

Fatty Acids - Blood Spot

Bloodspot Fatty Acid Profile

Why use Bloodspot™ testing ?

- Easy to implement in any practice
- Does not require venipuncture
- Cost-effective testing & therapy
- Easy enough for patients to use at home
- Simple and economical option for follow-up testing

Why use the Bloodspot™ Fatty Acids Profile*?

From a simple finger stick it measures key omega-3 and omega-6 fatty acids and calculates key indicators to establish your optimal balance. Trans fatty acids—the "bad" oils in processed foods—are also measured.

- **Improve patient compliance**
Testing guides and supports your recommendations for higher doses of fatty acid supplements.
- **Inflammatory balance**
Improper fatty acid intake affects the balance of anti- and pro-inflammatory eicosanoids, increasing health risks.
- **Statins**
Among the top five drugs prescribed last year, statins have been shown to unfavorably alter this inflammatory balance.
- **Increased free radical production**
Consumption of polyunsaturated fatty acids (PUFAs) without increasing antioxidant intake will cause increased production of free radicals.
- **Immune suppression**
Excessive consumption of omega-3 fatty acids can suppress immune function, leading to infections and poor wound healing.



Fatty Acids Research

Increased Consumption of Fatty Acid Supplements

Evidence of the adverse effects of fatty acid deficiencies has led to sharply increased consumption of essential fatty acid supplements. When incorporated into the cell membranes of the body, these omega-3 and omega-6 fatty acids function as precursors for eicosanoids that control a host of cellular functions and responses. The balance between

the pro-inflammatory and anti-inflammatory eicosanoids is influenced in large part by the balance of fatty acids we consume. Since inflammation has now been shown to be integral to so many disease processes, nutrients which counteract inflammation can have profound health benefits. But your patients need an answer to a critical question about their fatty acid supplementation— are they taking too little to be effective or such an excess that they are causing other health problems?

Anti-inflammatory and Pro-inflammatory Eicosanoids

Cold water fish oils contain a high concentration of the omega-3 fatty acids EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid). EPA is the precursor for the Series 3 eicosanoids, which have potent anti-inflammatory effects. The oil from certain plant seeds, particularly borage, evening primrose, and black currant, have high concentrations of the omega-6 fatty acid GLA (gamma linolenic acid), the precursor to the anti-inflammatory Series 1 eicosanoids.

The omega-6 fatty acid AA (arachidonic acid) is found in high concentration in the fat of red meats. AA is converted to the pro-inflammatory Series 2 eicosanoids, increasing the risk for various disease and inflammatory processes in the body. The Bloodspot™ Fatty Acid Profile can guide patients to the right balance of FA intake.

Statins Negatively Impact Fatty Acids Status

Recent research has shown that HMG-CoA reductase inhibitors ("statins") can increase the relative amounts of AA in the blood, resulting in an increase in the AA:EPA ratio.(1) "High fish oil consumption is now recommended for individuals at high risk for heart disease, and our findings suggest that increased dietary n-3 FAs—LNA, EPA, and DHA—may result in a more favorable FA profile during statin treatment." Routine monitoring of the AA:EPA ratio—an early marker of inflammation—would be particularly important for patients on these cholesterol-lowering drugs.

Excessive Intake of PUFAs Induces Free Radical Production

The free radical pathology induced by excessive intake of polyunsaturated fatty acids (PUFAs) develops insidiously. Researchers found that PUFA-induced lipid peroxidation is common among patients who supplement high doses of fatty acids without adequate antioxidant protection.(2) Clinical management of fatty acid and antioxidant supplementation is aided by testing for fatty acid balance and measuring markers of oxidant damage.

Immunosuppressive Effects of Omega-3 Fatty Acids

As a result of all of the positive research on the health benefits of fish oil and/or GLA rich oils, the nutrition industry has seen an explosive growth in consumption of these supplements. But taking too much and in the wrong balance is potentially dangerous, a fact not well appreciated or understood. The anti-inflammatory effects of omega-3 fatty acids can actually suppress immune function, leading to increased infections, poor wound healing, and possible tumor growth.(3) The EPA:DGLA ratio in the Bloodspot™ Fatty Acid Profile can help fine tune intake of these Series-1 and -3 eicosanoid precursors

(1) Harris JI, Hibbeln JR, Mackey RH, Muldoon MF, Statin treatment alters serum n-3 and n-6 fatty acids in hypercholesterolemic patients. Prostaglandins, Leukotrienes and Essential Fatty Acids Volume 71, Issue 4, October 2004, Pages 263-269.

(2) Lord, RS and Bralley, JA, Polyunsaturated Fatty Acid-Induced Antioxidant Insufficiency, Integrative Medicine Vol. 1, No. 1 Dec 2002/Jan 2003.

(3) Rees D, Miles EA, Banerjee T, Wells SJ, Roynette CE, et al., Dose-related effects of eicosapentaenoic acid on innate immune function in healthy humans: a comparison of young and older men. AM J Clin Nutr, 83:331-42, 2006.

*Bloodspot profile not available in New York



PATIENTS: GET STARTED!

Fatty Acids measured:

Polyunsaturated Omega-3

- ALA (Alpha-Linolenic Acid)
- EPA (Eicosapentaenoic Acid)
- DHA (Docosahexaenoic Acid)

Polyunsaturated Omega-6

- LA (Linoleic Acid)
- GLA (Gamma Linolenic Acid)
- DGLA (Dihomogamma Linolenic Acid)
- AA (Arachidonic Acid)

Trans

- Total C:18 Trans

Indicators calculated:

- **AA:EPA ratio** - A measure of "silent" inflammation
- **EPA + DHA %** - An early CVD risk indicator
- **LA:GLA Ratio** - Delta6 desaturase inhibition by decreased Zn or decreased Mg, increased insulin, or dietary excess of saturated or trans fatty acids
- **EPA:DGLA Ratio** - Helps balance intake of Series-3 and Series-1 eicosanoid precursors