I am is a Registered Associate Nutritionist (Association for Nutrition)

My academic background is in Sport Nutrition and Biology

I now specialise in the human microbiome in my role as Nutrition & Education Advisor at ADM Protexin, manufacturers of Bio-Kult and Lepicol



Matthew Hudson

MSc, BSc (Hons), ANutr

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MENOPAUSE AND THE MICROBIOME

Exploring connections and clinical implications



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AGENDA

- **An overview of key aspects of menopause**
  - An evolutionary perspective
  - Hormone functions
  - Health considerations

- **The relationship between menopause and the microbiome**
  - The oestrobolome
  - The vaginal–bladder–gut axis

- **Supporting health and wellbeing in menopause**
  - Diet and lifestyle approaches
  - Live bacteria

- **Wrap-up and questions**

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WHAT IS MENOPAUSE?

Premenopause

- Reproductive years when a person has periods
- No menopausal symptoms

Perimenopause

- Meaning “around or near menopause”
- Symptoms of hormonal changes may arise
- Periods can become irregular but pregnancy is still possible

Menopause

- After 12 consecutive months without a period
- Marks the end of a person’s reproductive years

Postmenopause

- Stage of life following menopause

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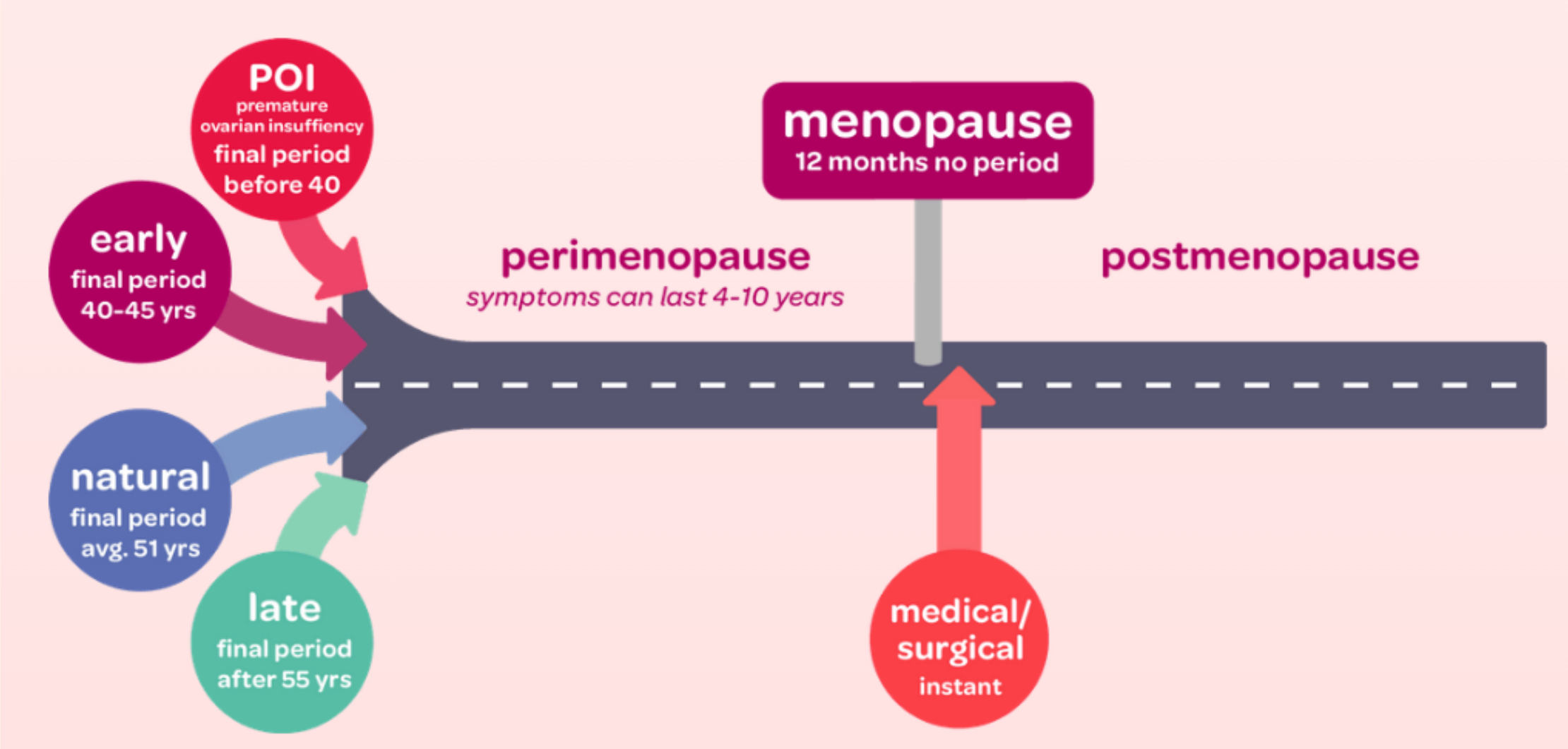

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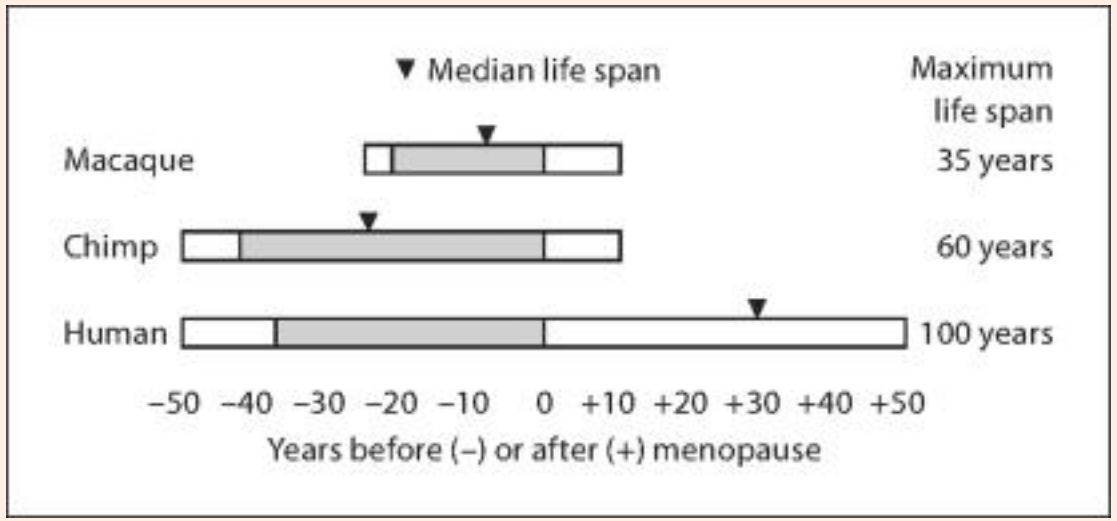
The *Grandmother Hypothesis* – an Evolutionary Perspective



Herndon (2009)



Older women can increase their fitness by helping to care for their grandchildren as allomothers. They can:

- Provide food
- Support physical and cognitive development
- Shorten their daughter's time to next conception

