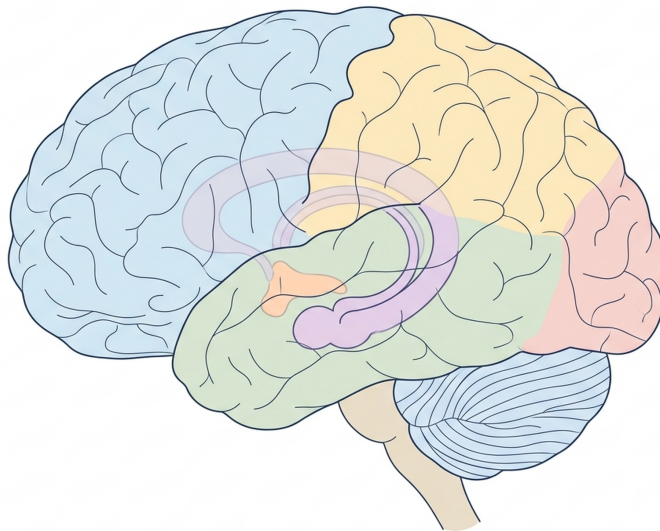


Understanding and optimizing brain regions

Eight regions, what they do, what strains them, and how therapy reaches each one

Why a therapist is handing you a brain map. Most of what happens in therapy has a physical address. Knowing roughly where a symptom lives makes it less mysterious, and knowing which approach engages which region makes the homework make sense.

THE EIGHT REGIONS



Prefrontal cortex	p. 2
Temporal lobe	p. 3
Occipital lobe	p. 4
Parietal lobe	p. 5
Limbic system	p. 6
Hypothalamus	p. 7
Cerebellum	p. 8
Brain stem	p. 9

Lateral view, face to the left. Inner structures shown ghosted.

THE FIVE APPROACHES IN THE THERAPY PANELS

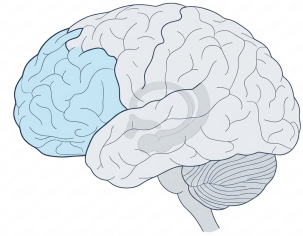
- CBT.** Cognitive behavioural therapy: thoughts, behaviours, exposure, experiments.
- ACT.** Acceptance and commitment therapy: acceptance, defusion, values, committed action.
- EMDR.** Eye movement desensitisation and reprocessing: memory reprocessing with bilateral stimulation.
- DBT.** Dialectical behaviour therapy: mindfulness, distress tolerance, emotion regulation, interpersonal skills.
- Mindfulness & somatic.** Meditation, breathing, body-based and polyvagal-informed practices.

Reading the therapy panels. Brain regions work as networks, not as separate parts, and most of what we know comes from group studies of people in scanners. The therapy panels describe the best-supported working models of how each approach engages a region. They are a way of understanding why the work works, not a promise about any one person's brain.

The Frontal Cortex

Understanding and optimizing brain regions

The prefrontal cortex is situated in the frontal lobes, specifically at the anterior region of the brain. It is positioned right behind the forehead. The prefrontal cortex, located in the frontal lobe of the brain, plays a crucial role in various cognitive functions and executive processes. It governs higher-order thinking, decision-making, behavioral regulation, and social interactions. This handout aims to provide information about the prefrontal cortex, its functions, factors that may impact its functioning, symptoms of dysfunction, and ways to optimize its function.



FUNCTIONS

- **Working Memory:** Aids in the temporary storage and manipulation of information crucial for tasks such as planning, problem-solving, and decision-making.
- **Cognitive Flexibility:** It allows individuals to switch tasks, change strategies, and adapt behavior to changes in the environment.
- **Impulse Control:** Helps in inhibiting impulsive responses and fosters self-control.
- **Emotional Regulation:** Gives individuals the ability to manage and control their emotional responses.

