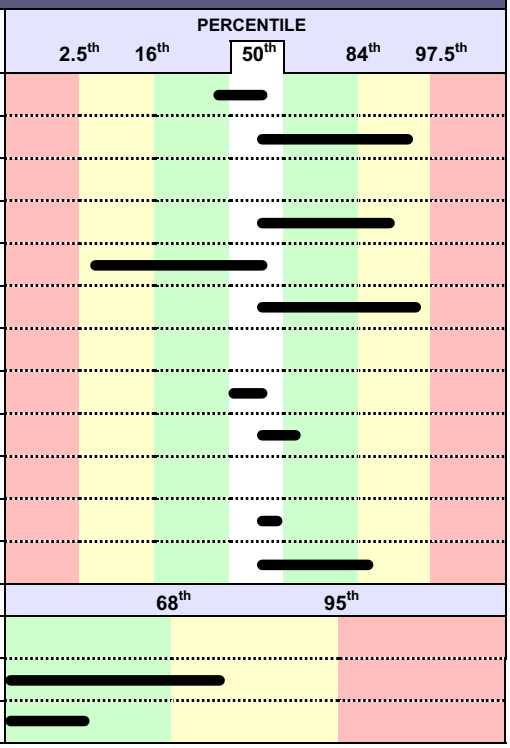
LAB #: Sample Report
PATIENT: Sample Patient
ID: Sample ID
SEX: Male
DOB: 01/01/1984 AGE: 42

CLIENT #: 12345
DOCTOR: Sample Doctor, MD
Doctor's Data, Inc.
3755 Illinois Ave.
St. Charles, IL 60174 U.S.A.

Fatty Acids; Erythrocytes

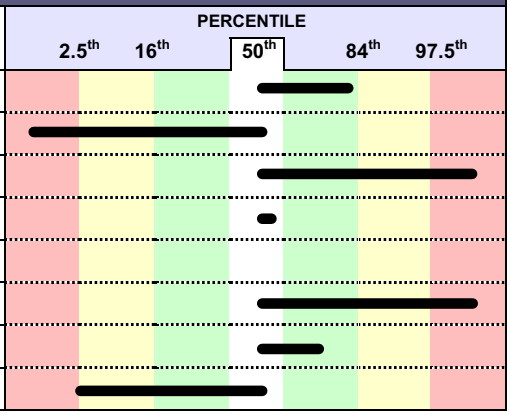
OMEGA 3 FATTY ACIDS	RESULT %/TOTAL	REFERENCE INTERVAL
Eicosapentaenoic (EPA) 20:5ω3	**0.9**	0.5- 5
Docosahexanoic (DHA) 22:6ω3	**7.6**	3- 8
OMEGA 6 FATTY ACIDS		
Linoleic 18:2ω6	**14**	7- 15
Dihomo-γ-linolenic (DGLA) 20:3ω6	**1.2**	1.2- 4
Arachidonic (AA) 20:4ω6	**19**	11- 20
MONOUNSATURATED FATTY ACIDS		
Oleic 18:1ω9	**15**	12- 20
Palmitoleic 16:1ω7	**0.30**	0.12- 0.65
SATURATED FATTY ACIDS		
Palmitic 16:0	**23**	17- 28
Stearic 18:0	**18**	14- 20

TRANSISOMER FATTY ACIDS		
Palmitelaidic 16:1ω7t	**0.032**	< 0.05
Elaidic 18:1ω9t	**0.1**	< 0.4



RATIOS

OMEGA 3 AND OMEGA 6 RATIOS	RESULT	REFERENCE INTERVAL
AA/EPA	**21**	2- 28
EPA/DHA	**0.12**	0.14- 1.2
AA/DGLA	**16**	5- 14
EPA/DGLA	**0.7**	0.2- 1.6
DESATURASE ENZYME MARKERS		
Linoleic/DGLA (Δ6)	**11**	2.5- 10
Stearic/Oleic (Δ9)	**1.19**	0.8- 1.4
DGLA/AA (Δ5)	**0.06**	0.065- 0.16



FATTY ACID DISTRIBUTION

	TOTAL	OMEGA 3	OMEGA 6	MONO	SATURATED	TRANS
Patient Distribution	**5230** µmol/L	**8** %	**35** %	**16** %	**41** %	**0.1** %
Average Distribution	**5200** µmol/L	**9** %	**29** %	**18** %	**44** %	**0.3** %

SPECIMEN DATA

Comments:
Date Collected: 06/19/2024
Date Received: 06/20/2024 <dl: less than detection limit
Date Reported: 06/21/2024
Method: Gas Chromatography (GC)

v07.10

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Erythrocyte Fatty Acids

This test measures the fatty acids (FAs) that are present as constituents of phospholipids in the membranes of erythrocytes (red blood cells). Each specific FA is reported as a percentage of total FAs measured. FAs are carboxylic acids that may be either unsaturated (one or more carbon-to-carbon double bonds) or saturated (no carbon-to-carbon double bonds). FAs may come from natural or synthetic sources. There are two families of essential FAs (EFAs), omega-3 and omega-6, all of which are poly-unsaturated FAs (PUFAs) meaning that they all have more than one C=C double bond.