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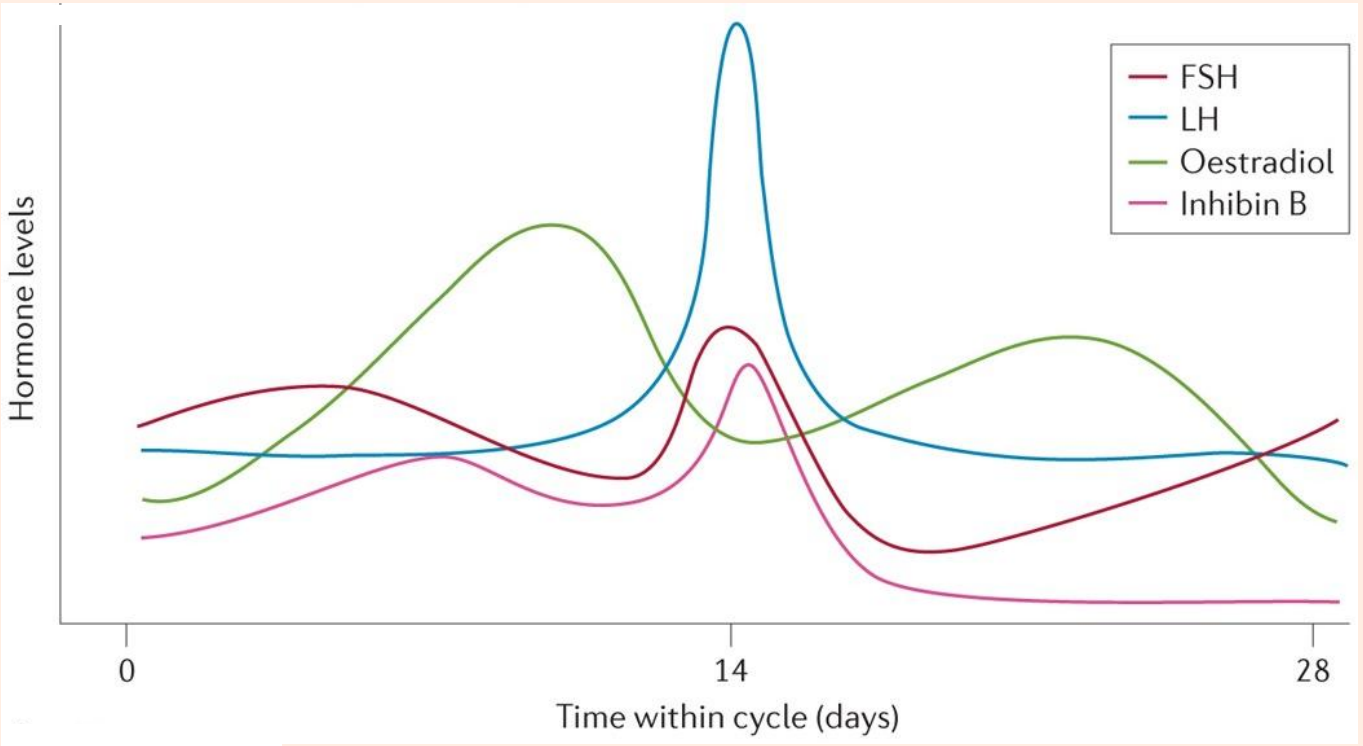
Premenopause reproductive hormones



Davis *et al*. (2025)

FSH
Follicle Stimulating Hormone is released by the pituitary gland in the brain and causes the maturation of an egg in the ovary

LH
Luteinising Hormone, also produced by the pituitary, stimulates the release of the egg

Oestradiol (oestrogen)
Oestrogen produced by the ovaries is involved in repairing and thickening the uterus lining

Inhibin B
Produced in the ovaries and sends feedback to the brain suppressing the secretion of FSH

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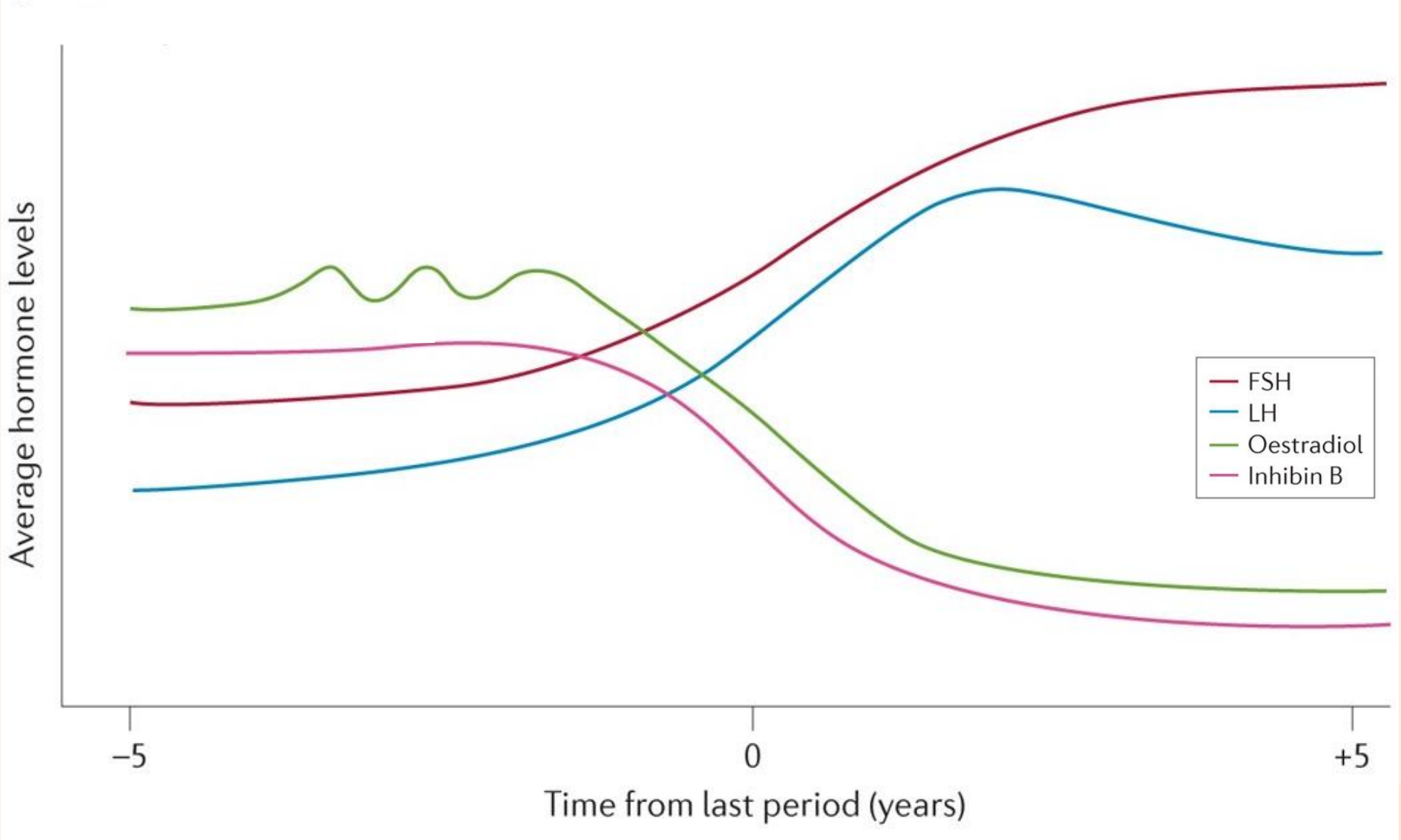
Reproductive hormones in menopause



Davis *et al*. (2025)

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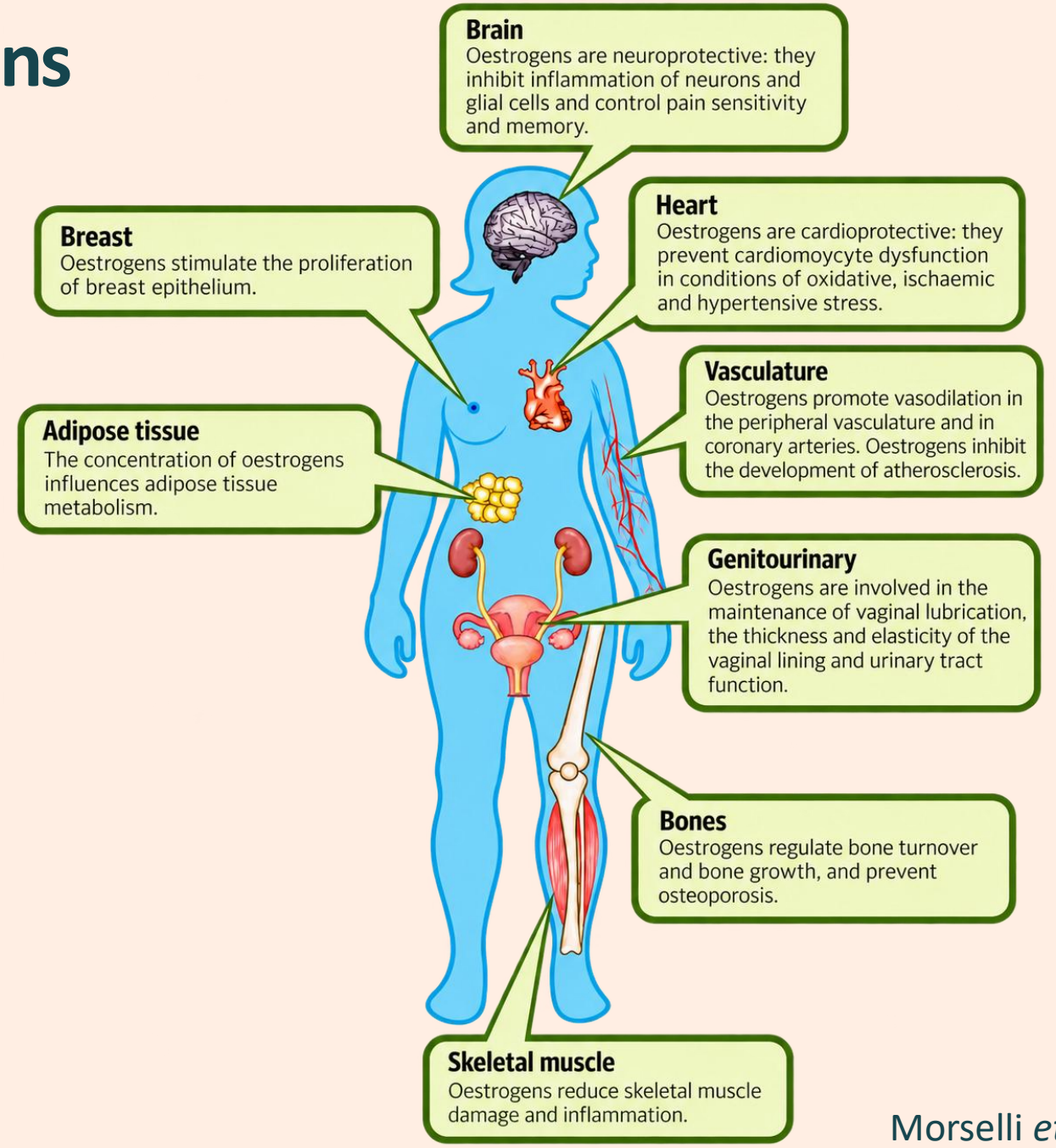
Role of oestrogens in wider health



