



Session 2 Part 1: Does Gut Health Matter?

1. Gut Health: Is Our Gut Our Second Brain?

- a. During the 4th-7th week of fetal development, our **brain, neurological system, and gastrointestinal system** develop **simultaneously**. Both our brain and gut are derived from Neural Crest Cells.
- b. It is during this time a fetus is most at risk for developing **birth defects/congenital abnormalities**. We should ask ourselves **WHY?**
- c. Our **nervous system hardwires itself into our gut** through the enteric nervous system (ENS).
- d. The ENS serves as a **messenger to the brain**.
- e. It relays messages regarding needs for **hormones, neurotransmitters, and blood** so we can absorb and digest the food we eat.
- f. Uniquely, the enteric nervous system within the gut **can also function separately from our brain**.
- g. **Patient case study:**

Patient: "Doc, I have this funny feeling in my stomach when I get nervous."

Doctor: "I think we need an X-ray. I am concerned you may have an incurable case of....."

"Butterflies in your belly" 😊

- h. **Our second brain?**

What is the "butterfly feeling" I get when I am nervous?

There are NO real butterflies, just **neurons** talking to your **gut!**

This feeling is a result of the **intimate relationship** between the **brain** and the **ENS**.
Welcome the **gut-brain axis**.

2. How does my gut influence my emotions?

- a. Research is revealing the vital influence the **gut microbiome** has over **emotional state** through the **gut-brain axis**.
- b. Changes in the gut microbiome from **chronic inflammation, stress, antibiotics, high-carbohydrate diet, high sugar intake, or environmental toxins** have been shown to **negatively impact our brain**.

Reference: J.F. Cryan & S.M. O'Mahoney; The microbiome-gut brain axis: from bowel to behavior; Neurogastroenterol Motil (2011) 23, 187-192



Question 1: What connects our gut health to our emotional health?

Answer: _____

- 3. Changes in your gut microbiome** can influence the central nervous system and have been shown to **influence behavior**.
- This can activate the **fight or flight response**, which can contribute to **chronic stress** and worsen **inflammation**.
- 4. How does my gut influence my health?**
- Chronic inflammation can lead to a **“leaky gut”**, where the microscopic “pores” that line the gut inflame and **allow gut material to seep through what should be a closed tunnel** into the vast surrounding blood stream.
 - Here we see a possible **catalyst** for **autoimmune diseases** and **chronic inflammatory conditions**.
 - ‘Leaky Gut’** has also been shown to cause a **‘Leaky Brain’**.
 - Some research reveals that leaky guts **release antibodies** which then cross the blood-brain barrier creating an **inflammatory reaction within the brain**. Welcome **brain fog, headaches, anxiety, and fatigue**.
- Reference: Axel Montagne and Berislav V. Zlokovic; Blood-Brain Barrier Breakdown in the Aging Human Hippocampus; Neuron; vol 85, Issue 2, 21 Jan 2015, 296-302*
- 5. How does my gut influence my mood?**
- Roughly **90% of serotonin** lives in your **gut**.
 - Our gut also houses **dopamine, glutamate, norepinephrine, GABA, and nitric oxide**.
 - Inflammation** within the gut will impede production of these **neurotransmitters**.
- 6. How does my gut influence the ability for my brain to adapt and influence my genetic code?**
- Our gut creates the essential **trophic factors** (building blocks) for **neuroplasticity**.
 - What are some of these trophic/building blocks?
 - Our gut creates **brain-derived neurotrophic factor (BDNF)**.
 - Neuroplasticity is the ability of the brain to adapt to change and Trophic factors are proteins that **stimulate the growth and production of new brain cells**. These trophic factors **also influence the transcription/activation of our DNA**.

Question 2: What is Neuroplasticity?

Answer: _____



HOW DO WE BRIDGE THE GAP TO OPTIMIZE OUR GUT HEALTH TO BETTER SUPPORT OUR EMOTIONAL, COGNITIVE AND PHYSICAL WELL-BEING? WE MUST SEEK FOODS TO NOURISH OURSELVES. REAL FOODS WE CAN GROW, HUNT, FISH AND FERMENT.

7. What is fermentation and can it aid in gut health?

- a. **Preservation process** for thousands of years.
- b. Shifts the ecosystem of the gut by **enhancing our microbiome**.
- c. **Improves digestion and absorption** through the production of **probiotics** and **digestive enzymes**.
- d. The byproduct of fermentation, **probiotics**, can **improve the immune system** (70% of which lives in our gut) and **reduce inflammation** (the nidus for almost all disease processes).

