

MOVE YOUR MIND

THE EXERCISE-MENTAL HEALTH CONNECTION

Understanding How Physical Activity Modulates Mood,
Stress Response, and Cognitive Function



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INTRODUCTION: THE STATUS OF MENTAL HEALTH IN THE U.S.

- Nearly 60 million adults (23.08%) experienced a mental illness in the past year.
- Nearly 13 million adults (5.04%) reported serious thoughts of suicide. The number of individuals who died by suicide in 2022 was the highest number ever recorded in the U.S., up after slight decreases in 2019 and 2020.
- One in five young people from ages 12-17 experienced at least one major depressive episode in the past year, yet more than half of them (56.1%) did not receive any mental health treatment. More than 3.4 million youth (13.16%) had serious thoughts of suicide.
- More than 45 million adults (17.82%) and 2.3 million youth (8.95%) are experiencing a substance use disorder.
- Data show there are 340 people for every one mental health provider.



INTRODUCTION: THE STATUS OF MENTAL HEALTH IN THE U.S.

- CDC
 - In the U.S. in 2023, mental illness as among the most common health conditions in the nation.
 - More than one in five American adults lives with a mental illness.



POLYCRISIS WHEN EVIDENCE SHOWS THAT THE NEED FOR MENTAL HEALTH CARE IS URGENT

Driving Factors

- Pandemic
- Social Media
- Youth Mental Health Crisis

Awareness

- Younger Generations are more Vocal (Social Media)
- Open Conversations, T.V. Shows, Podcasts, Clinical Research
- The Pandemic propelled mental health forward with a demand for management/treatment

Challenges

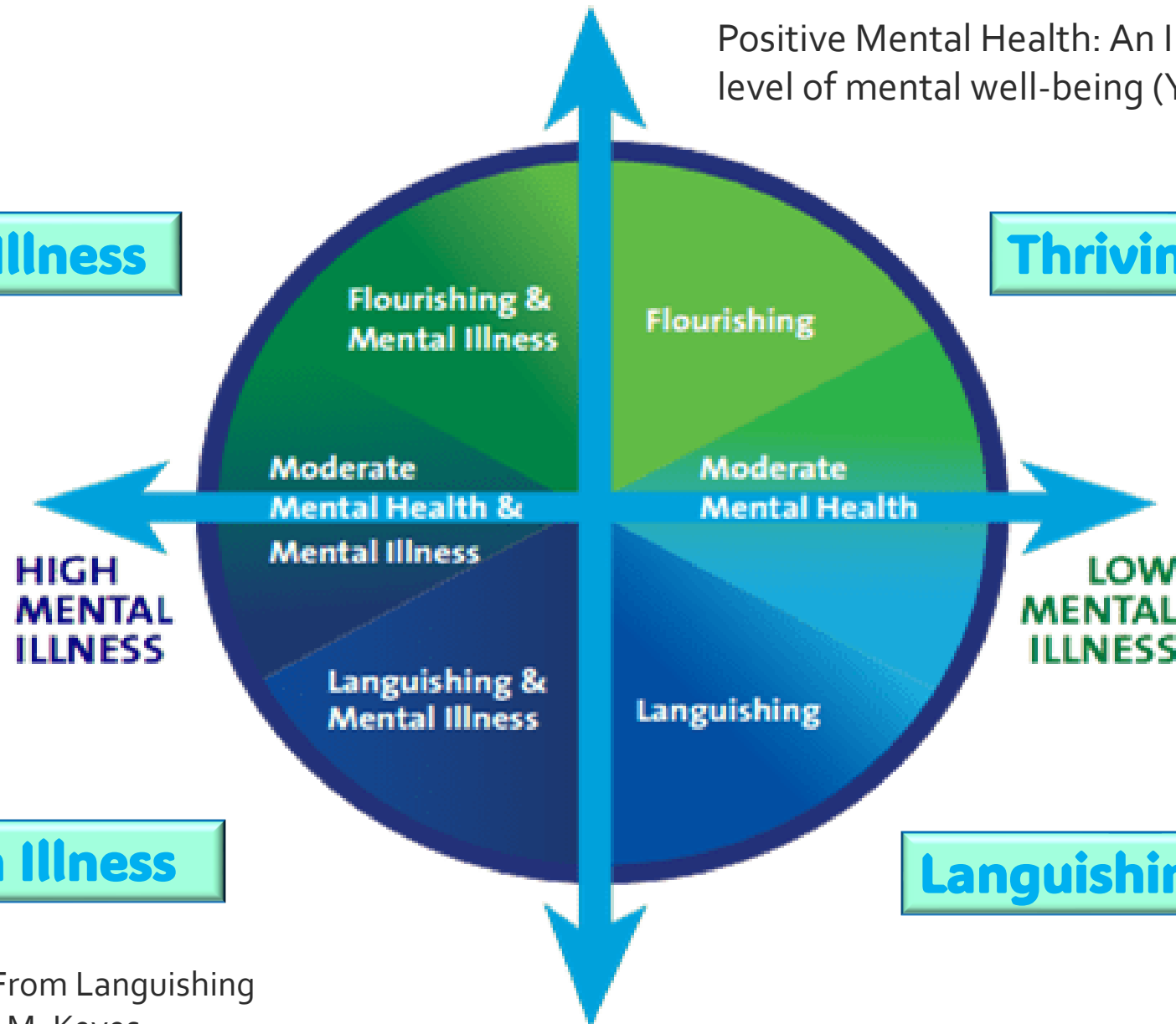
- Cost
- Stigma
- Lack of Insurance
- Lack of Providers

