

How Music Helps Unlock Memories and Improve Quality of Life for Dementia Patients

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STORY AT-A-GLANCE

- › Music activates several brain areas, including the amygdala, which is involved in the processing of emotion, and the medial prefrontal cortex, which is involved in the retrieval of both long- and short-term memories
- › Music can have a powerfully therapeutic effect on patients with dementia, helping them recall otherwise irretrievable memories, regain a sense of self and reconnect with family members over shared memories
- › Dementia patients who listen to their favorite music require less psychotropic medication to control their behavior

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Music is a potent form of communication. It conveys emotion – oftentimes far more effectively than words alone. When you hear music, many areas of your brain light up, including your nucleus accumbens, a part of your brain that releases the feel-good chemical dopamine and is involved in forming expectations.

The amygdala, which is involved in the processing of emotion, and the prefrontal cortex, which makes abstract decision-making possible, are also activated.¹ Certain hormones are also released. Oxytocin, for example, a bonding hormone released during interactions with loved ones, is released when singing together.²

Many evolutionary biologists believe music was fundamental in our ability to function as humans and hold together large communities of people, as music is capable of producing oxytocin, i.e., bonding and sharing emotions, on a massive scale.

Over the past decade, researchers investigating treatments for dementia and Alzheimer's have discovered the benefits of music as therapy. The 2014 documentary, "Alive Inside" demonstrates the remarkable benefits music can have on patients with dementia.

Personalized Playlists Improve Behavior and Reduce Medication Use

To evaluate the effects of the kind of music therapy featured in "Alive Inside," researchers implemented the "Music & Memory" program³ in 98 nursing homes, and compared the results with 98 nursing homes without the program.^{4,5,6}

Endpoints evaluated included the discontinuation of antipsychotic and/or antianxiety medication, reductions in disruptive behavior and improvement in mood. They found dementia patients who listened to music personalized to their tastes did in fact require less psychotropic medication to control their behavior. Over the course of six months:

- Over 20% of patients receiving music therapy were able to discontinue their antipsychotic medication, compared to an average of 17.6% prior to the implementation of the program. In nursing homes without the music program, discontinuation rates remained stable
- The proportion of residents with reduced dementia-related behavioral problems increased from 51% to 57%; behavior problems in the comparison group remained unchanged

As reported by Reuters:⁷

"The individualized music program designed for nursing homes ... didn't improve mood problems, but patients who listened to music tailored to their tastes and

memories did need less anti-anxiety and antipsychotic medication, researchers found.

'Alzheimer's disease and related dementias can result in aggressive or other difficult behaviors, which affect people's lives and take a toll on their caregivers,' said lead author Kali Thomas, an assistant professor at Brown University in Providence, Rhode Island. 'We think that familiar music may have a calming or pleasurable effect and reduce the need for caregivers to use medications to control dementia behaviors' ..."

A similar study called "Classical Connections," commissioned by the Santa Barbara Chamber Orchestra, is investigating the therapeutic benefits of live classical performances compared to recordings.⁸ Lead researcher Lori Sunshine, a music therapist, talks to the participants before and after each performance, and compares their reactions to recordings of the music.

Overall, it appears live performances have even greater benefits, in large part because of the social interaction that takes place. Interestingly, the benefits go far beyond mere improvements in mood and behavior. It appears music has the ability to actually trigger or reactivate memory, and even helps improve physical mobility.

How Music Helps Reignite Memory

Some of music's benefits appear to be rooted in its familiarity. That is, a person's favorite music, or songs they associate with important events, can trigger a memory of the song's lyrics, the related event and even the feelings and experience of it. The reason for this is because music strongly activates brain regions involved in memory, such as the amygdala – in a sense unlocking memories surrounding or associated with that particular piece of music.