SYMPTOMS OF DYSFUNCTION

- **Impaired Cognitive Abilities:** Such as attention, memory, problem-solving, and decision-making.
- **Impulsivity and Lack of Self-Control:** Impulsive behavior, struggle with delayed gratification, and difficulty inhibiting inappropriate responses.
- **Emotional Instability:** Emotional dysregulation, heightened emotional responses, and difficulty controlling emotions.
- **Social Difficulties:** Reduced empathy, impaired social interactions, and difficulty understanding social cues.

FACTORS IMPACTING PREFRONTAL CORTEX FUNCTION

STRESS

SLEEP DEPRIVATION

DRUGS

AGING

BRAIN INJURIES

TIPS TO OPTIMIZE FUNCTION

- **Practice Mindfulness and meditation**
- **Get Adequate Sleep:** Prioritize quality sleep to ensure optimal prefrontal cortex functioning.
- **Exercise Regularly:** Boosts blood flow, helps nourish the prefrontal cortex and supports its functioning.
- **Balanced Diet:** A nutritious diet rich in fruits, vegetables, and omega-3 fatty acids.
- **Cognitive Training:** Engage in activities that challenge cognitive abilities, such as puzzles, brain games, and learning new skills.
- **Stress Management:** deep breathing, relaxation exercises, or seeking support to decrease chronic stress and its negative impact on the prefrontal cortex.

THERAPY AND THE PREFRONTAL CORTEX · HOW EACH APPROACH REACHES THIS REGION

- **CBT.** Thought records and reappraisal are prefrontal work. Imaging studies show that re-evaluating a thought recruits the prefrontal cortex and quiets the amygdala; practice makes that pathway faster.
- **ACT.** Defusion ("I am having the thought that...") and values-based choice exercise cognitive flexibility, which is this region's specialty: stepping back from a thought instead of obeying it.
- **EMDR.** Successful treatment is associated with more prefrontal activity and less limbic reactivity to trauma cues. The preparation phase builds the observing, steadying capacity that lives here.
- **DBT.** Wise mind and the STOP skill are deliberate prefrontal pauses between urge and action. Every DBT skill leans on this region's inhibitory control, which is why skills are easier when rested.
- **Mindfulness & somatic.** Regular meditation is associated with stronger attention control and thicker prefrontal cortex in long-term practitioners. Sleep and exercise matter as much as technique.

The Temporal Lobe

Understanding and optimizing brain regions

The temporal lobe is a vital region of the brain located on the sides of the head, just above the ears. It plays a crucial role in multiple functions, including auditory perception, memory processing, language comprehension, and interpretation of sensory information. This handout aims to provide information about the temporal lobe, its functions, factors that may impact its functioning, symptoms of dysfunction, and ways to optimize its function.



FUNCTIONS

- **Auditory Processing:** responsible for processing sound and recognizing speech and other auditory inputs.
- **Memory Formation:** facilitates the formation, storage, and retrieval of long-term memories, including episodic memories (events and experiences) and semantic memories (facts and concepts).
- **Language Comprehension:** helps in understanding spoken words, reading comprehension, and interpreting the meaning of language.
- **Visual Perception:** is involved in object recognition and facial perception.
- **Emotion Regulation:** Contributing to emotional experiences and learning.

SYMPTOMS OF DYSFUNCTION

- **Memory Issues:** Difficulties in forming new memories, recalling past experiences, or recognizing familiar objects or faces.
- **Language and Communication Problems:**
- **Auditory Processing Deficits:** Trouble recognizing or understanding speech, distinguishing sounds, or perceiving music.
- **Mood and Emotional Changes:** Alterations in emotional responses, mood swings, irritability, or changes in emotional regulation and empathy.
- **Visual Disturbances:** Problems recognizing familiar objects, faces, or difficulties in interpreting visual information.

