Deep Brain Stimulation for the Treatment of Traumatic Brain Injury, NCT02881151

Informed Consent Form, V8.2 (approved May 3, 2022)

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Central Thalamic Deep Brain Stimulation for the Treatment of Traumatic Brain Injury (CENTURY-S)

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Are you participating in any other research studies? _____ Yes _____No

PURPOSE OF RESEARCH

You are invited to participate in a research study of deep brain stimulation (DBS) for the treatment of moderate to severe traumatic brain injury. As part of this study, you will have electrodes placed into an area called the central thalamus, which is located deep in the brain. These electrodes will be tunneled under the skin and attached to a device like a pacemaker that will be placed underneath the skin in your chest. We hope to learn whether this device will improve memory, focus and attention for people who have suffered a severe brain injury and continue to have trouble in these areas. You were selected as a possible participant in this study because you have recovered from a severe brain injury but still suffer from problems with your thinking that we hope might be helped by this treatment.

If you decide to terminate your participation in this study, you should notify the Protocol Director, Jaimie M. Henderson, MD at 650-723-5574.

This research study is looking for 6 people who have recovered from a severe brain injury (defined as Glasgow Coma Scale score 3-12), and who continue to have trouble with focus, attention, and memory. Stanford University expects to enroll all 6 of the research study participants. No other sites will enroll participants in this study.

VOLUNTARY PARTICIPATION

Your participation in this study is entirely voluntary. Your decision not to participate will not have any negative effect on you or your medical care. You can decide to participate now, but withdraw your consent later and stop being in the study without any loss of benefits or medical care to which you are entitled.

DURATION OF STUDY INVOLVEMENT

This research study is expected to take approximately 4 years to complete. Your participation in the study will last for approximately 1 year, although you will have the option to continue treatment after the conclusion of the study if you are receiving benefit. You will be randomly assigned to one of three groups. Group A will participate in the study for 370 days, group B will participate for 384 days, and group C will participate for 398 days.

A separate follow-up study will also be conducted for those who are eligible, and who would like to continue receiving deep brain stimulation.

PROCEDURES

If you choose to participate, the Protocol Director and his research study staff will conduct the following procedures:

Screening and assessments before surgery

Within two months before DBS implant surgery, you will complete physical and neurological screening examinations as well as complete laboratory studies to ensure your eligibility and suitability for surgery. You will be interviewed to obtain background information, and to determine your level of educational, work and social functioning before your injury. You will also undergo testing before surgery to assess your thinking; psychological health; level of educational and work performance; and your satisfaction with life. With your permission, the testing interviews will be audio taped. These tapes will be maintained on a secure server in a locked room with access controlled by the protocol director, transcribed for data analysis purposes, and then destroyed after completion of the study. The audio recordings may be sent to a HIPAA compliant transcription service to be transcribed. The screening procedures may occur over a few days. The research staff will provide you a schedule of the visit so you can make arrangements as needed.

I give consent to be audiotaped during the study, and for tapes resulting from this study to be used for data analysis purposes:

_____Yes _____No

In addition, we may need to photograph or videotape surgical procedures and may need to obtain photos of the surgical site if complications arise.

I give consent to be photographed during the study:

_____Yes _____No

I give consent to be videotaped during the study:

_____Yes _____No

Randomization

There will be three groups in the study. The group you are assigned to will be chosen by chance. This will happen after you have signed this consent form. You will be randomly assigned to treatment Group A, Group B or Group C. You have an equal chance (33.33%) of being randomized to any of the three groups. If you are randomly assigned to Group A your doctor will turn your DBS system on 30 days after surgery. If you are randomly assigned to Group B your doctor will turn your DBS system on 44 days after surgery. If you are randomly assigned to Group C your doctor will turn your DBS system on 58 days after surgery. You will be told which of these groups you have been randomized into.

You will also be assigned by chance to one of two groups that will determine whether your DBS system is turned off or left on in the last part of the study (the "double blind phase," described below). There is a 50% chance that you will be assigned to have your stimulator left on, and a 50% chance that your stimulator will be turned off during this phase. Your participation in the study will last the same amount of time no matter which group you are assigned to. You will not be told which of these groups you have been randomized into.

