



## Science behind the Alzheimer Society of Toronto iPod Project

The Alzheimer Society of Toronto (AST) initiated its iPod project in 2013; the project provides personalized music to older persons in community and residential settings and is based on the work of *Music and Memory*, a US-based non-profit organization. The AST Project aims to provide iPods, free of charge, to 10,000 older persons living with Alzheimer's disease and other dementias (ADOD) as a way of improving cognition, communication, and quality of life (Gerster, 2013).

Research also suggests that personalized music can assist in the management of behavioural and psychological symptoms of dementia (BPSD) such as depression, anxiety, agitation and aggression, which can adversely impact the lives of older persons and their caregivers, and pose challenges for providers.

This backgrounder explores the science behind AST's iPod Project specifically, and the potential of personalized music more generally to improve the lives of older persons with ADOD.

### What are the behavioural and psychological symptoms of dementia?

BPSD span a wide range of difficult-to-manage behavioural and psychological symptoms associated with persons with ADOD (Lawlor, 2002; Kar, 2009). Examples include depression, anxiety, apathy, agitation, aggression, delusion, hallucinations and sleep problems (Lawlor, 2002; Kar, 2009).

While estimates vary, it is thought that about two out of three persons with dementia experience some form of BPSD at any one time (Kar, 2009).

Studies have shown that among people with ADOD:

- Depression is the most common BPSD (Vega et al., 2007; Lyketsos & Lee, 2004)
- Anxiety affects 35%-76% (Fuh, 2006)
- Agitation is experienced by 55.9% (Vega et al., 2007).

BPSD are particularly challenging in residential care settings:

- About a third of persons with ADOD in community settings exhibit levels of BPSD in the clinically significant range (Lyketsos et al., 2000)
- About 80% of persons with ADOD in residential care settings show clinically significant levels of BPSD (Margallo-Lana et al., 2001).

### Why is it important to manage behavioural and psychological symptoms of dementia?

BPSD can pose risks to older persons: they can increase the rate of disease progression (Paulsen et al., 2000) and erode quality of life and well-being.

BPSD can pose risks to others. The emergence of BPSD are associated with increased caregiver burden (Coen et al., 1997; Matsumoto et al., 2007; Huang et al., 2012) and burnout (O'Donnell et al., 1992).

Risks can also include psychological and physical harm. Media reports have documented assaults by persons experiencing BPSD on other older persons and staff in residential care settings. Even the possibility of such behaviour can lead to individuals being refused service.

Policy-makers and providers are well aware of such challenges. For example, Behavioural Supports Ontario promises \$40 million to “hire new staff-nurses, personal support workers and other health care providers, and to train them in the specialized skills necessary to provide quality care” to persons exhibiting “responsive behaviours” such as pacing and wandering, general restlessness and agitation, trying to get to a different place, grabbing onto people, complaining, repetitive sentences and questions, cursing and verbal aggression, making strange noises, and screaming (LHINs, 2013).

### Why personalized music?

Music is a relatively low cost and low risk approach to managing BPSD. A 2005 study by Goodall & Eters showed that personalized music has an effectively substitute for medication and restraints.

Studies have found that personalized music (e.g., music familiar to and enjoyed by the older person with ADOD, also referred to as preferred music) is more effective than non-familiar music. Personalized music has been found to:

- Reduce agitation during and following the music session (Gerdner, 2000)
- Help individuals remain calmer, sit longer and stop shouting (Ragneskog et al., 2001)
- Reduce overall Cohen-Mansfield Agitation Inventory scores (CMAI) (Sung, Chang & Abbey, 2006).

A recent quasi-experimental study on nursing home residents showed that those who received personalized music had a significantly lower anxiety score at six weeks compared to those who received the usual treatment without music (Sung, Chang & Lee, 2010).

A review of research articles on the use of personalized music found that seven out of eight articles reported significant reductions in agitation and agitated behaviours (Sung & Chang, 2005).

### Other music interventions

Singing and background music have been shown to increase alert responses and communication. For example, an observational study on persons with late stage dementia living in residential care homes found that alert responses, such as head and eye movements, limb movements, changes in facial expressions, and vocalizations, were most frequent during singing sessions (Clair, 1996).

