Essential Fatty Acids

Rationale: Essential fatty acids are critical nutrients for humans. They exist in the cell membrane of every cell, and roughly 20% of an infant's brain is composed of essential fatty acids. Mother's milk is very rich in essential fatty acids, but most infant formulas lack this key ingredient needed for brain development.

Two general categories of essential fatty acids are omega-3 and omega-6. Omega-3 fatty acids have relatively short shelf-lives, so commercial food processing often hydrogenates or partially hydrogenates them, which provides long shelf life but eliminates their nutritional value. Thus, over 80% of the US population has low levels of omega 3 fatty acids – this is one of the most widespread nutritional problems in the US.

Low levels of essential fatty acids are associated with a wide range of psychological disorders, including depression, post-partum depression, bipolar (manic/depression) and Rett's syndrome (similar to autism). Most importantly, two published studies have found that children with autism have lower levels of omega –3 fatty acids than the general population.

S. Vancassel et al., Plasma fatty acid levels in autistic children, Prostaglandins Leukot Essent Fatty Acids 2001 65:1-7.

Bell et al. (2002) Abnormal fatty acid metabolism in autism and Asperger's syndrome. In: Phospholipid Spectrum Disorder in Psychiatry and Neurology (2nd edition).

Explanation of Treatment:

One of the best sources of omega 3 fatty acids are fish, who obtain them from algae and plankton in the sea. Unfortunately, many fish are high in mercury and other toxins, especially the large predators (shark, swordfish, and tuna). Small fish, such as salmon and shrimp, tend to have lower levels of mercury, but it depends where they come from. So, it is generally safer for children to obtain essential fatty acids from fish oil, since little mercury is stored in the oil. Because fish oil (and fish) spoil readily, it is important to obtain a high-quality oil that does not smell or taste rancid, and it should be kept refrigerated.

Two of the major omega 3 fatty acids are EPA and DHA. DHA is critical for early brain development, and EPA is useful for later development.

Recommended dosages: (based on the amount of omega 3's, not the total amount of oil which will contain other oils) are:

Omega 3: 20-60 mg/kg (600-1800 mg for a 30 kg, or 60 lb, child). For younger children, use a supplement richer in DHA, and for older children and adults, use a supplement richer in EPA.

Omega 6: ¼ as much omega 6 as omega 3; so, if taking 1000 mg of omega 3's, then 250 mg of omega 6. It is important to maintain a balance of omega 3 and omega 6, so although most people in the US have enough omega 6, those taking an omega 3 supplement usually should take more.

Flax seed oil is also a source of omega 3 fatty acids, but the form it provides (alpha linolenic acid) must be converted by the body to the active form (EPA and DHA). There have been some reports that children with autism respond poorly to flax seed oil, so we generally recommend fish oil instead.

Cod liver oil (or other fish liver oil) is a good source of omega 3 fatty acids, and also provides good amounts of vitamin A and vitamin D. However, vitamin A intake from all supplements should not greatly exceed the RDA intake (see vitamin/mineral section) for extended periods, since excess amounts will be stored in the liver and could affect liver function. (Carotenes are pre-vitamin A and are not a problem).

Testing: The level of essential fatty acids can be measured in the red blood cell membrane. However, because most people in the US have low levels of omega 3's, it is desirable to reach levels at the top of the "normal" range for omega 3's. Also, it is better to measure the absolute amount of each fatty acid, rather than just the percentage of each.