

# Nutrition & Gut Health for Perinatal Mental Health

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2024 WIC Conference



# Agenda

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- Types of Perinatal Mental Health Conditions
  - Why Postpartum?
- Nutritional & Lifestyle Factors
- Recommendations for Practice

NUTRITION IN PERINATAL MENTAL HEALTH  
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Women's  
mental health in  
the postpartum period  
is just as important  
as physical health  
and recovery.

@MOONMENTALHEALTH

# Types of Perinatal Mental Health Conditions



# Perinatal Mood Disorders

	What is it?	Prevalence	Signs and Symptoms	Treatment
Baby Blues	Common and temporary. Not a mood disorder.	Up to 85% of women	Mood changes, anxiety, irritability, crying, sleeplessness.	Resolves on its own, but often support groups and addressing infant behavioral dysregulation can help.
Major Depression (i.e., postpartum depression)	Depressive episode that occurs during pregnancy or within a year of giving birth.	12-14% of women (prevalence may be higher in WIC population)	Change in appetite, sleep, energy, motivation, and concentration; low self-care; guilt and worthlessness. May also experience suicidal thoughts or thoughts of harming baby.	Therapy (including dyadic therapy for mother and baby); medications; encourage self-care and sleep hygiene.

ADAPTED FROM ACOG.ORG  
GIRON ET AL, 2021

# Perinatal Mood Disorders

	What is it?	Prevalence	Signs and Symptoms	Treatment
Perinatal Anxiety Disorders	Generalized anxiety, panic disorders, or social anxiety experienced in pregnancy or the postpartum period.	GAD - 6-8% in the first 6 months after delivery Panic disorder - up to 3% Social anxiety - up to 7%	Fear and anxiety, panic attacks, shortness of breath, rapid pulse, dizziness, chest/stomach pain, sleep disturbance.	Therapy; medications; encourage self-care, behavioral exercises.
Obsessive-Compulsive Disorder (OCD)	Intrusive repetitive thoughts that are scary and do not make sense to the mother; may include rituals.	Up to 4% of women	Disturbing repetitive and invasive thoughts, compulsive behavior in response to intrusive thoughts.	Behavioral therapy and medication; encourage self-care and sleep hygiene.

# Perinatal Mood Disorders

	What is it?	Prevalence	Signs and Symptoms	Treatment
Postpartum Psychosis	Very rare and serious. Sudden onset of psychotic symptoms following childbirth (usually 24 hrs - 3 wks after delivery).	<1%	Mood fluctuation, confusion, marked cognitive impairment, hallucinations. May include altruistic delusions about suicide, homicide, or infanticide.	Requires immediate psychiatric help; hospitalization is usually necessary. Sleep hygiene may be preventive.
Posttraumatic Stress Disorder (PTSD)	Distressing anxiety symptoms experienced after traumatic event; may be related to traumatic labor and delivery process or poor outcome.	2-9% post-childbirth	Change in cognition, mood, arousal associated with traumatic event(s) and avoidance of stimuli associated with traumatic event.	Therapy; self-care; support groups.

# Patient Health Questionnaire (PHQ-2)

Over the last 2 weeks, how often have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
<i>For office coding:</i> _____ 0 _____ + _____ + _____ + _____				
= Total Score _____				



# Patient Health Questionnaire (PHQ-9)

Over the **last 2 weeks**, how often have you been bothered by any of the following problems?  
(Use "✓" to indicate your answer)

	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

FOR OFFICE CODING 0 + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_  
=Total Score: \_\_\_\_\_

If you checked off **any** problems, how **difficult** have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult  
at all

Somewhat  
difficult

Very  
difficult

Extremely  
difficult

# Edinburgh Postnatal Depression Scale

COX ET AL, 1987

Below is an example already completed.

