Institutional Review Board for Baylor College of Medicine and Affiliated Hospitals

Protocol Number: H-52200
Status: Approved
Initial Submit Date: 7/26/2022
Approval Period: 8/18/2022 - 8/9/2027

Section Aa: Title & PI

A1. Main Title

TRANSCRANIAL DIRECT CURRENT STIMULATION (TDCS) FOR IMPROVEMENT OF COGNITIVE FUNCTIONING, BRAIN FOG, AND WORKING MEMORY

A2. Principal Investigator

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A3a. Financial Conflict of Interest

Does any member of study personnel (Investigator (including investigator's spouse and/or dependent children)) that are involved in the design, conduct, or reporting of the research have a Significant Financial Interest (SFI) that would reasonably appear to be affected by the research for which funding is sought and/or associated with an entity/business that would reasonably appear to be affected by the research?

No

Section Ab: General Information

A4. Co-Investigators

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A5. Funding Source:

Baylor College of Medicine (Internal Funding Only)

A6a. Institution(s) where work will be performed:

BCM: Baylor College of Medicine

A6b. Research conducted outside of the United States:

Country:
Facility/Institution:
Contact/Investigator:
Phone Number:

If documentation of assurances has not been sent to the Office of Research, please explain:

A7. Research Category:

A8. Therapeutic Intent

Does this trial have therapeutic intent?
Yes

A9. ClinicalTrials.gov Registration

Does this protocol/trial require registration on ClinicalTrials.gov due to it: meeting the definition of an Applicable Clinical Trial, being required under the terms and conditions of an award, or being proposed to be published in ICMJE journals?
Yes

Who will be responsible for registering and maintaining the registration of this Applicable Clinical Trial?
The BCM PI will register the trial because either:

- the trial is BCM PI-initiated,
- BCM is the lead site of this multicenter trial, or,
- the industry sponsor has instructed the BCM PI to register the trial, or,
- registration of this trail is required as a term and condition of the reward by the funding agency.

ClinicalTrials.gov Identifier:
NCT05524233

Section B: Exempt Request

B. Exempt From IRB Review

Not Applicable

Section C: Background Information

Cognitive impairment refers to when an individual struggles to learn, concentrate, remember, or make decisions. This can be due to underlying neurological diseases (i.e. Alzheimer's disease, dementia, etc.), caused by viral illness (i.e. brain fog experienced by COVID-19 survivors) or physical trauma (i.e. concussion). Recent reports indicate that two out of three Americans experience some amount of cognitive impairment in their lifetime.

There are a number of therapies that have been used to help address this condition. One of these is transcranial direct current stimulation (tDCS), which delivers sustained direct current to to the head area via electrodes. A number of studies have indicated that this form of therapy is safe and efficacious at inducing neuroplasticity and exciting neuronal activity. These factors can help improve aspects of cognitive functioning such as working memory, learning, and task performance.

Thus we propose the use of tDCS (LIFTiD Neurostimulation, RPW Technology, LLC, NY, USA) applied externally and directed at the frontal lobes for a period of four weeks to address symptoms of cognitive impairment. Daily stimulation with this device is intended to train the brain to maximize attention, focus, and alertness.

Section D: Purpose and Objectives

The purpose of this pilot study is to examine the acceptability and proof of concept effectiveness of a wireless, transcranial direct current stimulation for people with cognitive impairments. Sample size (n=10) is convenient and designed to explore acceptability and feasibility. Participants who are enrolled will be provided a tDSC device to use for a period of four weeks. They will have two study visits, baseline (BL) and the 4th week visit (V1). During each visit participants will answer various questionnaires to assess patient-reported outcomes such as sleep quality, cognitive impairment, depression, anxiety, fatigue, and user acceptability.

Section E: Protocol Risks/Subjects

E1. Risk Category

Category 1: Research not involving greater than minimum risk.

E2. Subjects

Gender:
Both

Age:
Adult (18-64 yrs), Geriatric (65+ yrs)

Ethnicity:
All Ethnicities

Primary Language:
English, Spanish

Groups to be recruited will include:
Both patients and healthy, non-patient, normals

Which if any of the following vulnerable populations will be recruited as subjects?

