

A person is silhouetted against a vast, starry night sky. The Milky Way galaxy is visible, stretching across the frame from the bottom left towards the top right. The stars are numerous and bright, creating a dense field of light. The person is standing on a dark, rocky outcrop, looking up at the cosmos. The overall scene is awe-inspiring and captures the beauty of the night sky.

**Astronomy Adventure:  
Exploring the Cosmos  
Through  
MCQs and Short Explanations for Young  
Star-Gazers**

*Bhargav Bhushan Mishra*

**Neuroworld**  
**(Informative Q/A for Beginners)**  
**Vol. I**

**by:**

**Pitambari Priyadarshi Mishra**



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We are pleased to inform that all profit amount from each book will be allocated to RADD Corporate Social Responsibility (CSR) Fund. The fund will be provided to the deserving and needy students all over Nepal and to improve quality education in classroom of the government/community schools of rural Nepal.

RADD always welcomes you to co-operate, collaborate, and support from all the well-wishers and agencies.

## Preface

In the enchanting and culturally diverse land of Nepal, settled amidst the towering peaks of the Himalayas, the subject of neurology or neuroscience often remains overshadowed by other academic pursuits. It is a path less chosen, a field that is often perceived as daunting and unattainable, with limited provisions for higher education and a scarcity of specialised equipment for research and development. The enormous barriers, both literal and figurative, have kept this intricate subject at bay, because of which, in the realm of education, research, and advancement, neuroscience stands at a crossroads, awaiting discovery and recognition.

Yet, in this fast-paced world, we are witnessing an alarming increase in the prevalence of neurological diseases and conditions, a trend that is mirrored in the context of Nepal. As the burden of these neurological problems, it becomes increasingly imperative to equip our society, especially the younger generation, with a deeper insight into the intricate landscape of neurology.

With that as the major goal, this collection of neurological diseases and conditions, presented in a question-and-answer format, seeks to bridge the gap between the esoteric world of neuroscience and the layperson's understanding. In doing so, we hope to break the stereotypes surrounding the brain and the nervous system, dispelling the myths and unfounded fears that may persist for several neurological conditions, including mental health issues.

My ambition is simple yet crucial. After delving into these pages, I yearn for my readers to walk away with a fundamental understanding of various serious neurological illnesses. I hope to pique people's interest in the intricate workings of neurology, which, I believe, is a worthy pursuit for anyone.

Neuroworld (Informative Q/A for Beginners) has been in the works since 2020, and I am finally able to share its first volume with you and will soon present the remaining volumes as well. As we embark on this voyage together, let us keep in mind that the purpose of this book is not merely to disseminate knowledge but to stoke a spark of curiosity and compassion. By the end of this journey, I hope that you will emerge not only with a broader understanding of neuro-world but also with a newfound appreciation for the marvels of neuroscience. This, in itself, will be a significant accomplishment for me as well as the globe—a step towards fostering a more enlightened and compassionate society, not just in Nepal but throughout the world.

A handwritten signature in black ink, reading "Pitambari Priyadarshi Mishra". The signature is written in a cursive style with a large, stylized initial "P" and a horizontal line underneath.

**Pitambari Priyadarshi Mishra**

## Foreword

Our organization, the Regional Alliance for Development and Democracy (RADD), has made it its mission to do just that—provide opportunities to fresh, innovative thinkers and contribute to the holistic development of society. At the heart of RADD's mission lies a profound belief in the potential of the upcoming generation as the pillar upon which our collective future is built. This conviction is the cornerstone of our efforts to inspire and empower these bright young minds.

The book you hold in your hands today holds a special place in the tapestry of RADD's endeavors. It is a testament to our commitment to nurturing the intellectual curiosity and creativity of the new generation. This collection of works, curated with meticulous care, serves as a beacon, guiding the emerging talents of our time in their exploration of the intricate world of Neurology.

I want to take this moment to commend the author, Pitambari Priyadarshi Mishra, whose insightful contributions have enriched this collection. Pitambari Priyadarshi Mishra's dedication to their craft and passion for Neurology shine brightly through these pages, inspiring all who dare to delve into their words.

A special word of gratitude is also due to Pushpa Pradhananga from Image Setter Pvt. Ltd., whose creative talents have given this book its visually compelling and inviting form. The synergy between author and designer has resulted in a work that not only informs but also captivates the senses.

It is with great pride and a sense of purpose that we announce that the profits generated from the publication of this book will be deposited into our Corporate Social Responsibility (CSR) fund. These funds will be directed towards a meaningful project initiated and overseen by RADD aimed at catalyzing positive change within our society.

As you embark on this literary journey, I encourage you to absorb the knowledge, insights, and inspiration contained within these pages. May it ignite the flames of curiosity and innovation in the hearts of the new generation, for it is they who will shape the world of tomorrow.

Thank you for supporting RADD's mission and for celebrating the remarkable talents showcased in this book. Together, let us continue to pave the way for a brighter, more creative, and more inclusive future.

**Dr. Arun Kumar Singh**  
Chairman

### Q. 1: How much does the human brain weigh?

When you're born, your brain weighs about 1 pound. Throughout childhood, your brain grows to about 2 pounds. As an adult, your brain weighs around 2.7 to 3 pounds, depending on your sex and body size.

### Q. 2: What is the nervous system?

Your nervous system guides almost everything you do, think, say, or feel. It controls complicated processes like movement, thought, and memory. It also plays an essential role in the things your body does without thinking, such as breathing, blushing, and blinking. Your nervous system affects every aspect of your health, including your:

- Thoughts, memory, learning, and feelings.
- Movements, such as balance and coordination.
- Senses, including how your brain interprets what you see, hear, taste, touch and feel.
- Sleep, healing and aging.
- Heartbeat and breathing patterns.
- Response to stressful situations.
- Digestion, as well as how hungry and thirsty you feel.
- Body processes, such as puberty.

This complex system is the command centre for your body. It regulates your body's systems and allows you to experience your environment. A vast network of nerves sends electrical signals to and from other cells, glands, and muscles all over your body. These nerves receive information from the world around them. Then the nerves interpret the information and control your response. It's almost like an enormous information highway running throughout your body.

### Q. 3: What is Williams syndrome?

**Williams syndrome**, also known as **Williams-Beuren syndrome**, is a rare **neurodevelopmental** genetic condition characterised by many symptoms,

including unique physical features, delayed development, cognitive challenges, and cardiovascular abnormalities. **Williams syndrome** may cause poor growth in childhood, and most adults with the condition are shorter than average. **Williams syndrome** can also cause endocrine concerns like having too much calcium in your blood and urine, an underactive thyroid, and early puberty.

**Williams syndrome** usually occurs when someone is missing a small piece of chromosome 7. This means that most people with **Williams syndrome** have not inherited the condition from a parent. People with **Williams syndrome** have a 50% chance of passing the condition on to their children.

#### Q. 4: What is ethology?

The study of animal behaviour is known as **ethology**. **Charles Darwin**, famous for his evolutionary theory of Natural Selection, wrote in his book '**On the Origin of Species**' about instinct and the evolution of behaviours. Darwin pondered whether behaviours could evolve across generations, which would explain why some behaviours in humans and other animals are instinctual.

**Darwin's** studies of behaviour employed a method commonly used among scientists of his time: observational research. Even at a young age, he had a strong interest in nature and would record everything. Young Darwin would collect insects and birds and take extensive notes on their behavior. Observational research is a useful method of studying animal behaviour because it provides very detailed information about their behaviour in a low-cost, simple manner. Since it is not experimental, there are minimal ethical concerns as animals are not manipulated in any way. However, this method is time-consuming and relatively subjective, leaving it prone to bias and other confounding variables.

#### Q. 5: What are the main parts of the brain?

Your brain's structure is complex. It has three main sections:

- **Cerebrum:** Your cerebrum interprets sights, sounds, and touches. It also regulates emotions, reasoning, and learning. Your cerebrum makes up about 80% of your brain.
- **Cerebellum:** Your cerebellum maintains your balance, posture, coordination, and fine motor skills. It's located in the back of your brain.

- **Brainstem:** Your brainstem regulates many automatic body functions. You don't consciously control these functions, like your heart rate, breathing, sleep and wake cycles, and swallowing. Your brainstem is in the lower part of your brain. It connects the rest of your brain to your spinal cord.

#### Q. 6: How is the brain stem formed?

The human brainstem emerges from two of the three primary brain vesicles formed by the neural tube. The **mesencephalon** is the second of the three primary vesicles and does not further differentiate into a secondary brain vesicle. This will become the midbrain.

#### Q. 7: What is the cerebellum?

The cerebellum is a part of your brain located at the back of your head, just above and behind where your spinal cord connects to your brain itself. The name "**cerebellum**" comes from Latin and means "**little brain**". For centuries, scientists believed your cerebellum's job was to coordinate your muscle movements.

As you walk, balance on one foot, or ride a bike, each movement is tightly controlled by a brain region called the **cerebellum**. The cerebellum is located at the back of the brain and is small but mighty. Because it is so small, the cerebellum got its name from the Latin for "**little brain**", but it is actually home to over 80% of all the neurons in the whole brain. One of the many types of neurons found in the cerebellum is the **Purkinje cell**.

#### Q. 8: What is social isolation and loneliness?

Social connections and our social environments actually play a huge role in our physical and mental health. When we are physically separated from others, this is termed **social isolation**, and when we feel separated from others but are not necessarily physically separated, this is termed **loneliness**. Social isolation and loneliness are both seen as public health risk factors for a number of psychiatric disorders such as major depressive disorder, generalised anxiety, sleep disturbances, cardiovascular disease, and even early mortality.



### Q. 9: What is the autonomic nervous system?

Many parts of the brain are needed to regulate your emotions, but emotions also activate a part of the nervous system that extends beyond the brain, called the **autonomic nervous system**, which is responsible for the famous ‘fight or flight’ (**sympathetic**) and ‘rest and digest’ (**parasympathetic**) responses.

### Q. 10: What is interoception?

Via the autonomic nervous system, the brain sends signals to internal organs like the heart, lungs, and gut, but it also receives signals back. This sensation of your internal bodily state is called **Interoception**.

### Q. 11: What is lucid dreaming?

Most people wake up very soon after realizing they are dreaming, but some are able to remain in control of their minds and bodies while in a dream state. The experience of controlling one’s mind and body while dreaming is called **lucid dreaming**.

### Q. 12: What are the lobes that make up your brain?

Each side of your brain has different lobes (sections). While all the lobes work together to ensure normal functioning, each lobe plays an important role in some specific brain and body functions:

**Frontal Lobes:** The **frontal lobes** are in the front part of your brain, right behind your forehead. This is the largest lobe, and it controls voluntary movement, speech, and intellect. The parts of your **frontal lobes** that control movement are called the **primary motor cortex**, or **precentral gyrus**. The parts of your brain that play an important role in memory, intelligence, and personality include your prefrontal cortex as well as many other regions of your brain.

**Occipital Lobes:** These lobes in the back of your brain allow you to notice and interpret visual information. Your **occipital lobes** control how you process shapes, colours, and movement.

**Parietal Lobes:** The **parietal lobes** are near the centre of your brain. They receive and interpret signals from other parts of your brain. This part of your brain integrates many sensory inputs so that you can understand your environment

and the state of your body. This part of your brain helps give meaning to what's going on in your environment.

**Temporal Lobes:** These parts of the brain are near your ears on each side of your brain. The *temporal lobes* are important for being able to recall words or places that you've been. It also helps you recognise people, understand language, and interpret other people's emotions.

**Limbic Lobes:** The *limbic lobe* sits deep in the middle portions of your brain. The limbic lobe is a part of your temporal, parietal, and frontal lobes. Important parts of your limbic system include your *amygdala* (best known for regulating your "fight or flight" response) and your hippocampus (where you store short-term memories).

**Insular Lobes:** The *insular lobes* sit deep in the temporal, parietal, and frontal lobes. The *insular lobe* is involved in the processing of many sensory inputs, including sensory and motor inputs, autonomic inputs, pain perception, perceiving what is heard, and overall body perception (the perception of your environment).

### **Q. 13: What is REM sleep?**

Many of the most vivid dreams we remember upon waking occur during a part of sleep known as *rapid eye movement sleep*, or *REM sleep*. The study of lucid dreams has been most studied during REM sleep. However, one of the primary reasons researchers have focused on lucid dreams during REM sleep is actually unrelated to the vividness of the dreams but rather because of an amazing property of REM sleep. Individuals in REM sleep are unable to move a muscle, with the exception of those related to breathing and as the name would suggest, eye movements.

### **Q. 14: What is the diaphragm?**

Our brain controls breathing by sending signals to a large, flat muscle underneath our lungs called the *diaphragm*.

### **Q. 15: What causes a hiccup?**

Our brain controls breathing by sending signals to a large, flat muscle underneath our lungs called the diaphragm. When the *diaphragm* contracts,

it pulls down our lungs so that they inflate with air. Usually, this process occurs smoothly, often without having to consciously think about it. But occasionally, the brain will tell the diaphragm to abruptly contract. This sucks air down towards the lungs so fast that the muscles in our throat get caught off guard. Our vocal cords then snap shut, causing what we call a hiccup. Hiccups can be caused by swallowing excessive air, acidity in the stomach, or even prolonged bouts of laughter. And sometimes very serious and persistent hiccups can be caused by strokes or tumours in the brain.

### **Q. 16: What exactly is hiccupping?**

Hiccupping is a phenomenon that occurs in many mammals, including cats, rabbits, and horses. And though hiccupping occurs relatively infrequently for most mature humans, human foetuses (who spend their time in an essentially aquatic environment in the womb) spend up to 2.5% of their day actively hiccupping. The frequency of hiccupping then slowly decreases through infancy and into childhood. Hiccupping is a **vestigial behaviour** that is a remnant of the movement patterns that occurred when breathing through the gills of our fish- or frog-like ancestors.

There are other competing theories of the origin of hiccupping, such as the **“burping” hypothesis**. The burping hypothesis argues that hiccups serve a function similar to a burp: they help expel air that accumulates in the stomach when a mammalian infant is sucking milk from their mother.

### **Q. 17: What is vestigial behavior?**

A **vestigial behavior** is something that originally served a purpose in one of our ancestors, but that has lost this purpose over the course of evolution.

### **Q. 18: What is cerebellum balance?**

The cerebellum is important for movement control and plays a particularly crucial role in balance and locomotion. As such, one of the most characteristic signs of **cerebellar** damage is walking ataxia.

### **Q. 19: What are hypnic jerks?**

**Hypnic jerks** (also called **hypnagogic jerks** or **myoclonic jerks**) occur when someone experiences a sudden contraction of a part of their body, usually their

arms or legs, just as they're drifting off to sleep. After a **hypnic jerk**, people often feel the eerie sensation that they are falling before abruptly waking up. **Hypnic jerks** are merely disruptive and scary for the modern human that is settling onto their cushy mattress for an expectedly stable night of sleep.

Some scientists have postulated that the **hypnic jerk** is a protective reflex that aided the survival of pre-modern humans. When pre-modern humans made a habit of sleeping in trees, they may have developed a startle reflex so that they could quickly act to grab a branch if their bodies sensed that they were falling. It is possible that **hypnic jerks** may be a remnant of this branch-grabbing reflex. As the body relaxes as it drifts off to sleep, the brain sometimes mistakes this relaxation for falling and instructs the limbs to reach out to save itself from a fall.

#### **Q. 20: What are 5 functions of the cerebellum?**

The cerebellum controls voluntary movements such as: **walking; posture; balance; coordination; eye movements; and speech.**

#### **Q. 21: What is the function of Pons in brain?**

Your pons is a part of your brainstem, a structure that links your brain to your spinal cord. It handles unconscious processes and jobs, such as your sleep-wake cycle and breathing. It also contains several junction points for nerves that control muscles and carry information from senses in your head and face.

#### **Q. 22: Why to study animal behavior in the first place?**

We cannot exactly ask an animal how it is feeling or what it is experiencing; we measure behaviour to gain insight into its lived experience, which will help us understand their minds and our minds better. From a Darwinian perspective, studying animal behaviour may allow us to gain insight into the evolution of certain behaviours, distinguish between what is innate and what is learned, and identify the aspects of our nature that make us uniquely human.

#### **Q. 23: What makes up a neuron?**

A neuron has three basic parts: a cell body and two branches called an **axon** and a **dendrite**. Within the cell body is a nucleus, which controls the cell's activities and contains the cell's genetic material. The axon looks like a long tail

and sends messages from the cell.

**Q. 24: What are the 4 types of neurons?**

Neurons are divided into four major types: **unipolar**, **bipolar**, **multipolar**, and **pseudounipolar**. **Unipolar neurons** have only one structure extending from the **soma**; **bipolar neurons** have one **axon** and one **dendrite** extending from the soma.

**Q. 25: What is the brainstem?**

The brainstem is the structure that connects the cerebrum of the brain to the spinal cord and cerebellum. It is composed of three sections in descending order: **the midbrain**, **pons**, and **medulla oblongata**.

**Q. 26: What is the cerebellum and brainstem?**

**Cerebellum** is located under the **cerebrum**. Its function is to coordinate muscle movements, maintain posture, and balance. **Brainstem** acts as a relay centre connecting the **cerebrum** and **cerebellum** to the spinal cord.

**Q. 27: What part of the brain controls memory?**

Most available evidence suggests that the functions of memory are carried out by the **hippocampus** and other related structures in the **temporal lobe**. The **hippocampus** and the **amygdala**, nearby, also form part of the **limbic system**, a pathway in the brain.

**Q. 28: What happens if cerebellum is damaged?**

**Cerebellar dysfunction** causes balance problems and gait disorders along with difficulties in coordination, resulting in **ataxia**, uncoordinated movements, imbalance, speech problems (**dysarthria**), visual problems (**nystagmus**), and **vertigo** as a part of the **vestibulocerebellar system**.

**Q. 29: How many brain cells are there?**

Inside our skulls, we pack, on average, 86 billion neurons—up to three times more than those of our primate cousins. For years, researchers have tried to figure out how we manage to develop so many brain cells.

### Q. 30: What is cell body?

The cell body, also called the soma, is the spherical part of the neuron that contains the nucleus. The cell body connects to the dendrites, which bring information to the neuron, and the axon, which sends information to other neurons.

### Q. 31: What's ganglia?

**Ganglia** is the plural of the word **ganglion**. **Ganglia** are clusters of nerve cell bodies found throughout the body. They are part of the peripheral nervous system and carry nerve signals to and from the central nervous system.

### Q. 32: What are glial cells?

**Glial cells** are a type of cell that provides physical and chemical support to neurons and maintains their environment. Located in the central nervous system and peripheral nervous system, **glial** cells are sometimes called the “**glue**” of the nervous system, as well as **neuroglia** or just **glia**.

### Q. 33: What is the myelin?

**Myelin** is an insulating layer, or sheath, that forms around nerves, including those in the brain and spinal cord. It is made up of protein and fatty substances. This **myelin sheath** allows electrical impulses to transmit quickly and efficiently along the nerve cells. **Myelin** is made by **oligodendrocytes** in the **central nervous system (CNS)** and **Schwann cells** in the **peripheral nervous system (PNS)**.

### Q. 34: What are the 3 functions of myelin?

The **myelin sheath** has three functions:

1. Its fatty-protein coating provides protective insulation for your nerve cells, like the plastic insulation covering that encases the wires of an electrical cord.
2. It allows the electrical impulses to travel quickly and efficiently between one nerve cell and the next.

3. It maintains the strength of the impulse message as it travels down the axon.

**Myelin** is made by **oligodendrocytes** in your brain and spinal cord (your **central nervous system [CNS]**) and by **Schwann cells** in your peripheral nervous system. Your peripheral nervous system is the network of nerves outside of your **CNS**. These nerves communicate between your **CNS** and the rest of your body.

### Q. 35: What is a myelin sheath?

A **myelin sheath** is a sleeve (sheath) that's wrapped around each nerve cell (**neurons**). It's a protective layer of fat (**lipids**) and protein that coats the main "body" section of a neuron called the **axon**.

### Q. 36: What are the parts of a nerve cell?

A nerve cell is called a neuron. Nerve cells make up your nervous system. Your nervous system is your body's communication command center. It sends and receives communication from all parts of your body and reacts to changes inside and outside of your body.

Each nerve cell has three sections. The sections of a nerve cell can be thought of like a tree.

1. The **soma**, or cell body, is like the tree's root system. The roots of the soma, called **dendrites**, receive the "**nutrients**" from the soil. The "**nutrients**" in this case are the chemical messages they receive from other nearby nerve cells. These messages are converted into electric impulses. The soma also contains the cell's nucleus.
2. The **axon** is like the tree's long trunk. The nutrients are transported from the tree's roots up through the tree's trunk. Similarly, the axon transports the impulses from the soma onward along its path.
3. The **axon terminal** is like the tree buds at the end of the tree's branches. Leaves and pollen come out of these buds. The electrical impulses are sent (or "released" like pollen from a bud) to be picked up by the next nerve cell. This process keeps repeating as the impulse or message continues its journey within your brain and spinal cord or out to your body. The result might be muscle fibres contracting to move your arm,

help you breathe, or keep your heart beating.

