Clinical pharmacy update | Advancing Cognitive Health in Pharmacy: Evidence-Informed Omega-3 Strategies

Speaker: Dr Liza Oates – Naturopath & Wellness Consultant

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Conflict of interest statement

Dr Liza Oates, declares receipt of an honorarium for the preparation and delivery of this presentation. All content has been developed in accordance with evidence-informed practice principles, and efforts have been made to ensure balance and scientific accuracy.

LEARNING OUTCOMES

At the completion of this presentation, participants will be able to:

- Explain the increasing prevalence of dementia and need for evidence-informed prevention strategies
- Describe the contribution of omega-3 fatty acids for brain health, and the clinical evidence to support cognition
- Outline patient groups most likely to benefit from evidence-informed interventions for cognitive health
- Apply evidence-based dosing, dietary, and lifestyle strategies to promote cognition

Accreditation code: PSAAPP2623
Expiry: 12/03/2027
Competencies: 2.2, 2.3, 3.1, 3.2, 3.3, 3.5
CPD credits: Up to 1.0 Group 2 CPD credits

Pharmaceutical Society of Australia ACCREDITED CPD

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THE LANDSCAPE

- **Dementia cases are rising sharply** - global numbers to triple by 2050. (Nichols et al., 2022)
- Australians are increasingly **worried about cognitive decline** but unsure how to reduce their risk. (Alzheimer's Disease International, 2024)
- Cognition is the mind's ability to absorb information and translate it into understanding, decisions, and adaptive action. (Tiemtad et al. 2026)
- **Demand** for brain-health and nootropic supplements is **rapidly growing**. (Tiemtad et al. 2026)
- Up to **45%** of dementia cases may be **preventable** through modifiable factors. (Livingston et al., 2024)
- **Omega-3s** should be framed as part of a broader cognitive-health strategy.
- Pharmacists are well-positioned to provide **evidence-informed guidance** on cognitive wellbeing.

Alzheimer's Disease International. World Alzheimer Report 2024: Global changes in attitudes to dementia [Internet]. London: Alzheimer's Disease International; 2024 [cited 2026 Jan 30]. Available from: https://www.alzint.org/resource/world-alzheimer-report-2024/

Livingston, G., Huntley, J., Liu, K.Y., et al. (2024). Dementia prevention, intervention, and care: 2024 report of the Lancet standing Commission. *The Lancet, 404*(10452), 572-628. https://doi.org/10.1016/S0140-6736(24)01296-0

Nichols, E., Steinmetz, J. D., Vollset, S. E., Fukutaki, K., Chalek, J., Abd-Allah, F., Abdoli, A., Abualhasan, A., et al. (2022). Estimation of the global prevalence of dementia in 2019 and forecasted prevalence in 2050: an analysis for the Global Burden of Disease Study 2019. *The Lancet Public Health*, *7*(2), e105-e125. https://doi.org/10.1016/S2468-2667(21)00249-8

Tiemtad, P., Ingkaninan, K., Temkitthawon, P., Thimkorn, P., Rattanachaisit, N., Teaktong, T., & Dhippayom, T. (2026). Comparative effects of Bacopa monnieri and Ginkgo biloba on cognitive functions: A systematic review and network meta-analysis. *Phytomedicine*, 157915. https://www.sciencedirect.com/science/article/abs/pii/S0944711326001546

THE COGNITIVE HEALTH CONTINUUM

BRAIN OPTIMISERS

Healthy people chasing sharper thinking.

"Can supplements help me think faster, focus better, and stay sharp?"

PREVENTION SEEKERS

People with family history or strong prevention focus.

“What can I do now to reduce my long-term risk.”

SYMPTOM NOTICERS

People with subjective cognitive concerns.

"How can I stop things getting worse?"

THE MCI MANAGERS

People with mild cognitive impairment.

"Can supplements reverse this or at least slow the progression?"

THE DEMENTIA NAVIGATORS

People living with established dementia and their carers.

"Will this bring back some memory or slow it down?"

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STATISTICS

DEMENTIA IS NOW THE LEADING CAUSE OF DEATH IN AUSTRALIA (ABS, 2025)

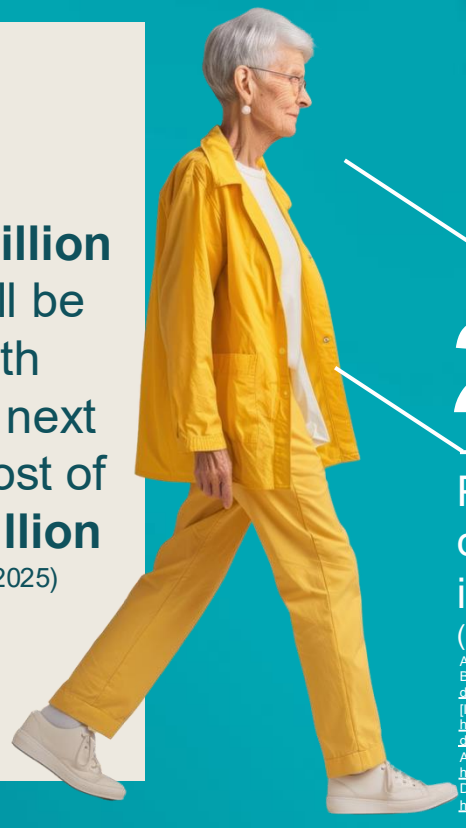
9.4%

of Australian deaths are caused by dementia – Overtaking ischaemic heart disease (8.7%) (ABS, 2025)

433,300

Australians currently **living with dementia**.
(Alzheimers Research Australia, 2025)

More than **6.4 million Australians** will be diagnosed with dementia in the next **40 years,** at a cost of more than **$1 trillion**
(Brown, Hansnata & La. 2025)



Dementia is responsible for nearly **262,000** healthy years of life lost (DALY) in 2024 (AIHW, 2025)

29,000

People live with **younger-onset** dementia (Alzheimers Research Australia, 2025) - including people aged 18-65 years
(Dementia Australia, 2025)

Alzheimer's Research Australia. (2025). *Alzheimer's Research Australia*. https://alzheimersresearch.org.au/ . Australian Bureau of Statistics, 2025, Causes of Death, Australia. Retrieved from https://www.abs.gov.au/statistics/health/causes-death/causes-death-australia/latest-release. Australian Institute of Health and Welfare. Burden of disease due to dementia [Internet]. Canberra: Australian Institute of Health and Welfare; 2025 [cited 2026 Jan 30]. Available from: https://www.aihw.gov.au/reports/dementia/dementia-in-aus/contents/deaths-and-disease-burden/burden-of-disease-due-to-dementia . Australian Institute of Health and Welfare. Dementia in Australia: Spending on health care [Internet]. Canberra: Australian Institute of Health and Welfare; 2025 [cited 2026 Jan 30]. Available from: https://www.aihw.gov.au/reports/dementia/dementia-in-aus/contents/spending-on-dementia/spending-on-health-care. Dementia Australia. (2025, December 1). *Dementia facts and figures*. Dementia Australia. https://www.dementia.org.au/about-dementia/dementia-facts-and-figures

FROM FEAR TO ACTION

Supporting brain health conversations in pharmacy practice

- Most adults **worry** about developing dementia. (Alzheimer's Disease International, 2024)
- **Anxiety** is amplified by social media, anticipated stigma and the belief that dementia is inevitable or untreatable. (Brijnath & Low, 2025; ADI, 2024)
- Concerns **technology** and GenAI are 'making our brains lazy'. (Kosmyna et al,2025)
- Anxiety is a risk factor and early symptom of dementia. (ADI, 2024)
- **Reframing** dementia as modifiable, not inevitable, **empowers** proactive action. (ADI, 2024)
- Use **supplement enquiries** to open broader prevention conversations and place products realistically within a lifestyle-based approach.

