Fifty brain health facts

from Season One of “Your Brain On”

By Drs Dean and Ayesha Sherzai from their free email newsletter you may subscribe to at TheBrainDocs.com

Five of our favorite facts — some fun, some important — from each

episode, starting with...

💘 LOVE 💘

1

The stress you experience in the early stages of a new romantic endeavor? That's an evolutionary response! It heightens your alertness to social cues and helps facilitate emotional expression — vital for forming new bonds.

2

When you get infatuated with someone, your serotonin levels drop. This can lead to obsessive thoughts and behaviors, similar to those observed in conditions like obsessive-compulsive disorder (OCD).

3

When you experience the extreme emotional stress of a breakup, your heart can literally change shape. This is called a 'takotsubo cardiomyopathy', a term coined by Japanese doctors in 1990, named after a pot used to catch octopi, because the doctors thought the left ventricle of a 'broken heart' looked kind of like an octopus in a trap!

4

Falling out of love can evoke physical pain, as observed through fMRI scans showing brain activity in regions associated with experiencing physical discomfort.

5

Support from friends and family during heartbreak aids in recovery by providing comfort and encouragement, leveraging our neuroplastic ability to find solace and build new connections.

🍰 SUGAR 🍰

6

Sugar consumption triggers signals from taste bud receptors to the gustatory cortex, creating the perception of ‘sweetness’ in your brain.

7

Sugar isn’t a dietary villain! Glucose, derived from carbohydrates, is absolutely necessary for energy production. It’s the brain's primary fuel source. You need a constant — but healthy — amount optimal cognitive function.

8

Evolutionary factors likely contribute to our preference for sweet foods — our ancestors developed a preference for glucose-rich foods whilst foraging, while also developing a distaste for bitter tastes, signaling potential toxicity. Hence, our ‘sweet tooth’!

9

Fruit is at its most sweet when it’s ripest, further emphasizing the evolutionary foundations of our inclination towards glucose-rich foods.

10

Excessive sugar consumption in modern diets, coupled with a lack of fiber, leads to spikes in blood sugar levels, damaging blood vessels in the brain and hindering oxygen delivery, resulting in cognitive issues like brain fog.

🏈 FOOTBALL & FANDOM 🏈

11

Watching sports with fellow fans activates your brain’s reward systems, releasing neurotransmitters like dopamine and oxytocin and giving you a sense of belonging.

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The neurological systems which help us feel empathy can ‘transport us into the minds of players’ as we watch, influencing rushes of joy or pain based on our team’s performance.

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Physiological reactions to sports events, such as increased heart rate and sweating, are tied closely to the limbic system, where emotions are processed.

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A 2012 study involving Spanish soccer fans showed that sporting events can elicit hormonal responses, impacting factors like blood pressure and energy mobilization.

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The stress response to sports events activates the sympathetic nervous system, enhancing focus and attention, akin to the body's preparation for "fight or flight" situations.

😴 DREAMS 😴

16

You might know that dreams happen most during the REM (Rapid Eye Movement) stage of sleep. Scientists who study lucid dreams have used these eye movements to prove whether people really can control their dreams! By giving people pre-determined eye movements to make while asleep, researchers can figure out the validity of people's claims that they can remain lucid while dreaming.

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REM sleep is characterized by decreased activity in the prefrontal cortex, allowing for uninhibited thought processes and supporting creative problem-solving. So when you say you're going to "sleep on it," there's neuroscience backing you up!

18

REM atonia is a form of paralysis which helpfully prevents you from making physical movements while you sleep, so if you dream that

you’re playing tennis, for example, you don’t actually swing an imaginary racquet around in bed!

19

Does cheese really give you weird dreams? Well, it’s the dairy we tend to eat closest to bedtime (think: pizza, lasagne, raclette), and many of us aren’t very good at digesting dairy. If your body is working hard at digesting something, you’ll sleep lighter, so you’ll be more likely to remember your dreams. It’s not that you’re necessarily dreaming more. It’s that you’re recalling more.

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Dreams do indeed reflect the anxieties and stresses of waking life — not so much in a directly literal way, but certainly in an abstract manner.

LOBOTOMIES

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In retrospect, lobotomies were obviously a dark mark on medical history, but there was a time when they were believed to a freeing alternative to life in dismal ‘mental institutions’.

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One of the most famous people who underwent a lobotomy was Rosemary Kennedy, sister of President John F. Kennedy. The operation, sought by her father, destroyed her life. Eunice Kennedy Shriver, another Kennedy sister, went on to found the Special Olympics in Rosemary’s honor.

23

Portuguese neurologist Egas Moniz, a prolific pioneer of lobotomies, won the Nobel Prize in Medicine for developing the operation. It’s one

of the most controversial awards in the prize's history, but the Nobel Foundation have a firm stance on not rescinding past accolades.