Morselli *et al*. (2017)

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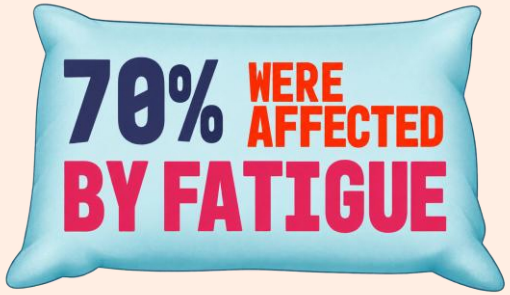
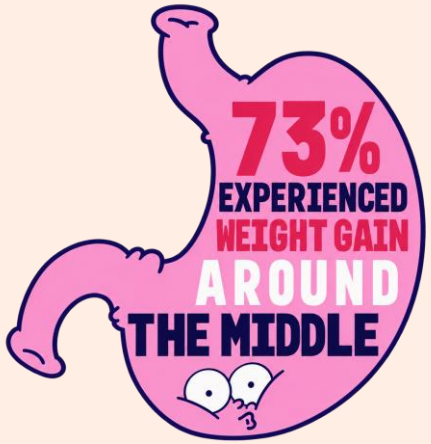
Symptoms of menopause and perimenopause

- Mood changes, poor memory and brain fog
- Vaginal problems
- Weight gain
- UTIs (urinary tract infections)
- Hot flushes and night sweats
- Sleep problems







Menopause Mandate Survey 2026

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Longer-term health considerations

Bone health (osteoporosis)

Women lose up to **20%** of their bone density in the five-to-seven years after menopause

Cardiometabolic disease (CMD)

CMD risk factors are present at higher levels in post- than premenopausal women, associated with a **2.25x** increased risk of cardiovascular disease

Genitourinary Syndrome of Menopause (GSM)

Around **40-54%** of postmenopausal women are affected by GSM

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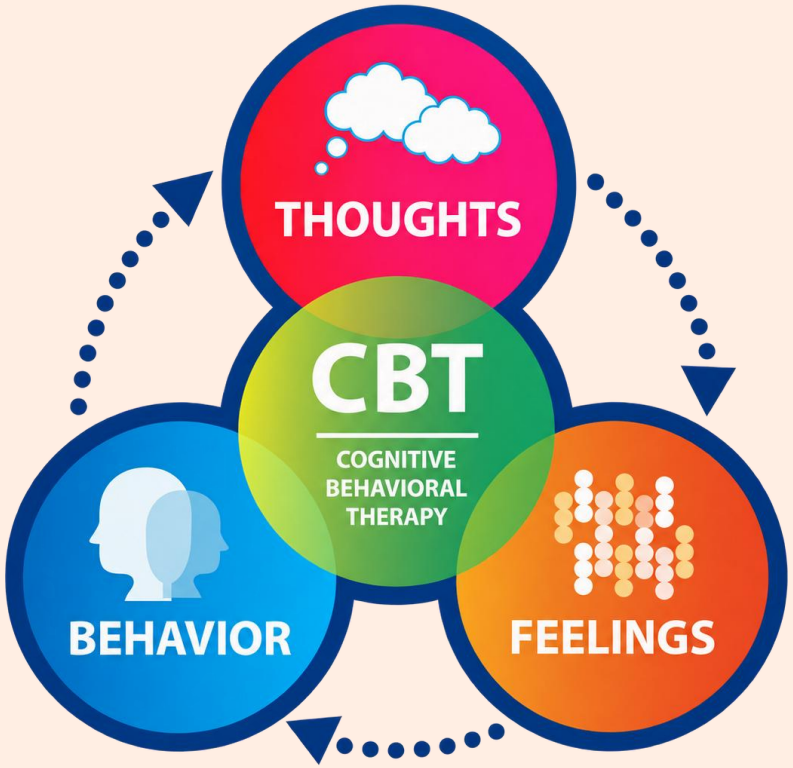
Management options





Diet and lifestyle considerations are also recognised as important components of care

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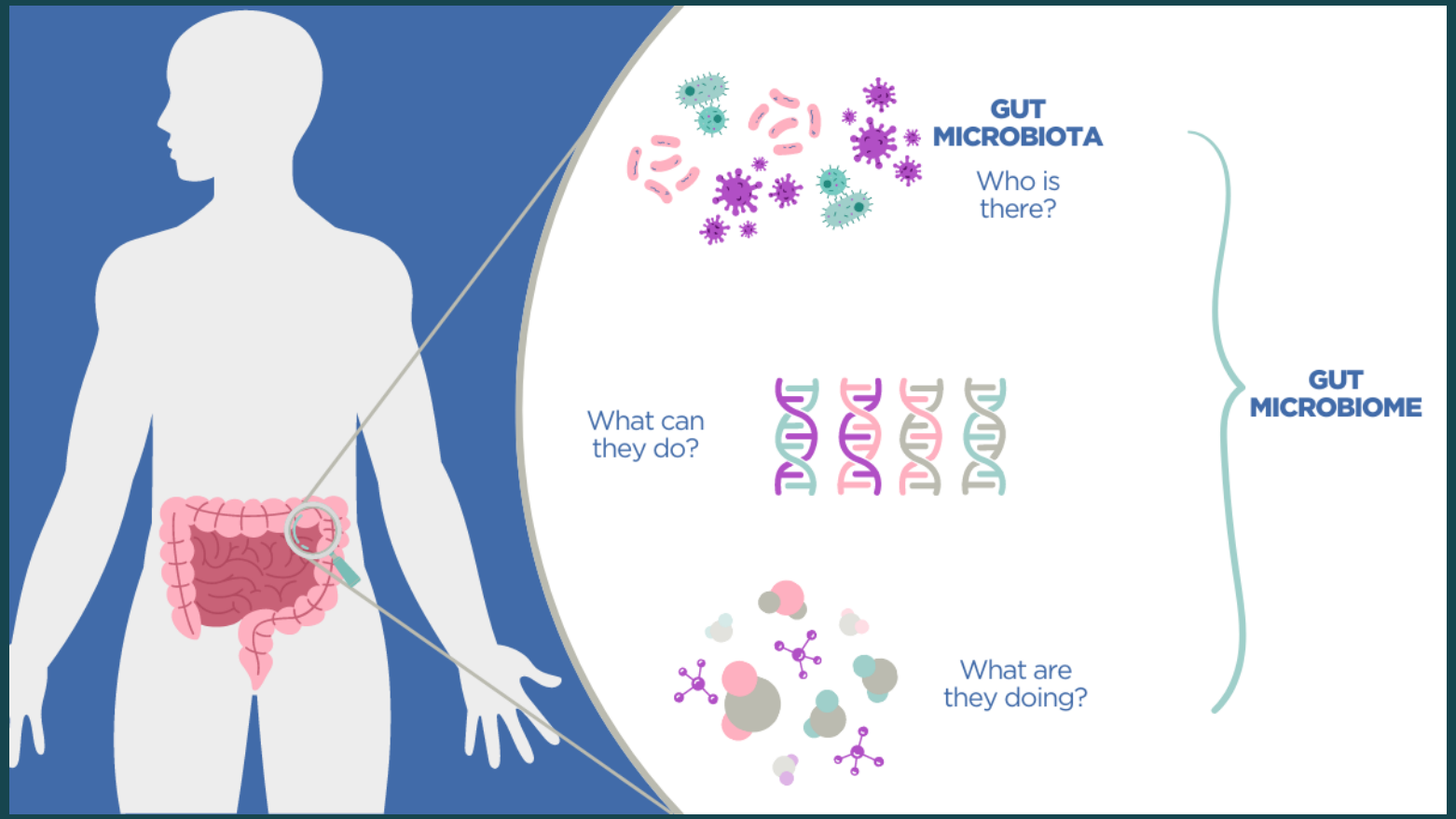
THE MICROBIOME IN MENOPAUSE

But first, what is the gut microbiome?