Alzheimer's Disease International. World Alzheimer Report 2024: Global changes in attitudes to dementia [Internet]. London: Alzheimer's Disease International; 2024 [cited 2026 Jan 30]. Available from: https://www.alzint.org/resource/world-alzheimer-report-2024/

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MODIFIABLE RISK FACTORS FOR DEMENTIA

The 2024 Lancet Commission identifies 14 modifiable risk factors accounting for approximately 45% of dementia cases worldwide (Livingston et al., 2024)

2 NEW RISK FACTORS: VISION AND HIGH LDL CHOLESTEROL

EARLY LIFE	MID LIFE		LATE LIFE
5% Less education	1% Excessive alcohol	2% Smoking	5% Social isolation
	1% Obesity	3% Depression	3% Air pollution
	2% Hypertension	3% Traumatic brain injury	2% Visual loss
	2% Diabetes	7% High LDL cholesterol	
	2% Physical inactivity	7% Hearing loss	

Livingston, G., Huntley, J., Liu, K. Y., et al. (2024). Dementia prevention, intervention, and care: 2024 report of the Lancet standing Commission. *The Lancet, 404*(10452), 572-628. https://doi.org/10.1016/S0140-6736(24)01296-0

LIFESTYLE

Lifestyle tips for cognition (Livingston et al., 2024)

Encourage exercise because people who participate in exercise are less likely to develop dementia

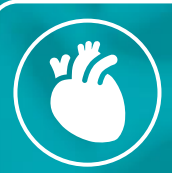
PHYSICAL ACTIVITY

Midlife hearing screening; use hearing aids when indicated; reduce noise exposure

HEARING HEALTH

Routine eye exams; early correction of vision problems

VISION HEALTH



Maintain systolic BP ≤130 mmHg from age 40; manage LDL, diabetes, obesity

CARDIOVASCULAR HEALTH

Regular social participation; community activities; age-friendly environments

SOCIAL ENGAGEMENT

Lifelong learning; mentally stimulating hobbies; structured cognitive tasks

COGNITIVE ACTIVITY

Reduce exposure to traffic/industrial pollution; support clean-air policies

AIR POLLUTION REDUCTION

Use helmets; reduce high-impact collisions

TBI PREVENTION

Livingston, G., Huntley, J., Liu, K. Y., et al. (2024). Dementia prevention, intervention, and care: 2024 report of the Lancet standing Commission. *The Lancet, 404*(10452), 572-628. https://doi.org/10.1016/S0140-6736(24)01296-0

DIET

The role of diet optimisation in cognition

Adherence to the **MEDITERRANEAN DIET equates to 11% lower dementia risk, 18% lower cognitive impairment risk and 30% lower Alzheimer's disease risk** (Fekete et al., 2025; Nucci et al., 2024).

Both diets are linked to better cognition, lower amyloid, tau, and neurofilament light levels, and reduced inflammatory markers (Liu et al., 2025).

The **MIND DIET** (Mediterranean-DASH Intervention for Neurodegenerative Delay) showed slightly stronger cognitive protection (Liu et al., 2025).

Fekete, M., Varga, P., Ungvari, Z., et al. (2025). The role of the Mediterranean diet in reducing the risk of cognitive impairment, dementia, and Alzheimer's disease: A meta-analysis. *GeroScience*. https://doi.org/10.1007/s11357-024-01488-3

Liu, X., Yang, B., Liu, Q., Gao, M., & Luo, M. (2025). The long-term neuroprotective effect of MIND and Mediterranean diet on patients with Alzheimer's disease. *Scientific Reports*. https://doi.org/10.1038/s41598-025-17055-5

Nucci, D., Sommariva, A., Degoni, L. M., et al. (2024). Association between Mediterranean diet and dementia and Alzheimer disease: A systematic review with meta-analysis. *Aging Clinical and Experimental Research*, 36, 77. https://doi.org/10.1007/s40520-024-02718-6

DIET

The importance of fish for cognition

HIGHER FISH INTAKE

Meta-analysis of 35 observational studies showing that people who eat the most fish have:

- 18% lower **risk of cognitive impairment** or decline,
- 18% lower risk of **dementia**,
- 20% lower risk of **Alzheimer's disease** with a clear dose-**response pattern showing risk reductions of up to 30% at higher intakes (150g/day).** (Godos et al., 2024)

LOWER FISH INTAKE

Lower fish intake during pregnancy was associated with:

- poorer child **language**,
- **social development** and
- **IQ** (Starling et al., 2014).

Godos, J., Micek, A., Currenti, W., Franchi, C., Poli, A., Battino, M., Dolci, A., Ricci, C., Ungvari, Z., & Grosso, G. (2024). Fish consumption, cognitive impairment and dementia: an updated dose-response meta-analysis of observational studies. *Aging Clinical and Experimental Research*, 36. https://doi.org/10.1007/s40520-024-02823-6.

Starling, P., Charlton, K., McMahon, A., & Lucas, C. (2014). Fish Intake during Pregnancy and Foetal Neurodevelopment—A Systematic Review of the Evidence. *Nutrients*, 7, 2001 - 2014. https://doi.org/10.3390/nu7032001.

UNDERSTANDING OMEGA 3

Omega-3 is a group of essential polyunsaturated fatty acids found in both plant and animal sources (NIH, 2023)

The three main omega-3s:

DHA (docosahexaenoic acid):

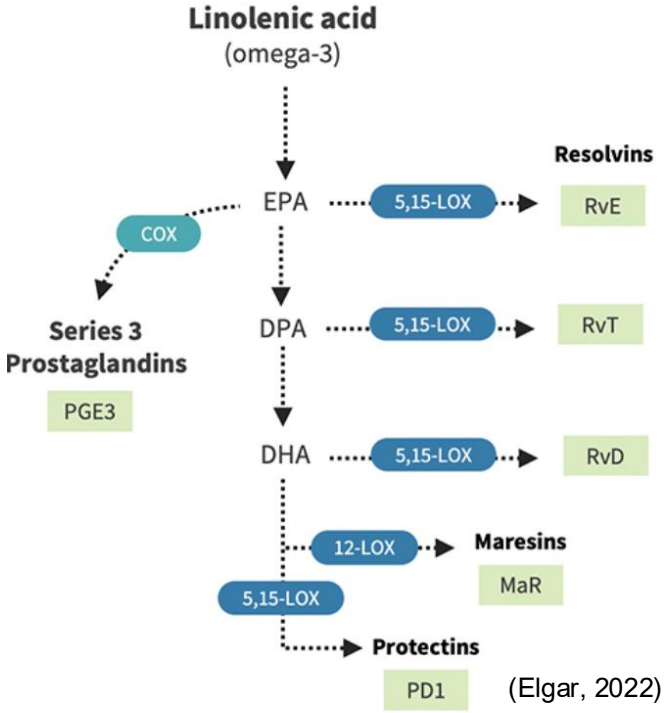
A **key structural fat** in the brain, retina, nervous and vascular system (Qin et al., 2023); critical for cognition and vision across the lifespan.

EPA (eicosapentaenoic acid):

Anti-inflammatory; supports **cardiovascular health**, lipid metabolism, and immune function (Crupi & Cuzzorcrea, 2022)

ALA (alpha-linolenic acid)

Conversion to EPA and DHA in humans is **limited** (NIH, 2023)



(Elgar, 2022)

Between **8-12% of ALA is converted to EPA,** and **less than 1%** is further converted to **DHA,** with gender variation, supporting supplementation **(Lenighan et al., 2019)**

Crupi, R., & Cuzzocrea, S. (2022). Role of EPA in Inflammation: Mechanisms, Effects, and Clinical Relevance. *Biomolecules*, *12*(2), 242. https://doi.org/10.3390/biom12020242. Elgar, K. (2022). *EPA/DHA: A review of clinical use and efficacy. Nutritional Medicine Journal*, *1*(2), 97–132. Retrieved from https://www.nmi.health/epa-dha-a-review-of-clinical-use-and-efficacy/ . Lenighan, Y. M., McNulty, B. A., & Roche, H. M. (2019). Dietary fat composition: replacement of saturated fatty acids with PUFA as a public health strategy, with an emphasis on α-linolenic acid. *Proceedings of the Nutrition Society*, *78*(2), 234–245. doi:10.1017/S0029665118002793. National Institutes of Health, Office of Dietary Supplements. (2023, March 16).*Omega-3 fatty acids: Fact sheet for health professionals*. https://ods.od.nih.gov/factsheets/Omega3FattyAcids-HealthProfessional/ . *Qin J, Kurt E, LBassi T, Ribeiro L, Sa L, Xie D. Biotechnological production of omega-3 fatty acids: current status and future perspectives. Frontiers in Microbiology. 2023 Nov 7;14. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10662050/*

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OMEGA 3 MECHANISMS OF ACTION FOR COGNITION

DHA constitutes up to 40% of the polyunsaturated lipids making up brain cells, as well as playing crucial roles in neurotransmission and neuroprotection.

