

## **Carney Human Testing Space (Carney HuTS) Standard Operating Procedures (SOP)**

### **Facility**

The Carney Human Testing Space (Carney HuTS) was established in 2019 when the Robert J. and Nancy D. Carney Institute for Brain Science (Carney) moved into newly renovated space on the 4th floor at 164 Angell St. Carney Institute administrative offices are located there, and the space also contains several human subjects testing rooms that are ideal for behavioral testing and electroencephalography (EEG), as well as the Transcranial Magnetic Stimulation (TMS) facility.

### **Structure and Governance**

#### HuTS committee

The HuTS is run by Carney and managed by a group of users within Carney, the HuTS committee. Contact information for the HuTS committee is listed on the web page and is currently [simona\\_temereanca\\_ibanescu@brown.edu](mailto:simona_temereanca_ibanescu@brown.edu). The use of community available testing space is governed by the HuTS committee and exists primarily to assess the needs of the community and the availability of the spaces.

Research involving human participants requires approval by the IRB. Further, specific approval for the use of the TMS equipment is governed by the Brain Stimulation Facility's (BSF's) Safety, Education and Training Committee (SETC), which falls under the administration of the Brown MRI Research Facility (MRF). The HuTS committee does not supersede or assume responsibility for the decisions for any of these governing bodies.

#### BSF Safety, Education and Training Committee (TMS only)

The Safety, Education and Training Committee (SETC) has oversight regarding the safe operation of the TMS equipment in the Carney HuTS. The committee sets operation procedures for the brain stimulation systems; these procedures will undergo annual review, though they can be modified at any time when new safety concerns arise. This committee will also approve training procedures for facility users to ensure proper use of equipment. Additionally, the Committee approves and oversees requests for usage of the TMS facility for educational purposes. The Committee meets in person at least annually to review safety policy and as needed for other matters.

The HuTS committee and BSF committee are separate, but overlapping entities that work together for the community. Please inquire if there are questions as to which committee is more appropriate to interact with.

### **General Procedures**

#### **Eligibility**

To be eligible to apply to conduct research at the Carney HuTS, individuals must be Brown-affiliated faculty or be co-sponsored by a Brown-affiliated faculty member. Post-doctoral fellows are not considered by the Carney HuTS committee to be faculty. Members of the Brown community, including Brown-affiliated hospitals, not holding faculty rank, or those outside the Brown community,

who wish to propose projects must arrange with a Brown-affiliated faculty member to submit a proposal to the HuTS committee. The identified faculty member must agree to assume responsibility for IRB/IACUC submissions, BSF SETC approval, supervision of research staff, and financial arrangements to use the HuTS.

## **Access**

The first step is to fill out a short online form indicating interest in using the space (separate from the BSF application form used specifically for TMS). The form is accessible on the Carney HuTS pages [For Researchers](#). The Carney HuTS committee will evaluate the request based on the current availability of the spaces and needs of the community, and either directly approve use or request further information (particularly for use of the TMS facility - see specific approval procedures below).

After approval by the Carney HuTS committee, approved PIs will be placed on an approved list with Carney administrative staff. PIs will then be able to contact administrative staff for appropriate access to the building, floor, approved rooms, and calendar scheduling. Once a PI has access, they assume all responsibility for their lab members' use of the facility, including proper training, knowledge of safety procedures, and care and use of the equipment and space. Carney and the HuTS committee reserve the right to revoke access in the case of improper use.

PIs may request for their lab members to gain access to the scheduling calendar and approved room(s), as long as they have the proper training level (see 'Training Requirements for TMS, below'). New users groups will obtain and return keys to Carney administrative staff before and after use. Regular users may request one key to the human testing room(s) per lab; individual lab members will not receive additional keys to the testing room(s).

## **Scheduling**

Scheduling will be on a first-come, first-served basis. Individuals are not permitted to reserve time slots on the calendar unless they have already scheduled a participant and/or testing session. If their need for the room(s) changes, we ask that they update the calendar accordingly. Use of all testing room(s) follows the calendar schedule by default. Carney administration and/or the HuTS committee reserve the right to reserve time for facilities management.

