Photobiomodulation for Brain Health

Overview: PBM for Brain Health

Photobiomodulation (PBM) is increasingly being explored as a non-invasive, drug-free approach to support brain health. Its mechanisms involve improving mitochondrial function, enhancing cerebral blood flow, and modulating neuroinflammation. PBM has shown promise in supporting cognitive function, mood regulation, traumatic brain injury (TBI) recovery, and neurodegenerative disease mitigation.

Mechanisms of PBM in Brain Health

The therapeutic effects of PBM on the brain occur through:
- Mitochondrial activation → boosts ATP production and neuronal function [1]
- Vasodilation → improves cerebral blood flow and oxygenation [2]
- Reduction of oxidative stress and inflammation [3]
- Neuroprotection and enhanced synaptic plasticity [4]
- Brain-derived neurotrophic factor (BDNF) upregulation → supports memory and neurogenesis [5]

Clinical Evidence

Studies demonstrating PBM's effectiveness for brain-related conditions:

- Cognitive Enhancement
  Barrett & Gonzalez-Lima, 2013: PBM to the forehead improved attention and memory in healthy volunteers.
  PubMed Link: https://pubmed.ncbi.nlm.nih.gov/23495878/
- Traumatic Brain Injury
  Naeser et al., 2011: Veterans with chronic TBI showed significant cognitive and mood improvements with PBM.
  PubMed Link: https://pubmed.ncbi.nlm.nih.gov/21666975/
- Depression
  Cassano et al., 2015: Near-infrared PBM applied to the forehead showed rapid improvement in depressive symptoms.
  PubMed Link: https://pubmed.ncbi.nlm.nih.gov/25603105/

- Alzheimer's Disease
  Saltmarche et al., 2017: PBM resulted in cognitive improvement in early Alzheimer's patients.
  PubMed Link: https://pubmed.ncbi.nlm.nih.gov/29036978/

How to Use PBM Healing's SPRB and GPRB Devices for Brain Health

SPRB

Best for: Targeted application to the forehead (prefrontal cortex) and occipital areas.
Wavelengths: Red (630–660 nm) and IR (850 nm)
Protocol:
- Forehead: Position over prefrontal cortex
- Occipital: Place at base of skull for posterior brain support
- Session duration: 15 minutes
- Frequency: 3–5x/week
- Use with eyes closed and protective eyewear if needed

GPRB (

Best for: Broader application across the head or neck for systemic benefits.
Protocol:
- Neck placement: Enhances carotid blood flow to the brain
- Shoulder/upper spine: Supports vagus nerve stimulation and systemic calming
- Session duration: 15 minutes
- Frequency: 3–5x/week

Practical Tips

Suggested protocols for different brain-related conditions:

Condition: Cognitive Support
Area: Forehead
Device: SPRB
Frequency: 4x/week
Notes: Use in the morning to support alertness

Condition: Depression/Anxiety
Area: Forehead + base of skull
Device: SPRB
Frequency: 5x/week
Notes: Use with eyes closed; evening sessions may support calm

Condition: TBI Recovery
Area: Forehead + neck

Device: GPRB
Frequency: Daily for 4–6 weeks
Notes: Coordinate with neurologist if applicable

Condition: Alzheimer's/Neurodegeneration
Area: Forehead + occipital + neck
Device: SPRB/GPRB
Frequency: 3–5x/week
Notes: Consistent use required for cognitive maintenance

Safety and Contraindications

- Do not shine light directly into the eyes.
- Use only with proper shielding or closed eyes during forehead applications.
- Avoid use over active brain tumors or epileptic foci unless cleared by a physician.
- SPRB and GPRB are generally safe when used as directed.

🧠 **Summary: Photobiomodulation for Brain Health**

Photobiomodulation (PBM) is a non-invasive, light-based therapy that may support brain health by stimulating mitochondrial function, enhancing cerebral blood flow, reducing neuroinflammation, and promoting neuroplasticity. It has shown potential benefits in cognitive enhancement, mood regulation, traumatic brain injury (TBI) recovery, and support for neurodegenerative conditions such as Alzheimer's disease.

⚠️ **Medical Disclaimer**

Photobiomodulation therapy is a supportive wellness modality and not a substitute for medical diagnosis or treatment. Individuals with neurological conditions, mood disorders, traumatic brain injury, or cognitive decline should consult a licensed physician or neurologist before initiating PBM.

- Do **not** use PBM devices over **active brain tumors**, **epileptic foci**, or **implanted neurological stimulators** unless explicitly cleared by a healthcare provider.

The information provided in this document is for educational and informational purposes only. It is not intended as a substitute for professional medical advice, diagnosis, or treatment. Individuals should always consult with a licensed physician or qualified healthcare provider before beginning any new therapy, including the use of photobiomodulation (PBM) devices.

PBM devices such as the SPRB and GPRB are wellness tools designed to support general health and well-being. They are not medical devices and are not intended to diagnose, treat, cure, or prevent any disease or medical condition. No medical claims are made or

implied. Results may vary based on individual factors, and PBM should not be considered a replacement for appropriate medical care.

References (with Links)

1. Hamblin MR. Mechanisms of PBM in the brain. Photobiomodul Photomed Laser Surg. 2016. https://pubmed.ncbi.nlm.nih.gov/26889906/
2. Zhang Q, et al. PBM improves cerebral blood flow. Brain Res. 2014. https://pubmed.ncbi.nlm.nih.gov/24680974/
3. Salehpour F, et al. PBM reduces oxidative stress in neurons. Oxid Med Cell Longev. 2018. https://pubmed.ncbi.nlm.nih.gov/29713273/
4. Rojas JC, Gonzalez-Lima F. Low-level light therapy of the eye and brain. Eye Brain. 2011. https://pubmed.ncbi.nlm.nih.gov/24273641/
5. Barrett DW, Gonzalez-Lima F. PBM and cognitive enhancement. Neuroscience. 2013. https://pubmed.ncbi.nlm.nih.gov/23495878/
6. Naeser MA, et al. PBM and TBI. J Neurotrauma. 2011. https://pubmed.ncbi.nlm.nih.gov/21666975/
7. Cassano P, et al. PBM and depression. J Affect Disord. 2015. https://pubmed.ncbi.nlm.nih.gov/25603105/
8. Saltmarche AE, et al. PBM for Alzheimer's. Photobiomodul Photomed Laser Surg. 2017. https://pubmed.ncbi.nlm.nih.gov/29036978/