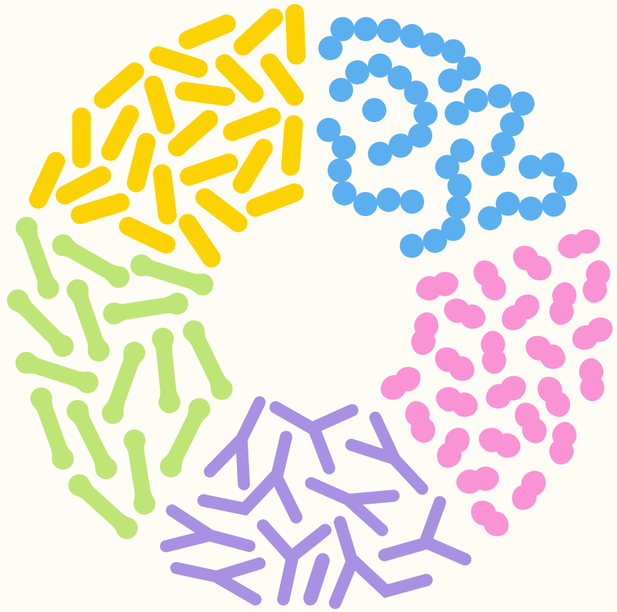
REPRODUCTIVE MICROBIOME

How It Affects Women's Reproductive Health, Fertility, Men’s Wellness, and Future Generations



Dr. Loredana M Shapson PharmD FNTP

LifeMod SOLUTIONS

ABOUT ME

LifeMod SOLUTIONS

Newtown, PA

Pharmacist Turned Holistic

Bloating, IBS and Gut Health

Feminine Microbiome Health

THE INFERTILTY CRISIS

1 in 6 couples worldwide face infertility (WHO)

6.7 million couples

17.5% of the population

Infertility diagnosis if there is the absence of full-term pregnancy and:

< Age 35 and more than 1 year of unprotected intercourse

>= Age 35, more than 6 months of unprotected intercourse

LifeMod SOLUTIONS

INFERTILITY CAUSES

Female

Hormonal Disorders
Ovarian Dysfunction
Fallopian Tube Problems
Uterine Conditions
Cancer
STIs

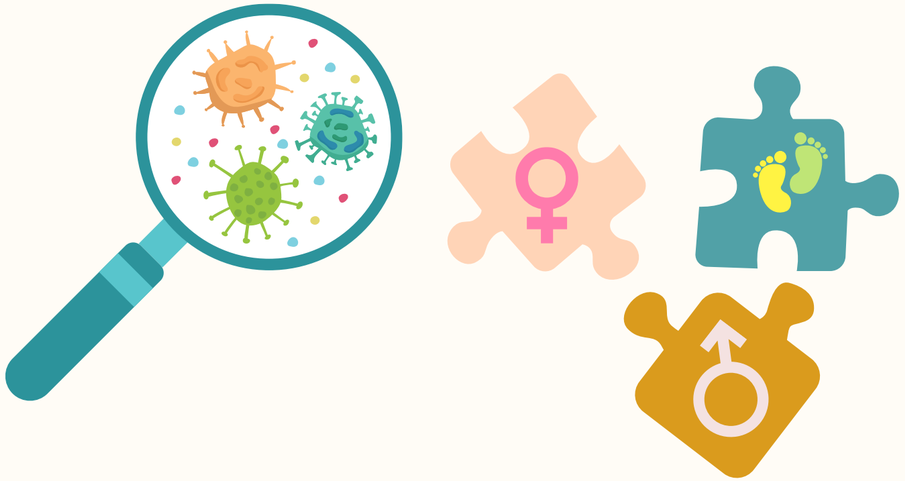
Male

Hormonal Disorders
Testicular Dysfunction
Ejaculatory Dysfunction
Genetic Disorders
Cancer
STIs

Hardware problems

LifeMod SOLUTIONS

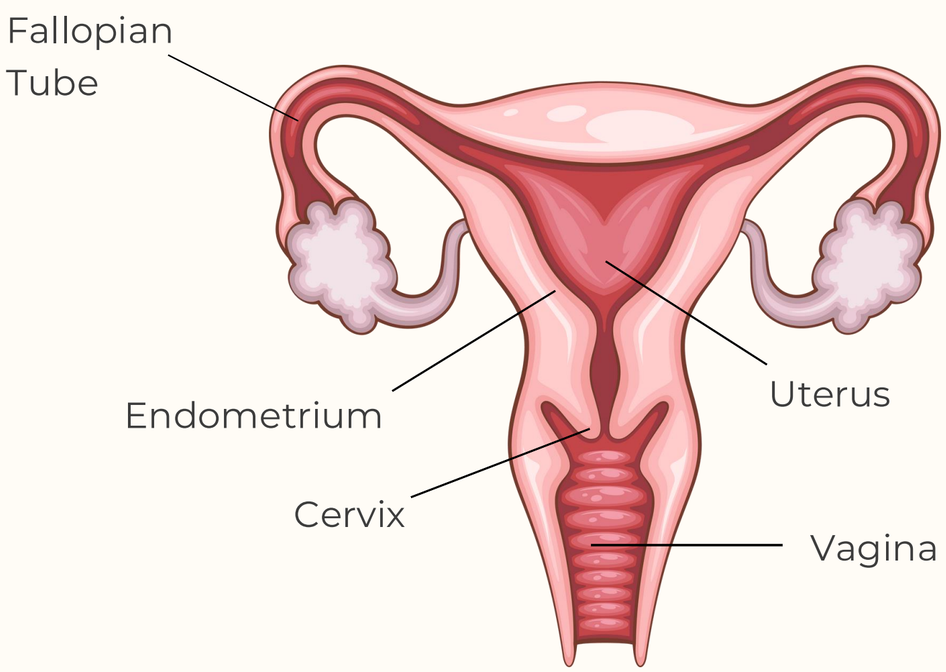
30–45% of infertility cases are “unexplained”



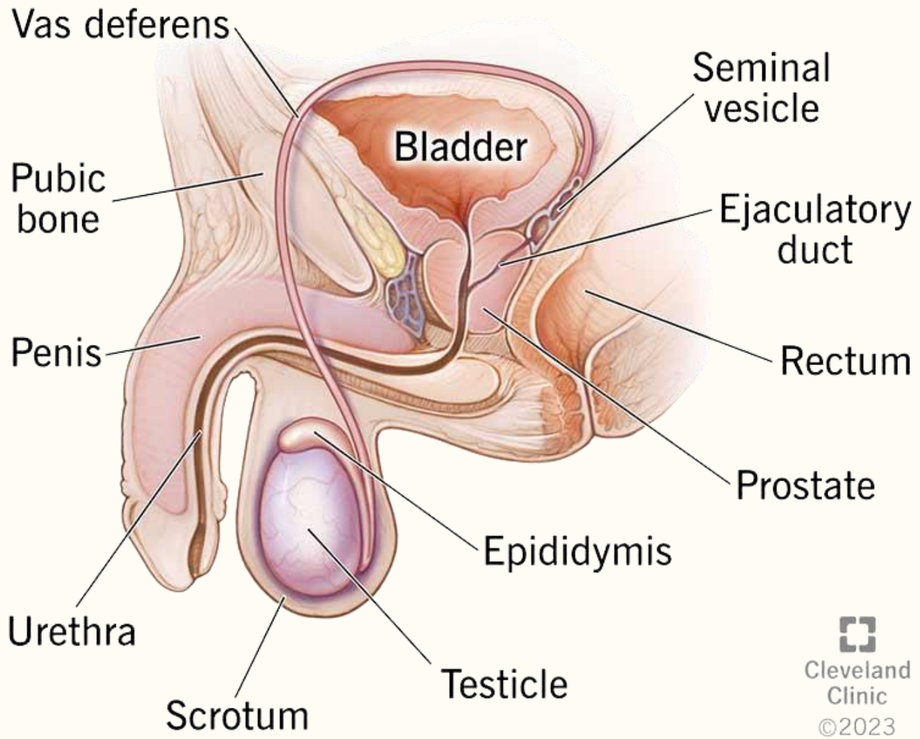
Is the reproductive microbiome a missing piece?

THE REPRODUCTIVE MICROBIOME

Female Reproductive System



Male Reproductive System



FEMALE MICROBIOME ♀

Optimal Profile:

✓ Lactobacillus dominant (>90%)
- → Produce lactic acid
- → Low vaginal pH: < 4.5
- → Antimicrobials (bacteriocins)
- → Hydrogen peroxide

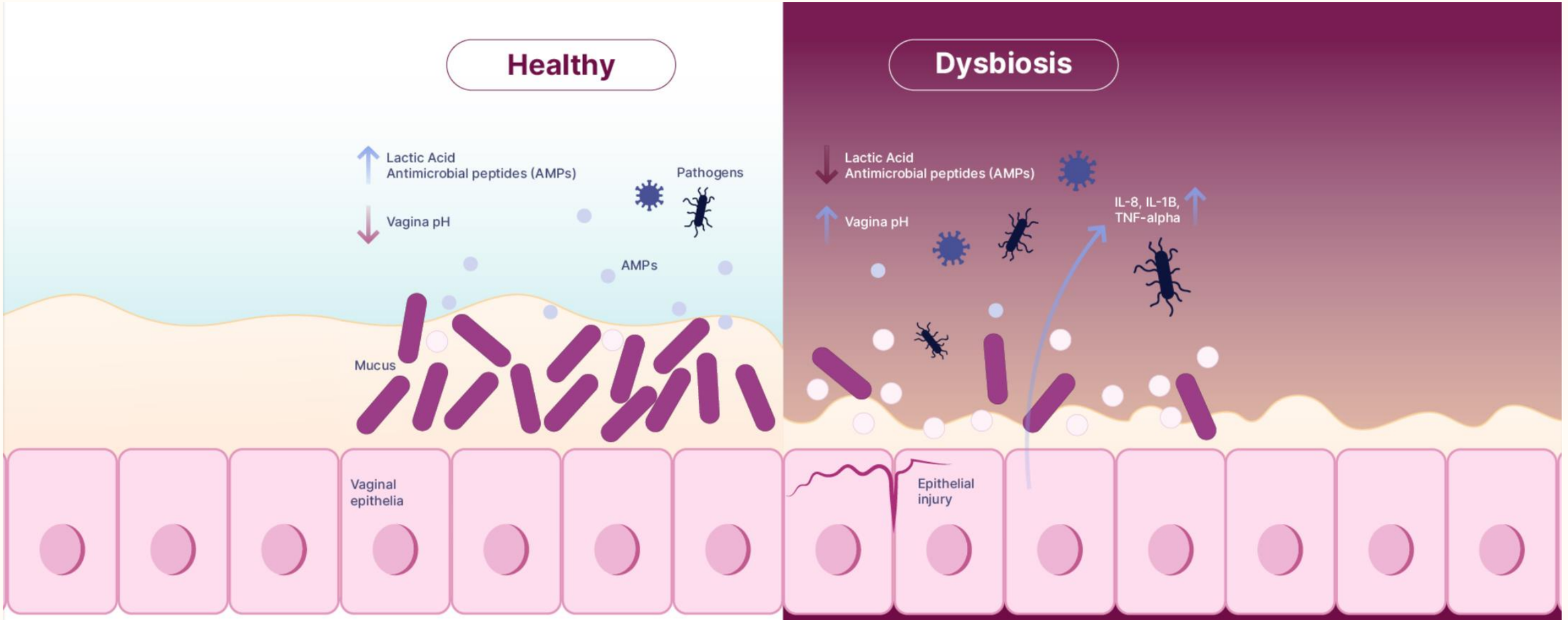
✓ Low diversity (<10%)

Dominant Species:

✓ Lactobacillus
- L. crispatus
- L. gasseri
- L. jensenii
- L. iners (may be associated with dysbiosis)

LifeMod SOLUTIONS

WHY IT MATTERS



+ dominated by *Lactobacillus* species

+ optimal pH: 3.8-4.5

+ maintains natural defenses

+ supports balanced vaginal flora

- disrupted *Lactobacillus* population

- pH imbalance (>4.5)

