EFFECTIVENESS AND LONGITUDINAL STUDY OF LIGHT/ELECTROMAGNETIC NEURO-STIMULATION

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NIKOLA TESLA

“If you want to find the secrets of the universe, think in terms of energy, frequency and vibration.”

QUESTIONS TO BE ANSWERED

1. Does Light and/or Electromagnetic stimulation affect the brain activity of individuals never exposed to Neurofeedback training?
2. If Yes, what changes can be noted over 20-40 sessions of Neurostimulation?
3. Are cognitive, physical and emotional aspects corrected?
4. How long might the changes last after the Neurostimulation program has ended?

METHODOLOGY AND PROTOCOLS

• 24 clients enrolled, males & female, ages 10-86
• Clients completed comprehensive health intake forms: medical history, S.C.I.-90-R, Depression Assessment (CES-D-R), Stress Test, Family History
• Neurostimulation performed three times per week, half an hour long, for 20-40 sessions.
• Clients held sessions in comfortable reclining chairs, quiet environment

METHODOLOGY AND PROTOCOLS

• Participants were also evaluated cognitively with the IVA-QS, Integrated Visual Auditory continuous performance test.

METHODOLOGY AND PROTOCOLS

• The cognitive functions were re-evaluated, with the same IVA-QS battery as used at the start of the study, after 20 and after 40 consecutive sessions of Neuro-Stimulation.
• The majority of the participants (95%) benefited from the Neuro-Stimulation program obtaining remarkable physical, emotional and cognitive improvements. Objectively the IVA-QS showed significant and continuous improvements.
• No negative side effects have been reported.
MEDICAL/PSYCHOLOGICAL ISSUES PRESENTED AMONG 24 CLIENTS:

- ADD/ADHD or LD (Learning Disabilities)
- Pain syndromes, fibromyalgia
- Sleep disorders
- Symptoms post stroke or post-concussion
- Asthma or COPD (Chronic Obstructive Pulmonary Disorder)
- Memory dysfunctions

Post training client notes completed after every session

Note initial size of behavior changes box

The Client Notes Form evolved and increased in the quantity of possible outcomes per client’s responses to “other noticeable changes.”

Changes were also confirmed by objective parties – and the IVA tests were possible.

HOW WAS THE TRAINING PERFORMED?

NEUROSTIMULATION WITH LIGHT AND ELECTROMAGS

Two Clients Session
True Blue (Eyes Open) and Red Blue (Eyes Closed)
SUMMARY

<table>
<thead>
<tr>
<th>Total participants</th>
<th>Total Male</th>
<th>Total Female</th>
<th>Age ranges Males</th>
<th>Age ranges Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>9</td>
<td>15</td>
<td>10-76</td>
<td>18-85</td>
</tr>
</tbody>
</table>

MOST SIGNIFICANT OUTCOMES SESSIONS 1-10

- Sleeps Better 86.9%
- More Focused 78%
- Seems Happier 73.9%
- More Active, More Talkative, Smiles More
  Tied at 69.5%

HONORABLE MENTION SESSIONS 11-20

- Breaths Better 75% (of cases)
- More Hopeful 75%
- More Active, More Outgoing, More Responsible, Improved Behavior, Thoughtful 65%
- More Energetic 60%
- Speech Clearer 40%
- Better Recall 30%

TOP 7 OUTCOMES POST NEUROSTIMULATION

SESSIONS 21-30

- Walking on own (of cases) 100%
- Seems Happier, Sleeps Better 77%
- More Strength 66%
- Reads Better, reads more 61%
- No More Tremors (of cases) 50%
- No Longer Snores 44%
- No More Pain 33%

SESSIONS 31-40

- More Confident 86.6%
- Laughs More 80%
- Calmer 73%
- Has More Energy 73%
- More Detailed, More Helpful, More Organized, More Outgoing 66.6%
- More Focused 60%
- Better Judgment 53%
- Improved Memory 53%
### Summary of Conditions and Outcomes