When scheduling, include the PI name, study name and study-specific contact person (if different from the PI and/or person doing the scheduling).

If a group is planning to use more than one room (e.g., briefly use a room to consent a participant before entering the experiment room), please also schedule time for that room accordingly and clearly mark the purpose. This is important for tracking the space's usage over time and allows for adaptation to the needs of the community.

## **Behavioral and EEG Research at the Carney HuTS**

There is one shared human testing room available for general use. The room is electrically shielded and contains an adjustable height desk and chairs (see website description \*add link\*), but is not currently outfitted with any shared experimental equipment (e.g., EEG equipment, computer monitor).

It is ideally suited for behavioral studies that require only portable equipment (e.g. a laptop) and/or for consenting participants for TMS experiments.

Users of the behavioral testing room should follow a few basic rules:

- Do not book the testing room for a time period longer than needed.
- Long-term equipment storage within the room should be pre-approved by a Carney HuTS committee member. Do not use other labs' stored equipment without permission.
- Please keep volume to a minimum and avoid disrupting occupants of the adjacent office spaces. Any equipment or behavioral tasks that create loud and/or prolonged noises should be pre-approved by the Carney HuTS committee.
- Return the room to its original condition when your session is complete. This includes returning the furniture to its original configuration, and, if needed, wiping down the desk after your session.
- Do not leave anything in the room other than pre-approved storage.

Study PIs who are interested in using additional space, resources and/or equipment should indicate so on the Carney Human Testing Space (HuTS) Inquiry Form accessible on the Carney HuTS pages [For Researchers](#), and will be contacted for more information by staff and/or a Carney HuTS committee member.

## **TMS Research at the Carney HuTS**

### **Research protocol submission requirements**

Access to the Carney TMS facility is approved through the BSF. The BSF policies described below do not supersede established University policies and procedures developed by the IRB and IACUC.

Prospective researchers must submit application paperwork to the BSF for approval and provide documentation that they have obtained necessary IRB and/or IACUC approval, as appropriate. All paperwork being submitted to the BSF should be submitted in electronic form (preferably in PDF format) to:

[BSF@Brown.edu](mailto:BSF@Brown.edu)

A hard copy of any forms requiring an original signature should be sent to:

Brain Stimulation Research Facility  
185 Meeting Street  
Brown University, Box G-LN  
Providence, RI 02912

### **BSF Application Form**

A completed BSF Application Form must be submitted and approved by the BSF for each research "project". Note that the HuTS Inquiry Form and BSF Application Forms are separate. The BSF Application Form can be found at the bottom of the [TMS Facility](#) page. For the purposes of the BSF, a

project is defined as a general set of experimental conditions and corresponding equipment use. For example, if you are approved to perform behavioral experiments, then you will need to submit for approval for an additional project if you want to begin TMS experiments. If you are already approved for behavioral experiments and would like to run a different behavioral experiment, an additional application is not necessary. As a general rule of thumb, if beginning a new project necessitates additional IRB approval or a new IRB protocol, then it will require an additional application to the BSF. If you have questions regarding whether or not to submit an additional application, please ask the BSF committee.

An unsigned face-page, or one with an electronic signature, should be submitted via E-mail in PDF format. An originally signed face-page should be submitted via mail. The form may be downloaded in PDF or Word format from <link to the form on the Carney website>

#### Biosketch

A Biosketch for the PI must be submitted via E-mail to the BSF (PDF format). Please use the current NIH 4-page format (<http://grants.nih.gov/grants/funding/2590/biosketchsample.pdf>).

#### Research Project Description

A 1-2 page research project description must be submitted via E-mail to the BSF (PDF format).