FACTORS IMPACTING TEMPORAL LOBE FUNCTION

STRESS EPILEPSY DRUGS AGING STROKE

TIPS TO OPTIMIZE FUNCTION

- **Cognitive Stimulation:** Engage in activities, such as puzzles, reading, learning new languages, or musical instruments, to promote brain plasticity and enhance its function.
- **Regular Physical Exercise** increases blood flow to the brain, supporting its overall functioning.
- **Healthy Lifestyle:** Adopt a balanced and nutritious diet, ensuring the consumption of brain-healthy foods like fruits, vegetables, whole grains, and omega-3 fatty acids.
- **Sleep Hygiene:** Prioritize sufficient and quality sleep, as it aids in memory consolidation and cognitive function.
- **Stress Management:** Practice stress management techniques like relaxation exercises, meditation, or engaging in activities that reduce stress, as chronic stress can negatively impact the temporal lobe function.

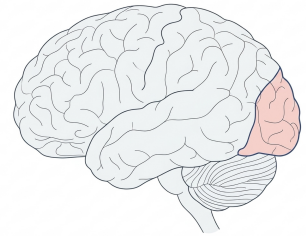
THERAPY AND THE TEMPORAL LOBE · HOW EACH APPROACH REACHES THIS REGION

- **EMDR.** Trauma memories are often stored as raw fragments without a time stamp. Reprocessing is thought to let the hippocampus, deep in this lobe, file the memory with its context so it stops feeling like it is happening now.
- **CBT.** Trauma-focused CBT and cognitive processing therapy build a coherent, worded account of what happened, using the language network here; a story with a beginning, middle and end is easier for the brain to store.
- **DBT.** The “what” skills of observing and describing put experience into words. Labelling a feeling is linked to calmer amygdala activity and more cortical processing: name it to tame it.
- **ACT.** Acceptance work treats memories as memories rather than current threats, which supports the same contextualising job; music, sound and words are all temporal-lobe anchors for grounding.
- **Mindfulness & somatic.** Mindfulness practice and aerobic exercise are both associated with hippocampal volume and better memory consolidation, which is one reason sleep and movement are part of trauma treatment.

The Occipital Lobe

Understanding and optimizing brain regions

The occipital lobe is an essential region of the brain located at the back of the head. It plays a critical role in processing visual information from the eyes, helping us perceive and understand the world around us. This handout aims to provide information about the occipital lobe, its functions, factors that may impact its functioning, symptoms of dysfunction, and ways to optimize its function.



FUNCTIONS

- **Visual Perception:** It receives visual information and forms a coherent and meaningful perception of the visual world.
- **Object Recognition:** Assists in recognizing and identifying objects, shapes, and patterns.
- **Color Perception:** Colors are processed in the occipital lobe, allowing us to distinguish and perceive different shades.
- **Depth Perception:** It helps us perceive depth and distance, allowing us to judge the spatial relationships between objects.
- **Visual Imagery:** The occipital lobe is involved in mental visualization and the generation of images in our mind's eye.

SYMPTOMS OF DYSFUNCTION

- **Visual Impairments:** Blurred vision, difficulty perceiving colors accurately, loss of visual field (partial or complete blindness in specific areas), or visual hallucinations.
- **Object Recognition Problems:** Difficulty recognizing familiar objects, faces, or shapes.
- **Visual Agnosia:** A condition where individuals can see objects but cannot interpret meaning to them.
- **Challenges with Depth Perception:** Trouble judging depths and distances accurately.
- **Visual Field Defects:** A vision loss within specific visual field areas, such as blind spots or tunnel vision.

FACTORS IMPACTING OCCIPITAL LOBE FUNCTION

GENETIC CONDITIONS

MIGRAINES

DISORDERS

STROKE

BRAIN INJURIES

TIPS TO OPTIMIZE FUNCTION

- **Visual Stimulation:** Engage in activities such as puzzles, drawing, painting, or creative visual arts.
- **Maintain Good Eye Health:** Regular eye check-ups.
- **Balanced Nutrition:** Follow a balanced diet with nutrients beneficial for eye and brain health, such as vitamins A, C, E, and omega-3 fatty acids.
- **Protect Your Eyes:** Wear appropriate eye protection when engaging in activities that pose a risk of eye injury or strain, such as using screens for prolonged periods or participating in high-risk sports.
- **Practice Mindful Visualizations:** Engage in guided visualizations or mental imagery exercises to stimulate the visual pathways in the occipital lobe.

