Microbes and Menopause: Transforming Care in Genitourinary Syndrome

By Optibac
Trusted friendly bacteria

Vaginal and Gut Microbiota Changes: Clinical Impact and the Role of Probiotics in Practice

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Nutritional Therapist, DipCNM

- **International Scientific Trainer**
- **Diploma from the College of Naturopathic Medicine**
- **Over 8 years of experience in clinical practice**
- **Busy mother juggling kids, work and my own practice**

Why Health Professionals Trust Us

Optibac
Trusted friendly bacteria

Science-led

- UK's most researched probiotic brand
- 850+ scientific papers
- Clinically proven strains
- 20 years of science setting the gold standard

Quality & Transparency

- World-leading lab partnerships
- Full strain traceability
- Natural ingredients

Targeted Efficacy

- Strain-specific results
- Aligned with WHO, IPA, WGO,
- NHS recommendations

Trusted Brand

- 7500+ Trustpilot reviews (☆ 4.8)
- Queen's & King's Awards
- Practitioner recognised (IHCAN awards)

Agenda

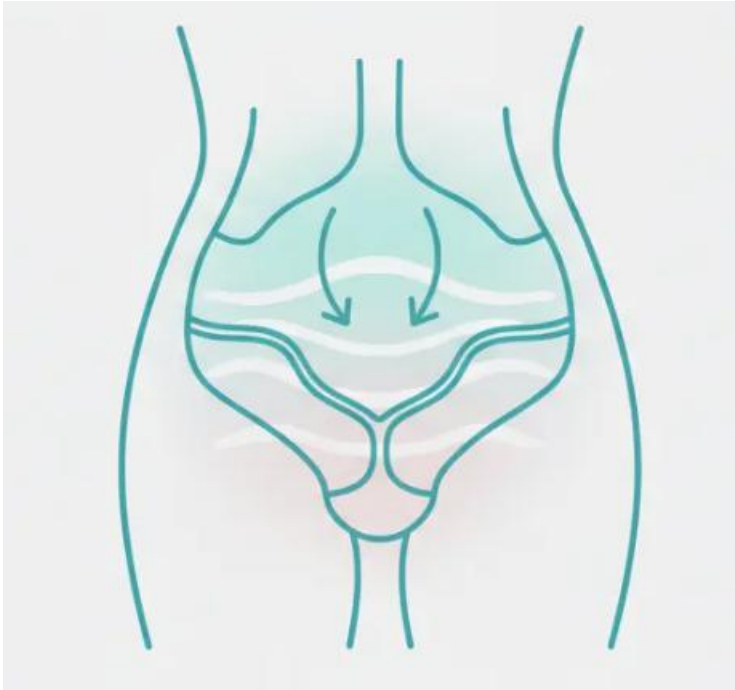
- What is GSM
- The vaginal and urinary microbiome in GSM
- The gut microbiome in GSM
- Restoring the ecosystem: probiotics in GSM management
- Clinical protocol example
- What Optibac offers practitioners

What is GSM

Genitourinary syndrome of menopause (GSM)

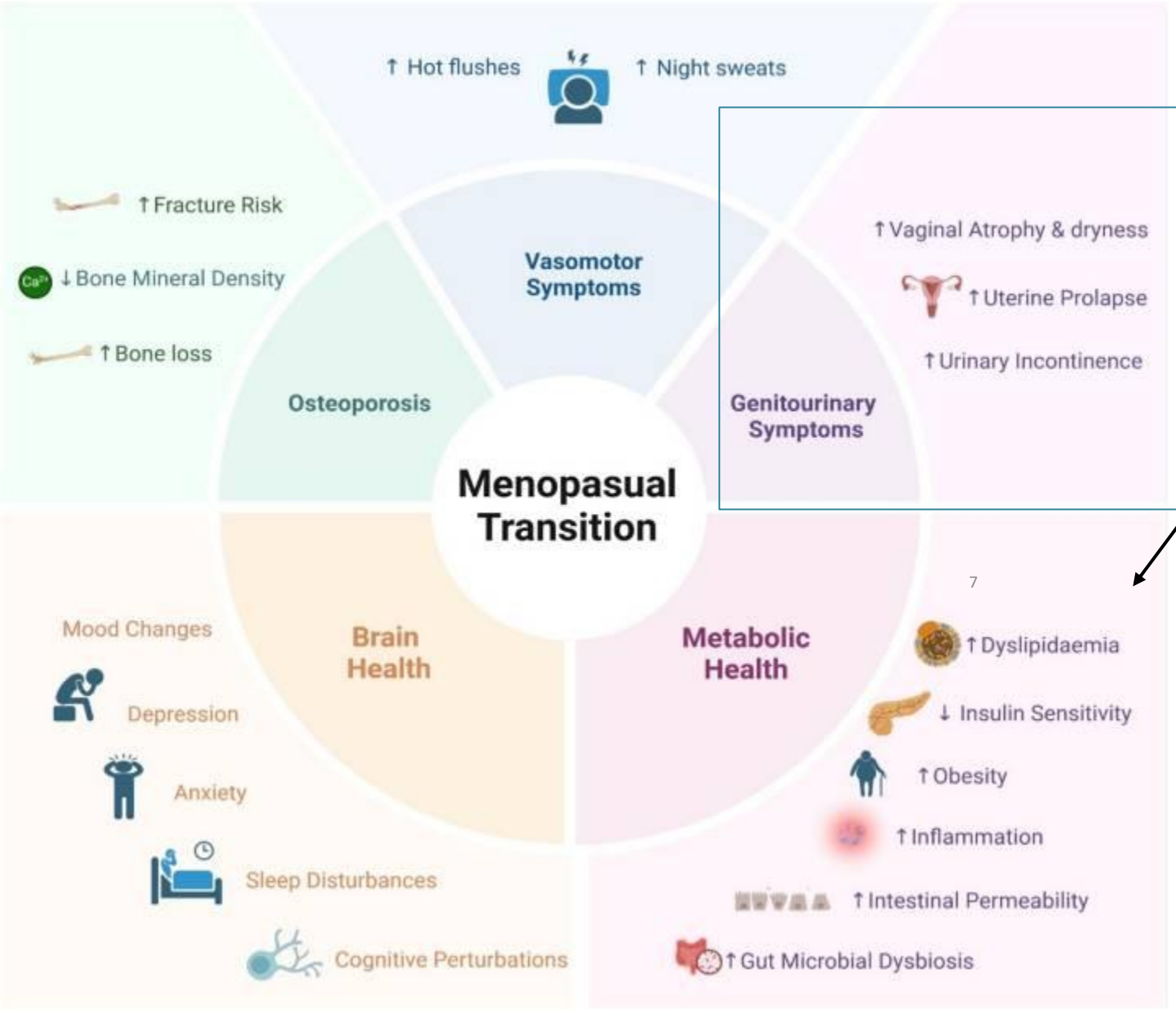
What is GSM ?
Chronic progressive condition caused by oestrogen decline during and after menopause => impact on all urogenital tissue quality including the vulva, vagina, bladder and urethra.

Statistics and Prevalence
- **High Prevalence:** affects 27% to 84% of postmenopausal women.
- **Under-treated:** While a majority of women experience symptoms, only 7% to 25% seek medical treatment .
- **Progression – chronic nature:** Symptoms often worsen over time if left untreated.
- **Timing:** symptoms typically begin in the late perimenopause or early menopause, often becoming more apparent 1–3 years postmenopause.



British Menopause Society, 2025
Karen Carlson et al., 2024

Key Symptoms



GSM Symptoms Include:

- **Vaginal/Vulvar:** Dryness, burning, itching, reduced lubrication, and pain during intercourse (dyspareunia), decreased pelvic floor muscle tone.
- **Urinary:** Increased urgency to pee, frequent UTIs, burning with urination, and incontinence

Early research suggests an association of GSM and other menopause symptoms e.g. metabolic health

Oksana Pavlovska et al., 2023

Marrium Liaquat et al., 2025

Vaginal and Gut Microbiota changes and Symptom Correlation in GSM

The onset, severity, and type of GSM symptoms may be associated with changes in vaginal microbiota in perimenopausal and postmenopausal women.

Observational cross-sectional study

VAGINAL MICROBIOME

Significant differences in vaginal microbial community among non-GSM women and GSM women:

↓ Lactobacillus dominance
↑ diversity + ↑ vaginal pH
↓ oestrogen → ↓ glycogen support
↑ pathogens
↑ GSM, UTI, BV risk

GUT MICROBIOME

↓ Diversity (α-diversity)
Compositional shifts (F/B ratio)
↓ SCFA-producing taxa
↑ systemic inflammation & metabolic risk

Chronic nature: Unlike hot flashes, GSM-related microbiome changes and associated symptoms tend to worsen over time without intervention. We should start supporting in perimenopause as soon as we start seeing changes in the microbiota

Clinical relevance: Gut–vaginal axis dysbiosis contributes to inflammation, infection susceptibility, and metabolic risk.

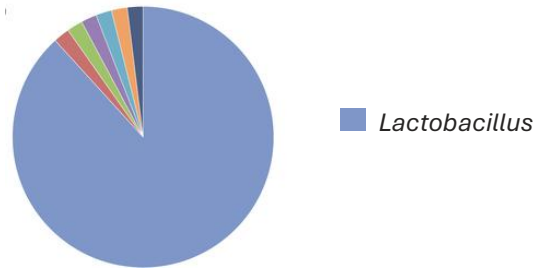
Qianru Zeng et al., 2024

The vaginal and urinary microbiome in GSM

Healthy vaginal and urinary microbiota – role of *Lactobacilli*

They play an important role in GMS and the risk of infections such as UTIs and BV.