"It brings upon all four quadrants of the brain to be activated. So all the neurons are being stimulated. The brain is enlivened and more activated. So, you're more

inclined to hear a person who can't remember something, remember something," Sunshine explains.⁹

Music also activates your medial prefrontal cortex, a brain region behind your forehead thought to be selectively involved in the retrieval of both long- and short-term memories.¹⁰ This is one of the last brain areas to atrophy among Alzheimer's patients, which helps explain how music can help reactivate memories even in patients with Alzheimer's, which is the most severe form of dementia.

As noted by Petr Janata, Ph.D., professor of psychology at University of California (UC) Davis' Center for Mind and Brain,¹¹ who has mapped brain activity of subjects as they listened to music:¹²

"What seems to happen is that a piece of familiar music serves as a soundtrack for a mental movie that starts playing in our head. It calls back memories of a particular person or place, and you might all of a sudden see that person's face in your mind's eye ... Now we can see the association between those two things – the music and the memories."

In the video below, the late Dr. Oliver Sacks, neurologist and author of "Musicophilia: Tales of Music and the Brain," explains how listening to familiar music may allow Alzheimer's patients to access memories that have otherwise become inaccessible.

Regaining a Sense of Identity

The recollection of music can also help revive a dementia patient's sense of identity, and help them reconnect with family members over shared memories. The success of the technique depends on nursing staff being able to figure out a patient's musical preferences, which is why you may want to ask your aging relatives about their favorite songs now (or relay yours to your caregivers) just in case.

It's also dependent on a person's interest in music throughout life. You don't have to be overly musical to appreciate music emotionally, as virtually everyone does, but as noted in the World Journal of Psychiatry:¹³

"[Music therapy] would not be appropriate for a person who did not have an appreciation for music prior to the onset of cognitive impairment. A positive correlation is expected between the degree of significance that music had in the person's life prior to the onset of dementia and effectiveness of the intervention."

Music and Your Brain

Another documentary illustrating the power of music and the success of the Music & Memory program for dementia patients is "Music on the Brain," an ABC Catalyst production. As noted on Music & Memory's website:¹⁴

"[M]usical favorites tap deep memories not lost to dementia and can bring participants back to life, enabling them to feel like themselves again, to converse, socialize and stay present ... The results can be nothing short of miraculous."

The goal of Music & Memory is to train care professionals on how to set up personalized playlists for dementia patients in their care, and there are hundreds of Music & Memory certified care organizations¹⁵ throughout the U.S. and Canada. If you would like to contribute to this cause, feel free to make a donation to Music & Memory.¹⁶ You can also donate your old iPods to the program.¹⁷ All Apple music players in working condition are accepted.

"Music on the Brain" also illustrates how music can be used for other neurological conditions that don't involve dementia. In addition to activating areas involved in memory, music also activates brain regions that control movement — a finding that has led to music being used to help people with diseases like Parkinson's, multiple sclerosis, stroke and other neurological disorders.

Emerging research suggests music may be an effective non-drug intervention for these conditions.^{18,19} People who ordinarily are unable to control their movements are suddenly

able to follow the beat of a song and dance. The music seems to provide an external rhythm that bypasses the malfunctioning signals in the brain.

The Rise of Psycho-Acoustic Medicine

In all likelihood, you're bound to hear more and more about psycho-acoustic medicine, a term describing the practice of using sound to affect physical and psychological health. As noted in an article in *The Mind Unleashed*:²⁰

"[T]he practices of using sound and frequencies to impact the physical and emotional health of the body has been used since the beginning of time. From Gregorian chants in churches, to the chanting of Tibetan monks, to Native American drumming, song and sound have been a catalyst in stimulating health and healing for the body and mind in all cultures.

The definition of psycho-acoustic medicine is the science of how music and sound impact the nervous system, psychologically and physiologically. Simply, how it is how sound impacts the mind and the body."