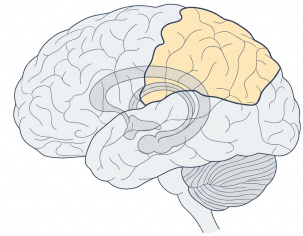
THERAPY AND THE OCCIPITAL LOBE · HOW EACH APPROACH REACHES THIS REGION

- **EMDR.** An EMDR target usually starts with the worst image. Eye movements tax visual working memory while the image is held, which is one proposed reason the picture loses vividness and emotional charge over sets.
- **CBT.** Imagery rescripting and imaginal exposure work directly with mental pictures: nightmares, flashbacks and “what if” scenes are visual events, and changing the image changes the feeling attached to it.
- **ACT.** Visualisation exercises (the stage, the stream, leaves on a stream) use imagery to create distance from thoughts; values work often starts with picturing a future scene.
- **DBT.** IMPROVE the moment begins with Imagery, and 5-4-3-2-1 grounding starts with five things you can see: deliberate looking pulls attention out of the internal picture and into the room.
- **Mindfulness & somatic.** Open-eyed grounding, soft gaze and noticing colour and light are simple occipital anchors when the mind is replaying scenes. Screen rest and eye care protect the hardware.

The Parietal Lobe

Understanding and optimizing brain regions

The parietal lobe is a crucial region of the brain that plays a significant role in processing sensory information and spatial awareness. This handout aims to provide information about the parietal lobe, including its location, functions, factors that may impact its functioning, symptoms of dysfunction, and ways to optimize its function.



FUNCTIONS

- **Sensory Perception:** It integrates sensory information from different senses.
- **Spatial Awareness and Orientation:** Helps us navigate and orient ourselves in space.
- **Perception of Movement:** It assists in perceiving and interpreting movement.
- **Attention and Awareness:** The parietal lobe contributes to our ability to pay attention, be aware of our surroundings, and shift our focus between sensory inputs.
- **Spatial Reasoning and Problem-Solving:** It involves spatial reasoning tasks, mental rotation, and problem-solving that require spatial manipulation or visualization.

SYMPTOMS OF DYSFUNCTION

- **Sensory Disturbances:** Tingling, numbness, or phantom sensations in the body or specific areas.
- **Spatial Disorientation:** Difficulty understanding and navigating within space.
- **Impaired Body Awareness:** Difficulty recognizing parts of the body or the misperception of the size, shape, or position of body parts.
- **Apraxia:** Difficulties in performing purposeful and coordinated movements, even though there may not be muscle weakness involved.
- **Contralateral Neglect:** Neglecting or failing to acknowledge one side of the body or visual field due to damage in the opposite parietal lobe.

FACTORS IMPACTING PARIETAL LOBE FUNCTION

NEGLECT SYNDROME

DISORDERS

STROKE

BRAIN INJURIES

TIPS TO OPTIMIZE FUNCTION

- **Sensory Stimulation:** Engage in activities that stimulate the senses.
- **Spatial Awareness Exercises:** Practice activities that promote spatial awareness, such as puzzles, mental rotation exercises, or navigating unfamiliar environments.
- **Body-mind Awareness Techniques:** Practice yoga, tai chi, or other body-mind awareness techniques that enhance body awareness and coordination.
- **Cognitive Training:** Engage in cognitive exercises that require spatial reasoning, problem-solving, or attentional control, such as puzzles, strategy games, or brain-training apps.
- **Healthy Lifestyle:** Maintain a healthy lifestyle, including regular exercise and a balanced diet.