(Barros e al. 2025)

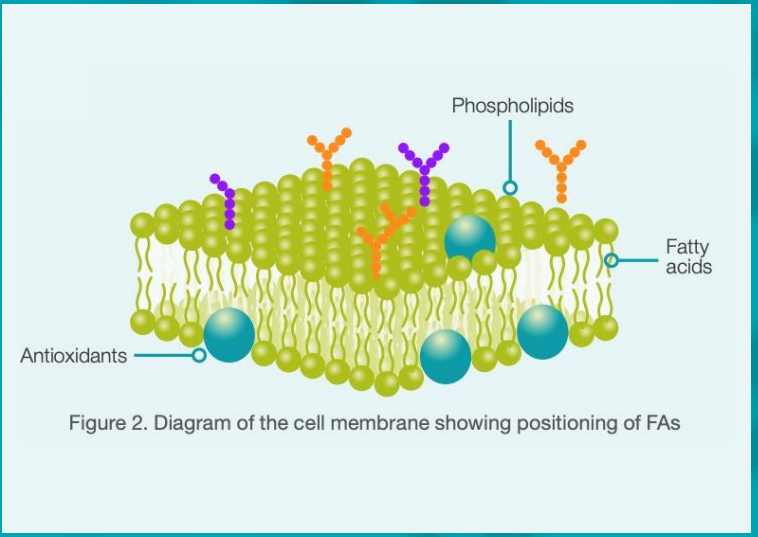

Figure 2. Diagram of the cell membrane showing positioning of FAs

DHA supports cognition by:

- **Neurotransmission** and **synaptic plasticity** support
- **Glutamatergic** and **GABAergic** signalling modulation for **learning and memory**
- Brain-Derived Neurotrophic Factor (**BDNF**) upregulation to promote **neurogenesis**
- **Anti-inflammatory** (pro-resolving mediators)
- **Antioxidative** and antiapoptotic effects
- **Cerebral vascular flow** improvement
- **Amyloid-B** and **tau** pathology modulation
- **Gut-brain axis** modulation (Sahebi & Rezvani Kakhki, 2025)

Barros, M. I., Brandão, T., Irving, S. C., Alves, P., Gomes, F., & Correia, M. (2025). Omega-3 Polyunsaturated Fatty Acids and Cognitive Decline in Adults with Non-Dementia or. Mild Cognitive Impairment: An Overview of Systematic Reviews. *Nutrients*, *17*(18), 3002. https://doi.org/10.3390/nu17183002. Sahebi, S., & Rezvani Kakhki, B. (2025). *Omega-3 fatty acids in Alzheimer's disease prevention among elderly women: Mechanisms of action, clinical evidence, and the critical role of early intervention*. **Nutrition and Dietary Supplements**, *17*, 159–173. https://doi.org/10.2147/NDS.S565039

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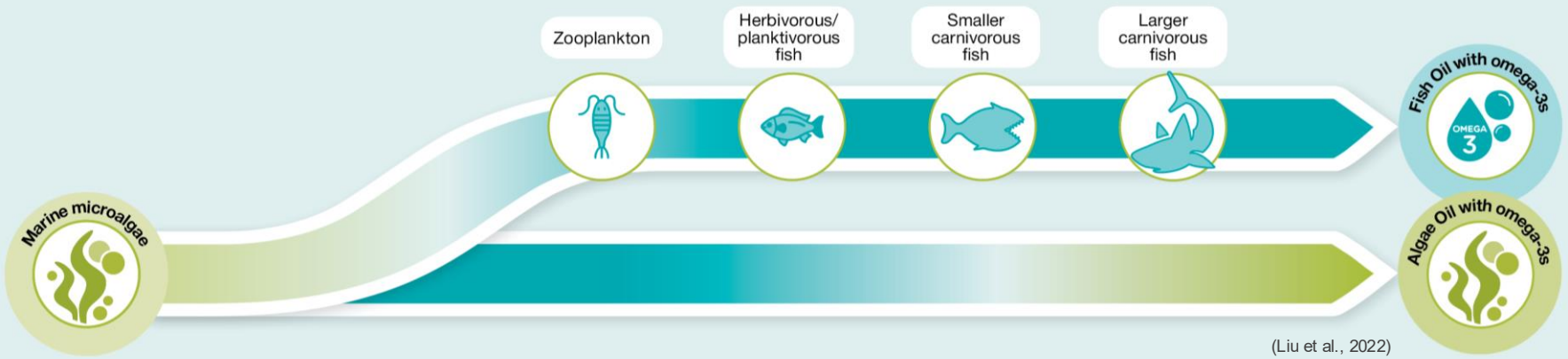
GETTING TO THE SOURCE OF OMEGA-3

	Fish oil	Krill oil	Algae oil
Origin	Sourced from oily fish (e.g. mackerel, anchovies, salmon and sardines) (Das et al., 2024)	Derived from Antarctic krill (Shahidi et al., 2024)	Sourced from marine microalgae – primary producers of EPA and DHA in the marine food chain (Saidaiah et al., , 2024)
Considerations	DHA and EPA in triglyceride form (Saidaiah et al., , 2024) Widely available Extensively studied Purity is important	DHA and EPA in phospholipid form (Saidaiah et al., , 2024) Natural source of astaxanthin (potent antioxidant) (Saidaiah et al., 2024, Shahidi et al., 2024) Shellfish allergy	High in DHA (Saidaiah et al., , 2024) Contaminant free Sustainable source (Saidaiah et al., , 2024) High bioequivalence to fish oil (Office of Dietary Supplements, 2025)
Who is this suited to?	Low dietary fish intake Cost effective	In need of high astaxanthin (antioxidants) (Saidaiah et al., , 2024) Phospholipid form may support bioavailability (Saidaiah et al., , 2024)	Don't consume fish (Saidaiah et al., , 2024) No fishy aftertaste (Saidaiah et al., , 2024)



(Liu et al., 2022)

Das P, Dutta A, Panchali T, Khatun A, Kar R, Kumar Das, T, et al. Advances in Therapeutic Applications of Fish Oil: A review. Measurement Food. 2024 Mar 1;13:100142–2.

Liu, Y., Ren, X., Fan, C., Wu, W., Zhang, W., & Wang, Y. (2022). *Health benefits, food applications, and sustainability of microalgae-derived n-3 PUFA*. **Foods, 11**(13), 1883. https://doi.org/10.3390/foods11131883

Office of Dietary Supplements. (2025). *Omega-3 fatty acids: Health professional fact sheet*. U.S. Department of Health & Human Services, National Institutes of Health. https://ods.od.nih.gov/factsheets/Omega3FattyAcids-HealthProfessional/

Saidaiah, P., Banu, Z., Khan, A., Geetha, A., & Somraj, B. (2024). A comprehensive review of omega-3 fatty acids: Sources, industrial applications, and health benefits. *Annals of Phytomedicine An International Journal*. https://doi.org/10.54085/ap.2024.13.1.20.

Shahidi F, Abad A. Why is Antactic krill (Euphasia superba) oil on the spotlight? A review. Food Production Processing and Nutrition. 2024 Sep 11;6(1).

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Can fish intake alone achieve therapeutic targets?

Seafood DHA-EPA profiles, ratios, and weekly intake requirements (Soltan & Gibson, 2008)
(See Appendix for full-sized table)

Fish Species	DHA (mg/150g serve)	EPA (mg/150g serve)	Ratio DHA: EPA	Total DHA + EPA (mg/ 150g serve)	Serves / week for 500mg/ day DHA+EPA
Atlantic Salmon *(aquaculture + environmental concerns)*	2873	1445	2 : 1	4318	**0.8**
Swordfish *(very high mercury)*	2484	432	5.8 : 1	2916	**1.2**
Gemfish *(overfished + moderate–high mercury)*	1361	312	4.4 : 1	1673	**2.1**
Ocean Trout *(aquaculture concerns)*	823	351	2.3 : 1	1174	**3.0**
European Carp *(muddy flavour; possible contaminants)*	964	190	5.1 : 1	1154	**3.0**
Snook *(spoils quickly)*	846	29	29.2 : 1	875	**4.0**
Squid *(generally low concern)*	703	168	4.2 : 1	871	**4.0**
Australian Salmon *(strong flavour)*	573	86	6.7 : 1	659	**5.3**
Flake (Blue Shark) *(high mercury; species mislabelling)*	583	45	13 : 1	628	**5.6**
Tommy Ruff (Australian Herring) *(stock fluctuations)*	527	94	5.6 : 1	621	**5.6**
Rainbow Trout *(low concern)*	434	140	3.1 : 1	574	**6.1**
Prawn (shrimp) *(imported may have antibiotics)*	277	241	1.1 : 1	518	**6.8**
Red Snapper (Bight Redfish) *(overfished)*	455	38	12 : 1	493	**7.1**
Flathead *(low concern)*	436	34	12.8 : 1	470	**7.4**
Blue Grenadier *(NZ sustainable; AU variable)*	330	47	7 : 1	377	**9.3**
Northern Whiting *(low concern)*	207	162	1.3 : 1	369	**9.5**
Southern Bluefin Tuna *(very high mercury; overfished)*	308	40	7.7 : 1	348	**10.1**
Barramundi *(imported may have antibiotics)*	171	130	1.3 : 1	301	**11.6**

General recommendation: 1-3 serves (150g) of fish per week. (Soltan & Gibson, 2008)

- Difficult to get enough omega-3 from diet alone
- Only a few species would achieve a modest daily target of 500mg DHA+EPA (Suh et al, 2024).