**Q. 37: What are the gaps in the myelin sheath called?**

Your myelin sheath isn't one solid covering. It's a lineup of individual sections of myelin, each separated from the next by a tiny gap—like the small amount of space you see between individual box cars on one long train. Each section of myelin is called an **internode**. Each gap in the myelin sheaths—between internodes—is called the **nodes of Ranvier**. The **nodes of Ranvier** are rich in positive sodium ions. As the electrical signal or impulse travels along the axon, it jumps from one node to the next. When passing over the gap, the sodium ions recharge the electrical signal so it can continue in its travel without losing its charge or lessening in signal strength.

**Q. 38: What is demyelination? What happens when the myelin sheath is damaged?**

About 100 billion nerve cells are in constant activity, sending and receiving messages that control every aspect of your body's functioning. When the myelin sheath on nerve cells is damaged, the electrical signal is slowed or stopped.

Myelin can be damaged when your body's immune cells think that myelin is a foreign substance. Your body's immune system produces inflammatory substances that damage myelin and eventually kill the cells (**oligodendrocytes** and **Schwann cells**) that make myelin. The location where myelin is attacked determines your symptoms. The destruction of the myelin sheath is called **demyelination**.

A myelin sheath can also be damaged or destroyed in adults by:

1. Stroke.
2. Infections, immune, and metabolic disorders.
3. Poisons.
4. Vitamin B12 deficiency
5. Certain drugs, including **ethambutol**.
6. Excess alcohol intake.



In addition, in a few rare inherited diseases, the myelin sheath doesn't properly form. These diseases include **Tay-Sachs disease, Gaucher disease, Hurler syndrome, and Niemann-Pick disease.**

### **Q. 39: What is sleep deprivation?**

**Sleep deprivation** is when a person doesn't get enough sleep. This can be a short-term issue, affecting one or a few nights, or it can be a chronic concern that lasts weeks or even months. **Sleep deprivation** can happen for countless reasons, many of them harmless, but it's also a key symptom of certain health conditions.

Sleep is something that everyone needs, and most people need a similar amount, depending on their age. That amount also changes with age. However, some people need more sleep to feel well-rested, while others need less, but these exceptions aren't common. A change in your sleep patterns, whether gradual or sudden, is a reason to talk to a healthcare provider.

The average daily amount of sleep needed, by age, is:

1. Newborns (up to 3 months old): 14 to 17 hours.
2. Infants (4 to 12 months old): 12 to 16 hours, including naptime.
3. Young children (1 to 5 years old): 10 to 14 hours, including naptime.
4. School-aged children (6 to 12 years old): 9 to 12 hours.
5. Teenagers (13 to 18 years old): 8 to 10 hours.
6. Adults (18 years and up): 7 to 9 hours.

Sleep deprivation can also take different forms. For some people, sleep deprivation happens because they stay awake instead of sleeping. For others, they're still sleeping, but they aren't getting quality sleep, so they still wake up feeling tired.

Sleep deprivation usually isn't a major problem in limited, isolated amounts. However, research shows that chronic sleep deprivation can cause or contribute to a variety of health issues.

#### **Q. 40: What is the first night effect?**

The “*first night effect*” (*FNE*) is a well-known phenomenon in *polysomnographic (PSG)* recordings characterised by decreased total sleep time, lower sleep efficiencies, a reduction in *REM sleep*, and longer *REM* latencies on the first night of testing.

#### **Q. 41: How does sleep affect the brain?**

Without sleep, you can't form or maintain the pathways in your brain that let you learn and create new memories, and it's harder to concentrate and respond quickly. Sleep is important for a number of brain functions, including how nerve cells (neurons) communicate with each other.

#### **Q. 42: Does sleep improve memory?**

When you learn something new, the best way to remember it is to sleep on it. That's because sleeping helps strengthen memories you've formed throughout the day. It also helps to link new memories to earlier ones. You might even come up with creative new ideas while you slumber.

According to Coren (the researcher), scores on intelligence tests decline cumulatively on each successive day you sleep less than you usually do. The daily decline is approximately one IQ point for the first hour of sleep loss, two for the next, and four for the next.

#### **Q. 43: What impacts your brain after sleep deprivation?**

Sleep deprivation impacts many regions of your brain, but two are of notable importance: the *amygdala* and the *prefrontal cortex*. In other words, sleep deprivation causes disruption in emotional centres in the brain, which is linked to increased anxiety.

#### **Q. 44: What is the amygdala?**

The *amygdala* is the part of the brain that's most closely associated with fear, emotions, and motivation. Its name means “*almond*” because it is almond-shaped. If you see something that frightens you, your *amygdala* might tell your body to panic.

Scientists can measure brain activity by taking **functional magnetic resonance imaging (fMRI)** scans. Using this method, researchers found that sleep deprivation leads to a **hyperactive amygdala**. The **amygdala** is critical for emotional regulation, and its dysfunction may be related to mood issues that occur from sleep deprivation.

**Q. 45: How many percent will increase anxiety levels in a single sleepless night?**

A single sleepless night can trigger a 30% increase in anxiety levels.

**Q. 46: What is the prefrontal cortex?**

In mammalian brain anatomy, the **prefrontal cortex (PFC)** covers the front part of the frontal lobe of the cerebral cortex. The basic activity of this brain region is considered to be the orchestration of thoughts and actions in accordance with internal goals. Many authors have indicated an integral link between a person's will to live, personality, and the functions of the prefrontal cortex.

This brain region has been implicated in executive functions such as planning, decision-making, working memory, personality expression, moderating social behaviour and controlling certain aspects of speech and language. Executive function relates to abilities to differentiate among conflicting thoughts, determine good and bad, better and best, same and different, future consequences of current activities, working towards a defined goal, prediction of outcomes, expectation based on actions, and social "control" (the ability to suppress urges that, if not suppressed, could lead to socially unacceptable outcomes).

The frontal cortex supports concrete rule learning. More anterior regions along the **rostral-caudal axis** of the frontal cortex support rule learning at higher levels of abstraction.

The **prefrontal cortex (PFC)** which is important for rational thinking and decision-making; the most evolved brain region-subverts our highest-order cognitive abilities. However, it is also the brain region that is most sensitive to the detrimental effects of stress exposure. This region has decreased activity during sleep deprivation, and these activity patterns are associated with impaired judgment, a common symptom of sleep deprivation.

**Q. 47: What is chronic sleep deprivation and sleep apnea?**

Most of us have experienced sleep deprivation in our lives, but for some, it is the norm. People who suffer from inadequate sleep for a prolonged period of time (weeks to years) are in a state of **chronic sleep deprivation**. Many people wake up in the morning feeling symptoms of sleep deprivation despite getting a long night's sleep, which may be indicative of a sleep disorder known as **sleep apnea**. Patients with **sleep apnea** wake up over a hundred times throughout the night due to difficulty breathing. Sleep disorder patients aren't the only ones that experience this; it can occur from other forms of sleep deprivation. When sleep intrudes into the waking brain, this can lead to errors in tasks like driving. Despite being abnormal for humans, this brain activity phenomenon is not uncommon in the animal kingdom. Some animals, like seals and dolphins, sleep with half of their brains "awake" while the other half is "asleep."

**Q. 48: What's the difference between the frontal and prefrontal cortexes?**

The **prefrontal cortex (PFC)** is an area of the **frontal lobe** that is located above the eyebrows. The **prefrontal cortex** is the area at the very front of the **frontal lobe**; it's the area of the brain just above the eyebrows beneath the forehead.

**Q. 49: At what age is the prefrontal cortex fully developed?**

This part of the brain is still developing in teens and doesn't complete its growth until approximately the early to mid-20's. The prefrontal cortex performs reasoning, planning, judgement, and impulse control, necessities for being an adult.

**Q. 50: What is the largest part of the brain?**

**The cerebrum** is the largest part of the brain and is composed of the right and left hemispheres. It performs higher functions like interpreting touch, vision, and hearing, as well as speech, reasoning, emotions, learning, and fine control of movement.

**Q. 51: What conditions and disorders affect the nervous system?**

Thousands of disorders and conditions can affect your nerves. An injured nerve has trouble sending a message. Sometimes it's so damaged that it can't send

or receive a message at all. Nerve injuries can cause numbness, a pins-and-needles feeling, or pain. It may be difficult or impossible for you to move the area that's injured. Nerve damage can happen in several ways. Some of the most common causes of nerve damage include:

**Disease:** Many *infections*, *cancers*, and *autoimmune diseases* like *diabetes*, *lupus*, and *rheumatoid arthritis* can cause nervous system problems. *Diabetes* can lead to diabetes-related neuropathy, causing tingling and pain in the legs and feet. A condition called multiple sclerosis attacks the myelin around nerves in the **CNS**.

**Stroke:** A *stroke* happens when one of the brain's blood vessels becomes blocked or suddenly bursts. Without enough blood, part of the brain dies. Then it can't send messages via nerves. A *stroke* can cause nerve damage ranging from mild to severe.

**Accidental Injury:** Nerves can be crushed, stretched, or cut in an accident. Car crashes and falls are common injuries that can damage nerves anywhere in your body.

**Pressure:** If a nerve is pinched or compressed, it can't get enough blood to do its job. Nerves can be pinched or trapped for many reasons, such as overuse (as in carpal tunnel syndrome), a tumour, or structural problems like sciatica.

**Toxic Substances:** Chemotherapy medicines, illegal drugs, excessive alcohol, and poisonous substances can cause *peripheral neuropathy* or nerve damage. People with kidney disease are more likely to develop nerve damage because their kidneys have a hard time filtering out toxins.

**Ageing process:** As you get older, your neurons' signals may not travel as fast as they used to. You may feel weaker, and your reflexes may slow down. Some people lose sensation in their fingers, toes, or other parts of their body.

#### **Q. 52: Which is the smallest part of brain?**

Situated just below the *thalamus*, the *hypothalamus* is the smallest part of the brain.

#### **Q. 53: What is the second-largest part of the brain?**

The *cerebellum* is the second-largest part of the brain. It is also called the little brain and is responsible for the precision of voluntary actions and the maintenance of the equilibrium and posture of the body.

#### Q. 54: What are the 3 types of brain?

The brain can be divided into three basic units: **the forebrain, the midbrain, and the hindbrain**. **The hindbrain** includes the upper part of the spinal cord, the brain stem, and a wrinkled ball of tissue called the cerebellum. **The hindbrain** controls the body's vital functions, such as respiration and heart rate.

#### Q. 55: Which acid is present in the brain?

Polysialic acid and polysialyltransferases. A major protein-bound sialoglycan in the brain is polysialic acid (polysia), a linear homopolymer of  $\alpha$ 2–8-linked sialic acid residues.

#### Q. 56: What are the types of sleep apnea?

There are two types of **sleep apnea**.

**Obstructive sleep apnea** happens when your upper airway becomes blocked many times while you sleep, reducing or completely stopping airflow. This is the most common type of sleep apnea. Anything that could narrow your airway, such as obesity, large tonsils, or changes in your hormone levels, can increase your risk for obstructive sleep apnea.

**Central sleep apnea** happens when your brain does not send the signals needed to breathe. Health conditions that affect how your brain controls your airway and chest muscles can cause central sleep apnea.

#### Q. 57: What is AA amyloidosis?

**AA Amyloidosis** is one type of the rare disorder **amyloidosis** (pronounced “am-uh-loy-doh-sis”). **Amyloidosis** happens when proteins in your body lose their three-dimensional (3D) structure and become twisted clumps of misshapen fibrils (**amyloid** deposits) that gather on your organs and tissues.

**AA amyloidosis** is also known as secondary **amyloidosis** or amyloid serum A protein. This **amyloidosis** type happens when you have high levels of inflammation in your body that boost the serum A protein levels in your bloodstream. You may have high serum A protein levels if you have a long-lasting infection or inflammatory disease. In a sense, **AA amyloidosis** is a serious complication of inflammatory diseases and conditions. Healthcare providers

treat **AA amyloidosis** by controlling the underlying disease or condition.

### Q. 58: What conditions or disorders can affect the brain?

About 1 in 6 people have some type of brain condition. There are many types of brain disorders and conditions that vary in severity, including:

- **Alzheimer's Disease and Dementia:** Progressive loss of cognitive (brain) functions, such as memory, problem-solving, or language.
- **Amyotrophic Lateral Sclerosis (ALS):** A neuromuscular disorder where the nerve cells in your brain break down.
- **Autism Spectrum Disorder (ASD):** A developmental disorder that can affect your ability to communicate, regulate behaviour or interpret social cues.
- **Brain Tumour:** An irregular mass of cells that starts in your brain and grows uncontrollably.
- **Epilepsy:** A brain disorder that disrupts the activity of your brain's nerve cells, leading to seizures.
- **Parkinson's disease:** A progressive nervous system disease that often starts with tremors (uncontrollable shakes).
- **Stroke:** An interruption of blood supply to your brain, either because of an artery blockage or artery rupture (burst).

### Q. 59: What is Apers disease?

**Alpers disease** is a rare genetic disorder (**mitochondrial disease**) that leads to **dementia**, liver failure, and seizures. Symptoms usually start between ages 2 and 4, or between ages 17 and 24. They may include muscle stiffness and twitching, a lack of growth, and migraines. **Alpers disease** is always fatal, but you can manage symptoms with drugs, therapy, nutrition, and breathing devices.

## Q. 60: What is aphasia?

**Aphasia** is a brain disorder where a person has trouble speaking or understanding other people's speaking. This happens with damage or disruptions in parts of the brain that control spoken language. It often happens with conditions like strokes. **Aphasia** is often treatable, and speech therapy can still help people who have this condition permanently.

## Q. 61: What is the difference between aphasia vs. dysarthria, dysphasia, or apraxia?

**Aphasia** is a condition that has a connection or overlap with several other speech-related disorders and problems, such as **dysarthria**, **dysphasia**, and **apraxia**.

1. **Aphasia:** This is the overall term for a brain-connected problem with language abilities, including speaking or understanding other people's speaking. Experts use this term for the full or partial loss of language abilities.
2. **Dysphasia (dis-fay-zh-ah):** This is an outdated term for partial loss of language abilities from a brain-related problem. The use of this term isn't common in most places. A major reason it fell out of use is the risk of confusion with the term "**dysphagia**".
3. **Dysphagia (dis-fay-gee-uh):** This is the medical term for a problem with swallowing. The ability to swallow relies on specific muscles to push food, liquid, medication, etc. down your throat. **Dysphagia** can happen with brain or nerve disorders or problems with the muscles themselves.
4. **Dysarthria:** This is when you have trouble speaking because you can't fully control parts of your mouth, face, and upper respiratory system. This can make you speak too loudly or softly, at uneven speeds, mispronounce words, or have unusual changes in pitch (changing between high- or deep-sounding voices).
5. **Apraxia:** This is a problem where you can't do something even though you have learned how to do it or have done it before. An example



would be suddenly not knowing how to use a key to open a locked door, even though you have no problem describing the action and still know how a lock and key work. People with **apraxia** often have trouble saying words correctly.

**Q. 62: What is psychogenic aphonia?**

**Psychogenic aphonia**, or **psychogenic conversion aphonia**, is when you suddenly lose your voice due to emotional or psychological stress. People who have psychogenic **aphonia** can speak, but only in strained whispers.

**Q. 63: What's the difference between psychogenic aphonia and hysterical aphonia?**

The terms **hysterical aphonia** and **psychogenic aphonia** both describe losing your voice because of emotional or psychological distress.

**Q. 64: What's the difference between aphonia and dysphonia?**

**Dysphonia** happens when there's something wrong with the structure of your mouth, tongue, throat, or vocal cords. **Velopharyngeal dysfunction (VPD)** is an example of **dysphonia**. If you have **aphonia**, your vocal structure is fine, but you're not using your voice the right way.

**Q. 65: What is Wolfram syndrome?**

**Wolfram syndrome** is a rare genetic disease. It's a progressive, **neurodegenerative disorder** that damages your brain and other tissues in your body. A series of symptoms usually appear during childhood and into adulthood. Diabetes and vision changes before age 15 are usually the first symptoms. Eventually, impaired brain function can lead to early death.

**Q. 66: What is Aphonia clericorum?**

**Aphonia clericorum** is when you lose your voice after injuring your **larynx** or having a disease that affects your larynx, such as **laryngeal cancer**.

**Q. 67: What is an abdominal migraine?**

**Abdominal migraine** is a form of migraine that causes episodes of moderate to severe abdominal (belly) pain. The episodes last from one to 72 hours. On average, they last 17 hours. The pain can be severe enough to interfere with daily activities.

It doesn't cause head pain, but a person can experience a traditional migraine headache and an abdominal migraine at the same time.

Researchers believe there's a connection between migraine headaches and abdominal migraines. The conditions seem to have similar triggers, relieving factors, and treatments. They may have a similar cause as well.

### **Q. 68: What triggers abdominal migraines?**

Certain situations may trigger episodes of abdominal migraine. These can vary from person to person. Common triggers include:

1. Stress, such as from school or family life.
2. Poor sleep and irregular sleep habits
3. Prolonged fasting.
4. Dehydration.
5. Travel and motion sickness
6. Exercise.
7. High-amine foods, such as citrus fruits, chocolate, cheese, salami, and ham.
8. Foods with additive flavouring, colouring and monosodium glutamate (MSG).
9. Flashing lights.
10. Consuming over 200 milligrammes of caffeine

### Q. 69: What is an altered mental status?

Certain illnesses, chronic disorders, and injuries that affect brain function can lead to an **altered mental status (AMS)**. This condition causes changes in consciousness and symptoms that can affect many organ systems. Many causes are treatable and don't affect long-term well-being. An **altered mental status (AMS)** isn't a specific disease. It's a change in mental function that stems from illnesses, disorders, and injuries affecting your brain. It leads to changes in awareness, movement, and behaviours.

### Q. 70: What are the types of altered mental status?

There are three types:

1. **Delirium** occurs suddenly and is a medical emergency. A person with delirium may act disoriented, be distracted and exhibit unusual behaviors. This type of AMS is reversible.
2. **Dementia** is a progressive disorder causing a decline in mental function that affects daily life. It primarily affects older adults. In advanced stages, a person loses awareness of their identity and surroundings.
3. **Psychosis**, due to a medical condition or medication, is a temporary condition in which a person loses touch with reality. They may experience disturbing thoughts, as well as sights and sounds that aren't real.

### Q. 71: What is Alzheimer's disease?

**Alzheimer's disease** (pronounced "**alz-HAI-mirs**") is a brain condition that causes a progressive decline in memory, thinking, learning, and organising skills. It eventually affects a person's ability to carry out basic daily activities.

**Alzheimer's disease (AD)** is the most common cause of dementia.

The symptoms of **Alzheimer's** worsen over time. Researchers believe the disease process may start 10 years or more before the first symptoms appear.

**AD** most commonly affects people over the age of 65.

## **Q. 72: What is the difference between Alzheimer's and dementia?**

Dementia describes the state of a person's mental function. It's not a specific disease. It's a decline in mental function from a previously higher level that's severe enough to interfere with daily living.

A person with dementia has two or more of these specific difficulties, including a change or decline in:

1. Memory
2. Reasoning and handling of complex tasks.
3. Language.
4. Understanding visual form and space relationships
5. Behaviour and personality.

Dementia ranges in severity. In the mildest stage, you may notice a slight decline in your mental functioning and require some assistance with daily tasks. At the most severe stage, a person depends completely on others for help with simple daily tasks.

Dementia develops when infections or diseases impact the parts of your brain involved with learning, memory, decision-making, or language. Alzheimer's disease is the most common cause of dementia, accounting for at least two-thirds of dementia cases in people 65 and older.

Other common causes of dementia include:

1. Vascular Dementia
2. Dementia with Lewy Bodies
3. Frontotemporal dementia
4. Dementia due to the Parkinson's disease

### Q. 73: Who does Alzheimer's disease affect?

Alzheimer's disease mainly affects people over 65. The older you are over 65, the more likely you are to develop Alzheimer's.

Some people develop Alzheimer's disease before age 65, typically in their 40s or 50s. This is called early-onset Alzheimer's disease. It's rare. Less than 10% of AD cases are early-onset.

### Q. 74: How common is Alzheimer's disease?

Alzheimer's disease is common. It affects approximately 24 million people across the world. Out of 10 people older than 65, nearly a third older than 85.

### Q. 75: What are the stages of Alzheimer's disease?

**Alzheimer's disease** organisations and healthcare providers use various terms to describe the stages of **Alzheimer's disease** based on symptoms.

While the terms vary, the stages all follow the same pattern: **AD** symptoms progressively worsen over time.

No two people experience **AD** in the same way, though. Each person with Alzheimer's disease will progress through the stages at different speeds. Not all changes will occur for each person. It can sometimes be difficult for providers to place a person with AD in a specific stage as stages may overlap.

Some organisations and providers frame the stages of Alzheimer's disease in terms of dementia:

1. Preclinical Alzheimer's disease.
2. Mild cognitive impairment (MCI) due to Alzheimer's disease
3. Mild dementia due to Alzheimer's disease.
4. Moderate dementia due to Alzheimer's disease
5. Severe dementia due to Alzheimer's disease.

### Q. 76: What causes Alzheimer's disease?

An abnormal buildup of proteins in your brain causes **Alzheimer's** disease. The buildup of these proteins —**amyloid protein** and **tau protein**—causes brain cells to die.

The human brain contains over 100 billion nerve cells and other cells. The nerve cells work together to fulfil all the communications needed to perform functions such as thinking, learning, remembering, and planning.

Scientists believe that **amyloid protein** builds up in your brain cells, forming larger masses called plaques. Twisted fibres of another protein called tau form tangles. These plaques and tangles block the communication between nerve cells, which prevents them from carrying out their processes.