It is expected that research protocols will follow the safety guidelines detailed in the most current Consensus Document on TMS safety: [Rossi et al., Clinical Neurophysiology \(2009\)](#). Any deviations from the safety guidelines in this document must be clearly highlighted in the research description. *The description should clearly state which risk category (class 1, 2 or 3; see Rossi, et al., section 7.1.1) the PI believes the proposed work falls under and why.*

#### Human Research Protections Program (HRPP) Approval

All research projects must have either Brown IRB (for human studies) or Brown IACUC (for animal studies) approval, as appropriate.

Researchers based at other institutions (e.g., Brown affiliated hospitals) must also have the appropriate IRB or IACUC approval from their home institution.

#### Facilities Use Agreement for External Users

Any PI conducting research at the BSF that is not an employee of Brown University must have a completed BSF Facilities Use Agreement in place between Brown and their home institution. The Facilities Use Agreement must be signed by a person authorized to act on behalf of the researcher's institution.

Researchers wishing to obtain further information about the Use Agreement or insurance requirements should contact:

Brown University  
Office of Insurance and Risk  
Box 1848, Brown University, Providence, RI 02912-1848  
401-863-9481

## Training requirements (TMS)

All persons conducting research under the auspices of the BSF/Carney HuTS must have undergone appropriate training and received certification from the BSF/Carney HuTS. Training requirements are specified according to the type of equipment that will be used. Users involved in TMS research must meet the TMS training requirements.

There are two levels of training/certification. All TMS sessions must have two people present at all times during a stimulation session with a participant, and must consist of at least one TMS Operator (the other person can be a TMS Team Member or TMS Operator).

Other non-study session room use such as neuronavigation targeting practice for training purposes (see below), or behavioral paradigm/computer use and debugging may be conducted with only one person present (TMS Team Member or TMS Operator). However, a TMS Operator must assume full responsibility for any and all use of the room at all times: scheduling, logging, equipment care and use, etc. If a TMS Team Member is in the room alone, a TMS Operator must be available and nearby to assist if necessary.

### TMS Team Member

A Team Member is familiar with brain stimulation equipment and principles of operation.

A Team Member is familiar with operational procedures at the TMS room.

A Team Member is familiar with possible adverse events associated with brain stimulation and understands appropriate emergency procedures.

Team Members may assist Operators with experimental protocols but may not administer brain stimulation except under the direct supervision of, and as directed by, a certified BSF Operator.

Team Members will not have direct access (swipe card) to the TMS room and are not authorized to use the equipment on their own.

A Team Member may be an undergraduate student, as long as all the above conditions are met.

Team Member training will be performed by a TMS Operator or other designated BSF staff. That person will be responsible for certifying that the Team Member has completed the following requirements.

Requirements include:

- (1) Review of the Rossi S et al. Safety, ethical considerations, and application guidelines for the use of transcranial magnetic stimulation in clinical practice and research. Clin Neurophysiol (2009).
- (2) TMS Facility site-specific orientation to include overview of emergency response procedures.
- (3) Review of the Power Point presentation containing safety procedures for seizure management: [https://drive.google.com/open?id=18qr5P5GeL-v1\\_qHMqcin3QQs8Ofkc6k6](https://drive.google.com/open?id=18qr5P5GeL-v1_qHMqcin3QQs8Ofkc6k6)

## TMS Operator

BSF Operators meet all of the Team Member requirements and have completed training in the safe operation of brain stimulation equipment and protocol delivery, allowing for independent operation of the BSF/TMS equipment.

It is the policy of the BSF that undergraduate students cannot be TMS Operators.

Requirements include:

- (1) Review of the Rossi S et al. Safety, ethical considerations, and application guidelines for the use of transcranial magnetic stimulation in clinical practice and research. Clin Neurophysiol (2009).
- (2) TMS Facility site-specific orientation to include overview of emergency response procedures.
- (3) Review seizure response training materials and knowledge of procedures as applicable to the TMS Facility
- (4) Demonstrates competency with equipment operation after a minimum of a 6 hour practicum under the supervision of a current TMS Operator.