In another study, researchers found that caregiver singing and background music for patients with severe dementia decreased caregivers’ verbal instructing and narrating during their caring activities and increased the patients’ understanding of the situation both verbally and behaviourally (Gotell, Brown & Ekman, 2002). However, patients without background music exhibited cognitive and behavioural symptoms associated with dementia when communicating, and as a result, the patient and the caregiver were observed to have difficulties understanding each other (Gotell, Brown & Ekman, 2002).

### Music therapy

Music therapy (directed by professionally trained and accredited music therapists (Boon, 2011)) can also produce a range of benefits. While music can be used by anyone, music therapy “is the skillful use of music and musical elements by an accredited music therapist to promote, maintain, and restore mental, physical, emotional, and spiritual health” (CAMT, 1994).

A number of studies have examined the impact of music therapy on depression and anxiety. In one study, researchers found that patients with mild to moderate Alzheimer’s disease had significant improvements in depression and anxiety; moreover, the effect lasted for up to 8 weeks (Guetin et al., 2009).

A case-control study indicated that the number of activity disturbances in participants of a music therapy group was significantly lower than non-participants over a 6-week period. Scores for aggressiveness and anxiety were also significantly lower (Svansdottir & Snaedal, 2006).

Raglio and colleagues found that patients with dementia given music therapy had lower Neuropsychiatry Inventory scores than those not receiving such therapy (Raglio et al., 2008). Specific BPSD, such as delusions, agitation, anxiety, apathy, irritability, aberrant motor activity, and night-time disturbances, all improved (Raglio et al., 2008). Other studies have found that music therapy can reduce depressive symptoms (Ashida, 2000; Chu et al., 2013) and result in improved cognitive function (Chu et al., 2013).

Another study by Raglio and colleagues found that music therapy was effective in reducing behavioural disturbances while simultaneously reducing delusions, agitation and apathy (Raglio et al., 2010). Moreover, group music intervention by certified music therapists significantly reduced agitation among patients with ADOD in a dementia day care unit (Choi, Lee, Cheong & Lee, 2009).

A study examining different forms of music therapy showed that patients with dementia in any music therapy group (listening to personalized music, group-personalized music, classical music, or singing music) had fewer agitated behaviours (Zare et al., 2010).

## Systematic reviews on music therapy

Systematic reviews of research on music and music therapy for persons with ADOD also point to positive outcomes (Koger, Chapin & Brotons, 1999).

A review of nursing and non-nursing research reports on music therapy from 1980 to 1997 found positive outcomes overall (Snyder & Chlan, 1999) although with great variation in type of music selected, number of sessions, length of exposure, populations studied and methodologies used (Snyder & Chlan, 1999).

A review of recent clinical control trials and randomized controlled trials on use of music therapy found improvements in BPSD (Raglio et al., 2012).

## A few qualifications

However, as in most areas of research, the findings are not unanimous.

A Cochrane Review on the use of music therapy for people with dementia concluded that there is “no substantial evidence to support nor discourage” its use in dementia care (Vink, Bruinsma & Scholten, 2011).

In fact, a small number of studies suggest that music therapy produces negative outcomes. For example, one randomized controlled study observed that persons with dementia in residential care settings were more apt to be aggressive and express other behavioural disturbances after music sessions (Cooke et al., 2010); another study showed that Baroque music (as compared to no music at all) increased the number of behaviour disturbances (Nair et al., 2011).

## Take home

In sum, the science behind the AST iPod Project suggests that in spite of some inconsistencies and qualifications, personalized music and other music interventions offer a range of potential benefits for older persons with ADOD, caregivers, and health care systems.

Moreover, personalized music and other music interventions appear to pose few risks, particularly in comparison to alternatives such as medications and physical restraints.

The AST iPod project presents an unprecedented opportunity to observe the benefits of personalized music across a large number of people; they aim to enrol 10,000 older persons in the iPod project. In addition, unlike other personalized music projects, they are targeting older persons living in both residential and community-based settings.

Evaluation of the AST iPod Project is ongoing; we will report results as they become available. Early findings suggest that in addition to achieving gains for older persons and caregivers, this project is increasing awareness of ADOD among

the public, providers and policy-makers, who almost naturally see the value of personalized music as a way of improving peoples' lives at low cost and with little risk.

For more information on the Alzheimer Society of Toronto Music and Memory: iPod Project, please visit: <http://www.alzheimertoronto.org/ipod.html>

The Music & Memory is a non-profit organization that incorporates personalized music into the lives of the elderly to improve their quality of life. For more information, please visit: <http://musicandmemory.org/>

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