- increased risk in bacterial or yeast related discomfort

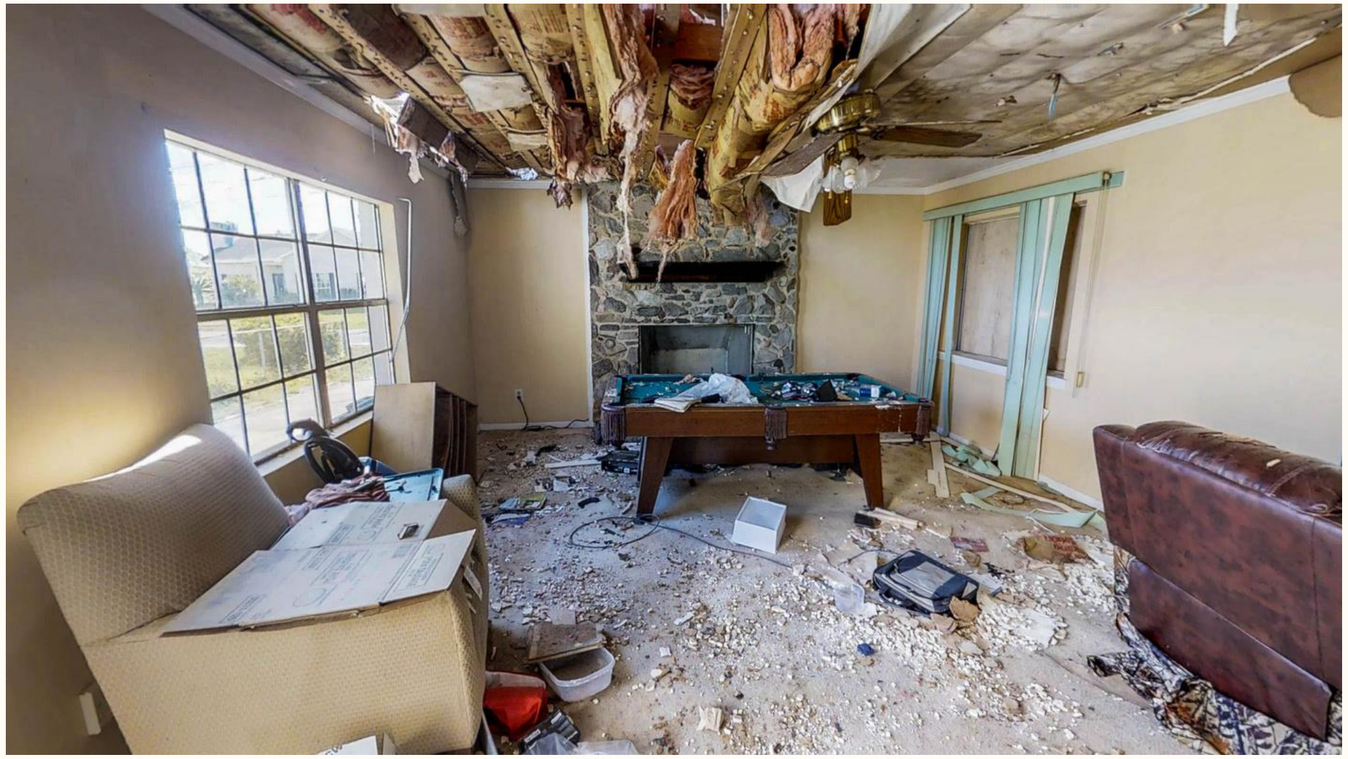
- inflammation or irritation

WHERE DO YOU WANT LIVE?

lactobacillus

LifeMod SOLUTIONS

....OR HERE?



LifeMod SOLUTIONS

Vaginal Dysbiosis and the 5 Community State Types[4]

The vaginal microbiome is clustered into five groups or community state types (CST)

State type I *L. crispatus* dominate

- Healthiest
- Lowest pH (<pH 4)
- Most resistant to dysbiosis (D-lactic acid)
- Stable throughout menstrual cycle

State type II *L. gasseri* dominate

- Not common
- pH of 4.4
- May transition to type I during pregnancy
- Rarely associated with disease

State type III *L. iners* dominate

- pH >4.5
- Associated with good vaginal health and dysbiosis
- L-lactic acid is less effective at inhibiting dysbiosis
- Can transition to BV-associated bacteria
- Higher association with vulvovaginal candidiasis (VVC)

State type IV Non-*Lactobacillus* dominate

- Low/no *Lacto*
- High risk of BV
- Least stable; fluctuates during menstrual cycle (MC)
- Highly associated with BV, sexually transmitted infections (STIs), endometritis, and pregnancy loss
- High pH and vaginal mucosal disruption

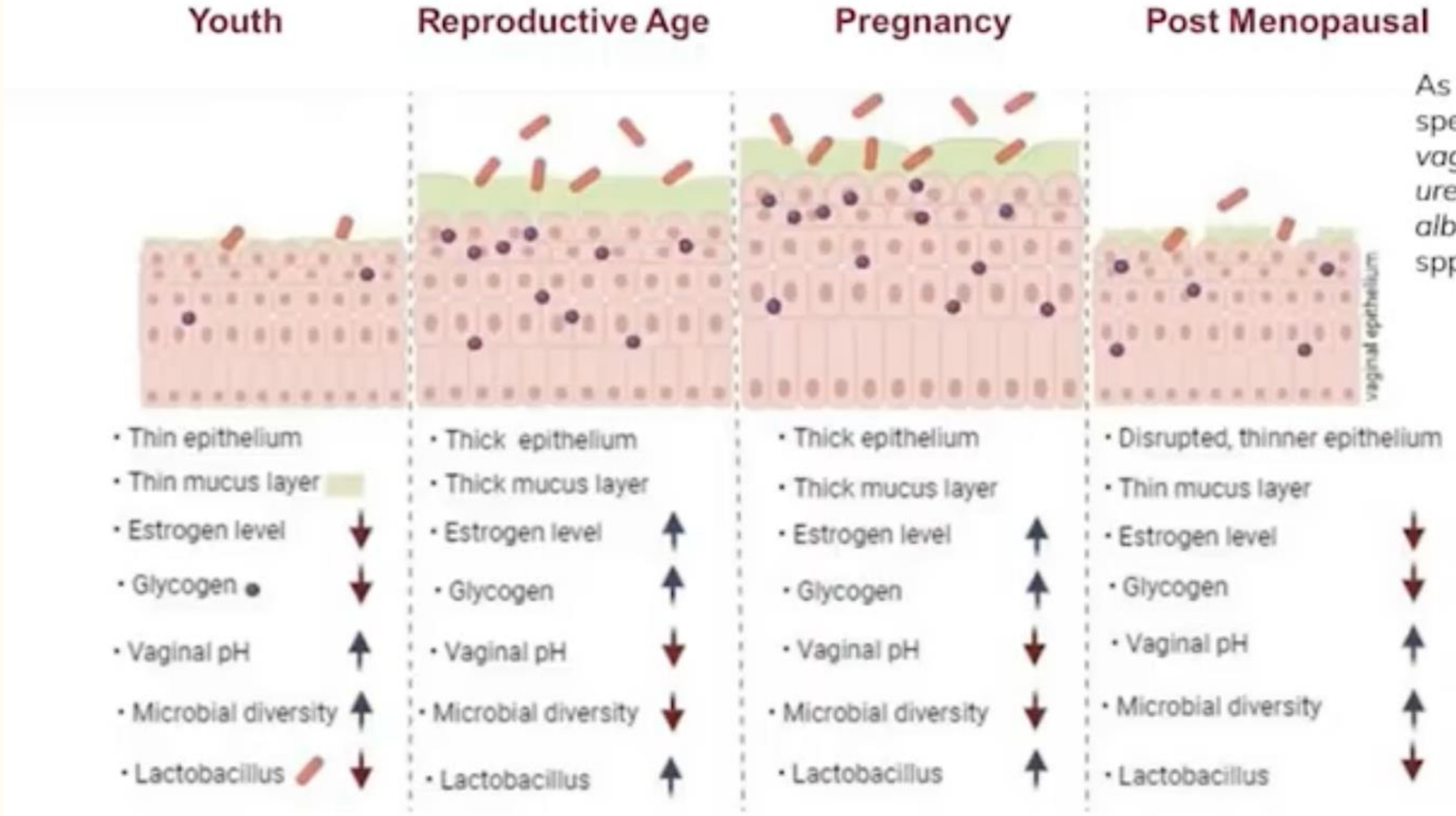
State type V *L. jensenii* dominate

- Uncommon
- pH of 4.2
- Considered healthy though

LifeMod SOLUTIONS

[Ravel 2011]

Vaginal Microbiome Throughout Lifespan



As *Lactobacillus* declines, species like *Gardnerella vaginalis*, *Ureaplasma urealyticum*, *Candida albicans* and *Prevotella* spp. increase.[23]

(Sadeghpour Heravi 2024)

HOW THE FEMALE MICROBIOME AFFECTS ♀

Conception

Miscarriage

Preterm Birth

LifeMod SOLUTIONS

Study Question

Is the pre-pregnancy vaginal microbiome associated with time-to-pregnancy (TTP) within 1 year?

CONCEPTION

PMID: 35909180

Study

n= 89
Fertile women

Methods

Vaginal swabs taken before conception

Pregnancy confirmed by ultrasound

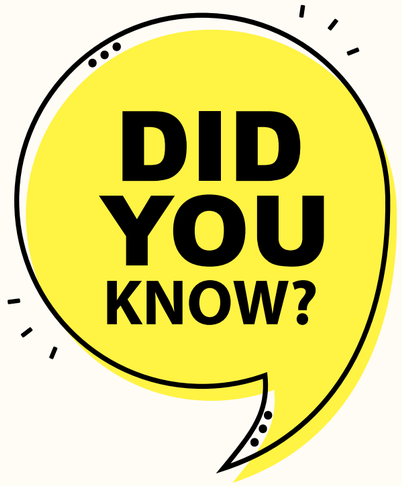
Results

59.6% Pregnant <1 yr → **Higher Lactobacillus**

Non-Pregnant → **Higher Gardnerella (BV)**

LifeMod SOLUTIONS

IN VITRO FERTILIZATION (IVF)



One round of IVF costs **$12,000 - $15,000**

Medicines can add **another $3,000–$5,000**

From start to transfer, **one IVF cycle takes about 6–8 weeks.**

30%–35% of women achieve live birth
after IVF–embryo transfer (IVF-ET)

PMID: 37882794

LifeMod SOLUTIONS

Study Question

Does endometrial microbiota affect IVF outcomes?

› Am J Obstet Gynecol. 2016 Dec;215(6):684-703.
doi: 10.1016/j.ajog.2016.09.075. Epub 2016 Oct 4.

Evidence that the endometrial microbiota has an effect on implantation success or failure

Outcomes

Lactobacillus Dominant (LD) >90% microbiota

Implantation

60.7% vs 23.1%

LD vs NLD

(P = .02)

Pregnancy

70.6% vs 33.3%

LD vs NLD

(P = .03)

Ongoing Pregnancy

58.8% vs 13.3%

LD vs NLD

(P = .02)

Live Birth

58.8% vs 6.7%

LD vs NLD

(P = .002)

Study Question

Does vaginal dysbiosis (VD) affect IVF outcomes?

Pathogens. 2021 Mar 4;10(3):295. doi: 10.3390/pathogens10030295

The Association between Vaginal Dysbiosis and Reproductive Outcomes in Sub-Fertile Women Undergoing IVF-Treatment: A Systematic PRISMA Review and Meta-Analysis

Results: Patients with Imbalance

~18 %

VD is present in IVF candidates

-45 %

Lower Chance + Ultrasound Pregnancy

+71 %

Increased Risk for Pregnancy Loss

LifeMod SOLUTIONS

Study Question

Is the vaginal bacteria associated with pregnancy success after vitro fertilization (IVF)?

Multicenter Study > Hum Reprod. 2019 Jun 4;34(6):1042-1054. doi: 10.1093/humrep/dez065.

The vaginal microbiome as a predictor for outcome of in vitro fertilization with or without intracytoplasmic sperm injection: a prospective study

PMID: 31119299

R Koedooder [1], M Singer [2], S Schoenmakers [3], P H M Savelkoul [2 4], S A Morré [2 5],

A prospective cohort study
n = 303 women

94%

Accuracy

Could predict successful IVF

LifeMod SOLUTIONS

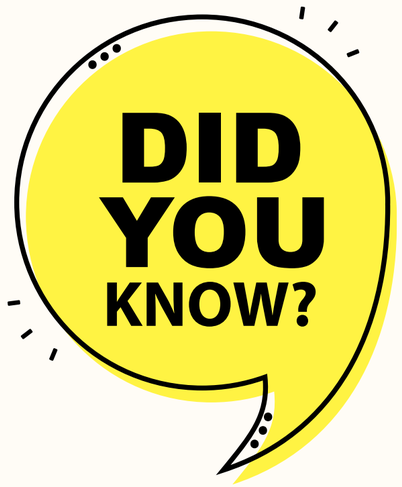
HOW THE FEMALE MICROBIOME AFFECTS ♀

Conception

Miscarriage

Preterm Birth

MISCARRAIGES



Miscarriage = spontaneous loss of pregnancy **before 20 weeks**

1 in 5 pregnancies (20%) end in miscarriage

A majority happen in the **first trimester (<12 weeks)**

The CDC estimates that about **half of women will experience at least one miscarriage** in their lifetime

LifeMod SOLUTIONS

Study Question

Is bacterial vaginosis (BV) associated with 1st vs. 2nd trimester miscarriages?

> J Cytol. 2016 Jul-Sep;33(3):135-140. doi: 10.4103/0970-9371.188050.

Bacterial vaginosis in association with spontaneous abortion and recurrent pregnancy losses

40%

Who had Miscarriage within 6 months were +BV
(P < 0.05)

No

No relationship recurrent pregnancy losses
(P < 0.05)

2nd Tri

+ BV
(P < 0.05)

Those +BV had zero symptoms
(P > 0.05)

LifeMod SOLUTIONS

Review > Front Cell Infect Microbiol. 2023 Sep 13:13:1232825.
doi: 10.3389/fcimb.2023.1232825. eCollection 2023.