HIGH MENTAL HEALTH

Positive Mental Health: An Individual's level of mental well-being (Y-Axis)

Thriving with Illness

Thriving without Illness



Mental wellbeing –
Mental illness: The
absence/presence of a
clinically diagnosed
mental illness (X-Axis)

**HIGH
MENTAL
ILLNESS**

**LOW
MENTAL
ILLNESS**

Languishing with Illness

Languishing without Illness

The Mental Health Continuum: From Languishing
to Flourishing in Life by Corey L. M. Keyes

LOW MENTAL HEALTH

EVIDENCE TO SUPPORT EXERCISE AND MENTAL HEALTH

Exercise can be as effective as cognitive therapy or even pharmacotherapeutic approaches in reducing symptoms of depression and anxiety.



Smith PJ, Merwin RM. The Role of Exercise in Management of Mental Health Disorders: An Integrative Review. Annu Rev Med. 2021 Jan 27;72:45-62. doi: 10.1146/annurev-med-060619-022943. Epub 2020 Nov 30. PMID: 33256493; PMCID: PMC8020774.

OBJECTIVES



1. Explain the physiological mechanisms through which exercise impacts mood, including endorphin release, neurotransmitter activity, and hormonal balance.



2. Describe how regular physical activity influences the stress response system and promotes resilience to daily life stressors.



3. Identify the cognitive benefits of exercise, including enhanced memory, executive function, and neuroplasticity.



4. Integrate movement strategies into fitness programming that specifically support mental health, stress management, and emotional balance for clients.

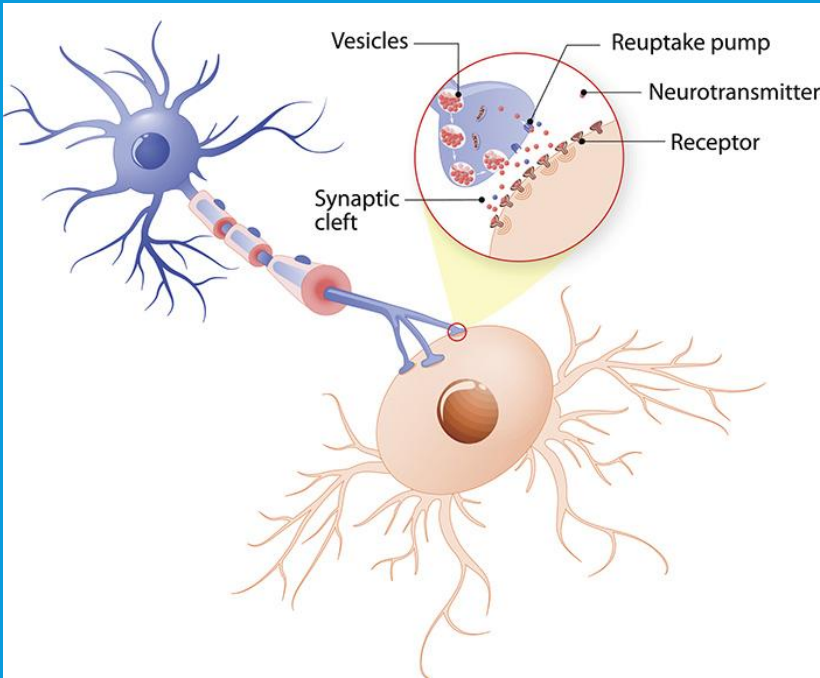
Exercise Influences Mood Through Several Interconnected Physiological Mechanisms

1. Endorphin Release

- **What they are:** Endorphins are endogenous opioid neuropeptides produced by the central nervous system and pituitary gland.
- **Mechanism:** During moderate to intense exercise (especially aerobic activities), the body releases endorphins into the bloodstream and can remain elevated for several hours after exercise.
- **Impact on mood:** These endorphins act on opioid receptors in the brain, reducing the perception of pain and producing feelings of euphoria and well-being—often referred to as the “runner’s high.”



Exercise Influences Mood Through Several Interconnected Physiological Mechanisms



2. Neurotransmitter Activity: Chemical messengers that transmit signals between neurons

- **Dopamine:**

- Promotes pleasure, motivation, and reward.
- Exercise increases dopamine availability and receptor sensitivity, contributing to better focus and enjoyment.