Vulnerable populations require special protections. How will you obtain informed consent, protect subject confidentiality, and prevent undue coercion?

E3. Pregnant woman/fetus

Will pregnant women and/or fetuses (as described in 45 CFR 46 Subpart B) be enrolled in the research?
No

E4. Neonates

Will neonates of uncertain viability or nonviable neonates (as described in 45 CFR 46 Subpart B) be enrolled in the research?
No

E5. Children

Will children be enrolled in the research?

No

Section F: Design/Procedure

F1. Design

Select one category that most adequately describes your research:

c) Pilot

Discuss the research design including but not limited to such issues as: probability of group assignment, potential for subject to be randomized to placebo group, use of control subjects, etc.

We will prospectively recruit 10 subjects with cognitive issues such as poor working memory, brain fog, or impairments due to dementia, Alzheimer's, or concussions. This will be a single-arm study, providing all recruited subjects with the tDCS treatment. All subjects will be followed and monitored for up to 4-weeks.

The patients will have two study visits where we will assess patient-reported outcomes through validated questionnaires. These include: instrumental activity of daily living scale (IADL), daily living independence (KATZ), depression (CES-D), fatigue (FACIT), cognitive assessment (MOCA), pain and mobility, global health (PROMIS), sleep (PSQI), frailty (TSFI, FRIED FRAILTY), anxiety (BAI), multi-dimensional assessment of fatigue (MAF), community engagement (Life-Space), and user acceptability (TAM).

Inclusion Criteria:

Adults (aged 18+) suffering from poor working memory, brain fog, or cognitive impairments (such as dementia, Alzheimer's, concussions, etc); ability to attend to the clinic for visits

Exclusion Criteria:

Severe cognitive decline that reduces their ability to interact with the tDCS device; Major visual or hearing weakness reduces the ability to interact with tDCS device; Major foot problems such as active lower extremity wounds, major foot deformity (e.g., Charcot Foot), previous major amputations, and claudication; Demand-type cardiac pacemaker, implanted defibrillator, implanted metal plate in the brain or head, or other implanted electronic devices; Epilepsy, seizures, brain lesions, migraine or severe heart disease; Sensitive skin or rash, broken skin, or open wounds; Pregnancy; and any conditions that may interfere with outcomes or increase the risk of the use tDCS based on the judgement of clinicians.

F2. Procedure

Please note that subjects will be consented before participating in any study-related activities. This study will not bring any direct costs to the subject.

At the baseline visit (BL) patients will receive the tDCS device (LIFTiD Neurostimulation, RPW Technology, LLC, NY, USA) and research staff will provide instruction on how to use the device along with a user manual. Patients will be asked to use the stimulation device for at maximum 20 minutes per day, for a period of 4-weeks. Finally, at the BL visit patients will also be asked to answer a number of questionnaires to assess patient-reported outcomes and cognition. These include: instrumental activity of daily living scale (IADL), daily living independence (KATZ), depression (CES-D), fatigue (FACIT), cognitive assessment (MOCA), attention(Number Span forward) working memory (Number Span backward), processing speed and executive functioning (Trail Making Test Part A and Part B), and memory encoding, recall, and recognition (Hopkins Verbal Learning Test), pain and mobility, global health (PROMIS), sleep (PSQI), frailty (TSFI, FRIED FRAILTY), anxiety (BAI), multi-dimensional assessment of fatigue (MAF), community engagement (Life-Space), and user acceptability (TAM).

At the final visit (V1), patients will return to the clinic and return the neurostimulation device. To assess feasibility and acceptability (Aim 1), patients will answer a technology acceptance model (TAM) questionnaire. This questionnaire will assess their perceived ease of use, perceived benefit and technology anxiety. Furthermore, patients will answer the same questionnaires assessed at baseline in order to address Aim 2. Both aims are listed below: - Aim 1: To examine feasibility and acceptability of tDCS in patients with cognitive issues.

