Poster Location: 9

**Multimodal optical imaging reveals rapid changes in absorption, scattering, and perfusion in the brain during cardiac arrest and post-resuscitation recovery**

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Over 565,000 people in the United States are affected each year by cardiac arrest (CA), and only a small percentage of these patients regain neurological function at or near their baseline levels. This poor outcome is largely attributed to the ischemic effect of CA on the brain, as well as the lack of reliable interventional techniques to improve reperfusion following cardio-pulmonary resuscitation (CPR). To obtain increased insight into the relationship between cerebral hemodynamics and electrical activity during CA and post-CPR, we developed a multimodal monitoring platform including optical imaging and electroencephalogram (EEG). We used this instrumentation to continuously monitor the brain in a clinically-translational rodent model of CA and CPR that mimics an intensive care setting. The rapid optical technology includes spatial frequency domain imaging (SFDI) and laser speckle imaging (LSI). SFDI obtains information about tissue hemoglobin concentration, oxygenation, and scattering at frame rates of up to 14 Hz. LSI provides spatial maps of blood flow at frame rates of up to 60 Hz. These techniques allow us to observe the spatiotemporal dynamics of parameters related to tissue perfusion, oxygenation, metabolism, morphology, and composition, throughout the experiment. We can visualize and quantify hyper-dynamic changes in these parameters even at times when the EEG has gone flat and there are no prominent fluctuations in the mean arterial blood pressure. We consistently observe changes in these parameters that coincide with entry into cardiac arrest, initial recovery of cerebral blood flow following CPR, and resumption of EEG activity. Using this data, our multimodal system has the potential to serve as a “test bed” for assessing the response of the brain to clinically-translatable interventional techniques during and immediately after CPR to promote cerebral reperfusion and improve neurovascular outcome.

**Keywords:** cardiac arrest; resuscitation; brain imaging; optical imaging; cerebral perfusion;

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Poster Location: 10

**Tinnitus Treatment Using a Novel Web-Based CBT Application: A Pilot Study**

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Objective: To evaluate the efficacy of web-based cognitive behavioral therapy (CBT) in the management of patients with chronic tinnitus. Study Design: Pilot clinical trial. Setting: Tertiary care medical center. Intervention: The subjects completed an online course spanning 8 to 10 weeks. During the online course, subjects were educated on the pathophysiology and management strategies for tinnitus in addition to cognitive behavioral therapy (CBT). The CBT modules included guided meditation, recognizing and controlling stress, and restructuring negative thoughts. Results: A total of 18 subjects with tinnitus were enrolled with 11 subjects (61%) completing the study. Mean age was 57±17 years. Paired sample t-test analysis of pre- and post-course surveys showed a mean difference of 21 in the Tinnitus Handicap Inventory (THI) (p=0.002). There was no statistically significant change in pre- and post-course psychoacoustic tinnitus measurements, or in depression, anxiety, stress, or post-traumatic stress disorder scores. Conclusions: Internet-based CBT is a potentially effective modality for providing patients suffering from chronic tinnitus a tool to manage symptoms. Our results indicate that web-based CBT helps reduce tinnitus the subjective loudness of tinnitus and impact it has on daily living as measured by the tinnitus handicap inventory.

**Keywords:** CBT; Tinnitus; therapy; clinical trial; internet based;