<table>
<thead>
<tr>
<th>Conditions Presented</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fear</td>
<td>• Trained Away</td>
</tr>
<tr>
<td>• Fibromyalgia</td>
<td>• Trained Away</td>
</tr>
<tr>
<td>• Focus/Concentration Issues</td>
<td>• Trained Away</td>
</tr>
<tr>
<td>• Headaches/Migraines</td>
<td>• Trained Away</td>
</tr>
<tr>
<td>• High Blood Pressure</td>
<td>• Trained Away</td>
</tr>
<tr>
<td>• Inability to use Limbs (legs/arms)</td>
<td>• Mobility of Limbs (3 cases)</td>
</tr>
<tr>
<td>• Learning difficulties</td>
<td>• Two Students Honor Roll</td>
</tr>
<tr>
<td>• Obsessive Compulsive Disorder</td>
<td>• Behavior Modified</td>
</tr>
<tr>
<td>• Oppositional Defiant Behavior</td>
<td>• Behavior Modified</td>
</tr>
<tr>
<td>• Pain (lower back, limbs, headaches)</td>
<td>• Trained Away</td>
</tr>
</tbody>
</table>

### Summary of Conditions and Outcomes

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<tr>
<th>Conditions Presented</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Asthma</td>
<td>• No longer requires nebulizer</td>
</tr>
<tr>
<td>• Attention Deficit Disorder (ADD)</td>
<td>• Trained Away</td>
</tr>
<tr>
<td>• Attention Deficit Hyperactivity Disorder (ADHD)</td>
<td>• Trained Away</td>
</tr>
<tr>
<td>• Corticobasal degeneration (CBD)</td>
<td>• Now able to walk without walker and has use of right side of body.</td>
</tr>
<tr>
<td>• Chronic Obstructive Pulmonary Disease (COPD)</td>
<td>• Able to move around house w/o oxygen for up to 30 minutes.</td>
</tr>
<tr>
<td>• Depression</td>
<td>• Trained Away</td>
</tr>
<tr>
<td>• Diabetes</td>
<td>• Managed</td>
</tr>
<tr>
<td>• Dizziness</td>
<td>• Trained Away</td>
</tr>
<tr>
<td>• Fatigue (Chronic)</td>
<td>• Trained Away</td>
</tr>
</tbody>
</table>

### COMPLETION RATES

<table>
<thead>
<tr>
<th>20 Sessions</th>
<th>40 Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 out of total of 24</td>
<td>15 out of 24</td>
</tr>
<tr>
<td>Completion rate 83%</td>
<td>Completion rate 62%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Males</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 out of 9, completion rate 77%</td>
<td>5 out of 9, completion rate 55%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Females</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 out of 15, completion rate 87%</td>
<td>10 out of 15, completion rate 67%</td>
</tr>
</tbody>
</table>

### PARTICIPANTS WHO COMPLETED PROGRAM - 40 SESSIONS

<table>
<thead>
<tr>
<th>Total Completed 15 of 24</th>
<th>Males Completed 5 of 9</th>
<th>Females completed 10 of 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>62%</td>
<td>55%</td>
<td>67%</td>
</tr>
</tbody>
</table>

### SUMMARY

**Participants by age**
- Children: 2 of 24
- Teens: 1 of 24
- 20’s: 5 of 24
- 40’s: 2 of 24
- 50’s: 1 of 24
- 60’s: 3 of 24
- 70’s: 2 of 24
- 80’s: 2 of 24

**Participants completed 40 sessions**
- Children: 0 of 24
- Teens: 1 of 24
- 20’s: 5 of 24
- 40’s: 2 of 24
- 50’s: 1 of 24
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- 70’s: 2 of 24
- 80’s: 2 of 24
PRE/POST 40 SESSIONS OF NEUROSTIMULATION --

• Objective evaluations: IVA, Integrated Visual and Auditory CPT
• Subjective evaluations: Stress Test, SCL-90R, Depression Test

IVA-QS FULL SCALES PRE AND POST 40 SESSIONS

IVA-QS VISUAL PARAMETERS PRE AND POST 40 SESSIONS

IVA-QS AUDITORY PARAMETERS PRE AND POST 40 SESSIONS
SUBJECTIVE TESTS PRE AND POST 40 SESSIONS OF NEUROSTIMULATION

- SCL-90R, Symptoms Check List
- Beck Inventory Depression List
- Stress Test

CONCLUSION

- The Light and/or electromags stimulation proved to be an useful approach that benefited all the participants.
- The benefits obtained and reported at the end of the study continued to be sustained 18 months later after the completion of the Neuro-Stimulation.