- Aim 2: To examine effectiveness of tDCS in patients with cognitive issues.

Device: LIFTiD neurostimulation uses transcranial direct current stimulation (tDCS) technology and was developed to help improve the brain's potential through electrical stimulation. Patients will be given the LIFTiD device headband, 1 mirror, 1 plastic spoon, 6 white sponges, 1 USB cable and 1 plastic bottle in a packet at the BL visit.

Preparation of device: 1. Patients must prepare a salt water solution in the plastic bottle provided using none iodized salt, tap water, and the provided measuring spoon. 2. Two sponges should be dampened with tap water and then saturated with the salt water solution made in step 1 on both sides. 3. Sponges should be placed in the electrodes in the LIFTiD headband. 4. LIFTiD headband should be placed on the forehead, centered and straight across. 5. Once fit, patient should

use the on/off button to begin stimulation. 6. Device automatically powers down after 20 minutes.

Stimulation frequency: maximum of 20 minutes daily. During the Stimulation the patient should perform an activity, such as read, answer emails, homework, etc.

After the completion of the study the patient should return the LIFTiD device to the Research Coordinator.

All in-person visits will occur at Baylor College of Medicine McNair Campus. Research staff may call patients in between the two visits to assess compliance and answer questions. Patients will not be paid for in person visits or phone calls.

Section G: Sample Size/Data Analysis

G1. Sample Size

How many subjects (or specimens, or charts) will be used in this study?

Local: 10 Worldwide: 10

Please indicate why you chose the sample size proposed:

Convenient and selected based on available resources to demonstrate feasibility and the proof of concept effectiveness of tDCS therapy. We plan to recruit 10 eligible subjects.

G2. Data Analysis

Provide a description of your plan for data analysis. State the types of comparisons you plan (e.g. comparison of means, comparison of proportions, regressions, analysis of variance). Which is the PRIMARY comparison/analysis? How will the analyses proposed relate to the primary purposes of your study?

Independent t-test, U-test, or Chi-square (depends on type of variables) to compare between groups (AG, and PG for key baseline descriptors including demographics and relevant clinical characteristics. Those descriptors which show statistical significant difference, baseline value of the outcomes measured in the model, and other variables that are deemed to be prognostic, will be considered as covariates for adjusting the results in the following assessments. Appropriate mixed models (linear for continuous or Generalized Estimating Equations (GEEs) for non-continuous or non-parametric variables) will be used to test the intervention effect for each of the outcomes. Results will be adjusted by covariates as described above.

Section H: Potential Risks/Discomforts

H1. Potential Risks/Discomforts

Describe and assess any potential risks/discomforts; (physical, psychological, social, legal, or other) and assess the likelihood and seriousness of such risks:

The devices and technologies are completely non-invasive, safe, non-toxic and non-ionizing. The potential risks to subject are minimal. However, like any battery powered systems, there is a minimum risk of sensor malfunctioning. In addition, the study devices are not waterproof, and although they use a low powered battery (similar to a cellphone battery), in order to avoid any risk of shock the monitor should not be submerged or saturated with fluids during operations or cleaning. It does not emit any radiation to the human body, and does not offer any significant risk to the subject.

Subjects may experience mild discomfort or irritation from the band or sponges on their forehead and mild headaches during adaptation period after initiating therapy. We will inform the subject to please notify the investigators if the band or sponges are uncomfortable.

All information we will collect about the subject will be stored in a secure location and coded in a way to maintain confidentiality. Only study personnel will have access to their records. Data collected during the study may be published and made publicly available. Data may also be shared with other research groups. However, data that could in any way identify them will not be made public or shared.

H2. Data and safety monitoring plan

Do the study activities impart greater than minimal risk to subjects?

No

H3. Coordination of information among sites for multi-site research

Is the BCM Principal Investigator acting as the SPONSOR-INVESTIGATOR for this multi-site research?

No or Not Applicable

Is BCM the COORDINATING CENTER for this multi-site research?

