STUDYBOOK

EXOMIND™

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EXOMIND™

Mechanism of Action

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Brain Function

The human brain is a vital part of the central nervous system (CNS) that controls human senses, thoughts, and actions.[1] EXOMIND™ stimulates specific parts of the brain using ExoTMS™ technology.

The brain is a highly complex organ, made up of neurons, which are its fundamental building blocks. The brain contains approximately 100 billion neurons, each forming thousands of synapses (small electrochemical connections with neighbouring neurons), creating intricate networks that allow the brain to process and transmit information.

Neurons communicate by transmitting electrical signals through these synapses, enabling the transfer of information across the brain. Synapses are full of neurotransmitters (tiny chemical messengers that enable neurons to communicate with each other). When one neuron wants to send an electrical signal to another, it releases neurotransmitters into the synapse. These chemicals cross the gap and attach to the next neuron, passing the electrical signal along. Key neurotransmitters such as dopamine, serotonin, and norepinephrine play vital roles in mood regulation, motivation, and cognitive function. A well-balanced neurotransmitter system supports mental clarity, emotional stability, and sustained attention, while imbalances can contribute to stress, low mood, and cognitive decline.[2,3]

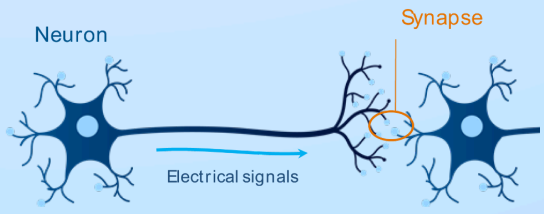

Figure 1. The neuron transmits the signal to the synapse, where it passes on the neighbouring neuron via neurotransmitters in the synapse.

The outermost layer of the brain, known as the cerebral cortex (filled with neurons), is responsible for higher-order functions, including reasoning, problem-solving, and sensory perception. The cortex is divided into four primary lobes: the frontal lobe (decision-making, planning, personality), parietal lobe (sensory integration and spatial awareness), occipital lobe (vision), and temporal lobe (language and memory). Beneath the cortex lies the inner brain (also filled with neurons), including structures like the limbic system or brainstem (responsible for primal survival functions such as eating, drinking and reproduction), which send information to the cortex for evaluation. In between the cortex and inner brain, there is the white matter (filled with connections between the neurons) connecting and transpassing information between these two functional structures. [4,5]

The brain is divided into two hemispheres, each playing a unique role in cognitive and emotional processing. The left hemisphere is primarily responsible for analytical thinking, emotional regulation, and self-control, helping individuals make logical decisions and suppress impulsive reactions. The right hemisphere, in contrast, is associated with spontaneous responses, stress reactivity, and emotional processing, playing a key role in immediate reactions to external stimuli.

DLPFC

At the forefront of the frontal lobe lies the left dorsolateral prefrontal cortex (DLPFC), a key part of the prefrontal cortex that plays a central role in emotional regulation, decision-making and self-perception. It acts as the brain's executive hub, integrating inputs from inner brain structures to evaluate information and guide responses. This process helps balance emotional impulses with rational decision-making, preventing impulsive behaviors and aligning actions with personal goals.[6,7]

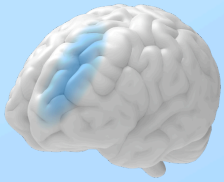

Figure 2. The human brain, with the left DLPFC highlighted blue.

In today's fast-paced world, the DLPFC is often underactive, even in healthy individuals, due to stress, overstimulation, and the pursuit of quick rewards, which can weaken its neural connections and diminish its functions. This may lead to reduced emotional regulation, causing impulsive behavior, heightened stress, impair decision-making and self-control, making it harder to align actions with long-term goals and resist immediate temptations.[8]

ExoTMS™

EXOMIND integrates advanced ExoTMS™ Technology, representing the latest evolution in non-invasive electromagnetic neuronal stimulation. This innovative approach is built on the robust foundation of traditional Transcranial Magnetic Stimulation (TMS), a technique supported by over 40 years of research and millions of successfully treated patients. TMS has long been established as a safe and effective method for enhancing brain function and addressing mental health challenges.[9]

ExoTMS™ advances this proven method with state-of-the-art innovations designed to optimize both patient comfort and therapeutic outcomes. Using gradual pulse delivery that provides a natural and comfortable stimulation of neural tissue, minimizing discomfort during treatment. Unique coil wiring alongside the advanced cooling technology enhances magnetic field delivery while ensuring increased number of pulses in the therapy to achieve efficient results in 4-6 sessions only. Additionally, EXOMIND protocol prevents the brain from becoming accustomed to the therapy by using parameter modulation, helping with maintaining long-term effectiveness and consistent therapeutic results.

