



The Brain In Transition

Menopause, Cognition & Mental Health

Julie Gough

Midlife Metamorphosis

- Many Eastern cultures regard this transitional stage of a woman's life as a time for new beginnings.
- Traditional Chinese medicine regards the menopause as the "**second Spring**" and it is regarded as positively transforming among some African women of the Sahara and Rajput women of India. (Rasmussen, 2010)
- In Ayurvedic and Chinese medicine, menopause is characterised by "**soul development**". The gateway beyond which a new sense of self emerges.
- And the theme continues in Japan with the word for menopause '**konenki**', translating as 'renewal' and 'energy'.
- But for many women, particularly here in the West, it is an entirely negative experience, with symptoms significantly affecting their daily personal, social, and professional lives.
- A systematic review concluded that negative emotions, negative attitudes, worry and anxiety exacerbate the symptoms of menopause. (Khandehroo, 2024)



Oestrogen, Progesterone. Testosterone

Oestrogen

- Boosts mood (Hogervorst, 2022) & enhances cognition. (Brann, 2022)
- Helps brain cells use glucose for energy. (Rettberg, 2014)
- Facilitates glutaminergic system influencing neural and cellular excitability (Sacco, 2012) whereas progesterone modulates this effect through its action on the GABAergic systems. (Martin, 2006)
- Oestrogen & progesterone can also influence pain-processing. (White, 2002)
- Oestrogen plays an important role in perimenopausal depression regulating the neural circuits such as the serotonin, noradrenergic, and dopaminergic systems. (Liang, 2024)
- Makes us look and behave in a way to promote reproduction – makes features more symmetrical, clears up skin, boosts confidence, makes us feel sensual and fertile.

Progesterone

- Calms the brain, reduces anxiety and can promote sleep.
- A metabolite of progesterone – allopregnanolone, may exert an anesthetic effect via GABAergic pathway. (Reddy, 2010) & influences emotional processing. (Sundstrom-Poromaa, 2020)
- Focuses us inward as we prepare to have our baby. Our brain relaxes; we become calmer, more protective and want to slow down.

Testosterone

- Brain testosterone levels exceed oestrogen levels in reproductive years, promoting cognition & memory. (Gluck, 2019)
- Confidence Boost - Helps us to feel strong and confident & gives libido a little boost in the run up to ovulation.

Peri-menopause - Second Puberty

- Peri-menopausal oestrogen levels can be up to a third higher than in younger women.
- In addition, peri-menopause is a time when cycles are less likely to be ovulatory, thus progesterone is low.
- Levels of androgens, including testosterone and DHEA also change in ageing women.
- The hormone fluctuations during this period are more severe than those during the menstrual cycle
- Sex hormones stimulate synthesis of neurotransmitters, the expression of receptors and influence membrane permeability. (Steiner, 2003)
- Progesterone has a stabilising effect on the HPA and is neuroprotective via stimulation of brain derived neurotrophic factor. (Singh, 2013)
- The drop in progesterone, along with the other hormonal shifts, can be destabilising for your brain cause quite dramatic imbalances in neurotransmitter levels leading to puberty-like mood swings, anxiety, aggression and depression.