Abundance of *Lactobacillus spp*

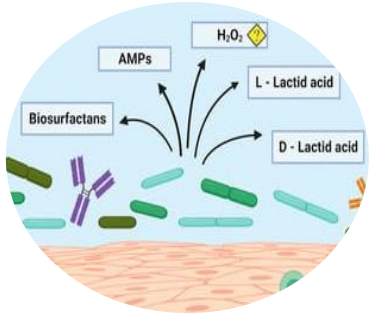


Healthy microbiota compositions have:

- 90% *Lactobacillus spp*- vaginal
- ~40% *Lactobacillus spp*- urinary

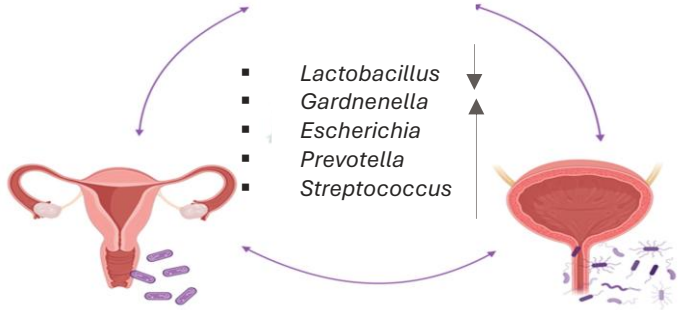
Strong vaginal-urinary microbiota overlap

Provides protective function



- ✓ Maintains acidic pH
- ✓ Produces antimicrobials
- ✓ Supports immune & barrier function

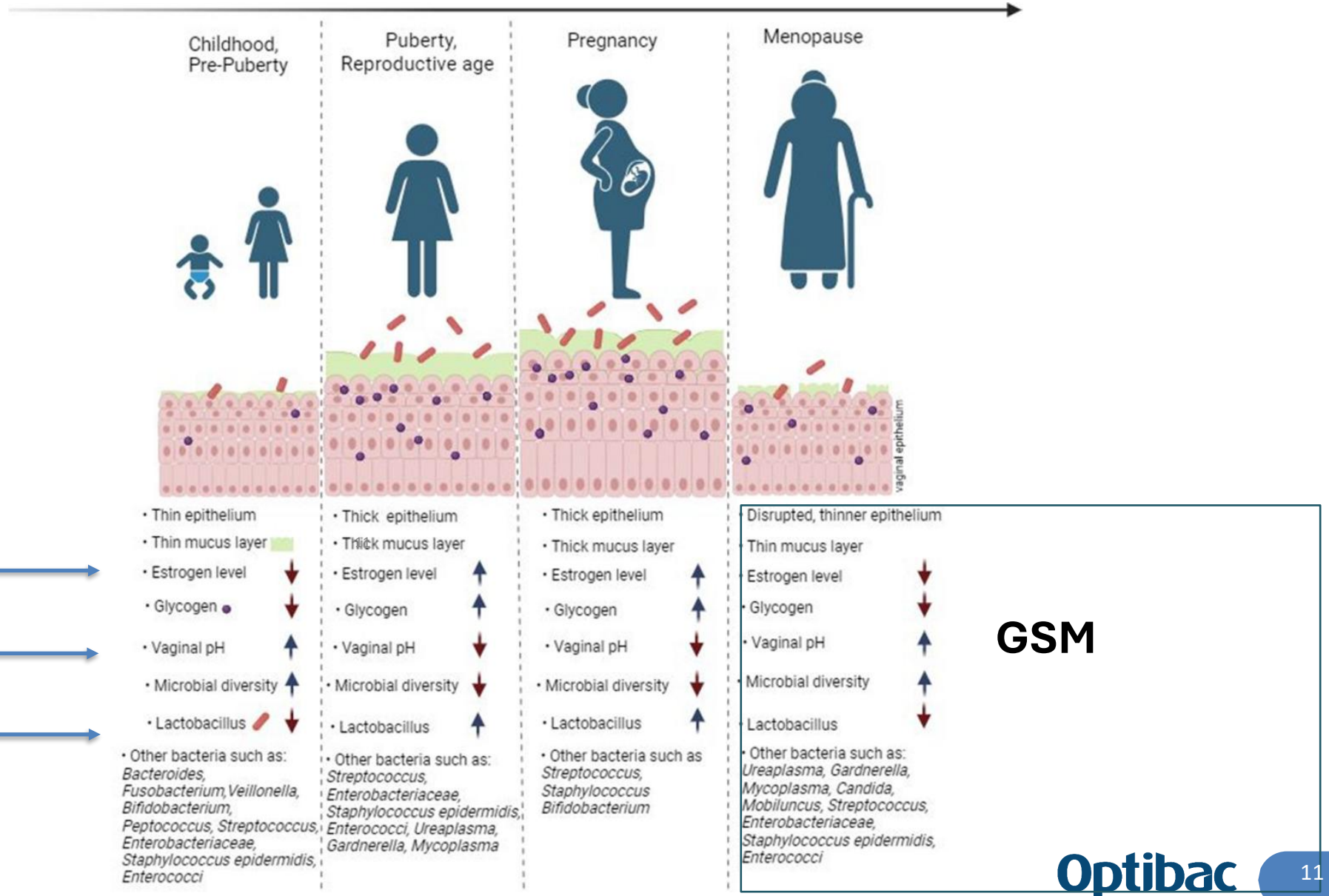
Clinical Impact



- Low *Lactobacillus* levels are linked to higher risk of UTIs, BV, and recurrence.
- Levels fluctuate with life stages and external factors.
- Microbiome therapies show promise in supporting a healthy composition.

(Seña, A. C. et al., 2021; Ravel et al., 2021 ; Lei Huang et al., 2022, Chitrakshi Chopra, et al., 2022, Carter KA et al., 2023, Pendharkar, S et al., 2023, NICE, 2023).