Limitations with fish:

- **Cost** may be prohibitive for some
- **Concerns**: mercury and contaminants, aquaculture practices, sustainability & environmental concerns (Soltan & Gibson, 2008)
- **Low / no dietary fish intake**: vegetarians, vegans, allergies, taste preference

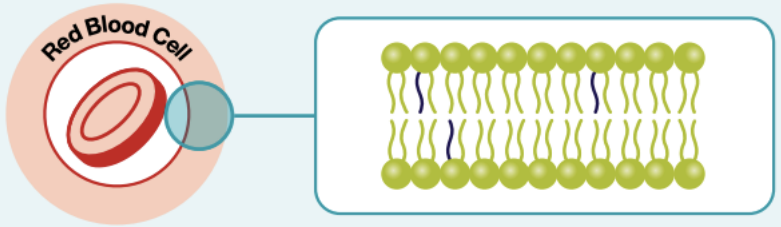
A more accurate way of ensuring optimal omega-3 status is to measure the **omega-3 index**

Soltan, S. S., & Gibson, R. A. (2008). Levels of Omega 3 fatty acids in Australian seafood. *Asia Pacific journal of clinical nutrition*, *17*(3), 385–390
Suh, S., Lim, E., Burm, S., Lee, H., Bae, J., Han, J., & Kim, K. (2024). The influence of n-3 polyunsaturated fatty acids on cognitive function in individuals without dementia: a systematic review and dose–response meta-analysis. *BMC Medicine*, 22.

MEASURING OMEGA 3

THE OMEGA 3 INDEX

- Reflects long-term omega-3 status
  (Schuchardt et al, 2024)
- Low index associated with poorer cognitive and cardiovascular outcomes



There are 64 FAs in this model membrane,
3 of which are EPA or DHA

3/64 = 4.6%

O3I = 4.6%

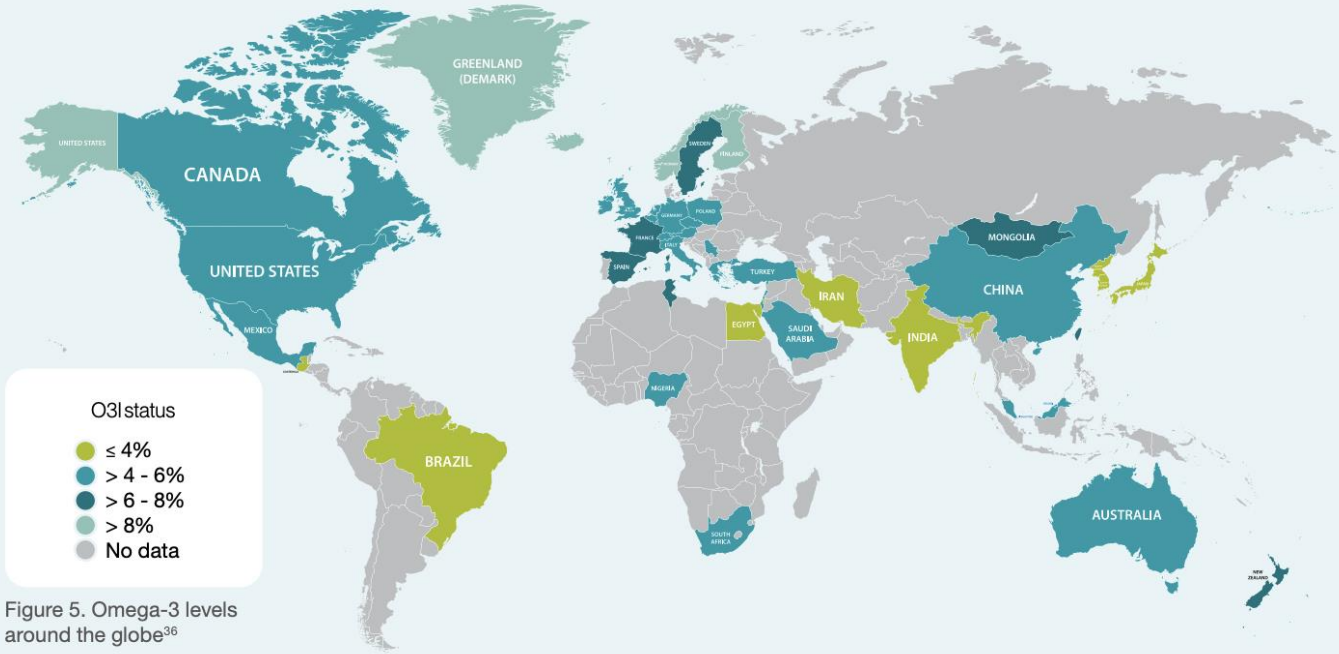


Figure 5. Omega-3 levels around the globe[36]

Secondary analysis of the Women's Health Initiative Memory Study confirmed that **higher red blood cell DHA and EPA** levels were associated with a modest but significant **reduction in dementia risk**, amounting to a 2.1% lower absolute risk over 15 years in older women. (Ammann et al., 2017)

Ammann, E. M., Pottala, J. V., Robinson, J. G., Espeland, M. A., & Harris, W. S. (2017). Erythrocyte omega-3 fatty acids are inversely associated with incident dementia: Secondary analyses of longitudinal data from the Women's Health Initiative Memory Study (WHIMS). *Prostaglandins, leukotrienes, and essential fatty acids*, *121*, 68–75. https://doi.org/10.1016/j.plefa.2017.06.006.
Schuchardt, J. P., Beinhorn, P., Hu, X. F., Chan, H. M., Roke, K., Bernasconi, A., Hahn, A., Sala-Vila, A., Stark, K. D., & Harris, W. S. (2024). Omega-3 world map: 2024 update. *Progress in lipid research*, *95*, 101286. https://doi.org/10.1016/j.plipres.2024.101286

Evidence for omega-3 supplementation

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EVIDENCE

BRAIN OPTIMISERS

HEALTHY PEOPLE CHASING SHARPER THINKING

A meta-analysis of RCTs in 40+ y.o. **adults without dementia** found that daily supplementation with **more than 500 mg** of omega-3s (and up to 420 mg EPA) **improved executive function** (e.g. planning, remembering instructions, etc.) during 12 months of intervention.
(Suh et al., 2024).

Suh, S., Lim, E., Burm, S., Lee, H., Bae, J., Han, J., & Kim, K. (2024). The influence of n-3 polyunsaturated fatty acids on cognitive function in individuals without dementia: a systematic review and dose–response meta-analysis. *BMC Medicine*, 22. https://doi.org/10.1186/s12916-024-03296-0.

EVIDENCE

PREVENTION SEEKERS

PEOPLE WITH FAMILY HISTORY OR STRONG PREVENTION FOCUS.

Strongest benefits when consumed **earlier in life or before significant impairment develops**. (Wood et al., 2021).

Long-term omega-3 supplementation is linked to a 64% lower risk of **Alzheimer's disease**. Across 48 longitudinal studies (n=103,651), **higher dietary omega-3** reduced **cognitive-decline risk** by about **20%,** with each 0.1g/day of DHA or EPA lowering risk by 8-10% (Wei et al. 2023)

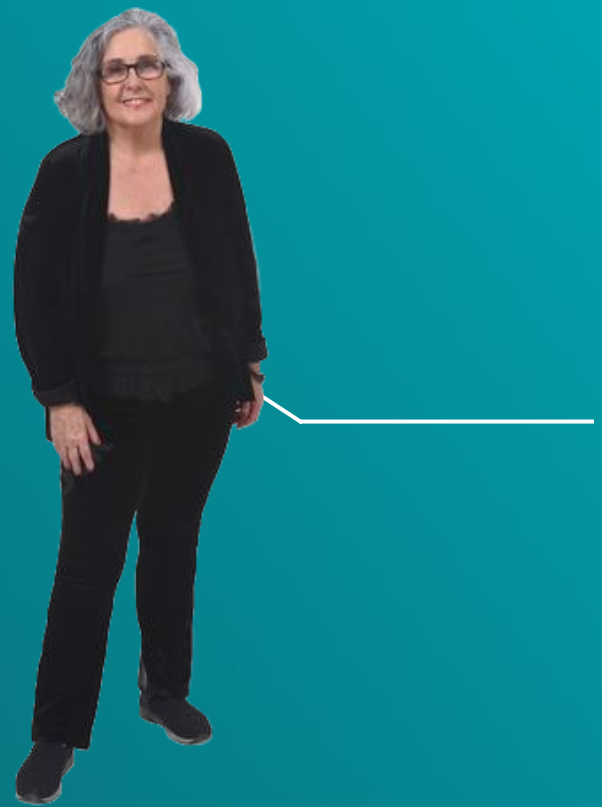
Wei, B. Z., Li, L., Dong, C. W., Tan, C. C., & Xu, W. (2023). The relationship of omega-3 fatty acids with dementia and cognitive decline: Evidence from prospective cohort studies of supplementation, dietary intake, and blood markers. The American Journal of Clinical Nutrition, 117(6), 1096-1109. https://doi.org/10.1016/j.ajcnut.2023.04.001

Wood, A., Chappell, H., & Zulyniak, M. (2021). Dietary and supplemental long-chain omega-3 fatty acids as moderators of cognitive impairment and Alzheimer's disease. European Journal of Nutrition, 61, 589 - 604. https://doi.org/10.1007/s00394-021-02655-4.