- **Serotonin (5-HT):**

- Regulates mood, anxiety, and sleep.
- Physical activity boosts serotonin production and reuptake efficiency, helping alleviate symptoms of depression and anxiety.

- **Norepinephrine (Noradrenaline):**

- Enhances alertness and energy.
- Exercise stimulates norepinephrine release, which can improve attention and stress resilience.

Exercise Influences Mood Through Several Interconnected Physiological Mechanisms

3. Hormonal Balance

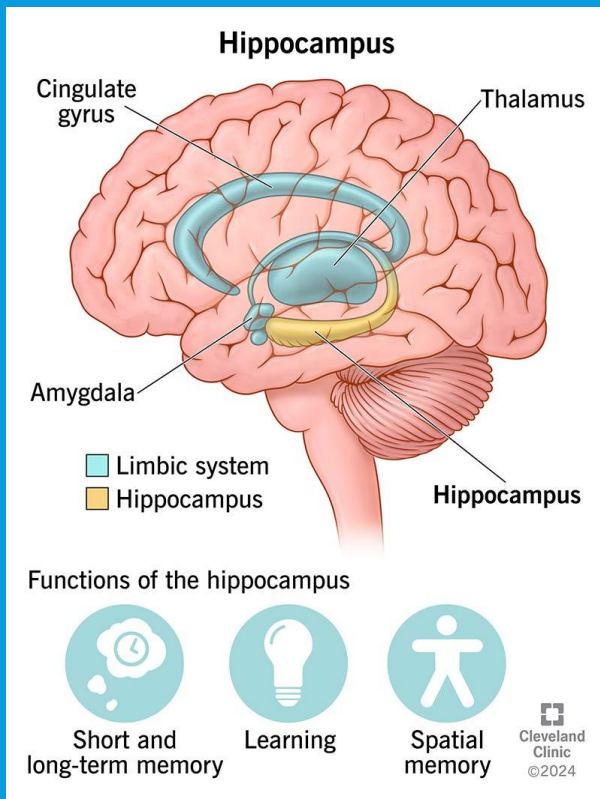
• **Cortisol (Stress Hormone):**

- Chronic stress leads to elevated cortisol, which is associated with depression and anxiety.
- Regular moderate exercise helps regulate cortisol production and enhances the body's stress response, leading to lower baseline levels over time.

• **Adrenaline (Epinephrine):**

- Temporarily spikes during exercise, boosting energy and alertness feelings of excitement and motivation.
- Controlled release during exercise can help the body adapt to stress better.

Exercise Influences Mood Through Several Interconnected Physiological Mechanisms

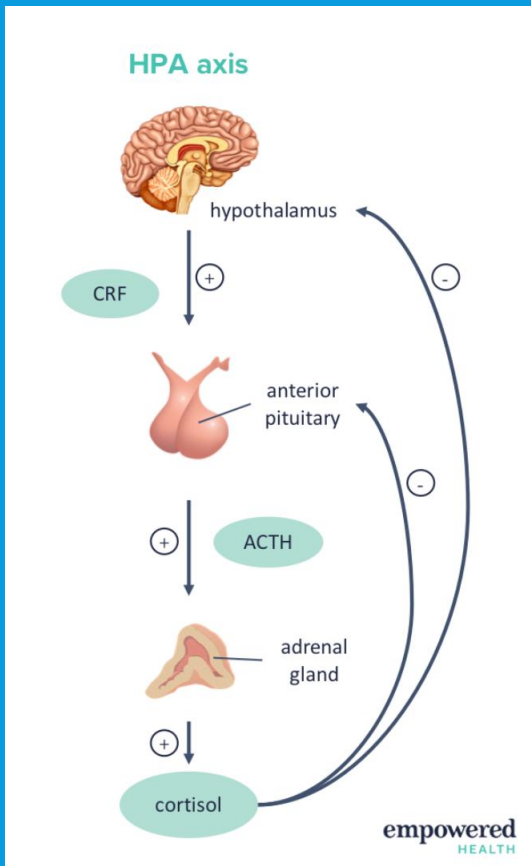


- **Insulin-like Growth Factor-1 (IGF-1):**
 - Exercise, particularly resistance training, can increase IGF-1 levels, which are associated with improved mood and cognitive function.
- **Brain-Derived Neurotrophic Factor (BDNF):**
 - A protein that supports neurogenesis (growth of new neurons) and synaptic plasticity.
 - Exercise increases BDNF, especially in the hippocampus, which is critical for mood regulation and cognitive function. (Hippocampus: a seahorse-shaped structure in the brain's temporal lobe, primarily responsible for learning, memory, spatial navigation.)

Exercise Influences The Stress Response System & Promotes Resilience To Daily Life Stressors

1. Regulation of the Hypothalamic-Pituitary-Adrenal (HPA) Axis

Exercise acts as a mild, controllable stressor that trains the HPA axis to respond more efficiently.