I have felt happy:  
 Yes, all of the time \_\_\_\_\_ (0)  
 Yes, most of the time  (1)  
 No, not very often \_\_\_\_\_ (2)  
 No, not at all \_\_\_\_\_ (3)

*This would mean: "I have felt happy most of the time" in the past week. Please complete the other questions in the same way.*

1. I have been able to laugh and see the funny side of things:  
 As much as I always could \_\_\_\_\_ (0)  
 Not quite so much now \_\_\_\_\_ (1)  
 Definitely not so much now \_\_\_\_\_ (2)  
 Not at all \_\_\_\_\_ (3)
2. I have looked forward with enjoyment to things:  
 As much as I ever did \_\_\_\_\_ (0)  
 Rather less than I used to \_\_\_\_\_ (1)  
 Definitely less than I used to \_\_\_\_\_ (2)  
 Hardly at all \_\_\_\_\_ (3)
3. I have blamed myself unnecessarily when things went wrong:  
 Yes, most of the time \_\_\_\_\_ (3)  
 Yes, some of the time \_\_\_\_\_ (2)  
 Not very often \_\_\_\_\_ (1)  
 No, never \_\_\_\_\_ (0)
4. I have been anxious or worried for no good reason:  
 No, not at all \_\_\_\_\_ (0)  
 Hardly ever \_\_\_\_\_ (1)  
 Yes, sometimes \_\_\_\_\_ (2)  
 Yes, very often \_\_\_\_\_ (3)
5. I have felt scared or panicky for no good reason:  
 Yes, quite a lot \_\_\_\_\_ (3)  
 Yes, sometimes \_\_\_\_\_ (2)  
 No, not much \_\_\_\_\_ (1)  
 No, not at all \_\_\_\_\_ (0)
6. Things have been getting to me:  
 Yes, most of the time I haven't been able to cope at all \_\_\_\_\_ (3)  
 Yes, sometimes I haven't been coping as well as usual \_\_\_\_\_ (2)  
 No, most of the time I have coped quite well \_\_\_\_\_ (1)  
 No, I have been coping as well as ever \_\_\_\_\_ (0)

7. I have been so unhappy that I have had difficulty sleeping:  
 Yes, most of the time \_\_\_\_\_ (3)  
 Yes, sometimes \_\_\_\_\_ (2)  
 No, not very often \_\_\_\_\_ (1)  
 No, not at all \_\_\_\_\_ (0)
8. I have felt sad or miserable:  
 Yes, most of the time \_\_\_\_\_ (3)  
 Yes, quite often \_\_\_\_\_ (2)  
 Not very often \_\_\_\_\_ (1)  
 No, not at all \_\_\_\_\_ (0)
9. I have been so unhappy that I have been crying:  
 Yes, most of the time \_\_\_\_\_ (3)  
 Yes, quite often \_\_\_\_\_ (2)  
 Only occasionally \_\_\_\_\_ (1)  
 No, never \_\_\_\_\_ (0)
10. The thought of harming myself has occurred to me: \*  
 Yes, quite often \_\_\_\_\_ (3)  
 Sometimes \_\_\_\_\_ (2)  
 Hardly ever \_\_\_\_\_ (1)  
 Never \_\_\_\_\_ (0)

**TOTAL YOUR SCORE HERE ►**

Thank you for completing this survey. Your doctor will score this survey and discuss the results with you.

Verbal consent to contact above mentioned MD witnessed by:

# Why Postpartum?



## Why Postpartum?

Lifestyle  
Changes

Hormonal  
Changes

Inflammation

Dietary/Nutrient  
Needs Changes

Gut  
Microbiome

# Nutrition & Lifestyle Factors & Interventions for Perinatal Mental Health



## Lifestyle Factors

- Untreated mental illness during pregnancy
- Reduced physical activity (pain, fatigue, healing, time/schedule)
- SLEEP
- Social isolation
- Stress (e.g., financial, low self-esteem, stress of parenthood)
- Skin-to-skin care



# Hormones

- Adrenal, placental, thyroid, and peptide hormones all implicated in PPD
- Drastic decrease in estrogen & progesterone following childbirth
  - This also causes imbalances in mood-regulating neurotransmitters such as serotonin
- Large shifts in thyroid hormone levels during pregnancy and then following childbirth
- Hypothalamic-pituitary-adrenal (HPA) axis dysfunction common in pregnancy → excessive or abnormal cortisol secretion



# Nutrients

- Heightened nutritional needs during pregnancy → possible nutritional deficiencies persisting into postpartum period
- Significant changes in nutrient status after childbirth
- Reduced dietary quality in context of postpartum life challenges
- Stopping prenatal vitamin
- Heightened nutritional needs during postpartum wound healing, lactation