Role of the vaginal microbiome in miscarriage: exploring the relationship

High-risk pregnancies are linked to the abundance of Gardnella *vaginalis, Atopobium vaginae as well as Chlamydia trachomatis in the vaginal* which may cause miscarriage.	(Bretelle et al., 2015)
In this study, the authors found that women who have had a second-trimester miscarriage have a much greater frequency of vaginal dysbiosis when compared to those who have had repeated miscarriages.	(McPherson, 2016)
In this study, the authors showed that reduced *Lactobacillus* spp. associated with the growth of *Streptococcusas, Prevotella* and *Atopobium, well as RM.*	(Chang et al., 2020)
In this study, the authors reported that women had a recurrent pregnancy loss, she has a high level of *Gardnerella vaginalis* and other anaerobic bacteria in their vaginal microbiome.	(Peuranpaa et al., 2022)
In women with RM, *Lactobacillus* spp. is absent from the vagina.	(Kuon et al., 2017)
the authors of this study reported that women who experienced miscarriage had a higher abundance of pathogenic bacteria, such as *Ureaplasma* and *Mycoplasma*, in their amniotic fluid compared to women with successful pregnancies.	(Ahmadi et al., 2014)
In this study, the authors reported that women who experienced one miscarriage in the previous six months had been suffering from bacterial vaginosis.	(Isik et al., 2016)
In this study, the authors found that women had recurrent miscarriage, she had a lower level of *Lactobacillus species* and a higher abundance of pathogenic bacteria in their cervical mucus compared to women with successful pregnancies.	(Chen et al., 2017)

HOW THE FEMALE MICROBIOME AFFECTS ♀

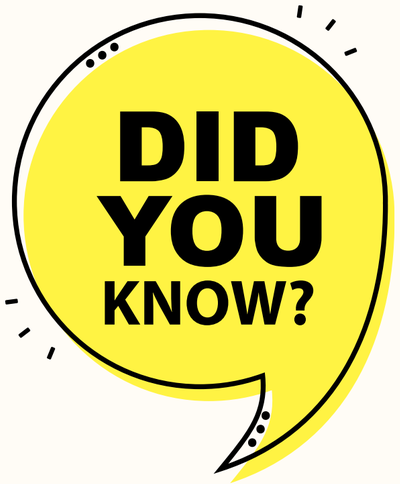
Conception

Miscarriage

Preterm Birth

LifeMod SOLUTIONS

PRETERM BIRTH



1 in 10 babies are born preterm, before 37 weeks (WHO)

Leading cause of death in children under 5, with **nearly 1 million deaths worldwide in 2022**

PMID: 40551192

LifeMod SOLUTIONS

Study Question

How does late-pregnancy vaginal microbiota affect preterm birth and prolonged membrane rupture?

Sci Rep. 2023 Jun 4;13:9061. doi: 10.1038/s41598-023-36126-z

Microbial diversity in the vaginal microbiota and its link to pregnancy outcomes

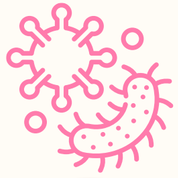
Results: L. crispatus-dominant (protective): lowest risk of preterm birth

83%

Accuracy could predict preterm births

+15%

NLD increased risk of preterm birth



29%

preterm <30 weeks had confection Candida + Ureaplasma

Pathogens Detected

Ureaplasma
Candida
Gardnerella (BV)

LifeMod SOLUTIONS

MOST WOMAN SHOW NO SYMPTOMS

84%

Women with Bacterial Vaginosis (BV) have no symtoms

PMID: 17621244

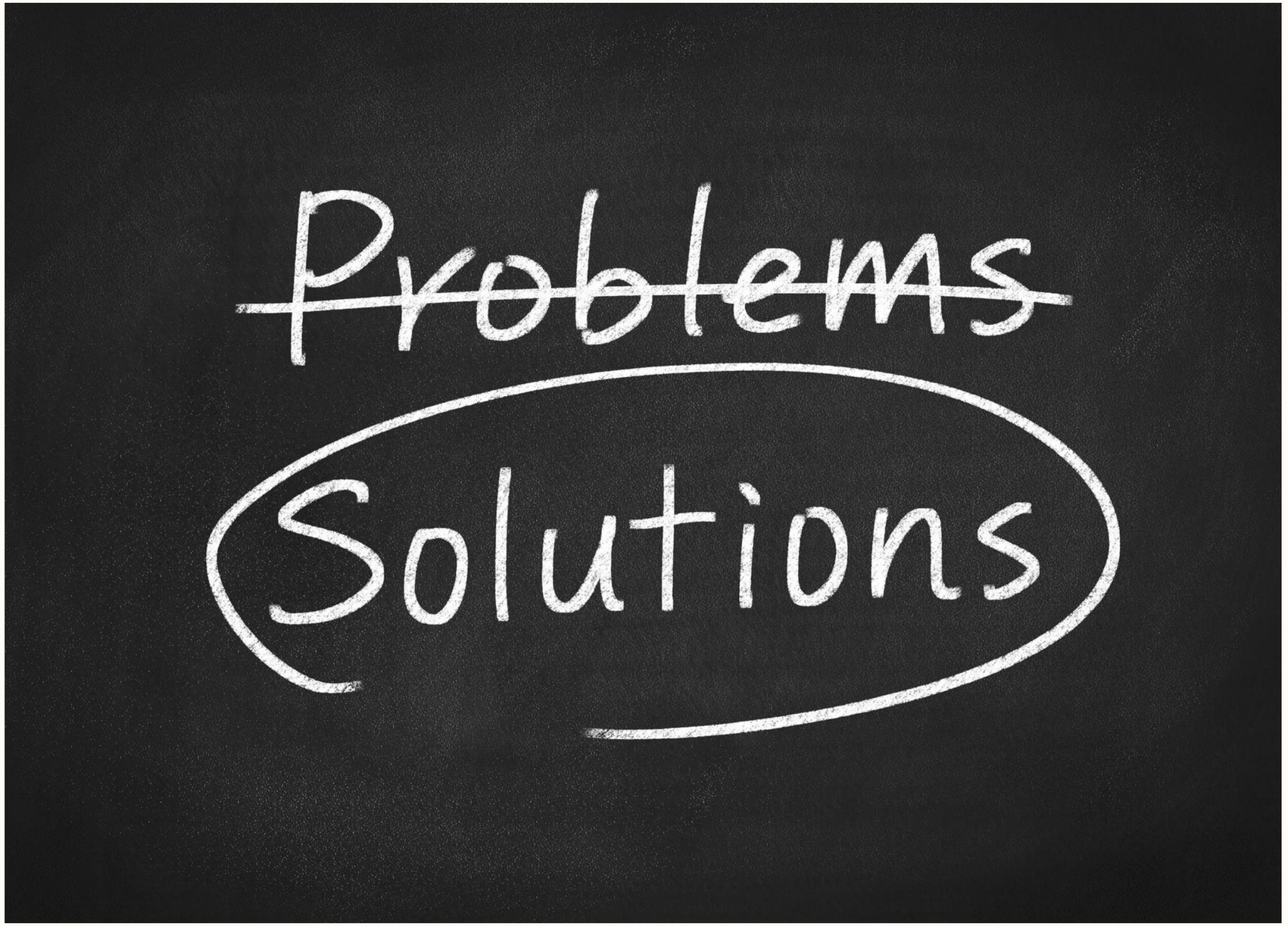
TESTING MATTERS

43%

Women with vaginal imbalance (< 80% lactobacillus) had no symptoms

PMID: 37762424

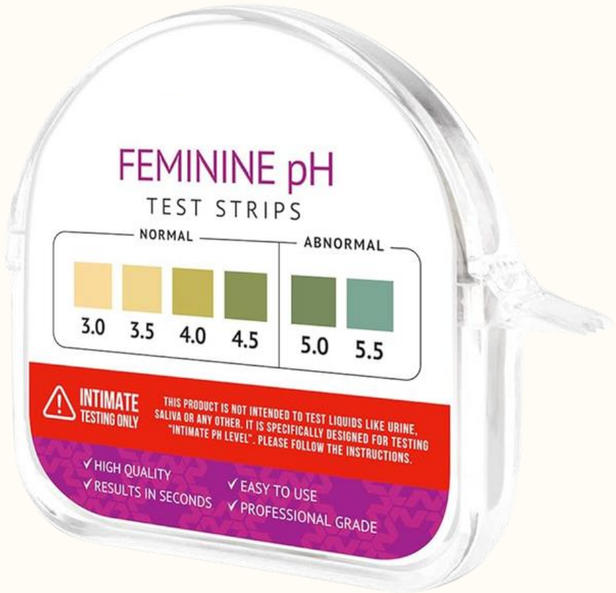
LifeMod SOLUTIONS



LifeMod SOLUTIONS

AT HOME TESTING OPTIONS

pH Testing



Start here!

Vaginal Microbiome Testing

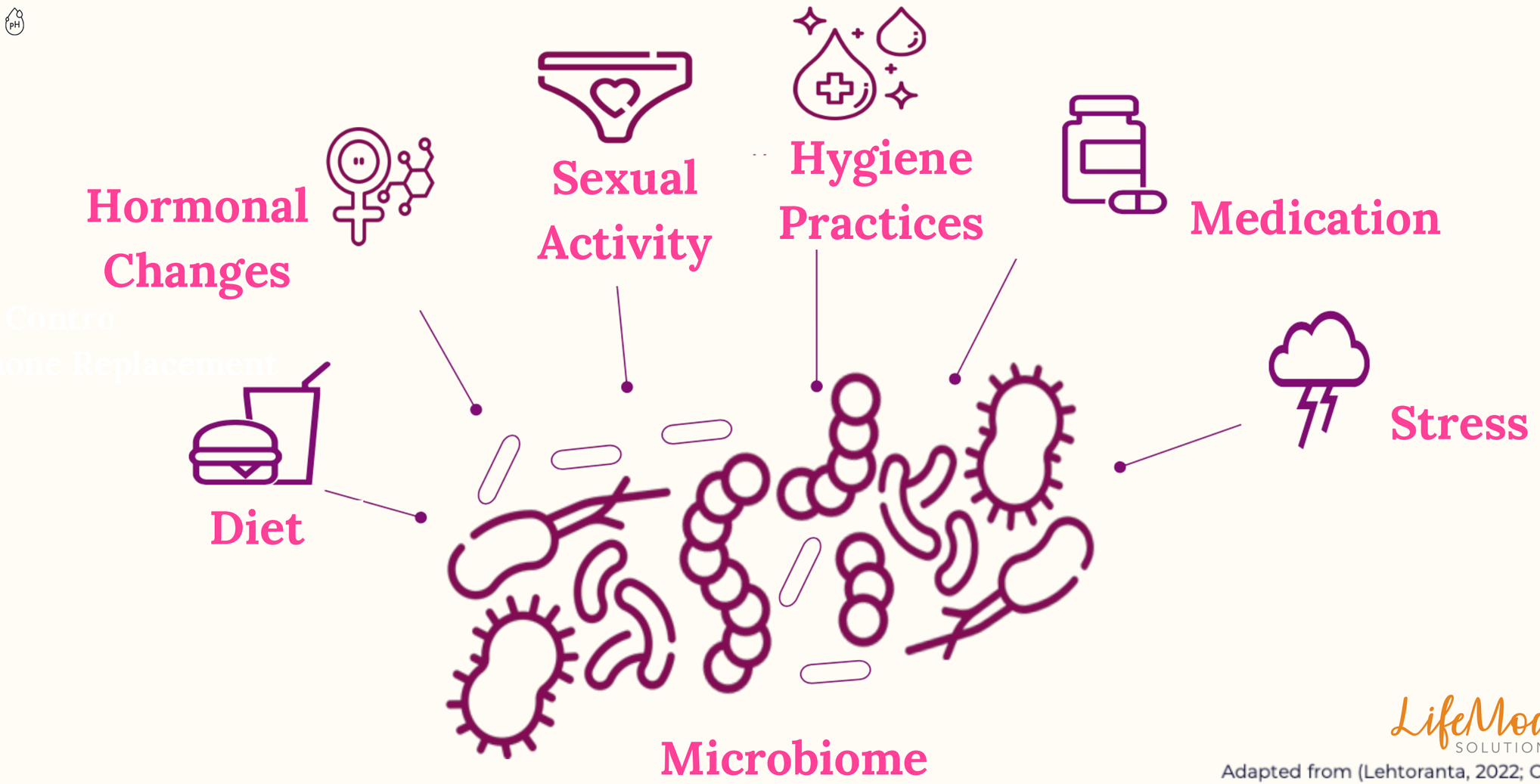
LifeMod SOLUTIONS

TESTING ORDERED BY DOCTOR ♀

Endometrial Microbiome Biopsy

LifeMod SOLUTIONS

Vaginal Health Influencers



Adapted from (Lehtoranta, 2022; Condori, 2022)