- Reduces baseline cortisol levels, preventing chronic overactivation of the stress response.
- Enhances negative feedback sensitivity, meaning the body can better “shut off” the stress response once a challenge is over.
- Promotes a quicker return to homeostasis after a stressor, resulting in less wear and tear on the body (reduced allostatic load).

Exercise Influences The Stress Response System & Promotes Resilience To Daily Life Stressors

The Autonomic Nervous System

Sympathetic NS

Norepinephrine and Epinephrine

Fight, Flight or Freeze

Increases

- Heart rate
- Respiratory rate
- Blood pressure
- Pupil dilation

Decreases

- Digestion
- Urine production



Parasympathetic NS

Acetylcholine

Rest and Digest

Increases

- Digestion

Decreases

- Heart rate
- Respiratory rate
- Blood pressure
- Pupil dilation

2. Balancing the Autonomic Nervous System

Physical activity helps modulate the balance between the sympathetic (“fight or flight”) and parasympathetic (“rest and digest”) branches:

- It lowers resting heart rate and blood pressure, signs of reduced sympathetic tone.
- It boosts parasympathetic activity, enhancing relaxation, recovery, and emotional regulation.

Exercise Influences The Stress Response System & Promotes Resilience To Daily Life Stressors

3. Psychological Resilience: Regular movement fosters

- A greater sense of control and self-efficacy, both of which are protective against stress.
- Improved sleep quality, which is critical for emotional regulation.
- A stronger mind-body connection, increasing awareness and management of stress symptoms.
- Reducing Inflammation: Chronic inflammation is a known contributor to stress and anxiety. Regular physical activity has anti-inflammatory effects, which can help mitigate the negative impact of stress.



Cognitive Benefits Of Exercise

1. Enhanced Memory

- **Hippocampal Growth:** Aerobic exercise increases the size and activity of the hippocampus, the brain region crucial for learning and memory.
- **Improved Memory Consolidation:** Exercise promotes better encoding and consolidation of memories, especially after learning sessions.
- **Greater Long-Term Recall:** Regular physical activity helps preserve memory in aging populations and reduces the risk of cognitive decline.

Cognitive Benefits Of Exercise

2. Improved Executive Function

- **Better Attention and Focus:** Exercise enhances the brain's ability to concentrate, shift attention, and manage multiple tasks.
- **Faster Cognitive Processing:** Physical activity speeds up information processing and reaction times.
- **Enhanced Inhibitory Control:** Movement helps the brain regulate impulses and supports better decision-making.

Cognitive Benefits Of Exercise

3. Increased Neuroplasticity

- **Growth of New Neurons (Neurogenesis):** Exercise stimulates brain-derived neurotrophic factor (BDNF), which supports the creation of new brain cells.
- **Strengthened Synaptic Connections:** Movement enhances the efficiency and strength of neural pathways.
- **Adaptation and Learning:** A more plastic brain is better at adapting to new challenges, recovering from injury, and learning new skills.

