	mg/dL	0 125 250 375 500	189	> 115
Apolipoprotein B	mg/dL	0 50 100 150 200	121	40 - 100
Homocysteine	µmol/L	0.0 5.5 11.0 16.5 22.0	7.5	<11.0

CardioMetabolic Risk Assessment

MODERATE

Reference Value: **LOW**

The CardioMetabolic Risk Assessment is an indication of your risk for developing cardiovascular disease, including stroke and diabetes. It is a composite value derived from laboratory test results and may not capture all of the individual risk factors for a particular patient. Additional elements that can impact risk that are not included are weight, blood pressure (hypertension), smoking, inflammation, medical history and family history. The risk score is provided to supplement, not supplant, the clinical utility of individual biomarkers and other clinical indications. The CardioMetabolic Risk Assessment is not intended to provide a single indicator of risk. Treatment decisions should be based on the totality of available information.

* This test was developed and its performance characteristics determined by SpectraCell Laboratories. SpectraCell is authorized under Clinical Laboratory Improvement Amendments (CLIA) to perform high-complexity laboratory testing. The U.S. Food and Drug Administration has not approved or cleared this test; however, FDA clearance or approval is not currently required for clinical use. The results are not intended to be used as the sole means for clinical diagnosis or patient management decisions.

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LPP Lipoprotein Particle Profile™

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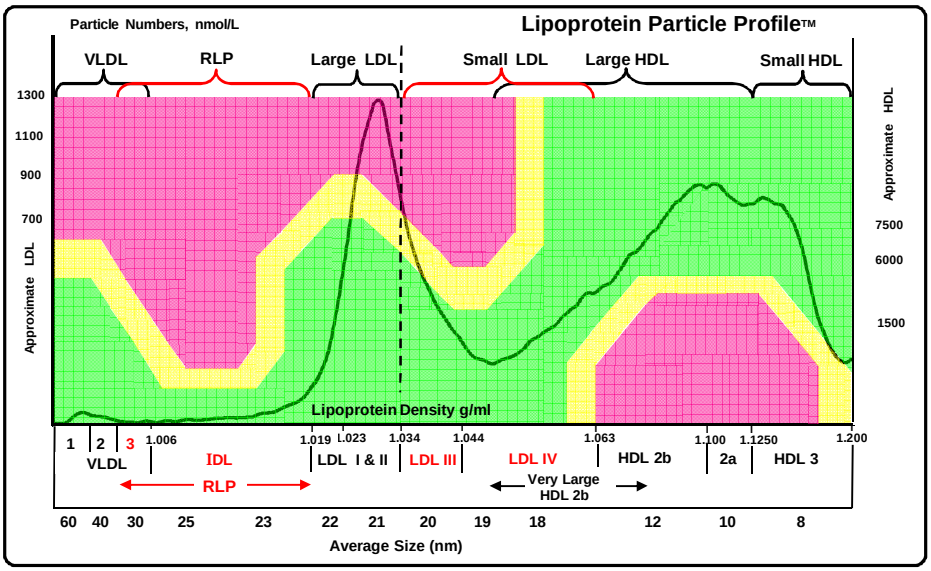
Laboratory Director: James W. Jacobson, Ph.D.
Lipid Science Director: Jan M. Troup, Ph.D.

Name: **Taylor, Angela L.**
DOB: **March 7, 1971**
Physician: **Angela Taylor**
Reference: pectraCell LPP -198 5-9-2016.xls 0.0521 52 0.97

Batch: **B6853**
Accession No: **Q02348**
Draw Date: **June 10, 2016**
Report Date: **June 27, 2016**



Lipoprotein Particle Numbers (nmol/L)

	Value	Reference Value	Alert (Notes Page 3)
VLDL Particles	10	<85	
Total LDL Particles	1073	<900	High (13)
Non - HDL Particles	1083	<1000	High (19)
RLP (Remnant Lipoprotein)	47	<150	
Small - Dense LDL III	369	<300	High (15)
Small - Dense LDL IV & HDL 2b	96	<100	
Total HDL Particles	8538	>7000	
Large - Buoyant HDL 2b	2623	>1500	