The slow and ongoing death of the nerve cells results in the symptoms of **Alzheimer's disease**. Nerve cell death starts in one area of your brain (usually in the area of your brain that controls memory, the **hippocampus**) and then spreads to other areas.

Despite ongoing research, scientists still don't know what exactly causes these proteins to build up. So far, they believe that a genetic mutation may cause early-onset Alzheimer's. They think that late-onset **Alzheimer's** happens due to a complex series of brain changes that may occur over decades. A combination of genetic, environmental, and lifestyle factors likely contributes to the cause.

### Q. 77: What are the signs and symptoms of Alzheimer's disease?

The signs and symptoms of **Alzheimer's disease (AD)** vary based on the stage of the condition. In general, the symptoms of AD involve a gradual decline in some, most, or all of the following:

- Memory.
- Reasoning and handling of complex tasks.
- Language.
- Understanding visual form and space relationships

- Behaviour and personality.

People with memory loss or other signs of Alzheimer's may have difficulty recognising their mental decline. These signs may be more obvious to loved ones. Anyone experiencing dementia-like symptoms should see a healthcare provider as soon as possible.

### **Q. 78: Symptoms of the mild stage of Alzheimer's dementia**

The symptoms of AD become noticeable in the mild stage. The most common early symptom is forgetting newly learned information, especially recent events, places, and names.

Other signs and symptoms of mild Alzheimer's include:

- Having difficulty finding the right words to express thoughts.
- Losing or misplacing objects more than usual.
- Having difficulty making plans or organising.
- Having difficulty problem-solving.
- Taking longer to complete routine daily tasks.

Most people in the mild stage of AD have no problem recognizing familiar faces and can usually travel to familiar places.

### **Q. 79: Symptoms of the moderate stage of Alzheimer's**

Moderate Alzheimer's is typically the longest stage and can last many years. People in the moderate stage of Alzheimer's often require care and assistance. People in this stage may:

- Have increased memory loss and confusion, often forgetting events or details about their lives, such as their telephone number or where they went to school.
- Have growing confusion about which day of the week it is, which

season they're in, and where they are.

- Have poor short-term memory.
- Have some difficulty recognising friends and family.
- Repeat stories, thoughts, or events that are on their minds.
- Have difficulty with simple math.
- Need help with self-care, such as bathing, grooming, showering, and using the bathroom.
- Experience more personality changes, including being agitated or acting out. They may show depression, apathy, or anxiety as the disease progresses.
- Develop groundless suspicions about family, friends, and carers (delusions).
- Develop urinary incontinence and/or fecal (bowel) incontinence.
- Have sleep disturbances.
- Begin to wander from their living area.

#### **Q. 80: Symptoms of the severe stage of Alzheimer's**

In the final stage of *Alzheimer's, dementia symptoms* are severe. People in this stage need extensive care. In the severe stage of Alzheimer's disease, the person often

- Has almost total memory loss.
- Is unaware of their surroundings.
- Needs help with all the basic activities of everyday living, such as eating, sitting up, and walking.



- Loses their ability to communicate. Their speech becomes limited to a few words or phrases.
- Becomes vulnerable to infections, especially pneumonia and skin infections.

Hospice care may be appropriate at this time for comfort.

### **Q. 81: How many brain cells does a human have?**

For many years, scientists thought the human brain had 100 billion nerve cells (neurons). Today, we know the actual number is closer to 86 billion. Your brain contains two types of cells:

- **Neurons** send and receive electric nerve signals.
- **Glial cells** help maintain your brain, form myelin (a fatty, protective substance found in white matter), and provide nutrition to your brain.

### **Q. 82: What is hospice care?**

**Hospice** is specialised care you may receive when your prognosis is measured in months instead of years and comfort is the primary goal. **Hospice** can help you prepare physically, emotionally and spiritually as you near the end of life. The aim of hospice is to allow people to maintain control over their lives, live with comfort and dignity, and feel supported as they prepare for death in their own way.

**Hospice** providers have expertise in managing symptoms, so you can feel comfortable and spend your final days in ways that are important to you. You and your family are surrounded by an extra layer of support from hospice nurses, social workers, chaplains, home health aides, physicians, volunteers, and bereavement counsellors.

### **Q. 83: What are the four levels of hospice care?**

The four levels of hospice care are:

- **Routine home care:** Your family and/or loved ones care for you at

home, and you receive regular visits from hospice care providers.

- **General inpatient (GIP) care:** You receive hospice care in a facility because you have pain or other symptoms that can't be managed at home.
- **Continuous home care:** You receive more intensive, short-term support at home to manage a symptom crisis. This care is for people who qualify for GIP and wish to remain at home.
- **Respite care:** You receive short-term, temporary hospice care in a facility to give your carers a rest.

Your hospice team will determine the most appropriate level of care for you. This level may change as your needs change.

#### **Q. 84: What is Down's syndrome?**

**Down's syndrome** is a genetic condition where people are born with an extra chromosome. Most people have 23 pairs of Chromosomes within each cell in their body, for a total of 46. A person diagnosed with Down syndrome has an extra copy of chromosome 21, which means their cells contain 47 total chromosomes instead of 46. This changes the way their brain and body develop.

#### **Q. 85: What are phobias?**

**Phobias** are a type of anxiety disorder. They cause an extreme fearful reaction to something that isn't actually harmful. Phobias are intense fears of certain situations or objects. Some of these fears may make sense, such as a fear of snakes. But often, the level of fear doesn't match the situation. Like with other anxiety disorders, you may spend a lot of time trying to avoid situations that may trigger the **phobia**.

A specific phobia, or a simple phobia, is an intense fear of a particular object or situation. It may cause you to avoid everyday situations. Some specific phobias include fear of - Animals, such as spiders, dogs or snakes; Blood; Flying; Heights; Injections (shots) etc.

### Q. 86: What is amaxophobia?

People who have **amaxophobia** have a fear of driving or being a passenger in a car or other vehicle. Someone with amaxophobia may have such extreme anxiety or fear at the thought of being in a vehicle that they're unable to get to work, stores, and other places. "**Amaxa**" (or "**hamaxa**") is the Greek word for carriage. Phobia means fear. Someone with a fear of driving or riding in a vehicle is amaxophobic. **Amaxophobia** is also called **Hamaxophobia**, **Motorphobia**, or **Ochophobia**. Two phobias closely linked to **amaxophobia** include **agoraphobia**, a fear of leaving one's home or being unable to escape from a place or situation, and **claustrophobia**, a fear of enclosed spaces.

### Q. 87: What are the bones and tissues that protect your brain?

A bony structure called your cranium surrounds your brain. Your cranium is part of your skull. All the bones of your skull protect your brain from injury. Between your brain and skull, you have three layers of tissue called the **meninges**:

- **Dura mater**: The outermost layer lines your entire skull. Parts of the dura mater form folds that separate the right half of your brain from the left.
- **Arachnoid**: The middle layer of the meninges is a thin, fragile layer of tissue that covers your entire brain.
- **Pia mater**: The innermost layer contains blood vessels that run into your brain's surface.

Between your **arachnoid** and **pia mater** tissue is a clear substance called your **cerebrospinal fluid (CSF)**. **CSF** also surrounds your spinal cord, which runs through the vertebrae (bones of your spine). **CSF** cushions and protects these vital nervous system organs.

### Q. 89: What is an anxiety disorder?

**Anxiety disorder** is a type of mental health condition. If you have an anxiety disorder, you may respond to certain things and situations with fear and dread. You may also experience physical signs of anxiety, such as a pounding heart and sweating.

It's normal to have some **anxiety**. You may feel **anxious** or **nervous** if you have to tackle a problem at work, go to an interview, take a test, or make an important decision. And **anxiety** can even be beneficial. For example, **anxiety** helps us notice dangerous situations and focuses our attention, so we stay safe. But an **anxiety disorder** goes beyond the regular nervousness and slight fear you may feel from time to time. An anxiety disorder happens when:

- Anxiety interferes with your ability to function.
- You often overreact when something triggers your emotions.
- You can't control your responses to situations.

**Anxiety disorders** can make it difficult to get through the day. Fortunately, there are several effective treatments for anxiety disorders.

### Q. 90: What causes anxiety disorders?

**Anxiety disorders** are like other forms of mental illness. They don't come from personal weakness, character flaws, or problems with upbringing. But researchers don't know exactly what causes **anxiety disorders**. They suspect a combination of factors plays a role:

- **Chemical imbalance:** Severe or long-lasting stress can change the chemical balance that controls your mood. Experiencing a lot of stress over a long period of time can lead to an anxiety disorder.
- **Environmental factors:** Experiencing a trauma might trigger an anxiety disorder, especially in someone who has inherited a higher risk to start.
- **Heredity:** **Anxiety disorders** tend to run in families. You may inherit them from one or both parents, like eye colour.

### Q. 91: How is irritable bowel syndrome (IBS) related to anxiety disorders?

Some people feel the effects of stress in their stomachs. People with **IBS** have uncomfortable problems with digestion, including stomach pain, constipation, and diarrhea. They also frequently have anxiety and depression, which can make symptoms worse.

The connection between **IBS** and anxiety comes from the nervous system partly controlling the colon. The nervous system's response to stress may affect the stomach. Among people who get treated for **IBS**, anywhere from 50% to 90% may also have an anxiety disorder or depression. Treatment for **IBS** may include stress management and psychotherapy to relieve symptoms.

## Q. 92: What is depression?

**Depression** is a **mood disorder** that causes a persistent feeling of sadness and a loss of interest in things and activities you once enjoyed. It can also cause difficulty with thinking, memory, eating, and sleeping.

It's normal to feel sad about or grieve over difficult life situations, such as losing your job or getting divorced. But **depression** is different in that it persists practically every day for at least two weeks and involves other symptoms than sadness alone.

There are several types of depressive disorders. **Clinical depression**, or **major depressive disorder**, is often just called "**depression**". It's the most severe type of depression.

Without treatment, depression can get worse and last longer. In severe cases, it can lead to self-harm **or death by** suicide. The good news is that treatments can be very effective at improving symptoms.

## Q. 93: What are the types of depression?

The American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) classifies depressive disorders as the following:

- **Clinical Depression (Major Depressive Disorder):** A diagnosis of **major depressive disorder** means you've felt sad, low, or worthless most days for at least two weeks while also having other symptoms such as sleep problems, loss of interest in activities, or change in appetite. This is the most severe form of depression and one of the most common.
- **Persistent Depressive Disorder (PDD):** Persistent depressive disorder is mild or moderate depression that lasts for at least two years. The symptoms are less severe than those of major depressive disorder.

Healthcare providers used to call **PDD dysthymia**.

- **Disruptive Mood Dysregulation Disorder (DMDD):** **DMDD** causes chronic, intense irritability and frequent anger outbursts in children. Symptoms usually begin by the age of 10.
- **Premenstrual Dysphoric Disorder (PMDD):** With **PMDD**, you have premenstrual syndrome (PMS) symptoms along with mood symptoms, such as extreme irritability, anxiety, or depression. These symptoms improve within a few days after your periods starts, but they can be severe enough to interfere with your life.
- **Depressive disorder due to another medical condition:** Many medical conditions can create changes in your body that cause depression. Examples include **hypothyroidism**, **heart disease**, **Parkinson's disease**, and **cancer**. If you're able to treat the underlying condition, the depression usually improves as well.

There are also specific forms of major depressive disorder, including:

- **Seasonal Affective Disorder (Seasonal Depression):** This is a form of major depressive disorder that typically arises during the fall and winter and goes away during the spring and summer.
- **Prenatal Depression and Postpartum Depression:** Prenatal depression is depression that happens during pregnancy. Postpartum depression is a form of depression that develops within four weeks of delivering a baby. The DSM refers to these as "**major depressive disorder (MDD)** with **peripartum** onset."
- **Atypical Depression:** Symptoms of this condition, also known as major depressive disorder with atypical features, vary slightly from "typical" depression. The main difference is a temporary mood improvement in response to positive events (mood reactivity). Other key symptoms include increased appetite and rejection sensitivity.

People with bipolar disorder also experience episodes of depression in addition to manic or hypomanic episodes.

#### Q. 94: What is bipolar disorder?

**Bipolar disorder** (formerly known as **manic-depressive illness** or **manic depression**) is a lifelong mood disorder and mental health condition that causes intense shifts in mood, energy levels, thinking patterns, and behavior. These shifts can last for hours, days, weeks, or months and interrupt your ability to carry out day-to-day tasks.

There are a few types of bipolar disorder which involve experiencing significant fluctuations in mood referred to as **hypomanic or manic** and **depressive episodes**. However, people with **bipolar disorder** aren't always in a **hypomanic or manic or depressive state**. They also experience periods of normal mood, known as **euthymia**.

#### Q. 95: What is panic disorder?

**Panic disorder** is an **anxiety disorder** that involves multiple unexpected panic attacks. A main feature of panic disorder is that the attacks usually happen without warning and aren't due to another mental or physical condition. There's often no specific trigger for them. Not everyone who experiences a panic attack develops **panic disorder**.

#### Q. 96: What is agoraphobia?

**Agoraphobia** is an anxiety disorder that causes an intense fear of becoming overwhelmed or unable to escape or get help. Because of fear and anxiety, people with agoraphobia often avoid new places and unfamiliar situations, like large, open areas or enclosed spaces; crowds; places outside of their home; public transportation, etc. Some people may even avoid leaving their homes. **Agoraphobia** is manageable with treatment, which includes medication, cognitive behavioural therapy, and lifestyle changes. The earlier you receive a diagnosis and treatment, the more likely it is that it will work.

#### Q. 97: What is claustrophobia?

Claustrophobia is an intense fear of confined or enclosed spaces. Many fears seem reasonable. We all try to avoid things that make us feel uncomfortable. The difference between a fear and a phobia is that a phobia is an intense and irrational fear towards one or more things or situations. Also, with phobias, the level of your fear doesn't match the actual danger presented by the feared object or situation.

Phobias become a health issue when the fear interferes with your ability to carry out daily activities. Phobias can limit your ability to work efficiently, put a strain on your relationships, and reduce your self-esteem. Common triggers include tunnels, elevators, trains, and airplanes. Behavior training is the main treatment. Other coping methods include relaxation, deep breathing exercises, and joining a support group.

### Q. 98: What is aquaphobia?

People with **aquaphobia** have a fear of water. The word “**aqua**” is Latin for water, and “**phobos**” is Greek for fear.

Someone with **aquaphobia** may have extreme fear or anxiety when thinking about or seeing water. They may avoid going to places near water, such as swimming pools or lakes. In severe cases, people may stop showering, bathing, or using water that is from the sink to wash their faces or brush their teeth.

### Q. 99: What is the difference between aquaphobia and hydrophobia?

**Hydrophobia** is a fear of water related to a late-stage rabies infection. People with **hydrophobia** have muscle spasms when they hear, see, or taste water. **Aquaphobia** is an extreme fear of water that is not related to a physical condition or illness.

### Q. 100: What is an absence seizure?

**Absence seizures** are brief **seizures** that cause a lapse in awareness. They typically start suddenly, without warning, and last a few seconds. They are common in children and are sometimes mistaken for daydreaming or not paying attention. Recovery is immediate. These **seizures** are also known by an older term, **petit mal seizures**. This name is no longer encouraged by the medical community. Most childhood absence seizures can be controlled with medication.

### Q. 101: What does an absence seizure look like?

If your child experiences an absence seizure:

- They may look like they are staring off into space or have a blank stare. Your child has temporarily lost awareness of what’s happening around them.



- They may suddenly stop all activity—even in the middle of an activity—and will not respond during the seizure. This is especially noticeable during school or when they are breathing heavily.
- Their eyes may turn upwards or their eyelids may flutter.

### **Q. 102: What is an atypical absence seizure?**

Healthcare providers define absence seizures as typical or atypical. Atypical seizures are recognized by their own unique EEG pattern and can occur at any age. This seizure type usually starts and ends more slowly and lasts longer (20 seconds or more) than typical absence seizures. Atypical absence seizures also usually cause more muscle movement in a person, such as smacking lips or chewing movements, more eye blinking, and rubbing fingers together, or other hand motions. Atypical absence seizures usually occur with other seizure types and more often affect children who have a learning disability and severe epilepsy.

### **Q. 103: What are the types of headaches?**

There are more than 150 types of headaches. They fall into two main categories: primary and secondary headaches.

### **Q. 104: What is a seizure?**

A **seizure** is a medical condition where you have a temporary, unstoppable surge of electrical activity in your brain. When that happens, the affected brain cells uncontrollably fire signals to others around them. This kind of electrical activity overloads the affected areas of your brain.

That overload can cause a wide range of symptoms or effects. The possible symptoms include abnormal sensations, passing out, and uncontrolled muscle movements. Treatment options, depending on seizure type, include medications, surgeries, and special diet changes.

The term **seizure** comes from the ancient belief in multiple cultures that seizures were a sign of possession by an evil spirit or demon. However, modern medicine has uncovered the truth: everyone can have **seizures**, and some people can have them more easily than others.

### Q. 105: What is the difference between seizures and epilepsy?

Understanding the difference between **seizures** and **epilepsy** starts with knowing that **seizures** fall into two main categories depending on why they happen.

- **Provoked seizures:** These happen because of other conditions or circumstances (high fevers, alcohol or drug withdrawal, low blood sugar). **Provoked seizures** make up about 25% to 30% of all **seizures**.
- **Unprovoked seizures:** These aren't symptoms of a current medical condition or circumstance and occur when a person's brain can more easily produce spontaneous **seizures**. This also includes **seizures** that happen more than seven days after a specific cause (like a head injury or stroke).

**Epilepsy** is a brain condition that puts you at risk of having spontaneous, **unprovoked seizures**. Healthcare providers diagnose it when you have at least two **unprovoked seizures** or a single **unprovoked seizure** and have a high risk of having at least one more in the next 10 years. Having a single **unprovoked seizure** increases the odds of having another. **Provoked seizures** aren't enough for a provider to diagnose you with **epilepsy**.

### Q. 106: How the spread of a seizure affects your body

**Seizure** types depend partly on where they happen in your brain. A healthcare provider can determine where they happened based on your symptoms. **Seizure** location tends to happen in two main ways:

- **Generalized seizures:** These are seizures that happen on both sides (hemispheres) of your brain. These seizures tend to cause more severe effects and symptoms.
- **Focal seizures:** also known as partial seizures, these happen in only one hemisphere. That means symptoms only happen in a specific part or on one side of your body. But focal seizures can sometimes spread and become generalised seizures.

### Q. 107: Are there any warning signs before a seizure?

Many people experience a period where they can feel that a seizure is going to happen. That lead-up time, known as **prodrome** (rhymes with “**dome**”), can sometimes include what’s known as an “**aura**”. An **aura** is actually a symptom of a focal seizure, which only affects one side of your brain.

When **focal seizures** don’t spread, an **aura** is the only effect of the **seizure**. When **focal seizures** do spread throughout your brain, an **aura** is more like a warning sign that a more severe seizure is about to happen. **Auras** can also take many different forms. These include:

- **Sensory symptoms:** If an aura affects areas of your brain connected to your senses, those neurons can mistakenly act as if they’re getting real input. That can cause symptoms like seeing bright lights or distortions in how objects appear, hearing unexpected sounds having sudden and unexpected tastes of smells and strange feelings on your skin.
- **Emotional changes:** **Auras** cause some people to feel negative emotions like fear or anxiety, or positive emotions like joy or excitement. Other people may feel **déjà vu** (“**day-zha voo**”, the French term for when a new experience somehow feels familiar) or **jamais vu** (“**zha-may voo**”, the French term for when a familiar experience somehow feels new).
- **Autonomic symptoms:** **Auras** can affect body systems that your brain runs automatically. Some examples include sweating, making too much saliva or drooling, and your skin going pale or turning red. A common aura is “**gastric uprising**”, a rising feeling in your belly.

### Q. 108: What is zoophobia?

Zoophobia is an extreme fear of animals. Many people who have zoophobia fear one specific type of animal. Others fear many types of animals or all animals.

The fear of animals is a type of anxiety disorder called a specific phobia. Specific phobias are intense fears of certain objects, situations, people, or animals. Many people with specific phobias know that the intensity of their fear isn’t proportionate to any actual threat. Still, it can be challenging to manage phobia symptoms.

### Q. 109: What are the types of animal phobias?

Some people who have zoophobia are afraid of one specific type of animal. For example, studies have found that the two most common types of animal phobias are ophidiophobia (fear of snakes) and arachnophobia (fear of spiders).

- Other common animal phobias include:
- Chiroptophobia (fear of bats).
- Cynophobia (fear of dogs).
- Entomophobia (fear of insects).
- Musophobia (fear of mice and rats).
- Spheksophobia (fear of wasps).

### Q. 110: What is Zellweger syndrome?

**Zellweger syndrome (ZS)** is a genetic disorder found in newborn babies. **ZS** is the most severe of the four disorders in the **Zellweger spectrum**. It causes serious problems with nerves and metabolism (changing food into energy) soon after birth. **ZS** affects the brain, liver and kidneys. It also harms important functions throughout the body. Another term for **Zellweger syndrome** is **cerebrohepatorenal syndrome**. The condition is usually fatal.

### Q. 111: What is yellow fever?

Yellow fever is a viral disease spread by the bite of specific kinds of mosquitoes. These mosquitoes and yellow fever are found in areas of Africa and South America located in the tropics and subtropics. The mosquitoes are infected when they bite primates who have the virus.