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Lobotomies began to fall out of favor in the 50s and 60s due to ethical concerns and advancements in medicine.

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Many people believe that emerging 'brain machine interface' technologies, like Elon Musk's Neuralink, could be a retread of the ethical qualms raised by lobotomies.

😵 ADHD 😵

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The DSM — the authoritative handbook for diagnosing mental disorders — didn’t mention any form of ADHD until 1968, when it was called ‘hyperkinetic reaction of childhood’.

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The current edition of ADHD lists three subtypes of ADHD: impulsive (restlessness, impulsivity, and difficulty sitting still), inattentive (easily distracted, forgetfulness, disorganization), and a combination of both.

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Research suggests potential links between ADHD and structural anomalies in the corpus callosum — the main bridge between the brain's left and right hemispheres — which may contribute to impulsivity and inattention.

29

Symptoms of ADHD can overlap with those of other mental health disorders, like anxiety, leading to difficulties in diagnosis and

understanding. For example, procrastination may manifest differently in individuals with ADHD compared to those without the disorder.

30

Overdiagnosis AND underdiagnosis of ADHD are prevalent, influenced by expanding diagnostic criteria and misinformation, particularly on social media. Don’t solely rely on social media for your health information!

🤦‍♀️ BEING A WOMAN 🤦‍♀️

31

Historically, dismissive diagnoses like 'hysteria' have overshadowed women's health concerns, including renowned figures like Virginia Woolf and Frida Kahlo.

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The physical, structural differences between female and male brains are so negligible, some experts refer to the brain as ‘monomorphic’ across the sexes.

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Women are disproportionately affected by Alzheimer's disease, with factors like post-menopausal hormonal changes, genetic variations, and longer lifespans contributing to higher prevalence rates.

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Despite advancements, neuroscience still exhibits a significant male bias, with a lack of sex-inclusive research and quantification of sample sizes.

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Studies on hormone replacement therapy’s impact on Alzheimer's disease prevention have yielded conflicting results — we need more comprehensive research in this area.

ALZHEIMER’S

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Direct costs associated with Alzheimer's disease — the fastest-growing epidemic in developed nations — exceed $350 billion annually, while indirect expenses surpass $340 billion. This could soar to over $1.1 trillion by 2050.

37

Alzheimer’s, the most common form of dementia, physically shrinks the brain, causing brain cells to die and resulting in memory decline, reduced capacity for thought and focus, difficulties with behavior and social situations, and, eventually, death.

38

Approximately 45% of people with an Alzheimer's diagnosis aren't informed of it by their physician, often due to the misconception that there’s no cure and to spare the family's feelings. Good communication is essential.

39

Caregiving for Alzheimer’s patients disproportionately falls on women, who make up two-thirds of caregivers and of those suffering from Alzheimer's. We desperately need better support systems and research focusing on how Alzheimer’s affects women.

40

Amyloid plaques and tau tangles inside neurons are core hallmarks of Alzheimer’s. New treatments like Aducanumab and Donanemab target these plaques and tangles, aiming to restore cognitive function. Lifestyle factors, particularly diet, are also key in mitigating the effects of these abnormalities, with diets rich in omega-3 fatty acids often recommended.

🏃 CARDIO 🏃

41

Cardio workouts boost serotonin levels, the “feel-good” neurotransmitter, which can alleviate stress and enhance mood regulation.

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Regular aerobic exercise triggers the release of VEGF, stimulating the growth of new blood vessels in the brain and improving blood flow and oxygen delivery.

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One of the absolute best forms of exercise? DANCE! It’s both mentally AND physically stimulating, AND social, AND free, AND can be done anywhere with no equipment!

44

Over time, regular exercise helps the body adapt to stress by reducing cortisol levels, which in turn strengthens the immune system and protects against diseases.

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High-intensity cardio sessions induce the release of endocannabinoids and Human Growth Hormone (HGH), contributing to a ‘runner's high’ sensation.

🇺🇸 PRESIDENTIAL AGING & MEMORY 🇺🇸

46

Benjamin Franklin was aged 81 when he made significant contributions to the United States Constitution. He's a prime example of wisdom and productivity in old age.

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Modern neuroscience distinguishes between 'normal forgetting' and significant memory loss, offering insights into the aging process and memory function.

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Physical appearance and speech patterns are poor indicators of cognitive abilities; individuals with memory disorders may appear articulate despite cognitive decline.

49

Many stories, particularly those of marginalized groups, are often overlooked in collective/social memory, highlighting the importance of preserving diverse perspectives to understand our shared history fully.

and last but not least, 50

Understanding memory processes can provide valuable insights into political discourse and decision-making, particularly in times of heightened societal tension.