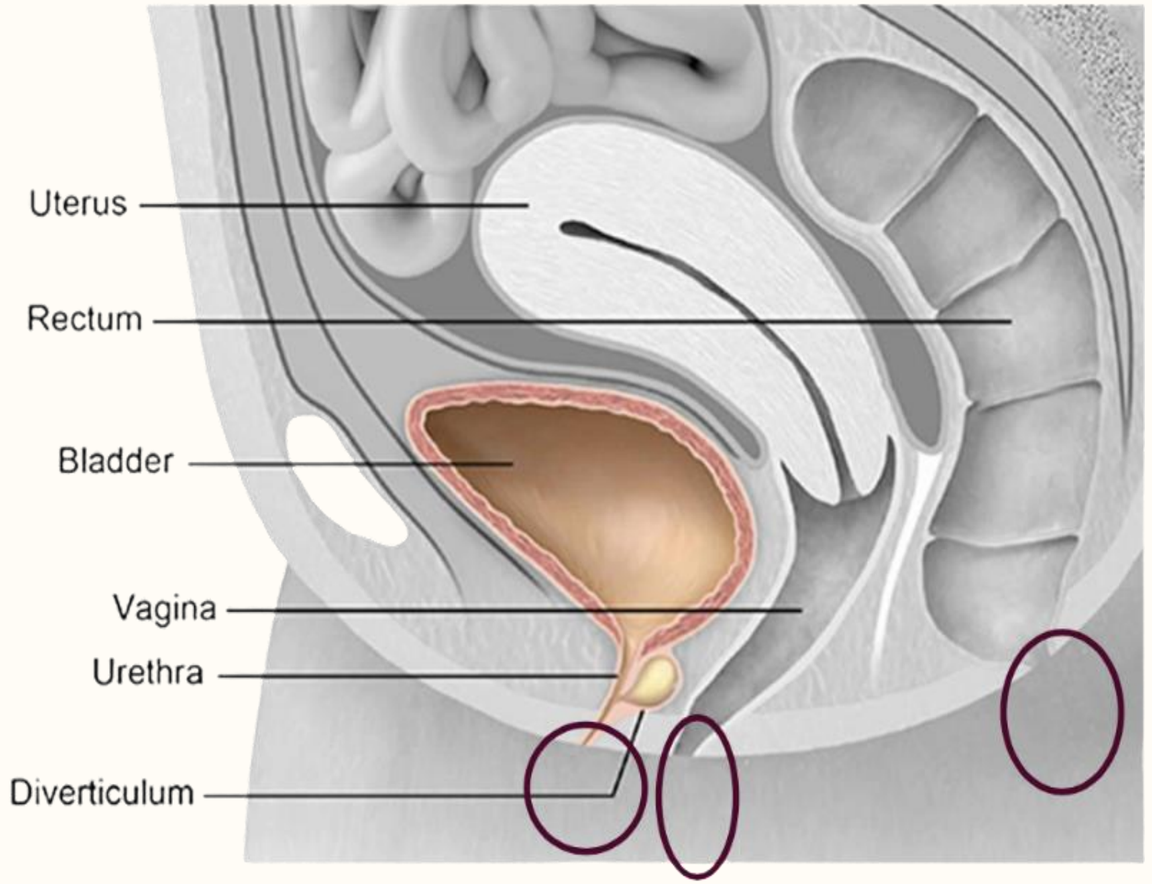
Gut-Vaginal Microbiome Axis

62.5%

Overlap between urinary and gut microbiomes

32%

Overlap between vaginal and gut microbiomes

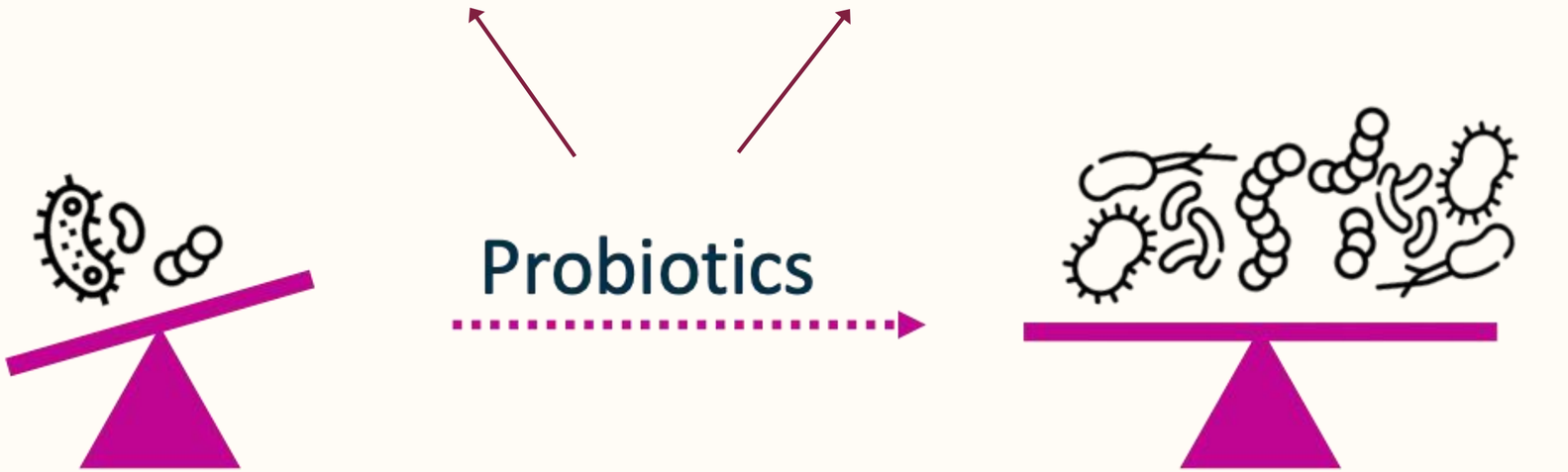


PMID: 34084752

LifeMod SOLUTIONS

CAN PROBIOTICS HELP ?

Food **Supplements**



Disrupted vaginal microbiota

Balanced vaginal microbiota

LifeMod SOLUTIONS

Probiotics & BV

Int J Environ Res Public Health. 2019 Oct 12;16(20):3859. doi: 10.3390/ijerph16203859

Probiotics for the Treatment of Bacterial Vaginosis: A Meta-Analysis

Ziyue Wang [1,2,3,†], Yining He [1,4,5,†], Yingjie Zheng [1,4,5,*]

Lactobacillus **probiotics cured 2–3× more women** after ~1 month compared with placebo

PMID: 31614736

LifeMod SOLUTIONS

RCT assessed the effect of 4 weeks of yogurt drink containing four strains (*L. Crispatus, LBV 88, L. Jensenii LBV 116, L. Gasseri LBV150N, L. Rhamnosus LBV96*) on BV

Randomized Controlled Trial > Benef Microbes. 2018 Jan 29;9(1):35-50.
doi: 10.3920/BM2017.0018. Epub 2017 Oct 25.

Effect of a yoghurt drink containing Lactobacillus strains on bacterial vaginosis in women – a double-blind, randomised, controlled clinical pilot trial

C Laue [1], E Papazova [1], A Liesegang [1], A Pannenbeckers [1], P Arendarski [2], B Linnerth [3],

100% women without BV

200% Reduction Amsel score (p=0.006)

Reduction in discharge and odor (p<0.5)

PMID: 16697231

LifeMod SOLUTIONS

Study Question

Does adding oral probiotics to metronidazole treatment improve the cure rate of bacterial vaginosis (BV)?

Randomized Controlled Trial > Microbes Infect. 2006 May;8(6):1450-4.
doi: 10.1016/j.micinf.2006.01.003. Epub 2006 Mar 29.

Augmentation of antimicrobial metronidazole therapy of bacterial vaginosis with oral probiotic Lactobacillus rhamnosus GR-1 and Lactobacillus reuteri RC-14: randomized, double-blind, placebo controlled trial

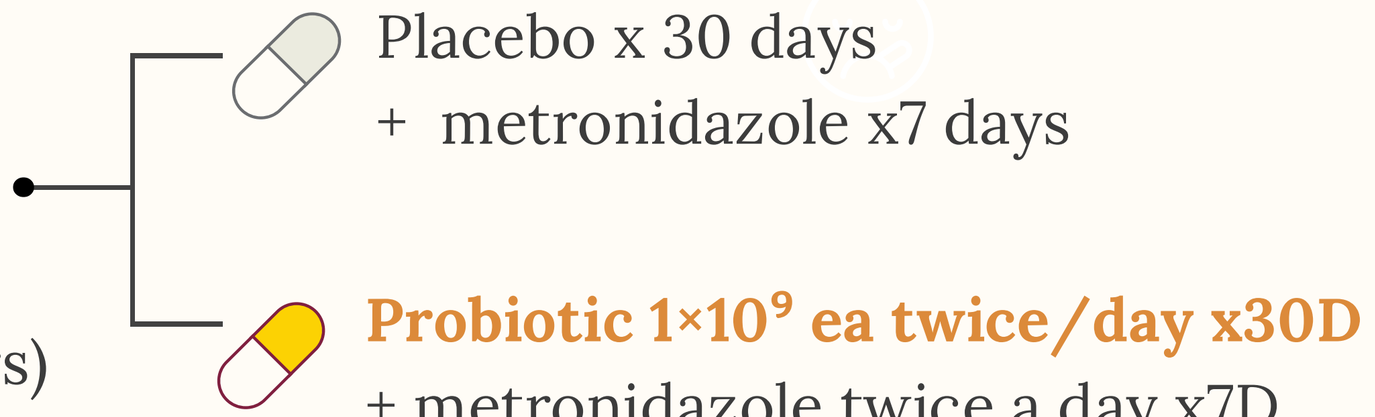
Kingsley Anukam [1], Emmanuel Osazuwa, Ijeoma Ahonkhai, Michael Ngwu, Gibson Osemene, Andrew W Bruce, Gregor Reid

Study

n=125

premenopausal (18–44 yrs)
confirmed BV markers
(Nugent score, BVBlue test, Sx)

Method



Placebo x 30 days
\+ metronidazole x7 days

Probiotic 1×10^9 ea twice/day x30D
\+ metronidazole twice a day x7D

LifeMod SOLUTIONS

Study Question

Does adding oral probiotics to metronidazole treatment improve the cure rate of bacterial vaginosis (BV)?

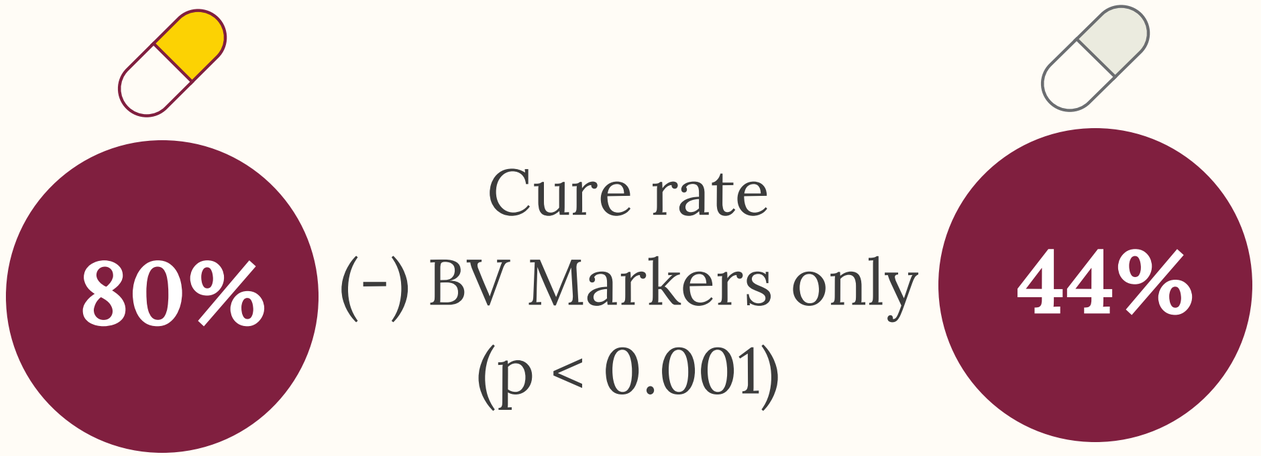
Randomized Controlled Trial > Microbes Infect. 2006 May;8(6):1450-4.
doi: 10.1016/j.micinf.2006.01.003. Epub 2006 Mar 29.

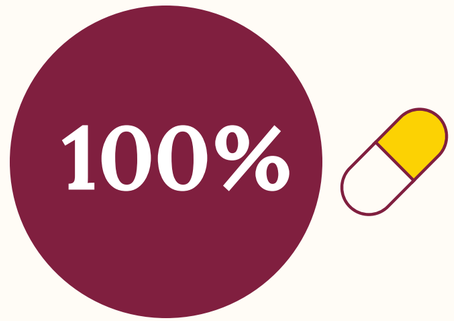
Augmentation of antimicrobial metronidazole therapy of bacterial vaginosis with oral probiotic Lactobacillus rhamnosus GR-1 and Lactobacillus reuteri RC-14: randomized, double-blind, placebo controlled trial

Kingsley Anukam [1], Emmanuel Osazuwa, Ijeoma Ahonkhai, Michael Ngwu, Gibson Osemene, Andrew W Bruce, Gregor Reid

Results:

Probiotics + metronidazole had better BV cure rates than metronidazole alone





Cured in Probiotic group
(-) BV markers/lab
(+) Lactobacillus colonization

LifeMod SOLUTIONS

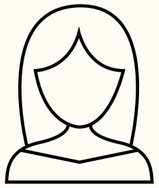
Study Question

Pregnancy outcomes after vaginal probiotic supplementation before frozen embryo transfer

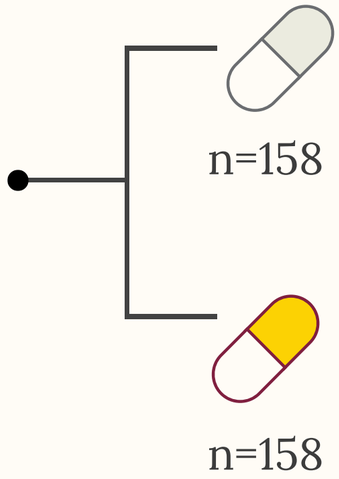
Randomized Controlled Trial > Sci Rep. 2023 Jul 23;13(1):11892.
doi: 10.1038/s41598-023-39078-6.

Pregnancy outcomes after vaginal probiotic supplementation before frozen embryo transfer: a randomized controlled study

Study



n=316 infertile women



Method

Placebo
+ Standard IVF protocol (estrogen priming, endometrium preparation, progesterone support, embryo transfer)

Intravaginal probiotic Lactobacillus acidophilus 1×10^8 CFU x 6 days
+ Standard IVF Protocol

LifeMod SOLUTIONS

Study Question

Pregnancy outcomes after vaginal probiotic supplementation before frozen embryo transfer

Randomized Controlled Trial > Sci Rep. 2023 Jul 23;13(1):11892.
doi: 10.1038/s41598-023-39078-6.

