



I Want To Know!

Q : I have multiple sclerosis, and I've heard that **Methylcobalamin** might be helpful. How much should I take?

A : Most users of **Methylcobalamin** supplements are basically healthy people who are simply looking to support their neurological structure and function into the future. For such people, a 5 milligram dose is usually the most appropriate choice. But we recognize that, as the well-documented neuroprotective and even neuroregenerative effects of this form of coenzyme B₁₂ become more widely known, and as the word on its use in clinical trials for neurological disorders spreads, more people with such disorders are becoming interested in taking **Methylcobalamin** supplements. However, we aren't physicians and, in any case, only *your* physician is familiar enough with your particular situation to determine the therapy that's right for you.

In consulting with your physician, one of the considerations that will be in the front of making an informed decision will be the doses of **Methylcobalamin** which have typically been used in clinical trials. This isn't a "one size fits all" situation, however, as different dosages have been used for different disorders, and also in different trials for a single disorder. So it should be clear, right off the top, why we can't recommend doses for particular individuals.

In general, most trials in which **Methylcobalamin** has been used to help people with various forms of **diabetic neuropathy**,¹⁻⁴ **non-diabetic neuropathy associated with uremia**,⁵ **peripheral facial paralysis** (including **Bell's palsy** and **Ramsay Hunt Syndrome**),⁶⁻⁹ **normal tension glaucoma**,¹⁰⁻¹⁴ and **dementia** (including **Pick's disease** and **Alzheimer's disease**)^{15,16} have used doses 1.5 milligrams or

greater, but rarely more than 5 milligrams. On the other hand, trials involving victims of **ALS (Lou Gehrig's disease)** and **multiple sclerosis (MS)** have used much higher doses, such as 25 milligrams per day for ALS¹⁷ and 60 milligrams daily for MS.¹⁸

Note that in some cases only one trial has ever been performed, with only a single dose used, and the results are often preliminary; it's therefore possible that higher (or lower) doses might be more effective. Because of the well-established safety of **Methylcobalamin**, many nutritionally-oriented physicians are working with their patients using doses considerably higher than those used in the relevant trial. There are some cases where this has seemed especially prudent to some physicians.

For instance, the evidence suggests that **Methylcobalamin** is much more effective against Bell's Palsy when taken within days of the initial attack; at later times, a higher dose might be more appropriate. Likewise, the only trial of **Methylcobalamin** in patients with **lumbar spinal stenosis**¹⁹ used only 0.5 milligrams per day – and achieved only very minor results. It seems reasonable to speculate that a higher dose might have been more effective, granted the fact that nearly all successful trials in other neurological disorders have used minimum doses of 1.5 milligrams, and many have been higher. Discuss these issues with your doctor.

There are also several neurological disorders in which there is reason to believe that **Methylcobalamin** might make a good supplement choice if your physician approves, but in which no clinical trial has been performed. These would include **Parkinson's disease**,²⁰⁻²⁴ **tinnitus**,²⁵ **Spinal Muscular Atrophy (SMA)**,^{26,27} and people taking the aminoglycoside antibiotic **gentamicin**²⁸ or who are suffering with **environmental illnesses** associated with neurological signs and symptoms.²⁸⁻³⁴ In such cases, because we don't have formal human trials to use as a guideline, your physician will have to rely all the more strongly on his or her judgement.

Q : Is your **Max DHA** a *pharmaceutical-grade* fish oil?

A : Yes.

To fully answer the questions that often follow this first one, let's back up a bit. Many health-conscious people are now looking specifically for a *pharmaceutical-grade* fish

oil supplement after having read Dr. Barry Sears' *The Omega Rx Zone*.³⁵ With this latest book, Dr. Sears does his readers a great service by introducing them to both the benefits of ultra-pure highly-unsaturated omega-3 fatty acid supplements, and to his "Zone" nutrition program, which can be used as a way to practice **caloric restriction** – the only *proven* method of slowing biological aging and extending maximum lifespan (see "The Road to Aging is Paved with Calories" in *The Holistic Lifestyle* 1(5)).

