



TEST PATIENT

Sample TestName
Sex : F
Date Collected : 00-00-0000

LAB ID: 00000000 UR#:00000000

TEST PHYSICIAN

DR EDWARD CHAN
11-1, WISMA LAXTON,
JALAN DESA, TAMAN
DESA, 58100 KL

INTEGRATIVE MEDICINE

BLOOD - EDTA

RED CELL FATTY ACID PROFILE

Red Cell Fatty Acid Summary

	Result	Range	Units	
Saturated Fats, Total	36.99	19.30 - 39.40	%	
Monounsaturated Fats, Total	22.64 *H	7.50 - 17.90	%	
Omega 3, Total	7.37	4.50 - 13.40	%	
Omega 6, Total	32.47 *H	12.10 - 29.20	%	
Omega 3/Omega 6 Ratio	0.2 *L	0.4 - 0.5	RATIO	
Omega 6/Omega 3 Ratio	4.4	2.3 - 14.5	RATIO	
AA/EPA ratio	10.8	1.4 - 52.6	RATIO	
OMEGA 3 INDEX	7.32		%	
Omega 3 Fatty Acids				
alpha Linoleic Acid	0.65 *H	0.10 - 0.20	%	
Eicosapentanoic Acid	0.84	0.10 - 1.20	%	
Docosapentanoic Acid	1.46 *L	1.90 - 4.70	%	
Docosahexanoic Acid	4.42	2.50 - 7.50	%	
Total Omega 3 Fatty acids	7.37	4.50 - 13.40	%	
Omega 6 Fatty Acids				
Linoleic Acid	20.56 *H	5.00 - 12.40	%	
gamma Linolenic Acid	0.12 *H	0.00 - 0.10	%	
Eicosadienoic Acid	0.27 *H	0.00 - 0.20	%	
Dihomo-g-linolenic Acid	1.28 *H	0.00 - 1.00	%	
Arachidonic Acid	9.06	6.20 - 13.70	%	
Docosatetraenoic Acid	0.92	0.00 - 1.00	%	
Docosapentaenoic Acid (n6)	0.26	0.00 - 1.00	%	
Total Omega 6 Fatty Acids	32.47 *H	12.10 - 29.20	%	
Monounsaturated Fats				
Palmitoleic Acid	0.42 *H	0.00 - 0.40	%	
Oleic Acid	20.72 *H	7.50 - 15.50	%	
Gondoic Acid	0.56 *H	0.00 - 0.40	%	
Nervonic Acid	0.94	0.00 - 1.00	%	
Total Monounsaturated Fats	22.64 *H	7.50 - 17.90	%	
Total Omega 9 Fatty Acids	22.22 *H	16.00 - 20.60	%	
Saturated Fatty acids				
Myristic Acid	0.17	0.00 - 0.70	%	
Palmitic Acid	19.45	9.30 - 21.70	%	
Stearic Acid	14.91 *H	9.30 - 13.70	%	
Arachidic Acid	0.44	0.10 - 5.00	%	
Behenic Acid	0.93	0.60 - 2.80	%	
Lignoceric Acid	1.09 *H	0.00 - 1.00	%	
Total Saturated Fats	36.99	19.30 - 39.40	%	
Trans Fatty Acid Profile				

(*) Result outside normal reference range

(H) Result is above upper limit of reference rang (L) Result is below lower limit of reference range



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BLOOD - EDTA	Result	Range	Units
Trans Palmitoleic Acid	0.05		%
Trans Oleic Acid	0.27		%
Trans Linoleic Fatty Acid	0.21		%
Trans Fatty Acids, Total	0.53 *L	0.78 - 3.04	%
Trans Fat Index	0.48	0.30 - 2.42	%



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Essential Fatty Acids Comment**OMEGA 3 INDEX:**

The biomarker, Omega 3 Index, has been derived from the accepted principle that the RBC membranes reflect cardiac membrane omega 3 FA content. As supplementation of omega 3 FAs (in particular EPA and DHA) is known to reduce the risk of CHD, the Omega 3 Index expresses the sum of the EPA and DHA as a percentage of the total identified fatty acids.

An Omega 3 Index greater than 8% is deemed to be desirable (Cardioprotective).

An Omega 3 Index between 4 and 8 % is deemed acceptable.

An Omega 3 Index less than 4% is deemed to be undesirable (High Risk).

ELEVATED alpha LINOLEIC ACID LEVEL:**May Indicate:**

Reduced delta-6 desaturase, elongase and delta-5 desaturase activity (especially if EPA is also low), Magnesium, niacin, pyridoxal-5-phosphate, vitamin C and/or zinc deficiency (especially if EPA is also low), Excessive ALA intake.

Treatment Considerations:

Magnesium, niacin, pyridoxal-5-phosphate, vitamin C and/or zinc supplementation, Reduce ALA intake if indicated, Treat other omega 3 imbalances as indicated.

LOW DOCOSAPENTANOIC ACID LEVEL:

DPA is an intermediate species between EPA and DHA and is needed for nerve membrane function. Add fish oil.

Assess other omega 3 levels and treat accordingly.

ELEVATED LEVEL LINOLEIC ACID:

Linoleic Acid is an essential fatty acid (omega 6). It is the parent molecule for omega 6 series. It plays a role in membrane structure as well as a role in eicosanoid production.

