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                       Potential Neural Mechanisms

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   Sommario/riassunto Music is an important source of enjoyment, learning, and well-being in
                       life as well as a rich, powerful, and versatile stimulus for the brain. With
                       the advance of modern neuroimaging techniques during the past
                       decades, we are now beginning to understand better what goes on in
                       the healthy brain when we hear, play, think, and feel music and how the
                       structure and function of the brain can change as a result of musical
                       training and expertise. For more than a century, music has also been
                       studied in the field of neurology where the focus has mostly been on
                       musical deficits and symptoms caused by neurological illness (e.g.,
                       amusia, musicogenic epilepsy) or on occupational diseases of
                       professional musicians (e.g., focal dystonia, hearing loss). Recently,
                       however, there has been increasing interest and progress also in
                       adopting music as a therapeutic tool in neurological rehabilitation, and
                       many novel music-based rehabilitation methods have been developed
                       to facilitate motor, cognitive, emotional, and social functioning of
                       infants, children and adults suffering from a debilitating neurological
                       illness or disorder. Traditionally, the fields of music neuroscience and
                       music therapy have progressed rather independently, but they are now
                       beginning to integrate and merge in clinical neurology, providing novel
                       and important information about how music is processed in the
                       damaged or abnormal brain, how structural and functional recovery of
                       the brain can be enhanced by music-based rehabilitation methods, and
                       what neural mechanisms underlie the therapeutic effects of music.

Ideally, this information can be used to better understand how and why music works in rehabilitation and to develop more effective music-based applications that can be targeted and tailored towards individual rehabilitation needs. The aim of this Research Topic is to bring together research across multiple disciplines with a special focus on music, brain, and neurological rehabilitation. We encourage researchers working in the field to submit a paper presenting either original empirical research, novel theoretical or conceptual perspectives, a review, or methodological advances related to following two core topics: 1) how are musical skills and attributes (e.g., perceiving music, experiencing music emotionally, playing or singing) affected by a developmental or acquired neurological illness or disorder (for example, stroke, aphasia, brain injury, Alzheimer's disease, Parkinson's disease, autism, ADHD, dyslexia, focal dystonia, or tinnitus) and 2) what is the applicability, effectiveness, and mechanisms of music-based rehabilitation methods for persons with a neurological illness or disorder? Research methodology can include behavioural, physiological and/or neuroimaging techniques, and studies can be either clinical group studies or case studies (studies of healthy subjects are applicable only if their findings have clear clinical implications).