The yellow fever virus can have a range of symptoms. Some people may have no symptoms. It can present with mild flu-like symptoms but can also be deadly in its most severe form. You could have flu-like symptoms with aches, pains, and fever, or you could begin bleeding and develop liver disease. Symptoms take about three to six days to develop.

**Q. 112: Who does yellow fever affect?**

People who work or live in the jungles of subtropical and tropical Africa and South America are most affected by yellow fever. Travellers from outside these areas are exposed to this disease by contaminated mosquitoes.

**Q. 113: How common is this condition?**

There are about 200,000 people in the world who are infected each year with yellow fever. The condition causes about 30,000 deaths per year. Most of these cases and deaths (about 90%) are in Africa.

**Q. 114: What is Walker-Warburg syndrome?**

Walker-Warburg syndrome is a genetic condition that affects the muscles in your child's body, including their brain and their eyes. This condition is a type of congenital muscular dystrophy present at birth or in infancy that leads to progressive muscle weakness over time. This condition causes life-threatening symptoms in children and a shortened life expectancy.

**Q. 115: What is dystroglycanopathy?**

You might hear *Walker-Warburg syndrome* identified as *dystroglycanopathy*. *Walker-Warburg syndrome* is a form of congenital (appears at birth) *muscular dystrophy*, which is a group of conditions that target the muscles of your child's body. There are several types of muscular dystrophy categorized as *dystroglycanopathy*, which identifies forms of muscular dystrophy caused by genes that produce the *dystroglycan protein*. *Walker-Warburg syndrome* is the most severe type of *dystroglycanopathy*.

**Q. 116: What is Weaver syndrome?**

*Weaver syndrome*, also called *Weaver-Smith syndrome*, is a genetic condition that causes bone overgrowth. The condition may also cause changes to the shape and appearance of your face and the size of your head. It can also affect other muscles and parts of your body.

*Weaver syndrome* affects each person differently. The most common characteristic is a tall stature. If you or your child have *Weaver syndrome*, you

may have less muscle tone, poor coordination, and bent or distorted hands or feet. People with Weaver syndrome may also have intellectual disabilities ranging from mild to severe.

### Q. 117: What is Wernicke-Korsakoff syndrome?

**Wernicke-Korsakoff syndrome (WKS)** is a brain and memory disorder that requires immediate treatment. It happens due to a severe lack of **thiamine (vitamin B1)**, which causes damage to your brain. **Thiamine** is an essential vitamin that your body uses to convert food into energy. WKS consists of two stages:

- **Wernicke encephalopathy**, a sudden and severe (acute) brain disorder
- **Korsakoff syndrome**, a long-term (chronic) memory disorder.

This condition is named for German neurologist **Carl Wernicke** and Russian neuropsychiatrist **Sergei Korsakoff**.

### Q. 118: What is West Nile virus?

**West Nile virus** is an infectious disease caused by microscopic germs (called viruses) that can make you sick. Mosquitoes infected with the **West Nile virus** can give it to people or animals, such as horses, when they bite the skin.

For most people, the **West Nile virus** causes minor or no symptoms. In rare instances, the **West Nile virus** can cause a dangerous neurological infection (an infection in your nerves and brain). A neurological infection can pose a serious threat to your health.

### Q. 119: What is a wheat allergy?

A **wheat allergy** is one of the most common types of food allergies. Your immune system overreacts to wheat you've ingested (eaten or drunk) or inhaled (breathed in). For many people, ingesting wheat is harmless. However, if you have a wheat allergy, your immune system views wheat as a harmful "invader," like a bacterium or virus. A wheat allergy can be deadly. If you have severe allergic reaction symptoms, such as swelling in your throat, go to your nearest emergency room (ER) immediately.

### Q. 120: What is white matter disease?

**White matter disease** is an umbrella term for changes and damage to your brain's white matter—the nerve fibres in your brain that connect different areas of your brain to each other and to your spinal cord like highways. You can also get white matter disease, also called **cerebral small vessel** or **microvascular disease**, from ageing and blood vessel changes in your brain's white matter. It can be mild, moderate, or severe.

When your white matter becomes damaged, it causes white matter lesions, which healthcare providers can “see” as bright spots on **magnetic resonance imaging (MRI)** of your brain. Some white matter lesions may not cause noticeable symptoms and can be considered almost “normal” with aging. However, some of these lesions can damage important pathways (highways) within your brain and cause problems with memory, balance, and walking.

**White matter disease** is strongly linked to cardiovascular disease risk factors, and researchers believe that white matter disease is a biomarker (medical sign) of the lifelong risk of stroke, dementia, and disability.

### Q. 121: What is an MRI?

An **MRI (magnetic resonance imaging)** scan is a painless test that produces very clear images of the organs and structures inside your body. **MRI** uses a large magnet, radio waves, and a computer to produce these detailed images. It doesn't use X-rays (radiation). Because **MRI** doesn't use X-rays or other radiation, it's the imaging test of choice when people will need frequent imaging for diagnosis or treatment monitoring, especially of their brain.

Some **MRI** exams use an injection of contrast material. The contrast agent contains gadolinium, which is a rare earth metal. When this substance is present in your body, it alters the magnetic properties of nearby water molecules, which enhances the quality of the images. This improves the sensitivity and specificity of the diagnostic images. Contrast material enhances the visibility of the tumours, inflammation, infection, blood supply to certain organs, blood vessels, etc.

If your **MRI** requires contrast material, a healthcare provider will insert an intravenous catheter (IV line) into a vein in your hand or arm. They'll use this IV

to inject the contrast material. Contrast materials are safe drugs. Side effects ranging from mild to severe do occur, but severe reactions are very rare.

### **Q. 122: What's the difference between an MRI scan and a CT scan?**

**Magnetic resonance imaging (MRI)** uses magnets, radio waves, and a computer to create images of the inside of your body, whereas computed tomography (CT) uses X-rays and computers.

Healthcare providers often prefer to use **MRI** scans instead of **CT** scans to look at the non-bony parts or soft tissues inside your body. **MRI** scans are also safer since they don't use the damaging ionising radiation of X-rays. **MRI** scans also take much clearer pictures of your brain, spinal cord, nerves, muscles, ligaments, and tendons than regular X-rays and **CT** scans.

However, not everyone can undergo an **MRI**. The magnetic field of an **MRI** can displace metal implants or affect the function of devices such as pacemakers and insulin pumps. If this is the case, a **CT** scan is the next best option. **MRI** scanning is usually more expensive than X-ray imaging or **CT** scanning.

### **Q. 123: What are the parts of the nervous system?**

The **nervous system** has two main parts. Each part contains billions of cells called **neurons**, or **nerve cells**. These special cells send and receive electrical signals through your body to tell it what to do. The main parts of the nervous system are:

**Central nervous system (CNS):** Your **brain and spinal cord make up your CNS**. Your brain uses your nerves to send messages to the rest of your body. Each nerve has a protective outer layer called **myelin**. **Myelin** insulates the nerve and helps the messages get through.

**Peripheral nervous system:** Your **peripheral nervous system** consists of many nerves that branch out from your **CNS** all over your body. This system relays information from your brain and spinal cord to your organs, arms, legs, fingers, and toes. Your peripheral nervous system contains your **somatic nervous system**, which guides your voluntary movements, and your **autonomic nervous system**, which controls the activities you do without thinking about them.



### Q. 124: What is a CT scan?

A **CT (computed tomography)** scan is a type of imaging test. Like an X-ray, it shows structures inside your body. But instead of creating a flat, 2D image, a **CT** scan takes dozens to hundreds of images of your body. To get these images, a **CT** machine takes X-ray pictures as it revolves around you.

Healthcare providers use **CT** scans to see things that regular X-rays can't show. For example, body structures overlap on regular X-rays, and many things aren't visible. A **CT** shows the details of each of your organs for a clearer and more precise view.

Another term for a **CT** scan is a **CAT scan**. **CT** stands for "**computed tomography**", while **CAT** stands for "**computed axial tomography**". But these two terms describe the same imaging test.

### Q. 125: What are strokes?

**Strokes** are very common. Worldwide, **strokes** rank second among the top causes of death. A **stroke** is a life-threatening condition that happens when part of your brain doesn't have enough blood flow. This most commonly happens because of a blocked artery or bleeding in your brain. Without a steady supply of blood, the brain cells in that area start to die from a lack of oxygen.

A **stroke** is a life-threatening emergency condition where every second counts. If you or someone with you has symptoms of a **stroke**, immediately **call your local emergency services number**. **The quicker a stroke** is treated, the more likely you'll recover without disability. To recognise the warning signs of a **stroke**, remember to think **BE FAST**:

- **B: Be watchful for a sudden loss of balance.**
- **E:** Look out for sudden loss of vision in one or both eyes. Are they experiencing double vision?
- **F: Ask the person to smile. Look for a droop on one or both sides of their face, which is a sign of muscle weakness or paralysis.**

- **A:** A person having a stroke often has muscle weakness on one side. Ask them to raise their arms. If they have one-sided weakness (and didn't have it before), one arm will stay higher while the other will sag and drop downward.
- **S:** Strokes often cause a person to lose their ability to speak. They might slur their speech or have trouble choosing the right words.
- **T:** Time is critical, so don't wait to get help! If possible, look at your watch or a clock and remember when symptoms start. Telling a healthcare provider when symptoms started can help the provider know what treatment options are best for you.

### **Q. 126: What is the brain?**

Your brain is an essential organ. All of your emotions, sensations, aspirations, and everything else that makes you uniquely individual come from your brain. This complex organ has many functions. It receives, processes and interprets information. Your brain also stores memories and controls your movements.

Your brain is one component of your **Central Nervous System (CNS)**. It connects to your spinal cord, the other part of your **CNS**. Your brain receives information from your five senses: sight, smell, sound, touch, and taste. Your brain also receives inputs, including touch, vibration, pain, and temperature, from the rest of your body, as well as autonomic (involuntary) inputs from your organs. It interprets this information so you can understand and associate meaning with what goes on around you.

Your brain enables:

- Thoughts and decisions
- Memories and emotions
- Movements (motor function), balance, and coordination
- Perception of various sensations, including pain.
- Automatic behaviour such as breathing, heart rate, sleep, and temperature control.

- Regulation of organ function.
- Speech and language functions
- Fight or flight response (stress response).

### **Q. 127: What is the difference between the left and right brain hemispheres?**

Your cerebrum divides into two halves: the left and right cerebral hemispheres. The two halves of the brain are connected by *nerve fibre bundles (white matter)* called the *corpus callosum*. The right side of your cerebrum controls movement on the left side of your body and vice versa.

Your left-brain hemisphere is often the “dominant” hemisphere, but this doesn’t apply to everyone. Most people who are right-handed are usually left-hemisphere dominant. Some patients who are left-handed have the right hemisphere dominant. Typically, the dominant hemisphere is responsible for your speech and language functions. Your non-dominant (which is the right hemisphere in most individuals) is responsible for your spatial awareness and processing of what you see.

About 1 in 10 right-handed people and about 1 in 3 left-handed people have dominance in the right hemisphere. This means that their speech functions are mostly centred on the right side of their brains. Many times, this is a normal variant, but in some people with brain tumours or epilepsy, the dominance can be shifted through a process called brain plasticity.

### **Q. 128: What does the nervous system do?**

Your nervous system uses specialised cells called neurons to send signals, or messages, all over your body. These electrical signals travel between your brain, skin, organs, glands and muscles.

The messages help you move your limbs and feel sensations, such as pain. Your eyes, ears, tongue, nose, and the nerves all over your body take in information about your environment. Then nerves carry that data to and from your brain.

Different kinds of neurons send different signals. Motor neurons tell your muscles to move. Sensory neurons take information from your senses and send

signals to your brain. Other types of neurons control the things your body does automatically, like breathing, shivering, having a regular heartbeat, and digesting food.

**Q. 129: Which nerves send signals to and from your brain?**

Your brain contains several types of nerves. Nerves carry messages by sending electrical impulses back and forth between your brain, organs, and muscles. The nerves in your brain are called cranial nerves. You have 12 pairs of cranial nerves from the brain to parts of your head and face. These nerves are responsible for specific sensations, such as hearing, taste or sight. White matter is the bundle of fibres that connect brain cells. There are numerous white matter tracts that connect one area of your brain to another, as well as structures deep in your brain. These white matter tracts can also travel to your brainstem and spinal cord so that information can be relayed from your brain to communicate with the rest of your body, and information from your body can travel to your brain.

**Q. 130: What other parts of the brain send and receive signals?**

Although most brain cells reside on the surface of your brain (called **grey matter**) and the cabling (white matter) is deep and connects various parts of your brain, there are some **nuclei** (collections of brain cells) that reside deep in your brain. They include:

- **Thalamus:** Your **thalamus** is a structure residing deep in your **cerebrum** and above your **brainstem**. This structure is sometimes referred to as the switchboard of the **central nervous system**. It relays various sensory information, like sight, sound, or touch, to your cerebral cortex from the rest of your body.
- **Hypothalamus:** Your **hypothalamus** sits below your **thalamus**. It's important for regulating various hormonal functions, autonomic function, hunger, thirst, and sleep. Your **hypothalamus** and **pituitary glands** are important structures involved in the control of your **hormonal system**.
- **Pituitary Gland:** Your **pituitary gland** sends hormones to different organs in your body.

- **Basal Ganglia:** Your **basal ganglia** are a group of nuclei deep in your **cerebrum** that are important in the control of your movement, including motor learning and planning.
- **Brainstem Nuclei:** There are a number of **nuclei** situated in your **brainstem** involved in a variety of different functions, including cells that give rise to a number of important cranial nerves, normal sleep function, autonomic functions (breathing and heart rate), and pain.
- **Reticular Formation:** Your **reticular formation** is a part of your brainstem and thalamic nuclei. These are a part of your reticular activating system (**nuclei plus** the white matter connecting these **nuclei**), which lies in your **brainstem**, **hypothalamus**, and **thalamus**. The **reticular activating system (RAS)** mediates your level of awareness, consciousness, and focus. They also help control your sleep-wake transitions and autonomic function.

#### Q. 131: What is the difference between varicose veins and spider veins?

**Varicose veins** and **spider veins** are both types of **venous disease**, but they look different. **Spider veins** are smaller and thinner than **varicose veins**. They look like red or blue spider webs or branches of a tree, and they are close to the skin's surface. **Spider veins** aren't usually painful. They can appear anywhere on your body, most often behind your knee, on your feet or on your face. **Varicose veins** usually appear on your feet, and legs.

#### Q. 132: What is vascular dementia?

**Vascular dementia** is a common type of dementia. **Vascular dementia** can affect your thinking skills, memory, language, behaviour and personality. **Vascular dementia** can occur after a stroke or other conditions where there's decreased blood flow to areas of your brain. Without proper blood flow, needed oxygen and nutrients aren't delivered, and brain tissue is damaged.

**Vascular dementia** is diagnosed if there's a decline in at least two types of thinking skills (like memory and language) that are related to a blood vessel blockage in your brain and impair your ability to function in daily life. If fewer than two abilities are impaired, or if changes in cognition don't impact your daily function, this condition is called vascular cognitive impairment.

**Vascular dementia** is the second-most common cause of **dementia** in older adults after Alzheimer's disease. About 15% to 20% of older adults who are diagnosed with **dementia** have **vascular dementia**. It's most common in older adults between the ages of 60 and 75. **Vascular dementia** affects more males than females.

Many of the medical conditions that would put you at risk for heart disease and stroke are the same risk factors that can make you more vulnerable to vascular dementia. You may have a higher risk if you:

- Are of older age (greater than 60).
- Have high blood pressure (hypertension).
- Have had one or more strokes.
- Have diabetes.
- Have high cholesterol **and lipid levels**.
- Have an irregular heart rhythm (arrhythmias, atrial fibrillation).
- Are a smoker.
- Are physically inactive.
- Are overweight.
- Have a family history of rare inherited diseases of the blood vessels that block the flow of blood in the brain.

### Q. 133: What is tachophobia?

**Tachophobia** is an irrational fear of speed. People with **tachophobia** are afraid of moving at a quick pace. They may fear riding roller coasters, driving, biking, or even walking too fast. Some people with **tachophobia** may avoid quick-moving transit at all costs. For example, they may refuse to ride aeroplanes, buses, or trains. In some cases, people may refuse to leave their homes for fear of encountering a fast-moving car or bus. **Tachophobia** is a type of specific phobia.

A specific phobia is an overwhelming fear of something that isn't actually a significant threat. Many people who have specific phobias know the fear is irrational. But it can still be challenging to control symptoms.

### Q. 134: What are the types of tumours?

A tumour may be:

- **Cancerous: *Malignant or cancerous tumours*** can spread into nearby tissue, glands, and other parts of the body. The new tumours are metastases (mets). Cancerous tumours can come back after treatment (cancer recurrence). These tumours can be life-threatening.
- **Noncancerous: *Benign tumours*** are not cancerous and are rarely life-threatening. They're localised, which means they don't typically affect nearby tissue or spread to other parts of the body. Many noncancerous tumours don't need treatment. But some noncancerous tumours press on other body parts and do need medical care.
- **Precancerous: *These noncancerous tumours*** can become cancerous if not treated.

### Q. 135: What is tachycardia?

When you have ***tachycardia***, your heart beats faster than normal for a few seconds to a few hours. Normally, your heart rate is 60 to 100 beats per minute when you're not active. When your heart beats more than 100 times a minute at rest, that is what you may call ***tachycardia***.

Because your heart beats too often, it doesn't have the time it needs to fill with blood between beats. This can be dangerous if your heart can't supply all of your cells with the blood and oxygen they need.

Your heart normally responds to electrical signals from your heart's ***sinoatrial (SA) node***. These signals control how often your heart beats. When you've had a scare, are very emotional or anxious, or are exercising, your heart may send signals more frequently for a short time. This is called sinus tachycardia and goes away when you calm down or rest.

### Q. 136: What is the thyroid?

The **thyroid** gland is a small organ that's located in the front of the neck, wrapped around the windpipe (trachea). It's shaped like a butterfly, smaller in the middle, with two wide wings that extend around the side of your throat. The **thyroid** is a gland. You have glands throughout your body that they create and release substances that help your body do a specific thing. Your thyroid makes hormones that help control many vital functions of your body.

When your thyroid doesn't work properly, it can impact your entire body. If your body makes too much thyroid hormone, you can develop a condition called **hyperthyroidism**. If your body makes too little thyroid hormone, it's called **hypothyroidism**. Both conditions are serious and need to be treated by your healthcare provider.

### Q. 137: What is Tourette syndrome?

**Tourette syndrome (TS)** is a neurological disorder that affects the brain and nerves. **TS** causes a person to make sudden movements or sounds called "**tics**". **Tics** are involuntary, so you can't control or prevent them. Motor **tics** involve body movements like shoulder shrugging. Vocal tics involve the voice, like throat clearing. Motor tics tend to develop before vocal tics. **Tourette syndrome**, or **Tourette's**, usually develops in early childhood. It often improves as you become an adult. **TS** is the most severe type of tic disorder. About one in 100 children has some form of tic disorder. **Tourette syndrome** is less common. It affects about one out of every 160 children.

### Q. 138: What is transient global amnesia (TGA)?

**Transient global amnesia (TGA)** is a rare medical condition in which you experience a sudden episode of memory loss. During a **TGA** episode, you can't form new memories (a condition called **anterograde amnesia**), and you have difficulty recalling recent memories (a condition called **retrograde amnesia**). "**Transient**" means passing. **Transient global amnesia** episodes usually last no more than several hours. In rare cases, they last up to 24 hours.

People with **TGA** remember who they are and can remember their friends and family members. They can still perform complex daily tasks, such as cooking or driving. They also retain their language and social interaction skills. However,



during a **TGA** episode, they may not know where they are or the day or time.

**Transient global amnesia** mainly affects people between the ages of 50 and 80 (75% of cases). It rarely affects people younger than 40.

Some studies suggest that people who have a history of the following health conditions may be more at risk for developing transient global amnesia: **heart disease, migraine, hyperlipidemia (high cholesterol)**.

### Q. 139: What is a transient ischemic attack?

A **transient ischemic attack** is like a temporary stroke. It means there's a temporary (transient) lack of blood flow to part of your brain. Without blood flow, the brain cells malfunction and start to die (**ischemia**).

Often shortened to **TIA**, a transient ischemic attack is a medical emergency that's very similar to an ischemic stroke. The symptoms of the two are the same, but **TIA** symptoms go away within 24 hours (most go away in minutes).

A common nickname for **TIA**s is "**mini-strokes**". But that's not an accurate name. A **TIA** isn't necessarily "**mini**" or smaller, and **TIA**s can easily affect large brain areas. Importantly, a **stroke** may occur after a **TIA** within a matter of minutes, hours, or days.

There are also two critical differences between strokes and **TIA**s. The first is that a **TIA** stops on its own. A **stroke** doesn't, and it needs treatment to stop and reverse the effects. A stroke also leaves behind evidence on a **magnetic resonance imaging (MRI)** scan. The changes remain even if your symptoms go away.

### Q. 140: What is transverse myelitis (TM)?

**Transverse myelitis (TM)** is a rare neurological condition caused by inflammation **of** the spinal cord.

Your spinal cord is a cylindrical structure that runs through the centre of your spine, from your brainstem to your low back. It's a delicate structure that contains nerve bundles and cells that carry messages from your brain to the rest of your body.