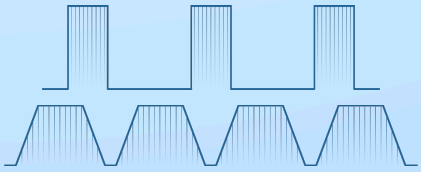

Figure 3. Standard TMS pulse delivery (top) and ExoTMS™ gradual pulse delivery (bottom).

These enhancements allow ExoTMS™ to deliver effective, individualized therapy while ensuring a high level of comfort.

Workout For Your Mind

The EXOMIND applicator, powered by ExoTMS technology, is engineered to precisely target the left DLPFC. Electromagnetic pulses from the applicator's coil reach the neurons in the DLPFC, generating electrical signals within them. Neurons are forced to pass these signals by activating and utilizing their connections with neighbouring neurons, leading to: rebuilding lost connections, strengthening weakened existing connections and increasing neurotransmitter release in synapses, improving neural communication and reliability of communication between neurons. These effects occur through neuroplasticity, the brain's natural ability to form and reorganize neural pathways in response to stimulation and learning.[10, 11]

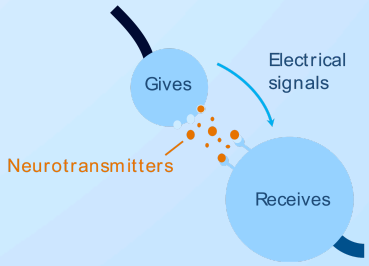

Figure 4. Neurotransmitter molecules pass electrical signals from one neuron to another through synapses.

These mechanisms restore the functionality of the left DLPFC, and enhance its engagement in everyday tasks. Enabling DLPFC to manage tasks requiring emotional regulation, decision-making, and cognitive control more effectively. This leads to improved overall mental well-being, mood, stress management, sleep quality, energy levels, concentration, and other benefits.

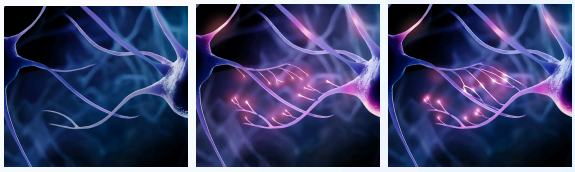

Figure 5. Conceptual depiction of neuroplasticity. From left to right: pre-treatment; neuronal adaptation; post-treatment.

ExoTMS™ is only targeting cortex of the brain, beneath the cortex are just neural connections, not functional brain regions.

Neurotransmitter Release

Stimulation of the left dorsolateral prefrontal cortex (DLPFC) has been shown to activate the brain's reward pathways (associated with reward regulation - production of neurotransmitters such as dopamine, serotonin etc.), particularly the mesolimbic dopamine system (located in the inner part of the brain - ventral tegmental area). This activation leads to increased release of dopamine in the prefrontal cortex and associated structures.[12] Additionally, the DLPFC is interconnected with other neuromodulatory centers, which are primary sources of norepinephrine and serotonin (locus coeruleus and raphe nuclei). Stimulation of the DLPFC can modulate the activity of these centers, resulting in localized increases of these neurotransmitters in the prefrontal cortex and associated limbical areas (nucleus accumbens).[13]

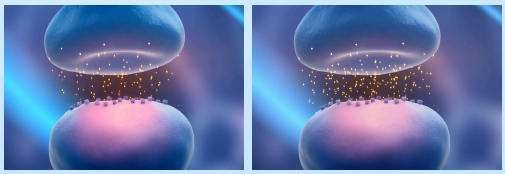

Figure 6. Conceptual depiction of how the neurotransmitter levels increase after TMS stimulation.

It's important to note that neurotransmitter systems exhibit region-specific distributions and effects. For instance, dopamine and norepinephrine critically influence prefrontal cortical functions, including cognition and executive processes.[14] This regional specificity ensures that the activation of neurotransmitter release in the prefrontal cortex does not indiscriminately stimulate the entire brain but rather enhances synaptic transmission and neuronal activity within targeted circuits.