Vaginal Microbiome Changes Throughout a Woman's Lifespan



Oestrogen →

Vaginal pH →

Lactobacilli →

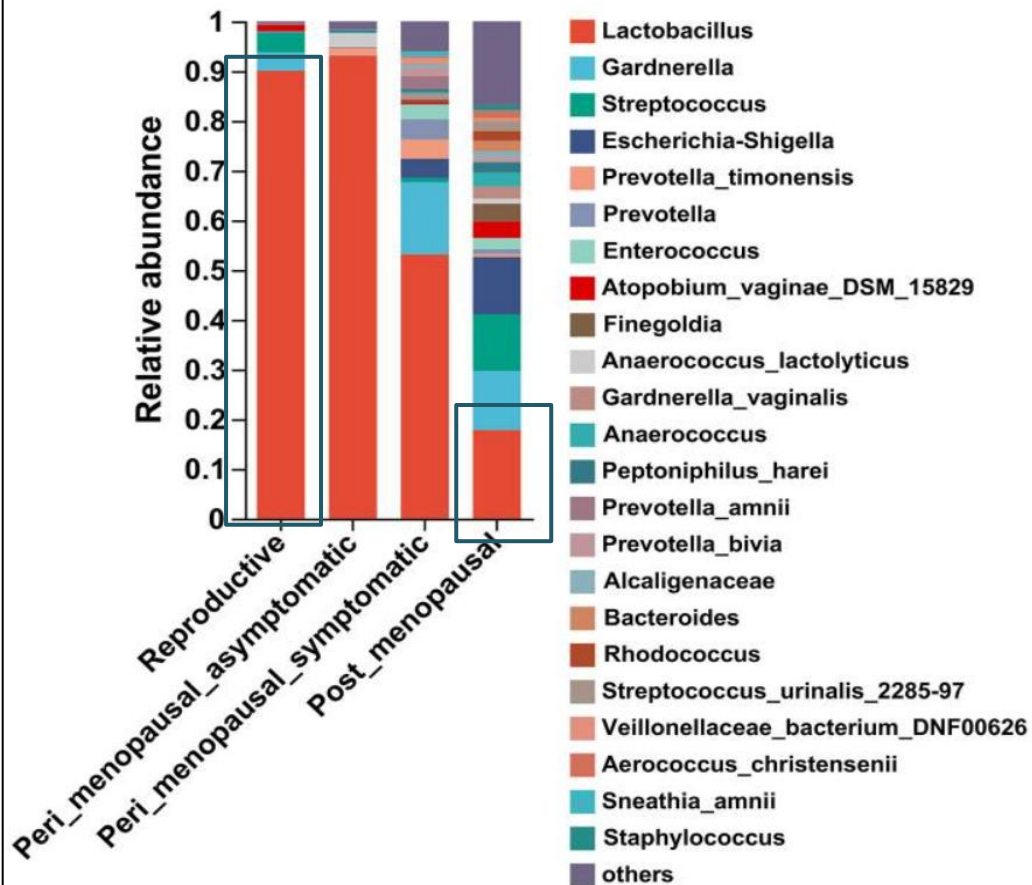
GSM

Vaginal microbiota changes and symptom correlation in GSM

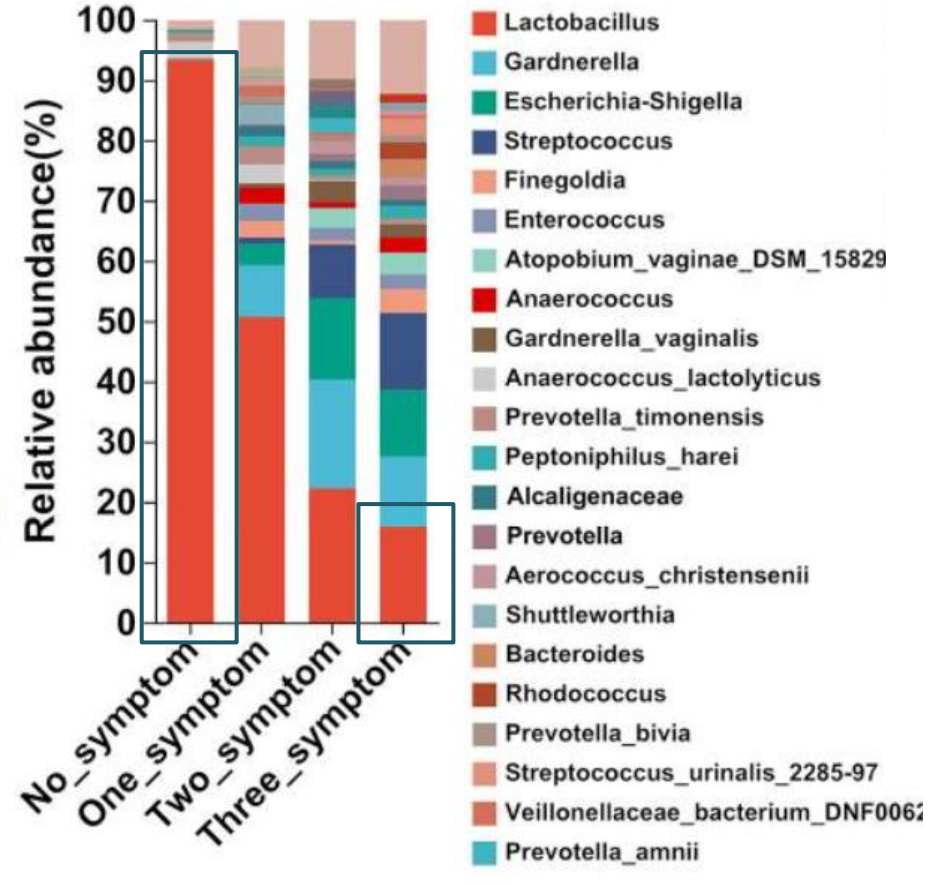
Lactobacillus abundance was found to be associated with fewer symptoms: onset, severity, and type of GSM

Retrospective observational cross-sectional study

Comparisons of vaginal microbial communities across life stages



Comparisons of vaginal microbial communities in non-GSM and GSM women.



Qianru Zeng et al., 2024

GSM implications - Urinary Tract Infections

Key facts: UTIs incidence and recurrences increase from 19–36% in premenopausal women to **55%** in postmenopausal women. 1 in 3 menopausal women face UTI challenges.

Marianne M Ligon et al, 2024

Cross-sectional observational study

Protective role of *Lactobacillus*

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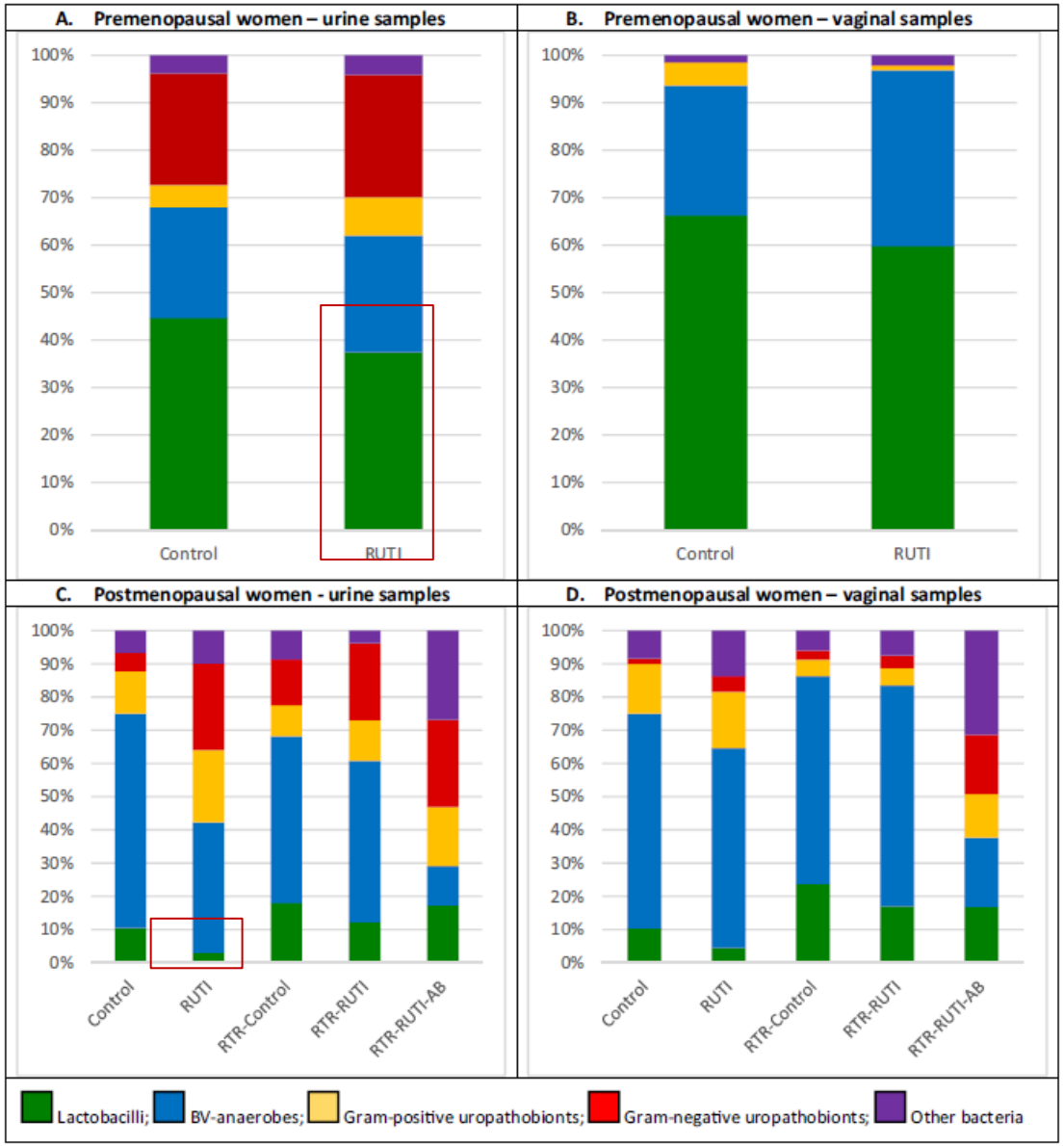
Urinary and vaginal microbiota composition in health and disease



(Floor Hugenholtz et al., 2022)

The gut microbiome in GSM

GSM: A multifactorial condition with systemic reach

Primary Sites of GSM

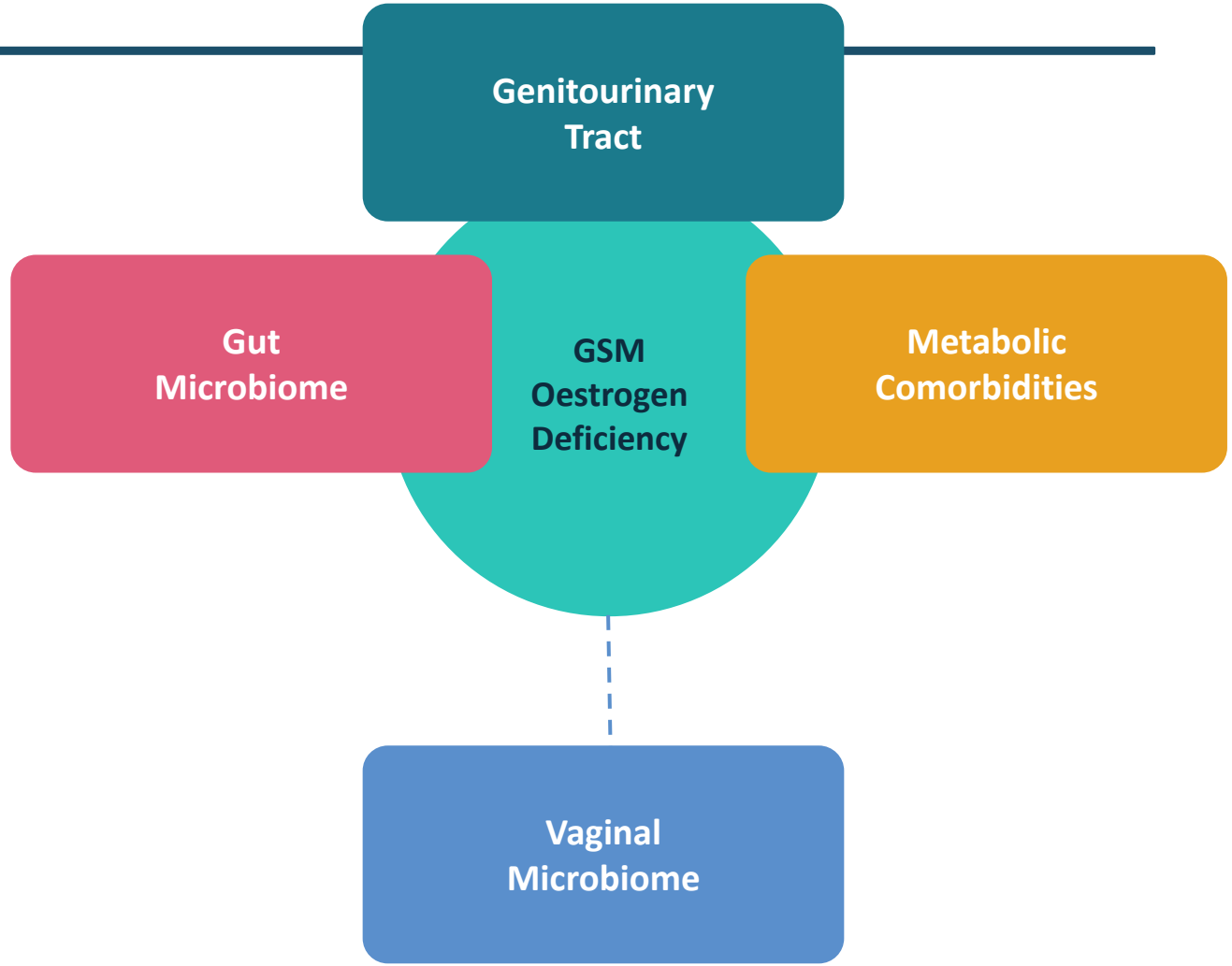
Although GSM affects the **vulva, vagina, urethra** and **bladder**, its aetiology is **multifactorial** — extending well beyond the genitourinary system.