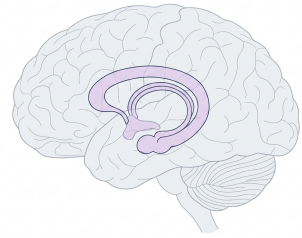
THERAPY AND THE PARIETAL LOBE · HOW EACH APPROACH REACHES THIS REGION

- **Mindfulness & somatic.** Body scan, yoga and somatic therapies train interoception, the felt sense of the body, which depends on parietal and insular cortex. Many trauma survivors have learned to tune this out; these practices tune it back in slowly.
- **EMDR.** Phase six is literally a body scan: after a memory loses its charge, the client checks the body for residual sensation and any remaining tension is targeted.
- **DBT.** Grounding and orientation (where am I, what day is it, what can I touch) are parietal tasks; they are the first move when dissociation or depersonalisation starts, both of which involve the temporoparietal region.
- **CBT.** Behavioural experiments and exposure include noticing bodily sensations accurately rather than catastrophically; interoceptive exposure for panic deliberately produces and sits with sensations.
- **ACT.** Contact with the present moment is an attention skill: noticing where attention is and moving it on purpose, which is one of the jobs this lobe does.

The Limbic System

Understanding and optimizing brain regions

The limbic system is a complex network of brain structures that plays a crucial role in regulating emotions, memory, and behavior. This handout aims to provide information about the limbic system, including its location, functions, factors that may impact its functioning, symptoms of dysfunction, and ways to optimize its function.



FUNCTIONS

- **Emotion Regulation:** It helps regulate emotions.
- **Memory Formation:** Plays a vital role in memory formation and consolidation, allowing us to retain and recall information over time.
- **Learning:** It contributes to the learning process by connecting emotions and rewards to certain behaviors, promoting adaptive learning and decision-making.
- **Motivation and Drives:** Helps regulate motivation and drives, such as hunger, thirst, sexual desire, and reproductive behavior, ensuring our basic survival needs are met.
- **Fight-or-Flight Response:** The limbic system, particularly the amygdala, plays a significant role in detecting and responding to potential threats.

SYMPTOMS OF DYSFUNCTION

- **Emotional Instability:** Difficulty regulating emotions, leading to excessive sadness, anxiety, irritability, anger, or even emotional numbness.
- **Memory Impairments:**
- **Changes in Social Behavior:** Altered social behavior, including difficulty recognizing emotions in others, decreased empathy, or changes in social interactions.
- **Altered Motivation and Drives:** Changes in appetite, sex drive, motivation levels, or reduced interest in previously enjoyed activities.
- **Anxiety or Fear Disorders:** Increased sensitivity to stress, heightened anxiety, frequent panic attacks, or exaggerated fear responses.

FACTORS IMPACTING LIMBIC SYSTEM FUNCTION

STRESS OR ANXIETY

DISORDERS

SUBSTANCE ABUSE

BRAIN INJURIES

TIPS TO OPTIMIZE FUNCTION

- **Emotional regulation techniques:** Practice stress management techniques such as deep breathing exercises, meditation, mindfulness, or engaging in creative outlets to regulate emotions and reduce anxiety.
- **Regular physical exercise:** Engage in regular physical activity, which has been shown to promote the release of endorphins, improve mood, and support overall brain health.
- **Healthy lifestyle habits:** Ensure sufficient sleep, maintain a balanced diet, minimize substance abuse, and reduce exposure to chronic stress to support optimal limbic system functioning.
- **Social engagement:** Foster social connections, engage in positive relationships, and practice empathy to support social behavior and emotional well-being.