SHORT HISTORY OF THE LIGHT/ELECTROMAGNETIC STIMULATOR AND ITS EFFECTS ON THE BRAIN ACTIVITY

- 2004, pROSHI BB was developed by Chuck Davis, from the Talos 4-Neurofeedback system, enhanced type of Neurofeedback (1998-2001)
- Mr. Tom Allen, after using the First prototype, observed decreased anxiety, reduced tremor and epileptic episodes and was able to reduce meds
- 2005 and 2006 he reported: See Testimonial

BRAIN WAVES CHANGES UNDER LIGHT STIMULATION

1. Amplitude changes of all the Frequencies noticed from the start
2. Medication presence influenced these changes
3. Coherence changes were also noticed when analyzed by qEEG
4. However the changes became permanent after Light stimulation training

AMPLITUDES CHANGES

25 y/o Patient with anxiety/depression
“6/26/07 the AHA moment!”

Top 45 y/o female w/ PTSD and HF
pROSHI II
Bottom: Case of ADHD 7 y/o w/ meds, less on the last session
D6  The coloring does not properly show graphics. Try more contrasting colors.
Dell, 2/22/2019
**Amplitudes Changes Under Light Stimulation**

Top: Client without major problem.
Bottom: Depressed client responding to the light stim added to Neurofeedback

**Amplitudes Changes With Light Stim Overtime**

Changes of the EEG amplitudes in a client with GVH post leukemia transplant; PTSD, depression, anxiety, chronic pain, sleep and memory problems...resolved.

**Coherence Changes**

- QEEG
- Connectivity map - eyes closed (EC) evaluation using the NeuroRep Program
- Observe: nZ score is 184

**Coherence Changes**

- QEEG - Connectivity map during EC and light stimulation using the NeuroRep Program
- Observe: nZ score is 97

**Coherence Changes**

- QEEG - Connectivity map EC post light stimulation
- Observe the Rebound effect when light stim stopped - nZ score to 180
ELECTROMAGNETIC STIMULATION ON ESSENTIAL TREMOR

HISTORY OF LIGHT AND SOUND
- 1930-40 W. Gray Walter and others used powerful electronic strobe lights and the new EEG equipment to alter brainwave activity producing trance-like states of profound relaxation and vivid imagery.
- 1960-70 Jack Schwartz built the first light and sound machine to create altered states.
- 1960-70 Dr. Joe Kamiya and Langley – Porter Neuropsychiatric Institute in San Francisco Alpha EEG feedback by helped initiate the age of biofeedback.

ELECTROMAGNETIC STIMULATION ON PARKINSON’S DISEASE, PD
- Top: Pre NF enhanced by Light and Electromagnetic stimulation
- Bottom: Post 38 sessions of NF enhanced by Light and Electromagnetic stimulation

HISTORY OF LIGHT AND SOUND
- 125 A.D. - Apuleius experimented with the flickering light produced by the rotation of a potter’s wheel, finding that it could reveal a type of epilepsy.
- 200 A.D. - Ptolemy studied the phenomenon of the flickering generated by sunlight through the spokes of a spinning wheel.
- 1790s - William Charles Wells described different effects of binocular vision. That lead to the study of the Binaural Beats.
- 1940 - William Gray Walter evaluated the effects of the stroboscopic light flashes on the whole brain using EEG.