Gut Microbiome Involvement

Emerging evidence suggests the gut microbiota plays a role in driving menopausal changes — with women with GSM showing altered gut microbiome composition linked to broader inflammatory dysregulation.

⚠ Systemic Implications

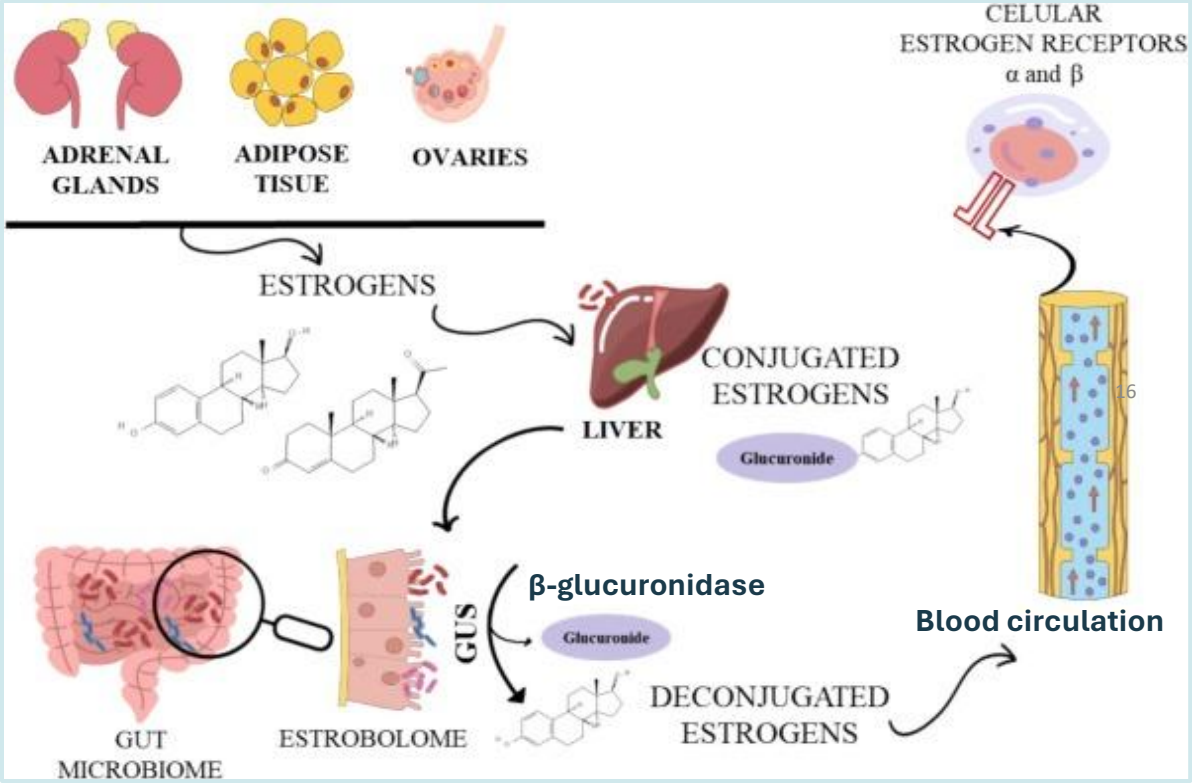
Women with GSM show higher rates of systemic risk factors and comorbidities.



Oksana Pavlovska et al., 2023 Brandilyn A Peters et al., 2022

Gut microbiome changes and impact in GSM: The Estrobolome

A collection of gut bacteria that metabolise oestrogen — not a single species, but a collection producing **estrogen-modulating enzymes.**



María Elena Martínez-Nortes et al., 2026

Altered during menopause → affects systemic and local oestrogen levels, potentially worsening **systemic and genitourinary symptoms.**

KEY BACTERIA INVOLVED

Lactobacillus —oestrogen metabolism
Bifidobacterium — oestrogen realted enzymes production
Bacteroides — β-glucuronidase production
Clostridium — metabolic functions
Escherichia coli — common producer (when in balance)
Collinsella — oestrogen regulation
Propionibacterium — contributor to enzyme pool

Ashley H Larnder et al., 2025

Gut microbiota changes and symptom correlation in GSM

Observational cross-sectional study.

Health & microbiome findings in women with GSM:
Menopause-related gut microbiome changes associated with adverse risk factors.

Higher prevalence of urogenital symptoms and metabolic comorbidities:

- Urogenital atrophy worsened
- Type 2 diabetes mellitus
- Metabolic syndrome (lower HDL, higher waist circumference, and higher blood pressure)
- Overweight

Bacteriological findings:

- ↓ *Bifidobacterium* and *Lactobacillus*
- ↑ Conditionally pathogenic bacteria:
  Escherichia coli (reduced enzymatic activity)
  Klebsiella
  Streptococcus

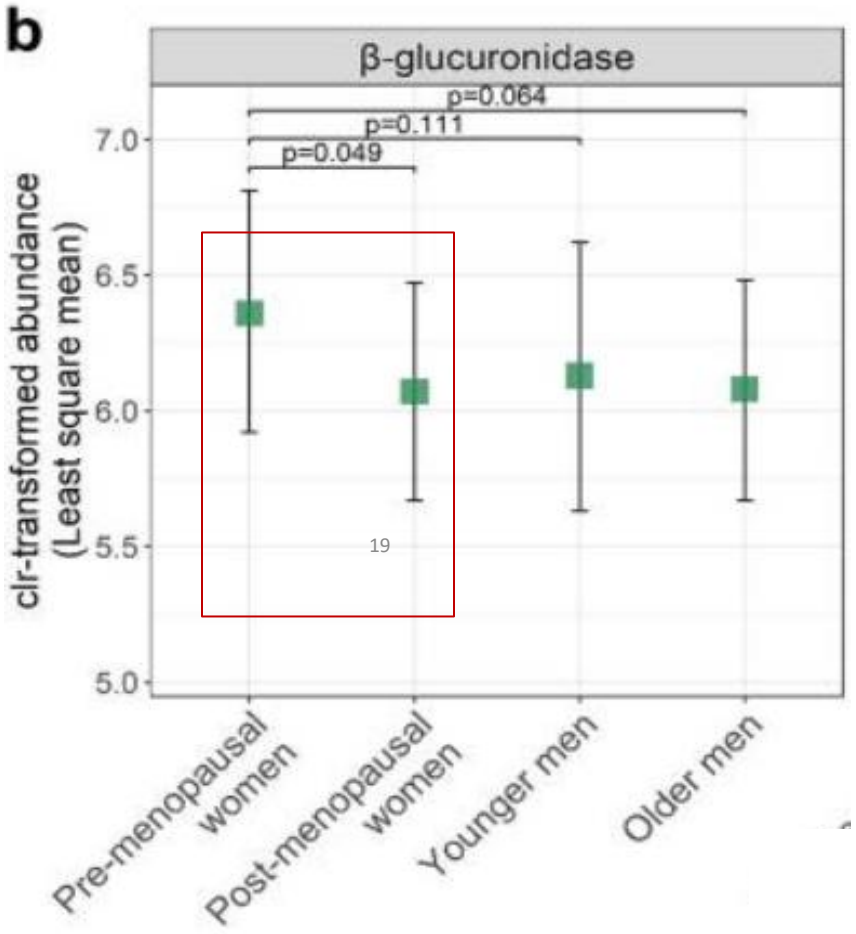
The content of intestinal microorganisms in 1 g of faeces in patients with GMS (subgroup Ia, Ib) and in women of the control group (group II)