In summary, sound frequencies are the internal communication system for your brain. Different frequencies activate different brain regions, thereby affecting neurotransmitters and hormones. When it comes to memory, by tapping areas of your brain linked to both emotions and memory, music can act as a back door to help you access past events that would otherwise be lost. As *Music & Memory* put it:

"Even for persons with severe dementia, music can tap deep emotional recall. For individuals suffering from Alzheimer's, memory for things – names, places [and] facts – is compromised, but memories from our teenage years can be well-preserved. Favorite music or songs associated with important personal events can trigger memory of lyrics and the experience connected to the music.

Beloved music often calms chaotic brain activity and enables the listener to focus on the present moment and regain a connection to others. Persons with dementia, Parkinson's and other diseases that damage brain chemistry also

reconnect to the world and gain improved quality of life from listening to personal music favorites."

If you're a caregiver to someone with dementia, creating a personalized playlist for him or her is a simple way to help them reconnect with the outside world and feel like themselves again, even for a little while. On a larger scale, if you have a loved one in a nursing home, you may want to suggest they consider the use of individualized playlists for all of their residents. The Music & Memory organization can help.²¹

Other Strategies to Help Prevent Dementia and Alzheimer's Disease

It's important to realize that dementia, including Alzheimer's, is largely a preventable disease, predicated on your lifestyle choices to enhance mitochondrial function. This is good news, as it puts the power into your hands. Diet is paramount, and the beauty of following my [optimized nutrition plan](#) is that it helps prevent and treat virtually all chronic degenerative diseases, including Alzheimer's disease.

Considering the lack of effective treatments, prevention really cannot be stressed strongly enough. The following suggestions can help protect your brain health well into old age:

Eat real food, ideally organic – Avoid processed foods of all kinds, as they contain a number of ingredients harmful to your brain, including refined sugar, processed [fructose](#), grains (particularly gluten), vegetable oils, genetically engineered ingredients and pesticides like glyphosate (an herbicide thought to be worse than DDT, which has already been linked to the development of Alzheimer's).

Ideally, you'll want to keep your added sugar levels to a minimum and your total fructose below 25 grams per day, or as low as 15 grams per day if you already have insulin/leptin resistance or any related disorders. Opting for organic produce will help you avoid synthetic pesticides and herbicides.

Most will benefit from a gluten-free diet, as gluten makes your gut more permeable, which allows proteins to get into your bloodstream where they sensitize your immune system and promote inflammation and autoimmunity, both of which play a role in the development of Alzheimer's.

Replace refined carbohydrates with healthy fats — Your brain does not need carbs and sugars; healthy fats such as saturated animal fats and animal-based omega-3 are far more critical for optimal brain function. Healthy fats to add to your diet include [avocados](#), butter, organic pastured egg yolks, coconuts and coconut oil, grass fed meats and raw nuts such as [pecans](#) and [macadamia](#).

Avoid all trans fats or hydrogenated fats that have been modified in such a way to extend their longevity on the grocery store shelf. This includes margarine, vegetable oils and various butter-like spreads. Contrary to popular belief, the ideal fuel for your brain is not glucose, but ketones. Ketones are what your body produces when it converts fat into energy.

The medium-chain triglycerides (MCT) found in coconut oil and MCT oil are a great source of ketone bodies. Also make sure you're getting enough animal-based omega-3 fats. High intake of the omega-3 fats EPA and DHA help by preventing cell damage caused by Alzheimer's disease, thereby slowing down its progression and lowering your risk of developing the disorder.

Optimize your gut flora — To do this, avoid processed foods, antibiotics and antibacterial products, fluoridated and chlorinated water, and be sure to eat traditionally fermented and cultured foods, along with a high-quality probiotic if needed. Dr. Steven Gundry does an excellent job of expanding on this in his book, "The Plant Paradox." His innovative approach has great potential to help your health.

Intermittently fast — Intermittent fasting is a powerful tool to jump-start your body into remembering how to burn fat and repair the insulin/leptin resistance that is a primary contributing factor for Alzheimer's.

Move regularly and consistently throughout the day – It's been suggested that exercise can trigger a change in the way the amyloid precursor protein is metabolized,²² thus, slowing down the onset and progression of Alzheimer's.