## BSF/TMS Operator Training

BSF system operation and related training will be conducted by BSF staff, Principle Investigator, or other TMS Operator as designated by the BSF, hereafter referred to as the Trainer. Certification to independently operate BSF equipment will be conferred upon the determination of competency and recommendation of the TMS Operator Trainer and approved by the Safety, Education and Training Committee and the BSF Medical Director. The training will involve on-site observation and supervised practice in the operational procedures, and safety and emergency protocols.

It is important to note that the specifics of the procedures listed below are dictated by the specifically approved IRB protocol. The TMS Operator Trainer is only responsible for illustrating general procedures for using the equipment. It is the responsibility of the TMS Operator in training to know the specific procedures they are, and are not, approved to perform. Training in all the procedures listed below may or may not be necessary. Further, clinician oversight may be required per the IRB and it is the responsibility of the PI to acquire this when requested by the IRB. It is expected that before training begins a list of the relevant procedures necessary will be made by the PI. The BSF and/or TMS Operator Trainer may ensure the procedures are approved in the IRB protocol and make recommendations as to whether or not they can provide the necessary training, and where the trainee may seek further training, if applicable. The procedures listed below are training that may generally be required.

## TMS Operator training requirements

- Subject screening procedures
- Subject preparation (positioning, coil connection, earplugs, etc.)
- Patient support (i.e., treatment chair)
- Hearing protection
- Emergency procedures
- Proper setup, care, and use of the neuronavigation system

- Accurate TMS coil targeting (using neuronavigation).
- Proper setup, care, and use of the EMG system for motor thresholding
- Determination of motor threshold
- System start-up and shut-down procedures for the behavior control computer, neuronavigation computer, neuronavigation system, and stimulators.
- Protocol selection
- Brain stimulation delivery
- Troubleshooting procedures
- Data archival and retrieval
- Documentation of session- Google drive excel sheet to note whether all equipment and computers functioned properly and/or system notifications (updates) or errors
- Coil handling and storage
- Knowledge of warnings about seizure risk and how it applies to protocols
- Familiarity with this document, the TMS SOP

Depending on the level of experience of the person being trained, mastery of the above skills will take more or less time. As stated above, the *minimum* number of hours of training for a TMS Operator is 6 supervised hours. These hours will be distributed at a minimum across one participant stimulation session spent shadowing the Trainer, supervised time learning to use equipment and to target using the neuronavigation system, and a minimum of three sessions performing thresholding and brain stimulation on a participant while directly supervised by the Trainer. After each session, it is expected that the Trainer will provide an evaluation of the above list of skills to the trainee and provide direct feedback on how to master skills not yet mastered.

The skill of accurately targeting using the TMS coil using the neuronavigation system may require more practice than can be achieved in single sessions with participants. It is recommended that to master this skill trainees seek time to practice targeting without stimulation under the supervision of a Trainer. Multiple trainees may practice in the same session.

### **Emergency Procedures**

What follows are general guidelines/suggestions for emergency procedures. The actual procedures that are followed in an emergency are dictated by the group's individual IRB protocol. It is the responsibility of the TMS Operator conducting the session to know and be prepared for the procedures required by their protocol.

This section describes the procedures and policies relevant to life threatening emergencies at the Brown University TMS facility within Carney HuTS by identifying responsibilities and authorizing staff to institute emergency measures within the scope of his/her demonstrated competence. For all emergencies, the following numbers and protocols will be used to contact Brown Public Safety as indicated:

**Campus phone:                    3-4111**  
**Non-campus phone:            401-863-4111**

### **Identify the event and location**

Acute, severe adverse events during the course of the TMS experiment could include things like superficial burns of participant's skin from TMS coil heating or induction of a generalized seizure. Other adverse events such as fainting, severe headache, and nonspecific stress reaction are possible with TMS and also with other types of brain research. Though protocols and procedures minimize the risk of these adverse events occurring, all research personnel will be trained to observe the signs of an adverse event, terminate study procedures, deploy first aid procedures (if necessary and in the purview of the group's protocol), and call Brown's Emergency Response System, if it appears a participant is experiencing an adverse event.

### Medical Emergency

In the event of any medical emergency, the first responder (TMS operator, researcher or other individual) is responsible to call Brown Public Safety from the nearest telephone.

