



HB-tES Familiarity Video Narrative:

The use of the HB-tES Training and Supervision Program and its materials is intended for research groups to use in the context of their IRB-approved studies. We do not endorse its use for other purposes or by laypeople using a tES device independently without research staff supervision. Please note that this is an example and should be adapted by other research laboratories to fit within their IRB-approved study parameters and use of different HB-tES devices. We do not endorse any specific HB-tES devices or companies. The images displayed are the Neuroelectrics Starstim®-Home Kit for illustrative purposes and do not represent an endorsement of this device.

Welcome! These videos are an example of educational materials for a course on how to conduct home-based transcranial electrical stimulation, as offered by the Hinda and Arthur Marcus Institute for Aging Research, and the Deanna and Sidney Wolk Center for Memory Health. This work was conducted at Hebrew SeniorLife, a senior care organization affiliated with Harvard Medical School.

This course has been created as an integrated part of the educational material to provide precise instruction on how to use the home-based tES brain stimulation kit. The course includes 6 sections. At the end of each section, you will be required to complete a quiz to test your knowledge. Once you have completed all the sections of the course, you will be ready to use the home-based brain stimulation device.

SECTION 1. This section will run you through all the equipment that we will ship to your home once you qualify as a study participant.

1) You will receive a backpack containing two boxes. The Neuroelectrics stimulation box, depicted on the left, and the Microsoft Tablet box, depicted on the right. Inside the Neuroelectrics Brain Stimulation Box, you should have all the items depicted in this picture. We will now run you through each item, one at a time.

2) **The Stimulation Device:** this is the most delicate piece of equipment. Please minimize the risk of damage, avoid accidental dropping, and do not place liquids in close proximity.

3) **The electrode Cable:** which on the one hand consists of a connector that will be plugged into the Stimulation Device. On the other hand, it consists of wires that will be connected to the electrodes and the earclip. These **wires** are used to transmit signal using electrical current. Please minimize damage to this item avoiding unnecessary twisting of the wires, accidental dropping, and do not place liquids in close proximity.

4) **A charging cable for the Stimulation device:** it is important to remember to charge the stimulation device every day after the stimulation session. We recommend keeping the equipment in a predetermined location within your home. Preferably, a dedicated socket should be used to recharge the stimulation device.

5) **Inside the brain stimulation box, you will be provided a headcap, electrodes, and one earclip.** The headcap should fit comfortably and not be too tight. Before we send you the equipment, we will help you measure your head size over the phone. This will allow us to estimate which cap would fit best for you. When you ultimately receive the equipment, and the headcap does not fit properly, you should contact the study coordinator. We will send you the right size. The electrodes and earclip will be used for the



stimulation. Detailed instruction on how to handle and clean the electrodes, earclip, and the head cap will be provided in a dedicated section of the video.

6) **You will be provided with 10 electrodes, which are stored in three different bags.** For one session you will only need to use four electrodes. Since the electrodes wear over time, you will be using one set of four electrodes for the first three weeks of your participation in the study, and another set of four electrodes for the last five weeks of your participation in the study. We have also provided you with a set of two spare electrodes. It is imperative that you understand that you may only use these spare electrodes after getting consent from one of the study staff to do so.

7) **The last items you will be receiving in the stimulation box are:** two bottles of gel, and one plastic syringe with no needle. The Curved Syringe will be filled up with gel during the stimulation set up. If during the course of the treatment you are about to finish the gel, please contact the study coordinator. We will ship additional gel to you.

8) Inside the box you will find a **brochure** depicting all the items that should be in the box. Please remember to double check that all the items are in the box. If you find that items are missing or damaged please contact the study coordinator.

