

Music-Based Sound Stimulation in Pediatric Acquired Brain Injury Rehabilitation: A Preliminary Case Study

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ABSTRACT

Sensory input is used in rehabilitation to stimulate subcortical and cortical activity in patients with acquired brain injury (ABI). Recent studies have shown that patients in minimally conscious and persistent vegetative states show neural activity in auditory and prefrontal cortices, and auditory association areas in response to auditory stimulation (Baker 2001, Boly 2005, Bradt 2010). Research supports the connection between music and sensory, emotional, motor and cognitive functions in higher level patients with ABI (Boly 2004). Increased research into the delivery of systematic, complex and meaningful sound stimulation is needed (Boly 2004). At Children's Specialized Hospital, progressive music-based sound stimulation protocols in association with Rancho Los Amigos/Levels of Coma Recovery have been developed to support the healing process. Children's Specialized Hospital is conducting limited clinical trials using The Listening Program™ and enhanced bone conducted sound. JP, a 9 year old girl diagnosed two weeks post Bickerstaff Brainstem Encephalitis (Rancho Level IV), began her 31-day listening protocol 12 days post admission. Parents and therapists observed decreased nystagmus, dizziness, and vomiting and an increased tolerance to movement, improved visual fixation, improved sleep/wake cycle, and decreased agitation which resulted in a decrease in medication. Both relate the changes in the rate of her recovery to her music-based sound stimulation program. Clinical findings suggest that listening with enhanced bone conduction may support neural activity associated with the vestibular system and assist the recovery of patients with ABI. Further research, with a feasibility pilot study and randomized clinical trials for both inpatients and outpatients, is warranted.

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