### **If a research participant is receiving brain stimulation:**

1. The TMS operator/designee will STOP all stimulations immediately.
2. Manually free participant from coils and all immobilization devices, making sure that the area around the participant is clear of immediate danger (objects/chairs, etc.)
3. A research assistant or designated staff member will meet the emergency responders at 164 Angel St. lobby. The designated staff member will guide the emergency response team to the appropriate location on the 4th floor. It is preferred that the TMS Operator and TMS Team member are in the room with the participant at all times, but if absolutely necessary (i.e., the responders do not have access), then the TMS Team member may leave to assist responders in gaining access to the space.
4. The TMS Operator and Team Member will cede responsibility to emergency responders as they enter the TMS Room, assisting the first responders as requested.
5. The TMS Operator will file an incident report and notify appropriate University personnel and offices (see [Incident Reports](#)).

### Seizure Procedure

The specific procedures in the event of a seizure will be as follows and are posted near the phone in the TMS room:

Research personnel are required to take the following steps in the event of a seizure (those marked with an asterisk were taken from <[http://www.cdc.gov/epilepsy/basics/first\\_aid.htm](http://www.cdc.gov/epilepsy/basics/first_aid.htm)>).

1. Keep calm and reassure other people who may be nearby.\*
2. Stop all on-going protocols immediately and remove any TMS coils or other hard or sharp objects that might be close to the participant.\*
3. **Call Brown EMS at 401- 863-4111.**
4. Note the approximate time that the seizure begins.
5. If possible, fully recline the participant chair, but keep armrests in place to protect the participant from falling onto the floor.
6. If possible, turn the participant gently on her/his side.\*
7. Remove eyeglasses and loosen ties or anything around the neck that may make breathing difficult.\*
8. Stay with the participant until EMS arrives.



9. Be friendly and reassuring as consciousness returns.\*
10. Contact the Principal Investigator as soon as possible (if only one staff person is with the participant during the seizure, wait until after EMS arrives).
11. TMS Operator will file an incident report and notify appropriate University personnel and offices (see [Incident Reports](#)).

**DO NOT ATTEMPT THE FOLLOWING:**

1. **Do not** put anything in the person's mouth. Do not attempt to hold or touch the patient's tongue, face, or head during a seizure.\*
2. **Do not** hold the person down or try to stop his movements.\*
3. **Do not** attempt artificial respiration.\*
4. **Do not** offer the person water or food until fully alert.\*
5. **Do not** administer any medications to the person.
6. **Do not** permit the person to leave the research area or go home without evaluation by a medical professional.

\* Source: [www.CDC.gov](http://www.CDC.gov)

Incident Reports

1. An incident report must be submitted when an event occurs that has potential consequences for the infrastructure of the facility or for any serious and unexpected adverse event involving a human research volunteer or an experimental animal.
2. The TMS operator will file a report of the incident, co-signed by the relevant PI and laboratory member in charge of the experiments. This report will be submitted to the BSF Administrative Assistant who will notify the BSF Director, the Associate Director for Research and the Chair of the Safety, Education and Training Committee.
3. Reports should be submitted internally to the BSF within 24 hours. BSF reports to other bodies, such as the relevant IRBs, should occur within three (3) business days or as required by IRB protocols. Copies of the reports to the relevant IRBs will go to the following Brown offices as appropriate depending on the nature of the incident:
  - \* Brown University Office of the Dean of Medicine and Biological Sciences
  - \* Brown University Office of Environmental Health and Safety.
  - \* Brown University Office of the Vice President for Research
  - \* Brown University Office of Insurance & Risk (if involving injury or which may result in an insurance claim)
  - \* Brown University Department of Public Safety

**Participant screening and safety**

Participant screening and consent is governed by IRB protocol. It is the responsibility of the PI to ensure adherence to the appropriate protocol. If there are questions regarding where to obtain this information, please see the Rossi et al 2009 paper for guidelines.