Biomarkers and Risk Factors

	Value	Reference Value	Alert (Notes Page 3)
Apo B-100 (mg/dL)	121	40 - 100	High (20)
Apo A-1 (mg/dL)	189	>115	
Lp(a) (mg/dL)	<5.0	6.0 - 29.9 [1]	
Metabolic Syndrome Traits	1	Zero	Possible (8)
C-Reactive Protein-hs (mg/L)	0.1	<3.0	
Insulin (ulU/mL)	3.9	< 21.0	
Homocysteine (umol/L)	7.5	<11.0	

Lipid Panel (mg/dL)

	Value	Reference Value	Alert (Notes Page 3)
Total Cholesterol	240	<200	High (1)
LDL - Cholesterol	150	40 - 130	High (2)
HDL - Cholesterol	73	>40	
Triglycerides	46	30 - 150	
Non - HDL- Chol (calc)	167	<160	High (5)

1. Reference Value for Blacks is 50.0 mg/dL

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Pre-Diabetes Test Report

Patient Name:	Taylor, Angela L.	BMI:	18	Batch Number:	B6853
Patient DOB:	3/7/1971	Gender:	F	Accession Number	Q02348
Physician	Angela Taylor			Date Received:	6/11/2016
				Report Date:	6/27/2016

The Pre-Diabetes Test Report is a comprehensive clinical laboratory assessment of relevant biomarkers to aid you and your provider in the diagnosis, treatment and monitoring of pre-diabetes.

Pre-diabetes is a condition that occurs before the onset of type 2 diabetes. Diabetes researchers believe that during the pre-diabetic period, significant damage is already happening within the body. They estimate that by the time a person is diagnosed with type 2 diabetes, their pancreas has already lost up to 80% of its ability to produce insulin. Increasingly, providers and patients are recognizing the need to identify and treat pre-diabetes in order to prevent damage to the body and ultimately prevent or delay the onset of type 2 diabetes and associated complications. The biomarkers and information included in the Pre-Diabetes Test Report can help you and your provider determine if you are starting to experience changes associated with pre-diabetes.

Pre-Diabetes Biomarkers Laboratory Report

Test			Patient Results	Reference Value
Insulin	µIU/mL	2.0 11.5 21.0 30.5 40.0	3.9	< 21.0
Glucose	mg/dL	30 73 115 158 200	90	70 - 105
HOMA-IR		0.0 5.0 10.0 15.0 20.0	0.9	< 3.0
Hemoglobin A1c	%	1.0 5.0 9.0 13.0 17.0	5.1	<5.6
eAG	mg/dL	0 113 225 338 450	100	< 117
C-Peptide	ng/mL	0.00 2.50 5.00 7.50 10.00	0.77	0.70 - 7.10
Adiponectin *	µg/mL	37.0 27.8 18.5 9.3 0.0	19.2	5.5 - 37.0
Leptin *	ng/mL	0.0 25.0 50.0 75.0 100.0	3.9	< 25.0
CRP-hs	mg/L	0.00 1.50 3.00 4.50 6.00	0.14	<3.00
Triglycerides	mg/dL	0 75 150 225 300	46	30 - 150
HDL	mg/dL	100 75 50 25 0	73	>40

* The performance characteristics of this test were determined by SpectraCell Laboratories. The U.S. Food and Drug Administration has not approved or cleared this test; however, FDA clearance or approval is not currently required for clinical use. The results are not intended to be used as the sole means for clinical diagnosis or patient management decisions.

Type 2 Diabetes Risk Assessment

LOW

Reference Value: **LOW**

The type 2 diabetes risk assessment is an indication of your risk for developing type 2 diabetes. It is a composite value derived from laboratory test results and demographics and may not capture all of the individual risk factors for a particular person. It is provided to supplement, not supplant, the clinical utility of individual biomarkers and other clinical indications. The Type 2 Diabetes Risk Assessment is not intended to provide a single indicator of risk. You should discuss these results with your provider. Treatment decisions should be based on the totality of available information.

Reference values and result evaluation assume a fasting sample was received. If the patient was not fasting, please interpret results accordingly.