Due to inflammation, the covering (**myelin sheath**) around the nerve cells in your spinal cord is damaged. This interrupts the signals between spinal nerves and the rest of your body, causing issues such as loss of sensation, movement and bladder control.

**TM** can happen around your spinal cord in any region along your spine. The term “**myelitis**” means inflammation of the spinal cord. “**Transverse**” refers to the pattern of changes in sensation and function—there’s often a band-like sensation across the trunk of your body in TM, with sensory changes below that band. In most cases, **TM** is a one-time condition with a sudden onset followed by improvement or stabilisation.

### **Q. 141: What is a traumatic brain injury (TBI)?**

A **traumatic brain injury**, or **TBI**, can happen when there is a blow to the head. The injury can be penetrating, such as a gunshot wound, or non-penetrating, such as being struck in the head in a car accident.

**Traumatic brain injuries** vary in severity. Many people recover from **TBIs** within days, and more severe forms can cause permanent brain injury or even death.

Anyone can experience a **TBI**, although nearly 80% of them happen to men. **TBIs** are also more common among people older than 65. People in this age group are more prone to losing their balance, falling, and hitting their heads. But even infants can experience **TBIs** from incidents like falling from a bed or changing table, or more rarely, from abuse. People involved in certain professions or activities have a higher risk of TBIs, including athletes (both recreational and professional); construction workers; military members; police and law enforcement, etc.

### **Q. 142: What are the types of traumatic brain injuries (TBIs)?**

The severity of the head injury is determined by several different factors, such as loss of consciousness, certain neurological symptoms that happened at the time of the injury, loss of memory for the injury and time surrounding it, and abnormalities on head CT or brain MRI.

There are several different types and grades of TBI:

- **Mild concussion (mTBI):** Concussions *are the most common type of TBI*. Three out of **4 TBIs** every year are concussions. These *mTBIs* can include brief alterations of consciousness, such as feeling “dazed” or losing consciousness for less than 30 minutes. People who have an *mTBI* can experience confusion for about one day, which is different from difficulties with attention or memory.
- **Moderate TBI:** This type of head injury is associated with loss of consciousness for over 30 minutes but less than one day. Confusion can last for up to one week.
- **Severe TBI:** Individuals with this type of head injury lose consciousness for over one full day. These injuries are typically associated with changes on a head **CT** or brain **MRI**.
- **Uncomplicated TBI:** Head **CT**/brain **MRI** are normal, regardless of mild, moderate, or severe grade.
- **Complicated TBI:** Head **CT** or brain **MRI** show changes, such as bleeding.
- **Closed:** Most **TBIs** are closed. A closed **TBI** means an outside force causes a blow or jolt to the head that did not penetrate the skull. This impact injures the brain, causing it to swell.
- **Open:** Healthcare providers may call an open **TBI** a penetrating **TBI**. This injury occurs when a bullet, knife or something else goes through the skull. If the object goes into the brain, it directly damages brain tissue.
- **Nontraumatic:** Also known as a hypoxic/anoxic brain injury. Some **TBIs** aren’t from trauma. They can result from **strokes**, **seizures** and events like choking and near-fatal drownings. These incidents can deprive the brain of oxygen (cerebral hypoxia).

#### Q. 143: What is trichotillomania?

**Trichotillomania** (often abbreviated as **TTM**) is a mental health disorder where a person compulsively pulls out or breaks their own hair. This condition falls under the classification of **obsessive-compulsive disorder (OCD)**. When

it's severe, it often has extremely negative effects on a person's happiness, well-being, and overall quality of life. **Trichotillomania** (pronounced **trick-oh-till-oh-main-ee-uh**) comes from three Greek words: **Tricho** means hair; **Tillo** means pull; and **Mania** means excessive behaviour or activity.

#### Q. 144: What is trigeminal neuralgia?

**Trigeminal neuralgia**, also referred to as **tic douloureux**, is a condition defined by intense facial pain that can disrupt your normal, everyday activities. Activities as simple as chewing, talking, smiling, brushing your teeth or shaving can trigger brief bouts of intense pain. Though these painful episodes are short-lived, the pain can return sporadically (on and off). Or you might also experience constant pain that isn't as severe.

Typically, **trigeminal neuralgia** is **unilateral** (meaning it only affects one side of your face). If it's bilateral, both sides will be affected, though not at the same time. **Bilateral trigeminal neuralgia** is also very rare. Interestingly, the right side of the face is usually more affected by this condition than the left.

#### Q. 145: What is trypanophobia?

**Trypanophobia** (**trih-PAN-o-foe-bee-uh**) is the overwhelming, extreme fear of medical procedures that involve needles. It's closely related to phobias of needles, pins or sharp objects. But people with **trypanophobia** specifically fear needles in the medical setting.

**Needle phobia** is a type of **specific phobia**. Intense **trypanophobia** can interfere with your life. A severe fear may cause you to miss necessary doctor's appointments or follow prescribed treatments.

#### Q. 146: What is trypophobia?

**Trypophobia** (**trip-uh-FOE-bee-uh**) is an aversion or repulsion to objects like honeycombs and sponges that have repetitive patterns or clusters of small holes. People with **trypophobia** are disgusted by the pattern of holes. They don't necessarily have a fear of holes.

**Q. 147: What is a tumour?**

A **tumour** is a solid mass of tissue that forms when abnormal cells group together. **Tumours** can affect bones, skin, tissue, organs and glands. If you have a **tumour**, it isn't necessarily cancer. Many **tumours** are benign (not cancerous). But they still may need treatment. **Cancerous, or malignant, tumours** can be life-threatening and require cancer treatment. **Tumours** can form throughout the body. They can affect bone, skin, tissues, glands and organs. **Neoplasm** is another word for **tumour**.

**Q. 148: What's the difference between a tumour and a cyst?**

A **tumour** is a solid mass of tissue. It may or may not be **cancerous**. A **cyst** is a small sac that may contain fluid, air or solid material. The majority of **cysts** are not **cancerous**.

**Q. 149: What is Turcot syndrome?**

**Turcot syndrome (tur-KOH)** is a rare genetic disease. It causes small growths (**polyps**) in your gastrointestinal tract and brain tumors.

Growths in your intestines can cause rectal bleeding, diarrhea and stomach pain. Depending on the size and location of the brain or spinal cord tumour, you may have neurological symptoms, such as headaches, blurred vision or difficulty with balance.

**Q. 150: What is Type 1 diabetes?**

**Type 1 diabetes** is a chronic (lifelong) autoimmune disease that prevents your pancreas **from making insulin**. Insulin is an important hormone **that regulates the amount of glucose (sugar)** in your blood. Under normal circumstances, insulin functions in the following ways:

- Your body breaks down the food you eat into glucose (sugar), which is your body's main source of energy.
- Glucose enters your bloodstream, which signals your pancreas to release insulin.

- Insulin helps glucose in your blood enter your muscle, fat, and liver cells so they can use it for energy or store it for later use.
- When glucose enters your cells and the levels in your bloodstream decrease, it signals your pancreas to stop producing insulin.

If you don't have enough insulin, too much sugar builds up in your blood, causing **hyperglycemia** (high blood sugar), and your body can't use the food you eat for energy. This can lead to serious health problems or even death if it's not treated. People with Type 1 diabetes need synthetic insulin every day in order to live and be healthy. Type 1 diabetes was previously known as **juvenile diabetes** and **insulin-dependent diabetes**.

#### Q. 151: What is the difference between Type 1 diabetes and Type 2 diabetes?

While Type 1 diabetes and Type 2 diabetes are forms of diabetes mellitus (**as opposed to** diabetes insipidus) that lead to **hyperglycemia** (high blood sugar), they are distinct from each other. In **Type 2 diabetes (T2D)**, your pancreas doesn't make enough insulin and/or your body doesn't always use that insulin as it should usually due to insulin resistance. Lifestyle factors, including obesity and a lack of exercise, can contribute to the development of **Type 2 diabetes** as can genetic factors. In **Type 1 diabetes**, your pancreas doesn't make any insulin. It's caused by an autoimmune reaction. **Type 2 diabetes** usually affects older adults, though it's becoming more common in children. **Type 1 diabetes** usually develops in children or young adults, but people of any age can get it. **Type 2 diabetes** is much more common than **Type 1 diabetes**.

#### Q. 152: What is Type 2 diabetes?

**Type 2 diabetes** is a disease in which your body can't use energy from food properly. Your pancreas produces **insulin (a hormone)** to help your cells use glucose (sugar). But over time, your pancreas makes less insulin, and the cells resist the insulin. This causes too much sugar to build up in your blood. High blood sugar levels from **Type 2 diabetes** can lead to serious health problems, including heart disease, stroke, or death.

#### Q. 153: What are the balance issues?

Your sense of **balance** helps you stay upright and feel stable as you navigate

your way through your day. Your sense of balance relies on a steady flow of information among your ears, eyes, tissues, and brain. When something disrupts that flow of information, you lose your sense of balance. Balance issues may be symptoms of certain medical conditions. Healthcare providers treat **balance** issues by managing the underlying medical condition. You might also need physical therapy.

### Q. 154: How does a sense of balance work?

Your sense of balance relies on the relationship between your central nervous system (brain) and your sensory system. Your sensory system includes:

- **The vestibular labyrinth in your inner ear:** This includes your semicircular canals (loops), which react when you turn your head, and **otolith organs** that react to gravity and movement.
- **Your Vision:** Your eyes **send impulses to your** brain that show where your body is in relation to other objects.
- **Your skin, joints, and muscles:** When your body moves, it puts pressure on tissues in your skin, muscles, and joints. These tissues send signals to your brain, telling it where your body is in relation to space. For example, if you're standing up and leaning back, you put pressure on the back of your foot and lower leg. That pressure lets your brain know you're leaning instead of standing straight.

Your **central nervous system (CNS)** pulls this information together so it can tell your body how to maintain balance. When something interferes with the system's connection, your central nervous system can't process information correctly, and you feel unsteady.

### Q. 155: How does bipolar disorder affect children ?

**Bipolar disorder** is different in children and teenagers than in adults. Adults with **bipolar disorder** often have clear episodes of **mania** or **depression** that last a week or longer. In children and teens, the phases may be less clear, and changes from one episode to the next may happen faster. For example, a child may exhibit periods of giddiness and silliness, anger outbursts, and unprovoked crying all in one day.

**Bipolar disorder** is different from the typical mood swings and ups and downs every child and teenager goes through. The mood changes *in bipolar disorder* are more extreme, often unprovoked, and also involve:

- Changes in sleep patterns.
- Changes in energy level.
- Issues with focus and the ability to think clearly.

**Bipolar disorder symptoms** can make it hard for your child to perform well in school or to get along with friends and family members. Some children and teens with bipolar disorder may try to hurt themselves or attempt suicide.

#### **Q. 156: What is barophobia?**

People who have **barophobia** have an intense fear of gravity. The word combines two Greek words: “**baros**”, which means pressure or weight, and “**phobos**”, which means fear. They worry that gravity will cause a fall that leads to serious injury or death. Or they fear that gravity may topple a heavy object onto them. A person with **barophobia** may also be frightened of images of outer space, where gravity doesn’t exist. A traumatic accident may cause a fear of gravity. **Psychotherapy** can help.

#### **Q. 157: What is bathmophobia?**

People who have **bathmophobia** have an extreme fear of stairs or slopes, such as a steep hill. “**Bathmo**” is the Greek word for steps, while “**phobos**” means fear.

#### **Q. 158: What is the difference between bathmophobia and climacophobia?**

Someone with **bathmophobia** may feel anxious or fearful at the mere sight of stairs or a steep incline. These feelings may persist as they go up or down stairs or an incline.

**Climacophobia** means fear of climbing. With this phobia, symptoms like fear and dread only happen during the act of climbing. Someone with **bathmophobia** may also have **climacophobia**, and vice versa.



### Q. 159: What is Bell's palsy?

**Bell's palsy** is a condition that causes temporary facial paralysis (palsy). It usually only affects the muscles on one side of your face. You may have a lopsided smile or an eyelid that you can't fully close. It rarely affects both sides of your face.

**Bell's palsy** happens when there's inflammation and swelling of your seventh cranial nerve—the nerve that controls facial muscles. Certain conditions (like viral infections) can cause inflammation, but many cases of **Bell's palsy** have no clear cause (idiopathic).

**Bell's palsy** can affect anyone at any age. But it's most likely to affect people between the ages of 15 and 60. The average age of onset is 40 years. The condition gets its name from **Sir Charles Bell**, a Scottish surgeon who first described it during the 19th century.

### Q. 160: What is bibliophobia?

**Bibliophobia** is an intense fear of books. The condition is a specific phobia (fear), which is a type of anxiety disorder. A person with **bibliophobia** might fear all books or only a specific kind, such as textbooks or children's books. Someone with **bibliophobia** might be afraid of books themselves, the stories they contain, or the act of reading a book. People with **bibliophobia** may:

- Avoid books and places where they might encounter books, such as schools, libraries, and stores.
- Experience shame or embarrassment about the fear.
- Get nervous when they merely think about books.
- Panic when they have to hold a book or read a book.
- Skip educational, professional, or personal activities that involve books.
- Worry excessively about the possibility of having to read or be near books.

A person with **bibliophobia** may understand that the fear is extreme but not be able to control it. Books are almost everywhere, and it's difficult to avoid them in everyday life. **Bibliophobia** can cause significant stress and even physical symptoms. The condition can affect a person's education, social experiences, and career path.

#### **Q. 161: What is bipolar disorder?**

**Bipolar disorder** (formerly known as **manic-depressive illness** or **manic depression**) is a lifelong mood disorder and mental health condition that causes intense shifts in mood, energy levels, thinking patterns, and behavior. These shifts can last for hours, days, weeks, or months and interrupt your ability to carry out day-to-day tasks.

There are a few types of bipolar disorder which involve experiencing significant fluctuations in mood, referred to as **hypomanic or manic** and **depressive episodes**. However, people with **bipolar disorder** aren't always in **a hypomanic or manic** or **depressive state**. They also experience periods of normal mood, known as **euthymia**.

#### **Q. 162: What is body dysmorphic disorder (BDD)?**

**Body dysmorphic disorder (BDD)** is a mental health condition that causes you to view your own physical appearance unfairly. The thoughts and feelings related to your appearance can consume you and affect your thoughts and actions. Eventually, **BDD** can negatively impact your quality of life and how you feel about yourself.

While everyone's body has unique characteristics and differences, **BDD** means you believe one or more of your body's characteristics are flaws. That belief compels you to spend significant amounts of time focusing on or trying to change what you think is wrong with you.

#### **Q. 163: What's the difference between body dysmorphic disorder and body dysmorphia?**

These are different names for the same condition. **Body dysmorphic disorder** is the condition's technical name, but "**body dysmorphia**" is more widely known.

**Q. 164: What is Boerhaave's syndrome?**

**Boerhaave's syndrome** is a rupture of the oesophagus caused by tremendous stress. It happens when forceful vomiting or excessive straining cause your oesophagus wall to split open. Healthcare professionals call this an "effort rupture" or "spontaneous rupture" to distinguish it from ruptures caused by direct injury to your esophagus. **Boerhaave's syndrome** is an uncommon cause of esophageal rupture, affecting an estimated 0.0003% of the population. It represents 15% of all traumatic ruptures of the oesophagus.

**Q. 165: What is the oesophagus?**

The **oesophagus** is the hollow, muscular tube that passes food and liquid from your throat to your stomach. It functions as part of your digestive system.

**Q. 166: What is the difference between Boerhaave's syndrome and Mallory Weiss syndrome?**

A **Mallory Weiss** tear is a tear in the inner lining of your esophagus. Like **Boerhaave's syndrome**, it also occurs after forceful vomiting or straining, and both are associated with drinking too much alcohol. A **Mallory Weiss** tear will cause you to vomit blood, but it doesn't tear all the way through the **oesophagus**. **Boerhaave's syndrome**, on the other hand, ruptures the full thickness of the **oesophagus** wall. This is also called a **transmural tear**. A **transmural tear** will likely need emergency repair, and repairing it can be a matter of life or death.

**Q. 167: What is borderline personality disorder (BPD)?**

**Borderline personality disorder (BPD)** is a mental health condition marked by extreme mood fluctuations, instability in interpersonal relationships, and impulsivity. People with **BPD** have an intense fear of abandonment and have trouble regulating their emotions, especially anger. They also tend to show impulsive and dangerous behaviours, such as reckless driving and threatening self-harm. All of these behaviours make it difficult for them to maintain relationships.

**Borderline personality disorder** is one of a group of conditions called "Cluster B" personality disorders that involve dramatic and erratic behaviours. **Personality**

**disorders** are chronic (long-term) dysfunctional behavior patterns that are inflexible, prevalent, and lead to social issues and distress.

Many people who live with borderline personality disorder don't know they have it and may not realize there's a healthier way to behave and relate to others.

**Q. 168: What is the difference between borderline personality disorder and bipolar disorder?**

While **bipolar disorder** is also characterised by wide fluctuations in mood and behaviour, it's distinct from **borderline personality disorder (BPD)**. In **BPD**, **mood** and **behaviour change rapidly** in response to significant stress, especially when interacting with other people, whereas in **bipolar disorder**, moods are more sustained and less reactive. People with bipolar disorder also have significant changes in energy and activity, unlike those with **BPD**.

**Q. 169: What causes borderline personality disorder?**

Healthcare providers believe **BPD** results from a combination of factors, including:

- **Childhood abuse and trauma:** Up to 70% of people with **BPD** have experienced sexual, emotional, or physical abuse as children. Maternal separation, poor maternal attachment, inappropriate family boundaries, and parental substance use disorder are also associated with **BPD**.
- **Genetics:** Studies show that borderline personality disorder runs in families. If you have a family history of **BPD**, you're more likely-but not guaranteed-to develop the condition.
- **Brain changes:** In people with **BPD**, the parts of their brain that control emotion and behaviour don't communicate properly. These problems affect the way their brain works.

**Q. 170: What is botanophobia?**

**Botanophobia** is an intense fear of plants. The condition is called a specific phobia (fear). Phobia is a type of anxiety disorder.

People with **botanophobia** might believe that plants can harm people. Or they might worry that plants will evolve and overtake humans. They may think plants are toxic or infested with harmful germs. Or they may even falsely believe that plants will suck up all the oxygen.

People with **botanophobia** often go to great lengths to avoid plants, such as: deciding where to live based on plant life; refusing to go outdoors; skipping educational, professional, or personal activities that involve plants.

Because plants are almost everywhere, **botanophobia** can cause significant stress and even physical symptoms. A person with **botanophobia** may understand that the fear is extreme but can't control it.

### Q. 171: Are there different types of botanophobia?

**Botanophobia** can involve fear of a specific type of plant or all plant life. The condition is also related to other specific phobias, including:

- **Anthophobia**, a fear of flowers;
- **Dendrophobia**, a fear of trees;
- **Germophobia**, a fear of germs that may live on plants;
- **Entomophobia**, a fear of insects, which are often found on plants;
- **Nosophobia**, a fear of illness, which a person with **botanophobia** might think can happen with plant exposure.

### Q. 172: What is botulism (*Clostridium botulinum*)?

**Botulism** is a serious illness caused by a bacterium called **Clostridium botulinum**. The bacteria produce a poison (toxin) that can attack your body's nervous system. If left untreated, botulism can be fatal.

**Botulism** poisoning is rare. But because it can cause death, you should call 911 or go to your nearest emergency room if you or your child develop **botulism symptoms**. Symptoms may include drooping eyelids and other signs affecting the muscles of your face, eyes, and throat. It can eventually affect muscles related to breathing.

**Q. 173: What happens if you get *Clostridium botulinum*?**

*Clostridium botulinum* toxins attack your nerves. This can cause weakness and paralysis of your muscles, like those that help you move, talk, and swallow. If the toxins attack the nerves that control your breathing, it can be fatal.

There are several different types of botulism. The most common kinds include *foodborne botulism*, *infant botulism*, and *wound botulism*. *Latrogenic botulism* and *adult intestinal toxemia botulism* are other rare forms of botulism.

**Q. 174: What is a brachial plexus injury?**

The *brachial plexus* is a network of intertwined nerves that control movement and sensation in your arm and hand. A *brachial plexus injury* involves sudden damage to these nerves, which may cause pain, weakness, loss of feeling, or loss of movement in your shoulder, arm, and/or hand.

The *brachial plexus* begins at your neck and crosses your upper chest to your armpit. Injury to this network of nerves often happens when your arm is forcibly pulled or stretched or your head and neck are forcibly pulled away from your shoulder.

Mild *brachial plexus injuries* may heal without treatment, but more severe injuries may require surgery to regain function in your arm or hand. Babies can experience *brachial plexus injuries* while in the uterus or during delivery. This injury is called *neonatal brachial plexus palsy (NBPP)*.

**Q. 175: What is the brachial plexus?**

The *brachial plexus* consists of five nerves that branch off from your spinal cord at your neck and conduct signals from your spinal cord to your shoulder, arm, and hand. You have a brachial plexus on each side of your body.

In the medical world, a plexus is a bundle of intersecting nerves, *blood vessels*, or *lymphatic vessels* in the human body. "*Brachial*" means "relating to the arm or to a structure resembling the arm" (the brachial artery, for example, is the main vessel supplying blood to the muscles in your upper arm and elbow joint). Thus, the *brachial plexus* is a bundle of nerves that runs from your spinal cord down into your arm.