In summary, stimulation of the left DLPFC leads to the activation of reward-related pathways and modulates neuromodulatory centers, resulting in localized increases in dopamine, norepinephrine, and serotonin within the prefrontal cortex and limbic system. This targeted neurotransmitter release supports improved synaptic communication and cognitive function in these specific brain regions.

Lifestyle Improvement

Additionally, EXOMIND goes beyond improving well-being by reshaping behaviors and supporting healthier lifestyles. By reactivating the dorsolateral prefrontal cortex (DLPFC). This process helps balance emotional impulses and rational decisions, preventing impulsive reactions and aligning behavior with personal goals.

By improving self-control and willpower, EXOMIND empowers patients to adopt healthier routines, bridging mind wellness and physical transformation for lasting lifestyle changes.

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EXOMIND™

Mental Wellness

ExoTMS Technology: A Breakthrough in Transcranial Stimulation for Enhancing Mental Well-Being

Michelle Dees MD[1], Yael Halaas MD[2], JD McCoy NMD[3]

1. Luxury Psychiatry Clinic., Winter Garden, FL, USA, 2. Yael Halaas, M.D., F.A.C.S., New York, NY, USA, 3. Contour Medical, Gilbert, AZ, USA

Highlights

- 33 patients (25–78 years, BMI 17.5–43.1 kg/m2) received 4 sessions
- Patients were evaluated using the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS)
- 91% of patients found the therapies comfortable
- 78% of patients felt less stressed and 69% felt more confident at 3 months

88%

Patients improved in mental well-being at 3 months

75%

Patients felt more energised at 3 months

78%

Patients experienced improved sleep onset at 3 months

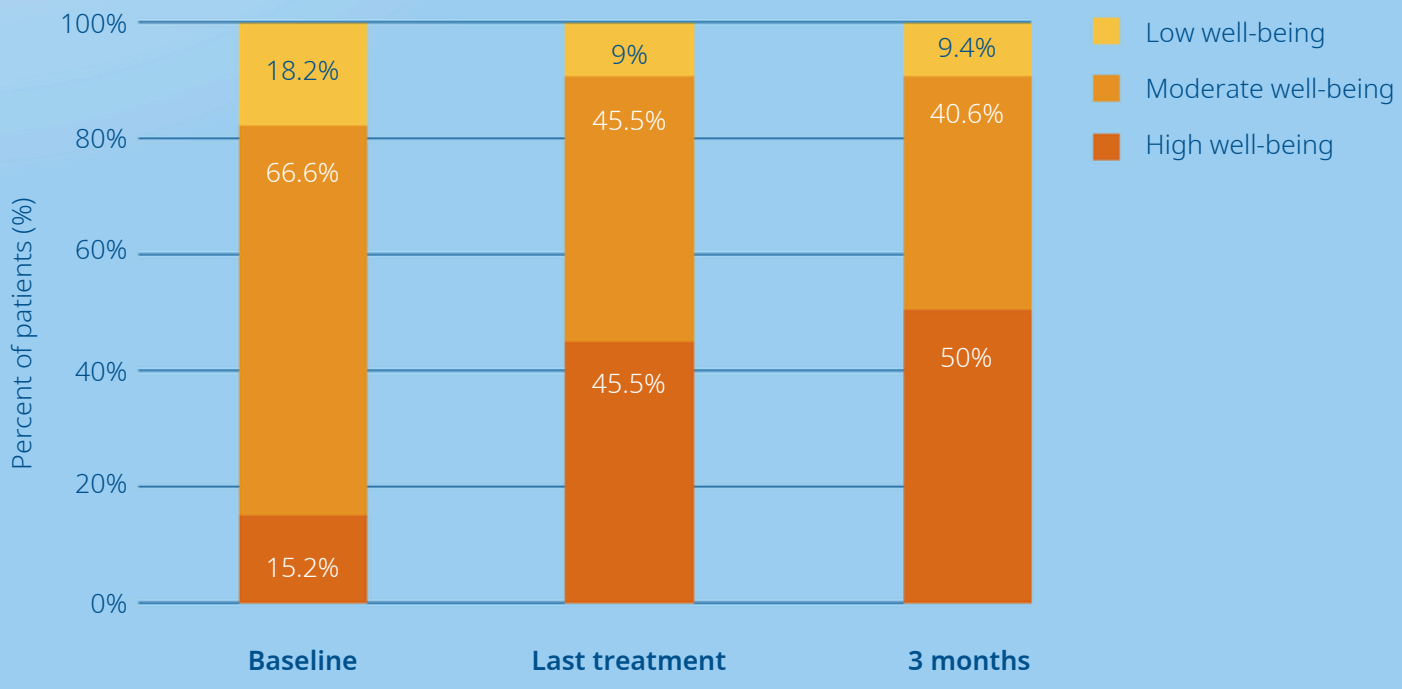

Figure 1: Percentage of patients in individual categories according to WEMWBS. The number of patients with high well-being increased by 3.2 times at 3 months.