Pregnancy outcomes after vaginal probiotic supplementation before frozen embryo transfer: a randomized controlled study

Results

No difference in getting pregnant however; **the miscarriage rate was significantly decreased in the study group** (9.5 vs. 19.1% p = 0.02)

The live birth rate was significantly higher in the probiotic group (35.71 vs. 22.22%, p = 0.03)

LifeMod SOLUTIONS

VAGINAL PROBIOTIC SUPPOSITORY

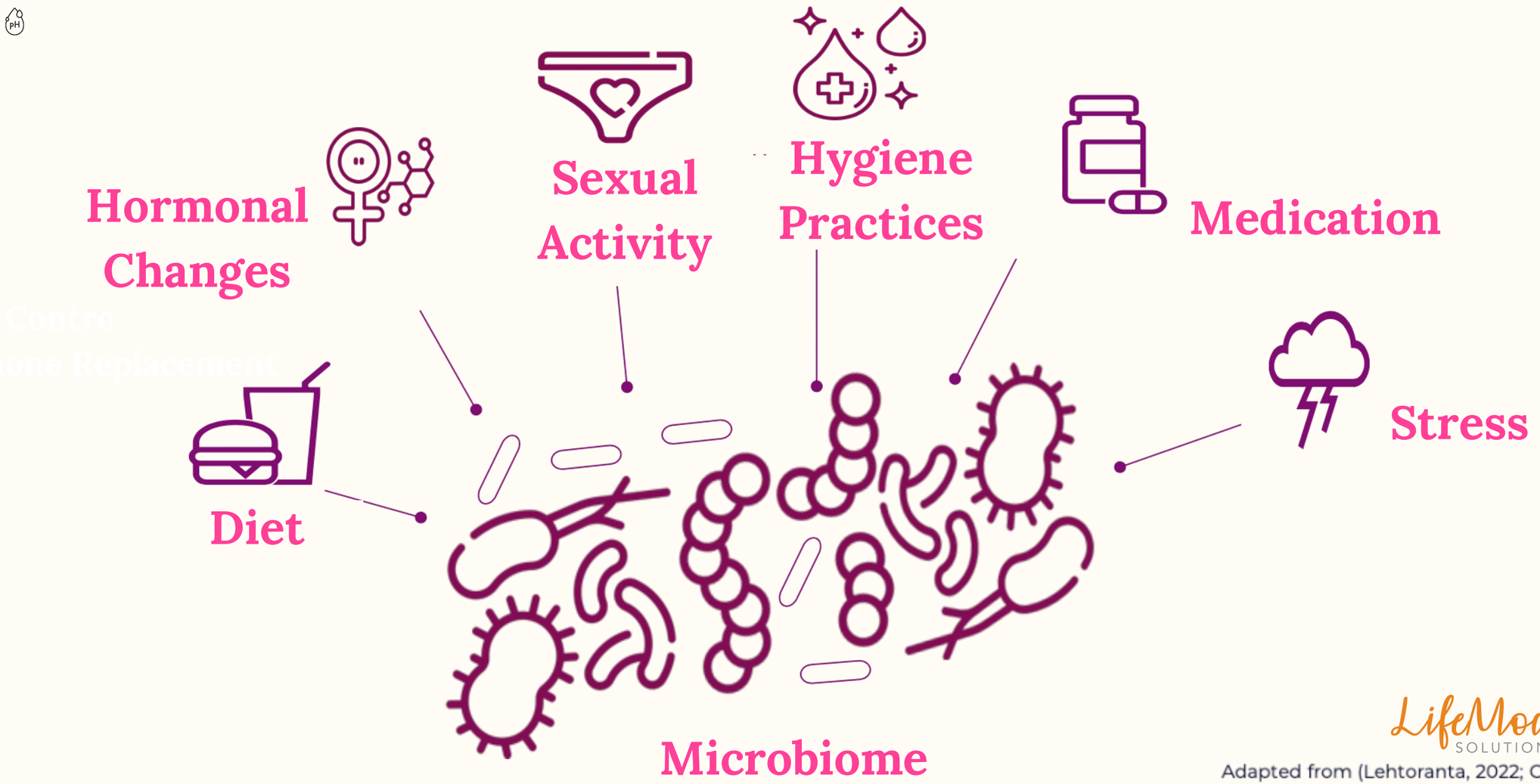
VS-01™ Probiotic + Prebiotic

- 3 proprietary live *L. crispatus* probiotic strains
- Prebiotic and nutrient complex for *L. crispatus* to thrive
- SMART Tablet™ delivery system for maximum efficacy

Vaginal Probiotic Blend 2 billion CFU per capsule.

Ingredients: Lactobacillus crispatus (LCr-86). Lactobacillus gasseri (LG-08). Lactobacillus jensenii (LJe-52). Lactobacillus reuteri (LR-08). Lactobacillus rhamnosus (LRa-05).
Capsule ingredients: Vegan capsule (hydroxypropyl methylcellulose, water). l-leucine.

Vaginal Health Influencers



Adapted from (Lehtoranta, 2022; Condori, 2022)

WHAT CHANGES THE MICROBIOME?

1. Anything that increases pH above 4.5

2. Anything that lowers the lactobacillus

LifeMod SOLUTIONS

WHAT CHANGES THE MICROBIOME?

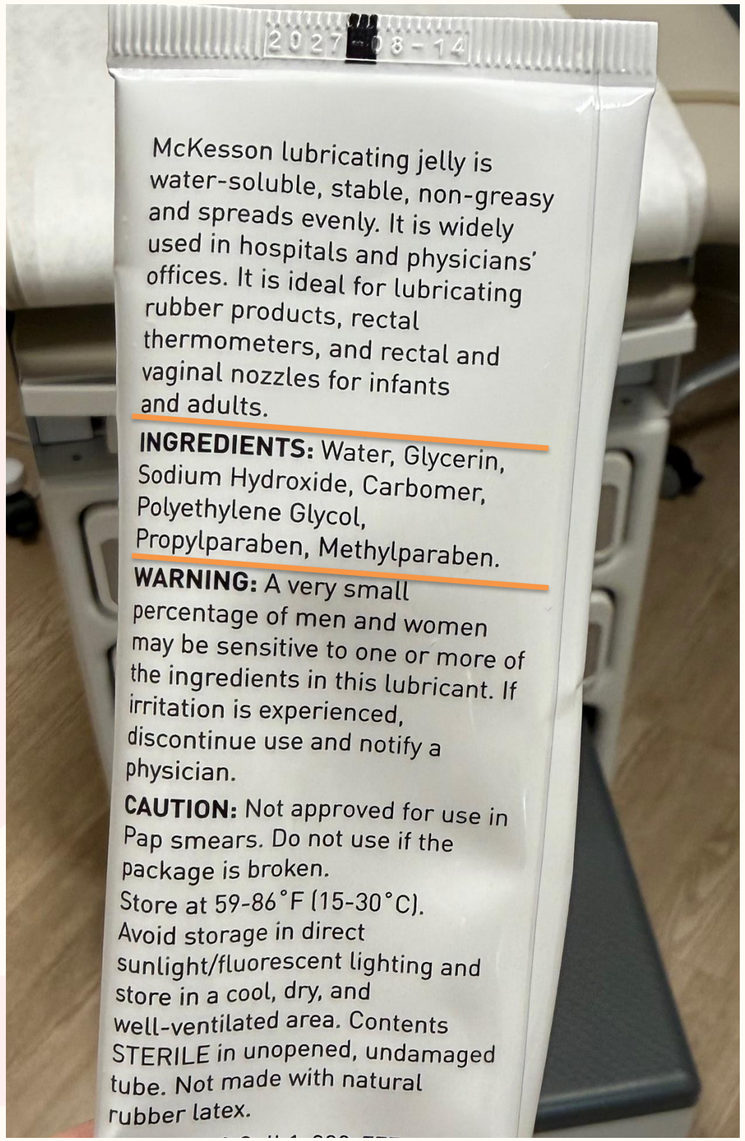
Hormonal Changes

- **Birth Control**
  - Copper-IUD as potentially higher BV risk in some patients. PMID: 35353163
  - Hormonal IUD >4–7 years may be linked Candida PMID: 35353163
- **Monthly menstrual cycles**
- **Menopause** (decreased estrogen)
- **Hormone Replacement Therapy**
  - Estradiol 10 mcg intravaginal + L. crispatus probiotic
    - ↓ dryness, ↓irritation, optimized pH PMID: 35353163
- **Estrogen changes through our lifespan**

LifeMod SOLUTIONS

Sexual Activity Tips

- Caution **water-based lubes**
  pH, preservatives, glycerin sugar
- Avoid **unnatural Condoms**
  plastic EDCs, preservatives
- Avoid **spermicides** nonoxynol-9 (condoms)
- **Semen/saliva** (pH, microbe exposure)
- Wash **sex toys** shared between partner



LifeMod SOLUTIONS

WHAT CHANGES THE MICROBIOME?

Hygiene Practice Tips

- **No Douching**! (5x more likely for BV)
- Use **pH balanced wash**
- Skip **Fragrances**/scented (EDCs)
- Avoid **preservatives**
- **Wipe** front to back after going to the toilet.
- Change your **period products** within the proper time frame.
- Choose **underwear** that is loose-fitting, lightweight, breathable, and made from a natural fabric, and change it often.

LifeMod SOLUTIONS

WHAT CHANGES THE MICROBIOME?

Medications

- Avoid unnecessary **antibiotics**
- Avoid **NSAIDS**
- Yes to vaginal/women **probiotics**
    - oral and vaginal suppository

Stress Management Practices

LifeMod SOLUTIONS

KEY TAKEAWAYS FOR WOMEN ♀

Vaginal pH & Microbes

- Healthy:
  - Low pH (3.5–4.5), low diversity <10%
  - Dominated by Lactobacillus >90%
    - (esp. L. crispatus, L. gasseri, L. jensenii)

Dysbiosis & Pregnancy:

- ↑ pathogens = Hostile environment for pregnancy

LifeMod SOLUTIONS

KEY TAKEAWAYS FOR WOMEN ♀

Conception & IVF

- Lactobacillus-dominant (LD)
    - ↑ pregnancy rate
    - ↑ implantation success IVF
    - ↑ live birth rates in IVF

- Non-Lactobacillus-dominant (NLD)
    - More failed IVF embryo transfers.

LifeMod SOLUTIONS

KEY TAKEAWAYS FOR WOMEN ♀

Miscarriage

- ↑ miscarriage risk especially Gardnerella, Ureaplasma and Mycoplasma

Preterm Birth

- High microbial diversity = increased risk of preterm delivery
- Delivery before 30 weeks had co-occurrence of pathogens Candida + Ureaplasma.

LifeMod SOLUTIONS

KEY TAKEAWAYS FOR WOMEN ♀

Testing

- Women can have an imbalance with zero noticeable symptoms.
- Fertility clinics are not routinely testing microbiome testing and you must ask or do testing on your own!
- Start with vaginal pH testing
- Vaginal Microbiome testing can be done at home while uterine microbiome testing is a biopsy done by a doctor.

LifeMod SOLUTIONS

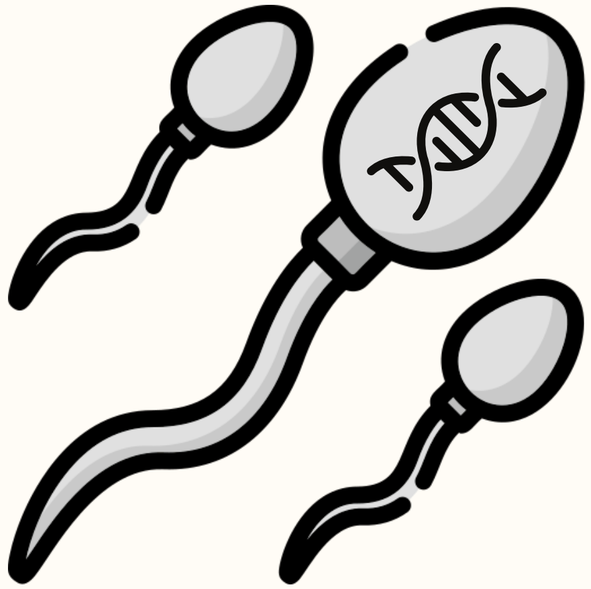
KEY TAKEAWAYS FOR WOMEN ♀

Vaginal Microbiome Influencers

- Avoid lifestyle habits that increase pH > 4.5 or reduce lactobacillus
- The gut is a major factor
- Vaginal probiotic suppository and oral probiotics help

