

Improving, Enhancing And Preserving Brain Health

By Dr. R. G. Wiseman Pinto

The human brain is an extraordinary organ, unique in its complexity and far superior to that of other species. It regulates countless vital functions, from voluntary actions such as movement and speech to involuntary ones like breathing and digestion. Beyond these functions, it is the seat of memory, emotions, thought, and personality. Different regions of the brain specialize in different roles: the cerebrum governs higher thinking and decision-making, the cerebellum ensures coordination and balance, while the brainstem sustains life itself through its control of respiration and other critical processes. What makes the brain even more remarkable is its ability to learn, reason, concentrate, communicate through language, and make decisions, allowing humans to continuously adapt to the demands of life.

World Brain Health Day, observed every year on July 22, emphasizes the global importance of maintaining brain health. It was initiated in 2014 by the World Federation of Neurology in collaboration with the Global Neurological Association to raise awareness about strategies to nurture and protect brain function. Each year, the initiative promotes preventive strategies, lifestyle changes, and cognitive well-being under the central message of “Brain Health for All Ages.” The goal is to remind people that protecting the brain is crucial not only for individual wellness but also for productivity, creativity, and quality of life.

Science tells us that the brain contains around 170 billion cells of more than 3,000 different types. These cells are responsible for storing memory, retrieving information, processing emotions, and even producing dreams. Because the brain is so integral to every aspect of human life, people everywhere aspire to keep it sharp, focused, and resilient. Fortunately, there are many ways to strengthen brain power and memory through everyday practices.

Hydration is fundamental. Drinking plenty of water ensures that brain cells function efficiently, as even mild dehydration can affect focus and cognitive performance. Nutrition is equally critical, and foods rich in vitamins, minerals, and healthy fats provide essential fuel for the brain. Fruits, vegetables, nuts, cereals, proteins, fish, seeds, and especially omega-3 fatty acids all promote mental wellness. Specific foods

such as walnuts, salmon, turmeric, yogurt, avocados, broccoli, cauliflower, blueberries, sweet potatoes, popcorn, dark chocolate, and even traditional South Indian foods like idlis, dosa, sambar, buttermilk, and curd rice have shown proven benefits. At the same time, refined and heavily processed foods should be avoided as they compromise brain health.

Physical activity plays a pivotal role as well. Walking, running, cycling, swimming, dancing, yoga, gardening, and gym workouts all improve circulation to the brain and stimulate the release of chemicals that encourage neuroplasticity, the brain's ability to adapt and form new connections. A positive mindset, social connections through regular interaction with loved ones, and mindfulness practices such as meditation are also vital in strengthening mental health. Adequate sleep, ideally between seven and nine hours each night, gives the brain the chance to repair and consolidate memory.

In today's world, where digital distractions are constant, it is equally important to train the brain to remain focused. Learning new skills, picking up a language, or practicing a hobby keeps the mind sharp and promotes lifelong learning. Playing games such as chess, solving puzzles, engaging in problem-solving tasks, or even simple recall exercises build resilience and improve memory. Activities like playing or listening to music, teaching others, reading newspapers, or exploring new ideas provide continuous mental stimulation. Stress management, avoidance of harmful substances like alcohol, tobacco, and narcotics, and the pursuit of relaxation through prayer or community service further contribute to healthy brain functioning.

One crucial neurotransmitter for memory and learning is acetylcholine, which serves as a chemical signal between neurons and between neurons and muscles. When levels of acetylcholine drop, individuals may struggle with concentration, memory loss, and even muscle weakness. This decline is especially evident in conditions like Alzheimer's disease. Since acetylcholine levels naturally decrease with age, it is vital to maintain nutrition and habits that support its production. Foods rich in choline, such as eggs, nuts, seeds, and leafy greens, are especially beneficial. Vitamin D, which the body produces through sunlight exposure, is also necessary for brain health, as it helps prevent dementia, depression, and other neurological conditions. The popular "20-20-20" rule—looking at something 20 feet away for 20 seconds every 20 minutes of screen use—is another simple but effective strategy for protecting mental sharpness in a digital age.

Intelligent people often demonstrate traits such as curiosity, humility, adaptability, and an openness to new perspectives. They listen more than they speak, remain aware of their own limitations, reflect deeply, and embrace lifelong learning. Intelligence is not a fixed quality; rather, it is shaped by genetics, environment, culture, diet, personality, and social influences. Emotional intelligence, which includes empathy, self-awareness, and relationship-building, is equally important as cognitive ability in defining true intelligence. Brain plasticity—the capacity of the brain to form and reorganize neural connections—illustrates just how dynamic the human mind can be. Neuroplasticity allows the brain to adapt after injuries, respond to new learning, and reshape itself throughout life, making continuous stimulation essential.

Scientific research shows that with age, the frontal cortex of the brain begins to show decreased gene expression, DNA damage, and oxidative stress caused by reactive oxygen species. Yet the brain retains remarkable resilience through structural plasticity (the growth of new neural pathways) and functional plasticity (the adaptation of brain functions). Creative pursuits such as painting, music, and other forms of artistic therapy are powerful tools in stimulating these adaptive processes.

Happiness also plays an essential role in brain health. It is both an art and a science, involving positive emotion, engagement, strong relationships, meaning, and accomplishment. A long-term study conducted by Dr. Robert Waldinger at Harvard University over 85 years revealed that the single most important factor in determining long-term happiness and health was not wealth, fame, or social status, but rather the quality of a person's relationships, particularly with their spouse or partner.

Recent discoveries in neuroscience highlight the role of specific proteins such as cypin, dystroglycan, and proteins involved in amyloid precursor processing in enhancing brain function. These proteins stabilize cell junctions and regulate synaptic function, which is often disrupted in conditions like Alzheimer's and Parkinson's disease. Dietary proteins rich in amino acids such as glutamate, found in foods like lean meat, fish, eggs, yogurt, beans, nuts, and blueberries, further support these vital processes.

Ultimately, control of the mind depends on multiple factors. About 50 percent is influenced by biological, genetic, and psychological temperament, 10 percent by environment and circumstances, and 40 percent by personal choices. This makes lifestyle decisions incredibly powerful in shaping overall brain health. Establishing

happiness and health clubs, nurturing family bonds, and maintaining strong friendships are all part of this holistic approach.

Brain health is not a luxury but a necessity for building better individuals, stronger societies, and a healthier world. By embracing practices such as proper nutrition, regular exercise, social connections, creativity, mindfulness, and continuous learning, we not only enhance our own mental performance but also contribute to a future where intelligence, resilience, and happiness flourish together. The brain may remain a mysterious organ in many ways, but what we already know is enough to prove that caring for it is the best investment one can make in life.

(Dr. R. G. Wiseman Pinto is a Professor of Pathology, former Head of Department at Goa Medical College, former Dean of Goa University, and the current President of the Asian Society of Cytopathology)