**Technician: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Participant Information:**

|  |  |  |
| --- | --- | --- |
| **Name:** |  |  |

1. Birthdate: (mm/dd/yy) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Age: \_\_\_\_\_\_\_\_\_\_\_
2. Sex: Female Male
3. Weight: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lb. or kg.
4. Height: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ inches or cm
5. Handedness: Right Left Ambidextrous
6. Location:  Outpatient qEEG lab  Bedside  Ambulatory  Other (specify):
7. Video?  Yes  No  Other \_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| 1. Reason(s) for referral? (check all that apply)   Research  Clinical  Other | 1. qEEG recording time:   (check one)  5 minutes  8 minutes  Other \_\_\_\_\_\_\_\_\_\_\_ |
| 1. Recording Condition: Eyes   Eyes Open  Eyes Closed | 1. Amplifier calibrated for this study or in past 6 months? Yes  No State amplifier name: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| 1. Sampling Rate:   128 Hz  256 Hz  512 Hz  1024 Hz  Other: \_\_\_\_\_\_\_\_\_\_\_ | 1. Electrode choices:   Wet  Dry (not for research due to high impedances   1. All electrode impedances below 5kOhms?  Yes  No |
| 1. Offline filter parameters:  Low Pass \_\_\_\_\_  High Pass \_\_\_\_\_  Band Pass  Other \_\_\_\_\_\_\_\_\_\_  None used 2. Behavioral State of Participant:  Awake Drowsy  Unresponsive  Asleep  Other (please specify): 3. Is this measurement resting state  or active task  ? If active, record task parameters:   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |

1. Artifact removal:

AO – artifact cut from record (recommended)

AC – uses ICA or PCA for reconstruction (not recommended)—invalidates (distorts) data therefore not recommended (https://www.youtube.com/watch?v=BfqCh2UeJik)

1. Reliability estimates on edited, artifact-free qEEG > .90? Yes  No
2. Electrode Placement: 19 channels (minimal for research) or  specify number of electrodes over 19\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. Montage:

|  |  |  |  |
| --- | --- | --- | --- |
| Average Reference | Deymed | Discovery | NeuroField |
| Common Reference | Deymed 19 | Discovery 19 | NeXus21 |
| Laplacian | Deymed 22 | Fistar | NeuronSpectrum |
| Linked Ears | Bipolar | Mitsar | Mindset |
| Nicolet | Cadwell | Nihon Kohden | GmbH |
| NovaTech | Other: | | |

1. Comparison Parameters:  Normative Database or  Controls? If database used, name database \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Experimental condition:  No Blinding  Single Blind  Double Blind
3. Briefly describe procedure to be used for recording issues which may arise during session:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. Use of eye movement (EoG) electrodes?  Yes  No
5. Use of EKG artifact electrodes?  Yes  No
6. Use of sEMG electrodes?  Yes  No
7. Observations of EEG Record?  Excessive spiking  epileptiform activity  Drowsiness  Other observations:

**-----------------------------------------**

**Normative Databases are vital to patient evaluation and science. For example, normative databases are typically used in blood tests, nerve conduction studies, ocular and retinal studies, and are integral to MRI, Fmri and PET. All of these dabases meet a set of statistical and scientific standards, including peer-reviewed publications, discoosure of inclusion/exclusion criteria, age range, number of samples per age group, SES status, statistical tests of validity, reliability and cross-validation, adequate sample sizes, etc. It is therefore recommended that the electroencephalographer use a validated normative database. Following is a list of gold standards by which to judge a QEEG normative database:**

* **Amplifier matching**
* **Peer-reviewed publications**
* **Artifact rejection**
* **Test-retest reliability**
* **Inclusion/exclusion criteria**
* **Sample size by age group (check for adequacy)**
* **Approximation to a normal curve**
* **Cross validation**
* **Clinical correlation**
* **FDA-registered**

Important note: All elements on this CRF are considered Supplemental – Highly Recommended and should be collected as part of a qEEG study.

**Specific Instructions**

**\***The intent of this module is to provide minimal data elements in the data collection of **Quantitative Electroencephalography (qEEG)**, which is distinguished from **non-quantitative EEG or visual examination of the EEG signal.** In visually-examined EEG, the technician or neurologist visually examines, without quantification, the eeg signal. In contrast, qEEG is the use of computers using Fast Fourier Transformations with power spectral analyses of the EEG signal to offer a much higher sensitivity and specificity than visual EEG alone. qEEG performs numerical analysis of the electrical potentials of the human brain recorded from the scalp surface, making its measures invisible to “eyeball” EEG.qEEG’s strength lies in its ability to detect a continuum of dysregulation in network dynamics which apply to a wide range of neurological and psychological brain disorders not visible to the naked eye.

An important fact to keep in mind when evaluating the brains of individuals with CFS or ME is that one is looking for brain damage that one could not necessarily see even if the brain were somehow removed from the skull. Since 1932 when Hans Berger first used the EEG in a clinical condition, many scientists have consistently found dysregulation in brain regions which can be matched to neuropsychological test scores. For the purpose of CFS or ME, the most consistent findings are as follows:

1. Reduced power in high (>8) frequencies, which is related to white matter deficits.
2. Changes in lower frequencies, especially delta.

Hypoconnectivity in delta network analysis, especially in the delta and alpha bands.