8. Gut-healing foods: 1-2 servings per day

- a. **Fermented vegetables** (kimchi, sauerkraut, carrots, green beans, beets, lacto-fermented pickles, traditional cured Greek olives)
- b. **Cultured dairy products** (buttermilk, yogurt, kefir, cheese). If tolerated, no more than 1 serving per day.
- c. **Cultured non-dairy products** (yogurt and kefir made from almond, coconut, etc.)
- d. **Fermented grains and beans** (lacto-fermented lentils, chickpea, etc.)
- e. **Fermented beverages** (water kefir and kombucha)
- f. **Fermented condiments** (raw apple cider vinegar- reduces insulin resistance)

9. Gut-healing foods: serving sizes

- a. Fermented vegetables: ½ cup prepared
- b. Cultured dairy products: 1 cup
- c. Cultured non-dairy products: 1 cup
- d. Fermented grains and beans: ½ cup prepared
- e. Fermented beverages: 1 cup
- f. Fermented condiments: 2 Tablespoons (1 fluid oz)

Question 3: Which gut-healing food also helps with insulin resistance?

Answer: _____



Session 2 Part 2: Goal Setting

10. The Science of Habit Formation

3 stages in forming habits:

- a. **Trial and exploration** of the new behavior
- b. **Forming the habit** through dopamine connectivity
- c. **Solidifying the habit** to function on autopilot

Reference: <https://www.psychologytoday.com/us/blog/the-athletes-way/201112/the-neuroscience-perseverance>

Stage 1:

- d. The prefrontal cortex communicates with the striatum, which communicates with the midbrain. Here dopamine is released if the activity is deemed as pleasurable.
- e. The dopamine release determines if we want to continue this behavior.
- f. This stage requires **great thought, focus, and detailed neuronal activity**. You must be **mindful** here both physically and mentally.

Stage 2:

- g. As we continue the **“like”** and **engage** in the behavior, our **path moves** to the sensorimotor cortex.
- h. Once again, the path travels through the striatum, to the midbrain where it **picks up more dopamine**.
- i. Here our **efforts are less detailed**. We are now laying down “chunks” of neuronal activity as opposed to detailed steps seen in stage 1.
- j. It takes us **less focus and concentration** to engage in the behavior once we have reached this stage.

Stage 3:

- k. The last stage involves a **path** connecting the infralimbic cortex with the striatum and **back to dopamine**.
- l. Once again, we are **firing dopamine** in order to semi-permanently **imprint this behavior**.
- m. This is the stage of **autopilot**. This requires very little detailed neuronal activity. **You don't have to think about the behavior, you just do it**.
- n. When faced with a new activity, we internally grade it as **positive + or negative -**.
- o. If we deem the activity as positive, we will **reinforce the activity through dopamine communication** within the prefrontal cortex, sensorimotor cortex, and infralimbic cortex.
- p. This is where the **deliberate activity** becomes a **habitual activity**.
- q. The **root of all habits** are created and supported through **dopamine!**
- r. **You** determine if the activity/behavior is **meaningful** and **pleasurable**.



11. *The Laws of Approach Versus Avoidance*

- a. We are wired to Move *towards* an Action which garners a Reward.
- b. We are less inclined to move towards something in order to avoid a punishment.
- c. The human brain was created to respond to “*Forward Reaction*” to achieve the reward, rather than a “*Forward Reaction*” to avoid harm.
- d. Immediate Rewards are far more effective than Future Punishment.
- e. Knowing and anticipating the Reward is there waiting for us elicits a similar reaction to that of earning the Reward.
- f. We do not need immediate positive feedback forever in order to maintain the behavior change.

Reference: Sharot, Tali, “The Influential Mind”, chapter 3, 64-65, 2017.

12. *The Science of Achieving Goals*

To achieve a goal it must be:

- a. **Purposeful**
- b. **Obtainable**
- c. **Sustainable**
- d. **Measurable**

The Science of Achieving Goals

- e. **Plant your purpose (Identify)**
- f. **Dig your whys/triggers**
- g. **Determine your routine**
- h. **Feel and/or Experience the reward**
- i. **Solidify through strategy**
- j. **Reflect on your triumphs**
- k. **ENVISION your success**

At the Root of Any Goal must lie its Purpose! Purpose = WHY? = Reward

13. *Step 1: Plant Your Purpose*

- a. Your **PURPOSE** is your **catalyst for change**.
- b. Your **PURPOSE** creates a **reward mechanism** to connect dopamine to the behavior.



- c. Connecting **dopamine** to the behavior plants the new behavior into a **solidified HABIT!**
- d. Your **PURPOSE** must be **meaningful to you** and **deeply rooted**.
“My purpose is to empower others to truly flourish in this great gift of LIFE”

Craving Our Purpose

Our purpose is not a personality trait, but rather our awareness for having some explicit purpose or meaning for our life. It can change and is as unique as our fingerprint. We must work to see our PURPOSE!