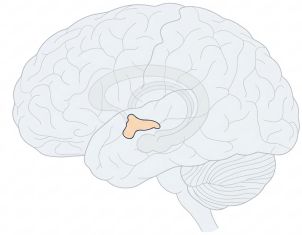
THERAPY AND THE LIMBIC SYSTEM · HOW EACH APPROACH REACHES THIS REGION

- **CBT.** Exposure therapy lays down new safety learning through prefrontal-amygdala pathways. The old fear memory is not erased; it is out-voted by newer learning, which is why practice between sessions matters.
- **EMDR.** EMDR aims at the stored emotional charge of a memory. Studies report reduced amygdala reactivity to trauma reminders after treatment, alongside the shift from “it is happening” to “it happened”.
- **ACT.** Avoidance keeps the alarm sensitive. Acceptance, willingness and defusion end the fight with the feeling, so the threat system gets the chance to learn that the feeling itself is survivable.
- **DBT.** Opposite action, check the facts and the PLEASE skills reduce emotional vulnerability; TIPP (cold water, intense exercise, paced breathing) brings an acute limbic surge down fast enough to think.
- **Mindfulness & somatic.** Observing an emotion without acting on it is associated with less amygdala reactivity over time. Stabilisation comes first in every approach: a fully activated alarm system cannot learn.

The Hypothalamus

Understanding and optimizing brain regions

The hypothalamus is a small but crucial structure located deep within the brain. It serves as the control center for several vital functions in the body. This handout aims to provide information about the hypothalamus, including its location, functions, factors that may impact its functioning, symptoms of dysfunction, and ways to optimize its function.



FUNCTIONS

- Regulation of Body Temperature
- Regulation of Hunger and Thirst
- Control of Hormonal Release
- Sleep-Wake Cycle Regulation
- Control of Emotional Responses
- Reproductive Function Regulation
- Autonomic Nervous System Regulation: helps regulate the activity of the autonomic nervous system, influencing involuntary bodily functions such as heart rate, blood pressure, and digestion.

SYMPTOMS OF DYSFUNCTION

- Hormonal Imbalances
- Temperature Regulation Issues
- Mood and Emotional Disturbances
- Disturbances in Hunger and Thirst
- Sleep Disorders
- Autonomic Nervous System Symptoms: Dysfunction in the hypothalamus may contribute to dysregulation of autonomic functions, such as irregular heart rate, blood pressure fluctuations, or digestive issues.

FACTORS IMPACTING HYPOTHALAMUS FUNCTION

STRESS OR ANXIETY

GENETICS

ENDOCRINE DISORDER

BRAIN INJURIES

TIPS TO OPTIMIZE FUNCTION

- **Healthy Lifestyle Habits:** Monitor and maintain a balanced diet, stay hydrated, and engage in regular exercise to support hypothalamus function and overall health.
- **Stress Management:** Practice stress-reducing techniques such as relaxation exercises, meditation, or engaging in enjoyable activities to support optimal hypothalamic response and decrease the impact of chronic stress.
- **Sleep Hygiene:** Establish a regular sleep schedule, create a relaxing sleep environment, and practice good sleep hygiene to support the proper regulation of the sleep-wake cycle.

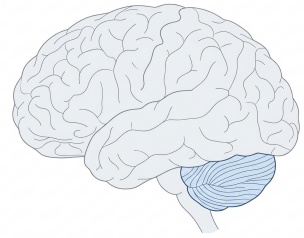
THERAPY AND THE HYPOTHALAMUS · HOW EACH APPROACH REACHES THIS REGION

- **Mindfulness & somatic.** The hypothalamus runs the stress-hormone axis. Paced breathing, progressive muscle relaxation, yoga and regular meditation are the practices most consistently linked to lower cortisol and a steadier stress response.
- **CBT.** CBT for insomnia (CBT-I) is the first-line treatment for the sleep problems that start here, and behavioural activation restores the daily rhythm of eating, light and movement the hypothalamus runs on.
- **DBT.** The PLEASE skills are hypothalamic housekeeping: treat physical illness, balance eating, avoid mood-altering substances, balance sleep, get exercise. Skipping them makes every emotion louder.
- **EMDR.** Chronic trauma is linked to a dysregulated stress axis; some studies find stress-hormone patterns move toward normal after successful trauma treatment. Stabilisation phases protect sleep and appetite along the way.
- **ACT.** Committed action around sleep, food and movement is values work in the plainest form. Hormonal and endocrine symptoms also need a medical review, so therapy here runs alongside the prescriber, not instead.

