

# Colour my world

When former pilot and Vietnam veteran, Curly, had a stroke at the age of 48 he was left quadriplegic, unable to speak and diagnosed with 'locked in syndrome' in a world where opportunities to express himself were severely limited. In 2009 he began working with music therapist, Matthew Huckel, at South Australia's Highgate Park neurological care facility, to try to improve and create opportunities for him to communicate and connect socially. This musical collaboration has produced a surprising change in Curly, with exciting implications for brain science.

"Curly loves listening to classical music so when I first started working with him I would play music at his bedside, according to what kind of mood he was in," explains Matthew. "He enjoyed listening to the entire Goldberg Variations by Bach and we would discuss the music afterwards. I learned to use the alphabet chart which is Curly's way of communicating - he makes small head movements to confirm individual letters for words and short sentences.

**"Because music is such an integral part of everybody's life, music therapy can stimulate the familiar - memories, feelings, thoughts, skills - that were present before the injury."**

"I introduced the idea of musical improvisation gradually to Curly, encouraging him to move his head and facial muscles and I would match his movements using percussion, piano and classical guitar. This was a subtle but important turnaround because it enabled him to drive the music and influence improvisations. He sometimes became quite emotional during these experiences.

"After about six months, we managed to purchase a sound beam device, an incredibly sophisticated piece of technology which, put simply, enabled him to make simple melodies and notes by moving



James Knowler photography

As anyone who sings or plays a musical instrument will tell you, making music, especially with others, is great for the mind, body and soul. And the benefits flow whether you are an accomplished musician or an enthusiastic amateur. In music therapy trained health professionals - registered music therapists - draw on the benefits of music to help people of all ages and abilities to attain and maintain good health and wellbeing. Music

therapists work in a range of places including hospitals, nursing homes, schools and the community, delivering tailor-made programs to meet specific needs.

When working with adults with physical and/or intellectual disabilities, music therapists use music-based activities to provide a range of cognitive, physical and sensory experiences, whilst providing opportunities for social interaction and communication. These may include writing songs for or with clients, playing instruments and improvising to create original pieces, listening to music, singing and chanting and engaging socially in a group setting.

In this way, musical relationships develop which encourage non-verbal and emotional expression and build self esteem, motivation and confidence.

Through music therapy, people who are debilitated by illness, injury, or trauma may also regain previous levels of function or adjust to new levels of functioning.

his head around in the beam. This was even more of a breakthrough as Curly was musically self-sufficient. He no longer had to be so dependent on me for the music.

"Each week, we improvised together using the sound beam device and he began to work out what head movements could make certain pitches of notes."

This slow and determined mastery of the device revealed an unexpected outcome - a change in Curly's brain which has opened up a new world for him.

"After one year of using the device I discovered via a chance discussion that Curly was seeing colours when he made music with the sound beam, such as 'bright orange', 'white' or 'light blue' if the music was beautiful or high pitched and 'grey' or 'brown' if the music was darker in mood and lower in pitch. There is a lot of evidence of this condition, synesthesia, occurring after strokes but no evidence, as far as I can tell, of the condition being activated in stroke patients through music making. This is really exciting."

Curly's experience is an example of neuroplasticity - the brain adapting to changes and building new pathways to compensate for lost function.

Abirami Thirumanickam is a speech pathologist at ASSIST, Disability Services and has worked alongside Matthew as part of a multidisciplinary allied health team. A musician herself, Abirami is a great advocate for the particular benefits of music therapy for patients with brain injury.



James Knowler photography

"I think music therapy can offer patients an enjoyable and motivating way of re-learning skills that may have been lost. Because music is such an integral part of everybody's life, music therapy can stimulate the familiar - memories, feelings, thoughts, skills - that were present before the injury.

"Of course, music as a whole is very therapeutic: it can excite and soothe nerves and bring out emotions. I've frequently seen its effectiveness in helping stimulate the senses of people who have acquired a brain injury, assisting their way to recovery."

According to Matthew Huckel, Curly says the synesthesia is an enjoyable aspect of his music making and sometimes triggers past memories. "I've noticed he cries more often, which is very cathartic for him."

More recently, Matthew has been analysing and recording Curly's music making and its various

harmonic keys to look at whether there are correlations between musical pitch and colour. There are plans to record Curly's improvisations and play them back to him to see whether he sees colours listening to, as well as making, his own music.

His progress and new-found engagement with music has amazed his wife, Maggie.

"I can't say I understand what is happening in the sessions, but I know that Curly really enjoys them. So much so that when Matthew changed his schedule recently and had to move Curly's sessions to one of the mornings I usually visit, I got shifted! In all my years of visiting, that's the first time Curly has asked me to make way for something else. I think it's great."

### what we know about...

#### music and adults with disability

"Music is wired across the brain in connection to memories, emotions and communication. Developments in MRI technology have helped show that making music increases brain activity, both through the associations that trigger memories stored deep in the brain and through new activity that can create new pathways - over both hemispheres of the brain. Impacts are even more potent in the case of singing or playing music with other people, because shared, positive experiences also release oxytocin - a brain tool for building trust.

Although music is often described as improving people's moods, it is also a powerful tool for expressing negative emotions, which, in the right context, can literally release emotional tension from the body and lead to a sense of relief and of being understood.

The earliest connections made between parents and their infants are inherently musical. Though she may not realise it, as she 'coos' and 'ahhhs' in response to her baby's behaviour, the mother is drawing on musical properties such as rhythm and melody as she interacts with her baby. Communicating in this way, mother and baby learn to understand one another's needs and desires.

The knowledge that musical properties are inherent in communication with babies before they use words helps explain why music provides a natural platform for connecting with people unable to use language - for example, people with acquired brain injury."

Dr Katrina McFerran, University of Melbourne



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