EVIDENCE

SYMPTOM NOTICERS

PEOPLE WITH SUBJECTIVE COGNITIVE CONCERNS.



A 2025 meta-analysis found omega-3 **supplementation** produced a modest but statistically significant **reduction in cognitive decline (MMSE)** in **older adults with non-dementia** or mild cognitive impairment, with benefits **independent of dose and duration.** (Barros et al., 2025)

Barros, M. I., Brandão, T., Irving, S. C., Alves, P., Gomes, F., & Correia, M. (2025). Omega-3 Polyunsaturated Fatty Acids and Cognitive Decline in Adults with Non-Dementia or Mild Cognitive Impairment: An Overview of Systematic Reviews. *Nutrients*, *17*(18), 3002.

EVIDENCE

THE MCI MANAGERS

PEOPLE WITH MILD COGNITIVE IMPAIRMENT.

A **2025 meta-analysis** found that omega-3 supplementation **improved working memory, attention,** and **processing speed** in **mild cognitive impairment.**

Among trials using omega-3s alone - 40% used DHA only, 60% used DHA+EPA.

Doses of **DHA 480-4,140 mg/day** and EPA 351–1,600 mg/day were studied across **4-24 months.** (Khatun et al., 2025).

Khatun, M., Choudhury, P. P., Mitra, A., & Mitra, A. (2025). Effect of omega-3 polyunsaturated fatty acid supplements on cognitive performance in patients with mild cognitive impairment or Alzheimer's disease: A systematic review and meta-analysis. Nutrition Reviews, nuaf167. https://doi.org/10.1093/nutrit/nuaf167

EVIDENCE

THE DEMENTIA NAVIGATORS

PEOPLE LIVING WITH ESTABLISHED DEMENTIA AND THEIR CARERS.

A systematic review and meta-analysis of 14 studies (n=2,766) of omega-3 in Alzheimer's disease found **58% of trials** demonstrated **positive outcomes**.

Two of the **studies** (n=485) that used the cognitive decline rating scale **(CDR)** showed **slowed progression of cognitive decline** (Calderon Martinez et al. 2024)

Calderon Martinez, E., Zachariah Saji, S., Salazar Ore, J. V., Borges-Sosa, O. A., Srinivas, S., Mareddy, N. S. R., Manzoor, T., Di Vanna, M., Al Shanableh, Y., Taneja, R., & Arruarana, V. S. (2024). The effects of omega-3, DHA, EPA, Souvenaid® in Alzheimer's disease: A systematic review and meta-analysis. *Neuropsychopharmacology reports*, *44*(3), 545–556. https://doi.org/10.1002/npr2.12455

PRESCRIBING CONSIDERATIONS

WHY OMEGA-3S MATTER

- No current dementia cure exists, omega-3s are a **safe, affordable, non-invasive way** to **delay progression** and **improve quality of life** (Castellanos-Perilla et al., 2024)

OMEGA-3S TARGET

- **≥500 mg/ day** for **brain optimisation** (Suh et al., 2024)
- **≥1.0 g/day total omega-3 fatty acids** for the **prevention of cognitive decline** (Wei et al., 2023)
- **Omega-3 index >8%** for the prevention of early-onset dementia (Sala-Vila et al., 2026)

TIMING AND DURATION

- **Take with fatty meals** (Chuang et al., 2024);
- Benefits emerge <6 months (yang et al., 2023) but sustain >10 years for ongoing benefit (Wei et al., 2023)

QUALITY

- Use **tested supplements** free from heavy metals and oxidation products (Zhou et al., 2025)

Castellanos-Perilla, N., Borda, M. G., Aarsland, D., & Barreto, G. E. (2024). An analysis of omega-3 clinical trials and a call for personalised supplementation for dementia prevention. *Expert Review of Neurotherapeutics, 24*(3), 313–324. https://doi.org/10.1080/14737175.2024.2313547 Chuang, J., Briskey, D., Dang, J., Rajgopal, A., & Rao, A. (2024). A randomized double-blind trial to measure the absorption characteristics of eicosapentaenoic acid and docosahexaenoic acid-rich oil blend with natural lipid-based delivery system. *Food Science and Biotechnology, 33*(8), 1957–1964. https://doi.org/10.1007/s10068-023-01466-z. Sala-Vila, A., Tintle, N. L., Westra, J., & Harris, W. S. (2026). Blood omega-3 is inversely related to risk of early-onset dementia. *Clinical Nutrition*, 57, 106559. https://doi.org/10.1016/j.clnu.2025.106559 . Suh, S. W., Kim, H. S., Han, J. H., Bae, J. B., Oh, D. J., Han, J. W., & Kim, K. W. (2024). The influence of n-3 polyunsaturated fatty acids on cognitive function in individuals without dementia: A systematic review and dose–response meta-analysis. BMC Medicine, 22(1), 59. https://doi.org/10.1186/s12916-024-03296-0. Wei, B.-Z., Li, L., Dong, C.-W., Tan, C.-C., & Xu, W. (2023). The relationship of omega-3 fatty acids with dementia and cognitive decline: Evidence from prospective cohort studies of supplementation, dietary intake, and blood markers. *The American Journal of Clinical Nutrition, 117*(6), 1096–1109. https://doi.org/10.1016/j.ajcnut.2023.04.001. Zhou, Q., Xu, L., Xu, Y., Xue, Q., Xue, C., Jiang, X., & Wen, Y. (2025). Systematically investigating the qualities of commercial encapsulated and industrial-grade bulk fish oils in the Chinese market. *Foods, 14*(9), 1623. https://doi.org/10.3390/foods14091623

SAFETY

EXCELLENT SAFETY PROFILE

Generally well tolerated

MOST COMMON ADVERSE EFFECTS

Mild transient gastrointestinal symptoms such as fishy aftertaste, nausea, belching, flatulence, abdominal discomfort, and loose stools (Office of Dietary Supplements, 2025)

- Taking supplements with meals, using enteric-coated formulations, or adjusting the dose may reduce adverse effects. (Ibi et al., 2024)
- The **risk-benefit ratio is generally favourable**, particularly for individuals at elevated risk of cognitive decline.

ATRIAL FIBRILLATION RISK

Once age is properly adjusted, omega-3 supplement use **shows no meaningful effect on atrial fibrillation risk** (O'Keefe et al., 2025)

BLEEDING RISK

Clinically significant bleeding complications are rare.

Omega-3 supplementation is generally considered safe even in individuals on anticoagulant therapy, medical supervision is advisable (Javaid et al, 2024)

Ibi, A., Chang, C., Kuo, Y. C., Zhang, Y., Du, M., Roh, Y. S., Gahler, R., Hardy, M., & Solnier, J. (2024). Evaluation of the Metabolite Profile of Fish Oil Omega-3 Fatty Acids (n-3 FAs) in Micellar and Enteric-Coated Forms—A Randomized, Cross-Over Human Study. *Metabolites*, *14*(5), 265. https://doi.org/10.3390/metabo14050265. Javaid, M., Kadhim, K., Bawamia, B., Cartlidge, T., Farag, M., & Alkhalil, M. (2024). Bleeding Risk in Patients Receiving Omega-3 Polyunsaturated Fatty Acids: A Systematic Review and Meta-Analysis of Randomized Clinical Trials. *Journal of the American Heart Association*, *13*(10), e032390. https://doi.org/10.1161/JAHA.123.032390 . O'Keefe E, O'Keefe JH, Tintle NL, Franco WG, Westra J, Harris WS. Associations between plasma omega-3 and fish oil use with risk of atrial fibrillation in the UK Biobank. *J Am Heart Assoc*. Published online December 10, 2025. doi: 10.1161/JAHA.125.043031. Office of Dietary Supplements - Omega-3 Fatty Acids. 2025. Available from: https://ods.od.nih.gov/factsheets/Omega3FattyAcids-HealthProfessional