EXOMIND™

Willpower & Self-Control

Novel ExoTMS Technology for the Improvement of Self-Control

Rakesh Nanda, MD, Henry Johnston III, MD, Louis Cady, MD

[1] [2] [3]

1. Jiva Med Spa, Columbus, OH, USA, 2. Aria Integrative Health, Denver, CO, USA, 3. Cady Wellness Institute, Newburgh, IN, USA

Highlights

- 21 patients (24–74 years, BMI 21.7–44.4 kg/m2) seeking improvements in willpower received 6 sessions
- Patients were evaluated using the Brief Self-Control Scale (BSCS) and Food Cravings Questionnaire–Trait (FCQ–T)
- 85% of patients found the therapies comfortable; no adverse events were reported

Patients reported improvement in willpower and self-control after the last treatment

Patients reported feeling more motivated after the last treatment

Patients reported feeling mentally stronger after the last treatment

EXOMIND™

Binge Eating

Novel ExoTMS Technology for the Reduction of Binge Eating Symptoms

David Pánek, MD, PhD1, Toni Slavchev Donchev, MD2
1. DP Neuro, Prague, Czechia, 2. Assoc. Professor, Medical Center Intermedica, Sofia, Bulgaria

Highlights

- 38 patients (24–66 years, BMI 19.6–44.4 kg/m2) with binge eating symptoms were enrolled in two parallel clinical studies received 6 sessions
- Patients were evaluated using the validated Binge Eating Scale (BES) questionnaire
- 92% of patients found the therapies comfortable; no adverse events were reported