LifeMod SOLUTIONS

MALE REPRODUCTIVE MICROBIOME ♂



35-50%

Cases of infertility is male factor

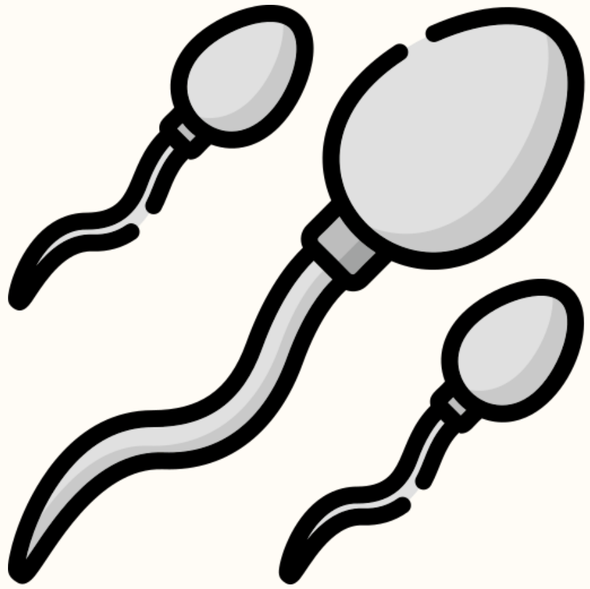
-50%

Drop in sperm counts in the last 40 years

Source: Shanna Swann

LifeMod SOLUTIONS

HOW MALE FERTILITY IS MEASURED



Semen Analysis

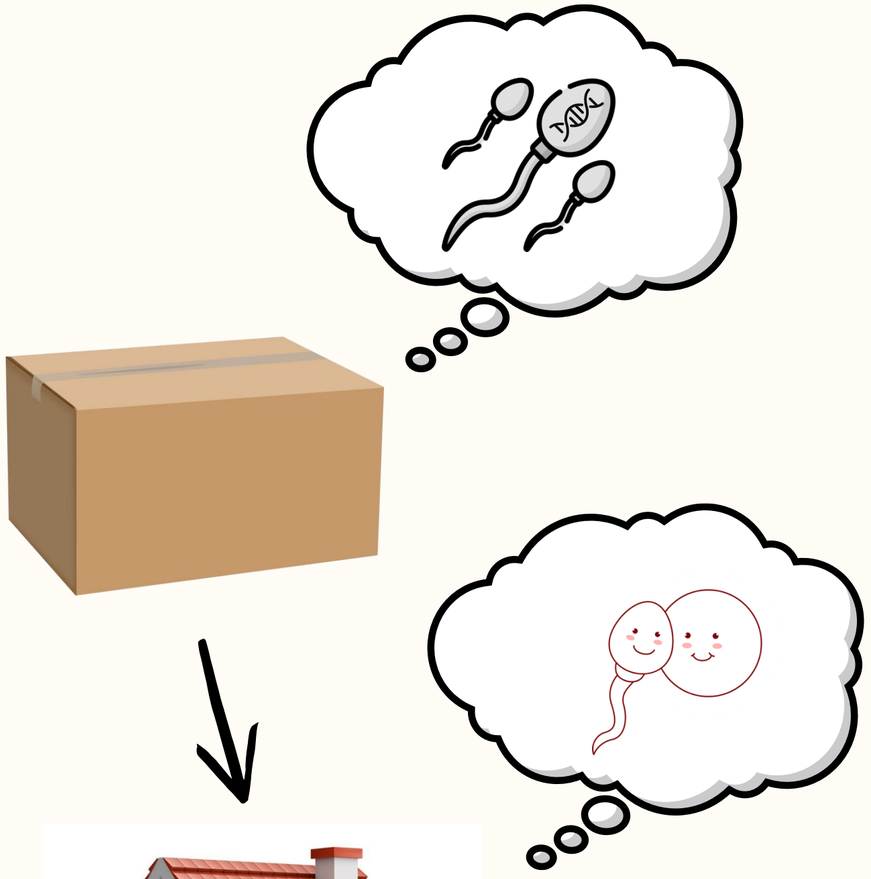
Measured as any dysfunction in the ejection and quality of semen, whether characterized by the absence, reduced quantity, or changes in sperm shape or their motility.

PMID: 38530761

LifeMod SOLUTIONS

SEMEN ANALYSIS

Sperm Paramater	Limit	Reference range (WHO)
Total sperm number (million)	≥39	39–928
Volume (mL)	≥1.5	1.5–7.6
Sperm Concentration (million/mL)	≥15	15–259
Total Sperm Motility (%)	≥4	4–81
Progressive Motility (%)	≥32	32–75
Normal Morphology (%)	≥4	4–48
Leukocytes (million)	<1	<1



LifeMod SOLUTIONS

ABNORMAL SEMEN ANAYLSIS

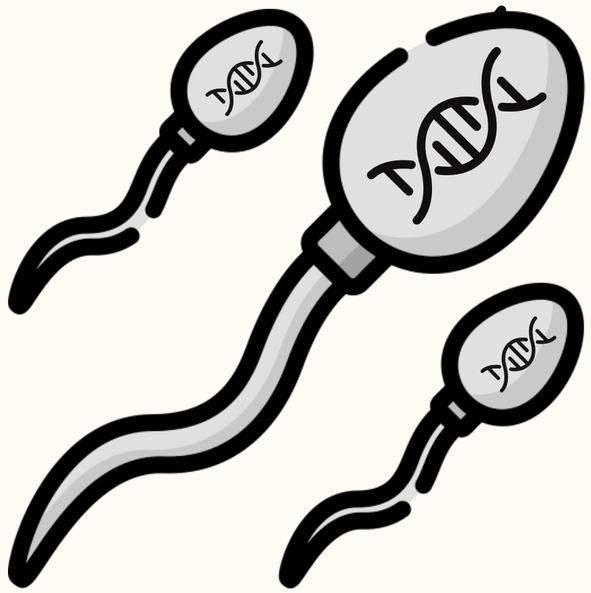
The Impact on Fertility

Getting Pregnant / Conception

- Sperm count concentration & total number affect conception chances
- Poor motility = they may never reach the eggs
- Abnormal-shaped sperm often can't penetrate the egg

LifeMod SOLUTIONS

ANOTHER MEASURE OF MALE FERTILITY



Sperm DNA Fragmentation (sDF)

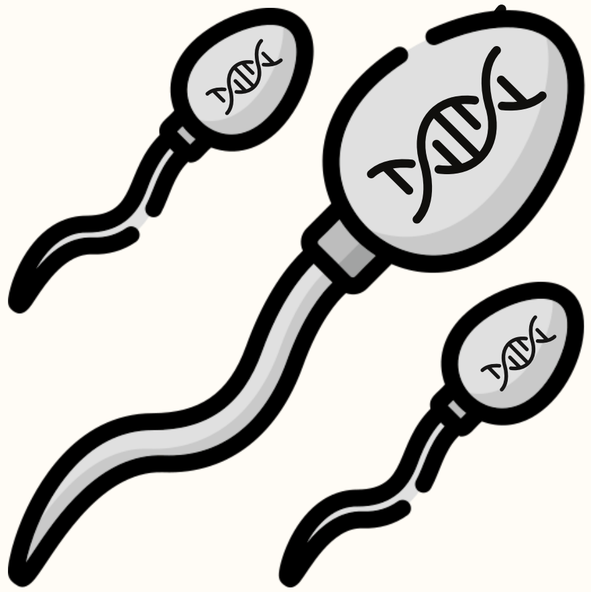
Damaged or broken DNA characterized by mutations, deletions, duplications, and single or double-stranded breaks
→ this is called fragmentation.

Low/Optimal: <15%
Intermediate Risk: 15-30%
High Risk: >30%

LifeMod SOLUTIONS

SPERM DNA FRAGMENTATION (SDF)

Impact on Fertility



Getting Pregnant

Failed implantation
(no pregnancy even if egg is fertilized)

Staying Pregnant

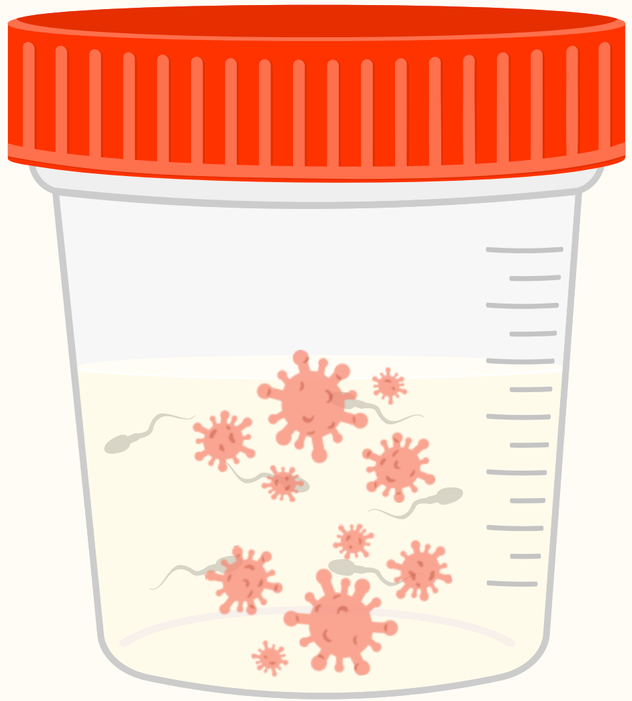
sDF >30% carry **twice the risk of miscarriage**

Even if sperm count is normal, the sperm may not be of sufficient quality.

PMID: 30979611
PMID: 40529018

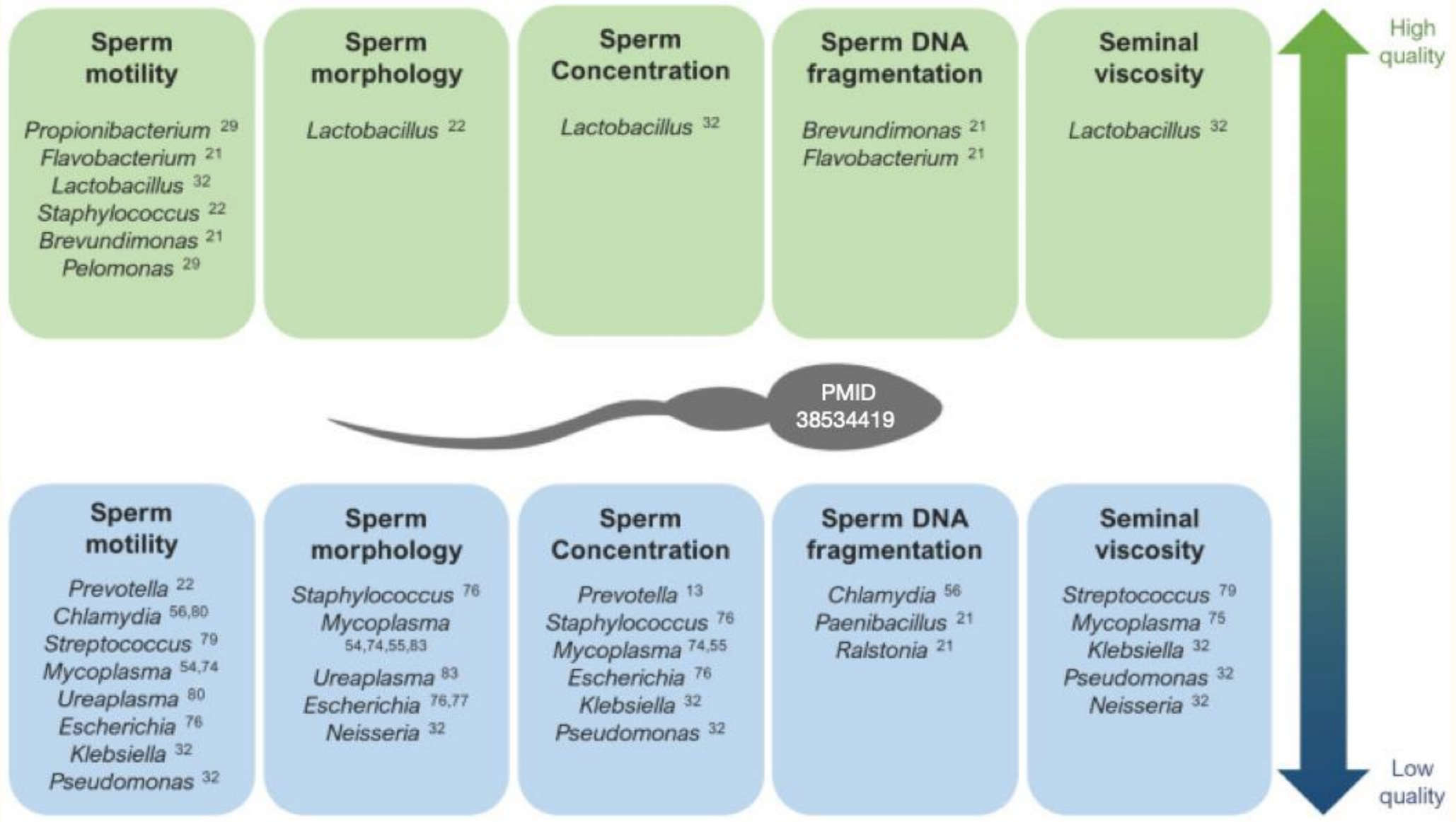
LifeMod SOLUTIONS

NEW BIOMARKER



Semen Microbiome
serves as a representative of the entire male genital system.