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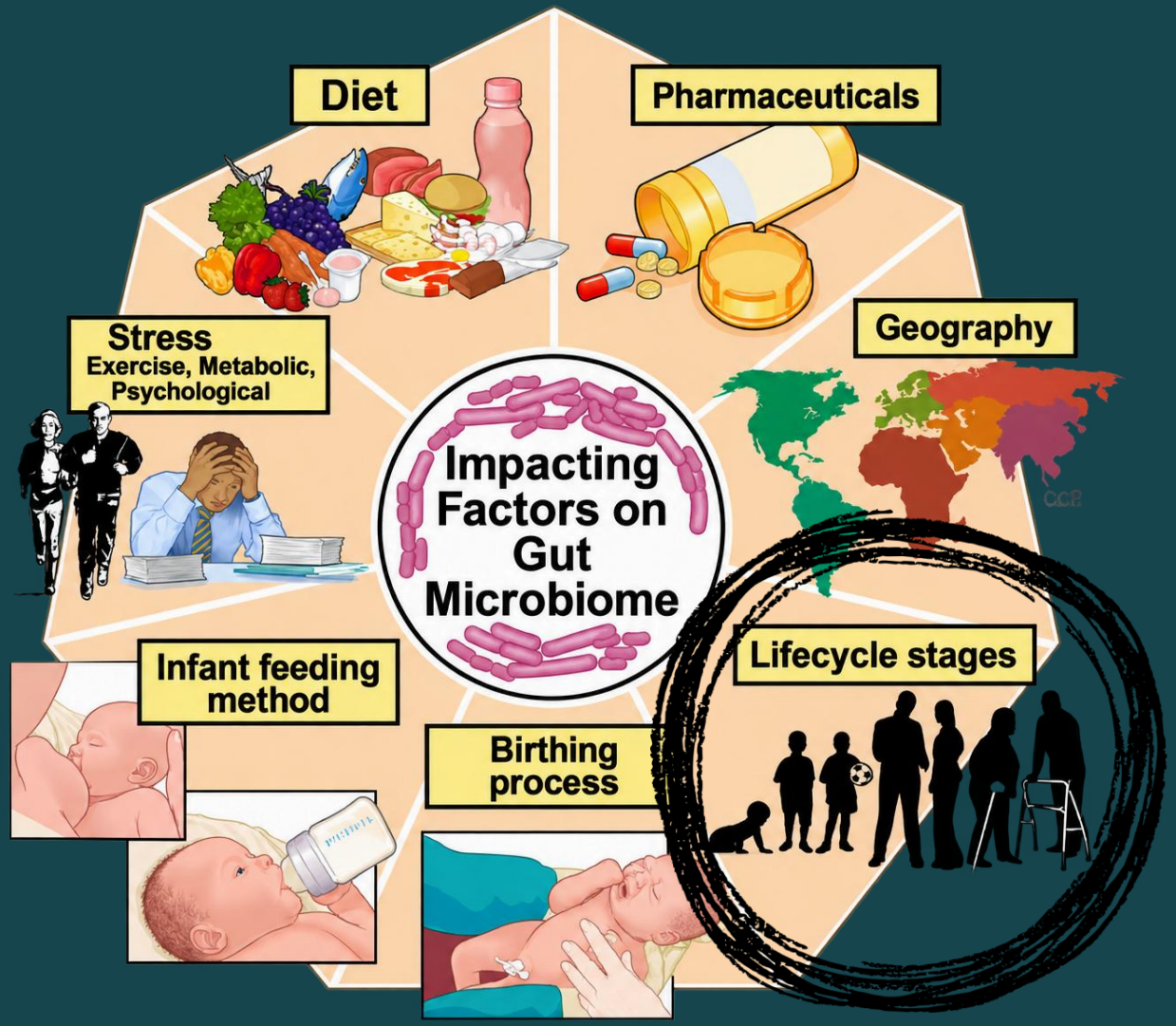
What factors influence the microbiome?



Cresci and Bawden (2015)

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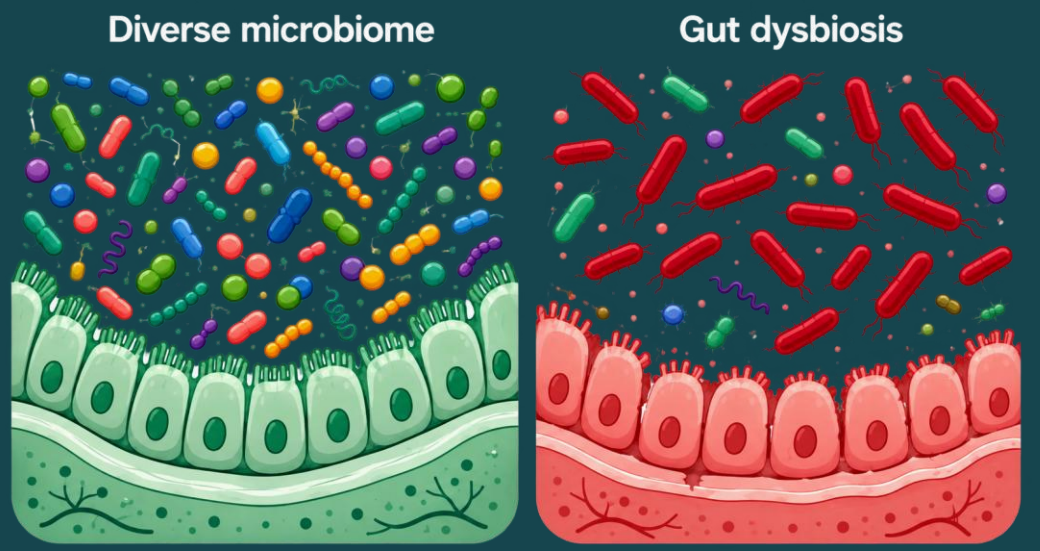
The gut microbiome's role in health and wellbeing



Associated with a broad range of **POSITIVE** health outcomes

Associated with a broad range of **NEGATIVE** health outcomes



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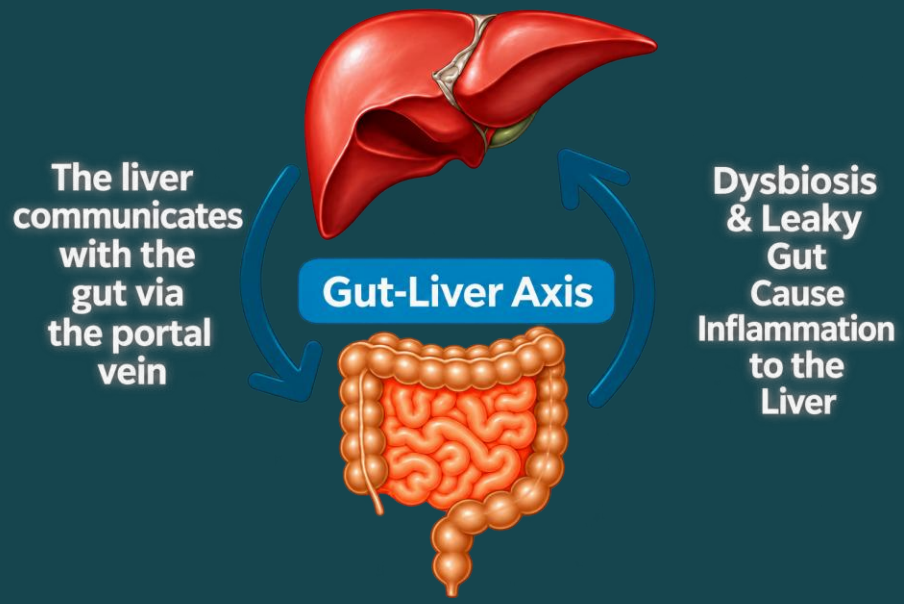
Examples of gut microbiome mechanisms





- During gestation, cells of the brain and gut develop almost simultaneously into the CNS and ENS, respectively.
- The gut-brain axis is a bi-directional communication system using nervous, hormonal and immune connections
- Gut microbes can produce short-chain fatty acids (SCFAs) which can influence brain health. Dysbiosis is strongly linked with depression.

