Nutrition and the Gut/Brain Connection

Taking a Deeper Look at Nutrition and Mood/Behavior

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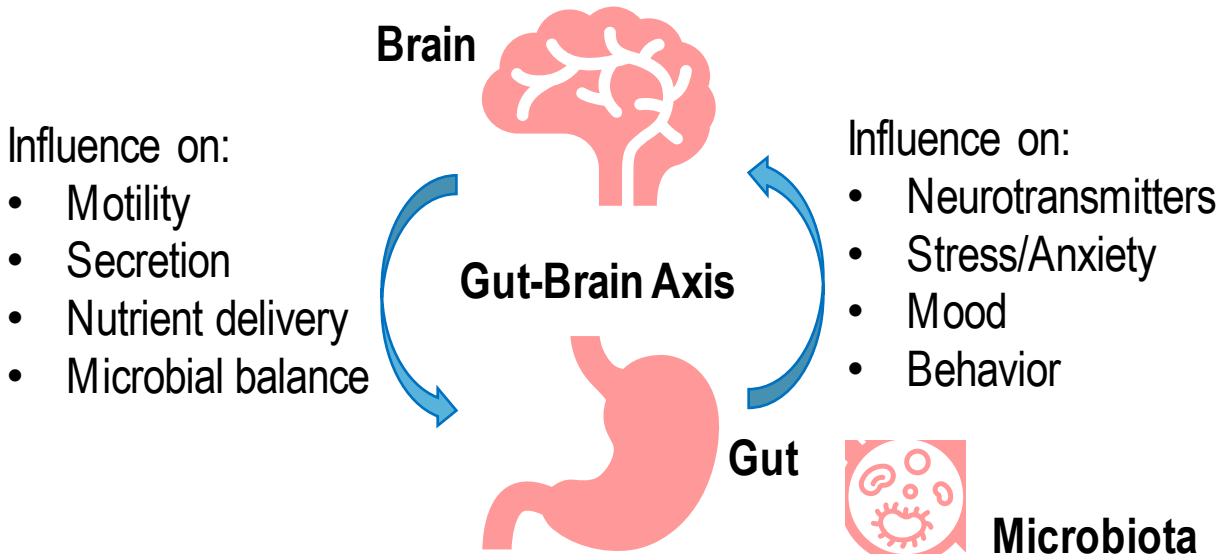
Objectives

- Examine how the gut and brain communicate
- Discuss how food may affect your mood
- Explore the idea behind nutritional psychiatry
- Identify nutrients that have been shown to positively affect mood and behavior, and determine specific foods that contain these specific nutrients
- Explore healthy eating habits that could be implemented daily to boost your mood

Communication Between the Gut and Brain

- Gut-brain axis links the enteric nervous system (GI tract) to the central nervous system
- Integrity of the gut is shown to impact higher cognitive function

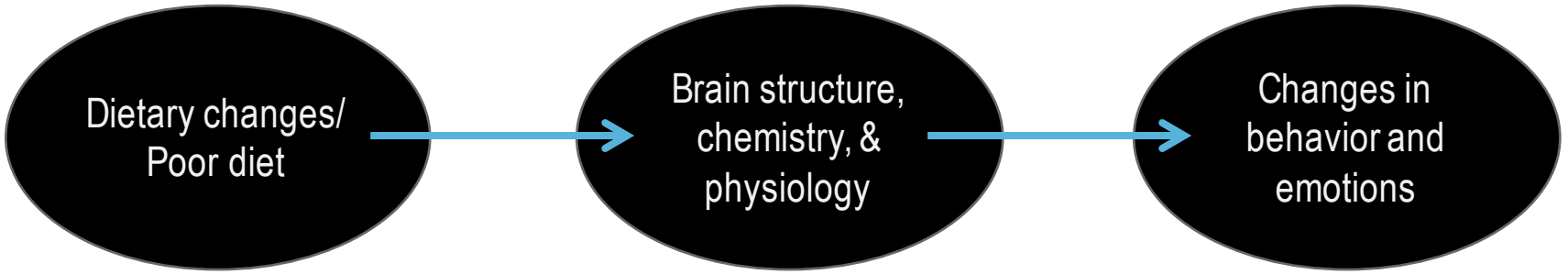


Bacteria Can Be Good

Of the ~100 trillion bacteria in the human body, 80% exist in the gut and GI tract!