The plexus connects these five nerves with the nerves that provide sensation to your skin and allow movement in the muscles of your arm and hand.

Each of the five nerves in the brachial plexus has a specific function, such as stimulating muscles or carrying sensory information, such as temperature and touch, from your hand to your brain.

Because each nerve has a different function, the location of the nerve injury and the type of nerve injury within the plexus determine the symptoms you experience and the type of treatment you may need.

### **Q. 176: What are the types of brachial plexus injuries?**

**Brachial plexus injuries** vary greatly in severity, depending on the type of injury and the amount of force involved. You can injure several different nerves of your brachial plexus with varying severity from the same event.

The main types of **brachial plexus injuries** include:

- **Stretch (neuropraxia):** This happens when a **brachial plexus** nerve mildly stretches, which damages the protective covering of the nerve. This causes problems with nerve signal conduction but doesn't always result in damage to the nerve underneath. It may heal on its own or require simple, nonsurgical treatment methods such as physical therapy to return to normal function.
- **Rupture:** This happens when a more forceful stretch of a **brachial plexus** nerve causes it to tear partially or fully. These types of injuries can often be repaired with surgery.
- **Avulsion:** This is the most severe type of **brachial plexus** injury. It happens when the nerve root tears away from your spinal cord. These types of injuries require surgery to regain function.

### **Q. 177: What's the difference between cervical radiculopathy and a brachial plexus injury?**

While **cervical radiculopathy** and a **brachial plexus injury** have similar symptoms, they are different conditions. **Cervical radiculopathy** (also known

as “*pinched nerve*”) is a condition that results in neurological dysfunction caused by compression and inflammation of any of the nerve roots of your **cervical spine (neck)**. Neurological dysfunction can include radiating pain, muscle weakness, and/or **numbness**.

While cervical **radiculopathy** results from compression and inflammation, a **brachial plexus injury** more commonly happens due to tearing or overstretching the nerves in the **plexus**.

**Brachial plexus injuries** often involve multiple nerve roots, and there’s usually an absence of neck symptoms, such as neck spasms **and pain, unlike with cervical radiculopathy**.

#### **Q. 178: What is bradyarrhythmia?**

A **bradyarrhythmia** is a heart rate that’s slower than typical because of an irregular heart rhythm. People with **bradyarrhythmia** have resting heart rates below 60 beats per minute. For most adults, a resting heart rate of 60 to 100 beats per minute is considered normal.

Sometimes, healthy people have naturally slow heart rates. But people with **bradyarrhythmia** have a slow heart rate because of a medical condition, heart disease, or defect that affects the heart’s rhythm.

#### **Q. 179: What’s the difference between bradyarrhythmia and bradycardia?**

Both terms mean having a slower than average heart rate. Bradycardia describes a resting heart rate below 60 beats per minute. **Bradyarrhythmia** describes a slow heart rate caused by an **irregular heartbeat (arrhythmia)**.

Healthy young people and athletes often have resting heart rates below 60 beats per minute. For them, **bradycardia** doesn’t indicate disease. In fact, the slow heart rate is a sign of their fitness and well-exercised hearts. It is also normal for your heart rate to drop below 60 beats per minute when you’re sleeping.

#### **Q. 180: What is bradycardia?**

**Bradycardia** is a condition where your heart beats fewer than 60 times per minute, which is unusually slow. This condition may be dangerous if it keeps



your heart from pumping enough blood to meet your body's needs. However, **bradycardia** can also happen without causing any harmful effects, especially in very physically active people.

### Q. 181: How do I know if I have bradycardia or tachycardia?

**Bradycardia** and **tachycardia** are opposite conditions.

- **Bradycardia:** The name **bradycardia** comes from the Greek words "**bradys**" and "**kardia**". These words together mean "**slow heart**".
- **Tachycardia:** Also from Greek. It combines the Greek words "**tachys**" and "**kardia**". These words together mean "**swift heart**".

### Q. 182: What is a brain aneurysm?

A **brain aneurysm**, also called a **cerebral aneurysm**, is a bulge in a weak area of an artery in or around your brain. The constant pressure of blood flow pushes the weakened section outward, creating a blister-like bump.

When blood rushes into this bulge, the aneurysm stretches even farther. It's similar to how a balloon gets thinner and is more likely to pop as it fills with air.

**Brain aneurysms** can occur anywhere in your brain, but most of them form in the major arteries along the base of your skull. Approximately 10% to 30% of people who have a **brain aneurysm** have multiple **aneurysms**. The majority of **brain aneurysms** are small and don't cause symptoms.

An **aneurysm** can cause symptoms if it puts pressure on nearby nerves or brain tissue. If the **aneurysm** leaks or ruptures (bursts open), it causes bleeding in your brain. A **ruptured brain aneurysm** can be life-threatening and requires emergency medical treatment. As more time passes with a ruptured **aneurysm**, the likelihood of death or disability increases.

### Q. 183: What happens when a brain aneurysm ruptures?

When it ruptures, blood spills (haemorrhages) into your surrounding brain tissue. The blood can put excess pressure on your brain tissue and make it swell. It usually causes a severe headache called a thunderclap headache, in addition to other symptoms.

A ruptured brain **aneurysm** can cause serious health problems, such as:

- **Subarachnoid haemorrhage (SAH):** Bleeding in the area between your brain and the thin tissues that cover and protect it (the **arachnoid layer**). About 90% of **SAHs** are due to ruptured brain **aneurysms**.
- **Haemorrhagic Stroke:** Bleeding in the space between your skull and brain

This can result in permanent brain damage or other complications, such as:

- **Vasospasm:** This happens when blood vessels get narrower or clamp down, and less oxygen reaches your brain.
- **Hydrocephalus:** This happens when a buildup of cerebrospinal fluid or blood around your brain puts increased pressure on it.
- **Seizures:** A **seizure** is a temporary, uncontrolled surge of electrical activity in your brain. It can make brain damage due to a ruptured aneurysm worse.
- **Coma:** A state of prolonged unconsciousness. It can last days or weeks.
- **Death:** Ruptured brain aneurysms result in death in about 50% of cases.

#### **Q. 184: What is brain atrophy?**

People with **brain atrophy**, also called **cerebral atrophy**, lose brain cells (neurons), and connections between their brain cells and brain volume often decrease. This loss can lead to problems with thinking, memory, and performing everyday tasks. The greater the loss, the more impairment someone has. There are two types of brain atrophy: **Focal: Damage occurs in one** area of your brain; **Generalized: Damage expands to your entire brain.**

People lose some brain cells as they get older, and brain volume decreases as well, but healthcare providers use the term **“brain atrophy”** when a person has more brain changes than expected for their age. Here, the damage happens faster than in the typical ageing process.

### Q. 185: Does brain atrophy lead to dementia?

There's a connection between **brain atrophy** and **dementia**. Specifically, **dementia** causes extreme brain atrophy. **Dementia** is a general term that describes severe thinking problems that interfere with daily life. The most common type of dementia is Alzheimer's disease.

### Q. 186: Does brain atrophy cause aphasia?

People with **aphasia** (speaking and language problems) as part of an underlying **neurodegenerative disease** like **Alzheimer's disease** often have brain atrophy as well. Here, damage occurs in areas responsible for producing and processing language. This **disorder** ranges in severity. Some people have trouble recalling the correct name for people, places and things. Others are completely unable to communicate.

### Q. 187: What is a brain bleed?

To most people, "**brain bleed**" simply means any bleed inside your head. However, a doctor-and specifically doctors who treat brain bleeds (**neurologists and neurosurgeons**)-would say that a "**brain bleed**" (also known by the medical term **intracranial haemorrhage**) is too broad of a term. These doctors further describe brain bleeds by their exact location. To better understand **brain bleeds**, it's important to have a basic understanding of the different types. First, there are two main areas where bleeding can occur: either within the skull but outside of the brain tissue or inside the brain tissue. These areas are further divided as follows:

#### 1. Bleeding within the skull but outside of the brain tissue:

The brain has three membrane layers (called **meninges**) that lay between the bony skull and the actual brain tissue. The purpose of the **meninges** is to cover and protect the brain. **Bleeding** can occur anywhere between these three membranes. The three membranes are called the **dura mater, arachnoid, and pia mater**.

- **Epidural bleed (haemorrhage):** This bleed happens between the skull bone and the outermost membrane layer, the **dura mater**.
- **Subdural bleed (haemorrhage):** This bleed happens between the **dura**

*mater* and the *arachnoid membrane*.

- **Subarachnoid bleed (haemorrhage):** This bleed happens between the *arachnoid membrane* and the *pia mater*.

## 2. Bleeding inside the brain tissue

Two types of brain bleeds can occur inside the brain tissue itself: **intracerebral haemorrhage** (also called **cerebral haemorrhage and haemorrhagic stroke**) and **intraventricular haemorrhage**.

- **Intracerebral haemorrhage:** *This bleeding occurs in the lobes, pons and cerebellum* of the brain (bleeding anywhere within the brain tissue itself, including the brainstem).
- **Intraventricular haemorrhage:** *This bleeding occurs in the brain's ventricles*, which are specific areas of the **brain (cavities)** where cerebrospinal fluid is produced.

### Q. 188: What happens to the brain when there is bleeding inside the head?

Since the brain cannot store oxygen, it relies on a series of **blood vessels** to supply oxygen and nutrients. When a **brain haemorrhage** occurs, oxygen may no longer be able to reach the brain tissue supplied by these **leaky or burst vessels**. The pooling of blood from an **intracranial haemorrhage** or **cerebral haemorrhage** also puts pressure on the brain and deprives it of oxygen.

When a **haemorrhage interrupts** blood flow around or inside the brain, depriving it of oxygen for more than three or four minutes, the brain cells die. The affected nerve cells and the related functions they control are damaged as well.

### Q. 189: What is a brain tumour?

A brain tumour is an abnormal growth or mass of cells in or around your brain. Together, **spinal tumours** and **brain tumours** are called **central nervous system (CNS) tumours**. **Brain tumours** can be **malignant (cancerous)** or **benign (noncancerous)**. Some tumours grow quickly, while others are slow-growing.

Only about one-third of **brain tumours** are **cancerous**. But whether they're

**cancerous** or not, **brain tumours** can impact brain function and your health if they grow large enough to press on surrounding nerves, blood vessels, and tissue.

**Tumours** that develop in your brain are called **primary tumours**. **Tumours** that spread to your brain after forming in a different part of your body are called **secondary tumours**, or **metastatic brain tumours**.

Researchers have identified more than 150 different **brain tumours**. Healthcare providers categorise primary tumours as **glial** (**composed of glial cells** in your brain) or **non-glial** (developed on or in the structures of your brain, including **nerves, blood vessels, and glands**) and **benign (noncancerous)** or **malignant (cancerous)**.

### **Q. 190: What are brain diseases?**

Your brain is the control centre of your body. It regulates growth, development, and bodily functions. All of your thoughts, feelings, and actions begin there.

Your brain is part of your nervous system. A network of nerves carries signals to your spinal cord and brain from your body and the outside world. Your brain processes the signals and sends responses back out through your spinal cord and nerves.

A wide range of diseases and disorders affect the brain. They can alter a person's behaviour, personality, and ability to process information and function. Many brain diseases impact a person's capacity to carry out daily activities.

### **Q. 191: What are the types of brain diseases?**

There are many types, including hundreds, of rare brain diseases. The general categories of brain diseases include:

- **Autoimmune brain diseases:**

**Autoimmune brain diseases** occur when your body's defences attack a part of your brain, mistaking it for an invader. **Multiple Sclerosis (MS)** is the most prominent of these. Like electrical wires, nerve cells have insulation covering them. **Multiple sclerosis** attacks this in your **brain, spinal cord, and the nerves** going to your eyes. There are less common **autoimmune brain diseases** that

mimic **MS**. There are others, like **autoimmune encephalitis**, that irritate your brain, causing confusion and involuntary movements.

- **Epilepsy:** Epilepsy is a tendency to have **seizures**. A **seizure** is an electrical storm in your brain, typically interfering with consciousness and causing **convulsions (uncontrolled movements)**. Some **seizures** can be subtle, causing a clouding of consciousness or uncontrolled movements of one part of your body.
- **Infections:** Infections occur when various types of germs invade your brain or its protective coverings. **Meningitis** happens when your protective coverings are infected. It often causes headaches, confusion and a very stiff neck. Sometimes, it's necessary to do a spinal tap to find out which germ is causing an infection so the right antibiotics can be given.
- **Mental illness: Mental, behavioural and emotional disorders** can diminish a person's quality of life and ability to function. Major types include **anxiety, bipolar disorder, depression, post-traumatic stress disorder, and schizophrenia**. **Psychiatrists** and **psychologists** generally treat mental illnesses. If your brain were a computer (and in some ways, it is), your mind would be like a programme running in it. In other words, your mind is your brain's "**operating system**". **Psychiatrists and psychologists** are like computer programmers who try to figure out why this programme is causing distress instead of working as it should. Often, treatment involves both medications and therapy. People are sometimes hesitant to see a mental health specialist. But they shouldn't be. Mental illness affects 1 in 5 adults.
- **Neurodegenerative brain diseases: Neurodegenerative disorders** are often due to the accumulation of abnormal proteins in your brain. They include **Alzheimer's disease, Parkinson's disease, and ALS (Amyotrophic Lateral Sclerosis)** among many others. They're most often slowly progressive and interfere with thought, memory, movement, or some combination of these things. They're more common in the elderly. Some run in families.
- **Neurodevelopmental disorders: Neurodevelopmental disorders** affect the growth and development of your brain and are usually cared for by **paediatric neurologists**. **Medical geneticists** may determine whether a

*disorder* is likely to be inherited. If it is, they provide family counseling. There are a large number of **neurodevelopmental disorders**, including **Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorder, and Dyslexia**.

- **Stroke:** A **stroke** occurs when a blood vessel supplying your brain with the nutrients it needs gets blocked or, less often, bursts. Either way, the effects are sudden. A **stroke** damages part of your brain. This can lead to problems with speech, understanding, vision, strength, sensation, or coordination. If enough of your brain is damaged by one or more **strokes**, it can cause dementia. Occasionally, seizures occur due to strokes.
- **Traumatic brain injuries:** **Traumatic brain injuries include** concussions and more serious brain injuries such as gunshot wounds. Brain injuries may happen due to falls, auto accidents, sports injuries, or domestic violence (including child abuse). Repeated head trauma can cause brain scarring, leading to **Chronic Traumatic Encephalopathy (CTE)**. **Neurosurgeons** may care for penetrating injuries and bleeding. **Psychologists, psychiatrists, and speech therapists** may be consulted for behavioural and thinking problems after brain injuries. Neurologists often care for the injured as well.
- **Tumours:** **Brain tumours** can develop when cancer spreads from other parts of your body, such as your **lung, breast, or colon**. Or they can form in your brain tissue itself or its coverings. Unlike **tumours** spreading from other places in your body, **tumours** arising in your brain itself or brain coverings are considered **benign** if they grow slowly and don't invade surrounding brain tissue. They're considered **malignant** if they grow rapidly and invade surrounding brain tissue. **Astrocytoma** is a common **tumour** arising from the brain itself. **Meningioma is a common tumour** arising from the coverings of your brain.

#### Q. 192: What is a paediatric brain tumour?

A **paediatric brain tumour** is a growth of abnormal brain cells in a child. A brain cell becomes abnormal when it undergoes genetic changes. A change in a specific gene in brain cells can cause the cell to form a tumour. There are many types of **paediatric brain tumours**, and they can occur at any age—from birth to adolescence and sometimes even in adulthood. **Brain tumours (neoplasms)** may be **malignant (cancerous) or non-malignant (or benign, not cancerous)**.

**Q. 193: What is a brain-eating amoeba (*Naegleria fowleri*)?**

***Naegleria fowleri* is an amoeba** that lives throughout the world in warm and shallow bodies of fresh water, such as lakes, rivers, and hot springs. It also lives in the soil. It's considered a free-living organism because it doesn't need a host to live. People who become infected by this amoeba develop a condition called **Primary Amoebic Meningoencephalitis (PAM)**. PAM is a very serious infection of the central nervous system that's almost always fatal.

You might also see the words "**ameba**" instead of "**amoeba**" and "**amebic**" instead of "**amoebic**". **Amoeba** is more common than **ameba**, but both words refer to an organism with one cell.

**Q. 194: What is brittle diabetes?**

**Brittle diabetes** is a type of diabetes that's especially difficult to manage and often disrupts everyday life. People with brittle diabetes have severe swings in blood glucose (blood sugar). The swings can cause frequent episodes of **hypoglycemia (low blood sugar) or hyperglycemia (high blood sugar)**.

**Brittle diabetes** is sometimes called **labile diabetes or unstable diabetes**.

**Q. 195: What's the difference between diabetes and unstable diabetes?**

With treatment and lifestyle changes, most people with diabetes can live healthy lives. But people with **brittle diabetes** have frequent problems managing the disease that can: affect their ability to live life normally; cause anxiety and depression, leading to hospitalisation or even death.

**Q. 196: What is Brown-Séquard syndrome?**

**Brown-Séquard syndrome (BSS)** is a rare neurological condition that happens when damage to your spinal cord causes muscle weakness or paralysis on one side of your body and a loss of sensation on the opposite side. The damage occurs on only one side of your spinal cord in a specific area.

Your **spinal cord** is a **cylindrical structure** that runs through the centre of your spine, from your brainstem to your low back. It's a delicate structure that contains nerve bundles and cells that carry messages from your brain to the rest of your body and vice versa. Your spinal cord is one of the main parts of



your nervous system.

**Brown-Séquard syndrome** is considered an incomplete Spinal Cord Injury (SCI), meaning there's partial preservation of sensory function, motor function, or a combination of both below where the injury occurred on your spinal cord. A complete **SCI** results in the loss of all sensory and voluntary motor functions below the level of the injury.

**BSS** has several possible causes, but the most common is **trauma**-typically **penetrating trauma**. Inflammation or pinching of your spinal cord can also cause **BSS** occasionally.

**Brown-Séquard syndrome** is named after scientist **Charles-Édouard Brown-Séquard**, who first described it in 1849.

**Q. 197: What is the difference between central cord syndrome and Brown-Séquard syndrome?**

**Central cord syndrome (CCS)** and **Brown-Séquard syndrome (BSS)** are both incomplete **spinal cord injuries**, but they're distinct conditions.

**CCS** is an incomplete traumatic injury to the centre of your spinal cord, usually in your neck. This injury results in weakness in your arms that is worse than in your legs.

**BSS** results from an incomplete spinal cord injury anywhere along your spine, and it causes weakness or paralysis on one side of your body and a loss of sensation on the other side below where the injury is.

**Q. 198: What is bulimia nervosa?**

**Bulimia nervosa**, also called **bulimia**, is an eating disorder. Eating disorders are mental health conditions that can be potentially life-threatening. If you have an eating disorder, you may have an obsession with food and weight. This obsession can harm your physical and emotional well-being.

**Bulimia nervosa** can be defined as a pattern of eating characterised by: consuming an unusually large amount of food in a short period of time (binge eating); getting rid of the food (purging). Purging may involve making you throw up (vomiting) or taking **laxatives**. **Laxatives** are medications that speed

up the movement of food through your body.

People with **bulimia** are usually at a normal, healthy weight. But they judge themselves harshly based on their view of their body shape and/or weight. They usually have self-esteem issues closely linked to their body image.

#### **Q. 199: What is cacophobia?**

**Cacophobia** is an intense fear of ugliness. The condition is a specific **phobia** (fear), which is a type of **anxiety disorder**.

People with **cacophobia** might be afraid of looking ugly themselves, or they might worry about seeing something they consider ugly. A person with **cacophobia** might fear all forms of ugliness or a specific kind, such as perceived ugliness in people, animals, places or objects.

People with **cacophobia** can get very stressed or anxious when they think about or see something they consider to be ugly. The condition can also affect personal and professional relationships. People with this condition may understand that their fear is extreme but may not be able to control it.

#### **Q. 200: What is carcinoid syndrome?**

**Carcinoid syndrome** is a rare condition that happens if you have **neuroendocrine tumours**. **Neuroendocrine tumours (NETs)** are tumours that start in specialised cells in your neuroendocrine system.

NETs develop when your **neuroendocrine** cells begin to rapidly divide and multiply, creating tumours that release unusually large amounts of serotonin and other substances. When that happens, you develop **carcinoid syndrome** symptoms. Sometimes, a **carcinoid syndrome** diagnosis is the first indication you have a neuroendocrine tumour.

Very rarely, people with **carcinoid syndrome** have carcinoid crises, a potentially life-threatening condition that can happen if your **carcinoid syndrome** goes undiagnosed or untreated.

#### **Q. 201: What's the difference between a carcinoid tumour and a carcinoid syndrome?**

The excess chemicals produced by **carcinoid tumours** can produce symptoms, which is called **carcinoid syndrome**. Only about 10% of people with carcinoid tumours develop **carcinoid syndrome**.

### Q. 202: What is catatonia?

**Catatonia is a syndrome**-a collection of signs and symptoms-where your brain doesn't manage muscle movement signals as it should and you behave abnormally. It happens with many other conditions, but **schizophrenia** is frequently associated with **catatonia**. Once thought to be the only condition associated with **catatonia**, it's now known that bipolar disorder is more commonly associated with **catatonia** and that **catatonia** occurs alongside a number of medical and mental health conditions.