The composition of the gut microbiota can affect:

- Carbohydrate and fat metabolism, with SCFAs influencing liver function also
- Detoxification of drugs and chemicals
- Balance of hormones e.g. **oestrogen**

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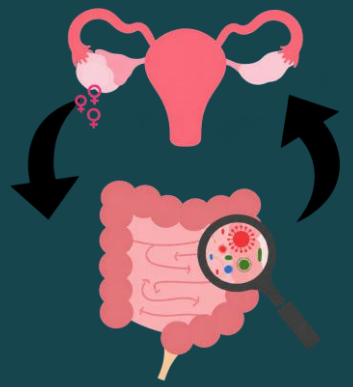
The oestrobolome

The relationship between oestrogen and the gut microbiota is bidirectional:

- Oestrogen levels influence the composition of gut microbiota
- Gut microbiota can influence levels of circulating oestrogens

The **oestrobolome** describes the collection of gut microbial genes capable of metabolising oestrogens**.** Specific gut bacteria can produce the β-glucuronidase enzyme, which is able to ‘recycle’ oestrogens



In a balanced gut microbiome, the amount of β-glucuronidase produced by the oestrobolome is optimal to maintain oestrogen homeostasis

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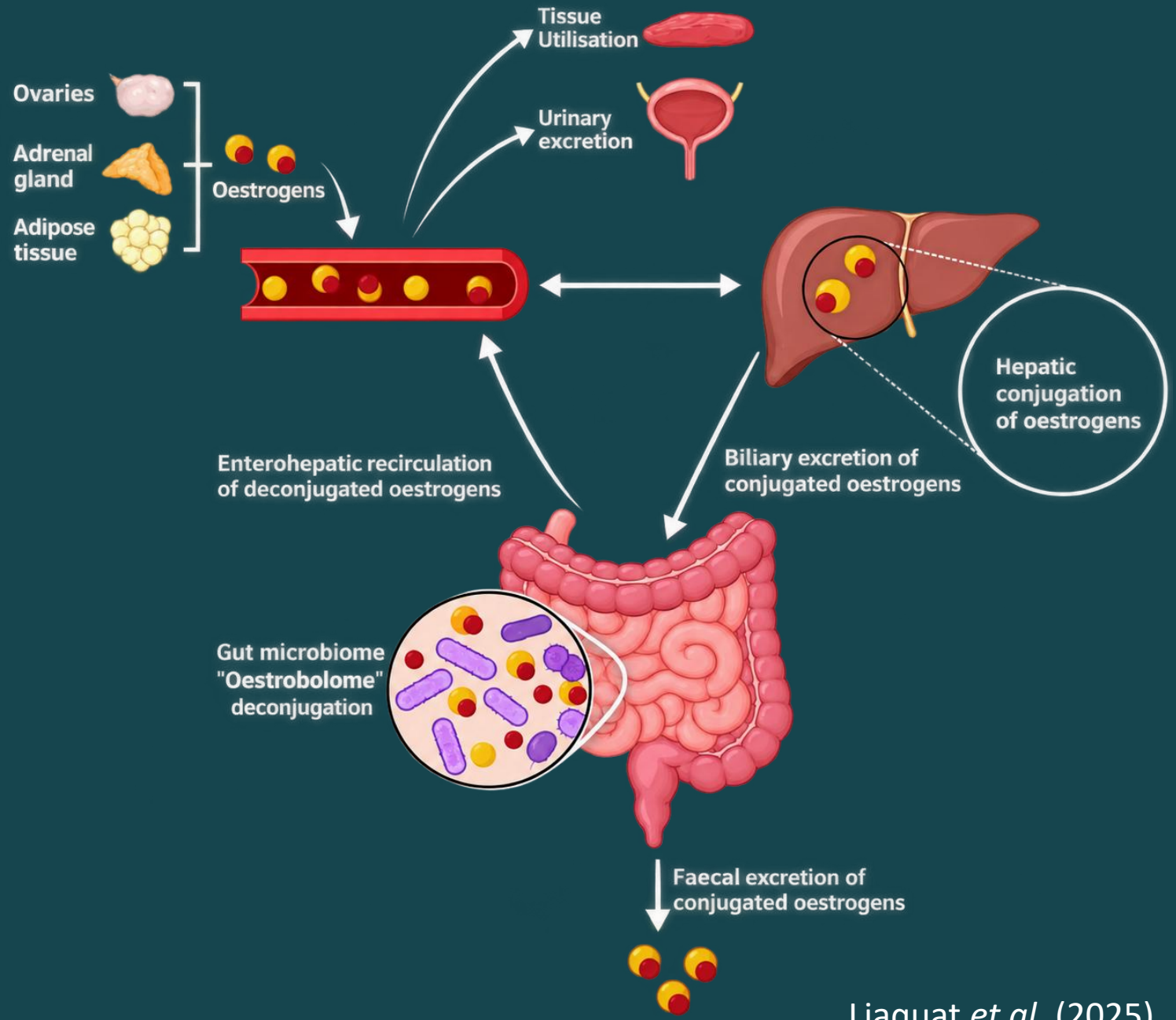

Liaquat *et al*. (2025)