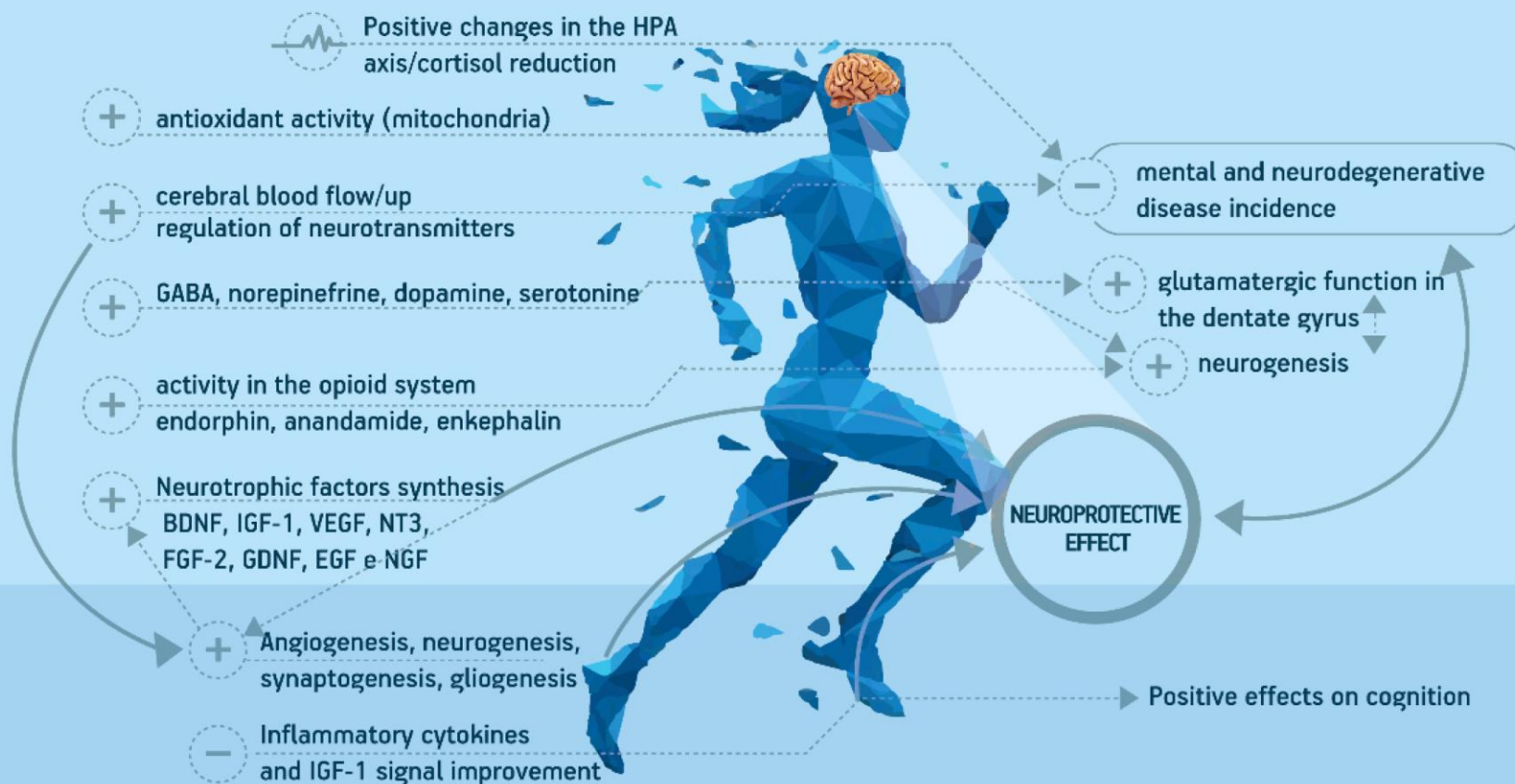
Cognitive Benefits Of Exercise

4. Additional Cognitive Benefits

- **Mood and Stress Regulation:** Exercise reduces cortisol and boosts mood-enhancing neurotransmitters like dopamine and serotonin, indirectly supporting cognitive function.
- **Reduced Risk of Neurodegenerative Diseases:** Regular activity is associated with lower rates of Alzheimer's, Parkinson's, and other forms of dementia.

SUMMING IT UP!

Neurophysiological and neurochemical effects of exercise

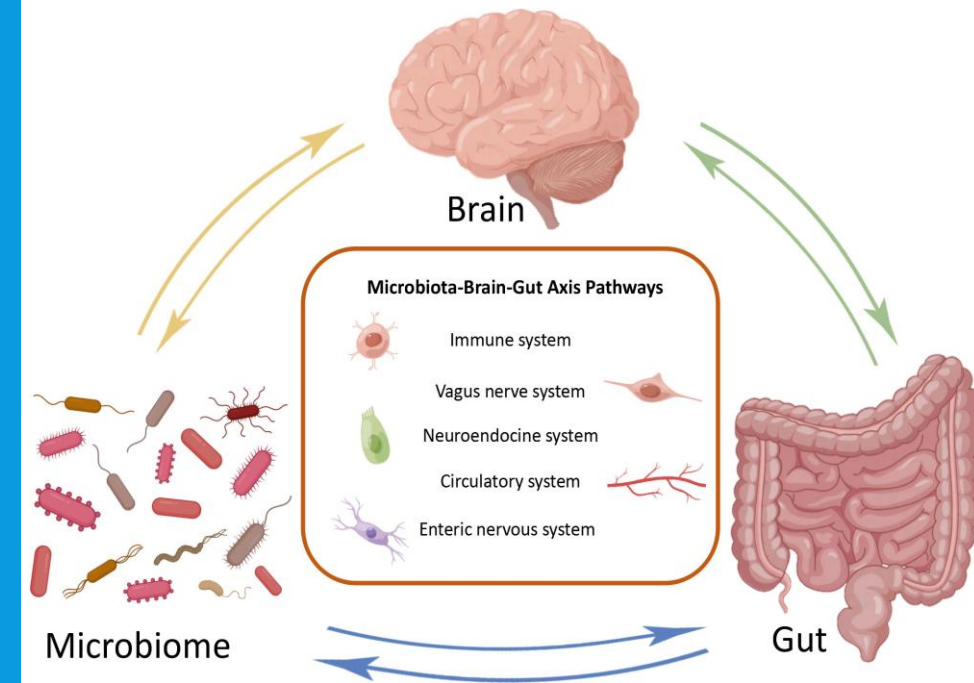


Gut-Brain Axis

Definition: The gut-brain axis is the bidirectional communication system between the gastrointestinal (GI) tract and the brain.

Key Players:

- **Central Nervous System (CNS)** – including the brain and spinal cord.
- **Enteric Nervous System (ENS)** – the "second brain" located in the gut wall.
- **Vagus Nerve** – a major communication pathway between the gut and brain.
- **Gut Microbiota** – trillions of microbes that influence brain function and health.
- **Immune System & Hormones** – mediate signals affecting mood and behavior.