LifeMod SOLUTIONS

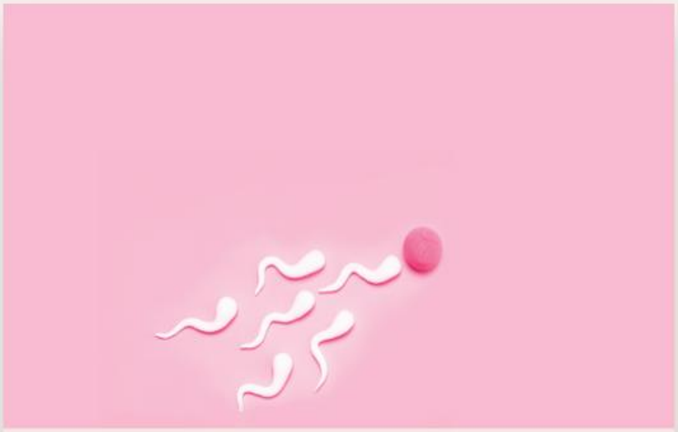

Sperm motility
Propionibacterium 29
Flavobacterium 21
Lactobacillus 32
Staphylococcus 22
Brevundimonas 21
Pelomonas 29
Sperm morphology
Lactobacillus 22
Sperm Concentration
Lactobacillus 32
Sperm DNA fragmentation
Brevundimonas 21
Flavobacterium 21
Seminal viscosity
Lactobacillus 32
High quality
PMID 38534419
Sperm motility
Prevotella 22
Chlamydia 56,80
Streptococcus 79
Mycoplasma 54,74
Ureaplasma 80
Escherichia 76
Klebsiella 32
Pseudomonas 32
Sperm morphology
Staphylococcus 76
Mycoplasma 54,74,55,83
Ureaplasma 83
Escherichia 76,77
Neisseria 32
Sperm Concentration
Prevotella 13
Staphylococcus 76
Mycoplasma 74,55
Escherichia 76
Klebsiella 32
Pseudomonas 32
Sperm DNA fragmentation
Chlamydia 56
Paenibacillus 21
Ralstonia 21
Seminal viscosity
Streptococcus 79
Mycoplasma 75
Klebsiella 32
Pseudomonas 32
Neisseria 32
Low quality

MALE MICROBIOME TESTING

FERTILYSIS Male Microbiome

Because fertility is a team sport, and your partner's microbiome matters

LEARN MORE



DNA Fragmentation Index (DFI)

Because DNA damage can hide in the healthiest of sperm

LEARN MORE

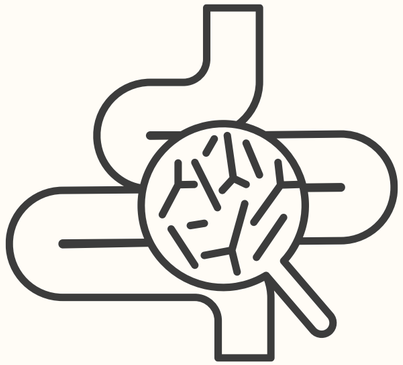
FERTILYSIS Male Microbiome & DFI

Because all-inclusive approach saves you time & money

LEARN MORE

LifeMod SOLUTIONS

MALE MICROBIOME INFLUENCERS ♂



Gut-Testis Axis

The microbiome-gut-testis axis is a complex, bidirectional communication system where changes in the gut microbiome can promote systemic alterations and inflammatory responses that negatively affect the testicular environment and sex hormone production (Magill and Macdonald, 2023). PMID: 31586185

LifeMod SOLUTIONS

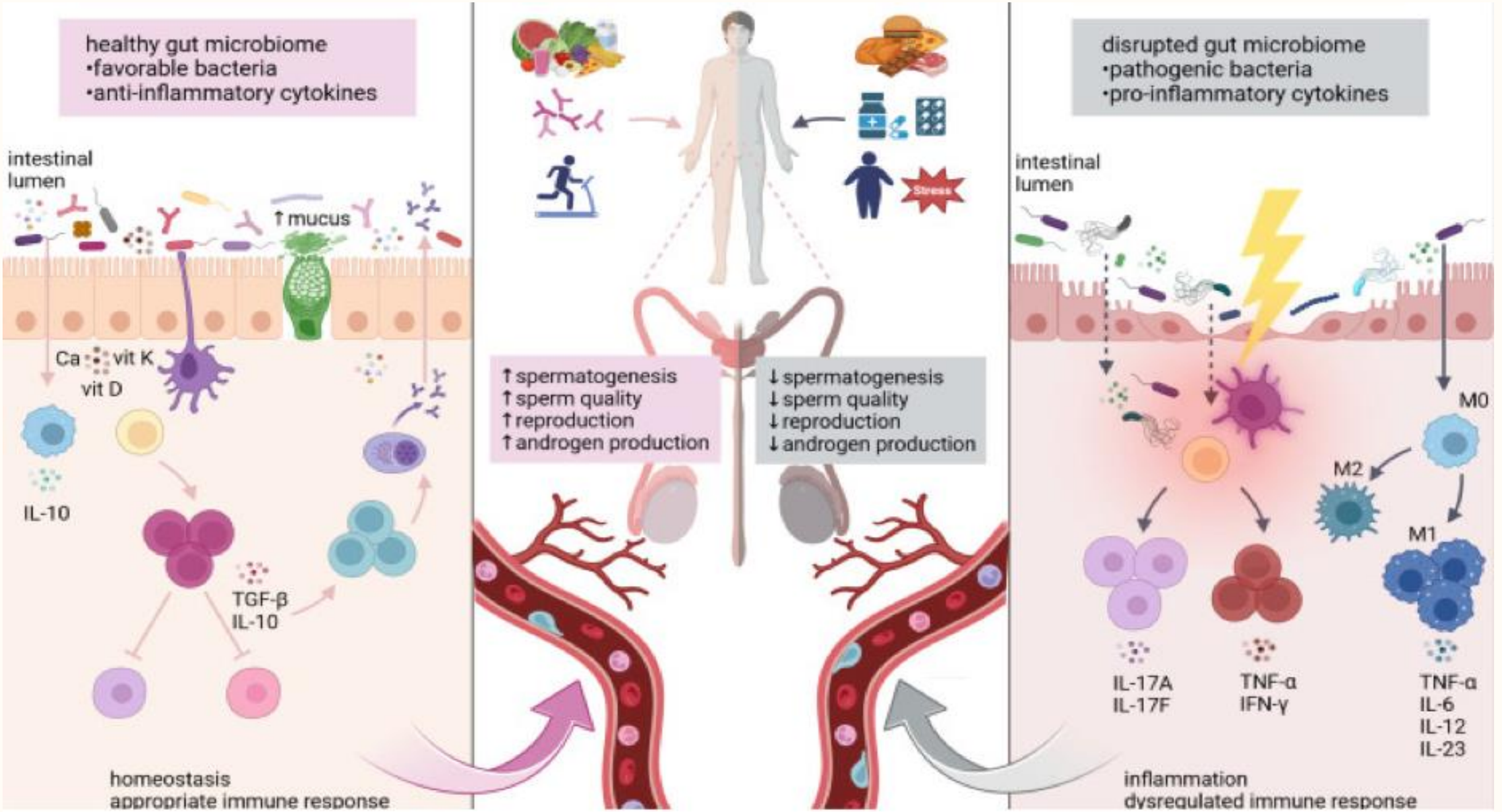


Image Source: PMID: 39850963

CAN PROBIOTICS HELP?

JBRA Assisted Reproduction 2024;**28**(2):341-348
doi: 10.5935/1518-0557.20240013

Review

Probiotics supplementation in the treatment of male infertility: A Systematic Review

Four randomized clinical studies met the inclusion criteria, focusing on men diagnosed with idiopathic male infertility (oligozoospermia, teratozoospermia, and asthenozoospermia). The findings revealed that probiotic administration exhibited promising antioxidant properties by combating reactive oxygen species (ROS), consequently protecting sperm DNA from damage that correlates with declining sperm quality. Significant improvements were observed across all sperm parameters, with notable enhancement in motility. Consequently, probiotic supplementation emerges as a potential therapeutic alternative for men diagnosed with idiopathic infertility, demonstrating positive effects on sperm quality.

LifeMod SOLUTIONS

Table 1. Description and main results of the studies included in the systematic review.

Author/Year	Design	No	follow-up time	Intervention	Results
Valcarce *et al*. (2017)	Randomized	9	6 weeks	*L. rhamnosus*CECT8361 + *B. Longum* CECT7347 (109 CFUs)	↑ sperm motility, ↓ DNA fragmentation and levels H_2O_2 intracellular of the sperm.
Maretti & Cavallini (2017)	Randomized, double-blind, placebo-con-trolled	41	24 weeks	*L. paracasei*B21060 (5 x 109 CFUs) + arabinogalactan 1243 mg + fructooligosaccharide 700 mg + L-glutamine 500 mg	↑ ejaculate volume, concentration, motility, number of spermatozoa ejaculated and percentage of typical shapes. All $p<0.01$ ↑ FSH, LH and T levels.
Helli *et al*. (2022)	Randomized, double-blind	50	10 weeks	*L. casei, L. rhamnosus, L. bulgaricus, L. acidophilus, B. breve, B. longum, S. thermophiles* (2 x 1011 UFCs)	↑ Ejaculated volume, total sperm count, concentration, total motility, percentage of motile sperm. ↑ TAC and plasma MDA concentration. ↓ CRP and TNF-α. ↑ testosterone and ↓ FSH, LH and PRL, but not significant.
Abbasi *et al*. (2021)	Randomized, triple-blind	47	11.4 weeks	*L. rhamnosus, L. casei, L. bulgaricus, L. acidophilus, B. breve, B. longum, S. thermophilus*(109 CFUs) and fructooligosaccharides.	↑ sperm concentration, motility and normal morphology. ↓ lipid peroxidation and DNA fragmentation.

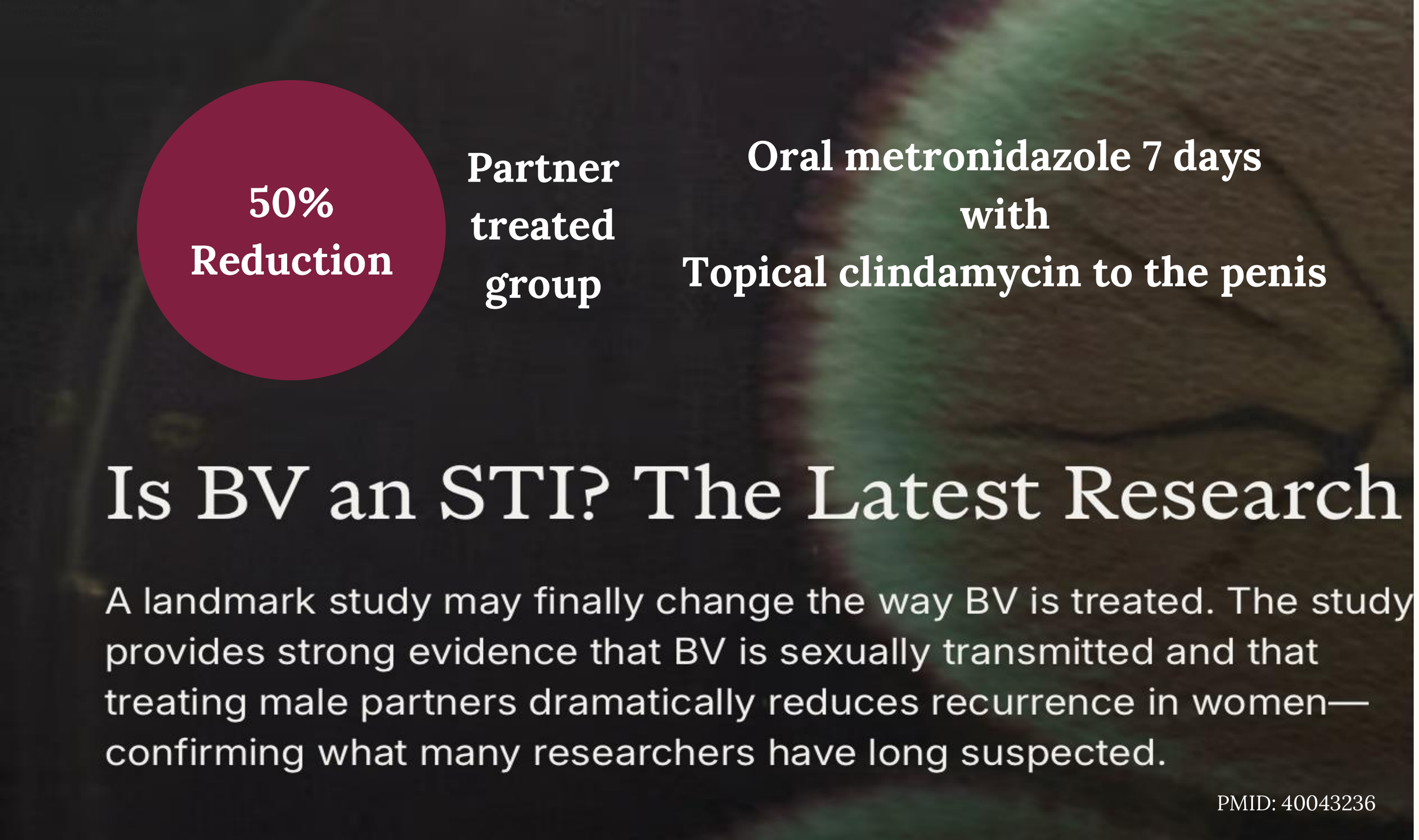
Improvements

Motility:
4/4 (100%)

Morphology:
2/4 (50%)

Count/Concentration:
3/4 (75%)

sDF
2/4 (50%)



Is BV an STI? The Latest Research

A landmark study may finally change the way BV is treated. The study provides strong evidence that BV is sexually transmitted and that treating male partners dramatically reduces recurrence in women—confirming what many researchers have long suspected.

PMID: 40043236

KEY TAKEAWAYS FOR MEN ♂

Testing

- Test **BOTH** semen analysis and sperm DNA fragmentation
- Sperm DNA fragmentation analysis is not routinely checked
- Even if sperm count is normal, the sperm DNA may not be of sufficient quality, leading 2-fold increase miscarriage

LifeMod SOLUTIONS

KEY TAKEAWAYS FOR MEN ♂

Male Microbiome

- Impacted by gut health: diet, lifestyle, probiotics, prebiotics.