FAs derived from the EFAs (or taken in via diet or supplements) are essential components of all cell membranes and appropriate membrane fatty acid content is pivotal for optimal membrane fluidity and cellular metabolism. The same FAs eventually give rise to hormone-like substances that are involved in the regulation of blood pressure, blood coagulation, lipid levels, immune response, tumor growth and inhibition, the inflammatory response to injury and infection, and may play a role in seizure disorders and dementias such as Alzheimer's disease. Fatty acid metabolism is very dynamic and proper balance among essential and non-essential FAs, as well as avoidance of harmful trans-FAs, is required for optimal health and wellness.

The American Heart Association's Nutrition Committee strongly advises these fat guidelines for healthy Americans over age 2:
- Limit total fat intake to less than 25-35 percent of your total calories each day; limit saturated fat intake to less than 7 percent of total daily calories
- Limit trans-fat intake to less than 1 percent (trace) of total daily calories; the remaining fat should come from sources of monounsaturated and polyunsaturated fats such as nuts, seeds, fish and vegetable oils
- Limit cholesterol intake to less than 300 mg per day, for most people. If you have coronary heart disease or your LDL cholesterol level is 100 mg/dL or greater, limit your cholesterol intake to less than 200 mg a day.
- Example: a sedentary female who is 31-50 years old needs about 2,000 calories each day. Therefore, she should consume less than 16 g saturated fat, less than 2 g trans- fat and between 50 and 70 grams of total fat each day (with most fats coming from sources of polyunsaturated and monounsaturated fats, such as fish, nuts, seeds and vegetable oils).

EPA/DHA Ratio Lower Than Expected

The EPA/DHA ratio is lower than expected in this sample. Check the individual results for EPA and DHA to determine why the ratio is low.

Both EPA and DHA are omega-3 FAs that can be bio-converted from the essential FA alpha-linolenic acid. However the bio-conversion process is inefficient and direct intake of EPA and DHA rich oils (e.g. fish oil) is a much more efficient way to restore the omega-3 FA content of membrane phospholipids. Retro conversion of DHA to EPA does occur but is inefficient; only about 10-12% when pure DHA is provided in the diet. DHA may be more important than EPA, especially in brain development (e.g. fetus and infants) and function (memory, concentration, attention, mood, etc).

No consensus in the literature as to the "best" EPA / DHA ratio in foods and supplements. However, depending on the clinical presentation of the patient and, in light of the ratio reported

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for this patient, consider the following supplemental doses of DHA or DHA+EPA as recommended by the International Society for the Study of Fatty Acids and Lipids (ISSFAL)
- Pregnant and lactating women 300 DHA (only DHA - no EPA) mg per day
- Infants 1 to 18 months - 14.5 mg/kg (32 mg/lb) DHA+EPA
- Children 18 months to 15 years - 6.8 mg/kg (15 mg/lb) DHA+EPA
- Adults - 500 mg DHA+EPA (minimum 220 mg DHA plus minimum 220 mg EPA)
- Adults with high triglycerides should take 2 to 4 grams of DHA plus EPA daily (American Heart Association recommendation).

AA/DGLA Ratio Higher Than Expected

The AA/DGLA ratio in this sample is higher than expected. High AA / DGLA ratios are consistent with a pro-inflammatory state.

The ratio may be high due to a relatively high level of AA (arachidonic acid) or a low level of DGLA (dihomo-gamma-linolenic acid). Check the individual levels of AA and DGLA. Increased levels of AA lead to increased pro-inflammatory eicosanoid production. Low levels of DGLA lead to decreased availability of the anti-inflammatory metabolites of DGLA.

Linoleic Acid/DGLA Ratio Higher Than Expected

The LA/DGLA ratio in this sample is higher than expected. This means that there is a preponderance of LA present in this sample (or a DGLA deficit). This ratio increases when the delta-6 desaturase enzyme (D-6-D) is inhibited due to Zn and/or Mg deficiency, high insulin levels or in the presence of excess saturated, monoenoic (e.g. oleic and palmitoleic acid) or trans-fatty acids. High LA/DGLA is a sensitive indicator of low zinc levels. Consider assessment of zinc status (DDI Whole Blood or RBC Elements tests). It may also imply a need to decrease supplementation of downstream desaturation products such as gamma-linolenic acid, eicosapentaenoic acid (EPA), and arachidonic acid (AA). Consider adding DGLA sources such as black currant or evening primrose oil.

DGLA/AA Lower Than Expedted

The DGLA/AA ratio in this sample is lower than expected.

Low DGLA/AA ratios are consistent with a pro-inflammatory state. The ratio may be low due to a relatively low level of DGLA (dihomo-gamma-linolenic acid)or a high level of AA (arachidonic acid). Check the individual levels of AA and DGLA. Low levels of DGLA lead to decreased availability of the anti-inflammatory metabolites of DGLA. Increased levels of AA lead to increased pro-inflammatory eicosanoid production.

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