Dry eye syndrome (DES) is a common problem caused by excessive dryness and other factors affecting the general population which involves inflammatory reactions in the cornea and associated regions of the eye. The severity can range from mildly irritating to much more severe symptoms associated with burning, stinging, itching, frequent blinking, redness, eye pain, others. DES prevalence in the population worldwide varies from approx. 15-55%.

The primary purpose of the present clinical trial was to determine if supplementation with EPA/DHA omega-3 fatty acids could improve dry eye symptoms and associated clinical measures of such in patients with pre-existing dry eye symptoms. The study utilized 64 patients with a past history of DES between the ages of 45-90 years recruited from an ophthalmology clinic. Patients were assigned randomly to one of two groups (31 to the ‘placebo’ group and 33 to the ‘treatment’ group providing EPA/DHA). Various assessments were performed at the beginning and the end of the study (following 30 days of daily supplementation with ‘placebo’ (‘control’ with no EPA/DHA) or ‘treatment’ with 600 mg of omega-3/day (360 mg EPA plus 240 mg DHA). Clinical measures included TBUT (Tear Break-Up Time) which is typically much higher in normal eyes as compared to dry eyes, Schirmer’s Score to determine if the eye produces enough tears to keep it moist, and the OSDI (Ocular Surface Disease Index).

The TBUT and Schirmer’s Score showed no statistically-significant change in those patients receiving the ‘placebo’ supplement (lacking EPA/DHA) whereas a highly significant
improvement was found for both measures in those taking the EPA/DHA supplementation. The TBUT improved by 71 % relative to baseline and the Schirmer's Score improved by 22 % in those patients assigned to receive supplemental EPA/DHA. DES-related symptoms as determined by the OSDI scores increased by 4 % in the ‘placebo’ group but showed a highly significant improvement (26 % reduction) in the group treated with EPA/DHA supplementation. The authors concluded that oral consumption of EPA/DHA omega-3 is associated with a decrease in the rate of tear evaporation, an increase in tear secretion, and an improvement in dry eye symptoms.

Dr. Holub's Comments:

While not addressed by the authors, the following brief commentary is offered with respect to potential mechanisms by which EPA/DHA supplementation can help alleviate dry eye disease (complementary to other treatment). EPA/DHA supplementation has been well documented in numerous randomized clinical trials to exhibit anti-inflammatory effects in diverse inflammatory conditions (such as rheumatoid arthritis). DES is associated with inflammation of the ocular surface. In DES, hyperactive neutrophils (neutrophils being a type of white blood cell) move to the inflammatory site and play a key role in the overall inflammatory process. The high level of AA (AA-arachidonic acid, a long-chain omega-6 fatty acid) in the neutrophil is converted by enzyme activity to form potent pro-inflammatory products known as ‘4-series leukotrienes’ which promote events associated with DES progression. When EPA/DHA is consumed orally (via fatty fish/seafood) or supplementation, the EPA/DHA replaces part of the AA in the neutrophil such that less of the pro-inflammatory leukotrienes can be formed. Furthermore, recent research has indicated that highly bio-active cellular products known as ‘resolvins’ (formed from EPA and DHA) can exert anti-inflammatory effects related to alleviating DES via reducing the actions of the 4-series leukotrienes.