No or Not Applicable

Section I: Potential Benefits

Describe potential benefit(s) to be gained by the individual subject as a result of participating in the planned work.

There is potential benefit of improvement of memory or cognitive functioning based on previous study of the use of tDCS. The patients might find it easier to concentrate or focus on a task.

Describe potential benefit(s) to society of the planned work.

As described above, this type of work may allow physicians to provide more personalized care for patients with cognitive impairments.

Do anticipated benefits outweigh potential risks? Discuss the risk-to-benefit ratio.

This study brings no more than minimal risk to subjects as it only involves a non-invasive device. There are some risks associated with lack of comfort from tDCS, , risk associated with electrical malfunction of the tDCS device, and other unknown risks. All devices will be checked before any use to minimize the risk associated with electrical malfunction. Although there is no direct benefit for participating in the study, their participation may help the investigators better understand the impact and functionality of tDCS.

Section J: Consent Procedures

J1. Waiver of Consent

Will any portion of this research require a waiver of consent and authorization?

No

J1a. Waiver of requirement for written documentation of Consent

Will this research require a waiver of the requirement for written documentation of informed consent?

No

J2. Consent Procedures

Who will recruit subjects for this study?

PI
PI's staff

Describe how research population will be identified, recruitment procedures, any waiting period between informing the prospective participant and obtaining consent, steps taken to minimize the possibility of coercion or undue influence and consent procedures in detail.

Subjects will be recruited from the Baylor College of Medicine and BCM St Luke's (Houston, TX, USA). They may get some referrals from other collaborators. In order to recruit or identify subjects, we will screen our patient charts for eligible subjects. The COI will identify eligible subjects and alert the coordinator. The coordinator will review all the details of the study with the subject and/or their family. If the subject agrees to participate in the study, they will be screened and then enrolled into the study.

Informed Consent Form signatures will be obtained according to standard Baylor IRB regulations. We will offer the subjects the ability to consent by phone and/or videoconference and send the consent form via the RedCap platform. Should the subject agree to eConsenting, RedCap eConsent will be used to send a link to each participant. Once the participant has opened the electronic copy of the eConsent, the PI/research staff will review the study and consent document with the participant, asking questions to gauge comprehension, and answering the subject's questions and concerns. This can be done in-person, by phone, or videoconference. The subject will have the option to email the ICF to themselves. Once the process is finished, the research staff will receive a link via email and will be able to see the completed ICF in REDCap. The ICF can be downloaded for additional signatures and/ or stored in REDCap. PI/PI Authorized staff should document the entire informed consent/assent process for each person in a visit checklist. Once received, the PI/research staff that explained the study should sign the appropriate signature line with the current date.

Should the subject not agree to eConsenting, the subject will receive a paper copy of the ICF to review. The PI/research staff will review the study and consent document with the participant, asking questions to gauge comprehension, and answering the subject's questions and concerns. The subject will be told to keep one form and returned the other to the investigator by mail, email, or fax. The Baylor Investigator/designee will sign the consent form when returned from the subject. The signed consent form will be maintained in research records and uploaded to REDCap.

Regardless of the method of consenting, a physical copy of the signed consent form will be provided to the subject in person. Should they request to have it emailed, we may also provide it to them via email.

Are foreign language consent forms required for this protocol?

No

J3. Privacy and Intrusiveness

Will the research involve observation or intrusion in situations where the subjects would normally have an expectation of privacy?

No

J4. Children

Will children be enrolled in the research?

No

J5. Neonates

Will non-viable neonates or neonates of uncertain viability be involved in research?

No

J6. Consent Capacity - Adults who lack capacity

Will Adult subjects who lack the capacity to give informed consent be enrolled in the research?

No

J7. Prisoners

Will Prisoners be enrolled in the research?

No

Section K: Research Related Health Information and Confidentiality

Will research data include identifiable subject information?

Yes

Information from health records such as diagnoses, progress notes, medications, lab or radiology findings, etc.