# Omega-3 Fatty Acids

- AA, EPA, and DHA are conditionally essential fatty acids, as the body's ability to synthesize them from their precursors changes over the lifespan and is often inadequate to meet the increased needs of growth, such as in infancy and pregnancy
- DHA (docosahexaenoic acid) is an essential structural component of brain phospholipids and important in neuronal membrane stability, signal transduction/neurotransmission, brain function, and behavior
- EPA (eicosapentaenoic acid) is an important modulator of inflammation, especially neuroinflammation
- Omega-3 fatty acids are now understood to be crucial to the health of the gut microbiome, as well

# Omega-3 Fatty Acids

- Avg American woman consumes less than 1/3 of recommended daily EPA+DHA. In pregnancy, this is exacerbated by concerns about mercury in fish.  
*Note: populations where seafood and omega-3 fatty acid consumption is high have dramatically lower prevalence of postpartum depression*
- Maternal DHA levels can be decreased by up to 50% during pregnancy, and may not be recovered for up to 26 wks postpartum
- DHA is essential for sleep regulation, and lower levels of DHA are associated with poorer infant sleep
- Lower blood levels of omega-3 fatty acids during pregnancy associated with higher risk of postpartum depression
- Elevated levels of neuroinflammation (elevated levels of pro-inflammatory cytokines) associated with lower levels of omega-3 fatty acids

## Omega-3 Fatty Acids: Recommendations for Practice

- DHA supplementation during pregnancy can reduce the risk of postpartum depression
- EPA during pregnancy or postpartum can reduce some symptoms associated with depression
- Education on low-mercury, cold-water fatty fish
- General recommendations: 350-450 mg EPA+DHA/day (minimum) during pregnancy and lactation OR approx. 8 oz/wk of cold-water, low-mercury, fatty fish (ex. salmon, mackerel, anchovies, sardines, herring)

Many commercial seafood species provide too few *omega-3 fats* or too much *mercury* for children and pregnant women to eat twice weekly

Good choices

Too few omega-3s\*

Too much mercury for kids\*\*

Too much mercury for kids and average-weight pregnant women\*\*\*

Anchovies  
Herring  
Mussels  
Salmon  
Sardines  
Shad  
Trout

Catfish  
Clams  
Cod  
Crab  
Oysters  
Pollock  
Scallops  
Shrimp  
Tilapia

American Lobster  
Canned Light Tuna  
Carp  
Flatfish  
Freshwater Bass  
Freshwater Perch  
Haddock  
Hake  
Snapper

Canned Albacore Tuna  
Halibut  
King Mackerel  
Orange Roughy  
Seabass  
Shark  
Spanish and Atlantic Mackerel  
Swordfish  
Tilefish  
Tuna Steaks



\* Species that fail to provide an adult consuming 8 ounces weekly with 1,750 mg of omega-3 fatty acids

\*\* Children's mercury exposure is based on a seafood portion size of 1 ounce per 20 pounds weight

\*\*\* Women's mercury exposure calculated for an average body weight (166 pounds), and 8 ounces of seafood per week.

## Vitamin D

- Neuroactive hormone with receptors broadly distributed throughout the brain
- Deficiency known to be associated with depressive symptoms
- May also play a role in brain immune function and neuroplasticity, both of which are proposed mechanisms for the observed effect on mood
- Vitamin D levels above 50 nmol/L associated with decreased risk of postpartum depression

*Guidelines suggest a daily supplement of 600 IU cholecalciferol per day for pregnant and lactating women; however, this may not be enough for many.*

## Magnesium & Selenium

- Some research has found higher serum levels of magnesium and selenium were protective against perinatal depression
- Supplementing selenium during pregnancy may decrease risk of PPD
- Using serum measurements may be an issue in the research, since it may not tell us much about actual body status
- **Food sources of magnesium: nuts, seeds, grains, beans, soy**
- **Food sources of selenium: seafood, Brazil nuts, grains, meat**

# Zinc

- EPDS scores are inversely correlated with zinc blood levels; risk of PPD increases with low zinc and high CRP
- Research in post-C section women who were given 100 mg zinc for 4 days showed significant increase in zinc status as well as significant decrease in EPDS scores
- Observational research indicates lower zinc intake is associated with increased depression scores and higher zinc intake appears to buffer the effects of stress.