9) **Congratulations** you have now completed the video section about the content of the stimulation box. Detailed instruction on how to assemble the equipment will be provided in the next section. You will be asked to respond to a short quiz before you move on to the next section. **THANK YOU.**

SECTION 2

Congratulations! You have reached the second section of the home-based tES course. This section will guide you step by step with detailed instruction on how to assemble the stimulation box items. Please pay attention to all steps, at the end of the section you will be asked to respond to a short quiz. **THANK YOU.**

1) Step 1. The first operation is to insert the plastic bottom parts of the electrodes into the headcap. Repeat the same operation for all the 8 holes on the headcap. As is shown in the video, it is important to make sure that the ridges are all through the hole.

2) Step 2. Gently place the headcap on the participant's head. The cap should be positioned on the head so that the midline of the cap is in one straight line with the middle of the person's face, as is shown in the picture. Then, fasten the headcap.

3) Step 3. Fill up the syringe with gel.

a. Open the gel tube.

b. Then, put the nozzle of the gel deep down into the syringe and fill the syringe.

c. Reassemble the syringe and push the gel to the front of the syringe chamber. Do not let it come out!

4) Step 4. The syringe filled with gel will be used to fill the bottom part of the electrodes. This is an essential step; lack of gel would compromise the functioning of the electrodes and could cause uneasiness to the participants. First the scalp must be exposed and visible. For participants with long hair, move the hair away



using the tip of the syringe or a q-tip to expose the scalp. Move the syringe gently to avoid unnecessary discomfort for the patient. You can employ a circular motion along to push excess hair under the ridge of the electrode. When the scalp is visible, press enough gel from the syringe to fill the bottom portion of the electrodes. Please, repeat the operation for all electrodes.

5) Step 5. Twist the top and bottom parts of the electrodes together. Make sure that all electrodes are properly twisted flat on the cap. Please, repeat the operation for all electrodes.

6) Step 6. Connect the Electrode Cable to the Stimulation Device. The Velcro on the stimulation device and the Velcro on the electrode cable must be facing the same side. The connector is breakable, please do not force it.

7) Step 7. Attach the Stimulation Device to the large Velcro located at the back of the headcap. Then, Attach the electrode cables Velcro to the small Velcro on the headcap. The stimulation device should be securely attached to the headcap.

8) Step 8. Clip on the wires to the top part of the electrodes. To facilitate the process, the clips have been colored to match with the colored buttons on the headcap. Please, repeat the operation until you clip all wires to match with the colored buttons on the cap. Some of the colored electrode wires may remain unclipped depending on the amount of electrodes on the cap. The gray wires will be clipped on in the next step.

9) Step 9. Place and connect the earclip. First, add a drop of gel between the connector pads. On the Electrode Cable, there are two **Gray cables**. Connect the two Gray cables to the earclip. Then, secure the earclip onto the participant's right earlobe. Please, make sure that the ear clip does not slide off from the ear lobe.

Congratulations! You have now completed the second course section on how to assemble the home-based stimulation box equipment. Now you will be asked to respond to a short quiz before you move to the next section. THANK YOU.

SECTION 3

Congratulations, you have made it to section 3! In this section we will provide you step by step with detailed instruction on how to prepare and use the tablet to run the stimulation session. Please pay attention to all steps, at the end of the section you will be asked to respond to a short quiz. THANK YOU.

- 1) Step 1: Turn on the tablet. The power button can be found on one of the long sides of the tablet. Shortly press the button closest to the side of the tablet. The screen of the tablet should now be turned on, as is shown in the picture.
- 2) Step 2: Unlock the tablet. Swipe up on the screen to unlock the tablet. On the next screen you should press 'sign in'. This will bring you to the tablet's home screen.
- 3) Step 3: Insert the Wi-Fi Dongle. Take the USB Wi-Fi dongle out from the NeuroElectrics Box. Insert the dongle into the USB port located on the short side of the tablet. Please consult the picture



for finding the correct port. Once you have plugged in the USB Wi-Fi dongle, a green light should start blinking at the end of the dongle.

