

Now listen: music a medicine for malady

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It seems music is able to soothe the body as well as the soul. Jane Richards reports how music therapy is producing exciting results, and science is only beginning to understand why.

BLOOD PRESSURE

Listening to 30 minutes of music each day may help lower blood pressure. A study of 48 adults aged 45 to 70 taking medication for mild hypertension found that those who listened to classical, Celtic or Indian music for 30 minutes a day for one month had significant reductions in blood pressure, Reuters reports.

"The results clearly illustrate the impact daily music listening has on ambulatory blood pressure," said DrPietro Modesti, of the University of Florence. Of the group, 28 listened to 30 minutes of "rhythmically homogenous" music daily while doing controlled breathing. The remaining 20 participants made no changes to their daily routine. Readings one and four weeks later showed systolic blood pressure - the top number in the blood pressure reading - dropped significantly in the music listeners. The control group recorded non-significant reductions.

SICK INFANTS

Lullabies can do more than soothe babies to sleep. A three-year study, Music Therapy for Vulnerable Infants, found that seriously ill babies who were in hospital for various reasons, including cardiac problems and surgery, showed physical improvements after being sung to. Dr Helen Shoemark, senior music therapist for the neonate and infant program at the Royal Children's Hospital, Melbourne, said the study, completed in 2005, showed music therapy was an affordable, effective investment.

During the study, run by the hospital with the University of Western Sydney, 10 sick babies were sung to three times a week over four weeks by Shoemark and their parents. The babies, many of whom were attached to hospital machinery, were not held while they were sung to. Another 10 babies at the same hospital matched on a severity of illness and age and weight scale were not sung to. The results were then compared to a group of 20 healthy babies at another hospital.

"The babies who did get the singing improved and started to come up to meet healthy prenatal criteria," Shoemark said. "Their neuro-behavioural development scores significantly improved." The neuro-behavioural scores - measuring stress indicators such as irritability and crying - of the sick babies who were not sung to deteriorated.

AUTISM

Whispered words overheard in class were music to Ann Lehmann's ears. It was not what was said, but the boy who said it. The selectively mute boy with autism had only ever spoken at home, said Lehmann, a

leading music therapist. Yet music therapy classes had helped prompt him to speak. "Confidence building is the main thing with autism," said Lehmann, national secretary of the Australian Music Therapy Association. She has seen some dramatic changes in autistic children she has worked with over the past five years at the South Coast School for Children with Autism.

She said children with autism found comfort in structure and repetition and can fear the unpredictable.

"Music has a structure through its underlying rhythm and repeated melodic patterns which can provide comfort to a child with autism, yet it also offers a degree of spontaneity and flexibility which can help children with autism become more playful."

It had also helped them develop flexibility and confidence, skills they needed to cope in a world that was neither predictable nor structured, Lehmann said.

SCHIZOPHRENIA

Young adults with acute **schizophrenia** showed significant improvement when they became involved in music therapy. A study from 2005 to 2007 at the University of Western Sydney - co-funded by Nordoff-Robbins MusicTherapy Australia - recorded decreases in irritability and manifest psychosis, stress anxiety and depression, as rated by standardised psychological assessments.

Improvements in communication and social interaction were also noted. The therapy mainly consisted of the group playing maracas, drums and xylophones.

Dr Alan Lem, music therapy co-ordinator at the university, attributed this to the social aspects of making music in a non-judgmental atmosphere and the easiness of musical expression through playing relatively simple instruments. "Concentration and focus on musical tasks can divert attention from disturbing thoughts. Focus on others and enjoyment derived from playing music can alleviate the symptoms of depression and anxiety," he says.

PALLIATIVE CARE

There is no musical cure for cancer but Denise Grocke, associate professor at the Faculty of Music at the University of Melbourne, says there is good evidence that music therapy can reduce anxiety among the terminally ill.

"This may be because it diverts attention away from their disease, their pain or their treatment and engages them in something meaningful and creative," she said.

She cited a 2005 study of 25 palliative care patients by the university with the Bethlehem palliative care centre in Caulfield, Melbourne. Half of the patients attended a one-off music therapy session. These patients showed a significant reduction in anxiety as measured with the widely accepted Edmonton Symptom Assessment System scale - where patients rate their emotions and physical symptoms before and after therapy. The patients also showed improvements in wellbeing and in appetite. No changes were reported in the control group.

BRAIN INJURIES

Singing can help map pathways to speech for those with brain injuries. Dr Felicity Baker, senior lecturer and co-ordinator for the music therapy program at the University of Queensland, says melodic intonation

therapy is helping patients tap into verbal skills through alternative neural pathways which are opened through singing.