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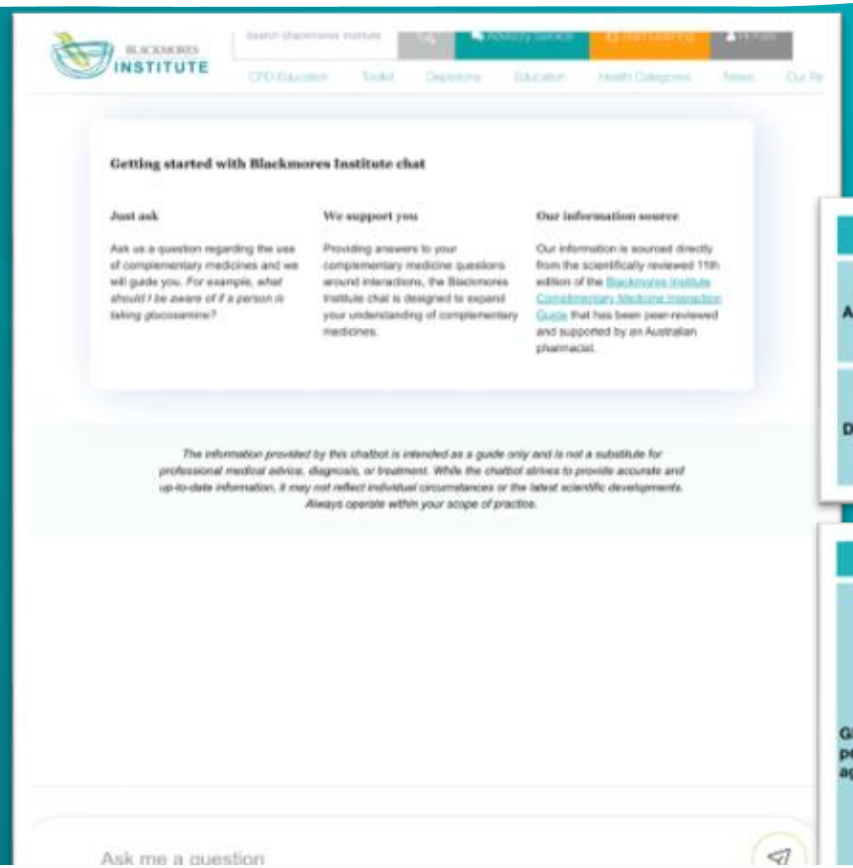

DRUG	NUTRIENT	CLINICAL EFFECT	EVIDENCE	LIKELIHOOD	
ACE inhibitors	Zinc	Long-term treatment with ACE inhibitors may increase urinary zinc excretion and lead to zinc deficiency. The risk of zinc deficiency is highest with captopril.[5,9]	A	Possible[9]	Monitor for symptoms of zinc depletion in patients on high doses of captopril for prolonged periods.[9] Recommended dose: 16-70 mg/day.[17]
Digoxin	Magnesium	Decreased renal reabsorption of magnesium leading to increased urinary excretion and a moderate depletion of magnesium.[6]	A	Likely[6]	Monitor for depletion; supplementation may be needed in some patients.[6] Recommended dose: 300-600 mg/day.[18-23]

DRUG	NUTRIENT	CLINICAL EFFECT	EVIDENCE	LIKELIHOOD	RECOMMENDATION
Glucagon-like peptide (GLP-1) agonists	Vitamin B1 (Thiamine)	Restricted food intake may result in nutritional deficiencies, including vitamin B1 deficiency.[13,14]	C	Possible[13,14]	Ensure adequate dietary intake and consider supplementation.[13,14] Recommended dose: 5-30 mg/day as a single dose or in divided doses for one month. For severe deficiency, up to 300 mg/day can be used.[15]
	Vitamin B12 (Cobalamin)	Once-weekly treatment may result in significant decreases in serum vitamin B12.[16]	C	Possible[16]	Monitor for depletion; supplementation may be needed in some patients.[16] Recommended dose: 1000 mcg/day.[16]
		Once-weekly treatment may result in significant [illegible]	C	Possible[17]	Monitor for depletion; supplementation may be needed in some patients.[16] Recommended dose: 16-70 mg/day.[17]

Ask me a question

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COMPLEMENTARY NUTRIENTS AND COFACTORS

While omega-3 fatty acids play critical roles in cognitive health, their metabolism and neuroprotective effects depend on adequate levels of complementary nutrients and cofactors

(Duričić, 2020).

- **B vitamins** (folate, B6, B12): regulate homocysteine; essential for omega-3 effectiveness; use B complex if diet inadequate
- **Vitamin D**: low levels associated with increased dementia risk
- **Antioxidants/polyphenols**: protect omega-3 from oxidation; reduce inflammation; support vascular function.

Đuričić, I. (2020). Nutritional aspects of cognitive impairment. Arhiv za farmaciju, 70(2), 98–108. https://doi.org/10.5937/ARHFARM2002098Q

BACOPA MONNIERI (BRAHMI) FOR MEMORY AND COGNITIVE PERFORMANCE

Traditional ayurvedic herb with a long history of **memory and intellectual enhancement.** (Tiemtad et al., 2026)

Key actions:

- **Antioxidant and anti-inflammatory**
  - Inhibition of lipid peroxidation in the brain
  - Down regulation of inflammatory cytokines
- **Modulation of cholinergic systems**
  - Enhances acetylcholine synthesis
- **Neuroprotection**
  - Regulation of b-amyloid aggregation
  - Synaptic plasticity (Tiemtad et al., 2026)

- **300 mg/day**: improves verbal learning, memory acquisition, delayed recall and total learning over 12 weeks (Cave et al., 2023).
- **600 mg/day**: **enhances working and short-term memory** (Tiemtad et al., 2026).
- Potential cognitive decline prevention (Wiciński et al., 2025).
- **Generally well tolerated**; mild, transient, dose-related GI symptoms such as nausea, abdominal cramps and increased bowel movements (Tiemtad et al., 2026).

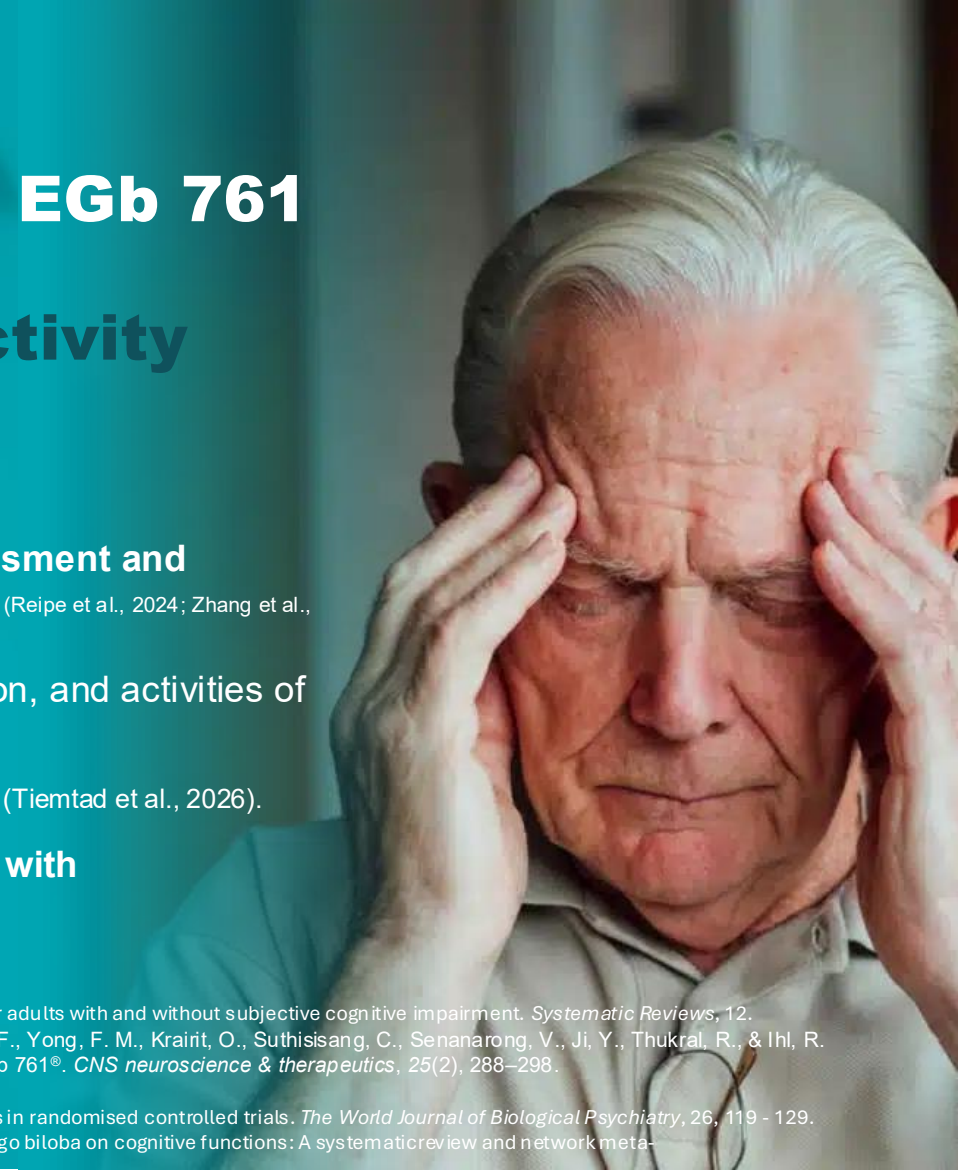
Cave, A., Chang, D., Münch, G., & Steiner-Lim, G. (2023). A systematic review of the safety and efficacy on cognitive function of herbal and nutritional medicines in older adults with and without subjective cognitive impairment. *Systematic Reviews*, 12.