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SpectraCell Laboratories
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OmegaCheck™ Report

Patient Name:	Taylor, Angela L.			Batch Number:	B6853
Patient DOB:	3/7/1971	Gender:	F	Accession Number:	Q02348
Physician	Angela Taylor			Date Received:	6/11/2016
				Report Date:	6/27/2016

FATTY ACIDS

	In Range	Out of Range	Flag**	Relative Risk	Optimal Range	Units	Previous Result	Date
OmegaCheck™ (Whole Blood: EPA+DPA+DHA)(1)	6.0			LOW	≥ 5.5	% by wt		
The risk categories for OmegaCheck are based on the top (75th percentile) and the bottom (25th percentile) quartiles of the CHL reference population. Consumption of foods rich in omega-3 fatty acids or supplements containing omega-3 fatty acids (EPA, DHA or DPA) may increase omega-3 fatty acid levels measured by OmegaCheck, and decrease the risk of sudden death due to cardiovascular disease.* The totality of the scientific evidence demonstrates that when consumption of fish oils is limited to 3 g/day or less of EPA and DHA, there is no significant risk for increased bleeding time beyond the normal range. A daily dosage of 1 gram of EPA and DHA lowers the circulating triglycerides by about 7-10% within 2 to 3 weeks. *Albert CM et al. N Engl J Med. 2001; 346; 1113-1118.								
Arachidonic Acid/EPA Ratio		6.4	H		< 5.0			
Omega-6/Omega-3 Ratio		7.1	H		< 4.5			
Omega-3 total	6.0					% by wt		
EPA		1.5	L		> 2.0	% by wt		
DPA	1.1				> 1.0	% by wt		
DHA		3.4	L		> 4.0	% by wt		
Omega-6 total	42.8					% by wt		
Cleveland HeartLab measures a number of omega-6 fatty acids with AA and LA being the two most abundant forms reported.								
Arachidonic Acid		9.6	H		< 9.0	% by wt		
Linoleic Acid		30.8	H		< 20.0	% by wt		

OUT OF RANGE RESULTS SUMMARY

	Result	Flag**	Relative Risk	Optimal Range	Units	Previous Result	Date
Arachidonic Acid/EPA Ratio	6.4	H		< 5.0			
Omega-6/Omega-3 Ratio	7.1	H		< 4.5			
EPA	1.5	L		> 2.0	% by wt		
DHA	3.4	L		> 4.0	% by wt		
Arachidonic Acid	9.6	H		< 9.0	% by wt		
Linoleic Acid	30.8	H		< 20.0	% by wt		

(1) This test is performed by a Liquid Chromatography-Tandem Mass Spectrometry (LC/MS/MS) method. This test was developed and its performance characteristics determined by the Cleveland HeartLab, Inc. It has not been cleared or approved by the U.S. FDA. The Cleveland HeartLab is regulated under Clinical Laboratory Improvement Amendments (CLIA) as qualified to perform high-complexity testing. This test is used for clinical purposes. It should not be regarded as investigational or for research.

**Flags: H = Out of Range High; L = Out of Range Low; CH = Critical High; CL = Critical Low

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Cardio Metabolic Test Report

Component Summaries

This information is provided for educational purposes.

Lipoprotein Particle Numbers

It is now recognized that measuring cholesterol, which is carried by lipoproteins, is insufficient for accurately quantifying a person's cardiometabolic risk. Lipoproteins are significant factors in causing heart disease and stroke and your lipoprotein particle numbers are clinically relevant. In particular, elevated small-dense LDL and Remnant Lipoprotein (RLP) are the most strongly linked to heart attack and stroke. Conversely, large-buoyant HDL2b indicates how well HDL is clearing excess cholesterol from the body. This information reveals potential cardiovascular problems that are often missed when using only a standard lipid panel to assess risk.