- 4) Step 4: Connecting to the Wi-Fi. Return to the tablet's home screen (you may need to turn the tablet on and unlock it again).
 - a. In the right bottom corner, you should search for the Wi-Fi symbol. The symbol is depicted in the picture. If the Wi-Fi icon is gray and has an asterisk sign on the top left, as is exemplified in the picture, it means that the tablet is not connected to the Wi-Fi. You must tap on this Wi-Fi icon and a list of Wi-Fi networks should appear. Try to tap precisely, sometimes you may need to tap twice.
 - b. Find your home Wi-Fi in the list. Ensure that the box next to 'connect automatically' is checked and tap 'connect'. Enter the password when prompted.
 - c. Check the Wi-Fi icon in the right bottom corner of the tablet's home screen again. The asterisk should have disappeared, and the icon should be white instead of grey.
- 5) Step 5: Open the NeuroElectrics home app and start the stimulation session.
 - a. Double tap on the icon in the middle of the home screen that reads 'launch home app'.
 - b. The following screen should appear informing you that 'you have a session today'. Slick the green button that says, 'Begin the session'.
 - c. You will be shown a preparatory screen. Please follow the instructions and click the yellow button that says: "next step" when you are ready.
- 6) Step 6: Pre-stimulation questionnaire. Before the start of each stimulation session, you will be asked to complete a short questionnaire. Here we want you to tell us whether you are experiencing any symptoms that are important for us to know about before you start the stimulation. We want you to take these questions seriously and answer them as truthfully as you can.
 - a. Should you report any significant experience of negative symptoms the stimulation session will be blocked, and you will not be able to continue with stimulation. We will be in contact with you to gauge the severity of the risk and decide whether you can continue with the stimulation.
 - b. Most of the questions are for the patient to answer. However, at the end there are a few questions directed at the administrator.
- 7) Step 7: Equipment set up. The next few screens on the tablet will guide you through the process of setting up your stimulation device. We have discussed this process extensively in section 2 of this video course. Should you need a refresher, please consult section 2 of this video.
- 8) Step 8: Start the stimulation. Once you have set up the stimulation equipment and passed the connectivity check, you will be presented with the following screen. Once you are ready, click the yellow 'start' button to begin the stimulation.
- 9) Step 9: Post-stimulation questionnaire. Once you have finished the stimulation, we will again ask you to respond to a short questionnaire. The purpose of this post-stimulation questionnaire is to measure any differences in symptoms between before and after stimulation. Again, we want you to



take these questions seriously and answer them as truthfully as you can. Should you report any significant experience of negative symptoms we will be in contact with you to gauge the severity of risk to your wellbeing.

Congratulations! You have now finished section 3 of the video course, setting up the tablet. In the next section we will go through some common problems you may run into and how you can resolve them. But first, please take the time to complete the following quiz about the information presented in this section. Thank you!

SECTION 4

This section will guide you step by step with detailed instructions on how to solve the most common problem that you can encounter during the stimulation session. Please pay attention to all actions; at the end of the section, you will be asked to respond to a short quiz. THANK YOU.

- 1) Electrode connectivity Check: Before starting the stimulation session, you will be asked to wait while the Home App checks the connectivity of each electrode.
- 2) Likely, you will not pass the connectivity check on your first try.
- 3) For safety, the system will not let you continue until all electrodes demonstrate an excellent connection.
- 4) If you do not pass the electrode connectivity check, you will receive a message on the screen that tells you one or more electrodes need further adjustments. This is very common.
- 5) The Home App graphics will guide you step by step to double-check your setup and make adjustments to the electrodes. A red circle will appear on the electrodes that need further adjustment, as shown in the video.
- 6) To improve the electrode's connectivity, 4 steps are essential. Step 1, make sure that the cable is well inserted into the device. Note you do not need to take the device and the cable off the headcap, it will be easier to perform this operation while both are still attached to the cap.
- 7) Step 2, make sure there is gel on the connector pads inside the ear-clip. The ear-clip should be securely placed on the participant's right earlobe and should not slide down.
- 8) Step 3, for the electrodes that were highlighted in red by the home app, unscrew the top parts. Use either the syringe or a Q-tip to part the hair exposing the scalp. Then fill the electrodes halfway with gel and screw the top and bottom parts of the electrodes back together once you are done.
- 9) Step 4, make sure the cables are clipped correctly by color matching the wires to the colored buttons on the headcap.
- 10) Once you have completed these 4 steps it may be useful to press down each electrode to check if they are closely in contact with the scalp. If there is an air gap in between, use tape to tape the electrode down.
- 11) After following the steps displayed on the screen, the system will recheck connectivity. You may need to try multiple times to get it right. If you still experience connectivity issues after a few tries, please call your study team for help.