"The therapy uses the musical parts of speech - the parts that make your voice rise when you are excited," Baker said.

"Patients are encouraged to create musical phrases and to sing them. This can create a voice - even in those who have difficulty accessing speech because of brain damage or stroke - by tapping into different pathways in the brain."

Singing therapy can eventually help people regain speech and help those whose speech is slurred. "We sing song phrases and gradually build the tempo up so they are sung at a faster rate. It seems to work because the patients can focus on the process of singing rather than on forming words or worrying about what they are articulating."

Music therapy may also help patients battling emotional trauma. "Patients who have been in car accidents, for example, may have difficulty in verbalising grief during a counselling session but they are perhaps more easily able to get their emotions across through music and song-writing."

EMOTIONAL WELLBEING

An elderly couple lie in separate beds in a palliative care ward. Suddenly the room fills with the sounds of a waltz - their wedding waltz.

Staff look on as they leave their beds and move across the room and begin to dance.

This is one of many amazing anecdotes told by Professor John Zalcborg, the chief medical officer at the Peter MacCallum Cancer Centre in Melbourne.

For someone who has been involved in music therapy for 20 or so years, he is still moved by the powerful effects the therapy has had on his patients and he is one of its most passionate advocates. He implemented it at Peter MacCallum after seeing its benefits at the Heidelberg Repatriation Hospital in the 1980s.

"I've seen what music therapy can achieve and I am passionate about it. It is a great way to harness goodwill and well-being and assist communications."

Music therapy can help whole communities - not just patients.

He cites a case where a young single migrant mother lay dying of cervical cancer at the cancer centre.

"There was a lot of grief there - two children were going to be left behind. Through the music therapy program she wrote a song for her children. It was a gift of love she was able to create and leave for them. While we weren't able to achieve what we wanted in regards to the outcome of her illness - it was something that we could offer them."

THE HORMONE PUZZLE

Music may exert healing and sedative effects partly through a paradoxical stimulation of a growth hormone usually associated with stress, says the pianist and surgeon Dr Claudius Conrad, of Harvard Medical School.

In a paper in *Critical Care Medicine*, Conrad said his team had revealed an unexpected element in distressed patients' physiological response to music: a jump in pituitary growth hormone - known to be crucial in healing. "It's a sort of quickening," he said, "that produces a calming effect."

Their study involved fitting 10 post-surgical intensive-care patients with headphones. In the hour after their sedation was lifted, five listened to Mozart and five heard nothing, *The New York Times* reported.

Those listening to music showed responses that Conrad expected based on other studies: reduced blood pressure and heart rate, less need for pain relief and a 20 per cent drop in the stress hormones epinephrine and interleukin-6 (IL-6). But they also showed a 50 per cent jump in pituitary growth hormone, which drives growth, responds to threats to the immune system and promotes healing. Growth hormone generally rises with stress and falls with relaxation. "You would expect GH, like epinephrine and IL-6, to go down in this case," said Dr John Morley, of StLouis University. "Yet here it goes up. The question is whether the jump in growth hormone drives the sedative effect or is part of something else going on."

Conrad believes growth hormone does have a sedative effect, which may reduce the IL-6 and epinephrine levels producing inflammation that causes pain and raises blood pressure and heart rate.

CHANGES IN THE BRAIN

Professor Steven Mithen, of the University of Reading, could do a lot of things but singing was not one of them. *New Scientist* reports that the scientist and author of *The Singing Neanderthals* decided to take a year of singing lessons and to track any changes in his brain via MRI. The scans showed significant signs of enhanced activity after the lessons - particularly on the right side of the brain. There were marked increases in the Brodmann area - the area associated with generating melody, harmonisation and with some aspects of rhythm. Activity also increased in two areas reflecting Mithen's improved ability to control pitch, project his voice and convey musical phrasing.

A MEDICAL PHENOMENON

The medicinal properties of Mozart continue to stun scientists. Listening to his works has been linked to reduced stress, improved learning, and pain relief. Now a University of Illinois study has found that a child with Lennox-Gastaut syndrome, a rare form of epilepsy, had fewer seizures while exposed to Mozart's Sonata in D Major for 10 minutes every hour, *The Independent* reported.

Another study at the university found changes in brain activity in 23 out of 29 cases when Mozart was played. In some cases the changes occurred during coma, suggesting any effect is not linked to the music being appreciated; it appears to have some kind of direct effect. The university's Dr John Hughes said Mozart's complex music might have an effect similar to pulsating electrical stimulation, bringing order to malfunctioning nerve cells in the brain.

"The architecture of Mozart's music is brilliantly complex ... part of his genius is to repeat themes in a way that was not boring. Repetition and periodic changes are found in all aspects of our brain function and also of our bodily functions."