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# ELDER CARE

## A Resource for Interprofessional Providers

### Music and Communication

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Music is ubiquitous across human cultures, and evidence of human music-making extends into the ancient archeological record. It is clear that music does important things for us as a species. Focused academic work on the physical, psychological, and social functions of music reveals at least three fundamental ways in which music might influence quality of life and of medical care for older people. These three factors - entrainment, emotion, and mental associations - are the topic of this edition of Elder Care.

#### Entrainment

A basic requirement to perform or enjoy music is an appreciation and awareness of the “beat” or pulse of the music. Most human music is organized around a steady beat, and the ability to follow this beat is called entrainment.

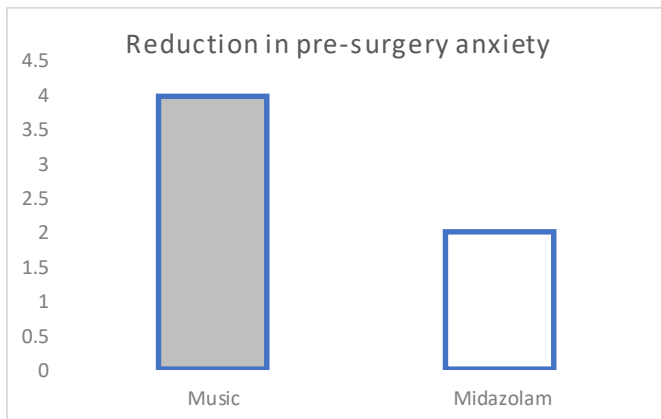
Conscious entrainment is far from easy. Only a couple of species other than humans show signs of being able to entrain to music and unconsciously, many human body systems entrain to musical rhythm. Entrainment and the ability to collectively entrain provide unique social experiences. Entrainment allows us to synchronize our behaviors with other people, and jointly synchronized activity increases empathy - the appreciation of others' emotional states. Hence, in therapeutic settings, music offers opportunities to engage empathic thinking and encourage group identity and social engagement. In settings in which social isolation is a concern (e.g., nursing homes) this may be particularly powerful.

Entrainment is also obviously and closely tied to the ability (and the enjoyment) in moving to music. Dance depends on entrainment. Hence, music offers an avenue to engage people in physical activity that is enjoyable and also manipulable (e.g., the relative intensity of the exercise can be adjusted by adjusting the pace of the music).

On the flipside of this observation, entrainment also provides a powerful tool for physiological and psychological calming. When people are agitated or aggressive (e.g., in Alzheimer's disease) evidence suggests that music can reduce their agitation, in part by slowing down relevant bodily systems.

#### Emotion

Music is also a powerful emotional stimulus. Evolutionary approaches suggest that music may reflect early forms of human communication that lacked semantic content but effectively conveyed emotional and relational meaning. Music is, therefore, able to adjust emotion. Music's influence on emotion has been used to treat anxiety. Along with the entrainment potential of music, its psychological calming effects can reduce, for instance, pre-surgical anxiety (Figure 1).



**Figure 1: Comparison of a musical intervention with the anxiolytic medication midazolam in reducing pre-surgery anxiety.**

Reduction in anxiety among a group randomly assigned to a music-listening condition was twice as large as the reduction in anxiety among a group who received midazolam: Data from Bringman H, Giesecke K., Thörne A., Bringman S. Relaxing music as pre-medication before surgery: a randomised controlled trial. *Acta Anaesthesiol Scand*, 2009 53(6), 759-764.

#### TIPS about Music and Communication in Older Adults

- More active music activity (playing, singing, dancing) is more involving than passive listening.
- Music that is personally and culturally familiar will be more immediately engaging for most listeners than music from other cultures. On the other hand, music from other cultures may provide intellectual challenges and advantages such as prejudice reduction for those who are musically adventurous.
- Music with a strong and steady beat and a clear bass pattern engages more motor-related areas of the brain.
- Group musical activity encourages empathy and group identification.
- Musical training increases hearing ability, especially hearing in noisy situations

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Similar effects are apparent in studies of music and pain reduction, with music serving as an effective means for reducing use of pain-reducing medications among those suffering chronic or acute pain.

More generally, music offers numerous routes for managing mood. Even sad music can make people feel better. Among other things, sad music provides a sense that the musician understands the listener's feelings, and is able to express those feelings "for" the listener. Such phenomena make music helpful in therapeutic contexts surrounding mental health. It also serves a calming function, similar to that described in the entrainment section above.

## Mental Associations and Pathways

Music demonstrates considerable abilities in activating unique mental pathways and hence in aiding autobiographical and procedural memory.

Among the more startling phenomena observed, aphasic stroke patients have shown the ability to sing words and phrases that they are unable to speak. This is thought to be because music is more equally distributed across both hemispheres of the brain, and hence people with damage in language areas of the brain are sometimes able to compensate for that damage by recruiting areas of the brain dedicated to music, with the accompanying information about singing.

Music is also sometimes effective in circumventing the cognitive effects of dementias such as Alzheimer's disease. This effect is dramatically illustrated in the movie "Alive Inside" (<http://www.aliveinside.us/>), a documentary about the power of music to help people with dementia regain memories of their past. While such effects are supported by limited research, musical interventions in some studies increases memory and attention. In part, such effects may occur because memory for music appears spared in some dementia victims; they recognize music from earlier in their lives, even when they are unable to remember other things.

Musical training at any point in the lifespan also provides assistance with normal aging processes such as hearing loss. People who are musically trained demonstrate advantages in late-life hearing, particularly in noisy situations. Musical training appears to provide practice in difficult hearing situations, training listeners in distinguishing pertinent sounds

from background noise. Such listening skills are essential in musical performance and advantageous in group situations.

The cognitive benefits of musical activity and training likely derive from the diversity of skills embedded in musical activity. Listening to and performing music involves language processes (for music with lyrics), motor activity (even listening to music recruits motor areas of the brain), understanding of musical pitch and temporal processes, and emotional centers of the brain. Hence, music involves highly distributed cognitive activity. Some of these processes may be partially redundant with one another, allowing understanding and appreciation of music even when certain brain areas are impaired. Examples of potential concerns that clinicians have with older adults and related musical interventions to address them are provided in the table below. More research is needed on the specific areas in which musical interventions might have the greatest potential with older adults.

Concern	Musical Treatment	Outcome
Agitation	Listening to slow-paced, calming music; gentle movement to music	Reduced agitation
Memory	Personalized listening to playlist of music familiar to subject	Activation of pathways to autobiographical memory
Aphasias	Listening to music with lyrics; exercises targeting musical-linguistic production (saying lyrics and trying to sing the accompanying melody)	Enhanced linguistic performance, speech fluency
Social Function	Group musical activities: joint singing or music making, accompanied by dance/rhythmic movement	Empathy, group identity
Depressive Symptoms	Playlist of emotionally meaningful music; sad music for feelings of being understood, happy music for mood adjustment	Improved affect; enhanced sense of self-awareness and understanding of mood

## References and Resources

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