**BLAES Parameter Sweep Experiment**

*Order of Operations*

1. Informed consent with patient (BLAES protocol)
   1. Briefly describe each of the 5 video options (see write-up of video summaries) to the patient and ask them which one they would like to watch during the task
2. Modify the Parameter Sweep run script
   1. Navigate to C:\Users\Brunnerlab\Desktop\BLAES\_param\_sweep
   2. Open the BLAES\_stimsweep\_generator\_CCEP.m
      1. Modify the script to reflect the patient’s video choice
         1. In line 90 change the “video\_num” variable to a number 1-5 based on which video the patient indicated wanting to watch
            1. Video 1 = 1 Year of Growing Food
            2. Video 2 = 2 Hours of Digital Art
            3. Video 3 = 500 Days Survival and Building In Rainforest
            4. Video 4 = Bob Ross Painting
            5. Video 5 = 60 Minutes Episode Great Inventions
      2. Modify the script to reflect the appropriate amygdala stimulation channels
         1. In lines 78 and 79 change the “cathodeChannels” and “anodeChannels” to the appropriate channel numbers for the two different amygdala stimulation locations
            1. **Be sure the cathode and anode channels are aligned vertically across lines 78 and 79 in the script for appropriate bipolar pairs**
      3. Modify the script to disable the CCEPs functionality
         1. In line 100 change the “allowCCEPs” variable to 0
            1. ***The first run with the patient will always be without CCEPs***
            2. If there is time for a second run with the patient, you can change this back to 1 to enable CCEPs
      4. Modify the script for the appropriate electrode surface area
         1. In line 87 change the “electrodeSurfaceArea” variable to the appropriate surface area (in mm2) based on the amygdala electrode for this patient
            1. WashU PMT electrodes = 5
            2. Utah Dixi electrodes = 5
            3. AdTech Behnke Fried electrodes = 7
      5. Modify the script to regenerate the Stimulation Test testing sequence and .png image that will be used for after-discharge testing with the neurologist
         1. In line 98 change the “generateTest” variable to 1
            1. This step is only necessary if the electrode surface area is being changed. (Setting this variable to 1 will regenerate the .png image that is used for testing with the neurologist and will reflect the updated charge densities.)
      6. Verify that no stimulation configurations are set to be removed
         1. In line 97, for the conditions2remove, make sure this list is empty (delete any values that are set here from a previous patient)
3. Once the modifications above are made, run the BLAES\_stimsweep\_generator\_CCEP.m script
   1. This will generate the Stimulation Test and Video parameter files with the updated channel numbers, etc. specified in the above steps
      1. You can verify the parameter files were updated/created by navigating to: C:\Paradigms\parms\BLAES\\_BLAES\_param\_sweep
4. Stimulation Testing w/ Neurologist
   1. Navigate to: C:\Paradigms\batch.blackrock\BLAES\_param\_sweep
   2. Open the \_BLAES\_ParamSweep\_test.bat file
   3. Open Config to verify the patient ID is set correctly and the stimulation triggers are set for the correct channels
   4. Set Config
   5. Start
   6. Test each stimulation configuration in order from lowest charge density to highest charge density based on the .png image displayed on the patient monitor (i.e. left to right and top to bottom)
      1. First make sure your cursor is clicked onto the patient monitor where the stimulation config image is displayed (to ensure key presses don’t modify settings in the BCI2000 GUIs)
      2. To initiate a particular stimulation configuration hit the keyboard letter key associated with that stimulation configuration (listed in the .png image displayed on the patient monitor)
         1. The CereStim Upload Status in the BCI2000 “Operator Watches” window should reflect the letter key press
      3. To deliver a 1s burst of stimulation with this specific stimulation configuration hit the Enter key on the keyboard
         1. Repeated Enter key presses will continue to deliver 1s bursts of stimulation at this stimulation configuration
      4. Repeat the initiation letter key press and subsequent Enter key presses until all stimulation configurations have been tested
      5. If a stimulation configuration causes after-discharges or becomes uncomfortable for the patient, **discontinue the stimulation testing and make note of the current stimulation Combo # and all subsequent (higher charge density) Combo #s (these stimulation configurations will need to be removed from the Video task in the steps below)**
   7. If no stimulation configurations need to be removed, you can proceed with the task
      1. Navigate to: C:\Paradigms\batch.blackrock\BLAES\_param\_sweep
      2. Run the batch file associated with the video selected by the patient
5. Removing Stimulation Configurations
   1. Modify the Parameter Sweep run script to remove any stimulation configurations indicated by the neurologist during the stimulation test
      1. Navigate to C:\Users\Brunnerlab\Desktop\BLAES\_param\_sweep
      2. Open the BLAES\_stimsweep\_generator\_CCEP.m
      3. In line 98 change the “generateTest” variable to 0
      4. In line 97 for the conditions2remove, add the numeric values for all stimulation configurations/Combo #s that need to be removed
      5. Once these modifications above are made, run the BLAES\_stimsweep\_generator\_CCEP.m script
         1. This will generate a new Video parameter file with the specified stimulation configurations removed
         2. You can verify the Video parameter file was updated by navigating to: C:\Paradigms\parms\BLAES\\_BLAES\_param\_sweep
6. Run the Task
   1. Make sure the speakers are turned on for the patient cart
   2. Navigate to: C:\Paradigms\batch.blackrock\BLAES\_param\_sweep
   3. Open the batch file associated with the video the patient selected
   4. Open Config to verify the patient ID is set correctly
   5. Set Config
   6. Start