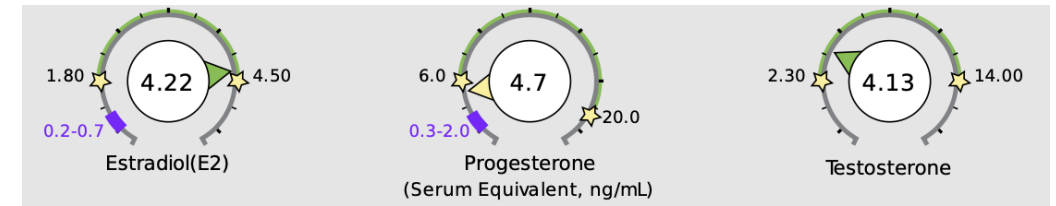
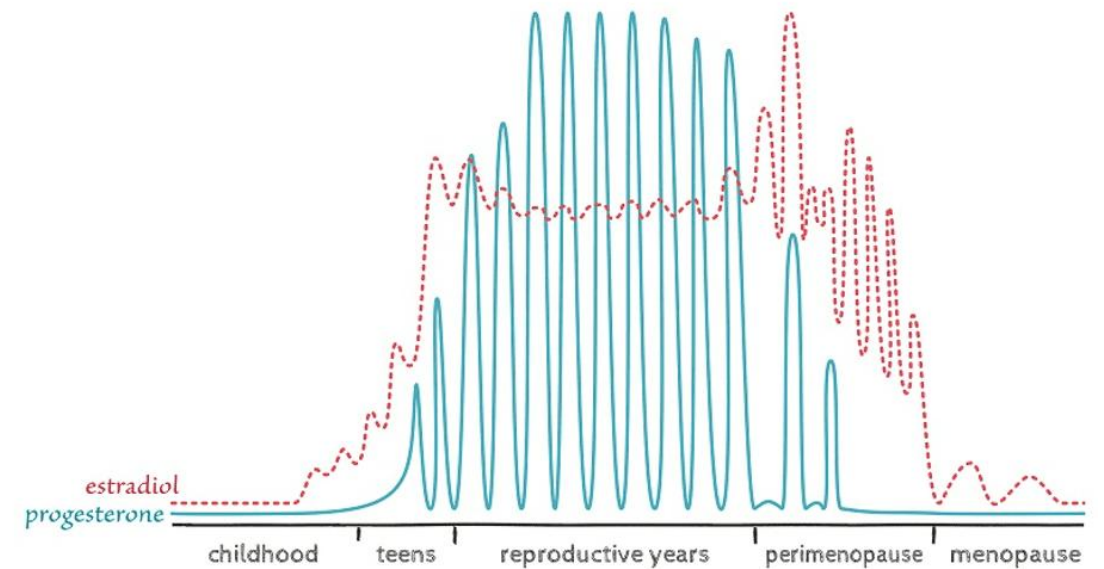
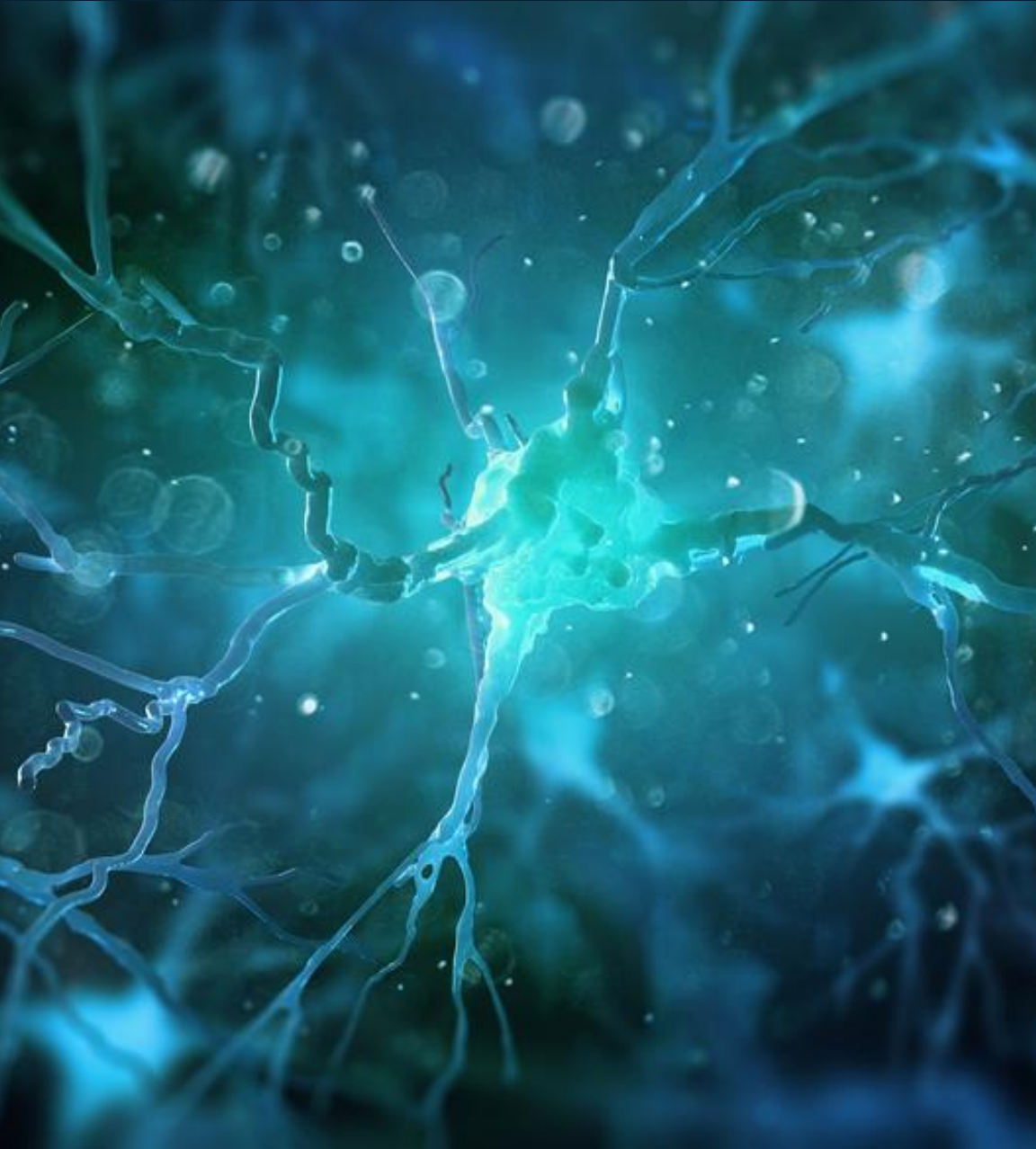