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Diet and lifestyle factors



Balanced plant-rich, high-fibre diet



Exercise

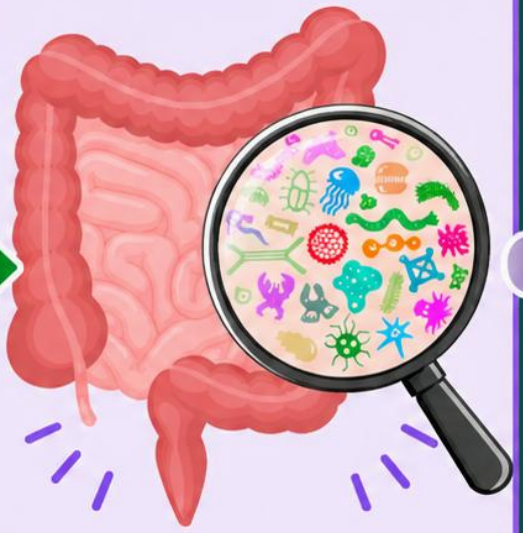


Hydration



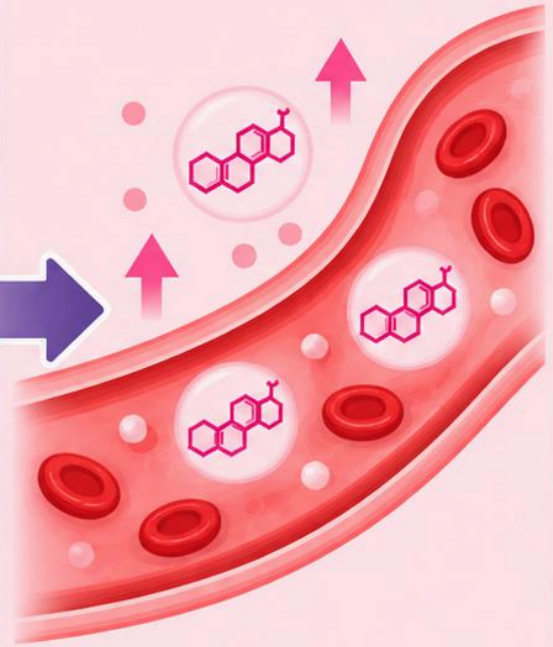
Other healthy habits

Gut microbiota diversity



May support a more balanced gut microbiota

Circulating oestrogens



May help support circulating oestrogen levels

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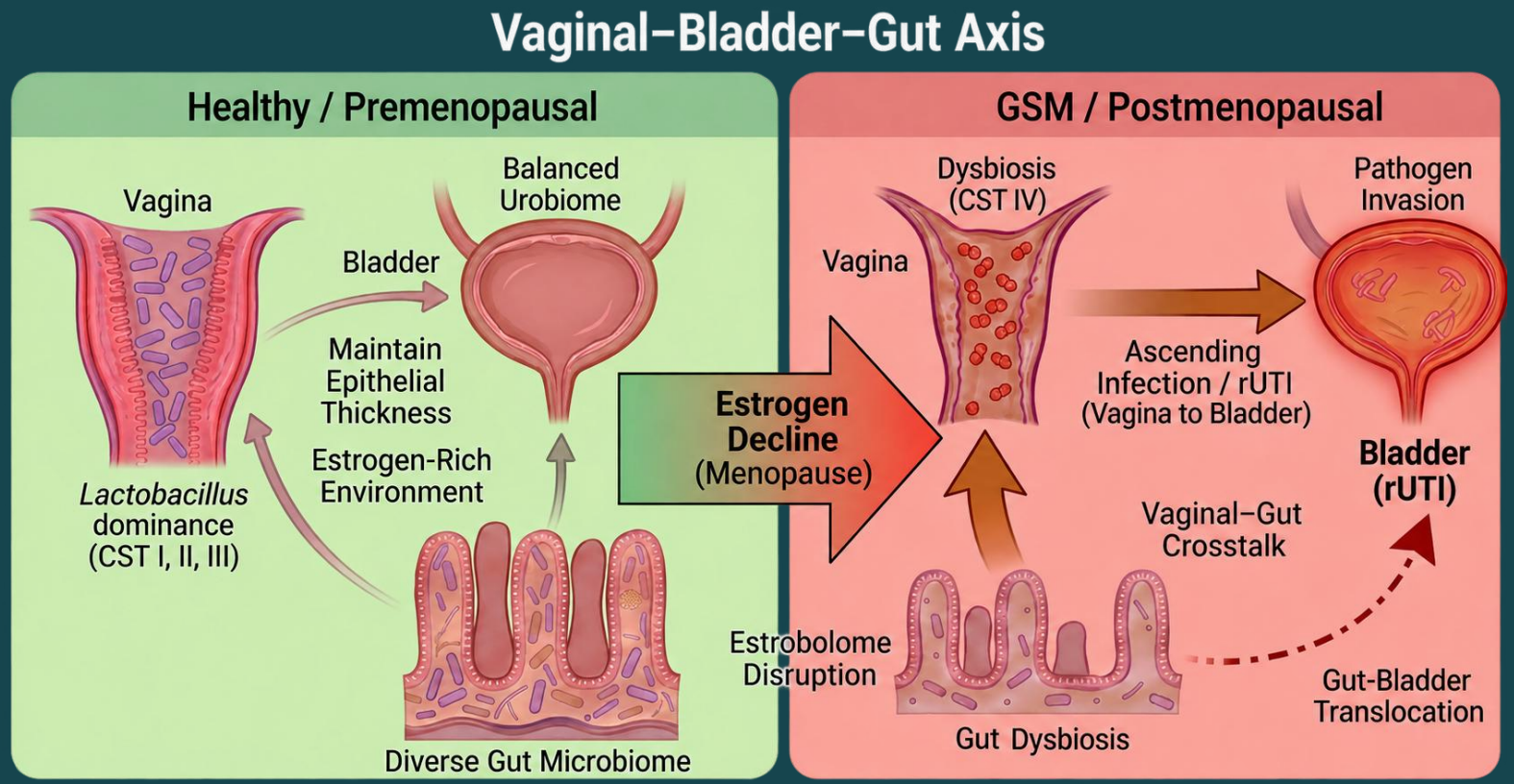
Oestrogen also plays an important role within the genitourinary microbiome…

- Postmenopause has been associated with greater microbial diversity of the vaginal microbiota. However, unlike the gut microbiota, this is associated with negative health outcomes
- Oestrogen supports epithelial glycogen availability, promoting an environment favourable to *Lactobacilli*. Consequently, menopause has been associated with reduced *Lactobacillus* dominance



GSM: A Systemic Breakdown of the Vagina-Bladder Gut Axis Driven by Estrogen Deficiency

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Inflammatory Bowel Diseases, 2025, **31**, 3443–3449
https://doi.org/10.1093/ibd/izaf204
Advance access publication 01 October 2025
Review Article - Clinical

Menopause and Inflammatory Bowel Disease: A Systematic Review

Tanvi Kale[1], Linda Yoo, PhD, RN[1,*], Ellie Kroeger, BS[1], Arwa Iqbal, BS[1], Sunanda Kane, MD, MSPH[2], Sara Shihab, MD, MSCP[3], Samantha Conley, PhD, RN[4], Kendra Kamp, PhD, RN[1,*]

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Abstract

Background: Research is limited on the impacts of menopause, defined as the permanent cessation of ovarian function and decline of reproductive hormones, on gastrointestinal symptom severity and disease progression in women with inflammatory bowel disease (IBD). This review synthesizes current evidence on the impact of menopause, menopause transition, and hormonal therapy (HT) on disease activity, IBD and menopause symptom severity, and disease progression among individuals with IBD.

Methods: A systematic literature review was reported following PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines and preregistered at PROSPERO (CRD42024564901). Five databases were searched without date restrictions. Data extraction and risk-of-bias assessment were performed independently by multiple reviewers. Results were qualitatively synthesized.

Results: Of 1667 records, 15 studies met inclusion criteria (5 cohort, 3 case-control, 7 cross-sectional) with IBD sample sizes from 37 to 1367. Evidence on HT and IBD risk was mixed: some studies linked HT to increased ulcerative colitis risk while others found no significant association after adjusting for confounders. Women with IBD experience earlier menopause than healthy control subjects. While most women reported no change in IBD symptoms postmenopause, a minority reported symptom worsening. HT may reduce flare severity. Women with IBD reported more severe vulvovaginal symptoms and had distinct vaginal microbiome profiles compared with healthy control subjects.

Conclusions: Few studies have explored the relationship between menopause and IBD. There is a need for continued research on the relationship between IBD disease activity and menopause symptoms to create tailored interventions to improve women's health with IBD across the lifespan.

Key words: menopause, inflammatory bowel disease, hormone replacement therapy

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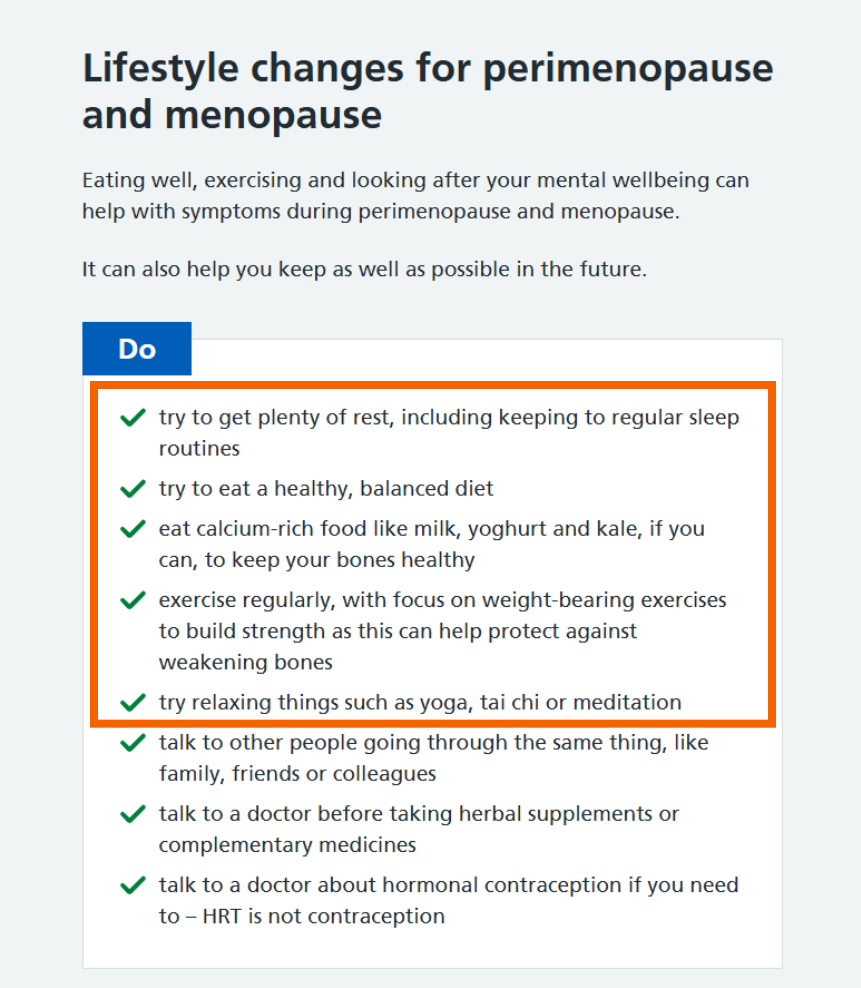
DIET AND LIFESTYLE APPROACHES



Lifestyle changes for perimenopause and menopause

Eating well, exercising and looking after your mental wellbeing can help with symptoms during perimenopause and menopause.

It can also help you keep as well as possible in the future.