Tiemtad, P., Ingkaninan, K., Temkitthawon, P., Thimkorn, P., Rattanachaisit, N., Teaktong, T., & Dhippayom, T. (2026). Comparative effects of Bacopa monnieri and Ginkgo biloba on cognitive functions: A systematic review and network meta-analysis. *Phytomedicine*, 157915.

Wiciński, M., Fajkiel-Madajczyk, A., Wójcicki, J., Ozorowski, M., & Szambelan, M. (2025). The Role of Bacopa monnieri in Alzheimer's Disease: Mechanisms and Potential Clinical Use—A Review. *Nutrients*, 17.

GINKGO BILOBA FOR COGNITIVE IMPAIRMENT

Ginkgo biloba, particularly the standardised EGb 761 extract, supports cognitive function through improved cerebral blood flow, antioxidant activity and neurotransmitter modulation (Tiemtad et al., 2026).



- **Dosing**: 240 mg/day for 22–26 weeks (Reipe et al., 2024; Zhang et al., 2016)
- **Evidence**: Small-to-moderate improvements in **cognition, daily functioning, global assessment and quality of life** in patients with Alzheimer's disease, vascular dementia, and mixed dementia (Reipe et al., 2024; Zhang et al., 2016)
- **2026 Cochrane Review:** Demonstrated small-to-moderate benefits in global status, cognition, and activities of daily living after 6 months in people with dementia (compared to placebo) (Wieland et al., 2026)
- **Generally well tolerated,** with occasional headache, dizziness or mild gastrointestinal upset (Tiemtad et al., 2026).
- No clinically important increase in bleeding risk at standard doses, though **caution advised with** anticoagulants / antiplatelets (Kandiah et al., 2019; Cave et al., 2023)
- Best suited to older patients experiencing MCI or dementia (Tiemtad et al., 2026)

Cave, A., Chang, D., Münch, G., & Steiner-Lim, G. (2023). A systematic review of the safety and efficacy on cognitive function of herbal and nutritional medicines in older adults with and without subjective cognitive impairment. *Systematic Reviews*, 12.

Kandiah, N., Ong, P. A., Yuda, T., Ng, L. L., Mamun, K., Merchant, R. A., Chen, C., Dominguez, J., Marasigan, S., Ampil, E., Nguyen, V. T., Yusoff, S., Chan, Y. F., Yong, F. M., Krairit, O., Suthisisang, C., Senanarong, V., Ji, Y., Thukral, R., & Ihl, R. (2019). Treatment of dementia and mild cognitive impairment with or without cerebrovascular disease: Expert consensus on the use of Ginkgo biloba extract, EGb 761®. *CNS neuroscience & therapeutics*, *25*(2), 288–298. https://doi.org/10.1111/cns.13095

Riepe, M., Hoerr, R., & Schlaefke, S. (2025). Ginkgo biloba extract EGb 761 is safe and effective in the treatment of mild dementia – a meta-analysis of patient subgroups in randomised controlled trials. *The World Journal of Biological Psychiatry*, 26, 119 - 129.

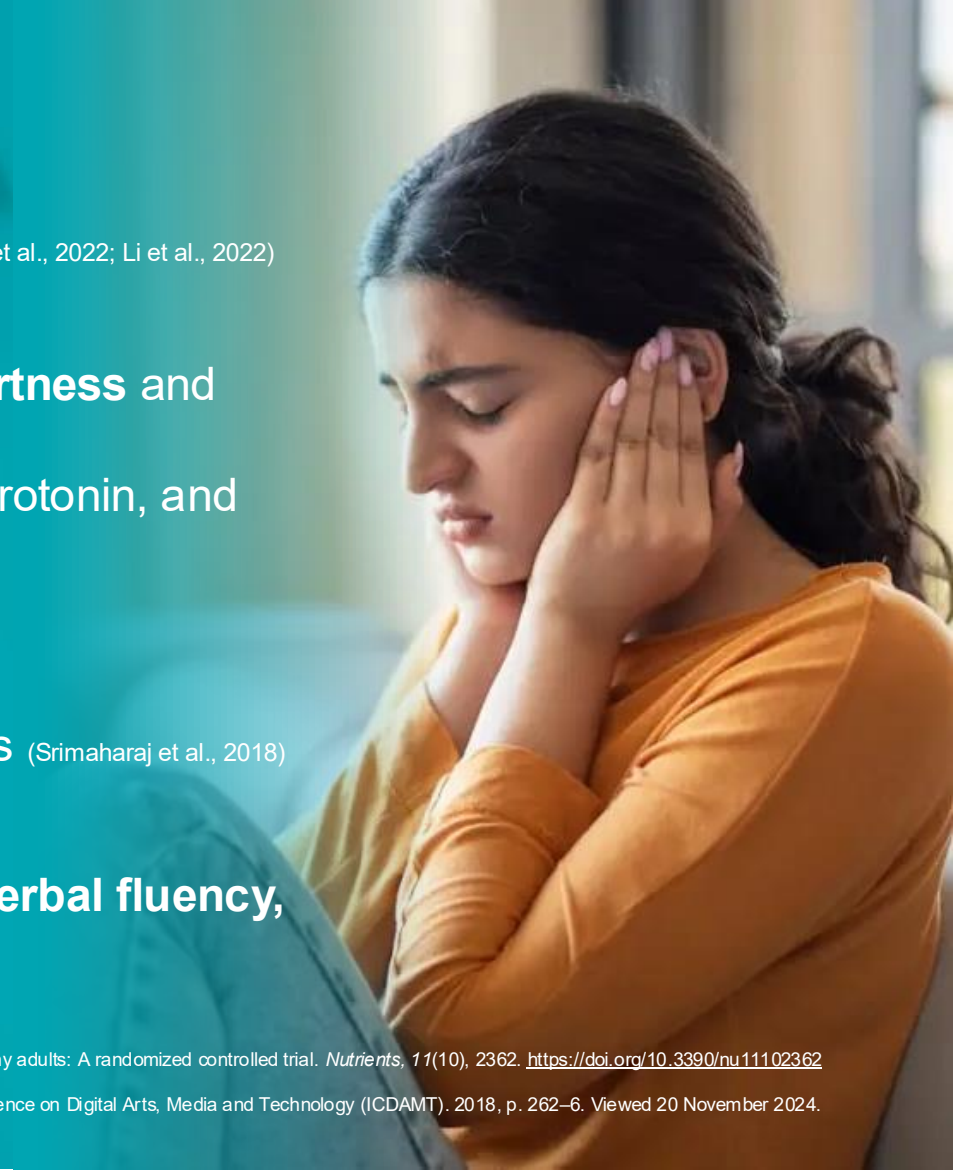
Tiemtad, P., Ingkaninan, K., Temkitthawon, P., Thimkorn, P., Rattanachaisit, N., Teaktong, T., & Dhippayom, T. (2026). Comparative effects of Bacopa monnieri and Ginkgo biloba on cognitive functions: A systematic review and network meta-analysis. *Phytomedicine*, 157915.

Wieland, L. S., Ludeman, E., Chi, Y., Feinberg, T. M., Chen, I. H., Chen, K. H., Zhu, Y., Wolverson, E., & Amri, H. (2026). Ginkgo biloba for cognitive impairment and dementia. *The Cochrane database of systematic reviews*, *2*(2), CD013661. https://doi.org/10.1002/14651858.CD013661.pub2

Zhang, H., Huang, L., Zhong, Y., Zhou, Q., Wang, H., Zheng, G., & Lin, Y. (2016). An Overview of Systematic Reviews of Ginkgo biloba Extracts for Mild Cognitive Impairment and Dementia. *Frontiers in Aging Neuroscience*, 8.