Image from DUTCH Test



(Prior, 2006)

Hormone Interactions – Cognition



- An estimated 44-62% of American peri-menopausal women complain of **cognitive decline**, especially **memory problems**. (El Khoudary, 2019)
- Decreases in attention/working memory, verbal learning, verbal memory, and fine motor speed may be most evident in the first year after the final menstrual period. (Weber, 2013)
- There seems to be **temporary loss of learning** during peri-menopause period, that resolves in menopause when learning resumes. (El Khoudary, 2019)
- The brain effectively re-calibrates in peri-menopause — if all goes well any slight cognitive decline is transient...if not it can be a **trigger for age-related neurological disease**. (Brinton, 2015)
- Cognitive difficulties may be a consequence of sleep disruption caused by hot flashes.
- But we also know that **oestrogen influences hippocampal and prefrontal cortex function**, potentially influencing verbal memory and executive function. (Maki, 2009)

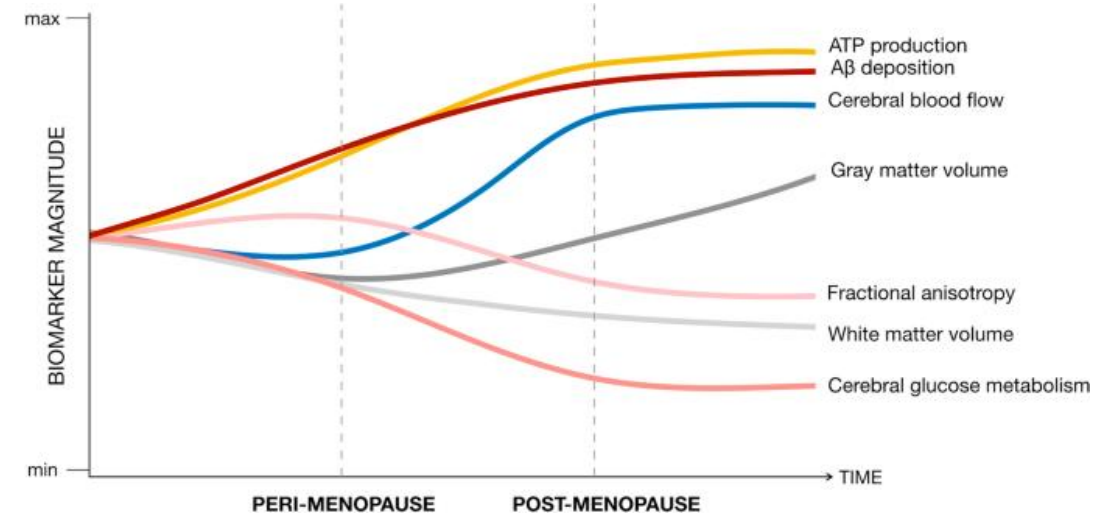
Hormone Interactions – Mood

- Oestrogen has complex effects in the central nervous system.
- **Anxiety, depression, mood changes, disturbed sleep, and sexual dysfunction** are not uncommon.
- Depression does not correlate with absolute levels of sex hormones but seem to be more triggered by degree of hormonal fluctuations. (Freeman, 2004)
- An estimated **20% of women have depression at some point during menopause.** (Soares 2006)
- Depression does not correlate with absolute levels of sex hormones but seem to be more triggered by degree of hormonal fluctuations (Freeman, 2004).
- Menopause associated reductions in circulating oestrogen could lead to imbalances in neurotransmitter levels in the hypothalamus and other portions of the CNS.
- Sex hormones stimulate synthesis of neurotransmitters, the expression of receptors and influence membrane permeability. (Steiner 2003)
- Progesterone has a stabilising effect on the HPA and is neuroprotective via stimulation of brain derived neurotrophic factor. (Singh, 2013)
- Higher testosterone levels, as well as presence of vasomotor symptoms and stressful life events were found to be significantly associated with higher depressive symptoms. (El Khoudary, 2019)



