

USANA Technical Bulletin

Disclaimer: The information provided in this Technical Bulletin is strictly educational. It may not be used to promote USANA products, nor is it intended as medical advice. For diagnosis and treatment of medical disorders, consult your health care professional. When there are references to third party websites, addresses, and/or phone numbers, USANA, Inc. makes no claim, actual or implied, regarding the content or validity of the information obtained from such sources. This Technical Bulletin may be copied and freely distributed only if all text remains intact and unchanged.

Phosphatidylserine (PS)

Technical Background

- Phosphatidylserine (PS) is one of four phospholipids, the building blocks of all cell membranes. Others include phosphatidylcholine, phosphatidylinositol, and phosphatidylethanolamine.
- The membranes of nerve cells are particularly high in PS. Here, PS increases the fluidity of the cell membrane and improves the entry of nutrients and the elimination of wastes.¹ Proper membrane integrity is essential for maintenance of the cell's internal environment, signal transduction, and secretory vesicle release.
- PS is essential to cognitive function. Studies have found that it may improve age-associated memory impairment (AAMI). When used in persons 50 years and older who had experienced "normal" AAMI, phosphatidylserine improved the cognitive age of the subjects by roughly 12 years.³
- Over 25 human clinical studies have been conducted with PS, including at least 12 double-blind, placebo-controlled trials.^{2,3} Most of these studies involved mature patients with existing, measurable losses in memory, judgment, abstract thought, and other advanced mental functions. Animal studies have also found significant improvements in memory with PS supplementation.⁴
- Some studies have found that PS may improve some elements of memory and cognitive function in Alzheimer patients.^{5,6}

Sources and Recommended Intake

- No Recommended Dietary Allowance (RDA) has been established for PS.
- Most phospholipids are present in virtually all vegetable and animal foods. Wheatgerm, soybeans, peanuts, eggs and liver are rich sources.
- Phosphatidylserine is present in foods in only small amounts. Until recently, supplemental PS was available only from bovine brain. Now however, supplemental PS is available as a soy lecithin-based concentrate.
- Doses of 100 mg/day have been tested clinically and proven to be effective. Much of the clinical testing of PS was performed with dosages of 300 mg/day, with one study using 800 mg/day for 10 days.⁷ No adverse effects have been reported using these intake levels.

Abstracts

Schreiber S, Kampf-Sherf O, Gorfine M, Kelly D, Oppenheim Y, Lerer B. An open trial of plant-source derived phosphatidylserine for treatment of age-related cognitive decline. Isr J Psychiatry Relat Sci. 2000;37(4):302-7.

We assessed whether the efficacy of plant-source derived phosphatidylserine (one of the phospholipids which play an important functional role in membrane-related processes in the brain) for treatment of age related cognitive decline is consistent with previous (placebo controlled) positive findings with bovine derivative of PS (BC-PS). Eighteen healthy elderly volunteers meeting Age Associated Memory Impairment inclusion and exclusion criteria were treated for 12 weeks with plant-source derived phosphatidylserine (PS) (100 mg x 3/day p.o.) and evaluated at base line, after 6 weeks of treatment and at the end of the trial. Fifteen concluded the study. All but two outcome measures elicited a significant drug over time effect. Post-hoc paired t-tests showed that the significant effect was attributable to an improvement from base line to week 6 and that effect was maintained at week 12. These results are encouraging. However, they await double-blind controlled verification in a large sample before suggesting that this may be a viable approach to the treatment of age-related cognitive decline, without exposing the patients to possible hazards involved in the treatment with bovine derivative of PS (BC-PS).

References

- ¹ Toffano G, Battistella and Orlandi. *Clinical Trials Journal* 1987; 24: 18-24.
- ² Crook T, Petrie W, Wells C, Massari DC. Effects of phosphatidylserine in Alzheimer's disease. *Psychopharmacol Bull* 1992; 28: 61-6.
- ³ Crook TH, Tinklenberg J, Yesavage J, Petrie W, Nunzi MG, Massari DC. Effects of phosphatidylserine in age-associated memory impairment. *Neurology* 1991; 41 644-9.
- ⁴ Suzuki S, Yamatoya H, Sakai M, Kataoka A, Furushiro M, Kudo S. Oral administration of soybean lecithin transphosphatidylated phosphatidylserine improves memory impairment in aged rats. 2001. *J Nutr*. 131(11):2951-6.
- ⁵ Crook T, Petrie W, Wells C, Massari DC. Effects of phosphatidylserine in Alzheimer's disease. *Psychopharmacol Bull* 1992; 28(1): 61-6.
- ⁶ Hashioka S, Han YH, Fujii S, Kato T, Monji A, Utsumi H, Sawada M, Nakanishi H, Kanba S. Phosphatidylserine and phosphatidylcholine-containing liposomes inhibit amyloid beta and interferon-gamma-induced microglial activation. 2007. *Free Rad Bio Med* 42(7):945-954.
- ⁷ *European Journal of Clinical Pharmacology*, 1992;41:385-8.