L-THEANINE FOR ATTENTION AND CALM FOCUS

- **Source:** L-theanine is found naturally in green tea (Camellia sinensis). (Wang et al., 2022; Li et al., 2022)
- **Key actions:**
  - **Stimulates alpha brain waves** (within 40 minutes) to promote **calm alertness** and meditative states that **support learning.** (Srimaharaj et al., 2018)
  - **Modulates neurotransmitters**: reduces glutamate, increases GABA, serotonin, and dopamine (Wang et al., 2022)
  - **Enhances neurogenesis** (Wang et al., 2022)
  - **Inhibits excitatory effects of caffeine** (Wang et al., 2022)
- **Pharmacokinetics:** Plasma levels peak at 50 minutes, lasting up to 8 hours (Srimaharaj et al., 2018)
- **Dosing:** 100-400 mg/day (clinical range) (Wang et al., 2022)
- **Evidence:** 200 mg/day for 4 weeks improves **stress-related symptoms, verbal fluency, and executive function in healthy adults (RCT, n=30)** (Hidese et al., 2019)



Chen S., Kang, J., Zhu, H. 2023. L-theanine and immunity: a review. 1;28(9). https://doi.org/10.3390/molecules28093846
Hidese, S., Ogawa, S., Ota, M., Ishida, I., Yasukawa, Z., Ozeki, M., & Kunugi, H. (2019). Effects of L-theanine administration on stress-related symptoms and cognitive functions in healthy adults: A randomized controlled trial. *Nutrients, 11*(10), 2362. https://doi.org/10.3390/nu11102362
Li MY, Liu HY, Wu DT, et al. L-theanine: a unique functional amino acid in tea (Camellia sinensis L.) with multiple health benefits and food applications. Front Nutr. 2022;9:853846
Srimaharaj W, Chaisricharoen R, Chaising S, et al. Classification of human brain attention focused on meditation, effected by L-theanine acid in Oolong tea. In: 2018 International Conference on Digital Arts, Media and Technology (ICDAMT). 2018, p. 262–6. Viewed 20 November 2024. https://ieeexplore.ieee.org/document/8376536
Wang L, Brennan M, Li S, et al. How does the tea L-theanine buffer stress and anxiety. Food Sci. Hum. Wellness. 2022;11(3):467–75.

COGNITIVE EXERCISE FOR ENGAGEMENT

In the ACTIVE trial, speed-of-processing cognitive training with booster sessions was associated with a ~25% lower risk of claims-based dementia diagnosis over 20 years (Coe et al.,2026).

- Computerised cognitive training in MCI gives **moderate memory gains**, especially when supervised (Chan et al., 2024).
- Benefits are **domain-specific**— no clear evidence for generalised cognitive transfer. (Chan et al., 2024)
- Other evidence suggests **multidomain approaches** may offer additional benefit although not tested in this review directly (Chan et al., 2024).

Chan, A., Ip, R., Tran, J., Chan, J., & Tsoi, K. (2024). Computerized cognitive training for memory functions in mild cognitive impairment or dementia: a systematic review and meta-analysis. *NPJ Digital Medicine*, 7.
Coe NB, Miller KEM, Sun C, et al. Impact of cognitive training on claims-based diagnosed dementia over 20 years: evidence from the ACTIVE study. *Alzheimer's Dement*. 2026; 12:e70197.

THE COGNITIVE HEALTH CONTINUUM

"Can supplements help me think faster, focus better, and stay sharp?"

BRAIN OPTIMISERS

Omega-3 (Suh et al., 2024)
Bacopa (Cave et al., 2023)
L-Theanine (Hidese et al.,2019

"What can I do now to reduce my long-term risk."

PREVENTION SEEKERS

Mediterranean/MIND diet (Liu etal.,2025)
Omega-3 (Wei et al. 2023)
Lifestyle and modifiable risk factors (Livingston et al., 2024)

"How can I stop things getting worse?"

SYMPTOM NOTICERS

Omega-3 (Barros et al.,2025)
Ginkgo (Gavrilova et al.,2014)
Cognitive exercises (Chan et al., 2024)

"Can supplements reverse this or at least slow the progression?"

THE MCI MANAGERS

Gingko (Hort et al., 2023)
Omega-3 (Khatun et al.,2025)
Cognitive exercises (Chan et al., 2024)

"Will this bring back some memory or slow it down?"

THE DEMENTIA NAVIGATORS

Ginkgo (Wieland et al., 2026)
Omega-3 (Calderon Martinez et al. 2024)

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WRAP UP

KEY MESSAGES FOR PATIENTS

THE OPPORTUNITY: Dementia is Australia's leading cause of death; public anxiety and interest in brain hacking - creates an opening for pharmacist-led prevention education (Alzheimer's Disease International, 2024)

TIMING MATTERS: Omega-3s most effective for prevention and early cognitive decline, before extensive neuronal loss (Barros et al., 2025)

FOOD FIRST APPROACH: Mediterranean or MIND dietary patterns; aim for >1 g/day (>7 g/week DHA+EPA) from fatty fish (Wei et al., 2023)

SUPPLEMENTATION: Aim for an Omega-3 Index >8%; DHA+EPA adjusted based on dietary intake to achieve this; generally safe at these doses. Algal forms may be preferable to some. (Sala-Vila et al., 2026; Suh et al., 2024)

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WRAP UP

KEY MESSAGES FOR PATIENTS

OPTIMISE OMEGA-3 EFFECTS: Ensure adequate B vitamins, vitamin D, and antioxidant-rich foods (Đuričić, 2020)

COMPLEMENTARY APPROACHES: Consider Bacopa, Ginkgo, L-theanine, cognitive exercises

LIFESTYLE FACTORS: Physical activity, hearing/vision health, cardiovascular health, social engagement, cognitive activity, air pollution reduction, traumatic brain injury prevention (Livingston et al., 2024)

Alzheimer's Disease International. World Alzheimer Report 2024: Global changes in attitudes to dementia [Internet]. London: Alzheimer's Disease International; 2024 [cited 2026 Jan 30]. Available from: https://www.alzint.org/resource/world-alzheimer-report-2024/

Barros, M. I., Teixeira, R. F., Pereira, L. A., Souza, C. R. V., Oliveira, T. O., & Silva, F. R. (2025). *Omega-3 polyunsaturated fatty acids and cognitive change among cognitively healthy adults: Effects of EPA and DHA supplementation*. Nutrients, 17(18), 3002. https://doi.org/10.3390/nu17183002

Đuričić, I. (2020). Nutritional aspects of cognitive impairment. Arhiv za farmaciju, 70(2), 98–108. https://doi.org/10.5937/ARHFARM2002098Q

Livingston, G., Huntley, J., Liu, K. Y., et al. (2024). Dementia prevention, intervention, and care: 2024 report of the Lancet standing Commission. The Lancet, 404(10452), 572-628. https://doi.org/10.1016/S0140-6736(24)01296-0

Suh, S. W., Kim, H. S., Han, J. H., Bae, J. B., Oh, D. J., Han, J. W., & Kim, K. W. (2024). The influence of n-3 polyunsaturated fatty acids on cognitive function in individuals without dementia: A systematic review and dose–response meta-analysis. BMC Medicine, 22(1), 59. https://doi.org/10.1186/s12916-024-03296-0

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CLINICAL TOOLS AND RESOURCES

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APPENDIX

Fish Species	DHA (mg/150g serve)	EPA (mg/150g serve)	Ratio DHA: EPA	Total DHA + EPA (mg/ 150g serve)	Serves / week for 500mg/ day DHA+EPA
Atlantic Salmon *(aquaculture + environmental concerns)*	2873	1445	2 : 1	4318	**0.8**
Swordfish *(very high mercury)*	2484	432	5.8 : 1	2916	**1.2**
Gemfish *(overfished + moderate–high mercury)*	1361	312	4.4 : 1	1673	**2.1**
Ocean Trout *(aquaculture concerns)*	823	351	2.3 : 1	1174	**3.0**
European Carp *(muddy flavour; possible contaminants)*	964	190	5.1 : 1	1154	**3.0**
Snook *(spoils quickly)*	846	29	29.2 : 1	875	**4.0**
Squid *(generally low concern)*	703	168	4.2 : 1	871	**4.0**
Australian Salmon *(strong flavour)*	573	86	6.7 : 1	659	**5.3**
Flake (Blue Shark) *(high mercury; species mislabelling)*	583	45	13 : 1	628	**5.6**
Tommy Ruff (Australian Herring) *(stock fluctuations)*	527	94	5.6 : 1	621	**5.6**
Rainbow Trout *(low concern)*	434	140	3.1 : 1	574	**6.1**
Prawn (shrimp) *(imported may have antibiotics)*	277	241	1.1 : 1	518	**6.8**
Red Snapper (Bight Redfish) *(overfished)*	455	38	12 : 1	493	**7.1**
Flathead *(low concern)*	436	34	12.8 : 1	470	**7.4**
Blue Grenadier *(NZ sustainable; AU variable)*	330	47	7 : 1	377	**9.3**
Northern Whiting *(low concern)*	207	162	1.3 : 1	369	**9.5**
Southern Bluefin Tuna *(very high mercury; overfished)*	308	40	7.7 : 1	348	**10.1**
Barramundi *(imported may have antibiotics)*	171	130	1.3 : 1	301	**11.6**

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