

Music for Epilepsy: Examining the Effect of Recorded Music on Epileptiform Activity in Pediatric Epilepsy

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Current research suggests that Mozart's *Sonata for Two Pianos in D Major (K.448)* can reduce epileptiform discharges and seizure frequency in children with epilepsy. While promising, past protocols are heterogeneous, and within-study comparisons to other music stimuli remain unexplored. Our pilot study aimed to examine whether exposure to Mozart K.448 or patient-selected preferred music altered epileptiform activity and clinical seizure frequency in children (ages 4–17) admitted to our Pediatric Epilepsy Monitoring Unit (EMU.) During their EMU stay (2–7 days, $M=3.30$), patients ($N=10$, 5 females, age ($M\pm SD$)= 10.42 ± 2.81) listened daily to Mozart K.448 and a time-matched instrumental mix of preferred music (~8.5 minutes each) via earbuds in a randomized order, with a ten-minute washout period in between. Continuous video-EEG captured epileptiform discharges and clinical seizures, while a pulse-oximeter monitored heart rate/heart rate variability throughout the session, including ten-minute pre- and post-music resting-state recordings. Exploratory behavioral measures were also collected. Preliminary data from $N=4$ participants were usable (excluded $N=2$ for noise, $N=1$ for altered patient mental status, and $N=3$ for negligible spiking). Spike-wave index (seconds with spikes/total time) showed minimal change from baseline across conditions (Δ pre-Mozart ($M\pm SD$)= 0.008 ± 0.04 ; Δ pre-preferred 0.03 ± 0.03 ; Δ pre-post 0.009 ± 0.04). Average heart rate also remained largely stable across conditions (Δ pre-Mozart -3.19 ± 6.13 ; Δ pre-preferred -6.13 ± 3.38 ; Δ pre-post -2.56 ± 7.85), with no significant differences detected (Kruskal-Wallis test, all $p > .05$). Although no condition-level effects were observed in this small preliminary sample, this pilot study demonstrates the feasibility of implementing structured music protocols in the pediatric EMU setting. Ongoing analyses of preferred-music features (e.g., tempo, style), along with continued participant recruitment, are expected to provide deeper insights into potential individualized effects of music in pediatric epilepsy.