Do

- try to get plenty of rest, including keeping to regular sleep routines
- try to eat a healthy, balanced diet
- eat calcium-rich food like milk, yoghurt and kale, if you can, to keep your bones healthy
- exercise regularly, with focus on weight-bearing exercises to build strength as this can help protect against weakening bones
- try relaxing things such as yoga, tai chi or meditation
- talk to other people going through the same thing, like family, friends or colleagues
- talk to a doctor before taking herbal supplements or complementary medicines
- talk to a doctor about hormonal contraception if you need to – HRT is not contraception

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Good nutrition and an active lifestyle remain the cornerstone of a healthy menopause. This is true whether Hormone Replacement Therapy (HRT) is part of a woman's treatment plan or not

British Menopause Society

People experiencing menopause should understand the importance of maintaining muscle mass and strength through physical activity

NICE

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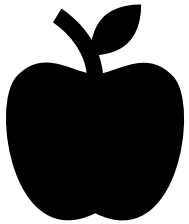
Healthy eating

- A Mediterranean diet can have beneficial impacts on menopausal women's health, including improvement in mood and reductions in risk factors associated with cardiometabolic disease
- Adequate calcium and vitamin D intake is fundamental to bone health, particularly in postmenopausal women



Physical activity

- Studies have shown that physical activity can benefit menopausal symptoms, particularly hot flashes and night sweats, potentially by increasing hypothalamic β-endorphins which help to stabilise thermoregulation
- Physical activity has also been demonstrated to improve bone density in postmenopausal women



Stress

- High levels of stress are significantly associated with menopausal symptoms while higher mindfulness and lower stress correlated with lower menopausal symptom scores
- Effective solutions that have been shown to improve symptoms are relaxation techniques such as deep breathing, progressive muscle relaxation, and guided visualisation



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While no strict consensus definition exists, the Mediterranean diet is characterised by a high intake of:

- Vegetables
- Fruits
- Whole grains
- Legumes
- Nuts
- Seeds
- Extra virgin olive oil

Alongside moderate consumption of:

- Fish
- Seafood
- Dairy products

While limiting:

- Red meat
- Refined sugars
- UPFs



It is a **balanced, varied, nutrient-rich, high-fibre dietary pattern** that supports gut microbiome diversity, metabolic health and overall wellbeing

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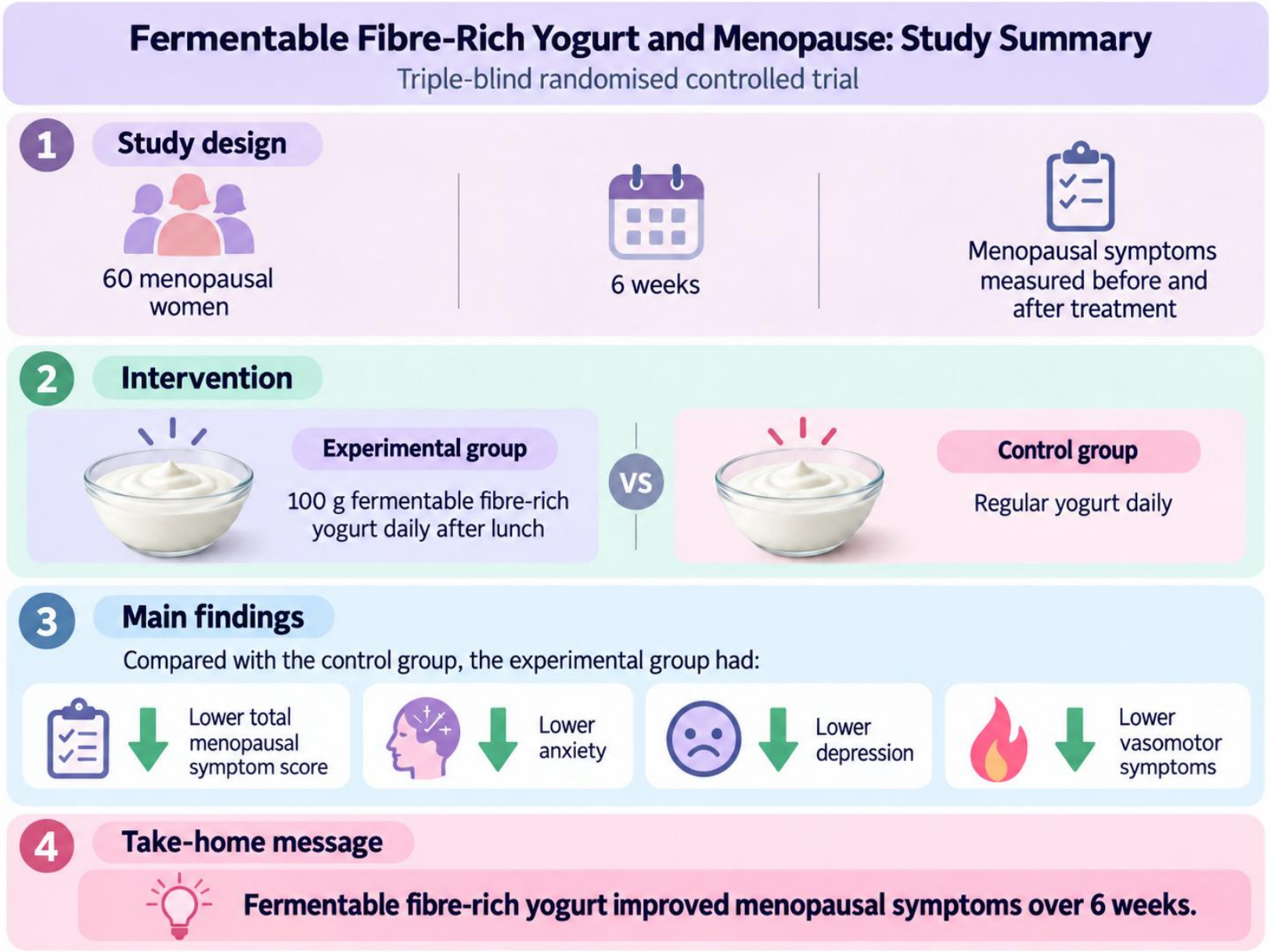
Fermentable fibre



Shafie *et al*. 2022

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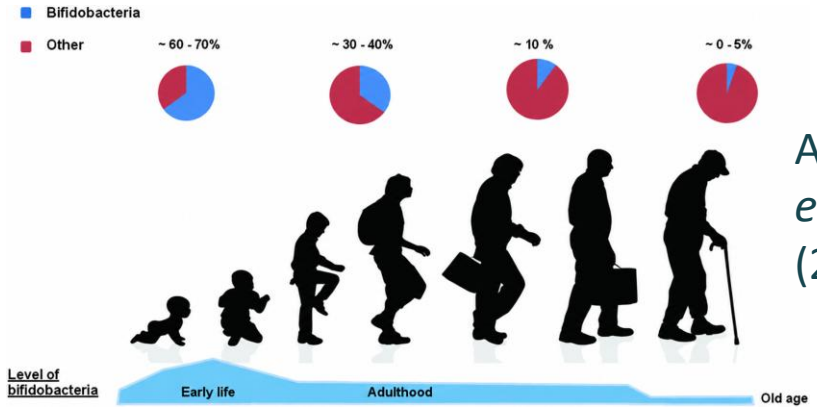
Isoflavones

- Isoflavones are naturally occurring plant compound found primarily in soybeans and soy-based foods, such as tofu, edamame and soy milk

- One study found that isoflavone supplementation modulated the gut microbiota, having a lasting effect on increasing *Bifidobacteria*



Arboleya *et al*. (2016)

- Isoflavones are considered phytoestrogens as certain gut bacteria can use them to produce equol, a compound with oestrogen-like activity. Not everyone has the gut bacteria needed to produce equol, and it is microbial diversity which has been associated with equol-producing capacity

- The study highlights a potential two-way relationship between phytoestrogens and the gut microbiota

Clavel *et al*. 2005



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LIVE BACTERIA





- Traditionally fermented foods provide beneficial strains of bacteria
- We can be exposed to beneficial strains in nature
- Beneficial strains can support the microbiome by producing metabolites, modulating their environment and inhibiting pathogens
- Live bacteria supplements offer a convenient, standardised means of ingesting these strains