**Food sources: seafood, meat, nuts, dairy, grains**

# Choline

- Known to be neuroprotective, and increasingly understood as important in pregnancy
- 89% of pregnant women don't meet choline needs
- Inverse relationship between dietary choline intake and depression risk, though more research is needed in PPD
- **Food sources: meat, milk, eggs, cruciferous vegetables, and certain beans**



# Iron

- Postpartum anemia may be associated with increased risk of PPD
- Iron supplementation in postpartum period should be based on laboratory testing
- **Food sources: meat, poultry, fish, eggs, beans, nuts, dried fruit, whole grains**

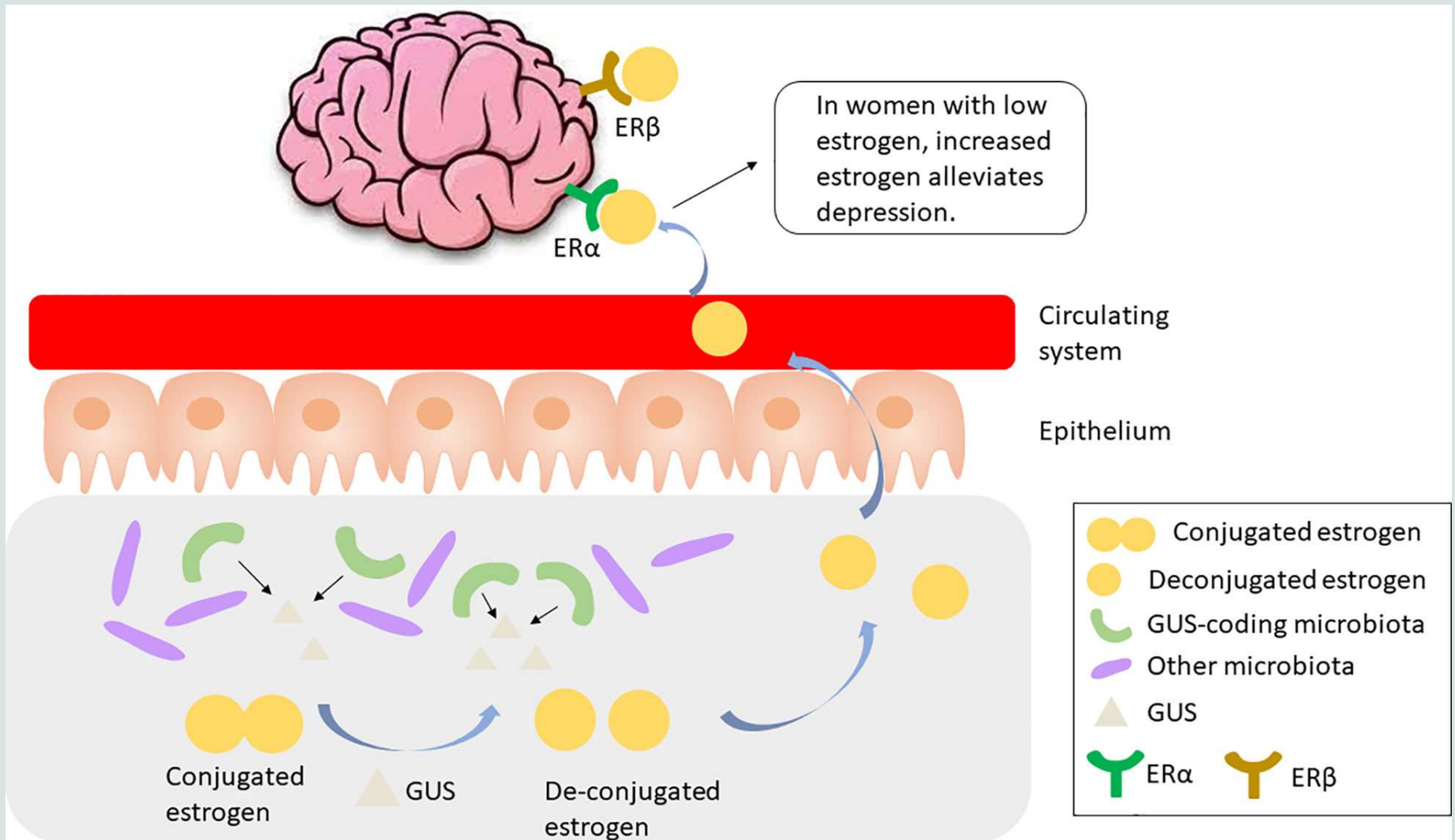
# Amino Acids

- Amino acids are essential for neurotransmitter and hormone production
- Tryptophan and tyrosine may be especially helpful in the early postpartum period to compensate for depletion of serotonin, norepinephrine, and dopamine
- **Food sources of tryptophan and tyrosine: meat and poultry, fish, dairy, nuts and seeds, whole grains, legumes, and soy**

# Gut Microbiome

- The gut microbiome changes throughout pregnancy and following delivery
- Dysbiosis can lead to changes in tryptophan metabolism (reducing serotonin/melatonin production)
- Reduced production of short-chain fatty acids like butyrate
- Interaction with the HPA axis?
- Possible interaction with hormone changes such as estradiol and progesterone depletion (GUS)