Gut-Brain Axis

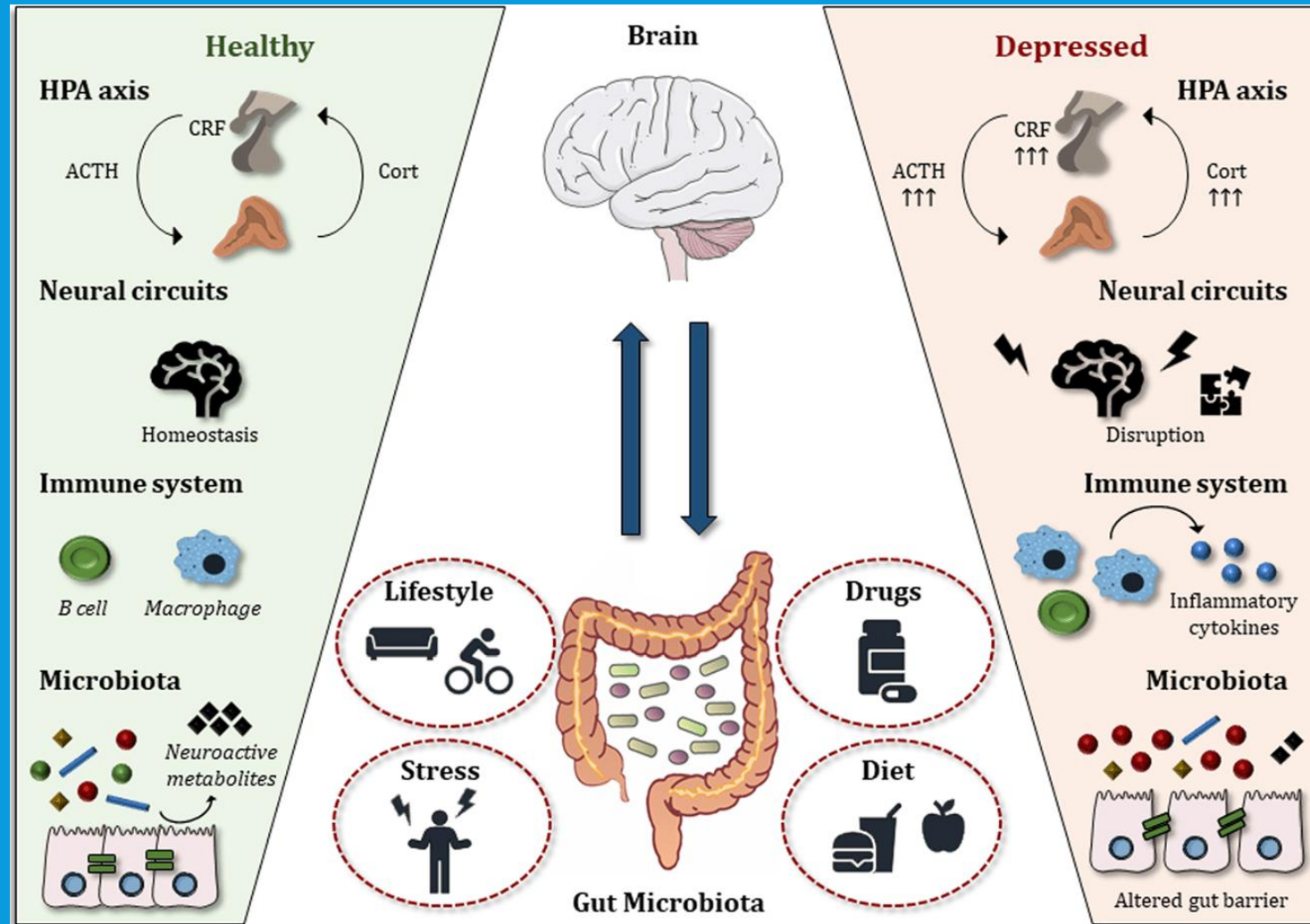
Communication Pathways:

- **Neural** – primarily via the vagus nerve and enteric nervous system.
- **Hormonal** – through gut hormones like ghrelin, leptin, and cortisol.
- **Immune** – via cytokines and inflammatory mediators.
- **Microbial Metabolites** – like short-chain fatty acids (SCFAs) and neurotransmitters (e.g., serotonin, GABA).

Roles & Functions:

- Regulates **digestion and appetite**.
- Influences **mood, stress response, and mental health** (e.g., anxiety, depression).
- Impacts **cognitive functions** such as memory and attention.
- Supports **immune system function and inflammation control**.