MRI (Magnetic Resonance Imaging)

Before surgery, you will have an MRI scan (magnetic scan) of your brain to help the surgeon plan your procedure. MRI machines use a strong magnet and radiofrequency magnetic fields to make images of the body interior. The scanning procedure is very much like an X-ray or CT scan. You will be asked to lie on a long narrow couch for about 45 minutes while the machine gathers data. During this time you will not be exposed to x-rays, but rather a strong magnetic field and radiofrequency magnetic fields, which you will not feel. You will, however, hear repetitive tapping noises that arise from the Magnetic Resonance scanner. We will provide earplugs or headphones that you will be required to wear. The space within the large magnet in which you lie is somewhat confined, although we have taken many steps to relieve the "claustrophobic" feeling.

DBS implant surgery and hospital stay

Within two months after screening and pre surgical assessments, you will be admitted to the hospital for surgical implantation of the DBS system. You will be admitted the day before surgery and will stay in the hospital for 3 to 5 days.

You will receive one DBS lead on each side of the part of your brain in an area called the central thalamus. Each lead is a wire a little larger than a pencil lead. Both leads will be connected to a single pacemaker-like device called an implantable neurostimulator. The

neurostimulator will be implanted on either the right or left side of your chest. The surgical procedures are described in more detail below.

DBS lead implant surgery

The day before surgery, you will be admitted to the hospital, so that five small screws can be implanted in your skull. This will be done using local anesthesia (numbing medicine to block pain to a specific area). After this you will have a CT scan (x-ray scan) done. This scan will be combined with the MRI scan to help your surgeon locate the final position for the DBS leads.

On the day of surgery, you will be given some sedative medicine to help you relax. The doctor giving you this medicine will decide how much you need, and he or she will be in the operating room with you until the end of your surgery.

You will then have two holes about the size of a dime drilled in the skull. Small plastic anchors will be placed that will hold the leads securely. You will then be allowed to awaken from sedation so we can test your responses to the stimulation.

We will place a tiny electrode with a tip finer than a human hair into the target area in order to listen to the brain cell activity. We may need to do this several times in order to find the right target. During this procedure we may ask you questions, move your arms and legs, or test the feeling in various parts of your body. This is to help us locate the precise location for the DBS lead.

After the lead is implanted you may have some side effects such as tingling sensations, muscle contractions, anxiety, nausea, double vision, or others. The surgeon may need to adjust the location of the lead in order to minimize or eliminate these effects.

Your surgeon will try to implant both leads (one on each side) on the same day. However, if you are tired, or if your surgeon thinks that implanting the second side in the same day may put your health at risk, the surgeon can make the decision to stop the surgery, and implant the second side on a separate date. If a second surgery is needed, it will be no more than 60 days after your first implantation surgery.

Once the DBS leads are implanted, the second stage of the procedure is to implant the neurostimulator. You will be under general anesthesia for this procedure, meaning that you will be completely asleep. The neurostimulator will be implanted on either the right or left side of your chest, and will be connected to the DBS leads with extension wires that are tunneled under the skin.

After your surgery, you will be admitted to the hospital. During your hospital stay, you will have another CT scan of your head to show the location of the leads and make sure

your there is no bleeding in your brain. When the leads and the generator are implanted, the DBS system is considered complete. You will also be assessed for any side effects. When you leave the hospital, the DBS system will be off and will not be delivering stimulation to your brain.

Before your DBS system is turned on, you will have some time to readjust to any effects of the surgery. You will also be monitored to make sure you are not experiencing any effects that may be unique to you. Before you leave the hospital, we will randomly assign you to one of three groups. The length of your readjustment and monitoring period will be determined by the group that you were randomly assigned to. The next section explains the difference between each group.

Electrophysiology Tests

During the course of this study, you will undergo some EEG tests. It is not painful, and it is not a surgical procedure. This test records your brain waves while you are resting and while you are doing things that require thinking and concentration. Electrodes will be attached to your scalp with glue, which will be washed off after the test is over. We will ask you to rest quietly, and to answer some questions that require thinking and concentration. The entire test will last a few hours and may need to occur over a few days. This test will happen 30 days after discharge from the hospital, and 3 more times during the time that you are enrolled in the study. Also, a CT scan will be performed about a 30 days after surgery to assess the final location of the leads.