Lipid Panel

The basic Lipid Panel is a direct measurement of cholesterol, not lipoproteins (which carry cholesterol) and is a very general indicator of cardiometabolic risk. Measuring lipoproteins is a more accurate and precise way to evaluate your cardiometabolic risk than measuring cholesterol since cholesterol values can be normal in more than 50% of people who have a heart attack or stroke. The basic lipid panel can be helpful when viewed in context with other biomarkers, particularly your lipoprotein particle numbers. Lowering LDL-cholesterol is generally the primary target for treatment. However, elevated triglycerides and low HDL-cholesterol are highly associated with metabolic syndrome – a cluster of conditions including increased blood pressure, high blood glucose level, excess body fat around the waist and abnormal triglycerides or HDL levels. Having three or more of these conditions increases your risk of heart disease, stroke and diabetes.

Vascular Inflammation and Biomarkers

Inflammation appears to play a role in many chronic diseases, including cardiovascular disease. These factors included here are important determinants of cardiometabolic risk, particularly with respect to the health of blood vessels. Apo-B (Apolipoprotein B100) is a measure of all atherogenic (harmful) lipoprotein particles in the blood. Lipoprotein(a) – "Lipoprotein little a" or Lp(a) – is an extremely atherogenic lipoprotein that is strongly linked to developing thrombosis (blood clots). Your Lp(a) level is largely determined by your genes and is not generally affected by lifestyle. High levels of Lp(a) may be a sign of increased risk of heart disease. C-reactive protein (CRP) is an indicator of inflammation throughout the body, including the cardiovascular system. Even in small amounts – measured by a high sensitivity test method (CRP-hs) – CRP is associated with increased risk of heart disease. Finally, high levels of homocysteine are associated with red blood cell aggregation. Although no direct cause and effect relationship has been identified, high homocysteine is associated with low levels of vitamin B6, B12 and folate. It is most likely an indicator of poor lifestyle and diet.

Cardiometabolic Risk Assessment

A variety of approaches have been taken to assess the risk of a heart attack or stroke. These risk Assessment are generally comparable but can differ and are subject to interpretation and impact of factors not being considered in the calculations. The Cardiometabolic Risk Assessment provided here is an indication of your risk (Low, Moderate or High) for developing cardiovascular disease, including stroke and diabetes. It is a composite value derived from laboratory test results and may not capture all of the individual risk factors for a particular patient. Additional elements that can impact risk that are not included are weight, blood pressure (hypertension), smoking, inflammation, medical history and family history. The risk Assessment is provided to supplement, not supplant, the clinical utility of individual biomarkers and other clinical indications. The CardioMetabolic Risk Assessment is not intended to provide a single indicator of risk. Treatment decisions should be based on the totality of available information. Do not use this tool if you have already been diagnosed with heart disease, diabetes, peripheral arterial disease or carotid artery disease. You are already at high risk. Talk to your provider about your risk of a heart attack or future cardiovascular problems.

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Pre-Diabetes Test Report

Component Summaries

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Insulin

Insulin is a hormone that allows blood sugar to be utilized by muscle, liver and fat cells throughout the body. Its main function is to regulate plasma glucose levels within a narrow range and therefore tells a lot about the efficiency with which a person can metabolize carbohydrates. Especially in persons without diabetes, elevated fasting insulin can facilitate diagnosis of insulin resistance, which predisposes a person to cardiovascular disease, stroke and diabetes. Insulin levels can be elevated for two reasons: the body is de-sensitized to the action of insulin (insulin resistance), or blood sugar levels are high enough to warrant excess release of insulin in order process the glucose in the bloodstream which ultimately results in an inability to produce insulin. In the absence of full-blown diabetes, to which high insulin is a precursor, the primary line of therapy is lifestyle changes – specifically weight loss, when visceral adiposity (fat in the midsection) is present, and exercise.

Glucose

Blood glucose (also known as blood sugar) is a measure of the amount of glucose circulating in blood. Since the body's tendency toward homeostasis tightly regulates blood sugar levels, too much or too little blood sugar can indicate a metabolic abnormality. Abnormally low fasting blood sugar (hypoglycemia) can be caused by certain medications, excess alcohol intake, hormone deficiencies, severe illness, and pancreatic tumors or severely restricted caloric intake. High fasting glucose can be indicative of a person with decreased sensitivity to endogenous insulin, which is a hallmark of insulin resistance, and potentially diabetes.