### Hearing Protection

All participants undergoing TMS are required to wear hearing protection in the form of ear plugs. Individual IRB protocols may specify additional requirements for hearing protection (e.g., specific acceptable decibel attenuation levels). The TMS Operator is responsible for choosing appropriate hearing protection for their protocol.

### **TMS Room and Equipment Use**

#### Room Log

All TMS Operators will log room use in the appropriate file on the Brainsight (neuronavigation) computer. The incoming and outgoing state of the equipment, and any issues with the room/and or all equipment and computers should be noted.

Any issues that could affect future groups using the room or TMS equipment should also be reported immediately to Carney administrative staff and/or the BSF administration. Failure to do so could result in revoked access.

#### File Storage

The Carney HuTS does not ensure the safety of recorded data. The behavioral control and neuronavigation computers are not backed up. Each PI will have a designated folder on each computer. All files for studies run by each PI should be entirely within that designated folder. The Carney HuTS committee reserves the right to remove files outside designated folders at any time and may periodically need to remove files from within PI folders to ensure adequate free space on the machine. Every effort will be made to notify PIs in the event that files need to be removed in a timely fashion, but Carney HuTS is not responsible for equipment failure. Best practice is to copy study files to a secure location immediately at the conclusion of the study session.

Please note that connections to servers and cloud services should be disconnected and/or logged out at session conclusion. The Carney HuTS is not responsible for open connections. Best practice is to not save passwords to the computers.

#### Supplies

Currently there are no common supplies for use with TMS. Individual lab groups are expected to purchase their own supplies, such as ear plugs and electrodes. There may be common supplies in the future and, to that end, we are tracking expenses. Please list relevant purchases on the Resource Management Log google spreadsheet

<[https://docs.google.com/spreadsheets/d/1aHq5k8NpLDownBnkrRdsGKgBAp\\_1ILDKJIQXtFjZU-l/edit#gid=0](https://docs.google.com/spreadsheets/d/1aHq5k8NpLDownBnkrRdsGKgBAp_1ILDKJIQXtFjZU-l/edit#gid=0)>.

#### Equipment Maintenance

Computer, application, and other equipment updates or installations should not be performed by BSF/Carney HuTS PIs, Operators, or Team Members without the express consent from the Carney HuTS committee, as additions and updates have the potential to affect all users. This statement

includes, but is not limited to, updates to operating system, updates to installed software (e.g. neuronavigation, MATLAB, virtual machines), installing new software and/or updating firmware.

Efforts will be made to turn off automatic software updating features. If you suspect that an automatic update has happened, please note it in the log and notify the Carney HuTS committee.

Please contact the Carney HuTS committee with requests for installations and updates. The Carney HuTS committee will either directly approve, poll users and then approve, or nominate another party to perform the installation/update.

Troubleshooting questions regarding the computers can be directed to Scott Lessard at [scott\\_lessard@brown.edu](mailto:scott_lessard@brown.edu) or (401) 863-6530.

The TMS Equipment is tagged using Brown's official inventory system. Every other year (odd years), Brown inventory employees will need to verify the location of and scan the bar codes physically located on the equipment. Assistance in the inventory process should be provided by a TMS Operator and/or Carney administrative staff.

### Equipment Care and Storage

What follows is a list of the most critical rules in terms of equipment care and storage. This list is not all-inclusive, and it is expected that TMS Operators will make every effort to preserve and maintain the equipment in good working order.