You will also have the option to participate in the same EEG and neurophysiology tests more frequently throughout the study.

DBS Activation

Once your DBS system is turned on, you will be assessed for another 14 days. During this 14-day period, the settings that will be used during the treatment phase will be determined. Your thinking and concentration will be tested. You will be asked if you feel thinking, concentration and emotional state have changed since the DBS has been turned on. You will also be monitored for side effects. All office visits during this part of the study will be recorded on video. This video recording procedure is a required part of the research study. During the DBS adjustment period you will again have the electrophysiology tests described above, where the electrodes are attached with glue to your scalp. During these 2 weeks, there will be multiple visits to make adjustments to the DBS system and for testing. The research staff will go over the planned schedule in advance so you can make the arrangements needed to attend all the visits.

Treatment Phase

This is a 90-day period where the amount of DBS stimulation you receive is known by you and the study team. During this period, you will receive 12 hours of stimulation per day. At the end of the 90-day treatment period, you will be reassessed with the same tests you have taken during the course of the study, including the electrophysiology tests described above.

Double-Blind Phase

You will be randomly assigned to a group that either continues stimulation or has their DBS device turned off. No one will know what group you belong to during this period. If you are in the group where your treatment ends, the DBS will be switched off for 21 days immediately after completing the 90-day treatment phase. If you are in the group where your treatment is to continue unchanged, you will continue to receive stimulation 12 hours per day over the same 21-day period. There is a 50:50 chance that you will be assigned to have your stimulator left on, and a 50:50 chance that your stimulator will be turned off during this phase. No matter what group you have been assigned to, you will be reassessed using the same tests used during the course of the study. The electrophysiology tests will also be repeated at the end of this period. At the completion of this double-blinded phase, everyone will have his or her DBS device turned on, and you will receive 12 hours of stimulation per day.

Three and Six-Month Open Label Follow-Up Period

You will have two follow-up visits after your double-blind phase ends. These visits will occur within the first six months of the end of your double-blind phase. These visits will consist of some of the same exams and assessments you completed during the course of your participation in the study. The visit procedures may need to occur over a few days. The research staff will provide you a schedule of the visit so you can make arrangements as needed. The trial will be considered complete at the end of the six-month follow-up period.

Optional continuation of DBS

After the trial is completed**,** you will have the option to continue receiving deep brain stimulation if there are no medical reasons or other concerns that could pose a risk to your safety or quality of life. If you would like to continue receiving DBS, you will be monitored using tests selected for you based on your response to the effect and from your input.

Women of Childbearing Potential

If you are a woman who is able to become pregnant, it is expected that you will use an effective method of birth control to prevent exposing a fetus to a potentially dangerous agent with unknown risk. If you are pregnant or currently breast feeding, you may not participate in this study. You understand that if you are pregnant, if you become pregnant, or if you are breast-feeding during this study, you or your child may be exposed to an unknown risk.

To confirm to the extent medically possible that you are not pregnant, you agree to have a pregnancy test done before beginning this research study.

You must agree to avoid sexual intercourse or use a birth control method judged to be effective by the investigator and which will not interfere with the proposed investigation. You must accept the risk that pregnancy could still result despite the responsible use of reliable method of birth control. You agree to notify the investigator as soon as possible of any failure of proper use of your birth control method, or if you become pregnant, either of which may result in your being withdrawn from the study.

PARTICIPANT RESPONSIBILITIES

As a participant, your responsibilities include:

- Follow the instructions of the Protocol Director and study staff.
- Keep your study appointments. If it is necessary to miss an appointment, please contact the Protocol Director or research study staff to reschedule as soon as you know you will miss the appointment.
- Tell the Protocol Director or research study staff about any side effects, doctor visits, or hospitalizations that you may have.
- Tell the Protocol Director or research staff if you believe you might be pregnant.
- Complete your questionnaires as instructed.
- Ask questions as you think of them.
- Tell the Protocol Director or research staff if you change your mind about staying in the study.
- If you have any concerning changes to your health in between scheduled visits, please contact Protocol Director or research staff immediately.