HOMA-IR

The Homeostatic Model Assessment of Insulin Resistance or HOMA-IR is an estimate of insulin resistance – your body's impaired response to your own insulin – derived from fasting glucose and insulin levels. It indicates both the presence and extent of any insulin resistance you might currently express. Higher HOMA-IR values represent greater degrees of insulin resistance.

Hemoglobin A1c

Hemoglobin A1c (HbA1c) is an indicator of blood glucose levels over the previous 2-3 months, but weighted heavily by the most previous 2-4 weeks. HbA1c is a considered a relatively long term marker of glycemic control compared to glucose levels and is also considered a good test for measuring blood sugar control in known diabetics. In addition, some consider HbA1c a valuable marker for accelerated aging since it is an indicator of the damaging effects of glycation in the body. Advanced glycation end products, including HbA1c, have been linked to chronic diseases such as cardiovascular disease, diabetes, cancer and neurodegeneration. In diabetics, high HbA1c levels are strongly associated with increased risk of diabetic complications such as heart disease, neuropathy, retinopathy (blindness) and nephropathy (kidney disease).

Estimated Average Glucose (eAG)

eAG or "estimated average glucose" is derived from your HbA1c result and is considered easier for most people and their providers to work with than HbA1c since it is given in the same units as fasting blood glucose readings (mg/dL) and can be compared directly.

C-Peptide

C-peptide is produced in the pancreas when proinsulin splits apart and forms one molecule of C-peptide and one molecule of insulin and is a measure of endogenous (produced by the patient, not from an injection or pill) insulin production and secretion. C-peptide levels can help distinguish between type 1 diabetes (an autoimmune disorder where the pancreas cannot produce enough insulin) and type 2 diabetes (a disorder in blood sugar metabolism where the pancreas produces plenty of insulin but the body is resistant to it.) Type 1 diabetics will typically have low C-peptide levels while type 2 diabetics will typically have normal or high C-peptide levels. C-peptide can also be useful in diagnosing the cause of hypoglycemia (low blood sugar) in the absence of type 1 or 2 diabetes, specifically in the case of insulinoma (a tumor of the pancreatic β-cells).

Adiponectin

Adiponectin is a peptide hormone produced by adipocytes (fat cells) whose main function is to help muscles use glucose for energy. It tells cells to burn glucose and fatty acids (carbs and fats) for fuel. High levels of adiponectin are good, as it is an indicator of efficient cellular energy production and metabolism. Excess body fat will naturally secrete inflammatory materials, which suggests an intricate relationship between low adiponectin, high inflammation and obesity. Factors that increase adiponectin include weight loss, exercise, certain vitamins and minerals, omega 3 fatty acids, intermittent fasting and some diabetic medications.

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Pre-Diabetes Test Report

Component Summaries

This information is provided for educational purposes.

Leptin

Leptin is a hormone released by fat cells that helps control body weight through its effect on the appetite centers in the brain. Increased caloric intake as well as increased body fat leads to high leptin levels which, correspondingly, causes a decrease in hunger. Decreased caloric intake and decreased body fat cause a decrease in leptin and therefore, an increase in appetite. Leptin is released in a pulsatile fashion, with levels highest at night and lowest in the morning. Because obese people have larger fat cells, they produce more leptin and, therefore, levels tend to run high. Elevated leptin levels normally tell the body to stop eating, yet obese people continue to eat, despite having consumed sufficient calories. This paradox is called "leptin resistance". In obese people, leptin levels are chronically high and after a while the brain starts to ignore or become resistant to its effects. Without the effect of leptin, the appetite controlling factor that tells the body that it is full and not hungry is absent.

hs-CRP

High Sensitivity C-Reactive Protein (hs-CRP) reflects the presence of inflammation in the body. For some time now, hs-CRP levels have been known to be associated with risk for developing cardiovascular disease where levels below 1 mg/L are associated with the lowest risk, levels between 1 and 3 mg/L are at average risk and levels above 3 mg/L are associated with highest risk. However, there is more to the story. Recent studies have shown that low-grade inflammation is also associated with the risk of developing type 2 diabetes and that chronic sub-clinical inflammation is a part of the insulin resistance syndrome and strongly related to features of metabolic syndrome. A healthy lifestyle – eating a healthy diet, maintaining a healthy weight, getting enough physical activity, not smoking, limiting alcohol use – can have a big impact on reducing inflammation.