- Sexual Habits:
    - If female partners are treated with antibiotics, male partners should be too.
    - Condoms

LifeMod SOLUTIONS

INFANT MICROBIOME

LifeMod SOLUTIONS

Maternal-Fetal Connection

Window of microbiome modulation

Pregnancy

Gut Microbiota
Placental Microbiota
Vaginal Microbiota
Diet
Lifestyle
Stress
Antibiotics

Delivery

Vaginal Delivery
Cesarean Delivery
Antibiotics
Vertical Transmission
Gestational age at birth

Infancy

Breastfeeding
Formula feeding
Maternal Diet
Maternal Microbiota
Antibiotics

PMID: 28720399

LifeMod SOLUTIONS

Semin Fetal Neonatal Med. Author manuscript; available in PMC: 2018 Oct 1.

Published in final edited form as: Semin Fetal Neonatal Med. 2017 Jul 15;22(5):284-289. doi: 10.1016/j.siny.2017.07.002

Prenatal and postnatal administration of prebiotics and probiotics

Kristin Sohn [1], Mark A Underwood [1,*]

PMID: 28720399

3. Dysbiosis in pregnancy

Adverse health states during pregnancy may be associated with intestinal microbial changes. Obesity and excessive weight gain during pregnancy are associated with adverse gut microbiota alterations in mothers and their infants. Overweight pregnant women have significantly reduced numbers of intestinal bifidobacteria and significantly increased numbers of staphylococci, Bacteroides, Enterobacteriaceae (e.g. *Escherichia coli*) and clostridia with similar changes associated with excessive weight gain during pregnancy and with progression from the first to the third trimester of pregnancy [7]. Infants of overweight mothers have significantly higher concentrations of staphylococci, clostridia, and Bacteroides and lower concentrations of bifidobacteria in their fecal samples when compared to infants of normal weight mothers and infants of mothers with normal weight gain during pregnancy [8]. Furthermore, infants born to mothers with pre-gestational diabetes have a significant increase in bacterial diversity and a higher prevalence of Bacteroides, Parabacteroides, and Lachnospiraceae in their meconium when compared to infants born to mothers without diabetes [9]. Decreased *Lactobacillus* and *Bifidobacterium* spp. colonization during early infancy is associated with a greater risk for allergies at five years of life [10], and decreased bifidobacterial numbers and increased *S. aureus* numbers in infancy may predict childhood obesity [11]. These studies provide compelling evidence that the maternal microbiome affects the infant microbiome, which has lasting effects on childhood health.

DISEASE RISK WITH CHILDHOOD GUT IMBALANCES

- Asthma
- Eczema / Atopic Dermatitis
- Infant Colic
- Allergic Rhinitis (Hay fever)
- Celiac Disease
- Type 1 Diabetes
- Obesity / Metabolic Syndrome / Insulin Resistance
- Necrotizing Enterocolitis (NEC)
- Mortality (preterm babies)
- Sepsis (preterm babies)
- Food Allergies

PMID: 40507094
PMID: 28720399
PMID: 38256127

LifeMod SOLUTIONS

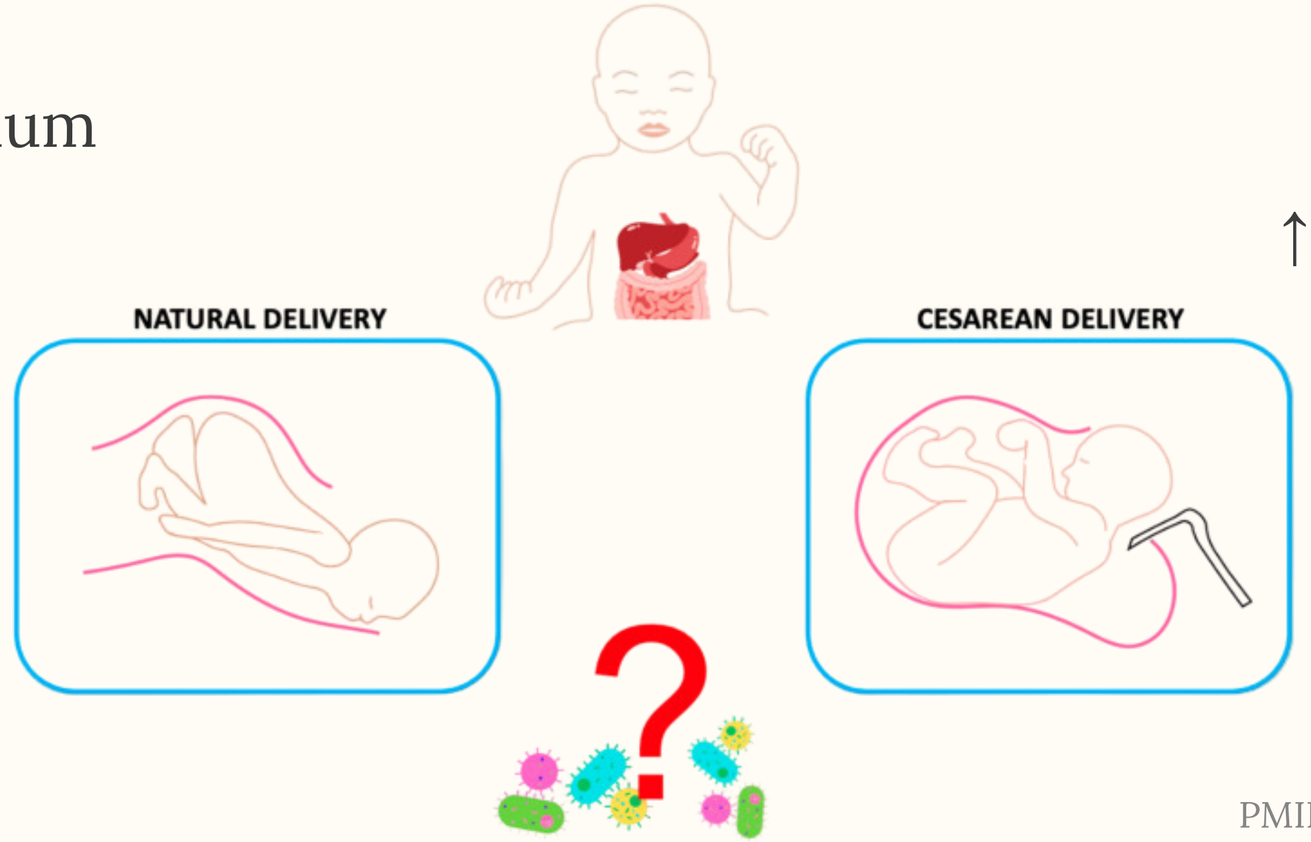
INFANT MICROBIOME INFLUENCERS

Birth Method Matters

↑ higher
Bifidobacterium

Lower
Bifidobacterium

↑ higher pathogens



PMID: 40507094

LifeMod SOLUTIONS

Study Question

Can perinatal probiotics reduce infections and favor healthier maternal/infant microbiomes?

Randomized Controlled Trial > Nutrients. 2025 May 28;17(11):1825.
doi: 10.3390/nu17111825.

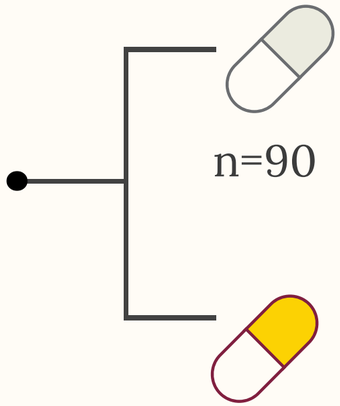
The Effect of Probiotics on Health in Pregnancy and Infants: A Randomized, Double-Blind, Placebo-Controlled Trial

Study

n=180
Pregnant
to Nursing
Mothers

Method

28 weeks gestation +
4–6 wks postpartum



Placebo

n=90

Probiotic (Prenatis™)
Lacticaseibacillus rhamnosus Rosell®-11
Bifidobacterium bifidum HA-132

n=90

Outcomes Measured

Mom & Baby
Illnesses

Inflammatory
Blood Markers

Mom/Baby
Stool + Breastmilk

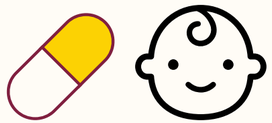
Study Question

Can perinatal probiotics reduce infections and favor healthier maternal/infant microbiomes?

Randomized Controlled Trial > Nutrients. 2025 May 28;17(11):1825.
doi: 10.3390/nu17111825.

The Effect of Probiotics on Health in Pregnancy and Infants: A Randomized, Double-Blind, Placebo-Controlled Trial

Moms were sick less often (p=0.05)



Babies of probitoics moms cut infant sick days in ½ (p=0.03)

Improved gut colonization (↑ Bifidobacteria) C-section benefited most

LifeMod SOLUTIONS

C-SECTION SOLUTIONS

Exclusive Breast Milk remains the strongest protector narrowing C-Section–vaginally born differences due to special sugars in breast milk (HMOs) that strongly shape gut bacteria

Start Probiotics & Prebiotics in CS Infants within 3 months

Mixes of Bifidobacterium + Lactobacillus **partly** restore “good” gut bacteria to more like vaginally born infants

PMID: 38256127

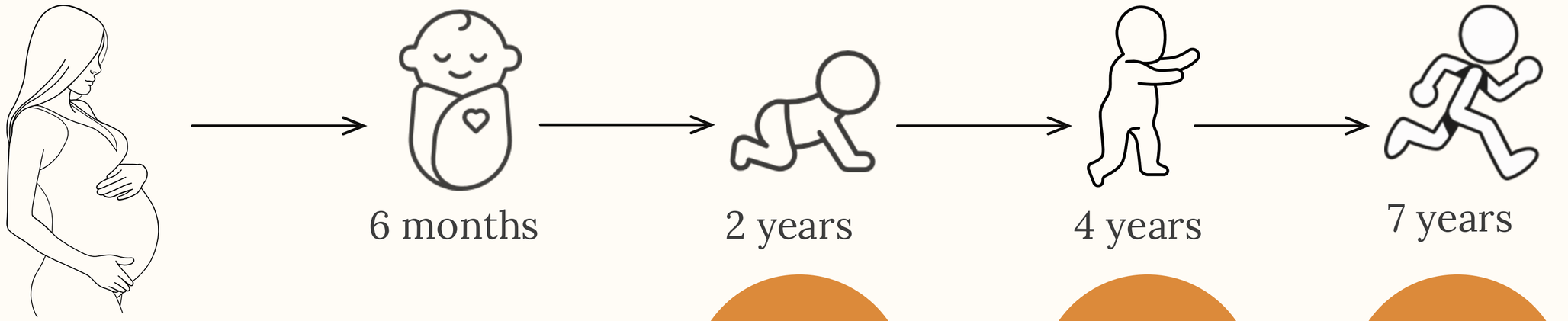
LifeMod SOLUTIONS

Study Question

3 clinical studies investigated the effect on LGG® strain on red scaly skin

1 × 1010 Lactobacillus rhamnosus strain GG

vs placebo



pre- and post natal seeding

½ moms 4 weeks prenatally

½ the infants given LGG x 6 months

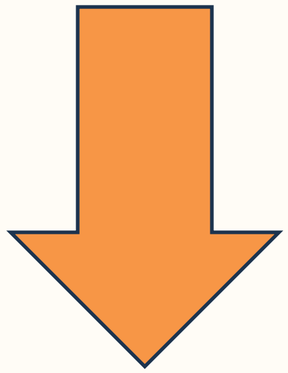
PMID: 11297958
PMID: 12788576
PMID: 17289135

LifeMod SOLUTIONS

> Benef Microbes. 2017 Oct 13;8(5):717-725. doi: 10.3920/BM2016.0233.
Epub 2017 Aug 31.

To add or not to add probiotics to infant formulae? An updated systematic review

A Skórka [1], M Pieścik-Lech [1], M Kołodziej [1], H Szajewska [1] PMID: 28856907



Less colic and irritability
Less diarrhea
Fewer spitting episodes
Fewer respiratory infections

LifeMod SOLUTIONS

INFANT MICROBIOME SOLUTIONS

During Pregnancy

- Take daily probiotics supplements and foods (**Lactobacillus + Bifidobacterium multi-strain blends**)
- WAPF / High-fiber diet and/or prebiotics supplements specifically fructo-oligosaccharides (**FOS**) and galacto-oligosaccharides (**GOS)**.
- **Avoid Antibiotics**, when possible.

PMID: 28720399
PMID: 38256127

LifeMod SOLUTIONS

Breast milk is a microbiome tool

- Second line is WAPF homemade baby formula.
- **Formula Fed**
  - add infant probiotic/prebiotic.

PMID: 28720399
PMID: 38256127

LifeMod SOLUTIONS

INFANT MICROBIOME SOLUTIONS

- **If Preterm NICU:**
  - Breastmilk + multi-strain probiotic/prebiotic to reduce infant mortality risk
- **If C-section/antibiotic exposure:**
  - Breastmilk
  - Add probiotics and prebiotics to accelerate protected colonization.

PMID: 28720399
PMID: 38256127

LifeMod SOLUTIONS

KEY TAKEAWAY FOR INFANTS

Early microbiome modulation **in the first 3 years of life** is critical for immune programming and long-term health.

PMID: 40507094
PMID: 28720399
PMID: 38256127

LifeMod SOLUTIONS

Thank You

Let's Stay Connected

15% OFF VAGINAL MICROBIOME TESTING

SCAN HERE

FREE Guide FEMININE HEALTH PROTOCOLS

SCAN HERE

Access to Supplements LifeMod Fullscript

SCAN HERE

Schedule a FREE 15 minute Phone Consult

LifeMod SOLUTIONS