WITHDRAWAL FROM STUDY

If you first agree to participate and then you change your mind, you are free to withdraw your consent and discontinue your participation at any time. Your decision will not affect your ability to receive medical care for your disease and you will not lose any benefits to which you would otherwise be entitled.

If you decide to withdraw your consent to participate in this study, you should notify Jaimie M. Henderson, MD at 650-723-5574.

If you withdraw from the study, you will have the option of having the DBS system surgically removed or undergoing a 2 month wash-out period (in which the DBS will be turned off) followed by your normal neurologic care. Once you withdraw from the study, the device will be turned off (no matter what the randomized treatment was assigned). The device can only be reactivated by the Protocol Director after you have undergone a 2 month wash out period and the Protocol Director decides it is appropriate to continue with stimulation. If you choose to have the system surgically removed the sponsor will pay the associated costs.

The Protocol Director may also withdraw you from the study without your consent for one or more of the following reasons

- Failure to follow the instructions of the Protocol Director and study staff.
- The Protocol Director decides that continuing your participation could be harmful to you.
- Pregnancy
- You need treatment not allowed in the study.
- The study is cancelled.
- Other administrative reasons.
- Unanticipated circumstances.

POSSIBLE RISKS, DISCOMFORTS, AND INCONVENIENCES

There are risks, discomforts, and inconveniences associated with any research study. These deserve careful thought. You should talk with the Protocol Director if you have any questions.

Risk of Surgery

As with any surgery, there are risks involved from the surgery and/or the anesthesia. Your doctor will discuss these with you. The risk of serious complications from surgical placement of the electrodes is estimated at less than 5%. This is based on known risk of similar surgery done in different brain targets for the treatment of Parkinson's disease and other conditions. The most serious risk of surgery is bleeding into the brain (about 3%). Bleeding into the brain can lead to death or stroke that may result in permanent neurological problems, including weakness, paralysis, seizures or convulsions, difficulty speaking, impaired thinking and loss of feeling. The risk of death with the general anesthesia for implantation of the pacemaker is small. Damage to brain tissue might also be experienced. This could cause problems like loss of concentration or memory. There is also a possibility of bleeding under the skin of your scalp or chest. You may experience

pain, discomfort and/or swelling at the sites of the incisions in the head and chest. These problems generally go away within 1 week. You can also have air entering the veins or brain which can cause damage. Air entering the brain may cause confusion leading to an extra day stay in the hospital. Cerebrospinal fluid or fluid around the brain may leak or be found to be abnormal during the surgery. An additional surgery may be necessary to manage some complications.

Risk of DBS treatment

While using the device several complications can occur. The most common known risks of DBS treatment are:

- Pain, stress or discomfort after the procedure
- Headaches
- Need for lead repositioning
- Lead breaking
- Paresis (weakness) or paralysis
- Lead migration/dislodgement
- Intracranial hemorrhage (bleeding in the brain)
- Intracranial hemorrhage leading to death
- DBS system explantation (removal)
- Infection
- Erosion
- Component malfunction (IPG, lead, extension)
- Seizures
- Subcutaneous hematoma (blood clot beneath the skin)
- Allergic reaction
- Burrhole ring and cap failure (device which holds lead in place)
- Electrode short circuit or open circuit
- Perioperative MI (heart attack) leading to death
- Seroma (fluid collection) at the IPG ("pacemaker") site
- Leakage of cerebro-spinal fluid
- Paresthesia (tingling)
- Dysarthria or dysphasia (difficulty speaking)
- Dysequilibrium (dizziness or troubles with balance)
- Dystonia (muscle cramping or involuntary movement)
- Gait disorder (trouble walking)
- Electrical shocking or jolting
- Attention deficit
- Insufficient therapeutic effect
- Ataxia (incoordination)
- Dyskinesia (involuntary movements)
- Sensory deficits

- Suicidal ideation
- Mania or hypomania
- Facial weakness
- Fatigue
- Loss of energy
- Numbness
- Rebound symptom worsening with discontinuation of stimulation
- Transient heaviness in arm
- Changes in blood pressure or heart rate
- Nausea or vomiting
- Rapid or shallow breathing
- Anxiety
- Apathy (lack of interest in activities)
- Undesirable stimulation
- Undesirable sensations (temporary or permanent)

You may require additional neurosurgical procedures to manage one of the complications listed above, or to replace a broken lead. You may also require further surgical procedures to replace the neurostimulator device when the battery expires.