Pondering Your Purpose

- What gets you out of bed every day?
- Who depends on you and why?
- Whom do you depend upon and why?
- How do you help other people in your community and the world?
- How do you take care of yourself?
- How do you provide for yourself and your family?
- What are you passionate about?
- What do you love doing?
- What are you still seeking to accomplish?
- What brings you true Joy? What is your role within that?
- Who do you admire and why?
- What do you want your epitaph to say?

“A lack of joy is almost always sourced by a lack of purpose. When you have a reason to live, a vision to accomplish something important, life becomes exciting, compelling and very, very fun.” – Will Bowen

14. Step 2: Dig your WHY

- a. Your foundation has been laid in **your PURPOSE!**
- b. Now dig and plant your **WHY!**
- c. **Your WHY is Your Reward**

1. "I want to _____ beacuse...."
 1. I want to have more energy
 2. I want to feel more comfortable in my own skin
 3. I want to reduce the number of medications I am taking
 4. I want to physically interact with life as I age
 5. It makes me feel happy, joyful, pleased
 6. I am a role model
 7. Makes me feel proud, confident
 8. Feeds my curiosity
 9. Allows me to grow as a person
 10. Allows me to build deeper relationships
 11. Its my passion/purpose
 12. It is my self- expression
 13. Sense of accomplishment
- d. Both **short-term** and **long-term** 'WHYS' will garner you more success!
- e. We often need extrinsic motivators to help bridge the gap until we are intrinsically motivated.
 1. Awards
 2. Praise
 3. Recognition
 4. Honor/Prestige
 5. Data as feedback
 6. Financial Incentives
 7. Benefits/Perks
 8. Tangible outcomes
 9. Checklist complete

Growing a Habit Loop



Well-Being, A Tribe Planted with Purpose



What is the foundation of all your well-being efforts?

Answer: _____

15. Step 3: Determine HOW- Your ROUTINE

- a. **Connect your WHY to HOW you are going to achieve it.**
- b. **WHY:** Improve my energy
 - How: Eat vegetables with every meal.
 - How: Sleep a minimum of 7-8 hours a night.
 - How: Spend 10 minutes daily praying and meditating.

16. Step 4: Engage the HOW then FEEL or EXPERIENCE the Reward

- a. As you engage in the behavior, meditate on the reward.
- b. Stop. Be mindful. Envision both your short-term and long-term goals.
- c. Experience the Reward!
- d. *Your brain will release **dopamine** to help solidify the behavior into a **new HABIT**.

17. Step 5: Solidify your new Habit through Strategy

- a. **Seek the reward** both during and away from the behavior.
- b. **Use visual imagery** strategically in your day in order to strengthen the roots of your new habit.
- c. **Schedule it** during your day.
 - Close your eyes. Picture your Purpose. Experience your WHY. Reap your Reward.
- d. **Create visual cues** to trigger your Why!
 - Create a screen shot on your phone.
 - Place a picture reminder in your home, car, office.

18. Step 6: Reflect on Your Triumphs for the Day

- a. **Reframe** how you **perceive success**.
- b. **Choose** to focus on the **triumphs** rather than the failures.
- c. **Practice self-forgiveness**.
- d. **Envision** the triumphs for **tomorrow**.



TO REVIEW:

It all begins with planting your Purpose! Dig your whys, create your routine, solidify your strategy, draw strength from your PURPOSE (CUE) and reap your rewards! (Tangible and Experiences/Feelings)

Mindfulness Exercise: Visual Imagery

This week's Cognitive Action Plan:

TRACK

- a. **Track What and How Much you eat and drink. BE SPECIFIC!**
- b. Review your records to understand **WHAT, WHEN, and WHY** you **CHOOSE** what you eat and drink.

IDENTIFY

- a. **Identify your Triggers.** Stress? Boredom? Celebration? Habit?
- b. **Your Purpose**
- c. **Reasons Why I Want to Be Healthy (take a picture and make it your screensaver)**

This week's Nutritional Action Plan:

- a. Try at least 2 ***Fermented foods*** this week.
- b. Reduce your ***carbohydrates to 125 grams per day.*** Adjust macro settings in your app.
- c. Continue tracking all food and beverage intake.
- d. Continue with 64 fluid oz. of water daily.
- e. Continue with at least 3 servings of non-starchy vegetables per day.



Goal Setting & Gut-Healing Foods

1. What are my goals and how am I going to achieve them (be specific)?

2. What are 3 strategies I can use to solidify healthy habits?

3. What are 3 gut-friendly foods or beverages I can try?

ACTION ITEMS

The Reasons I want to be healthy:



What triggers my unhealthy habits?

My Purpose – Spend some time here. Answer the questions from the session. Write down what comes to mind. Words, pictures, shapes.