In discussing the value of the highly unsaturated omega-3 fatty acids in fish oil, Dr. Sears rightly focuses his readers' attention on the *quality* issues involved in making an informed choice among particular fish oil supplements, discussing processing technique, omega-3 concentration, and the problem of PCBs, mercury, and other contaminants. But unfortunately, in the process of waking many people up to the wide gap that separates food-grade fish oil from pharmaceutical-grade supplements, Dr. Sears also muddies the waters on a few specific points, by introducing some criteria for assessing supplement quality which are completely idiosyncratic, and which actually have *nothing* to do with fish oil quality. These additional, superfluous "standards" are not recognized by the various European pharmacopoeias which register pharmaceutical-grade fish oil supplements, or by the body that sets world standards for pharmaceutical products: the **International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals (ICH)**.

The most notably arbitrary (and potentially unintentionally misleading) criterion introduced by Dr. Sears' book is the assertion that the ratio of the omega-6 fatty acid **arachidonic acid (AA)** to the omega-3 fatty acid

eicosapentaenoic acid (EPA) in pharmaceutical-grade fish oils is always less than 0.04. This is not necessarily so. In particular, **Max DHA** – although a pharmaceutical-grade fish oil – does not meet this criterion *by intention*, as a result of the research that went into its formulation. **Max DHA** is a fish oil designed to be high in **DHA (docosahexaenoic acid)**, in contrast to the higher EPA seen in most fish oil supplements. This higher ratio was chosen because of the evidence favoring the specific cardiovascular benefits of DHA, related to its role in preventing pro-inflammatory signaling from **cytokines**, a class of chemical messengers in the body.^{36,37}

But precisely because the ratio of DHA-to-EPA is much higher in **Max DHA** than it is in most fish oil supplements, the smaller amount of EPA means that this supplement also has a higher EPA-to-AA ratio than many fish oils – even though the *absolute amount* of AA is as low as is expected by Dr.

The amount of *total omega-3 fatty acids* in **Max DHA** exceeds Dr. Sears' expectations.

Sears in a pharmaceutical-grade fish oil, and even though the amount of *total omega-3 fatty acids* in **Max DHA** exceeds Dr. Sears' expectations: **Max DHA contains a minimum 66% omega-3 fatty acids by weight**, and most batches actually exceed 70%. But the *proportions* of the omega-3 fatty acids in **Max DHA** is different by design. If **AOR** were to bring up the EPA concentration of **Max DHA**, it would be at the expense of its DHA content – a move which would defeat the entire rationale of this supplement.

At the same time, Dr. Sears has unfortunately *neglected* a discussion of another key aspect of fish oil supplement quality: **peroxide value**. Because of their multiple double bonds, highly unsaturated omega-3 fatty acids like EPA and DHA are vulnerable to attack by free radicals. Common food-grade fish oil supplements contain relatively high levels of peroxidized EPA and DHA *to begin with*, when the material is encapsulated – and these lipid peroxides then slowly propagate themselves throughout the supplement, through free radical chain reactions. And to make matters worse, most fish oil supplements fail to provide enough antioxidant protection to meaningfully hinder these reactions as the supplement sits on the shelf: typically, the only antioxidant used is mixed tocopherols.