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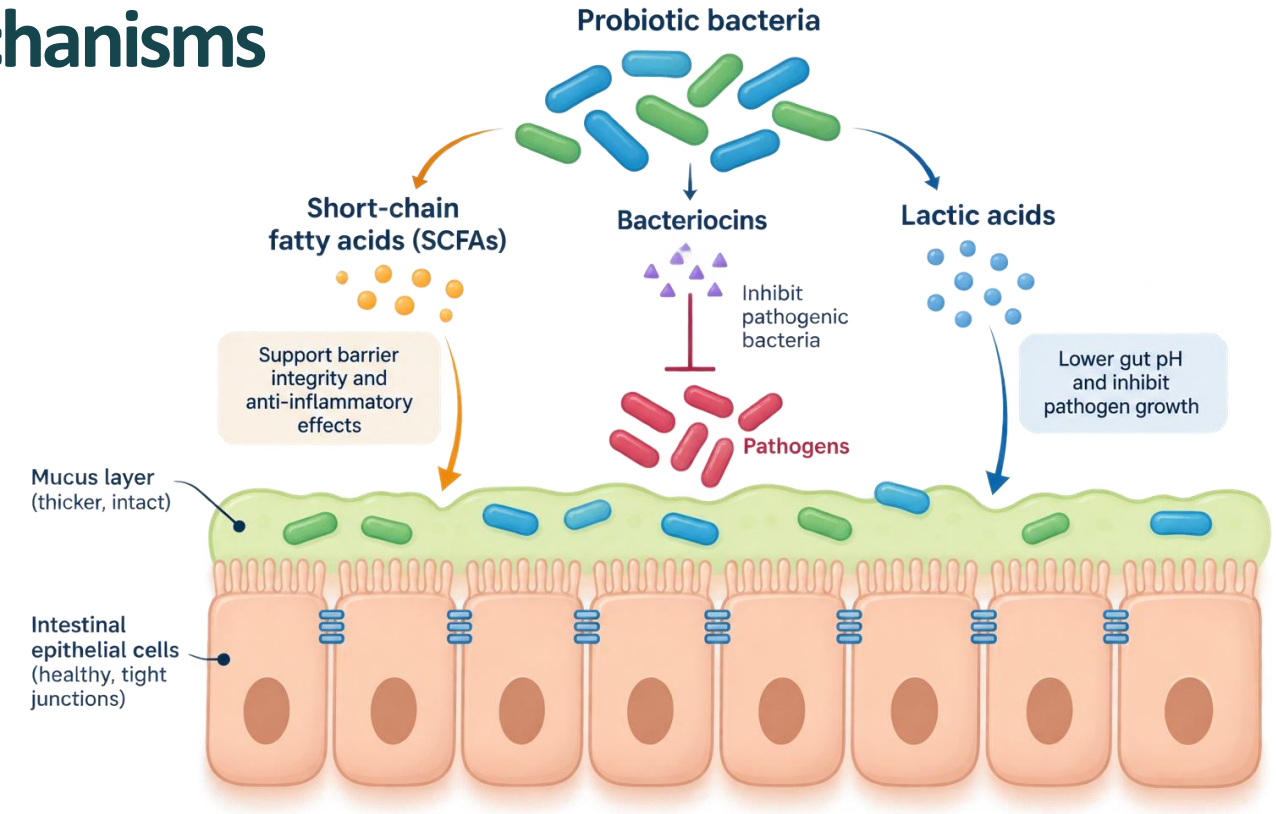
Live bacteria mechanisms



Adapted from Vijayaganapathi and Mohanasrinivasan (2025)

- Beneficial strains can inhibit pathogens in the gut, or other areas they may translocate to, through competitive exclusion, modulation of their environment and the production of antibiotic-like substances
- SCFAs produced through microbial fermentation can support gut barrier function, but are also involved in metabolic and brain health

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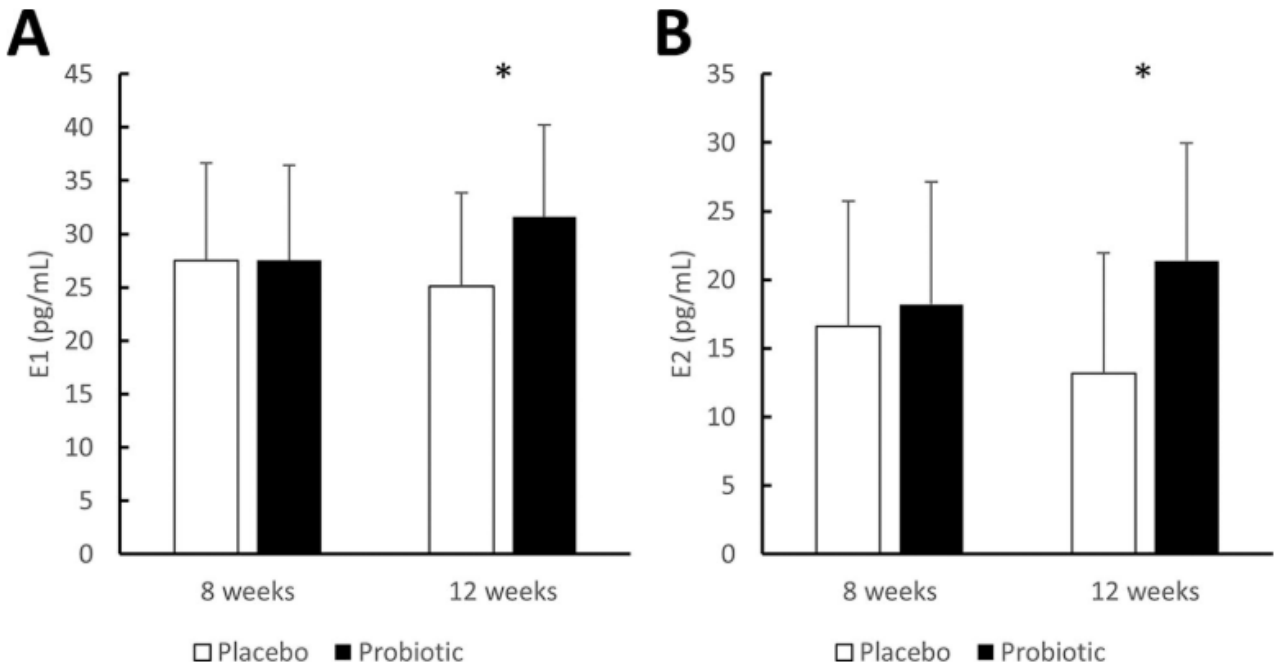
In vitro screening for β-glucuronidase activity of 84 strains isolated from traditionally fermented foods and healthy human samples found that one ***Levilactobacillus brevis*** strain and three ***Lacticaseibacillus rhamnosus*** strains could deconjugate oestrogens

In a subsequent randomised, double-blind, placebo-controlled trial, 111 peri- and postmenopausal women were given either a live bacteria supplement with β-glucuronidase activity or a placebo daily for 12 weeks



This clinical trial was the first to demonstrate the oestrogen modulation capacity of a live bacteria supplement in women during the menopausal transition

Honda *et al.* 2024

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Contents lists available at ScienceDirect

Clinical Nutrition ESPEN

journal homepage: http://www.clinicalnutritionespen.com

Meta-analysis

Investigating the effects of probiotics during the menopause transition: A systematic review & meta-analysis

Robin A.F. Andrews [a,*], Arron Lacey [b], Helen Roach [c], Rebeccah Tomlinson [d], Emma J. Kidd [a], Kate Bache [c]

- One of the most comprehensive reviews to date including 39 studies involving a total 3187 women
- Results suggest **live bacteria supplements can have positive effects on menopausal symptoms** (including total menopausal symptoms, vasomotor symptoms, psychological symptoms, vaginal dryness and vaginal microbiome health) **and cardiovascular, genitourinary and bone health**
- Some evidence that they may enhance effects of isoflavones and certain HRT, so could be beneficial adjuncts to these approaches
- However, the most efficacious strains and doses are yet to be established

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- **Clinically researched 14-strain blend**
  - *Lacticaseibacillus paracasei* PXN® 37
  - *Lactiplantibacillus plantarum* PXN® 47
  - *Lacticaseibacillus rhamnosus* PXN® 54
  - *Bacillus subtilis* PXN®21
  - *Bifidobacterium bifidum* PXN® 23
  - *Bifidobacterium breve* PXN® 25
  - *Bifidobacterium longum* PXN® 30
  - *Lactobacillus helveticus* PXN® 35
  - *Lactococcus lactis* ssp. *lactis* PXN® 63
  - *Streptococcus thermophilus* PXN® 66
  - *Bifidobacterium infantis* PXN® 27™
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  - *Lactobacillus helveticus* PXN® 45
  - *Ligilactobacillus salivarius* PXN® 57
- **Up to 4 capsules per day**



- **Clinically researched 7-strain blend**
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  - *Streptococcus thermophilus* PXN® 66
  - *Lactobacillus helveticus* PXN® 35
  - *Bifidobacterium breve* PXN® 25
  - *Bifidobacterium longum* PXN® 30
  - *Lactobacillus delbrueckii* ssp. *bulgaricus* PXN® 39
  - **With added:**
    - Vitamin D3
      - Bone health and immune function
    - Vitamin B6
      - Hormone regulation and psychological function
    - Vitamin E
      - Antioxidant capacity
- **1 capsule per day**



- **Clinically researched 14-strain blend**
- **With added:**
  - Vitamin D3
    - Bone health and immune function
  - Vitamin B6
    - Hormone regulation and psychological function
  - Vitamin B12
    - Immune and psychological function
  - Zinc
    - Bone health, immune function, cognitive function and antioxidant capacity
- **Up to 4 capsules per day**

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Digestive & Immune



Gut- Brain Axis



Mother & Child



Intimate Health



Gummies



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Fast Dissolves



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Thank you for listening!

Any questions? ☺

For future enquiries, please don’t hesitate to contact us at **info@bio-kult.com**

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