Triglycerides

Triglycerides are the major transporters of dietary fats throughout the bloodstream as well as the main storage unit for fat in adipose tissue (fat cells). Elevated triglycerides are often a sign of other conditions that increase the risk of heart disease and stroke, including obesity and metabolic syndrome. High triglyceride levels are indicative of abnormal lipoprotein metabolism and can also be a sign of poorly controlled type 2 diabetes. Through a complex metabolic interaction, triglycerides promote the formation of small, dense LDL particles, which are particularly dangerous. Diets high in carbohydrates or excessive alcohol will increase triglyceride levels, while omega 3 fatty acids can reduce triglyceride levels substantially in a dose-dependent manner. Exercise can also help lower triglycerides.

HDL Cholesterol

Particles called lipoproteins carry cholesterol in the blood. Two important kinds of lipoproteins are low-density lipoprotein (LDL) and high-density lipoprotein (HDL). Total cholesterol is a measure of the total amount of cholesterol in your blood and is based on HDL, LDL and VLDL levels. LDL cholesterol contains the majority of the body's cholesterol and is known as "bad" cholesterol because having high levels can lead to plaque buildup in your arteries and result in heart disease and stroke. HDL cholesterol is the good or "healthy" cholesterol. It helps to carry cholesterol to the liver where the cholesterol is broken down and excreted. High levels are desirable and can reduce the risk of heart disease and stroke. Reasons some people have low HDL cholesterol levels and high LDL cholesterol levels include genetic factors, high triglyceride levels, type 2 diabetes, certain medications, smoking, obesity, eating unhealthy and not being physically active. By living a healthy lifestyle – eating a healthy diet, maintaining a healthy weight, getting enough physical activity, not smoking, limiting alcohol use – you can keep your cholesterol in a healthy range and reduce your risk for heart disease and stroke.

Type 2 Diabetes Risk Assessment

Diabetes is a metabolic disorder and a life-long disease marked by high levels of sugar in the blood. It can be caused by too little insulin (a hormone produced by the pancreas to regulate blood sugar), resistance to insulin or both. Pre-diabetes is a condition in which blood glucose levels are higher than normal but are not high enough for a diagnosis of diabetes. Pre-diabetes is especially prevalent in people over 45 years of age who are over-weight (as indicated by a body mass index over 25) and physically inactive. This group has a higher risk of developing type 2 diabetes. Although people who have pre-diabetes are at increased risk for developing type 2 diabetes, heart disease and stroke, not everyone in this group will develop these conditions. The SpectraCell Pre-Diabetes Test is an evaluation of specific risk factors that can indicate the presence of pre-diabetes and provide an assessment of your risk for developing type 2 diabetes (Low, Moderate, or High). This test can be especially useful for identifying people within higher risk groups that are most likely to benefit from early medical and/or lifestyle intervention.

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OmegaCheck™ Report

Component Summaries

This information is provided for educational purposes.

OmegaCheck™

Omega-3 and omega-6 fatty acids are polyunsaturated long chain fatty acids (PUFA) required by the body for proper functioning, normal growth and the formation of neural synapses and cellular membranes. Omega-3 and -6 fatty acids are considered "essential" and obtained primarily from dietary sources.

Three of the most important omega-3 fatty acids are eicosapentaenoic acid (EPA), docosapentaenoic acid (DPA) and docosahexaenoic acid (DHA). Omega-3 fatty acids are primarily obtained from food sources, such as oily fish. They have antioxidant (1), anti-inflammatory (2) and anti-thrombotic (3) effects, and can help to reduce triglyceride levels (4-6). Two of the most important omega-6 fatty acids are arachidonic acid (AA) and linoleic acid (LA). Omega-6 fatty acids are obtained from animal sources and plant oils, and have pro-inflammatory (2,7) and pro-thrombotic (7) properties at high levels.