The Cerebellum

Understanding and optimizing brain regions

The cerebellum is a crucial structure located in the lower part of the brain, at the back of the skull. It is responsible for coordinating movement, maintaining balance, and regulating many other important functions. This handout aims to provide information about the cerebellum, including its location, functions, factors that may impact its functioning, symptoms of dysfunction, and ways to optimize its function.



FUNCTIONS

- **Motor Coordination:** Coordinates motor movements.
- **Precision and Timing:** Controls the precise timing and sequencing of movements, allowing for smooth, accurate, and well-coordinated actions.
- **Balance and Equilibrium:** By receiving and integrating sensory information, the cerebellum helps maintain balance and equilibrium.
- **Muscle Tone Regulation:** It helps regulate and refine muscle tone.
- **Cognitive Functions:** Beyond motor control, the cerebellum also interacts with the cerebral cortex, impacting certain cognitive functions such as attention, language, and emotional regulation.

SYMPTOMS OF DYSFUNCTION

- **Motor Coordination Issues:** Difficulty with tasks requiring fine motor skills, such as writing, buttoning clothes, or using utensils.
- **Balance and Equilibrium Problems:** Unsteadiness
- **Tremors or Shaking Movements:** Involuntary trembling in the hands, arms, or legs.
- **Dysarthria:** Speech difficulties characterized by slurred or slow speech.
- **Lack of Coordination:** Difficulty in performing movements with smoothness and accuracy.
- **Cognitive and Emotional Changes:** Problems with attention, language, memory and mood regulation.

FACTORS IMPACTING CEREBELLUM FUNCTION

STROKE

GENETICS

ALCOHOL AND DRUGS

BRAIN INJURIES

TIPS TO OPTIMIZE FUNCTION

- **Engage in Physical Activity:** Participating in physical exercise that involves coordination and balance, such as yoga, dancing, or martial arts, can help improve cerebellar function.
- **Practice Coordination Exercises:** Activities that challenge balance, visual-motor coordination, and dexterity, such as juggling, playing musical instruments, or playing sports, can enhance cerebellar function.
- **Get Sufficient Sleep:** Prioritizing quality sleep is essential for optimal brain health.
- **Maintain a Balanced Diet:** Consume a nutritious diet rich in vitamins and minerals.
- **Avoid Alcohol and Drug Abuse:** Minimizing or avoiding alcohol and drug abuse can help protect the cerebellum from potential damage.

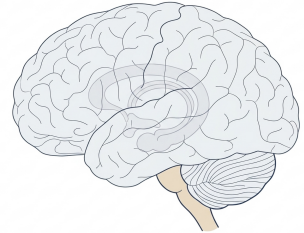
THERAPY AND THE CEREBELLUM · HOW EACH APPROACH REACHES THIS REGION

- **EMDR.** Bilateral stimulation (eye movements, alternating taps or tones) is rhythmic, timed, left-right activity, the cerebellum's native language. Rhythm and timing are part of why bilateral work feels settling.
- **Mindfulness & somatic.** Walking, drumming, yoga, tai chi and dance are used in trauma-informed and somatic work for the same reason: coordinated rhythmic movement regulates arousal from the bottom up.
- **DBT.** Intense exercise in TIPP, and mindful movement in the "participate" skill, both recruit cerebellar coordination to shift state when words are not enough.
- **CBT.** Behavioural activation often starts with movement; the cerebellum's links to attention and mood (the cerebellar cognitive affective syndrome) are one reason exercise reliably lifts mood.
- **ACT.** Committed action is embodied: practising a skill badly, then better, is cerebellar learning, and ACT's tolerance for imperfect first attempts fits how this structure learns.