- 12) Another issue you might run into is that the session may automatically abort while stimulation is in progress. This can happen when the connection between the electrodes and the scalp worsens over time. Luckily, if you follow the upcoming instructions you will be able to restart the stimulation and complete the remaining minutes of the session.
- 13) At this point you should not take off the headcap. All you should do is click on the green button that says: "BEGIN THE SESSION" to complete the remaining stimulation time. The home app will walk you through the instruction pages and recheck connectivity. Please use this opportunity to double-check your set up.
- 14) To prevent the session from automatically aborting again, the administrator should periodically check all the electrodes by pressing them down to ensure they are always in close contact with the scalp. If one or more electrodes start to become loose, quickly add a tape to tape them down tightly. The administrator should also make sure the ear-clip stays on and does not slide off the participant's earlobe the entire time.
- 15) Congratulations! You have completed section 4 of the video. Here we discussed solutions to some frequent issues related to the stimulation. Please take the following quiz to test your knowledge.

SECTION 5

Now that you have completed the stimulation, it is time to clean up! In this section we will give detailed instructions on how you should clean up and safely stow away all the stimulation equipment.

- 1) First, clip off the electrode cables from the electrodes. Disconnect the electrode cables from the stimulation device, and then take off the stimulation device from the headcap. Once you have done this you can go ahead and turn off the device. There is a button on the bottom of the right side of the device. Press this until the LED light behind the NE logo turns off. You have successfully turned off the device!
- 2) Now it is time to wash the headcap. First, you must take off the headcap. Take out the electrodes and turn the cap inside out. Wash the cap with hand soap. Make sure the cap is wet before you do this.
- 3) After this, you should rinse the soap from the headcap and leave the cap to dry.
- 4) Now it is time to clean the other components! Rinse the electrodes, earclip, and the syringe with warm water to wash off the remaining gel. Again, here it is also important that you do not soak the components in hot water!
 - a. It is possible that some gel dried up in the tip of the syringe and blocks the water. If so, use a pin to unblock the syringe.
 - b. A useful tip is that you can use the syringe to wash off the gel from the parts of the gel that are hard to get to.
 - c. After this is done let the electrodes, earclip, and syringe dry somewhere on a towel.
 - d. Once things are dry you can safely store them in the NeuroElectrics box. Please also include the electrode cable into the box. Then, put the box in a secure location until you will use the equipment for the next session.



- 5) Now it is time to make sure that the stimulation device is charging so it will be ready for use for tomorrow's session.
 - a. Look for the stimulation device charger.
 - b. Then, plug one end of the charger into an outlet, and the other into the bottom of the stimulation device.
 - c. You know the device is correctly charging if the light next to the charging port lights up. **YOU.**
- 6) Now, you must charge the tablet.
 - a. The charger can be found in the tablet box.
 - b. The charger consists of two components as is depicted in the picture here.
 - c. You must combine the charger and the power cord to assemble the charger. This picture shows how that should look.
 - d. Finally, you must plug the charger into a socket on the one end and into the tablet on the other end. Look at the picture here to see where you must plug the charger into the tablet. Once the charger has been correctly attached, a little white LED light on the charger will light up.

