tCS Safety

Boston, 24th February 2017
Safety Recommendations

• Screening for exclusion criteria
• Keep informed of new safety guidelines
• Consider specific device
• Obtain IRB approval
• Consider environment for stimulation (ex. Hospital/University)
• Have emergency procedures prepared
Practical Safety Considerations

- Hair
- Excess Water Run-off
- Old/Dried out sponges
- Broken Electrodes
- Rusting of Equipment
- Battery Charge
- Current Fluctuation During Stimulation
- Current Spiking During Device On/Off
Risks to Subjects
Theoretical Risks (1): skin

• Potential Effects
  – Electrolysis, Permeability Changes, Increased Metabolic Activity, Seizure?
• Burn
• Stimulating subjects with:
  – Reduced Sensation
  – Broken Skin
  – Conductive Implants
  – Tumor
  – Concurrent Pharmacological Treatments
Tissue heating

- Animal study —
  Liebetanz et al, 2009
Skin burn/dermatitis

Skin lesion: “The anodal electrode was fixed by an EEG cap. Two mA stimulation current was applied for 26 min, including 30 s ramp in and 30 s ramp out.”

Healthy subject – single session (Wang, 2015)
Skin lesion (2)

Patient – several sessions (4/5) – 1mA over 20 minutes.

(Palm, 2008)
Contact dermatitis

Healthy subject: Single session, symptoms appeared after 24 hs of stimulation and got worse. (Kaubish, 2012)