Clinical Significance

- Consumption of omega-3 fatty acids reduces the occurrence of major acute cardiac events in healthy individuals or patients with cardiovascular risk factors or who have cardiovascular disease (8-14).
- Consumption of omega-3 fatty acids leads to a reduction in triglycerides (4-6) and non-HDL (6), as well as Lp-PLA2 levels (6).
- A high intake of omega-6 fatty acid precursors can interfere with the absorption of omega-3 fatty acids (8).
- The mean omega-6:omega-3 ratio of the standard American diet is approximately 10:1 (8). A diet with an omega-6:omega-3 fatty acid ratio of 4:1 or less may reduce total mortality up to 70% over 2 years (11).

Treatment Considerations –*These treatment considerations are for educational purposes only. Specific treatment plans should be provided and reviewed by the treating practitioner.*

- **Assess dietary intake of omega-3 and omega-6 fatty acids** – Dietary sources of omega-3 fatty acids include fatty fishes, such as salmon or sardines, nuts and plant oils. Foods high in omega-6 fatty acids include red meat, poultry, eggs, plant oils, and nuts.
- **Consider omega-3 fatty acid supplementation** – If currently taking, consider adjusting dosage and retest in 1-2 months.
- **Assess lifestyle habits** – Consider diet/exercise/weight reduction efforts if appropriate.

OmegaCheck™ References

1. Kesavulu MM et al. Effect of ω-3 fatty acids on lipid peroxidation and antioxidant enzyme status in type 2 diabetic patients. Diabetes Metab. 2002; 28: 20-26.
2. James MJ et al. Dietary polyunsaturated fatty acids and inflammatory mediator production. Am J Clin Nutr. 2000; 71: 343s-348s.
3. Engstrom K et al. Effect of low-dose aspirin in combination with stable fish oil on whole blood production of eicosanoids. Prostaglandins Leukot Essent Fatty Acids. 2001; 64: 291-297.
4. Balk E et al. Effects of omega-3 fatty acids on cardiovascular risk factors and intermediate markers of cardiovascular disease. Evid Rep Technol Assess 2004: Mar(93): 1-6.
5. Musa-Veloso K et al. Long-chain omega-3 fatty acids eicosapentaenoic acid and docosahexaenoic acid dose-dependently reduce fasting serum triglycerides. Nutrition Reviews. 2010; 68: 155-167.
6. Kastelein JJP et al. Omega-3 free fatty acids for the treatment of severe hypertriglyceridemia: The EpanoVa fOr Lowering Very high tyriglyceridEs (EVOLVE) trial. J Clin Lipidol. 2014; 8: 94-106.
7. Schmitz G. The opposing effects of n-3 and n-6 fatty acids. Prog Lipid Res. 2008; 47: 147-155.
8. Saito Y et al. Effects of EPA on coronary artery disease in hypercholesterolemic patients with multiple risk factors: Sub-analysis of primary prevention cases from Japan EPA Lipid Intervention Study (JELIS). Atherosclerosis. 2008; 200: 135-140.
9. Marchioli R et al. Early protection against sudden death by n-3 polyunsaturated fatty acids after myocardial infarction. Time-course analysis of the results of the Gruppo-Italiano per lo Studio della Sopravvievenza nell'Infarto Miocardio (GISSI)-Prevenzione. Circulation. 2002: 105; 1897-1903.
10. Pottala JV et al. Blood eicosapentaenoic and docosahexaenoic acids predict all-cause mortality in patients with stable coronary heart disease: The Heart and Soul Study. Circ Cardiovasc Qual Outcomes. 2010; 3: 406-412.
11. de Lorgeril M et al. Mediterranean alpha-linolenic acid-rich diet in secondary prevention of coronary heart disease. Lancet. 1994; 343: 1454-1459.
12. Simopoulos AP. The importance of the omega-6/omega-3 fatty acid ratio in cardiovascular disease and other chronic diseases. Exp Biol Med. 2009; 233: 674-688.
13. Albert CM et al. Blood levels of long-chain n-3 fatty acids and the risk of sudden death. N Engl J Med. 2002; 346: 1113-1118.
14. Harris WS and von Schacky C. The Omega-3 Index: A new risk factor for death from coronary heart disease? Prev Med. 2004; 39: 212-220.