Gut-Brain Axis



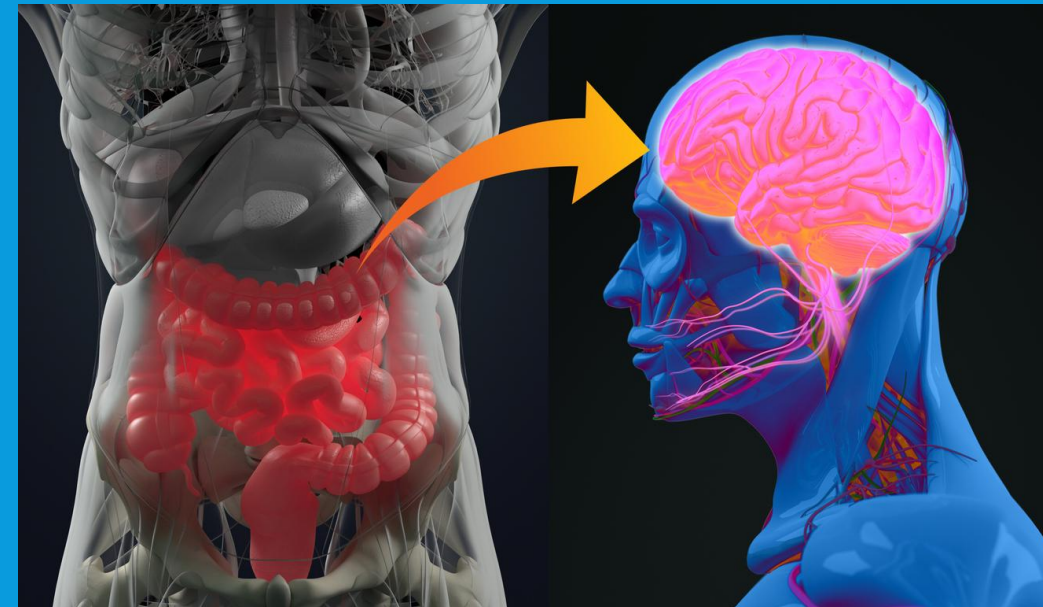
Gut-Brain Axis

Disruptions in the gut-brain axis can contribute to:

- Irritable bowel syndrome (IBS)
- Mood disorders (e.g., depression, anxiety)
- Neurodevelopmental conditions (e.g., autism spectrum disorders)
- Chronic inflammation and autoimmune diseases

Improving Gut-Brain Health:

- Balanced diet rich in fiber, prebiotics, and probiotics
- Regular physical activity
- Stress management
- Adequate sleep
- Avoiding unnecessary antibiotics
- Psychobiotics: Bacteria that have a beneficial effect upon behavior and mood



Fitness Programming to Support Mental Health

1. Begin with Intention: Mindful Movement Warm-Up

- **Purpose:** Ground clients in the present moment; enhance body awareness and emotional regulation.
- **Strategy:**
 - Incorporate breath-led dynamic movements (e.g., gentle spinal rolls, cat-cow, walking lunges with breath).
 - Use cueing that draws attention to internal sensations (“Notice how your body feels as you move”).
 - Add grounding techniques like heel rocks or standing balance to foster a sense of control and presence.



Fitness Programming to Support Mental Health



2. Utilize Rhythmic and Repetitive Movement

- **Purpose:** Rhythmic activities have been shown to regulate the nervous system and promote emotional stability.
- **Examples:**
 - Walking, cycling, rowing, swimming
 - Mat Pilates with continuous flow
 - Light dance or aerobic patterns
- **Programming Tip:** Keep intensity moderate to activate parasympathetic tone and minimize cortisol spikes.

Fitness Programming to Support Mental Health

3. Incorporate Breathwork and Autonomic Regulation

- **Purpose:** Leverage breath to down-regulate the stress response.
- **Techniques:**
 - 4-7-8 breathing post-exercise
 - Box breathing during cooldown (4-4-4-4)
 - Exhale-focused breathwork during effort to reduce tension
- **Cueing:** “Inhale to expand, exhale to release tension.”



Fitness Programming to Support Mental Health

4. Encourage Play and Joy

- **Purpose:** Positive emotion and laughter reduce cortisol, enhance neuroplasticity, and build emotional resilience.
- **Programming Options:**
 - Add games (partner ball toss, animal walks, “Simon Says” movements)
 - Integrate light choreography or dance sequences
 - Use music with a positive emotional tone



Fitness Programming to Support Mental Health



5. Leverage Strength Training for Empowerment

- **Purpose:** Resistance training improves mood and self-efficacy.
- **Approach:**
 - Focus on functional, confidence-building movements (e.g., squats, lifts, carries).
 - Highlight progress: “You’re stronger this week than last.”
 - Use circuits to maintain engagement without overloading intensity.