Congratulations you have now completed the video section about cleaning up the equipment after the stimulation. You will be asked to respond to a short quiz before you can move on to the next section. **THANK YOU.**

SECTION 6

This section will provide important information on the risk and benefits of home based tES, on commonly reported side effects, on the safety procedure to protect the participants, what to do in case of adverse events and to provide contact information to study participants. Please pay attention to all actions; at the end of the section you will be asked to respond to a short quiz. **THANK YOU.**

- 1) Transcranial electrical stimulation is a safe, noninvasive brain stimulation technique currently being used in a wide variety of clinical and research fields. Transcranial electrical stimulation (tES) is a painless method for focal brain stimulation. Hundreds of tES trials have demonstrated the technique to be well tolerated and safe.
- 2) Some common side effects of tES are sensations that can be felt under the electrodes during stimulation include mild tingling, light itching, slight burning, discomfort, or mild pain. These sensations can sometimes continue for a brief period following completion of the stimulation session but are usually resolved shortly after stimulation.
- 3) More general side effects that can occur during or after tES are skin redness, mild fatigue, headache, and difficulties concentrating.
- 4) More rarely, one may experience nausea and nervousness. And although it has never been reported for the use of tES, seizures are a theoretical risk.
- 5) At the beginning and end of each session a questionnaire will be given asking about experience of any negative sensations or symptoms, whether related or unrelated to the stimulation.



- 6) In the pre-stimulation questionnaire we will ask you whether you are experiencing any **headache, neck pain, or scalp pain**. If you indicate that you don't have any of such pains, or that you only have a mild version of such pains, the stimulation session will proceed. However, if you indicate that you are moderately or severely experiencing such pains, then we will not allow you to proceed with the stimulation session. In that case a notification will be sent to the study contact number and email. Depending on the severity of the situation, we may advise you to contact your general health care provider or report to the Emergency department for evaluations.
- 7) In the post-stimulation questionnaire, we will ask you whether you are experiencing any sleepiness. Again, if you indicate that you are either not or only mildly experiencing sleepiness, then no further action will be taken. If you are experiencing moderate or severe sleepiness, then a notification will be sent to the study contact number and email. We will determine if the session can be continued or rescheduled. We may advise you to contact your general health care provider or report to the Emergency department for evaluations.
- 8) In addition to the questions asked to the patient, the administrator will be asked to conduct daily scalp checks. During a scalp check the administrator will see if they can find any skin redness, scalp burning, or even scalp lesions.
- 9) Then, in the pre-stimulation questionnaire we will ask the administrator to indicate if any skin abnormalities were discovered during the scalp check. If no abnormalities are found, then the session may proceed. If abnormalities are discovered, then the session will stop. A notification will be sent to the study contact number and email. We will determine if the session can be continued or rescheduled. We may advise you to contact your general health care provider or report to the Emergency department for evaluations.
- 10) Throughout the study we will watch out for any potential adverse events. An adverse event is any untoward medical occurrence in a participant, whether causally related to the study or not. Adverse events will be recorded on the appropriate case report forms and source documents. The investigator and/or trained staff member will evaluate all adverse events as to their severity and relation to the test article.
- 11) Any participant who suffers an adverse event during the conduct of study protocols will be triaged immediately by the medical investigators and will be referred to their primary care physician and/or treating psychiatrist for ongoing care. The treating provider will bill the insurance company or other third parties, if appropriate, for the care a participant receives for any injury. We will try to have these costs paid for, but the participant may be responsible for some of them. There is no cost to the participant or insurer for the device.
- 12) If throughout the study any question arise, we can always be contacted at the study email and study phone number provided. All requests will be reviewed and answered in a timely manner, within less than 24 hours. If a serious medical adverse effect or urgent matter occurs, please put **urgent** in the email title, and **leave a message** at the study phone number if you do not receive an answer. All urgent matters will be responded to within an hour.

Congratulations you have now completed the last training video section of this home-based tES course. You will be asked to respond to a short quiz before you are completely done. We will review your answers for all the quizzes. THANK YOU for taking the time to go through these videos.