- Functions of gut microbiota:
  - Constitutes the intestinal barrier
  - Promotes the continuous existence of gut microbiota
  - Stimulates intestinal epithelial cell regeneration
  - Produces mucus and nourishes mucosa
  - Involved in the maturation of the immune system
  - Intestinal synthesis and metabolism of certain nutrients, hormones, and vitamins
  - Drug and poison removal

How Can Food Affect Your Mood?



- Chemicals in the brain control our mood
- Serotonin ("feel good hormone"):
  - Relays messages from one area of the brain to another
  - Influences mood, appetite, sleep, memory, learning, temperature regulation, social behavior
  - ~90% is found in the digestive system

Nutritional Psychiatry

- The science of how nutrients affect:
  - Mood
  - Stress tolerance
  - Inflammation
  - Energy
  - Sleep
  - Cognition
  - Medication needs
  - Behavior dysfunction

- Diet is playing an increasingly important role in mental health and well-being

Nutrition's Role in Mood

- Research is finding a connection between certain nutrients found in our foods and their effect on mood, emotions, and overall health

Carbohydrates

Probiotics

Omega-3

Vitamin D

Selenium

Don’t Ditch Carbs—Just Choose “Smart” Ones

- Carbs are not only essential for everyday diet but may also boost your mood
- Eating carbohydrates together with protein-rich foods may boost the amount of tryptophan—a nonessential amino acid (body does not produce)—in your brain
- Increased tryptophan levels = Increased serotonin levels
- Focus on healthy sources of carbohydrates and maintain a balanced diet
  - Fruits, vegetables, whole grains, and legumes
  - These foods will also help regulate blood sugar levels

Probiotics—Gut Health

- Live bacteria and yeasts are good for you and safe to consume
- Functions:
  - Help replace the “good” bacteria
  - Promote health within the GI tract
  - Shape the immune system
  - Ferment fiber
- Healthy gut function has been linked to normal central nervous system function

Probiotics—Gut Health

- Where can you find probiotics?
  - Yogurt
  - Kefir
  - Sauerkraut
  - Tempeh
  - Kimchi
  - Kombucha
- Studies have shown that consuming probiotics can help improve mood and maximize nutrient absorption

Omega-3 Fatty Acids

- Polyunsaturated fatty acids must be consumed through dietary sources
- Affect neurotransmitter pathways in the brain
- Help with central nervous system function and signal transmission
- DHA and EPA: fatty fish, fish oils, fortified foods
- ALA: flaxseed, canola oil, soybean, walnuts, leafy greens
- Countries with high consumption of fish appear to have lower prevalence of mental health disorders
- Low levels of DHA and EPA linked to higher risk of mental health disorders

Vitamin D

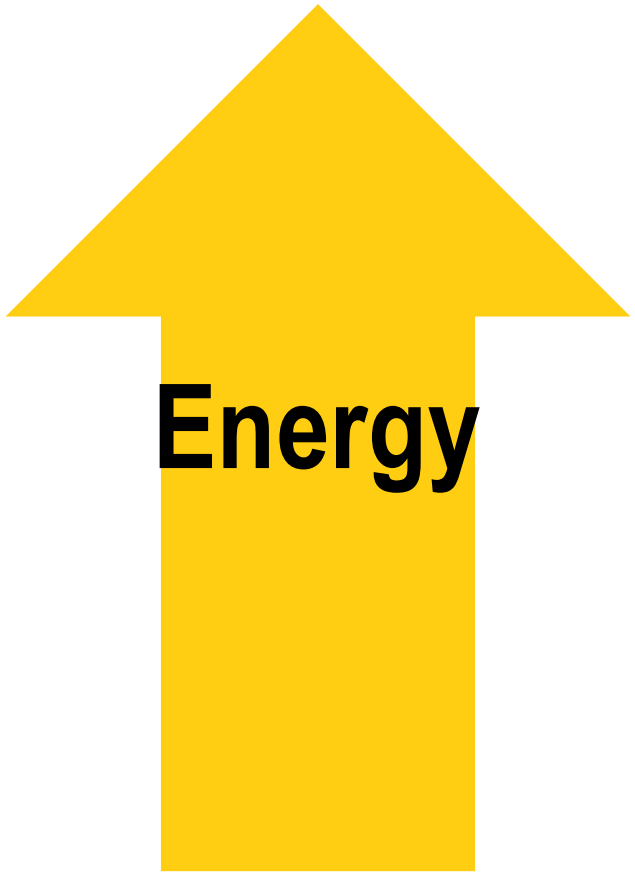
- More vitamin D has been shown to increase levels of serotonin in the brain
- No specific amount suggested – more research is needed
  - Very individualized and based on many factors