The Brain Stem

Understanding and optimizing brain regions

The brain stem is a vital component of the central nervous system, located at the base of the brain. It serves as a bridge connecting the brain to the spinal cord and plays a fundamental role in various critical functions. This handout aims to provide information about the brain stem, including its location, functions, factors that may impact its functioning, symptoms of dysfunction, and ways to optimize its function.



FUNCTIONS

- **Connection Between Brain and Spinal Cord:** It acts as a conduit for signals between the brain and spinal cord, facilitating communication throughout the nervous system.
- **Basic Life-Sustaining Functions:** The brain stem controls critical functions necessary for survival, including respiration, heart rate, blood pressure regulation, and consciousness.
- **Sensory and Motor Pathways:** It contains sensory and motor pathways.
- **Sleep and Wake Cycle Regulation:** The reticular formation within the brain stem regulates the sleep-wake cycle and maintains arousal and consciousness.

SYMPTOMS OF DYSFUNCTION

- **Cranial Nerve Dysfunction:** Impaired eye movement, vision problems, difficulty swallowing, trouble speaking or enunciating, changes in facial sensations, or hearing difficulties may manifest.
- **Motor and Sensory Issues:** Muscle weakness, loss of sensation, problems with coordination and movement, difficulty balancing, and tremors may be observed.
- **Autonomic Dysfunctions:** Disruptions in essential automatic bodily functions such as breathing abnormalities, heart rate irregularities, or fluctuations in blood pressure may occur.
- **Sleep-Wake Disturbances**

FACTORS IMPACTING BRAIN STEM FUNCTION

STROKE

NEUROLOGICAL DISORDERS

TUMOR

BRAIN INJURIES

TIPS TO OPTIMIZE FUNCTION

- **Maintaining a Healthy Lifestyle:** A balanced diet, regular exercise, sufficient sleep, and avoiding harmful substances like tobacco or excessive alcohol can promote overall brain health.
- **Seeking Medical Treatment:** If experiencing persistent symptoms related to brain stem dysfunction, consulting with a healthcare professional is crucial for proper evaluation, diagnosis, and treatment.
- **Physical Therapy and Rehabilitation:** In cases of brain stem injury or dysfunction, physical therapy may play a significant role in rehabilitating and maximizing residual function.

THERAPY AND THE BRAIN STEM · HOW EACH APPROACH REACHES THIS REGION

- **Mindfulness & somatic.** Breath is the one brainstem function you can steer on purpose. Long, slow exhales act on the brainstem's breathing and vagal centres and are the common core of polyvagal-informed, somatic and relaxation work.
- **DBT.** Paced breathing and the cold-water element of TIPP work at this level: they change heart rate and arousal directly, before any thinking is possible.
- **EMDR.** Fight, flight and freeze are brainstem-driven. EMDR's preparation and closure phases exist to keep arousal inside the window of tolerance, because processing only works when the brainstem is not running the show.
- **CBT.** Interoceptive exposure for panic deliberately produces the brainstem's alarm signals (racing heart, breathlessness) so they can be relearned as uncomfortable rather than dangerous.
- **ACT.** Present-moment contact often begins with the breath. Co-regulation also happens here: a calm voice and pace from the therapist settles arousal before any technique does.

My brain and my therapy

Connect what you notice in yourself to the map, and to the work we are doing.

Symptoms I recognise from the “symptoms of dysfunction” lists, and which region they sit in

Factors on my pages that apply to me right now Stress, sleep, substances, injury, illness, age.

The approach(es) we are using, and the regions the therapy panels say they reach

What I would expect to notice changing first, if the work is landing

One “tip to optimize function” I will act on this week

Questions for my therapist or doctor