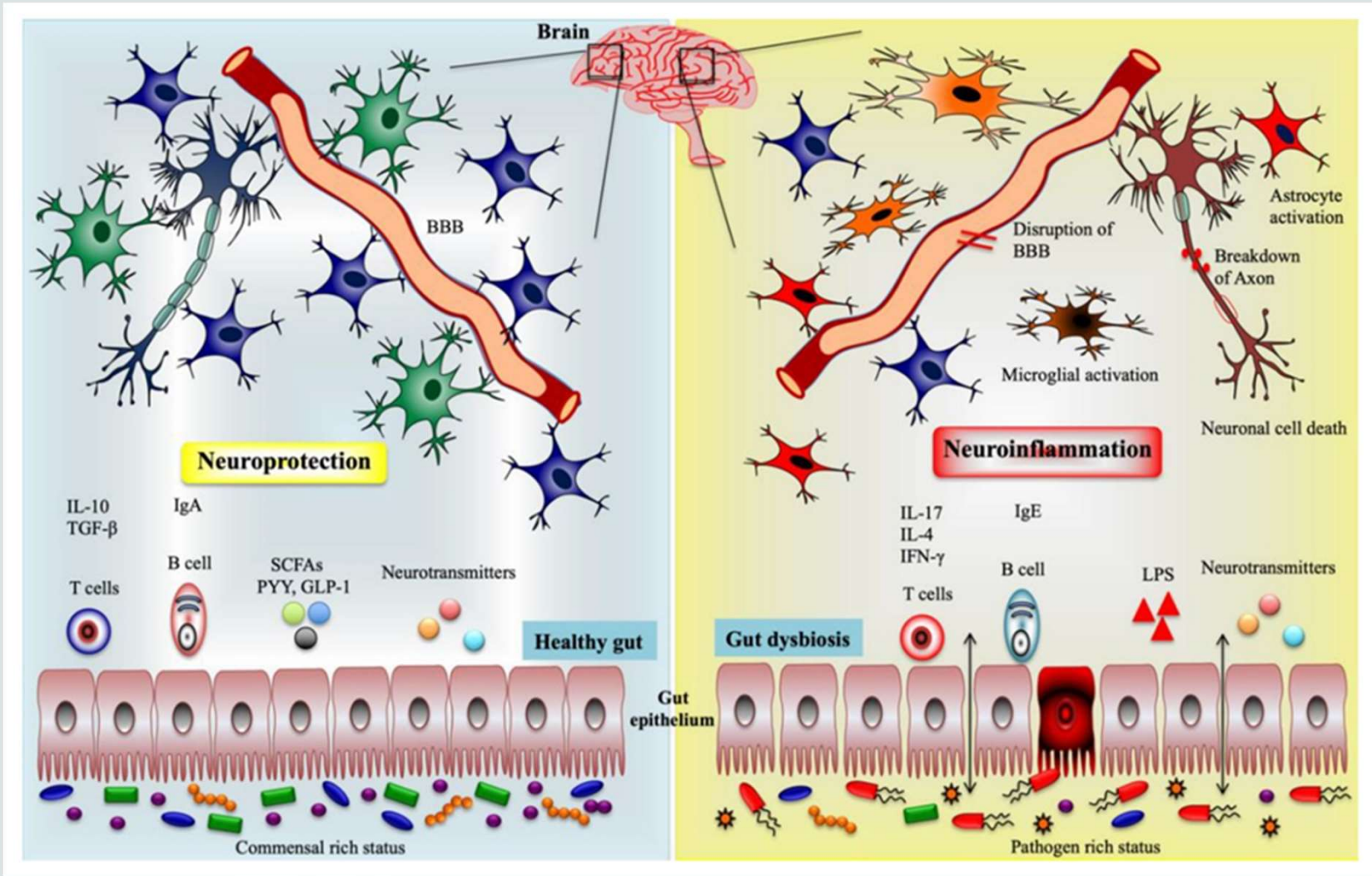


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# Probiotics

- Some *Lactobacillus* species probiotics may promote estrogen levels, regulate stress hormones in some people
  - Ex. *L. rhamnosus* HN001; *Limosilactobacillus reuteri* PBS072
- Some *Bifidobacterium* species probiotics may improve serotonin levels in some people
  - Ex. *B. animalis* ssp. *lactis* 420; *B. breve* BB077

# Prebiotics

- Prebiotic fibers like FOS and GOS increase levels of beneficial microbes like *Bifidobacterium* & decrease levels of depression-associated microbes like *Proteobacterium*
- Animal studies indicate possible alleviation of PPD from high-fiber (inulin) diet
  - ❖ *upregulated the expression of serotonin and norepinephrine*
  - ❖ *suppressed neuroinflammation*
  - ❖ *restructured the gut microbiome and increased formation of short-chain fatty acids (SCFAs).*
  - ❖ *the increase in beneficial microbes (such as Lactobacillus) and in SCFA levels were positively correlated with behavioral improvements*
- Other “prebiotics” - omega3s, phytochemicals?

## Fermented Foods

- Abundance of caution needed in pregnancy, so intake tends to be low
- However, fermented foods may be the best source of probiotics+prebiotics for the gut microbiome, overall nutritional status, and budget
- *Food sources: yogurt with live, active cultures, kefir, sauerkraut, kimchi, natto, etc... choose culturally relevant options*



# Inflammation & Neuroinflammation

- Substantial release of pro-inflammatory cytokines occurs after childbirth
- Some evidence connects certain types of depression with inflammation; research in the perinatal space is mixed
- Some of the nutrients thought to ameliorate PPD may do so due to their anti-inflammatory effects rather than treatment of nutrient deficiency per se (vitamin D, fish oil, zinc)
- Gestational diabetes increases risk of PPD