Microorganisms	Group I, *N* = 39		Group II, *n* = 26
	Subgroup Ia, *n* = 22	Subgroup Ib, *n* = 17	
Bifidobacterium ($\times 10^8$)	17.69 ±5.15 (pIa-Ib = 0.776) (pIa-II < 0.01)	15.76 ±4.33 (pIb-II < 0.01)	54.25 ±7.31
Lactobacillus ($\times 10^6$)	6.47 ±1.92 (pIa-Ib = 0.343) (pIa-II = 0.018)	4.29 ±1.21 (pIb-II = 0.004)	18.67 ±4.56
Escherichia coli with reduced enzymatic activity ($\times 10^6$)	29.04 ±6.54 (pIa-Ib = 0.864) (pIa-II = 0.028)	27.60 ±5.21 (pIb-II = 0.018)	12.45 ±3.26
Bacteroides ($\times 10^8$)	18.29 ±3.79 (pIa-Ib = 0.667) (pIa-II = 0.556)	15.88 ±4.07 (pIb-II = 0.400)	23.63 ±8.16
Streptococcus viridans ($\times 10^6$)	0.71 ±0.12 (pIa-Ib = 0.447) (pIa-II = 0.032)	0.83 ±0.10 (pIb-II = 0.002)	0.35 ±0.11
Enterococcus faecium ($\times 10^6$)	34.28 ±7.53 (pIa-Ib = 0.609) (pIa-II = 0.488)	40.01 ±8.18 (pIb-II = 0.839)	42.50 ±9.02
Staphylococcus epidermidis ($\times 10^4$)	0.91 ±0.17 (pIa-Ib = 0.150) (pIa-II = 0.406	0.62 ±0.10 (pIb-II = 0.424)	0.74 ±0.11
Klebsiella ($\times 10^5$)	1.39 ±0.19 (pIa-Ib = 0.120) (pIa-II < 0.001)	2.01 ±0.34 (pIb-II < 0.001)	0.30 ±0.04
Candida albicans ($\times 10^4$)	0.73 ±0.19 (pIa-Ib = 0.364) (pIa-II = 0.835)	1.08 ±0.33 (pIb-II = 0.718)	0.85 ±0.54

Oksana Pavlovska et al., 2023
Brandilyn A Peters et al., 2022

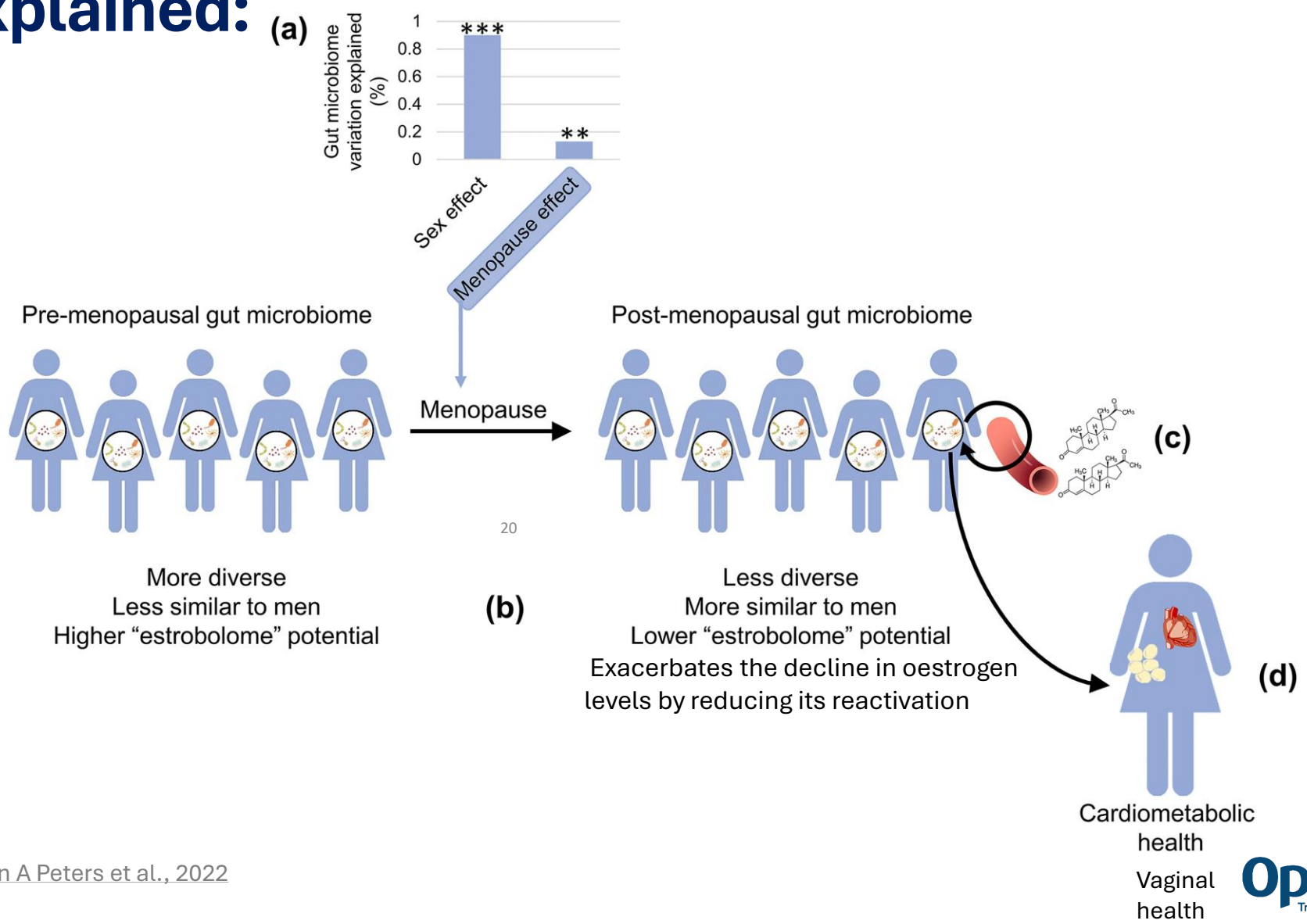
Gut microbiota changes during menopause: The estrobolome

A disrupted estrobolome is linked to intensified symptoms



Brandilyn A Peters et al., 2022

Gut microbiota changes and its impact in GSM Summary explained:



Brandilyn A Peters et al., 2022

GSM is the tip of the iceberg

Beyond the GSM scope

Severity links to gut microbiome disruption — and beyond

More severe GSM = greater dysbiosis

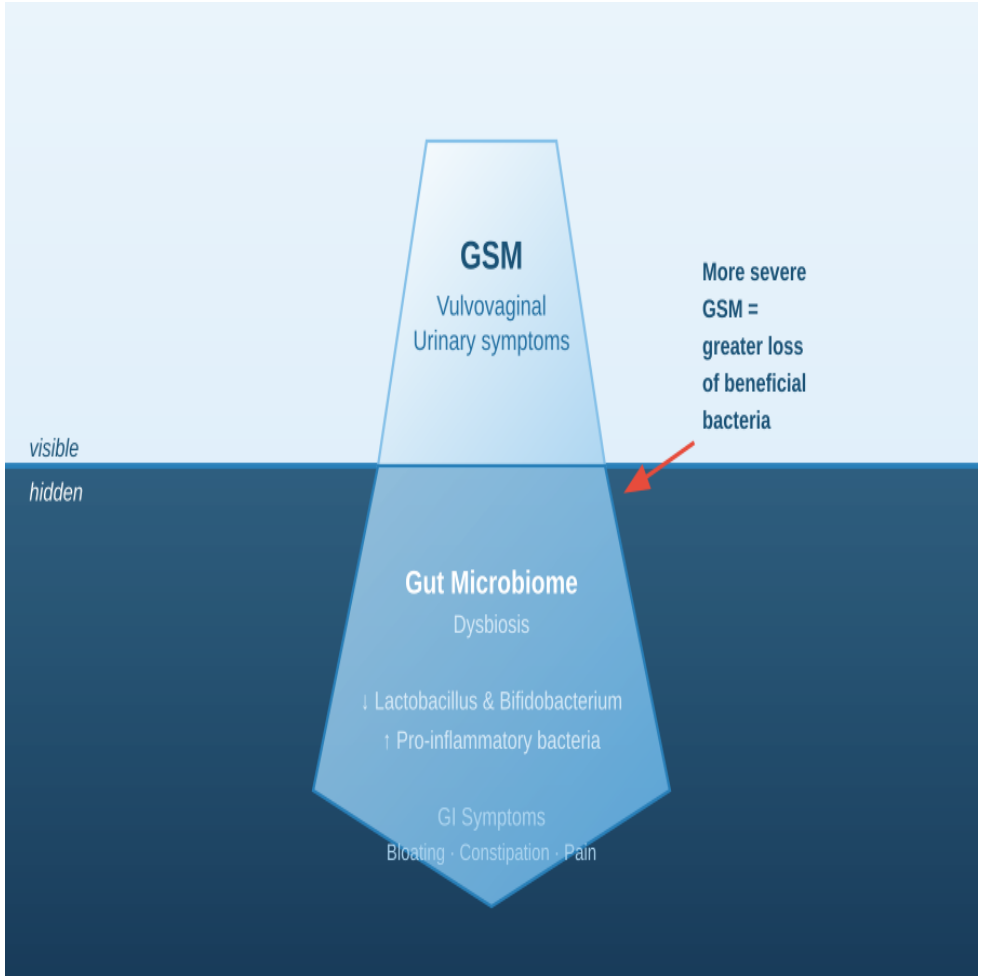
Women with higher GSM severity scores show significantly greater loss of beneficial bacteria -*Lactobacillus and Bifidobacterium* - a pattern mirroring vaginal microbiome disruption.