The Brain re-Wires

- The menopausal brain is a **brain in transition**.
- There is a dynamic neurological transition that significantly impacts brain structure, connectivity, and metabolic profile. (Mosconi, 2021)
- In other words a “brain resetting” reshaping the neural landscape to ensure successful transition into late life.
- There has been a long-held belief that oestrogen receptors in the female brain 'shut down' after menopause, but the latest findings show the contrary – there are more receptors in the peri- and post-menopausal periods. This shows that oestrogen has many functions in the brain. (Mosconi, 2024)
- Increased levels of oestrogen receptors in the amygdala, posterior cingulate cortex and frontal regions were associated with a higher risk of mood changes and memory complaints. (Mosconi, 2024)
- Oestrogen loss also seems to trigger an adaptive reaction to increase ketone bodies as an alternative fuel for the brain. (Ding, 2013)



(Mosconi, 2021)

Nutritional Support for Cognition & Mood

- **Mediterranean diet** is associated with better cognition in older adults. (Chen, 2021)
- Rich in good sources of protein and building blocks for connective tissue, nervous system and gut integrity.
- High in phytonutrients and phyto-oestrogens are linked with gentler menopause. Rosemary & sage help with hormonal fluctuations.
- **Sage** may increase alertness, calmness and feeling of content. (Tildesley, 2005)
- **Saffron** has serotonergic, antioxidant, anti-inflammatory, neuroendocrine and neuroprotective effects. (Lopresti, 2014)
- Oestrogen clearing effects of **rosemary** & phyto-oestrogenic actions of sage to help with hormonal fluctuations.
- **Lemon balm** known to have an anxiolytic effect as well as having benefits to cognition & memory. (Miraj, 2017)
- **Healthy fats** and more favourable ratio of omega 3-fats for improving menopausal symptoms (Abshirini, 2018). Legumes and fatty fish consumption linked with a menopause on average 3 years later. (Mosconi, 2024).
- **Microbiome support** – Fermented foods & prebiotic rich foods like Kimchi, sauerkraut, stewed apples, ground flaxseeds.
- Our gut is our second brain and beneficial gut bacteria help to metabolise serotonin, our happiness neurotransmitter and GABA our calming neurotransmitter.



Lifestyle Support for Cognition & Mood



Address fundamental areas/potential triggers:

- Maintain balance and recognise importance of social support groups.
- **Support sleep patterns** drive the synthesis, secretion and metabolism of reproductive hormones. (Lateef,2020).
- **Respect body clock** – Increase daylight exposure in the morning & avoid blue-light in the evening.
- **Manage stress** – Greater reliance on the adrenal glands (ovary back up system) for production of oestrogen and progesterone in a much weaker form.
- **Consider quitting all alcohol** - alcohol impairs neurogenesis. (Geil, 2014)
- **Staying active** – Helps stimulate production of BDNF to support neuronal changes. Contributes to increased wellbeing & sense of self esteem as well as improved sleep and decreased joint pain, (Hajj, 2020) and hence improves the quality of life of women during mid-life. (Abshirini, 2019)
- Physical activity may play a protective role in attenuating climacteric symptoms and hence improve the quality of life of women during mid-life. (Abshirini, 2019)
- **Getting out in nature.**

Key Nutrients

- **Phospholipids & choline** for structural integrity of cells.
 - Phosphatidyl serine also has the ability to improve HPA feedback and support stress response and are essential for structural integrity of the cells. (Hellhammer, 2004)
- **Methylation** support for neurotransmitter synthesis.
- **B12** – A woman over 50 has a 40% chance of being deficient in B12. (Briden, 2021). A critical nutrient for brain and nerve health.
- **Magnesium Taurate** is beneficial for brain health & cognition. (Chen, 2019)
 - Magnesium helps stabilise HPA, promotes neurogenesis and metabolic flexibility. (Briden, 2021)
 - Taurine helps calm neuro-excitation and promotes neurogenesis. (Jakaria, 2019)
- Also consider **L-carnitine** (Montgomery, 2003) & **alpha lipoic acid** (Hager, 2001)
- **Choline** – Drop in oestrogen decreases activity of PEMT enzyme meaning less phosphatidylcholine is made in the body. (Fischer, 2010)
- **N-acetyl cysteine** – Protective against glutamate overload. (Briden, 2021)
- **Omega-3** fish oils to maintain healthy fluidity of cell membranes.
- **Sage** – Increases alertness, calmness and feeling of content. (Tildesley, 2005)
- **Saffron** – Serotonergic, anti-inflammatory, neuroprotective. (Lopresti, 2014)