Exercise also increases levels of the protein PGC-1 alpha. Research has shown that people with Alzheimer's have less PGC-1 alpha in their brains and cells that contain more of the protein produce less of the toxic amyloid protein associated with Alzheimer's.

Optimize your magnesium levels – Preliminary research strongly suggests a decrease in Alzheimer symptoms with increased levels of magnesium in the brain. Unfortunately, most magnesium supplements do not pass the blood brain levels, but magnesium threonate appears to hold some promise for the future for treating this condition and may be superior to other forms.

Get sensible sun exposure – Research shows people living in northern latitudes have higher rates of death from dementia and Alzheimer's than those living in sunnier areas, suggesting vitamin D and/or sun exposure are important factors.²³

Sufficient vitamin D is imperative for proper functioning of your immune system to combat inflammation associated with Alzheimer's. If you are unable to get sufficient amounts of sun exposure, make sure to take daily supplemental vitamin D3 to make your blood level at least 40 to 60 ng/ml. This is typically about 8,000 units of vitamin D for most adults.

That said, it's important to recognize that sun exposure is important for reasons unrelated to vitamin D. Your brain responds to the near-infrared light in sunlight in a process called photobiomodulation.

Research shows near-infrared stimulation of the brain boosts cognition and reduces symptoms of Alzheimer's, including more advanced stages of the disease. Delivering near-infrared light to the compromised mitochondria synthesizes gene transcription

factors that trigger cellular repair, and your brain is one of the most mitochondrial-dense organs in your body.

Avoid and eliminate mercury from your body – Dental amalgam fillings are one of the major sources of heavy metal toxicity; however, you should be healthy prior to having them removed. Once you have adjusted to following the diet described in my optimized nutrition plan, you can follow the [mercury detox protocol](#) and then find a biological dentist to have your amalgams removed.

Avoid and eliminate aluminum from your body – Common sources of aluminum include antiperspirants, nonstick cookware and vaccine adjuvants. There is some suggestion that certain mineral waters high in silicic acid may help your body eliminate aluminum.

Avoid flu vaccinations – Most flu vaccines contain both mercury and aluminum.

Avoid statins and anticholinergic drugs – Drugs that block acetylcholine, a nervous system neurotransmitter, have been shown to increase your risk of dementia. These drugs include certain nighttime pain relievers, antihistamines, sleep aids, certain antidepressants, medications to control incontinence and certain narcotic pain relievers.

Statin drugs are particularly problematic because they suppress the synthesis of cholesterol, deplete your brain of coenzyme Q10, vitamin K2 and neurotransmitter precursors, and prevent adequate delivery of essential fatty acids and fat-soluble antioxidants to your brain by inhibiting the production of the indispensable carrier biomolecule known as low-density lipoprotein.

Limit your exposure to non-native electromagnetic fields (cellphones, Wi-Fi routers and modems) – The primary pathology behind cellphone damage is not related specifically to brain tumors, or even to cancer. The real danger lies in damage from the reactive nitrogen species peroxynitrites.²⁴ Increased peroxynitrites from cellphone exposure will damage your mitochondria, and your brain is the most mitochondrial-dense organ in your body.

Increased peroxynitrite generation has also been associated with increased levels of systemic inflammation by triggering cytokine storms, autonomic hormonal dysfunction and mitochondrial dysfunction.

Peroxynitrite is an unstable structural ion produced in your body after nitric oxide is exposed to superoxide, and this complex chemical process begins with exposure to low-frequency microwave radiation from your cellphone, Wi-Fi and cellphone towers.^{25,26}

Challenge your mind daily – Mental stimulation, especially learning something new, such as learning to play an instrument or a new language, is associated with a decreased risk of dementia and Alzheimer's. Researchers suspect that mental challenge helps to build up your brain, making it less susceptible to the lesions associated with Alzheimer's disease.

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