Gut microbiome: a proposed aetiological player

Scientists do not exclude the aetiological involvement of intestinal microbiota in menopausal disorders — including GSM pathophysiology.

A domino effect on GI function

Lower oestrogen → pelvic floor weakening → altered gut motility → bloating, constipation, incomplete emptying - with symptoms sometimes mimicking Irritable Bowel Syndrome (IBS). Gut microbiota dysbiosis may amplify all these effects.



Oestrogen receptors are found throughout the GI tract. As oestrogen falls in menopause, gut barrier integrity, motility and microbial balance are all affected.

Gut Microbiota Changes in Menopause

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Restoring the ecosystem: probiotics in GSM management

Do probiotics have a role in GSM?

Clinical rationale for probiotic intervention

Qin Xiang Ng et al., 2018
Oksana Pavlovska et al., 2023
Robin A.F. Andrews et al., 2026
Medicines and Healthcare products Regulatory Agency (2019)
Fawcett Society

01 THE PROBLEM

VAGINAL MICROBIOME

In healthy vaginas, *Lactobacillus* comprises ~90% of the microbiome.

In GSM, this dominance collapses. Low-*Lactobacillus* communities drive vulvovaginal atrophy independently of oestrogen levels.

As *Lactobacillus* ↓, pathogens ↑ — worsening GSM onset and severity.

Brotman et al. 2018 · Zeng et al. 2024

GUT MICROBIOME · ESTROBOLOME

Gut dysbiosis ⟷ Vaginal dysbiosis: Interconnected axes amplifying GSM

Menopause-associated dysbiosis alters the estrobolome (↓ β-glucuronidase), reducing oestrogen recycling and heightening GSM.

Liaquat et al. 2025 · Peters et al., 2022

02 CURRENT – HRT THERAPY

No single consensus on the management and treatment of patients with GSM.

60-90% success treatment. BUT, ~22% of women on HRT still present with severe GSM symptoms.

HRT discontinuation intensifies symptom rebound.

For every 1,000 women using HRT for 5 years, about 5 additional breast cancer cases occur.

Probiotics may enhance effects of estriol and isoflavones — an adjunct opportunity.

03 PROBIOTIC EVIDENCE

Vaginal Dryness
SMD −0.95
2026 meta-analysis

Vasomotor Symptoms (hot flushes)
SMD −0.96
2026 meta-analysis

Vaginal Microbiome
SMD −0.91
2026 meta-analysis . Nugent score

Recurrent UTI
RRR 42%
2018 meta-analysis

Sexual & Physical QoL
MENQoL ↑
RCT 2025 · scores improved

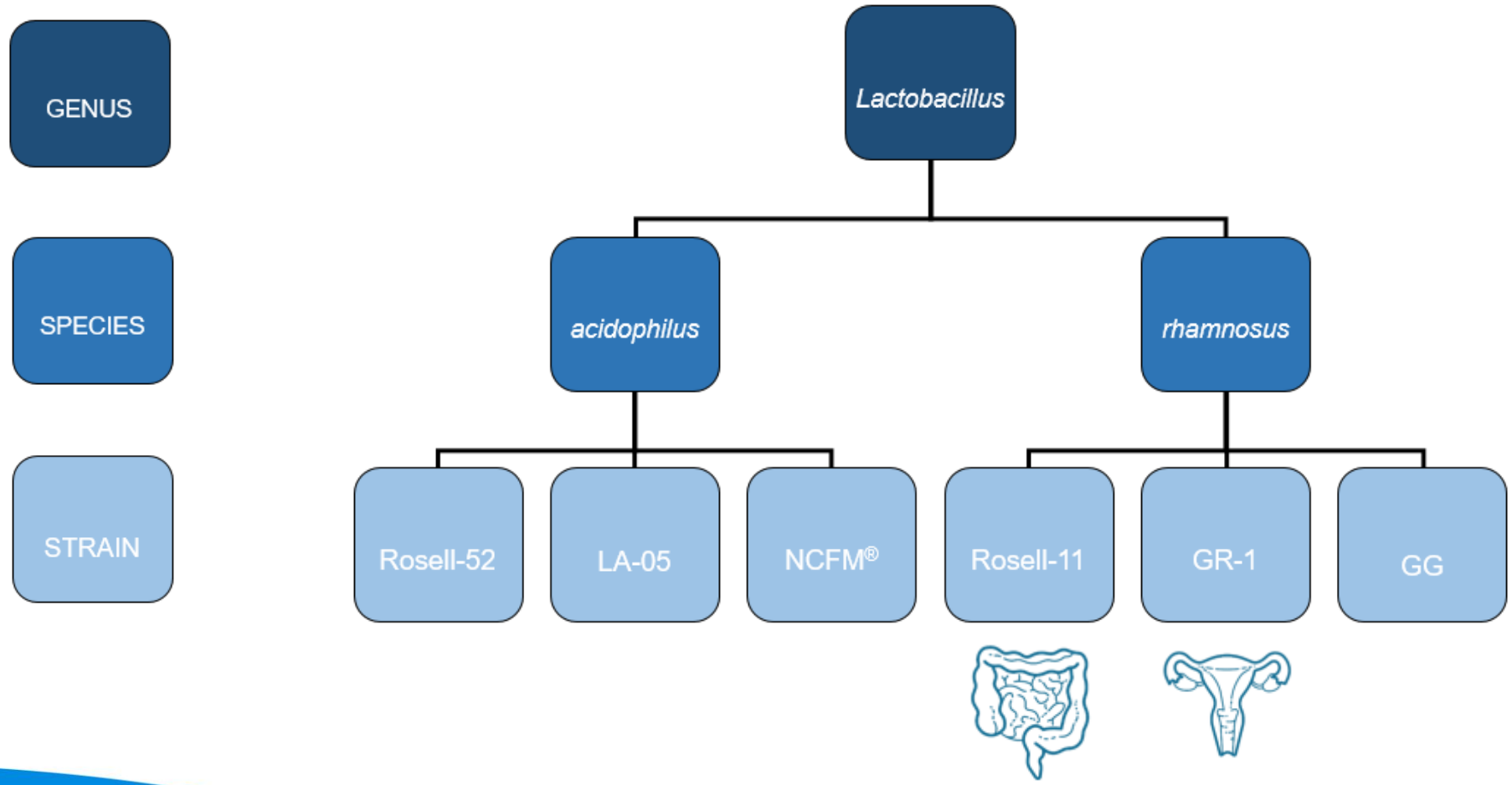
Evidence promising but early. Strain-specific outcomes – Heterogeneous methods and small RCTs ·

Some key strains with evidence:

- *L. rhamnosus* GR-1 + *L. reuteri* RC-14 (UTI & vaginal microbiome)
- *L. crispatus* (vaginal protection)
- *Bifidobacterium spp.* (gut-estrobolome axis)

What are probiotic strains?

*Look for actual **strains** vs species*

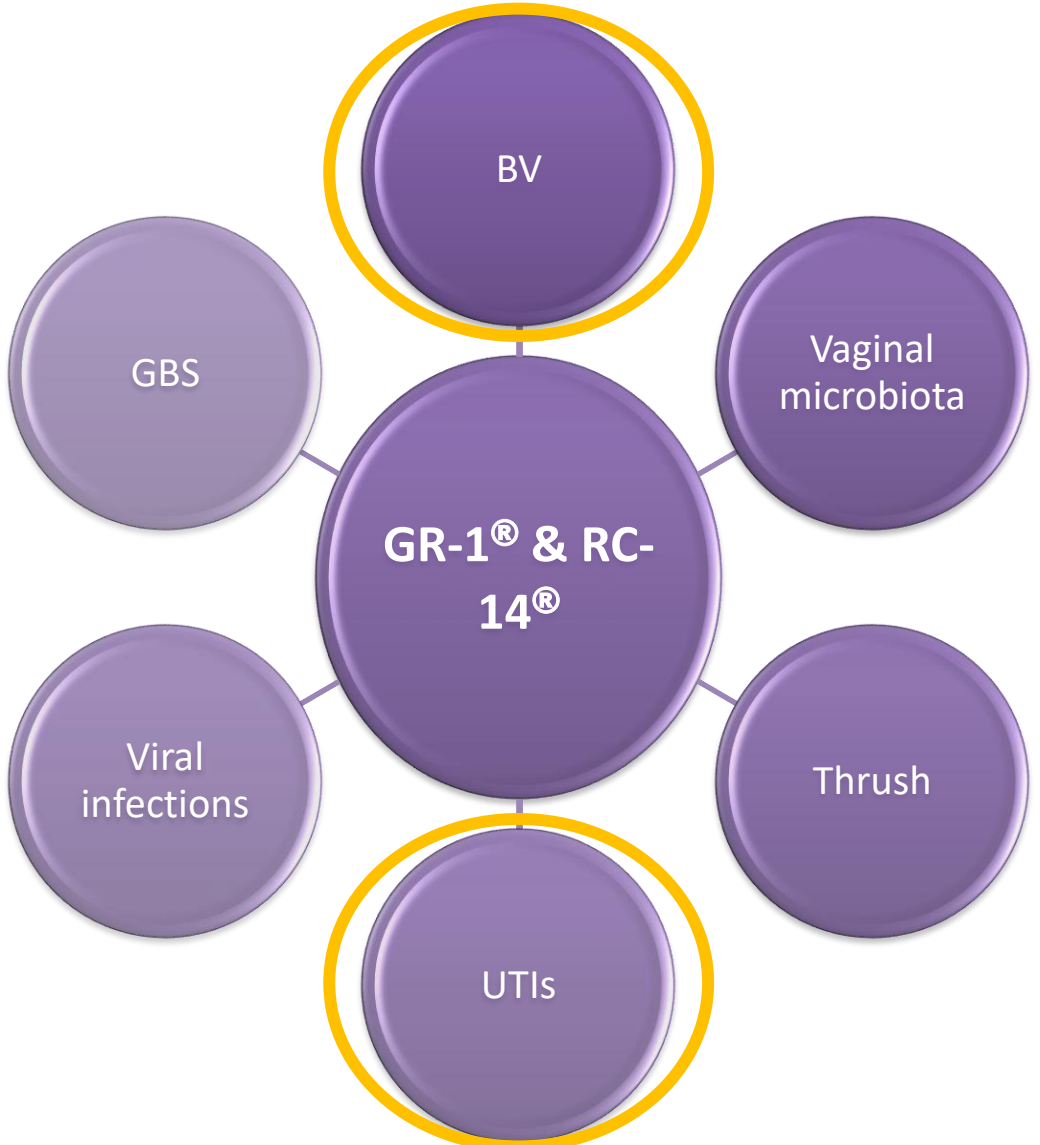


Supporting the Genitourinary Tract:

Clinical Research of *L. rhamnosus* GR-1® and *L. reuteri* RC-14®

Introduction:

1. World's most scientifically documented probiotic strains for women's intimate health and clinically trialled for over 40 years (Peng Liu et al., 2023).
2. Researched in +2500 women including adolescents, pregnant and postmenopausal women.
3. ~30 gold standard clinical trials just on this combination.



Clinical research of *L. rhamnosus* GR-1® and *L. reuteri* RC-14®

How do they work?

13 clinical trials in BV

4 clinical trials for UTI management

3 report cases in UTIs

10 clinical trials assessing vaginal microbiota composition

- ✓ Significantly reduces Nugent & Amsel scores in BV (Vujic et al., 2013)
- ✓ Inhibition of BV pathogens including *Gardnerella vaginalis*
- ✓ Increase in *Lactobacilli*, in particular commensal levels including *L. crispatus*
- ✓ Significantly reduces the number of recurrent UTIs (Beerepoot M A J et al., 2012).
- ✓ Clinical improvement of symptoms.
- ✓ Enhances the action of antibiotics up to 50%

Optibac
Trusted friendly bacteria

For Women

Contains the world's most researched strains for vaginal health. Specially formulated for those with Bacterial Vaginosis (BV), Thrush & UTIs.

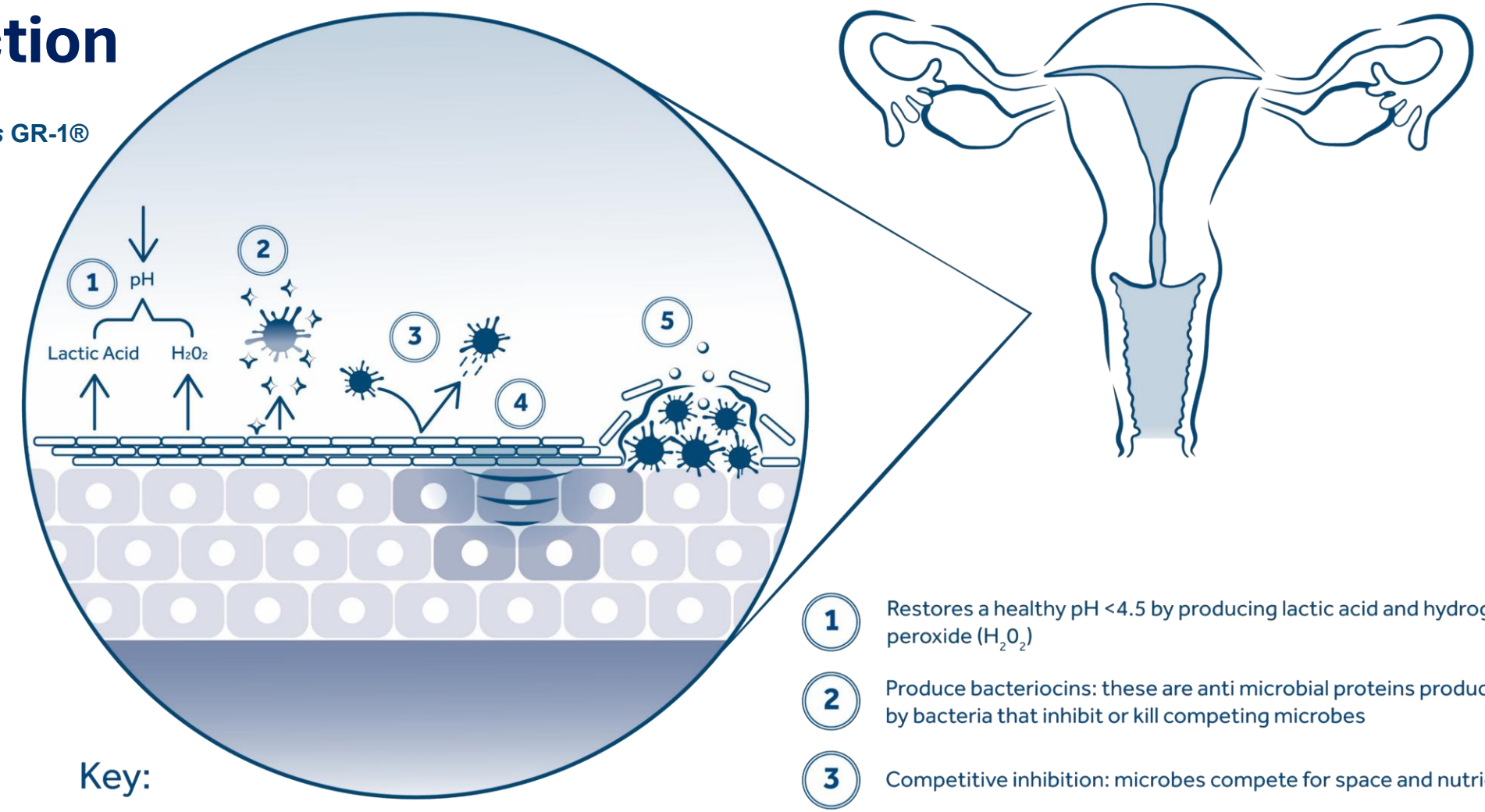
- ✓ Contains 3 extensively researched probiotic strains: *Lactobacillus rhamnosus* GR-1®, *Lactobacillus reuteri* RC-14® & *Lactobacillus paracasei* F-19®
- ✓ Proven to reach the intimate area alive
- ✓ BV symptoms are often confused with Thrush – For Women can be taken for both conditions
- ✓ Can be taken alongside antifungals and antibiotics

Directions for use:

During infection: 2 capsules per day
To maintain vaginal health: 1 capsule per day
Age 12+

Modes of action

MOAs Unique to *L. rhamnosus* GR-1® and *L. reuteri RC*-14®



1. Restores a healthy pH <4.5 by producing lactic acid and hydrogen peroxide (H_2O_2)
2. Produce bacteriocins: these are anti microbial proteins produced by bacteria that inhibit or kill competing microbes
3. Competitive inhibition: microbes compete for space and nutrients
4. Modulates cytokines to decrease inflammation
5. Produces biosurfactants: these 'natural detergents' weaken biofilms. For instance, *L. rhamnosus* GR-1® and *L. reuteri* RC-14® help to break down biofilms in women with bacterial vaginosis, thrush or UTIs

L. rhamnosus GR-1® and *L. reuteri* RC-14® effective in preventing rUTIs

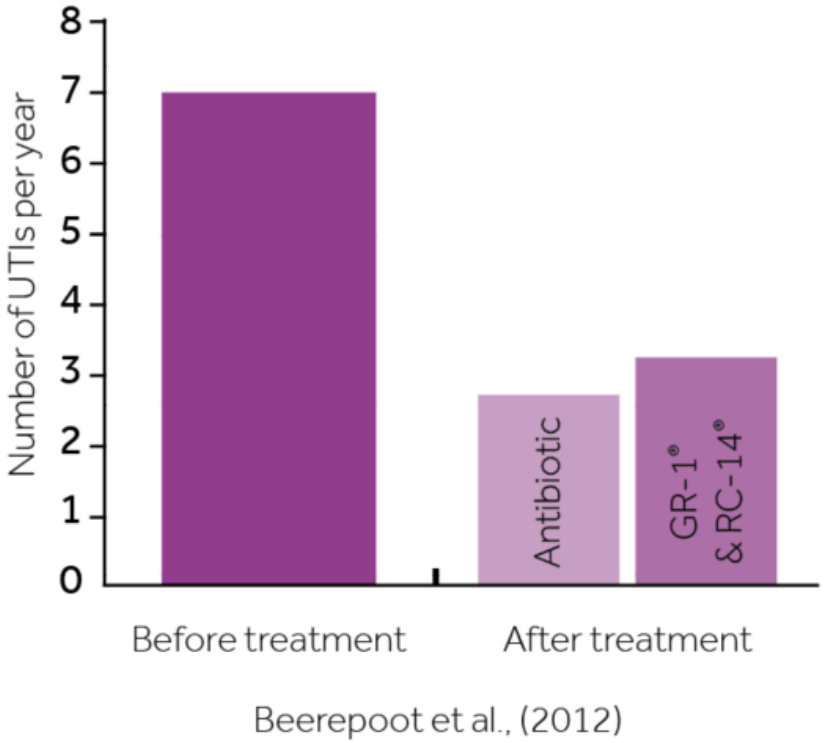
RCT with 252 post-menopausal women suffering from recurrent UTIs.