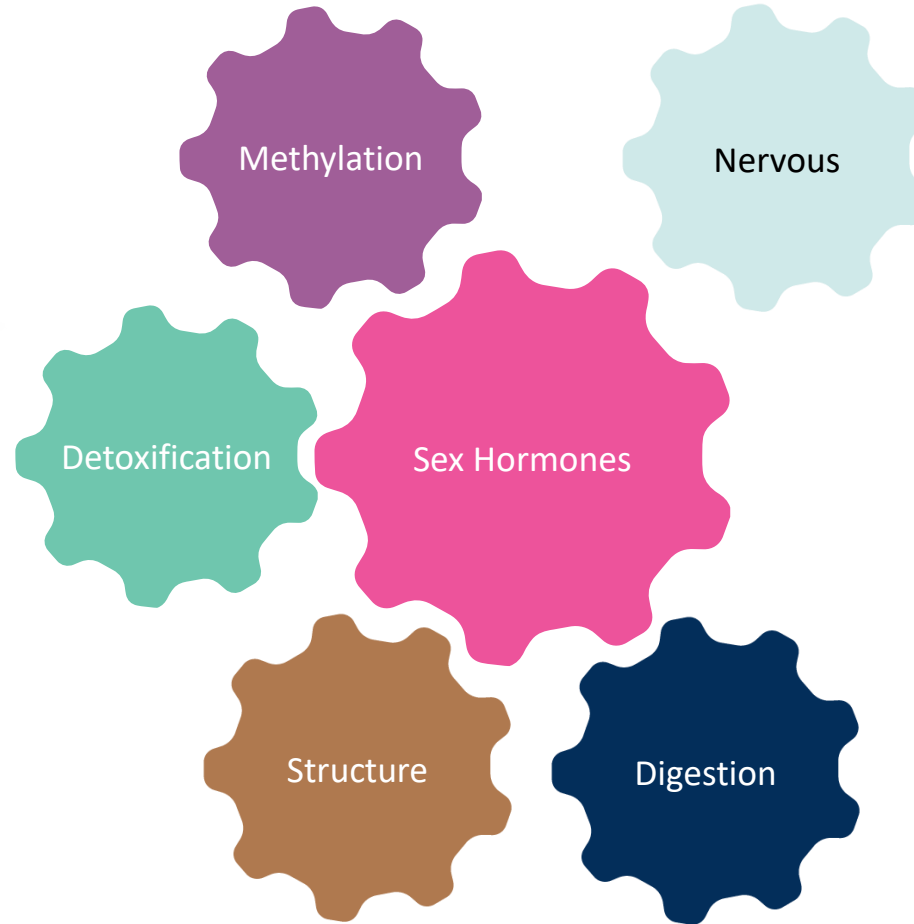
Supplement Support for Menopause



Menopause Multinutrient & Female Balance
Broad spectrum support for hormonal balance and overall health, including energy, bone & heart health, and immunity.



Liquid Collagen & Hyaluronic Acid
8g type I marine collagen with hyaluronic acid & vitamin C for skin health.



Neuro Complex & Calm Complex
Unique and high potency combinations to support brain health, memory & mood.



Female Biotic
Clinically-researched probiotics for female health and vaginal microbiome.

Menopause User Trial

82% of menopausal women experienced an improved quality of life after 12 weeks.*

91% reported an improvement in **hot flashes**

90% reported an improvement in **night sweats**

81% reported an improvement in **sleep**

75% reported an improvement in **stress & anxiety**

75% reported an improvement in **tiredness**

Over 85% would recommend to friends and family

Over 84% would recommend to friends and family



*'My mind has been feeling more **together**, as opposed to all over the place as it had been before the trial.'*

*'The difference is amazing. **Hot flushes** used to make me feel sick and **lightheaded**, so feeling normal again was such a relief.'*

*'I feel more **confident** due to fewer hot flashes.'*

*'My **night sweats** have reduced considerably.'*

*'I am **happier**. I would definitely recommend.'*

*'My **sleep** improved within 5 days.'*

* Independent user trial. Results from 82 participants.

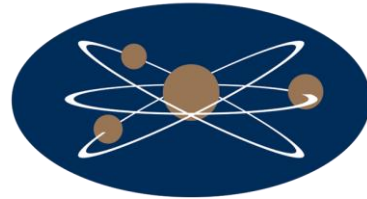
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