Additional risks of having a DBS system:
You should not be exposed to Diathermy (deep heating) treatments that are sometimes used for muscle relaxation. Energy from diathermy can be transferred through the implanted system and can cause tissue damage at the location of the implanted electrodes, resulting in severe injury or death. Please be aware that you should always inform your health care providers that you have an implanted DBS system and should not be exposed to any type of diathermy.

After DBS implantation, you should not undergo Magnetic Resonance Imaging (MRI). MRIs have the potential to induce repositioning, rotation, and heating in implanted medical devices. Exposure to MRI with an implanted DBS system may also cause permanent neurological damage or even death. If you need regular MRI to monitor another medical condition, you cannot participate in this study.

The long-term effects of DBS for traumatic brain injury are not known. There may be side effects or risks that are not yet know. You will be monitored carefully to determine if you are experiencing a reaction to DBS.

There may be some inconvenience to you due to travel to and from your study visits.

When the DBS system is turned off at the end of the study, any benefit you were experiencing will be lost. However, after all study visits are completed, you have the option of having the system turned back on and continuing in a long-term follow-up study.

Below is the list of adverse events that, in the judgement of the Protocol Director, are related directly to the DBS device or surgery:

- Abnormal behavior
- Abnormal dreams
- Activities of daily living impaired
- Agitation
- Anxiety
- Balance disorder
- Bradykinesia
- Cerebral hemorrhage
- Cognitive disorder
- Complication of device removal
- Confusional state
- Convulsion
- Deep vein thrombosis postoperative
- Delirium
- Depression
- Depression suicidal
- Device deactivation due to environmental factors
- Device electrical finding
- Device failure
- Device migration
- Dizziness
- Dyskinesia
- Dysphagia
- Fall
- Fatigue
- Freezing phenomenon
- Gait disturbance
- Grand mal convulsion
- Headache
- Inability to swim
- Implant site erosion
- Implant site infection
- Implant site reaction
- Incision site complication
- Incision site pain

- Inguinal hernia
- Injury to nerve tissue (such as the spinal accessory nerve)
- Intracranial hemorrhage
- Lethargy
- Localized infection
- Medical device complication
- Medical device discomfort
- Mental status changes
- Mobility decreased
- Motor dysfunction
- Muscle rigidity
- Muscle spasms
- Paraesthesia
- Procedural complication
- Procedural pain
- Scar pain
- Sexual dysfunction
- Somnolence
- Speech disorder
- Suicidal ideation
- Suicide attempt
- Tunneling wires through unintended anatomy (such as in between the ribs and entering the thoracic cavity)
- Visual disturbance
- Weight decreased
- Weight increased
- Wound dehiscence

Risks of Head CT scans

This research study involves exposure to radiation from three head CT scans. This radiation exposure is not necessary for your medical care and is for research purposes only. The additional amount of radiation exposure is about 8.9 mSv, which is approximately equal to 18% of the limit that radiation workers (for example, a hospital x-ray technician) are allowed to receive in one year. This amount of radiation involves minimal risk and is necessary to obtain the research information desired.

Risks of MRI scans

Magnetic fields do not cause harmful effects at the levels used in the MRI machine. However, the MR scanner uses a very strong magnet that will attract some metals and affect some electronic devices. If you have a cardiac pacemaker or any other biomedical device in or on your body, it is very important that you tell the operator/investigator immediately. As metallic objects may experience a strong attraction to the magnet, it is

also very important that you notify the operator of any metal objects (especially surgical clips), devices, or implants that are in or on your body before entering the magnet room. All such objects must be removed (if possible) before entering the magnet room. In some cases, having those devices means you should not have an MRI scan performed. In addition, watches and credit cards should also be removed as these could be damaged. You will be provided a way to secure these items. If you have any history of head or eye injury involving metal fragments, if you have ever worked in a metal shop, or if you could be pregnant, you should notify the operator/investigator. You should also notify the operator/investigator if you have any tattoos on your body. Tattoos could become warm and irritated during the scan and remain so for several days. If you would prefer not to participate in the MR scan due to the presence of tattoos on your body, please inform a research team member.