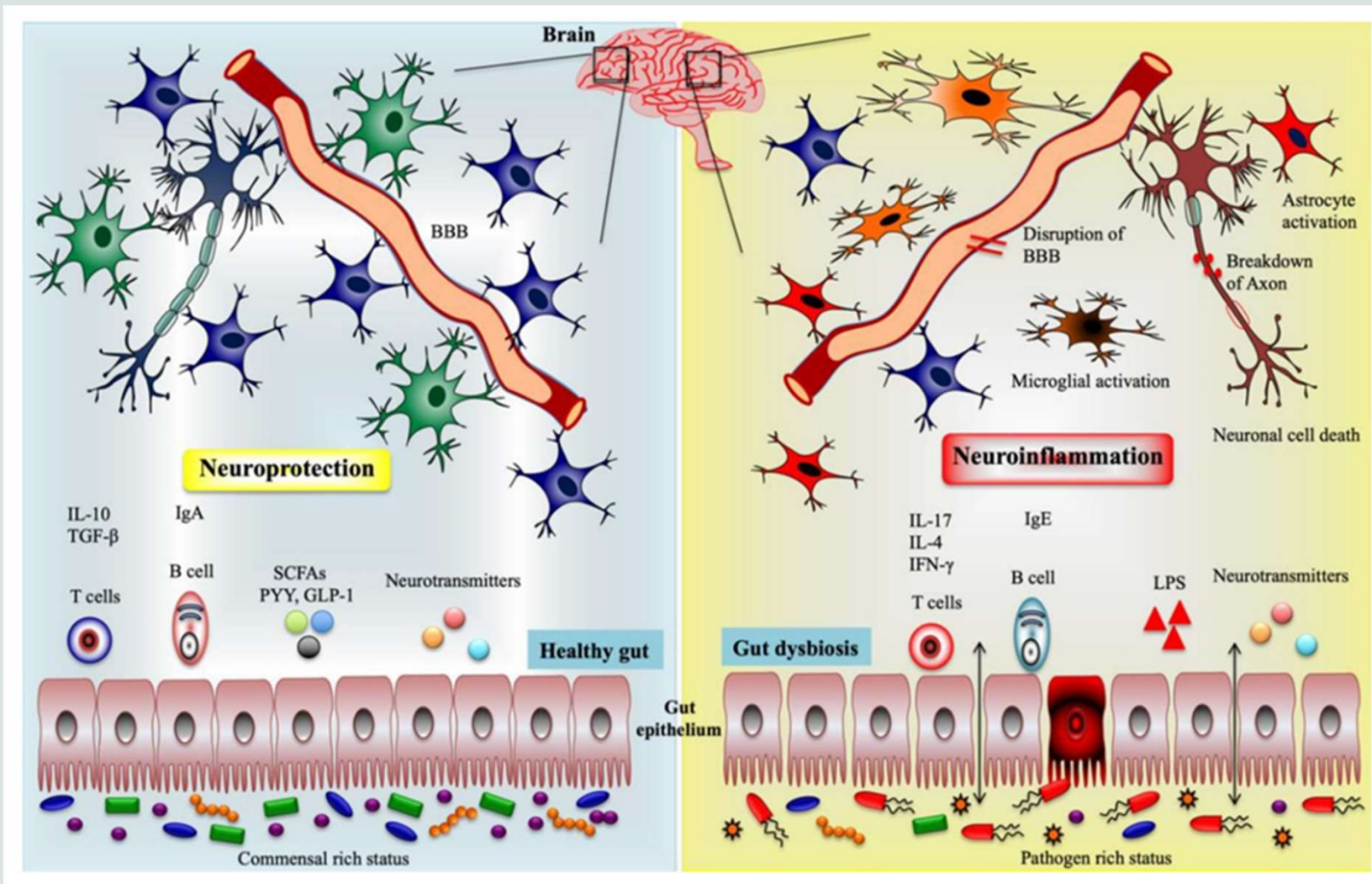


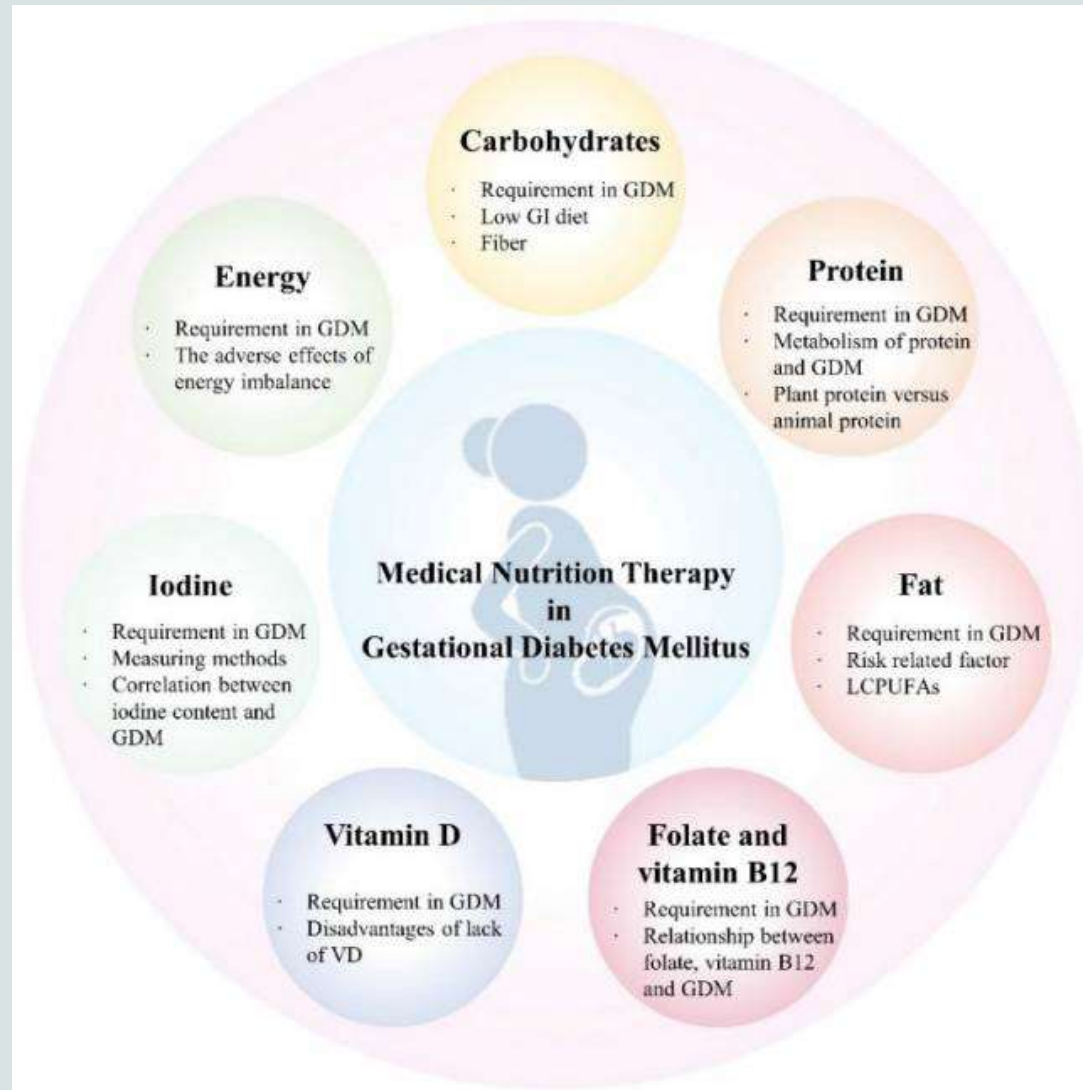
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# Gestational Diabetes and Postpartum Depression

- Bidirectional relationship:
  - GDM is linked with increased risk of depression (both during pregnancy and postpartum)*
  - History of depressive symptoms is linked with an increased risk of GDM*
- Elevated cytokine and adipokine concentrations in women with GDM (inflammation)
- Abnormal glucose metabolism → elevated cortisol levels → depressive symptoms
- Plus... another source of stress

# Preventing and Managing Gestational Diabetes

- Lifestyle (smoking cessation, exercise)
- Diet (Mediterranean, low-glycemic index diet, plant vs. animal protein, quality of fat sources)
- Prevent deficiencies (especially vitamin B12, folate, vitamin D, iodine)



# Inositol?

- Previously known as vitamin B8
- Widely available in plant foods
- Supplementation may reduce risk of GDM, especially in overweight/obese women
- Has also been studied as a mood-stabilizing nutrient in depression and anxiety

## Specific Food Interventions

- Vegetables
- Fruit
- Fish and seafood
- Eggs
- Nuts and seeds
- Olive oil
- Pulses
- Spices and herbs
- Herbals - chamomile tea, magnolia tea, saffron?



# Whole Diet Interventions

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- More plants
- Mediterranean Diet
- Treating glycemic dysregulation during and after pregnancy

FISCHER & MORALES, 2023; PAPADOPOULOU ET AL, 2023







## Takeaways

- Stay on your prenatal vitamin or get a standard multivitamin (consider checking iron status)
- Eat cold-water, low-mercury, fatty fish and/or take a fish oil supplement
- Eat plenty of nutrient-dense whole plant foods (fruits, vegetables, whole grains, pulses, nuts, seeds)
- Consider adding safe sources of fermented fruits, vegetables, beans, and dairy to eating pattern
- Other forms of nutrition: Support mom's access to sleep and rest, need for skin-to-skin contact with baby, social connections, gentle movement, ability to metabolize stress, etc.

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# Thank You

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