**There are three main forms of catatonia: excited, withdrawn, and mixed.**

**Excited/hyperkinetic:** This form involves increased movement (such as in the form of pacing), agitated behaviour, unusual or exaggerated movements, repetitive movements or speaking, or mimicking someone speaking or moving near them.

**Withdrawn/hypokinetic:** This form of **catatonia** is often easier to spot because people with this form of catatonia have very limited responses-or no response at all-to what's happening around them. They may be mute, show no emotions or facial expressions, hold completely still, stare, or stay in an unusual position for an extended period.

**Mixed:** This form combines the features of **hyperkinetic and hypokinetic catatonia**.

**Catatonia** is a disorder that disrupts how your brain works, disrupting how a person processes and reacts to the world around them. People with **catatonia** often don't react to things happening nearby or may react in ways that seem unusual. Impaired communication, unusual movements or lack of movement, and behaviour abnormalities are the most striking features of this condition.

Researchers have studied catatonia since German psychiatrist **Karl Kahlbaum** named and described it in 1874, but it remains highly underdiagnosed. Part of this is because, until recent decades, **catatonia** was mistakenly believed to only occur in people with **schizophrenia**. Further challenges to diagnosis include

disagreement within psychiatry on how many criteria and which criteria are required to diagnose catatonia. In addition, some catatonic signs, such as agitation and mutism, overlap with other conditions.

### **Q. 203: What is caregiver burnout?**

**Caregiver burnout** is a state of physical, emotional, and mental exhaustion that can happen when you dedicate time and energy to managing the health and safety of someone else. Caregivers who experience burnout may feel tired, stressed, withdrawn, anxious, and depressed. **Caregiver burnout** can impact a person in various ways, including physically, psychologically, financially, and socially.

Burnout feels like a candle that ran out of a wick—it doesn't have what it needs to continue to provide light. It can occur when you don't get the help you need personally because you devote all of your time and energy to helping someone else. It can also happen when you try to do more than you're able to, whether emotionally, physically, or financially.

Your health and well-being matter just as much as the person you're caring for. It's important to know the signs and symptoms of caregiver burnout so you can get the help you need when you need it most.

### **Q. 204: What is catatonic schizophrenia?**

**"Catatonic schizophrenia"** is a subtype of **schizophrenia** that includes **catatonia** as a key feature. Experts no longer recognise it as a diagnosis, making this name obsolete. Today, experts recognise **schizophrenia** as a specific disease with a spectrum of disorders. Healthcare providers regard **catatonia** as an important syndrome to consider and treat, especially when it happens with **schizophrenia**.

### **Q. 205: What is the difference between catatonic schizophrenia and paranoid schizophrenia?**

Like **"catatonic schizophrenia"**, **"paranoid schizophrenia"** is an obsolete term for a diagnosis that no longer exists. **Paranoid schizophrenia** was the name for **schizophrenia** where experts regarded paranoia, delusions, and hallucinations as key symptoms. **Catatonic schizophrenia** is the term for **schizophrenia** where **catatonia** is the most dominant feature.

### Q. 206: What is a cavernous hemangioma?

A **cavernous hemangioma** is an abnormal cluster of tightly packed, thin-walled **capillaries** (*smallest blood vessels*). The thin walls of these capillaries make **hemangiomas** prone to bleeding. The blood within the **capillaries** is usually slow-moving or not moving at all.

**Cavernous hemangiomas** mostly occur in your brain or brainstem but can sometimes occur in your spine or other areas of your body. Bleeding in your brain can cause seizures or a stroke.

**Cavernous hemangiomas** are also called **cerebral cavernous malformations**, **cavernomas**, occult **vascular malformations**, or **cavernous malformations**. A **cavernous hemangioma** looks like a raspberry. It has blood-filled spaces separated by connective tissue. **Hemangiomas** can range in size from a fraction of an inch to dime-sized or larger.

### Q. 207: What is Cauda equina syndrome?

**Cauda equina syndrome** is the compression of a collection of nerve roots called the **cauda equina**. Nerves send and receive electrical signals all across your body. The collection of nerve roots, shaped like a horse's tail, is located at the bottom of your **spinal cord**.

Because of the **cauda equina nerves**, you can move and feel sensations in your legs and urinary bladder. Compressed **cauda equina** nerves can cause pain, weakness, incontinence, and other symptoms. This syndrome can cause permanent damage, including paralysis, if left untreated. Quick treatment might prevent permanent damage, like paralysis.

### Q. 208: What are the types of cauda equina syndrome?

There are two types and two classifications of **cauda equina syndrome**. The **syndrome** is acute or chronic, and it's either complete or incomplete.

#### **Types of Cauda equina syndrome**

- **Acute cauda equina syndrome:** Severe symptoms start suddenly. You'll likely need surgery within 24 to 48 hours.

- **Chronic cauda equina syndrome:** This name means long-lasting cauda equina syndrome. It describes two scenarios:

If you've had symptoms of **cauda equina syndrome** for a period of time before you see a healthcare provider, it's labelled chronic.

If the surgery doesn't fix your nerves and there is permanent damage, you'll likely have symptoms for the remainder of your life. Your healthcare provider calls these symptoms chronic.

### **Classifications of Cauda equina syndrome**

- **Complete cauda equina syndrome:** Complete **cauda equina syndrome** causes urinary and/or bowel retention or incontinence. Retention means that you're unable to pee or poop, and incontinence means that you can't stop yourself from peeing or pooping. It affects about 60% of people with **cauda equina syndrome**.
- **Incomplete cauda equina syndrome:** This affects the other 40% of people with **cauda equina syndrome**. Typical symptoms include loss of urgency or increased urgency sensations in the bladder and bowels without retention or incontinence. This means you can't feel that you have to poop or pee, or you feel the sensation stronger than before.

### **Q. 209: What is central cord syndrome?**

**Central cord syndrome (CCS)** is an injury to the central part of your spinal cord in your neck (**cervical spinal cord**). It can cause weakness in your arms and sometimes in your legs. **Central cord syndrome** is also known as an **incomplete spinal cord injury**. Most people with this condition aren't completely paralysed.

### **Q. 210: What is vasculitis?**

**Vasculitis** is the inflammation (swelling) of the blood vessels, the network of hollow tubes that carry blood throughout the body. **Vasculitis** can affect very small blood vessels (**capillaries**), medium-size blood vessels (**arterioles and venules**), or large blood vessels (**arteries and veins**). If blood flow in a vessel with **vasculitis** is reduced or stopped, the parts of the body that receive blood from that vessel begin to die.

### Q. 211: What is central nervous system vasculitis?

**Central nervous system (CNS) vasculitis** is inflammation of blood vessel walls in the brain or spine. (The brain and the spine make up the central nervous system.) **CNS vasculitis** often occurs in the following situations:

- Accompanied by other **autoimmune diseases** such as **systemic lupus erythematosus**, **dermatomyositis**, and, rarely, **sarcoidosis** and **rheumatoid arthritis**;
- Infection, such as **viral** or **bacterial**;
- **Systemic vasculitic disorders** (affecting the whole body), which include **granulomatosis with polyangiitis (GPA)**, **eosinophilic granulomatosis with polyangiitis (EGPA)**, **microscopic polyangiitis**, **cryoglobulinemic vasculitis**, and **Behçet's syndrome**.

It can also occur without any associated systemic disorder. In this case, the **vasculitis** is only confined to the brain or the spinal cord and it's referred to as **primary angiitis of the CNS (PACNS)**.

### Q. 212: What is central pain syndrome (CPS)?

**Central pain syndrome (CPS)** is a chronic condition where you feel ongoing pain because of an issue with your nervous system. It can happen because of damage to your **brain** or **spinal cord** or because of a malfunction in your nervous system that can happen when you live with chronic pain.

When **central pain syndrome** happens because of an injury or damage, the affected brain or nerve cells malfunction and send constant pain signals. **Central pain syndrome** from chronic pain happens because your nerve cells become too sensitive to pain signals. That can cause them to send pain signals mistakenly or to wrongly interpret other signals as painful.

This condition is often difficult to treat. Pain relievers, even stronger drugs like **opioid** medications, commonly won't bring relief from the pain. But experts have uncovered newer treatment methods and medications that can often help people with this condition.

**Q. 213: Is central pain syndrome (CPS) the same as fibromyalgia?**

*CPS* and *fibromyalgia* aren't the same thing, but they're often connected. *Fibromyalgia* is a chronic pain condition that affects your joints and muscles. People with *fibromyalgia* are much more likely to develop *central pain syndrome* because chronic pain alters how their nervous system works.

**Q. 214: What is central pontine myelinolysis?**

*Central pontine myelinolysis (CPM)* is a condition affecting *myelin* and *nerve cells* in the middle part of your *brainstem* called the *pons*. Your brainstem relays information between your spinal cord and the larger "thinking" part of your brain. It also helps control essential functions like breathing, digestion, and heart rate. Another name for *CPM* is *osmotic demyelination syndrome*. In *central pontine myelinolysis (CPM)*, damage to the *myelin sheath*-the protective covering around nerve cells-happens and can lead to the injury and death of nerve cells in the *pons*.

This damage most commonly occurs when your sodium levels rise too quickly, usually as a result of being treated for low sodium levels. *CPM* has a wide range of symptoms, including muscle weakness, paralysis, difficulty speaking, and behavioural changes. Many people with *CPM* recover fully. Others may have ongoing disabilities that interfere with their daily lives. In rare cases, *CPM* leads to death.

**Q. 215: What is the difference between central pontine myelinolysis and extrapontine myelinolysis?**

*Myelinolysis* doesn't always occur in the *pons* (the middle part of your brainstem). *Extrapontine myelinolysis (EPM)* is when *myelinolysis* occurs outside the *pons* in other parts of your brain. *EPM* rarely occurs without *CPM*. About 1 in 4 people with *CPM* also have *EPM*.

**Q. 216: What are cephalic disorders?**

*Cephalic disorders* are conditions that happen when the brain and spinal cord of a foetus don't develop correctly. This results in malformations of these parts of the nervous system. *Cephalic disorders* can also involve malformations of other body parts, organs, and systems. These conditions vary from minor to very severe. In the most severe cases, a foetus can't survive the effects of



these conditions. It can lead to a miscarriage (before 20 weeks of pregnancy) or stillbirth (at or after 20 weeks of pregnancy).

The term “**cephalic**” comes from an ancient Greek word that means “**head**”. **Cephalic disorders** mainly involve the brain but also affect the spinal cord because they develop together. Together, these make up your **central nervous system (CNS)**. Experts organise cephalic disorders into different categories based on three criteria:

- **Location:** What part(s) of the **CNS** does the disorder affect? Does it affect any other body parts, organs, or systems?
- **Effect:** How did the affected part(s) of the **CNS** develop differently than expected? Is it larger or smaller than expected, or is it another kind of difference?
- **Cause:** What’s responsible for the disruption in development? Did it happen because of an event or environmental factor that affected the person who is pregnant, or is it genetic?

#### **Q. 216: What is cerebellar degeneration?**

**Cerebellar degeneration** is the **deterioration (damage or death)** of the nerve cells in your **cerebellum**. Your **cerebellum** is in the back of your brain. It controls many important functions. These include coordination in balance, standing, walking, speech, and muscle movements. **Cerebellar degeneration** can be the result of Alcohol use disorder or nutritional deficiencies; **neurodegenerative disorders**; or **paraneoplastic syndromes** (immune responses to cancerous tumours).

#### **Q. 218: How does a lack of oxygen affect the brain?**

Your brain runs your **nervous system**. It needs oxygen to function. In fact, the brain uses about a fifth of your body’s total oxygen supply. Oxygen helps send nerve signals and messages throughout the body. When the brain doesn’t get enough oxygen, brain cells begin to die. Cell death happens within 5 minutes of low oxygen.

#### **Q. 219: What is cerebral hypoxia?**

**Cerebral hypoxia** occurs when your brain doesn't get enough oxygen. A related condition, **anoxia**, occurs when no oxygen reaches the brain. Healthcare providers often use the terms together: a **hypoxic-anoxic brain injury**. Without oxygen, brain cells die, and a brain injury can occur. It can happen even when enough blood reaches the brain, such as when you breathe in smoke or carbon monoxide.

Treatments can help people who have brain injuries from **cerebral hypoxia**. But no one can bring back dead brain cells or reverse a brain injury. The condition can result in lifelong brain damage. If it continues for too long, it can be fatal.

### Q. 220: What is cerebral palsy?

**Cerebral palsy (CP)** is a neurological condition that can present as issues with muscle tone, posture, and/or movement disorders. It's the result of damage to your brain during foetal development or another developmental disability that affects the way your brain develops. The signs and symptoms of **CP** appear early in childhood and can vary widely from person to person. The main effect of **CP** is that it disrupts control of muscle movement (conditions that do this are known as movement disorders). It may also affect nearby brain areas and the abilities they control, but that isn't always the case. Having **CP** doesn't automatically cause someone to have an intellectual disability. There are three main types of **CP**:

- **Spastic:** This type involves muscle tightness and spasms.
- **Dyskinetic:** This type involves issues with muscle control.
- **Mixed:** This type involves features of both the spastic and dyskinetic types.

Experts also organise subtypes of **CP** by patterns based on what part of your body they mainly affect. Those patterns are: **diplegic**, which affects your arms more than your legs; **quadriplegic**, which affects all your limbs; **hemiplegic**, which affects one side of your body (left or right) more than the other; **monoplegic**, which affects one limb; and **paraplegic**, which affects your legs.

### Q. 221: What are the symptoms of cerebral palsy?

**Cerebral palsy** can have several different signs and symptoms. Some affect

movement, while others affect certain body parts, appearance, and behaviour. Some examples of non-movement signs and symptoms include:

- **Head size differences:** These can include an unusually *small head (microcephaly)* or an unusually *large head (macrocephaly)*.
- **Irritability:** Babies with **CP** may seem fussy or irritable frequently.
- **Lack of interaction:** Babies and children with **CP** may not react to people around them.
- **Hypotonia:** This means a lack of muscle tone, giving affected body parts a “**floppy**” appearance (this usually happens early on and later becomes spasticity or **dystonia**).
- **Delayed development:** Children with **CP** often have delays in reaching some expected developmental milestones. Many of these involve movement but can involve other abilities, too.

#### Q. 222: What is cerebral venous sinus thrombosis (CVST)?

**Cerebral venous sinus thrombosis (CVST)** is a blood clot in one of your brain’s larger veins. This rare issue makes up 1% of all stroke types. When a blood clot blocks a major vein in your brain, your blood flows the wrong way. This increases the pressure in your brain and causes it to swell. Typical locations for blood clots from **CVST** include your: *transverse sinus, superior sagittal sinus, inferior sagittal sinus, sigmoid sinuses, cavernous sinus, and deep sinuses of your cortex.*

#### Q. 223: What is cerebrospinal fluid?

Your brain and spinal cord have a protective layer of **cerebrospinal fluid (CSF)**. **CSF** contains nutrients that your brain can use. The **CSF** layer also supports and cushions your brain and spinal cord from sudden movements. The effect is similar to putting a grape in a jar. If the jar is empty and you give it a good shake, you’ll bruise or damage the grape. That’s what would happen to your brain if you had no **CSF**. But if you fill the jar with water and then shake it, the water slows down how fast the grape moves and cushions it, preventing damage.

**Q. 224: What is a cerebrospinal fluid (CSF) leak?**

A **cerebrospinal fluid leak** is when the fluid surrounding your brain and spinal cord leaks out from where it's supposed to be. If the leak is large enough, it can cause severe symptoms that make it hard or even impossible to go about your life as usual.

**Q. 225: What is cerebrovascular disease?**

**Cerebrovascular disease** is an umbrella term for conditions that impact the blood vessels in your brain. "**Cerebro**" refers to your brain, and "**vascular**" refers to your blood vessels (**arteries and veins**).

**Cerebrovascular diseases** may cause a reduction in blood flow to your brain (**ischemia**) or bleeding (**haemorrhage**) in a part of your brain. Both conditions are generally referred to as "**stroke**". **Blood vessel diseases** in the brain can lead to strokes, as well as many other vascular conditions. If you or a loved one have a **cerebrovascular disease**, it's important to restore blood flow to the brain as soon as possible. Otherwise, brain cells can quickly die and cause permanent disability or death.

**Q. 226: What blood vessels do cerebrovascular diseases affect?**

**Cerebrovascular diseases** can affect both arteries and veins. The most commonly affected cerebral blood vessels that supply blood to your brain include:

- **Carotid arteries:** These blood vessels run along the front of your neck. The majority of people have a **carotid artery** on the right and one on the left.
- **Vertebral arteries:** These blood vessels run along the back of your neck. The majority of people have a **vertebral artery** on the right and one on the left.

**Q. 227: What are the types of cerebrovascular disease?**

Stroke is the most common type of **cerebrovascular disease**. Other types of **cerebrovascular disease** include, but aren't limited to:

- **Arteriovenous malformation (AVM);**
- **Brain aneurysm;**
- **Brain bleed, haemorrhage (intracranial haemorrhage);**
- **Carotid artery disease (carotid artery stenosis);**
- **Cervical artery dissection;**
- **Reversible cerebral vasoconstriction syndrome;**
- **Subarachnoid haemorrhage (SAH);**
- **Transient ischemic attack (TIA) or ministroke;**
- **Hereditary hemorrhagic telangiectasia (HHT);**
- **Moyamoya disease.**

**Q. 228: What is cervical artery dissection?**

**Cervical artery dissection** happens when there's a tear in one or more layers of blood vessel tissue. **Cervical artery dissection** is a common cause of stroke in young and middle-aged adults. Your **cervical arteries** are a group of large blood vessels in your neck. They include the **carotid arteries** (which supply the front part of your brain) and the **vertebral arteries** (which supply the back of your brain and your spine).

**Q. 229: What is the cervical spine?**

Your **spine (backbone)** is the long, flexible column of bones that protects your **spinal cord**. It begins at the base of your skull and ends at your tailbone at your pelvis. Your **cervical spine** is the neck region of your spine. It consists of **seven bones (C1-C7 vertebrae)**.

**Vertebrae** help protect your spinal cord from injury. Between your **vertebrae** in your **spine** are round cushions called **discs**. They have soft, gel-like centres and a firmer outer layer, like a jelly doughnut. These disks provide cushioning for your vertebrae and flexibility for you.

Your **spinal cord** acts like a highway that connects the nerves located all over your body to your brain so that your brain can send signals and communicate with the rest of your body. A nerve root is the initial segment of a nerve that leaves your **spinal cord**. It's the root for the nerves that extend out to other parts of your body. Different nerve roots along your spine extend to different parts of your body.

Your **cervical spine** supports your head and allows you to move and rotate it. Nerves in your **cervical spine** branch out to your body, controlling many bodily functions like breathing and upper body movement.

### Q. 230: What is cervical kyphosis?

When looking at the profile of your body, your neck normally has a natural **c-shaped curve**. The opening of the **C** faces your back. This type of curve is called **lordosis**. In **cervical kyphosis**, the curve straightens or even reverses, with the **C** opening towards the front of your body. The curve of your neck determines the level of your natural gaze.

**Cervical kyphosis** is sometimes called **military neck** because it causes a straight-necked posture similar to that of a soldier. In more severe cases, the curvature in the neck causes a person's natural gaze to tilt downward.

**Cervical kyphosis**, or **military neck**, occurs when your cervical spine is straight or curves towards your front instead of its natural curve towards your back. When severe, it can cause **pain**, **neurological symptoms**, and **disability**. Non-surgical and surgical treatments are available to restore the shape of your spine and relieve symptoms.

### Q. 231: What is cervical radiculopathy (pinched nerve in the neck)?

**Cervical radiculopathy** (also known as "**pinched nerve**") is a condition that results in **neurological dysfunction** caused by compression and inflammation of any of the nerve roots of your **cervical spine** (neck). **Neurological dysfunction** can include radiating pain, muscle weakness, and/or numbness.

"**Cervical**" comes from the Latin word "**cervix**" which means "**neck**". In the case of **cervical radiculopathy**, the issue is in your neck, not your **cervix**. (The **cervix**, the narrow passage forming the lower end of the uterus, is called so because it's a neck-like passage.)

### Q. 232: What is cervical spondylosis?

**Cervical spondylosis** is a general term for age-related wear and tear in the **cervical spine (neck)** that can lead to neck pain, neck stiffness, and other symptoms. Sometimes this condition is called **arthritis** or **osteoarthritis of the neck**.

### Q. 233: What are the parts of the cervical spine?

Your entire spine is made up of **24 vertebrae (bones of the spine)**. The **cervical spine** consists of seven vertebrae that begin at the base of the skull. Running through an opening in the entire vertebral column are the spinal cord and its nerves. The spinal cord and nerves carry messages between the brain and rest of the body, including muscles and organs. Between each **vertebra** are **discs**. The **discs** act like the body's shock absorbers. The **discs** are made of flexible but strong connective tissue filled with a gel-like material. **Discs** are like "**jelly-filled, cushy doughnuts**" between each **vertebra**.

There are three joints between each pair of vertebrae. The front joint is called the **intervertebral disc**. Two joints in the back of the spine are called facet joints. Within every joint is **cartilage**, which cushions the ends of bones. **Ligaments** are soft bands of tissue that connect the vertebrae together.