There is a possibility that you will experience a localized twitching sensation due to the magnetic field changes during the scan. This is not unexpected and should not be painful. However, you may have the scan stopped at any time if this occurs.

If you have had a previous reaction to Gadolinium-based contrast agents or a history of severe allergies, please notify the operator/investigator. If you have kidney problems, please tell the operator.

It has been observed that deposits of Gadolinium-based contrast agent (GBCA) remain in the brains of some people who undergo four or more contrast enhanced MRI scans, long after the last administration. It is not yet known whether these Gadolinium deposits are harmful or can lead to adverse health effects. You should talk to the study doctor if you have any questions about the use of GBCAs with MRIs.

Some of the radio frequency imaging coils, imaging software and devices being used in your scan are not approved by the FDA but are similar to counterparts that have been approved by the FDA. There is a small risk of heating from the cables associated with these devices. Please report any heating sensation immediately.

Dizziness or nausea may occur if you move your head rapidly within the magnet.

If you feel discomfort at any time, notify the operator and you can discontinue the exam at any time.

There may be other risks related to participation in the study that we are unable to predict.

POTENTIAL BENEFITS

We hope that this treatment may improve your ability to concentrate and focus. It is also possible that this treatment may improve your thinking ability. We cannot and do not guarantee or promise that you will receive any benefits from this study.

ALTERNATIVES

If you choose not to participate in the study, your alternative is to continue to receive routine standard medical care from your regular medical providers.

PARTICIPANT'S RIGHTS

You should not feel obligated to agree to participate. Your questions should be answered clearly and to your satisfaction. If you decide not to participate, tell the Protocol Director.

You will be told of any important new information that is learned during the course of this research study, which might affect your condition or your willingness to continue participation in this study.

ClinicalTrials.gov

A description of this clinical trial will be available on *http://www.ClinicalTrials.gov*, as required by U.S. Law. This Website will not include information that can identify you. At most, the Web site will include a summary of the results. You can search this Website at any time.

CONFIDENTIALITY

The results of this research study may be presented at scientific or medical meetings or published in scientific journals. Your identity and/or your personal health information will not be disclosed except as authorized by you or as required by law**.** However, there is always some risk that even de-identified information might be re-identified.

Patient information may also be provided to other Federal and other regulatory agencies as required. The Food and Drug Administration (FDA), for example, may inspect research records and learn your identity if this study falls within its jurisdiction.

The purpose of this research study is to obtain data or information on the safety and effectiveness of the Medtronic Activa PC or the Medtronic Percept PC neurostimulator system for the treatment of traumatic brain injury. These preliminary results will be

provided to the Food and Drug Administration and other federal and regulatory agencies as required.

This research is covered by a Certificate of Confidentiality from the National Institutes of Health. The researchers with this Certificate may not disclose or use information, documents, or biospecimens that may identify you in any federal, state, or local civil, criminal, administrative, legislative, or other action, suit, or proceeding, or be used as evidence, for example, if there is a court subpoena, unless you have consented for this use. Information, documents, or biospecimens protected by this Certificate cannot be disclosed to anyone else who is not connected with the research except, if there is a federal, state, or local law that requires disclosure (such as to report child abuse or communicable diseases but not for federal, state, or local civil, criminal, administrative, legislative, or other proceedings, see below); if you have consented to the disclosure, including for your medical treatment; or if it is used for other scientific research, as allowed by federal regulations protecting research subjects.

