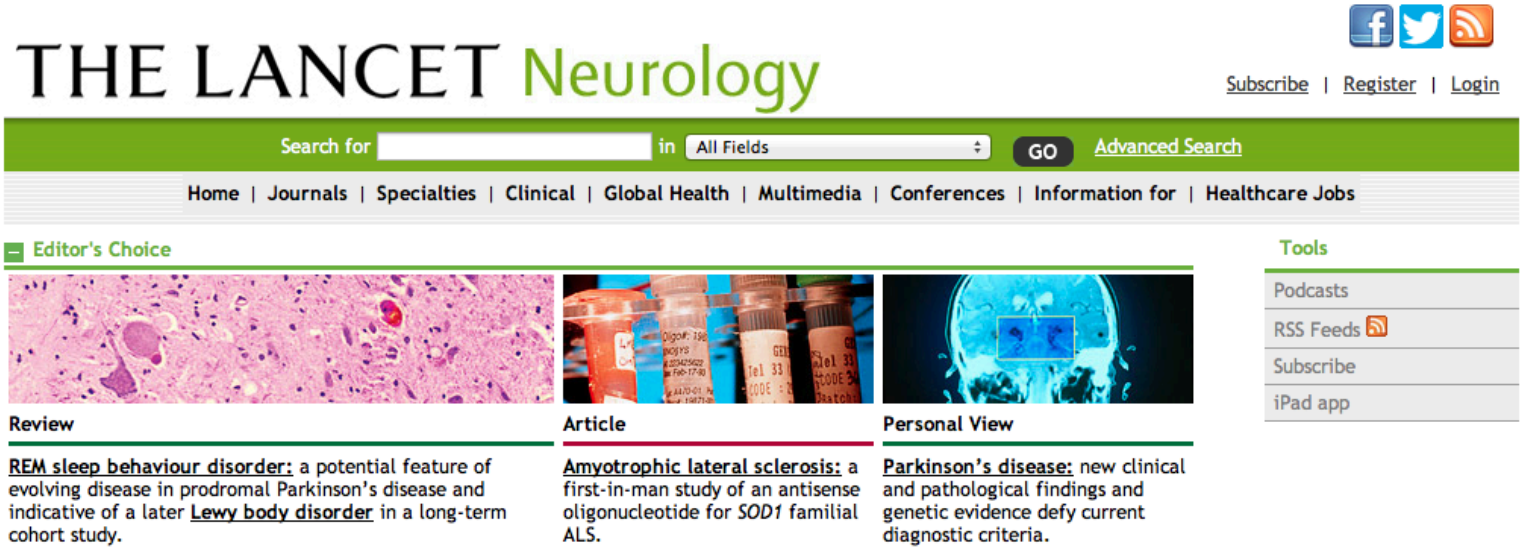


One of the world's leading medical journals, "The Lancet", invites authors, scientists, and doctors to explain their views on a topic or issue challenging popular perceptions, regarding various treatments for illnesses. Write an article for The Lancet that analyses the benefits of musical therapy, explaining how music can speak to us in ways language cannot, and informing your readers of its merits.

**Should we be using music as therapy for health and well-being? How does music speak to us in ways that language cannot?**

**By Chibi Auerbach**

Mental disorders are without a doubt, common obstacles that many experience in their lifetime. An estimated 26.2% of Americans ages 18 and older suffer from a diagnosable mental disorder in a given year. When applied to the 2004 U.S. Census residential population estimate for ages 18 and older, this figure translates to 57.7 million people. Nearly half of those with any mental disorder meet criteria for 2 or more disorders, with severity strongly related to comorbidity. These mental illnesses include bipolar disorder, schizophrenia, dysthymic disorder, obsessive compulsive disorder, panic disorder, and various others that affect us globally. There are numerous options for treatment such as medications, psychotherapy, brain stimulation treatments, and hospitalization and residential treatment programs. However, one source of therapy, although not as established or conventional as the others, has been scientifically proven to affect the human brain significantly. Music, using all of its facets- emotional, mental, physical, spiritual and aesthetic has allowed us the development of the ability to build connections with our inner selves and others around us. Music therapy harnesses the power that music itself possesses.

Being calming, joyful, or poignant, music has the ability to stir memories and powerfully resonate with our feelings by using its qualities and components of rhythm, melody and tonality to reflect our emotional and physical condition.  One of the primary advantages of music therapy is that it is helpful for those who find expressing themselves verbally particularly challenging, enabling clients to access and express their

creativity that is often flattened by feelings of low self-worth or depression. Stanford University research has found that musical training improves how the brain processes the spoken word, a finding that researchers say could lead to improving the reading ability of children who have dyslexia and other reading problems. The study shows that musical experience can help the brain improve its ability to distinguish between rapidly changing sounds that are key to understanding and using language. Researcher John Gabrieli, a former Stanford pysychology professor said that "what this study shows is that there's a specific aspect of language ... that's changed in the minds and brains of people with musical training…especially for children ... who aren't good at rapid auditory processing and are high-risk for becoming poor readers, they may especially benefit from musical training." A small but growing body of scientific evidence suggests that music and other rhythmic stimuli can alter mental states in predictable ways and even heal damaged brains. Not only does this investigation show us that playing a musical instrument has cognitive benefits, but also suggests that the brain is not an immutable organ fixed at birth but is adaptable, that with training people can alter their mental agility.