The combination of relatively high peroxide values and low antioxidant protection causes most fish oil supplements to be oxidatively unstable. This instability results in most fish oil supplements failing to deliver the full benefits of their DHA and EPA contents – a fact which has been illustrated in several human studies.³⁸⁻⁴¹

In one controlled trial,³⁹ scientists compared the effects of equal amounts of omega-3 fatty acids from a conventional





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Every second of every day, your body's fundamental structural components are being slowly warped by the formation of *Advanced Glycation Endproducts (AGE)*.^{*} AGE form when the body's proteins, lipids, and DNA react with the sugar in your blood, or with ultra-reactive metabolites of the body's glucose metabolism called *triosephosphates*. These reactions lead to irreversible modifications of the enzymes, cellular membranes, and genetic information that underpin cellular function.^{*} So as we AGE ... so we age.^{*}

But now the first proven anti-AGE nutrient has arrived.^{*} **Benfotiamin** is thiamin-based phytonutrient found in trace amounts in heated garlic. **Benfotiamin**'s unique structure allows it to be absorbed *directly* through the cell wall.^{*} When you take **Benfotiamin**, it opens up a key metabolic "safety valve" for triosephosphates. So they don't build up.^{*} And AGE damage is prevented.^{*}

This isn't just a biochemical curiosity. In both animal studies and controlled human trials, users of **Benfotiamin** experience lower levels of AGE within their cells, shielding their structure and function from AGE warping.^{*}

Your cells are being caramelized from within. **Benfotiamin** takes the heat off.^{*}

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and a stable fish oil supplement. While both supplements favorably modulated cholesterol and fibrinogen levels, **stable fish oil had a more potent positive impact on cardiovascular risk than conventional fish oil.** People using the stable fish oil supplement experienced a 17% boost in **HDL ("good") cholesterol**, while a seeming 4% upward budge in the conventional fish oil group's readings was so small as to be judged non-significant (in the sense that it could have happened purely by chance). Similarly, **lipoprotein(a) (Lp[a])**, a little known but important cardiovascular risk factor, was reduced by 19% in people taking stable fish oil, while "only minor changes" happened among those swallowing conventional fish oil pills. There may also have been a stronger effect of stable fish oil on **fibrinogen**: those who used stable fish oil supplements experienced a 10% reduction in this risk factor, versus a 7% reduction in the conventionally-supplemented group. And stable fish oil lowered **total cholesterol** by 6%, while the conventional fish oil had no effect on this variable.³⁹

Similarly, other studies have documented the fact that stable fish oil supplements deliver superior health benefits relative to conventional fish oil in joint inflammation in arthritis³⁷ and in maintaining control of blood sugar.³⁸

In formulating **Max DHA**, AOR has taken the steps required to create a truly stable fish oil supplement. First and foremost, the original fish oil used in **Max DHA** has a **low starting peroxide value**: not more than 5 milliequivalents (mEq) of oxygen per kilogram of the original fish oil at encapsulation. Then, this high initial stability is maintained by using a properly-chosen combination of antioxidants, taking advantage of the "recycling" properties of the **antioxidant network**⁴²⁻⁴⁴ (see Dr. Lester Packer's excellent book, *The Antioxidant Miracle*, and "Recycle Your Antioxidants!" in an upcoming issue of *Advances*).

Specifically, **Max DHA** combines alpha-tocopherol (which is a better vitamin E molecule than other tocopherols for this specific antioxidant job)⁴⁵ with **ascorbyl palmitate** (a special fat-soluble form of vitamin C). Because of the ability of ascorbyl palmitate to regenerate any alpha-tocopherol molecules used up in the process of breaking free radical chain reactions to their active antioxidant form, this combination provides a dramatic improvement in antioxidant efficacy compared to either antioxidant alone, in a *true synergistic effect*.^{43,46} And the staying power of ascorbyl palmitate is, in turn, extended using the remarkably powerful **carnosic acid in rosemary oil**, which like other flavonoids "boosts" the recycling power of vitamin C.⁴⁷⁻⁴⁹ The result is a fish oil which sets industry standards for oxidative stability.

Dr. Sears should be saluted for drawing public attention to the value of omega-3 fatty acids, and to the importance of

quality issues in choosing a fish oil supplement. Unfortunately, in casting his nets to the sea of health, he has drawn in some red herrings in his catch of salmon, and also missed one truly prize fish. **Max DHA is pharmaceutical-grade fish oil: stable, concentrated, and pure.**

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