The Certificate cannot be used to refuse a request for information from personnel of the United States federal or state government agency sponsoring the project that is needed for auditing or program evaluation by the National Institutes of Health (NIH) which is funding this project, or for information that must be disclosed in order to meet the requirements of the federal Food and Drug Administration (FDA). You should understand that a Certificate of Confidentiality does not prevent you from voluntarily releasing information about yourself or your involvement in this research. If you want your research information released to an insurer, medical care provider, or any other person not connected with the research, you must provide consent to allow the researchers to release it.

The Certificate of Confidentiality will not be used to prevent disclosure as required by federal, state, or local law of child abuse and neglect, or harm to self or others.

The Certificate of Confidentiality will not be used to prevent disclosure for any purpose you have consented to in this informed consent document including obtaining photographs or videos of procedures, audiotaping interviews, obtaining laboratory results, placing research data in your medical record, and other procedures necessary to participate in this clinical trial.

Authorization To Use Your Health Information For Research Purposes

Because information about you and your health is personal and private, it generally cannot be used in this research study without your written authorization. If you sign this form, it will provide that authorization. The form is intended to inform you about how your health information will be used or disclosed in the study. Your information will only be used in accordance with this authorization form and the informed consent form and as required or allowed by law. Please read it carefully before signing it.

What is the purpose of this research study and how will my health information be utilized in the study?
We are doing this study to see if stimulation of a part of the brain called the central thalamus can improve memory, focus and attention for people who have suffered a severe brain injury and continue to have trouble in these areas. Your health information will be used to determine whether you are eligible for the study, and will help us decide whether or not you are getting benefit from the treatment. It will also be used to understand how the activity of the brain changes during stimulation. The results of this study will be presented at scientific conferences and published in the medical literature, but your health information will not be disclosed. Your health information may be shared with the Food and Drug Administration (FDA), which has granted permission to perform this study.

Do I have to sign this authorization form?
You do not have to sign this authorization form. But if you do not, you will not be able to participate in this research study, including receiving any research-related treatment. Signing the form is not a condition for receiving any medical care outside the study.

If I sign, can I revoke it or withdraw from the research later?
If you decide to participate, you are free to withdraw your authorization regarding the use and disclosure of your health information (and to discontinue any other participation in the study) at any time. After any revocation, your health information will no longer be used or disclosed in the

study, except to the extent that the law allows us to continue using your information (e.g., necessary to maintain integrity of research). If you wish to revoke your authorization for the research use or disclosure of your health information in this study, you must write to: Jaimie M. Henderson, MD, 300 Pasteur Dr., Stanford, CA 94305.

What Personal Information Will Be Obtained, Used or Disclosed?
Your health information related to this study, may be used or disclosed in connection with this research study, including, but not limited to, name, address, telephone number, e-mail address, CT and MRI scans, medical history, videos, photos, intraoperative localization data, and neural recording data.

Who May Use or Disclose the Information?
The following parties are authorized to use and/or disclose your health information in connection with this research study:

- The Protocol Director, Jaimie Henderson
- The Stanford University Administrative Panel on Human Subjects in Medical Research and any other unit of Stanford University as necessary
- Research Staff

Who May Receive or Use the Information?
The parties listed in the preceding paragraph may disclose your health information to the following persons and organizations for their use in connection with this research study:

- The Office for Human Research Protections in the U.S. Department of Health and Human Services
- Academic collaborators and research staff at Weill Medical College, University of Utah, University of Florida the Cleveland Clinic, Spaulding Rehabilitation Hospital and University of Toronto
- TranscribeMe
- The Food and Drug Administration
- The National Institutes of Health
- The Clinical Oversight Committee for the study

Your information may be re-disclosed by the recipients described above, if they are not required by law to protect the privacy of the information.

When will my authorization expire?
Your authorization for the use and/or disclosure of your health information will end on December 31, 2030.

Will access to my medical record be limited during the study?
To maintain the integrity of this research study, you may not have access to any health information developed as part of this study until it is completed. At that point, you would have access to such health information if it was used to make a medical or billing decision about you (e.g., if included in your official medical record).