The brain does not consist of one “section” committed to processing music. This is because listening to music, even with simple compositions combines multiple distinct neurological processes. The auditory cortex is a crucial part of processing the sound of music. Part of the temporal lobe, the auditory cortex receives information from the ear and assesses the pitch and volume of the sound. Rhythm however, is only connected in a relatively minor way to the auditory cortex. Even a basic 1:12 rhythm requires the left frontal cortex, left parietal cortex and right cerebellum. Where more complex or unusual rhythms require additional areas of the cerebral cortex and cerebellum. Research has shown that music with a strong beat stimulates the brain and ultimately causes brainwaves to resonate in time with the rhythm, and slow beats encourage the slow brainwaves that are associated with hypnotic or meditative states. Thus faster beats may encourage more alert and centralized thinking. The above facts typify the adaptive qualities that music contains.

Harold Russell, a clinical psychologist and research professor at the University of Texas Medical Branch, used rhythmic light and sound stimulation to treat Attention Deficit Disorder in elementary and middle school boys. His research found that rhythmic stimuli that sped up brainwaves increased concentration in ways similar to ADD medications such as Ritalin and Adderall. He noticed that over several months of 20 minute sessions, the children made “lasting gains in concentration and performance on IQ tests and had a notable reduction in behavioural problems compared to the control group”. Russell used brainwave entrainment to help his wife recover from a severe stroke. "One day she told me the fog went away," he said.

Additionally, Thomas Budzynski a psychologist at the University of Detroit Mercy also discovered that rhythmic therapy could improve cognitive functioning in some elderly people by increasing blood flow throughout the brain. Budzynksi explained that "the brain tends to groove on novel stimuli, and when a novel stimulus is applied to the brain, the brain lights up and cerebral blood flow increases." To maintain the high blood flow, Budzynski used a random alternation of rhythmic lights and sounds to stimulate the brains of elderly people. Budzynski discovered that many of the seniors improved performance on an array of cognitive tests. Evidence based on hearsay suggests that this increased blood flow could also help victims of brain damage regain cognitive function.

The building of a musical structure around a central chord, otherwise known as tonality, reels in more parts of the brain.  Recognizing the tone of a piece of music relies on the prefrontal cortex, cerebellum, and many parts of the temporal lobe. Thus meaning that music already brings in three out of four lobes of the human brain—frontal, parietal and temporal, leaving only the visual processing occipital unaffected. Music has the ability to enhance one's creativity by affecting the brain's centre, responsible for creativity development. The act of processing music is centred on the right hemisphere of the brain, however it would be an oversimplification to state that the left side of the brain focuses entirely on logic and right on creativity. Although the music predominantly involves more of the right hemisphere than the left, the processing of music in the brain is so decentralized that it is hard to specify a single category for all the different areas involved. How can music speak to us in a way that language cannot? Songs that have lyrics draw upon the language centres of the brain. The two main parts of the brain associated with language are Wernicke's area (temporal lobe) and Broca's area (frontal lobe). Scientific research has indicated that Wernicke's area is crucial to language comprehension while Broca's area engages in language production, although there is significant overlap. In all circumstances, we can add these to the list of brain regions tied up in music comprehension. Violinist Robert Gupta delivers a TED talk on the effects of music on disabled individuals, in which he describes a disabled man who has the incapability of forming three or four word sentences, but can still sing the perfect lyrics to a song. The music was able to literally rewire the brains of Dr. Gupta's patients and create a homologous speech centre in the right hemisphere to compensate for the left hemisphere's damage, giving us a "powerful and poignant reminder of how the beauty of music has the ability to speak where words fail". Dr. Gupta also discovered that deeply "Parkinsonian" patients would find that their tremors would steady when listening to music, and late stage Alzheimer's patients who's dementia was so far progressed that they could no longer recognize their family, could still pick out a Chopin piano tune which they had learnt when they were children. Gabe Turow, a scientist at Stanford university believes that "systematically, this could be like taking a pill. Listening to music seems to be able to change brain functioning to the same extent as medication, in many circumstances."

Although there are numerous advantages and benefits of musical therapy, the potential detrimental affects should also be considered. Music triggers reward systems in our brains much like drugs do, and could easily become an addiction at an unhealthy level. Having music around us constantly -- from supermarkets to hotel lobbies to our restaurants -- could numb us to its effects. Musical intervention by untrained doctors can be ineffective or can even cause increased stress and discomfort. Relying on this type of treatment alone and avoiding or delaying conventional medical care for cancer may have serious health consequences. However, the less advantageous aspects of musical therapy alone are not severely threatening to ones health, and the benefits outweigh the negative aspects.
Overall, musical therapy is arguably the least deleterious and most innocuous form of mental disorder treatment existent today. Research for musical therapy is still in its infancy, however advocates hope that it may provide a cheap, safe and effective way to treat a variety of neurological disorders. It has been said that "if we can get some reliable evidence from neuroscientists that music therapy works, music is cheap and nearly anybody can get access to it," (Russel). Gabe Turow has a promising belief that "we may be sitting on one of the most widely available and cost effective therapeutic modalities that ever existed." We need music to relieve ourselves from whatever dawning pain we might be experiencing. We need music to

define our humanity. We need music to maintain society's soul.

References:


http://science.yourdictionary.com/articles/how-does-music-affect-the-brain.html

http://www.cancer.org/treatment/treatmentsandsideeffects/complementaryandalternativemedicine/mindbodyandspirit/music-therapy

http://science.howstuffworks.com/life/music-and-happiness1.htm

http://io9.com/5837976/what-happens-to-your-brain-under-the-influence-of-music

http://en.wikipedia.org/wiki/Music_therapy

http://www.naturalnews.com/024286_music_brain_the.html

http://www.medicalnewstoday.com/articles/232150.php

http://www.nbcnews.com/id/21134540/vp/24391634#24391634

http://www.ted.com/talks/robert_gupta_between_music_and_medicine.html

http://blog.ted.com/2012/10/02/music-the-mind-and-medicine-a-qa-with-robert-gupta/

http://connects.catalyst.harvard.edu/profiles/profile/person/30427