- Before unplugging the Magstim system or shutting off power to the room, make sure to switch off both Mains Power Switches on the back of the machine (there are two such switches, see p. 9 of the Magstim Rapid2 manual). Do not plug the Magstim device into any power outlet sockets other than that specifically designated.
- At the start of each session the Operator should check the Magstim Rapid2, power supply unit (PSU), user interface (UI) and the stimulating coil for any signs of damage, paying particular attention to the plastic casing. If there are any signs of physical damage to the Magnetic Stimulator, PSU, UI or the stimulating coil, they must not be used. The coil pins should be checked before each session for any signs of pitting, or burning, as under conditions of exceptionally hard use at high energy levels, it is possible for the localised heating to manifest itself in the form of micro-welds (See p. 48 of Magstim Rapid2 manual). The cooling vents should also be checked to ensure that they have not become blocked, or obstructed. Battery status of the UI can be checked on the user configuration screen and when low, is reported on the main Options Menu screen.
- The TMS coils do not have any specialised protection against the ingress of liquids; therefore conditions where ingress of liquid, or the forming of condensation within the coil, can occur must be avoided as the electrical insulation will be compromised. Coils must not be immersed in water, put in an ice bucket, or refrigerated, even if placed within a plastic bag, as condensation may be created within the coil. Liquids are not permitted to be in the TMS room within close vicinity to the TMS system. Cooling must only be performed by using a flow of cool air from a fan or air conditioning unit.

- The stimulating coil, exterior of main frame, PSU, UI, foot switch, MEP Pod and MEP Pod patient cables may be cleaned using an isopropyl alcohol moistened cloth. Ensure that the equipment has dried thoroughly before use. The coil cannot be sterilised. Do not allow the coil to become contaminated with body fluids. Do not clean or wipe the touch screen with anything abrasive as it will cause permanent damage.

**Report any damage to the machine PSU UI or coils, or low battery status, to the Carney HuTS committee immediately and do not begin a study session if any of these issues arise.**

### General Equipment Safety

This list is a general overview, and TMS Operators are referred to the user manual(s) for the equipment and their IRB protocols for a complete list.

- The Magstim Rapid2 and its stimulating coils must not be used on, or in the vicinity of, patients or subjects with cardiac demand pacemakers, implanted defibrillators, or other electronic implants.
- The Magstim Rapid2, its coils and accessories generate high intensity magnetic pulses. The induced eddy current is of sufficient magnitude to stimulate nerves and muscle. Do not discharge the Magstim with the stimulating coil in the vicinity of metallic objects or these may be projected, moved and/or damaged. The Magstim Rapid2 must not be used in an explosive atmosphere or in the presence of flammable anaesthetics. Do not discharge the Stimulating Coil in the vicinity of objects sensitive to magnetic fields. Examples are credit cards, floppy disks and computer screens.
- The strong magnetic pulses generated by stimulating coils induce eddy currents in any conductive medium such as the human body, nearby metallic objects or electronic devices. Particular care must be taken to ensure that leads connected directly to the patient, or other equipment, are not in a position where the stimulating coil can couple resulting in currents being induced in them.
- When the magnetic pulse is delivered, a discharge click is produced by the Magstim Rapid2 and its stimulating coil. The use of ear plugs is required by all persons in the TMS room, including study participants, operators and all other study personnel.
- High voltages are present within this System. Do not remove covers. Refer servicing to qualified personnel.
- The Magstim Rapid2, its stimulating coil and accessories must not be used if there are any signs of external damage or if any parts are damp or wet.

### Equipment Storage

TMS Operators should observe how equipment is stored prior to use, note any issues, and return equipment when the session is complete.

- The large, tall storage locker in the TMS room may be used for TMS study equipment with the permission of the Carney HuTS committee. Do not leave study materials in the small plastic storage unit in the room, and do not use other labs' study materials without permission.
- The large, short storage unit in the TMS room is to be used for storing TMS coils. Coils are to be placed securely on a flat surface and with the cord looped loosely. Long-term storage for coils that are not often used may include wrapping the coil in bubble wrap.
- The reflective sphere sensors on the Brainsight coil tracker and wand are extremely delicate and should not be allowed to touch any hard surface. Do not touch the spheres or allow them to come in contact with anything when using this equipment. Store these items on a flat surface such that the spheres do not come in physical contact with anything. If you notice that a large portion of the reflective material has been scraped off of the spheres, report it to the Carney HuTS and/or BSF committees so that they can be properly replaced.

For additional information, please see the appropriate TMS equipment manuals (available upon request from the Carney HuTS Committee or found in the shared Brown TMS Google Drive, which PI's and TMS Operators will be given access to once approved).