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HISTORY OF LIGHT AND SOUND
- 1970s - William Charles Wells described different effects of binocular vision. That lead to the study of the Binaural Beats.
- 1980-90 Farley investigated the medical applications that some manufacturers claimed and he concluded that there is not in need to be covered under medical devices by FDA.
- 1980s Michael Hutchison “Megabrain report”
- 1980s Dr. Tom Budzinsky “Twilight Learning” – Brain Brightener
- 1984 Dr. Gene Brockopp - coherence of the high frequency EEG pattern is apparently related to increased intellectual functioning.

HISTORY OF LIGHT AND SOUND
- 1988 Dr. Marion Diamond in her book “Enhancing Heredity,” showed that sensory stimulation of the brain of rats increased dendritic growth.
- 1991 Harold Russell, Ph.D. reported at AAPB meeting on new research that showed that L/S at beta frequencies (18-21 Hz) appeared to improve the cognitive functioning of ADDH (Attention Deficit Disorder-Hyperactive) children.
• Optogenetics
• Dec 7, 2016 - Using LED lights flickering at a specific frequency, MIT researchers, the Nature paper, have started a company called Cognito Therapeutics to...
• FLASHING LIGHT THERAPY FOR ALZHEIMER’S DISEASE
• A non-invasive therapy that just might outperform drugs

2/25/2019
9

MAYO CLINIC
• Light therapy for Seasonal Affect Disorder, SAD
• Light Therapy for Neuropathy
• Transcranial Electromagnetic Stimulation (TMS)

BRAIN WAVE ENTRAINMENT
• Any stable frequency evokes a cortical response. The brain synchronizes its dominant brainwave frequency with that of the external stimulus. This is called Brainwave Entrainment.

• https://mindalive.com/index.cfm/research/research-articles-by-dave-siever/

BRAINWAVES DIS-ENTRAINMENT
• “Light or other electromagnetic waves, at the level of the brain electrical production [1-40 Hz] presented randomly to the brain stimulates the brain to correct its self!” Chuck Davis
• This is called Dis-entrainment!

• http://www.nnrionline.com/

"THE LIGHT BLINKING AT A RATE OF 40 TIMES PER SECOND STIMULATES GAMMA WAVES IN THE VISUAL CORTEX, WHICH IN TURN SOMEHOW MODIFIES OR TRANSFORMS THE MICROGLIA INTO WHAT PROFESSOR TSAI CALLS "AN ENGULFING STATE".

Normal neurons and neurons containing tangles and surrounded by Amyloid plaques. These plaques and tangles, the hallmarks of Alzheimer’s disease, are the proteins that, stimulated by flashing light therapy, the newly-voracious microglia clear out. Image credit Bright Focus Foundation

There are different types of lights that can be used in therapy lamps, including fluorescent, polychromatic polarized (often used in the treatment of carpal tunnel syndrome), and full-spectrum.
• Doctors first used these artificial lights in the treatment of diseases which used to plague humankind, like syphilis, pellagra, and tuberculosis.
• Spectro-Chrome system (Dinshah Ghadiali) is still widely used today. This system is based on the idea that certain colors in the light spectrum have a special relationship with certain parts of the body.
NEAR INFRA RED LIGHT STIMULATION

• Since 2008-Non-invasive Near Infrared Light stimulation improves memory and helps improve vision in macular degeneration and in Parkinson’s Disease (Quiet mind, Dr. Marvin Berman and Dr. Douglas Pfeiffer)

REFERENCES

* https://mindalive.com/index.cfm/research/research-articles-by-dave-siever/

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* Neuro-Rehabilitation Effectiveness: Study of the Neurodynamic-Activator™ as a standalone device. (Course) presented at the 41st BSC (WABN-Western Association for Biofeedback and Neuroscience) Annual Conference, Costa Mesa, CA, Ibric, V.L. and Owes, M. (Nov 7-9, 2015).

REFERENCES

* "My brain is only a receiver - In the Universe there is a core from which we obtain knowledge, strength and inspiration.
* "I have not penetrated into the secrets of this core, but I know that it exists.”

NIKOLAS TESLA