The Basics of EEG
General Welcome and Introduction, Overview of Course

Background
· History, anatomy vs. physiology (structure vs. function)
· Technology – digital EEG, computer power
· Advantages of EEG technology - timing, noninvasive, inexpensive
· Clinical Applications, Diagnostic issues, Treatment related (including NF)
· Amplitude and frequency, filters, infra-low frequency signals
· Q and A

EEG Sources, Recording, Viewing
· Generators – where do EEG signals come from?
  High threshold bursting neurons and chemical environment
· Localization - dipole model, LORETA (more in qEEG presentation)
· Measurement 10/20, 10/10
· Viewing and interpretation of waveforms
  Montage and reference
  Artifacts
· Reliability of EEG Patterns: Phenotype model
· Q and A

Cygnet Screens
· Examples
· Q and A

Examples of EEG Patterns and Abnormalities
· Slowing
  Drowsiness and sleep
· Developmental
  Hypnagogic hyper synchrony
  Posterior slow waves of youth
· Pathology
  Persistent focal v. Diffuse
  Intermittent bursts of slow
· Burst patterns and paroxysms
· Seizures, types, first aid
· Q and A

Medication Effects
· Psychotropic medications
· Neutraceuticals, vitamins, hormones
· Drugs of Abuse
· Q and A

Summary and Review
The Basics of qEEG
Brief Review of Previous Day, Outline of Today’s Lecture

Background on EEG Analysis
- Basics of spectral analysis – artifecting, background vs. transients, resolution
- Compressed Spectral Array, sum and difference displays using two EEG channels
- Topographic Mapping – amplitude, variability, difference maps
- Coherence and phase
- Bispectral analysis
  - Q and A

Z-Scores and Normal Databases
- Meaning and computation of a z-score
- Patterns of z-score deviations
- Databases- Availability, usefulness and weaknesses
  - Infra-low and Gamma
  - Q and A

Source Localization
- LORETA – intensity vs. connectivity
  - Number of electrodes
- Network Analysis – Covariation over time
  - Q and A

Event Related Potentials
- Signal Averaging
- BAERs
- Dipole Generators vs., Phase reset Models
  - P300, MMN
  - P600 and language
  - Q and A

Examples of qEEG Patterns and Abnormalities
- Slow patterns:
  - Dementia
  - Stroke
  - Drowsiness and sleep
- Developmental:
  - Learning disability- Dyslexia
  - Autism and PDD
  - Effects of abuse, trauma, and neglect
- Psychiatric:
  - Anxiety
  - Depression
  - Psychosis
  - Medication Effects
  - Q and A

Predicting Outcome
- Predicting Outcome with medication and neurofeedback
  - BRITE trial
- Clinical Interview
- Phenotype Model again
  - Q and A

Summary and Review