Fitness Programming to Support Mental Health

6. Integrate Flow-State Practices

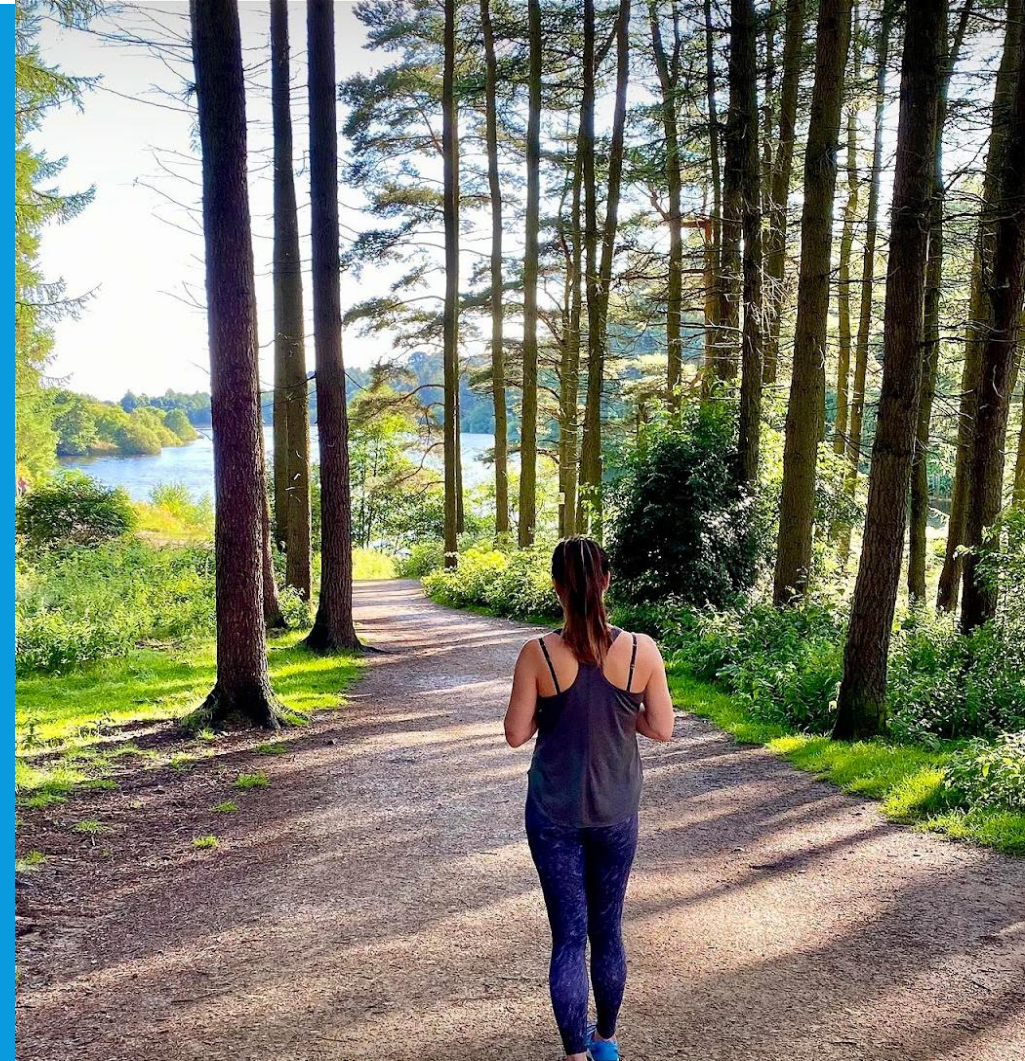
- **Purpose:** Flow states improve focus, emotional regulation, and stress resilience.
- **Best Modalities:**
 - Vinyasa-style yoga, Pilates flow, tai chi, martial arts-inspired drills
 - Cue smooth transitions and encourage intrinsic pacing
- **Tip:** Keep challenge level just above comfort zone to maintain flow.



Fitness Programming to Support Mental Health

7. Use Nature and Environment as Tools

- **Purpose:** Nature exposure reduces anxiety and promotes mood elevation.
- **Strategy:**
 - Take sessions outdoors when possible (walks, resistance bands in parks)
 - Encourage “movement homework” like forest walks or gardening



Fitness Programming to Support Mental Health

8. Include Reflection and Integration Time

- **Purpose:** Cognitive integration reinforces emotional gains from movement.
- **Tactics:**
 - 3-5 min post-workout journaling: “How do you feel now vs. before?”
 - Use a “word check-in” before and after sessions (e.g., one word to describe mood)
 - Verbalize and validate emotional shifts during sessions



Fitness Programming to Support Mental Health

9. Train Consistency Over Intensity

- **Purpose:** Regular movement is more beneficial for mental health than sporadic high-intensity workouts.
- **Action:**
 - Design sustainable, flexible plans
 - Offer shorter “mini movement snacks” (5–15 min bursts)
 - Reinforce the mental health value of just “showing up”



Fitness Programming to Support Mental Health

10. Foster Safe, Supportive Social Connection

- **Purpose:** Group movement can ease isolation, foster belonging, and elevate mood.
- **Strategies:**
 - Include small group formats with cooperative exercises
 - Promote positive interaction (“Cheer on your partner”)
 - Provide community-based accountability and support



THANK YOU!



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Live Happily Ever Fit!



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