* Dr Eric Chudler
  + Bruxism
    - EC: targeted, doable, emg is easier to do. Top choice
  + Therapy Mapping
    - What conditions targeting
      * Spinal cord injury, upper limb, hands/arms; maybe stroke patients as well
    - Would this have an app monitoring it?
      * Yes,
      * Goal 1: adjustable sleeve for tracking of movement
        + Put sensors in same place every day
      * Goal 2: analyze being abel to classify different movements and analyzed throughout the day
      * Goal 3: ML algorithms
      * Goal 4: enhanced therapist experience
    - EC: second choice
  + Visual Expression
    - Do you think 16 channels in enough?
      * Could be depending on which channels we choose
      * Other models have used 16 channels
    - Study a few years ago that tried to use model to
    - EC: this is going to be hard to do in 10 weeks, eeg is hard, not sure of clinical relevance
    - EC: music synthesizer is possible and much simpler and has a good use case for spinal cord injury people to still be able to be creative
* Dr Kim Ingraham
  + Bruxism
    - How would it be worn
    - Make sure to pitch vision of how it would look
    - Ask potential users: is your teeth grinding bad enough to wear a headband
  + Therapy mapping
    - Separate guis for therapist & patients
      * More to improve therapist decision making
    - Does something like this exist now? How are therapists getting this info now?
      * Mostly questionnaires & physical examinations
    - KI: cool idea, relevant challenge right now, using tech in the loop with PT
    - KI: closing the loop between strength of emg signal and outcome
    - Can you prove the same thing by using a grip sensor
    - Does PTs care about individual muscles?
    - Forearm has alot of small muscles and cross talk
  + Visual expression
    - Who is target market
    - VE idea is complicated
* Dr Amy Orsborn
  + Bruxism
    - 3rd part needs lots of data
    - Target users: how would you titrate strength of vibration motor
    - Does literature support vibration?
  + Therapy mapping
    - Customers would be clinicians? Yes, PTs
    - Do PTs need or want this device?
    - How long would it take to put on? What is the wearability of it?
  + Visual expression
    - How would you validate that its working?
    - For the two w/o ground truth…. Would customers get frustrated using the device? Need to test some measure of efficacy? As you get towards product, need data that shows that people enjoy using it.
  + Project ranking:
    - Where we’d spend most of the time makes them different. Therapy mapping wed spend most of our time on the hardware and perfecting the placement. Bruxism is more about integrating the systems; when to stimulate, what to stimulate, determining efficacy. Visual expression - challenge is evaluation and determining what to optimize.
* Dr Jeffrey Herron
  + Music synthesizer
    - Technical parts - BCI task… how many degrees of freedom? Pitch up and down, volume up and down? Space of controllability that someone is expected to work with.
    - Takes alot of training for someone to learn a single degree of freedom with EEG based systems…. this is a lot to train
    - Very similar to cursor control, just with auditory results instead of movement ones
    - Want to be a conscious thing, not just doing biofeedback.
    - What would be required for creativity - if output controls input and there’s a feedback loop
    - Big ask of 10 week project, more of a scientific study
    - Eeg based systems are very difficult to do active curson control with
      * Lots of literature for EEG based task design (translate
  + Bruxism
    - Think about where classifier lives - on microcontroller or on cell phone app? Microcontroller better
    - Need reference electrode
    - Voltage symbol
  + Therapy mapping
    - Why does it need to be a sleeve in rehab environment
    - How far would you push in 10 week project? Would you collecting data? How would you be collecting data? Then you’d have to provide the data to therapist for them to quantify. Where is the processing happening?
    - Do you want to make EMG hardware? Or would you rather code?
    - Dry electrodes are really sensitive to motion. Not stabilized by gel. Any amount of movement across surface creates a lot of noise, which looks very similar to EMG data.
  + Top pick: bruxism
* Dr Sarah
  + Bruxism
    - Think about usability and design on the user
    - Is the signal clear
    - Think about gamification
      * Build in behavioral nudges with dopamine response to those things
  + Therapy mapping
    - Pick very specific muscles and big muscles where the signal is much easier to detect. EMG is very messy and changes very much within a person day to day. Would require long period of time to detect increase/decrease in muscle activity…. Maybe lower limb would be clearer?
    - IMU - electrogoneometer
    - Not sure if IMU provides what we need
    - Maybe in a stroke population, muscle activity is significant over time
  + Visual expression
    - Big population of people who cant see anything in their mind
    - Curious if different in neurotype - autistic vs non-autistic
* Alex Berardo-Cates, MS
  + Bruxism
    - Level of ambition is appropriate for 10 weeks
    - Clearly scoped & defined
  + Therapy mapping
    - How does this differ from existing therapist quantitative methods?
    - Motivation setting based task makes sense
    - What are you trying to complete within 10 weeks? Building model with IMU and EMG data?
  + Visual expression
    - Fun, cool idea
    - Low risk project
    - Not dealing with potential injury - dealing with creativity and art
    - User testing and being able to show that its working within a 10 week timeline
    - Seems room to pivot is limited. If it doesnt go as planned, not the easiest idea to scale back.

|  | Eric (BIOE) | Pro. Kim+ TA | Amy (BIOE) |
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| Idea 1 bruxism | 1. Doable: EMG  2. Masseter is a good target  3. Monitoring is easy | 1. How to stick on the face: sticker  2. Think about how to convince people want to use | 1. Vibration and stimulation evidence  2. Software: how much stimuli we need |
| Idea 2  IMU | 1. Doable: EMG | 1. Does individual muscle important for therapist?  2. Large Database is also what we can get | 1. PT or patient?  2. Do PT need this device?  3. Precise location, for individual (Hardware) |
| Idea 3 | 1. 16 channels may not enough  2. Similar idea: interpret dream  3. EEG is difficult | 1. Is there any ground true?  2. How to define customers? | 1. How to validate? Ground true |
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