Food	Serving	Vitamin D IUs
Cod liver oil	1 tbsp	1,360
Salmon, cooked	3.5 oz	360
Mackerel, cooked	3.5 oz	345
Tuna, canned in oil	3 oz	200
Sardines, canned in oil	1.75 oz	250
Orange juice, fortified	8 oz	100
Milk, organic and fortified	8 oz	98
Cereal, fortified	1 cup	40
Egg (Vitamin D found in yolk)	1 egg	20
Beef liver, cooked	3.5 oz	15
Swiss cheese	1 oz	12

Selenium

- Low levels of selenium have been linked to poorer moods
- The brain retains selenium in the body when there is a deficiency
- Food sources: oysters, tuna, clams, sardines, pork tenderloin, crab, saltwater/freshwater fish, chicken, lean lamb, sunflower seeds, whole-wheat bread, brown rice, eggs, and so many more!

Breakfast—“The Most Important Meal of the Day”



Mood-Boosting Nutrients for Breakfast

Iron

-Spinach
-Tofu
-Potatoes
-Eggs
-Raisins
-Nuts
-Fortified grains/breads

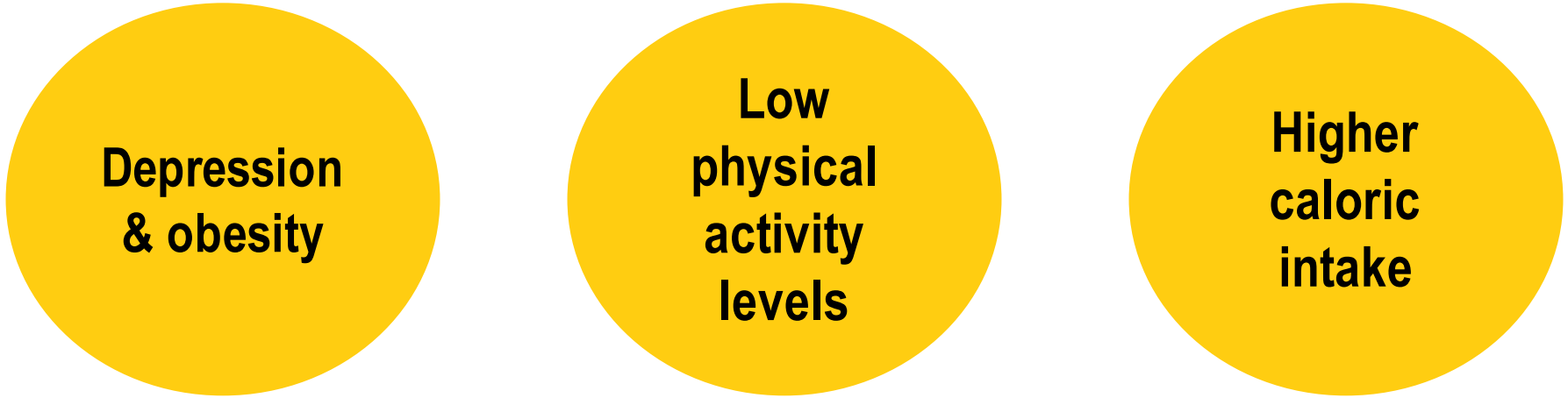
Thiamine (B1)

-Legumes
-Some seeds
-Fortified grains/cereals

Folate (B9)

-Leafy greens
-Legumes
-Fortified grains/breads

Activity



- Effects of physical activity extend beyond the short-term, with research supporting that exercise can help alleviate long-term depression

Exercise

- Ways exercise can improve one's mood:
  - Increase serotonin
  - Help normalize sleep
  - Meaningful activity/purpose
  - Sense of accomplishment
  - Slow, healthy weight loss
  - Restriction of any food or food group could lead to irritability

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