_____ _____
Signature of Adult Participant Date

_____
Print Name of Adult Participant

FINANCIAL CONSIDERATIONS

Payment
You will be compensated for your travel costs and for your time involvement in the study. You will receive $50 per clinic visit for a total of up to $450 to cover travel-related expenses and meals over the course of the study. If you decide to drop out of the study before you have completed the 12-month study visit, your payment will be prorated. You would then be paid for the visits that you completed during your time taking part in the study. In addition, modest accommodations may be available at no charge based on need for participating in study related activities.

Payments may only be made to U.S. citizens, legal resident aliens, and those who have a work eligible visa. You may need to provide your social security number to receive payment.

Costs
If you participate in this study, the study will pay for those services, supplies, procedures, and care associated with the study that are not a part of your routine medical care. However, there may be additional costs to you. These include basic expenses like transportation and the personal time it will take to come to the study visits. You and/or your health insurance must pay for services, supplies, procedures, and care that are required during this study for routine medical care. **You will also be responsible for any co-payments and/or deductibles as required by your insurance.** Participation in this study is not a substitute for health insurance.

Sponsor
The NIH (National Institutes of Health) is providing financial support and/or material for this study.

Consultative or Financial Relationships
Medtronic, Inc. is providing materials but no financial support to Stanford Medical Center for this study.

Dr. Jaimie Henderson receives no direct compensation from Medtronic for this study.

COMPENSATION for Research-Related Injury

All forms of medical diagnosis and treatment – whether routine or experimental – involve some risk of injury. In spite of all precautions, you might develop medical complications from participating in this study. If such complications arise, the Protocol Director and the research study staff will assist you in obtaining appropriate medical treatment. In the event that you have an injury or illness that is directly caused by your participation in this

study, reimbursement for all related costs of care first will be sought from your insurer, managed care plan, or other benefits program. **You will be responsible for any associated co-payments or deductibles as required by your insurance.**

If costs of care related to such an injury are not covered by your insurer, managed care plan or other benefits program, you may be responsible for these costs. If you are unable to pay for such costs, the Protocol Director will assist you in applying for supplemental benefits and explain how to apply for patient financial assistance from the hospital.

You do not waive any liability rights for personal injury by signing this form.

CONTACT INFORMATION

Questions, Concerns, or Complaints: If you have any questions, concerns or complaints about this research study, its procedures, risks and benefits, or alternative courses of treatment, you should ask the Protocol Director, Jaimie M. Henderson, MD, at 650-723-5574. You should also contact him at any time if you feel you have been hurt by being a part of this study.

Independent Contact: If you are not satisfied with how this study is being conducted, or if you have any concerns, complaints, or general questions about the research or your rights as a participant, please contact the Stanford Institutional Review Board (IRB) to speak to someone independent of the research team at 650-723-5244 or toll free at 1-866-680-2906. You can also write to the Stanford IRB, Stanford University, 1705 El Camino Real, Palo Alto, CA 94306.

EXPERIMENTAL SUBJECT'S BILL OF RIGHTS

As a research participant you have the following rights. These rights include but are not limited to the participant's right to:

- be informed of the nature and purpose of the experiment;
- be given an explanation of the procedures to be followed in the medical experiment, and any drug or device to be utilized;
- be given a description of any attendant discomforts and risks reasonably to be expected;
- be given an explanation of any benefits to the subject reasonably to be expected, if applicable;
- be given a disclosure of any appropriate alternatives, drugs or devices that might be advantageous to the subject, their relative risks and benefits;

- be informed of the avenues of medical treatment, if any available to the subject after the experiment if complications should arise;
- be given an opportunity to ask questions concerning the experiment or the procedures involved;
- be instructed that consent to participate in the medical experiment may be withdrawn at any time and the subject may discontinue participation without prejudice;
- be given a copy of the signed and dated consent form; and
- be given the opportunity to decide to consent or not to consent to a medical experiment without the intervention of any element of force, fraud, deceit, duress, coercion or undue influence on the subject's decision.

May we contact you about future studies that may be of interest to you?

____ Yes ____ No

Signing your name means you agree to be in this study and that you will receive a copy of this signed and dated consent form.

_____ _____
Signature of Adult Participant Date

_____
Print Name of Adult Participant

_____ _____
Signature of Person Obtaining Consent Date

_____
Print Name of Person Obtaining Consent