74%

Patients showed complete binge eating recovery at 1 month

87%

Patients felt improved self-control over eating at 1 month

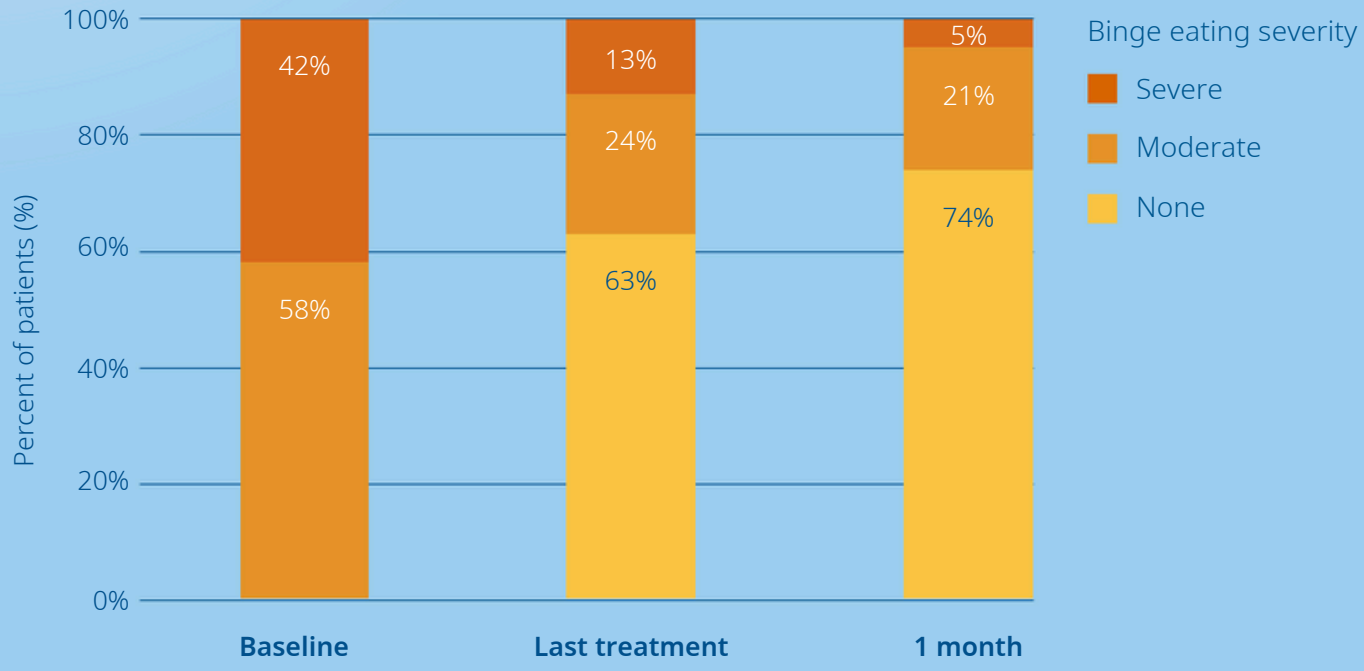

Figure 1: The BES questionnaire measures binge eating severity on a scale of 0-46: <17 point = no binge eating, 18-26 points = moderate binge eating, and ⩾27 points = severe binge eating. At baseline, all patients exhibited binge eating symptoms. At 1 month, 28 subjects (74%) showed no binge eating behavior.

EXOMIND™

Food Cravings

Mind Over Cravings: ExoTMS as the Novel rTMS Technology for Food Cravings Reduction

Monika Klírová, MD, PhD

1. Assoc. Prof., National Institute of Mental Health, Klecany, Czechia

Highlights

- 23 patients (23–71 years, BMI 18.8–42.6 kg/m2) seeking healthier eating habits received 4–6 sessions
- The validated Food Cravings Questionnaire–Trait (FCQ–T) was used for the evaluation, which showed a 36% reduction in food cravings at 1 month
- 78% of patients had lost weight at 1 month

2.3 kg
Average weight loss at 1 month

100%
Patients reduced food cravings at 1 month

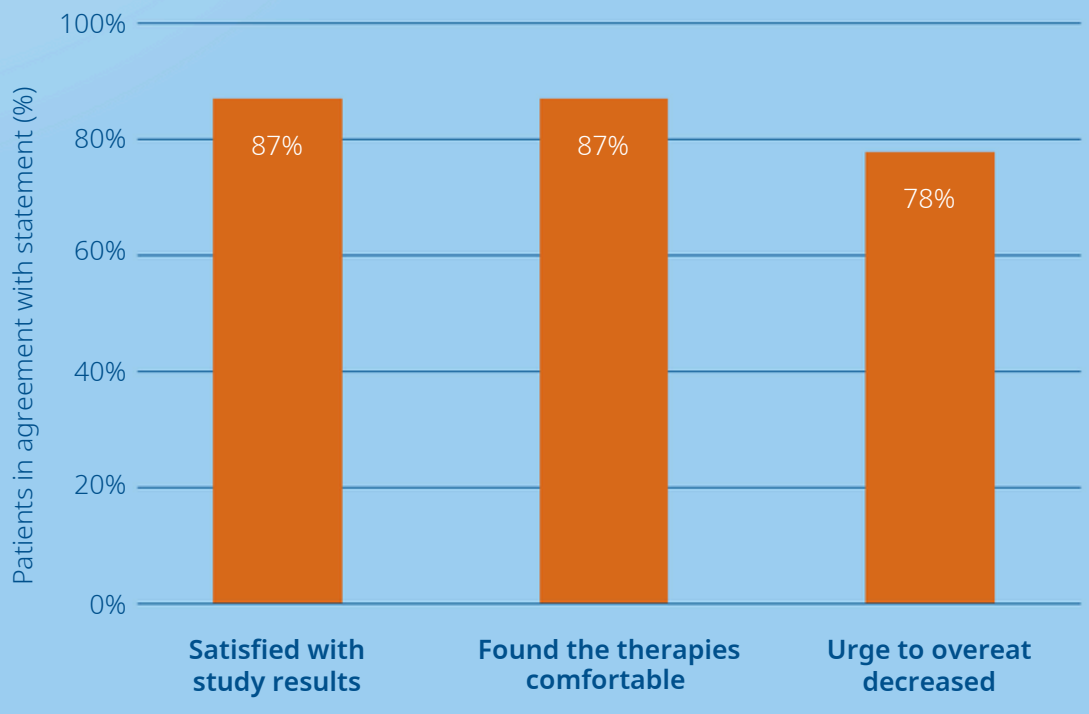

Figure 1: Percentage of patients in agreement with statements.