**Spondylosis** is the natural wearing down of these parts of the spine. **Cartilage** wears out over time; **discs** lose their volume and become dried and cracked; ligaments may thicken; and **bone spurs** may form where bones rub against each other in areas that are no longer covered with cartilage. All of these changes are defined as **spondylosis**.

### Q. 234: What is Charles Bonnet syndrome?

**Charles Bonnet syndrome** (pronounced "**bo NAY**") is a condition that happens when a person with low vision has visual **hallucinations**. The eye's retina facilitates the conversion of light into a visual message for the brain. When you're not able to do this, your vision gets worse, and you become more likely to develop **Charles Bonnet syndrome**.

The **hallucinations** can be simple, like bright-coloured patterns that show up over everything you see. The medical term for this is **unformed hallucinations**.

You can also see more complicated things, like animals, buildings, or people that don't exist. The medical term for this is ***formed hallucinations***.

Although scientists aren't quite sure of the ***pathophysiology*** behind ***Charles Bonnet syndrome***, they think that the ***hallucinations*** happen because lower vision reduces the number of images your brain gets. Your brain wants more images, so it uses memories to recall things that it's seen or simply makes things up. This can be worrisome and confusing if you don't know what's happening.

### **Q. 235: What is chemotherapy brain fog (chemo brain)?**

***Chemotherapy brain fog***, or ***chemo brain***, is feeling as if you can't think as quickly and as clearly as you did before you had cancer or received cancer treatment. Healthcare providers may refer to this condition as ***chemotherapy-induced cognitive impairment*** or ***cancer-treatment-related cognitive impairment***. But healthcare providers have learned that people develop cognitive problems before, during, or after receiving treatment. Most of the time, ***chemo brain*** is a short-term issue, but some people may have the symptoms for months after they've finished treatment. Healthcare providers can't cure ***chemotherapy brain fog***, but they can recommend medications, therapy and activities that may help lift the fog of chemotherapy brain.

### **Q. 236: Does chemotherapy brain cause personality changes?**

Some studies show people with chemo brains have depression. Sometimes, people get angry or frustrated because they can't do things as well or as quickly as they once could.

### **Q. 237: What are chemo brain symptoms?**

Issues with memory and executive function are common chemo-brain symptoms. In this case, memory means being able to remember what people tell you and things you already know, like addresses and names. Executive function is your ability to manage your time and make decisions. Symptoms may include:

- Having trouble thinking of the right word for a particular object or doing things that once came easily, like adding up numbers in your head,



- Having trouble following the flow of a conversation;
- Having a short attention span or trouble focusing on a specific task or idea;
- Having trouble multitasking, so you feel you need to do one thing at a time;
- Feeling sluggish, tired, or not having energy;
- Feeling clumsy, as if something's wrong with your motor skills

### Q. 238: What is a Chiari malformation?

**Chiari malformation** is a condition in which brain tissue in the lower back part of your **skull** is forced into the **spinal canal**. Most of the time, this happens because of a structural problem—a misshaped or smaller-than-normal part of the **skull**. Because there is not enough room in the **skull**, part of the **brain**, specifically the **cerebellum**, grows downward into the **spinal canal**. This can cause compression of the **brain** at the base of your **skull**. **Brain tissue** in the **spinal canal** can block the flow of **cerebrospinal fluid**. This fluid cushions the brain and spinal cord, circulates nutrients and chemicals, and removes waste products.

### Q. 239: Where is the cerebellum?

The **cerebellum** and the **brain stem** share a close space within the lower back portion of the **skull**. They reside above an opening at the base of the skull called the **foramen magnum**, through which the **spinal cord** passes. A **Chiari malformation** occurs when the **cerebellum** is forced downward below the **foramen magnum** and into the **spinal canal**. The **cerebellum** controls your muscle movements, posture, balance, speech, and coordination.

### Q. 240: Who does Chiari malformation affect?

**Chiari malformation** can affect anyone. Females have a slightly higher chance of having a **Chiari malformation** than males. In most cases, babies are born with the condition. However, sometimes **Chiari malformations** aren't discovered until the teen years or adulthood, when a brain scan is ordered for another reason. Although there is no cure for **Chiari malformation**, surgeons can treat

or manage symptoms in most people.

#### Q. 241: What is childhood apraxia of speech?

**Childhood apraxia of speech (CAS)** is a motor-speech neurological (brain) condition that affects some young children as they learn to speak. Children with **CAS** know what they want to say but are unable to form the words.

#### Q. 242: What is the difference between childhood apraxia of speech, developmental verbal dyspraxia, and developmental apraxia of speech ?

**Childhood apraxia** of speech, developmental **verbal dyspraxia**, and **developmental apraxia** of speech refer to the same condition. **Apraxia** means that you completely lose the ability to do something. **Dyspraxia** means that you partially lose the ability to do something with accuracy. The difference between the two terms is **severity**, with **apraxia** being the most severe. You will see all three terms interchangeably used by different healthcare providers.

#### Q. 243: What is chordoma?

**Chordoma** is a rare **malignant (cancerous) bone tumour** that forms in your spine or the base of your skull. It's a type of **sarcoma**. **Chordomas** can occur at any point along your spine.

- About 35% develop in the base of your **spine (sacrum)**.
- About 35% develop where your spine meets your **skull (the skull base)**. These are called **clival chordomas** because the bone in the skull base that's most often involved is the **clivus**.
- About 30% develop in the **vertebrae** of your mobile spine—most commonly the second **cervical vertebrae** (in your neck), followed by your **lumbar spine**, and then your **thoracic spine**.

**Chordomas** typically grow slowly, but they can be difficult to treat due to how they invade nearby nervous system tissue. They also tend to recur (come back) after treatment, usually in the same place. **Chordomas** spread to other parts of your body (**metastasize**) in 30% to 40% of cases. If an advanced **chordoma** does **metastasize**, it most commonly spreads to your lungs, nearby lymph nodes, other bones, liver, and skin.

### Q. 244: What are the types of chordomas?

The World Health Organisation (WHO) recognises three distinct types of **chordoma** based on what the cells look like under a microscope (their histology):

- **Classic/conventional chordoma:** This is the most common type (80% to 90% of all cases). It's made up of a unique type of cell that looks "bubbly". **Chondroid chordoma** is a variant of this type. It makes up 5% to 15% of all **chordoma** cases. **Chondroid chordoma** often forms at the base of your skull.
- **Dedifferentiated chordoma:** This is a rare type of **chordoma** (less than 5% of cases) that appears as a mix of abnormal cells. It's more aggressive, faster-growing, and more likely to **metastasize** than conventional **chordoma**.
- **Poorly differentiated chordoma:** This type is very rare. There have been fewer than 60 cases recorded in the medical literature. **Poorly differentiated chordoma** is characterised by the deletion of a gene called **SMARCB1**, or **INI1**. These **chordomas** most commonly affect children and young adults.

### Q. 245: What is chromophobia?

**Chromophobia (or chromatophobia)** is an intense fear of colors. Most people with this disorder are afraid of one or two colours in particular. Others have a phobia of all colours, or they may only be sensitive to bright colours.

People with **chromophobia** experience extreme discomfort or anxiety when they see a colour that triggers their phobia. They may have trouble breathing, sweat a lot, or even have a panic attack. Some people may avoid leaving their house and interacting with others. This can damage relationships and impact a person's ability to work. Therapy and medications can help people manage this disorder.

### Q. 246: What colours are people afraid of?

Although it's possible to be afraid of all colours, people with **chromophobia** are more likely to be fearful or anxious about one or two colours in particular. Specific colour phobias include:

- **Chrysofobia**, fear of the colour orange or gold.
- **Cyanophobia**, fear of the colour blue.
- **Kastanophobia**, fear of the colour brown.
- **Leukophobia**, fear of the colour white.
- **Prasinophobia**, fear of the colour green.
- **Rhodophobia**, fear of the colour pink.
- **Melanophobia**, fear of the colour black.
- **Xanthophobia**, fear of the colour yellow.

#### Q. 246: What is chronic traumatic encephalopathy (CTE)?

**Chronic traumatic encephalopathy (CTE)** is a brain condition that can develop due to repeated head impacts and concussions. This condition affects how areas of your brain function, communicate, and work with each other. Depending on the extent of the damage and the affected brain areas, this condition can have severe effects. **CTE** is best known for affecting professional athletes in contact sports, especially boxing, American football, and ice hockey. However, this condition can develop in people with repeated head impacts, regardless of their sport (or if they don't play sports at all). Healthcare providers also identify it in military veterans who experienced multiple explosion- or blast-related incidents.

The names of CTE break down like this:

- **Chronic:** This means **CTE** is a long-term condition.
- **Traumatic:** This term means **CTE** is trauma- or injury-related.
- **Encephalopathy:** This combines two words from ancient Greek. The literal translation is "**brain disease.**"

#### Q. 247: What is chronophobia?

**Chronophobia** is an extreme fear of time or the passage of time. People with

this **anxiety disorder** feel intense discomfort or dread when they think about time passing them by. They may be concerned about their own mortality or worry about getting older. Some people become obsessed with watching the clock or marking days off the calendar. **Chronophobia** can cause people to have racing thoughts or obsessive behaviors. In severe cases, it can lead to panic attacks, social isolation, and problems with relationships. **Psychotherapy** can help people manage symptoms and improve their quality of life.

#### **Q. 248: What is claustrophobia?**

**Claustrophobia** is an intense fear of confined or enclosed spaces. Many fears seem reasonable. We all try to avoid things that make us feel uncomfortable. The difference between **a fear** and a phobia is that a **phobia** is an intense and irrational fear of one or more things or situations. Also, with **phobias**, the level of your fear doesn't match the actual danger presented by the feared object or situation. **Phobias** become a health issue when the fear interferes with your ability to carry out daily activities. **Phobias** can limit your ability to work efficiently, put a strain on your relationships, and reduce your self-esteem.

#### **Q. 249: What is clinical depression (major depressive disorder)?**

**Clinical depression**, also known as **major depressive disorder (MDD)**, is a mental health condition that causes a persistently low or depressed mood and a loss of interest in activities that once brought joy. **Clinical depression** can also affect how you sleep, your appetite, and your ability to think clearly. These symptoms must be present for at least two weeks for a diagnosis.

**Clinical depression** is a chronic condition, but it usually occurs in episodes, which can last several weeks or months. You'll likely have more than one episode in your lifetime. This is different from **persistent depressive disorder**, which is **mild or moderate depression** that lasts for at least two years. There are several subtypes of **major depressive disorder**. Some of the most common subtypes include **seasonal affective disorder (seasonal depression)**; **prenatal depression and postpartum depression**; and **atypical depression**.

People with clinical depression often have other mental health conditions, such as **substance use disorder (dual diagnosis)**, **panic disorder**, **social anxiety disorder**, and **obsessive-compulsive disorder**.

#### **Q. 250: What is the difference between clinical depression and depression?**

It's normal to feel sad when you're faced with difficult life situations, such as

losing your job or a relationship. Some people may say they feel depressed in these situations. **Clinical depression (major depressive disorder)** is different in that it persists practically every day for at least two weeks and involves other symptoms than just sadness alone.

It can be confusing because many people call **clinical depression** or **major depressive disorder** just “**depression**”. But there are several different types of **depressive disorders**, such as **persistent depressive disorder** and **premenstrual dysphoric disorder**. **Clinical depression** is the most severe type of **depression**.

#### **Q. 251: What is CNS lymphoma?**

**CNS lymphoma** is a rare type of cancer that develops in your **central nervous system (CNS)**. It may form in your **brain, spinal cord, spinal fluid**, and (as it’s so close to your brain) your eye. It’s a type of **non-Hodgkin lymphoma**.

When the **lymphoma** starts in the **CNS** and isn’t found anywhere else in your body, it’s called primary **CNS lymphoma**. If **lymphoma** is found in other parts of your body as well as your **CNS**, it’s called **secondary CNS lymphoma**.

**CNS lymphoma** starts in **white blood cells** called **lymphocytes** that are part of your **lymphatic system**. Your **lymphatic system** is an important part of your **immune system**. It helps your body fight infections and diseases.

#### **Q. 252: What is a concussion?**

A **concussion** is a **mild traumatic brain injury** that results from a bump, violent jolt, or blow to the head that disrupts normal brain function. A **concussion** can also be caused by a hit to your body that is strong enough to cause your head to forcefully jerk backwards, forwards, or to the side.

**Concussions** stretch and bruise nerves and blood vessels and cause chemical changes in your brain that result in a temporary loss of normal brain function. A single **concussion** usually doesn’t cause permanent damage to your brain. Multiple concussions over a lifetime may result in structural changes in your brain. **Concussions** are not usually life-threatening. However, the effects of a concussion can be serious and last for days, weeks, or even longer.

#### **Q. 253: What’s the difference between a concussion and a traumatic brain injury?**

Really, there is no difference. Both are considered injuries to the brain. These

are virtually the same terms.

**Q. 254: What is conduct disorder?**

**Conduct disorder (CD)** is a mental health condition that affects children and teens and is characterised by a consistent pattern of aggressive behaviours and actions that harm the well-being of others. Children with **conduct disorder** also often violate rules and societal norms.

**Conduct disorder** lies on a **spectrum of disruptive behavioural disorders** which also includes **oppositional defiant disorder (ODD)**. In some cases, **ODD** leads to **CD**. **Conduct disorder** often occurs alongside other **psychiatric** conditions, including **depression**, **attention-deficit/hyperactivity disorder (ADHD)**, **learning disorders**.

**Q. 255: What is the difference between conduct disorder and personality disorder?**

A **personality disorder** is a mental health condition that involves long-lasting, disruptive patterns of thinking, behaviour, mood, and relating to others. Most **personality disorders** begin in the teen years, when personality further develops and matures. As a result, almost all people diagnosed with personality disorders are over the age of 18.

One exception to this is **antisocial personality disorder (ASPD)**; approximately 80% of people with this disorder will have started to show symptoms by the age of 11.

There's not much difference between **conduct disorder (CD)** and **ASPD**, but **CD** is typically diagnosed in children. If an adult meets the criteria for both conditions, then a mental health professional would give them a diagnosis of **ASPD** instead of **CD**.

**Q. 256: What is coulrophobia?**

**Coulrophobia (COOI-ruh-FOE-bee-uh)** is a **fear (phobia)** of clowns. Children and adults who fear clowns may experience extreme, irrational reactions when they see clowns in person or view pictures or videos of clowns. Someone with a fear of clowns is **coulrophobic**. They may go out of their way to avoid any exposure to clowns.

Awareness of **coulrophobia** is relatively new. The term **coulrophobia** first appeared in the late 1990s. "**Coulro**" is the Greek word for stilt walkers.

### Q. 257: What is corticobasal degeneration?

**Corticobasal degeneration** is a **neurological (brain) disorder**. "**Corticobasal**" refers to the two parts of your brain the disease affects. "**Degeneration**" refers to deterioration or loss of function. It damages cells in your brain, causing parts of it to **shrink (atrophy)**. The disease's symptoms may first appear on one side of your body but eventually affect both sides as the disease progresses. With progression, you gradually lose your ability to talk, swallow, and move. The disease could also affect other areas of thinking, including judgement and memory. **Corticobasal degeneration** affects your- **Cerebral cortex**: This outer layer of nerve tissue aids your memory, learning, voluntary movements, and senses. **Basal ganglia**: This group of nerve cells is critical for learning and motor functions.

### Q. 258: What are the types of corticobasal degeneration?

**Corticobasal syndrome** is a term used to specify that the symptoms, taken together, are similar to **corticobasal degeneration**. Many underlying **neurodegenerative diseases** can be caused **by corticobasal syndrome**, including:

- **Progressive supranuclear palsy**: Approximately 1 in 4 people have a type that resembles **progressive supranuclear palsy**. It affects balance, eye movement, speech, and swallowing.
- **Frontotemporal dementia**: About 15% of people have **frontotemporal dementia**. They may struggle to organise their thoughts and behave in inappropriate, uninhibited ways.
- **Dementia**: An estimated 5% develop a type of dementia that's similar to **Alzheimer's disease**. They have problems with memory and gauging spatial distances between themselves and other people or objects.
- **Aphasia**: Five percent have language problems or **aphasia**. They have trouble finding the right words to say and become unable to follow grammar rules.



## Q. 259: What is CPTSD?

**Complex post-traumatic stress disorder (CPTSD, C-PTSD, or cPTSD)** is a mental health condition that can develop if you experience **chronic (long-term) trauma**. It involves stress responses such as anxiety, having flashbacks or nightmares, avoiding situations, places, and other things related to the traumatic event, heightened emotional responses such as impulsivity or aggressiveness, and persistent difficulties in sustaining relationships.

Examples of **chronic trauma** include: Long-term child physical or sexual abuse; Long-term domestic violence; Being a victim of human or sex trafficking. War; Frequent community violence.

While **CPTSD** is often associated with chronic trauma in childhood, adults who experience chronic trauma can also develop the condition.

**CPTSD as a diagnosis:** Experts across the field of **psychology** disagree on whether **CPTSD** is a distinct condition and diagnosis. For example, two organisations that publish professional reference books have different opinions about **CPTSD**. Some experts believe that **CPTSD**, **PTSD**, and **borderline personality disorder (BPD)** may exist on a spectrum of trauma-related mental health conditions that vary in the severity of their symptoms.

## Q. 260: What's the difference between CPTSD and PTSD?

The main differences between **PTSD** and **CPTSD** are the length of the **trauma** and the symptoms. Traditionally, experts thought **PTSD** generally developed from short-term trauma, such as a vehicle accident or a natural disaster. With research, they realised that people who experience long-term, repeated trauma tend to have other symptoms in addition to those of **PTSD**.

Both **CPTSD** and **PTSD** involve symptoms of **psychological** and **behavioural stress responses**, such as flashbacks, **hyper-vigilance**, and efforts to avoid distressing reminders of the traumatic event(s). People with **CPTSD** typically have additional symptoms, including chronic and extensive issues with emotional regulation, identity and sense of self, and relationships.

## Q. 261: What's the difference between CPTSD and BPD?

**CPTSD** and **borderline personality disorder (BPD)** share several similar symptoms, such as impulsive behaviour, feelings of worthlessness, and difficulty forming lasting relationships. Because of this, some experts wonder if

these conditions are actually distinct.

According to existing criteria for each condition, the main difference is that chronic trauma has to be the cause of **CPTSD**, whereas trauma doesn't have to be the cause of **BPD**. However, **BPD** is strongly associated with childhood trauma, such as abuse or neglect.

Another difference is that a person usually develops **BPD** in young adulthood. A person can develop **CPTSD** at any age.

### Q. 262: What is Creutzfeldt-Jakob disease (CJD)?

**Creutzfeldt-Jakob disease (CJD)** is a rare disease that causes fast deterioration of an affected person's brain. As this condition worsens and damages your brain, it causes **dementia**-like symptoms.

With **CJD**, faulty proteins, known as **prions**, build up in your brain cells, damaging and destroying those cells. The condition is very severe, and its effects develop and worsen quickly. It's ultimately fatal, and unfortunately, there's no way to cure, treat, or even slow down the progress of this disease.

**Creutzfeldt-Jakob (pronounced "croy-tz-felt ya-cob")** disease typically affects people between the ages 50 and 80, becoming more common as you get older. However, the genetic subtype of **CJD** usually happens earlier, most often between ages 30 and 50. It affects men and women at equal rates overall.

One of the subtypes of **CJD**, known as variant **CJD (vCJD)**, affects people who ate beef that came from cattle infected with **bovine spongiform encephalopathy (BSE)**.

### Q. 263: What is cyberphobia?

**Cyberphobia** is an extreme fear of computers. Someone with a computer phobia has an intense fear of using a computer or being around computers. They may avoid going places (like an office or school) where computers might be.

Providers also call this phobia **logizomechanophobia**. This name comes from the Greek words "**log**" which means word, and "**machano**", which means machine. People with this condition may also feel anxious or worried about using the internet. In severe cases, **cyberphobia** can cause people to stop using

computers or the internet completely. They may also avoid smartphones, which are actually minicomputers. Because technology plays a major role in modern life and computers are everywhere, extreme **cyberphobia** can cause significant problems. People with severe **cyberphobia** may avoid going to work, school, or public places where computers might be. Therapy can help people with this disorder manage symptoms and learn to accept and use this technology.

#### Q. 264: What is cyclothymia?

**Cyclothymia (cyclothymic disorder)** is a milder form of bipolar disorder. It involves frequent mood swings and **hypomanic** and **depressive episodes**.

**Bipolar disorder** is a lifelong mood disorder and mental health condition that causes intense shifts in mood, energy levels, thinking patterns, and behavior. These shifts can last for days, weeks, or months. They can interrupt your ability to carry out day-to-day tasks.

People with **cyclothymic disorder** experience episodes of **hypomania** and **mild depression** for at least two years. These changes in mood can occur quickly and at any time. A person with **cyclothymia** may have brief periods of **normal mood (euthymia)**, but these periods last fewer than eight weeks.

#### Q. 265: What is cynophobia?

**Cynophobia** is an extreme fear of dogs. The name of this phobia comes from “**cyno**”, the Greek word for dog. Children and adults with this disorder go out of their way to avoid dogs. They may have severe anxiety or a full panic attack when hearing a dog bark, watching a movie about a dog, or going to a place where a dog might be. In severe cases, people with this disorder avoid friends or stay indoors because they worry about meeting a dog. Several types of therapy can help people with this phobia.



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