May Indicate:

Excessive dietary intake of omega 6 (e.g. vegetable oils) (especially if GLA, DGLA & AA are also high), Low delta-6 desaturase enzyme activity (especially if GLA is also low), Magnesium, niacin, pyridoxal-5-phosphate, vitamin C or zinc deficiency (especially if GLA is also low).

Associated Symptoms & conditions:

Inflammatory conditions.

Treatment Considerations:

Reduce dietary intake of omega 6, Avoid all other vegetable oils, Magnesium, niacin, pyridoxal-5-phosphate, vitamin C or zinc supplementation, Make dietary changes to reduce insulin levels (e.g. low carbohydrate diet, low glycemic index diet),

ELEVATED LEVEL GAMMA LINOLEIC ACID:

Gamma linoleic Acid is produced from LA by the enzyme delta-6 desaturase. It is the precursor of DGLA, an anti-inflammatory fatty acid, and is also the precursor of arachidonic acid, a pro-inflammatory fatty acid.

May Indicate:

Excessive dietary intake of omega 6 (e.g. vegetable oils) (especially if GLA, DGLA & AA are also high), Vitamin B5 and biotin deficiency (especially if DGLA is also low).

Treatment Considerations:

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Reduce dietary intake of omega 6 fatty acids if indicated, Use olive oil, Avoid all other vegetable oils, Magnesium and vitamin B5 supplementation.

ELEVATED LEVEL EICOSADIENOIC ACID:

Eicosadienoic Acid is the elongation product of GLA and the direct precursor of DGLA.

Treatment Considerations:

Assess other EFAs levels and treat accordingly.

LOW LEVEL PALMITOLEIC ACID:

Palmitoleic Acid is the desaturation product of Palmitic Acid.

Food Sources:

Avocado Oil, Cow's Milk, Evening Primrose Oil, Macadamia Oil.

ELEVATED LEVEL PALMITOLEIC ACID:

May Indicate: EFA deficiency

ELEVATED LEVEL OLEIC ACID:

Oleic acid is an omega 9 fatty acid that is critical for membrane fluidity.

May Indicate:

Increased membrane fluidity, Malignant tissue (especially if stearic acid is also low).

Associated Symptoms & Conditions:

Prostate Cancer (especially if stearic acid is also low).

Treatment Considerations:

Omega 3 supplementation, Use omega 6 supplementation with caution.

LOW LEVEL MYRISTIC ACID:

Food Sources: Butter, Coconut oil, Macadamia oil.

ELEVATED LEVEL STEARIC ACID:**May Indicate:**

Diet high in saturated fat, Magnesium, niacin, pyridoxal-5-phosphate, vitamin C or zinc deficiency (especially if oleic acid is also low).

Associated Symptoms & Conditions:

Atherosclerosis, Cardiovascular disease, High cholesterol, High triglycerides, Stroke.

Treatment Considerations:

Reduce dietary intake of saturated fat, Magnesium, niacin, pyridoxal-5-phosphate, vitamin C or zinc supplementation.

LOW LEVEL ARACHIDIC ACID

Food Sources: Butter, Evening Primrose Oil, Peanut oil, Pumpkin Seed Oil, Wheat Germ Oil.

INFLAMMATION INDEX COMMENT

An AA/EPA ratio of 3.0 is deemed acceptable whilst an ideal/optimal ratio is 1.5. The patient needs to be titrated using Omega 3 Essential Fatty Acids to bring the patient to an optimal ratio.

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Supplementation Recommendations:

The following dosages are suggestive guidelines as indicated in the literature:

AA/EPA Ratio	Interpretation
1.5	Ideal
3.0	Good
10	Moderate risk
>15	High risk

Treatment Suggestions	Omega-3 Per Day
Maintenance	2.5g
Improved CV function	5.0g
Chronic pain	7.5g
Neurological disease	10.0g

TRANS FAT INDEX REFERENCE RANGES:

Desirable:	< 1.0 %
Intermediate:	1.0 - 1.65 %
Undesirable:	> 1.65 %

Like the essential omega-3 and omega-6 fatty acids, trans-fatty acids (fats) come only from our foods; that is, they cannot be made in the body like saturated and mono-unsaturated fats can. Although a small amount of these fats are found "naturally" in foods like full-fat dairy products and beef, the great majority (80-90%) of trans fats come from the "partial hydrogenation" of liquid vegetable oils. This is an industrial process that converts these oils into solid margarines and shortenings. Consumption of these "industrial trans fats" has been linked to increased levels of "bad" cholesterol, and decreased levels of "good" cholesterol, and more importantly, to a higher risk for heart attacks.

Blood levels of trans fats reflect levels in the diet - the more you eat, the higher they are in the blood. Therefore, the only way to lower trans fat levels in the blood is to consume less trans fats from foods. The foods that provide the most trans fats in the diet include cakes, cookies, pies, pastries, french fries, tortilla chips, crackers, popcorn, and margarines.

Unfortunately, it is virtually impossible to know for certain how much trans fat is in your diet. This is because varying amounts of trans fats are included in literally thousands of food products, and the amounts in any given food product can change over time depending on the prices of the fats used to produce the food. Consequently, the only way to know your personal Trans Fat Index is to measure it.