- **Group 1-** 1 billion CFU per cap x 2/day of L. rhamnosus GR-1® and L. reuteri RC-14®
- **Group 2-** 480 mg of antibiotics (Tri-Sul)

Design: Probiotic or antibiotics for 12 months

The probiotics performed almost **as effectively as an antibiotic,** with a 50%+ reduction in both groups.

After 1 month of Tri-Sul, resistance increased from 20% to 40% to 80% to 95% for E. coli cases. Probiotics do not cause or increase resistance.



Probiotics were nearly as effective as antibiotics

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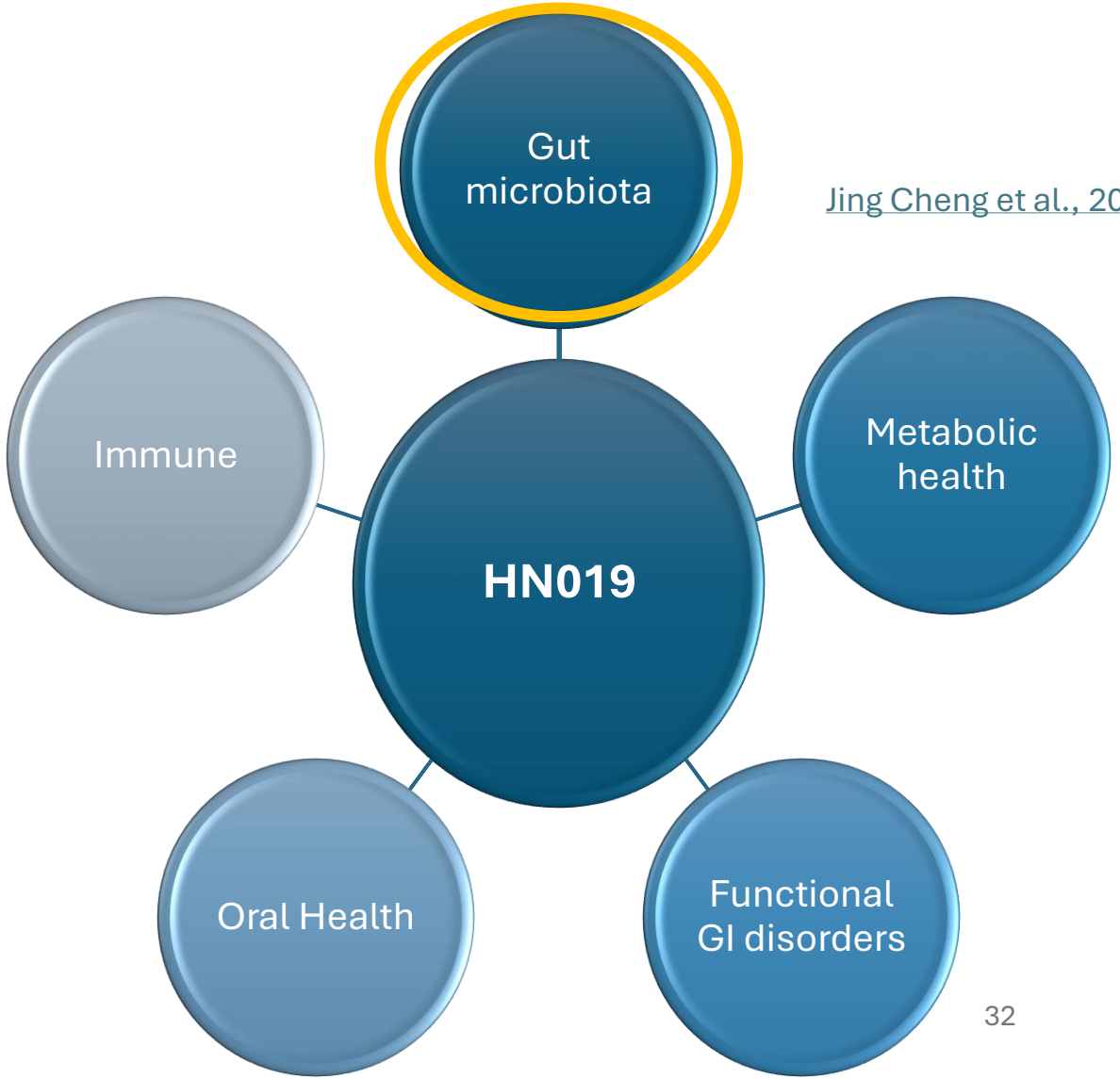
Supporting the gastrointestinal tract:

Clinical Research of *Bifidobacterium lactis* HN019

- Extensively researched in over **40 published studies** including healthy and compromised subjects across all age groups.
- Included in several meta-analyses for constipation.
- Researched in over 1,000 individuals.
- Multiple clinical trials on gut health including abdominal pain modulation, constipation, bloating and microbiota composition.



Jing Cheng et al., 2021

Every Day MAX

A high strength and premium combination of 3 probiotic strains, including *L. acidophilus* NCFM®, *B. lactis* HN019 and *B. lactis* BI-04.

- ✓ Anyone who is looking for a quality, high strength probiotic.
- ✓ These specific strains have been shown to improve:
  - ✓ Digestion (all round support for many GI issues)
  - ✓ Reduces upper respiratory tract infections and boosts immune activity
  - ✓ Supports a healthy gut environment (reduces inflammation and encourages the growth of good bacteria)
  - ✓ Moderate reaction to allergens

75 Billion Live cultures

No dairy

Suitable in pregnancy

Vegan

Gluten free

Menopause friendly

Active ingredients:
Lactobacillus acidophilus NCFM®, *Bifidobacterium lactis* HN019, *Bifidobacterium lactis* BI-04

RCT: *B. lactis* HN019 for intestinal microflora composition

Randomised, double-blind, placebo-controlled intervention study with 80 elderly subjects.

Group 1- reconstituted skim milk (RSM) with placebo

Group 2-4 reconstituted skim milk (RSM) with low, medium and high dose of probiotic HN019.

Design: Probiotic or placebo for 4 weeks.

Key findings:
Significant increases in resident *Bifidobacteria, Lactobacilli* and *Enterococci* were observed in all probiotics group - dose-related increases.
The probiotic caused ~5–10× increases more than placebo in beneficial bacteria and similar-scale reductions in harmful ones (*Enterobacteria*) at higher doses.

M Ahmed et al., 2007

Case Study

Case Study

Sarah, 54, 18 months post-menopause

Presenting symptoms

- Vaginal dryness & discomfort during sex
- Recurrent UTIs (x3 in 8 months)
- Bladder urgency & disrupted sleep
- Low mood & fatigue
- Bloating & changed bowel habits

Suggested protocol

Diet

- 30 plant foods per week
- Daily fermented foods (kefir, yoghurt, kimchi)
- Phytoestrogen-rich foods (ground flaxseed, legumes)
- Reduce ultra-processed foods, sugar & alcohol
- Adequate hydration

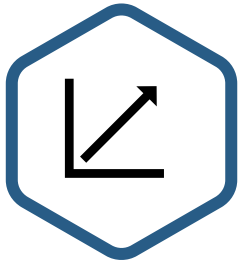
Lifestyle

- Resistance & weight-bearing exercise
- Stress management
- Sleep prioritisation

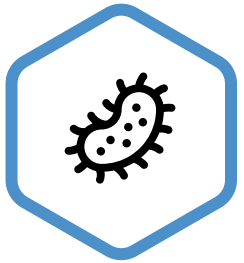
Supplements & Therapeutics

- Probiotic support: Optibac For Women & Optibac Every Day MAX
- Topical oestrogen (GP discussion)
- Omega-3 fatty acids

Summary Take-away messages

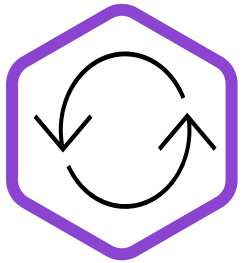
1) 

High Incidence
GSM affects up to 84% of women.
Symptoms severity go beyond the GSM scope and there are other areas impacted such as gastrointestinal and metabolic health.

2) 

Key correlation to symptoms: Loss of beneficial bacteria
The gut, vaginal, and bladder microbiota play a key role.
The genitourinary tract sees a significant reduction of protective *Lactobacillus*, associated to higher risk of infections.

The gut microbiota composition also shows loss of beneficial bacteria (*Lactobacillus* and *Bifidobacteria*) associated to severity of GSM.

3) 

Clinical management
HRT treatment shows good outcomes to manage symptoms, but still up to22% of women suffer from GSM, and if treatment is stopped, symptoms come back more severe.

4) 

Evidence-Based Prevention - Probiotic Strategies
Probiotics like *L. rhamnosus* GR-1®, *L. reuteri* RC-14® show clinical efficacy.
Clinical trial: Probiotics nearly as effective as antibiotics in UTIs. Probiotic monotherapy reduced UTIs by 42% vs placebo.
HN019 has shown to modulate gut microbiota.

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THANK YOU!

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