Yes

Specific information concerning alcohol abuse:

No

Specific information concerning drug abuse:

No

Specific information concerning sickle cell anemia:

No

Specific information concerning HIV:

No

Specific information concerning psychiatry notes:

No

Demographic information (name, D.O.B., age, gender, race, etc.):

Yes

Full Social Security #:

Yes

Partial Social Security # (Last four digits):

No

Billing or financial records:

No

Photographs, videotapes, and/or audiotapes of you:

Yes

Identifiable biospecimens

No

Other:
No

At what institution will the physical research data be kept?
The physical research will be kept in our BCM offices housed in the Mcnair Building room B10.401.

How will such physical research data be secured?
Physical data will be kept in locked file cabinets that only the research team has access to.

At what institution will the electronic research data be kept?
Data will be kept locked on network computers in our BCM offices, under the password protected server. Address:\\discovery1.ad.bcm.edu\bcm-dept-icamp

Additional electronic data may be stored on REDCap. REDCap is hosted by Baylor College of Medicine - Institute for Clinical & Translational Research.

Such electronic research data will be secured via BCM IT Services- provided secured network storage of electronic research data (Non-Portable devices only):
Yes

Such electronic research data will be secured via Other:
Yes, (describe below):
Electronic data will be stored using the REDCap (Research Electronic Data Capture) software. This software is used to electronically collect and manage research data. REDCap is a secure, web-based platform.

Electronic data will also be stored and secured under the password protected server provided by BCM IT Services.

Will there be anyone besides the PI, the study staff, the IRB and the sponsor, who will have access to identifiable research data?
Yes, identify the classes of the persons:
People who ensure quality from the institutions where the research is being done, federal and other regulatory agencies will have access to all of the research data.

Please describe the methods of transmission of any research data (including PHI, sensitive, and non-sensitive data) to sponsors and/or collaborators.
Transmissions, if any, will only happen via secure emails.

Will you obtain a Certificate of Confidentiality for this study?
No

Please further discuss any potential confidentiality issues related to this study.
NA

Section L: Cost/Payment

Delineate clinical procedures from research procedures. Will subject's insurance (or subject) be responsible for research related costs? If so state for which items subject's insurance (or subject) will be responsible (surgery, device, drugs, etc). If appropriate, discuss the availability of financial counseling.
All clinical/standard procedures will be billed to the subject's insurance. These include, physician visits, debridement, medications prescribed by physician.

There will be no research procedures charged to the subject or their insurance. This includes, the research device, materials provided by the research team, visits with the research team.

If subjects will be paid (money, gift certificates, coupons, etc.) to participate in this research project, please note the total dollar amount (or dollar value amount) and distribution plan (one payment, pro-rated payment, paid upon completion, etc) of the payment.

Dollar Amount:
0

Distribution Plan:
The subject will not be paid for this study.

The research study may cover the subject's parking or transportation expenses to go to their research visits.

Section M: Genetics

How would you classify your genetic study?

Discuss the potential for psychological, social, and/or physical harm subsequent to participation in this research. Please discuss, considering the following areas: risks to privacy, confidentiality, insurability, employability, immigration status, paternity status, educational opportunities, or social stigma.

Will subjects be offered any type of genetic education or counseling, and if so, who will provide the education or counseling and under what conditions will it be provided? If there is the possibility that a family's pedigree will be presented or published, please describe how you will protect family member's confidentiality?

Section N: Sample Collection

None

Section O: Drug Studies

Does the research involve the use of ANY drug* or biologic? (*A drug is defined as any substance that is used to elicit a pharmacologic or physiologic response whether it is for treatment or diagnostic purposes)

No

Does the research involve the use of ANY gene transfer agent for human gene transfer research?

No

O1. Current Drugs

Is this study placebo-controlled?

No

Will the research involve a radioactive drug?

No

Section P: Device Studies

Does this research study involve the use of ANY device?

Yes

Device 1: Transcranial Direct Current Stimulation (tDCS) Device

Section Q: Consent Form(s)

Electrical Stimulation for Cognitive Issues

Section R: Advertisements

None