



Evidence-Based  
Guideline:  
Individualized  
Music for Persons  
with Dementia  
(6<sup>th</sup> Edition)

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This is a general evidence-based practice guideline. Patient care continues to require individualization based on patient needs and requests.

## Individualized Music for Persons with Dementia

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### **Scheme for Grading the Strength and Consistency of Evidence in the Guideline**

Evidence-based practice guidelines are developed from several sources of evidence, such as research findings, case reports, and expert opinion. The practice recommendations are assigned an evidence grade based upon the type and strength of evidence from research and other literature.

The grading schema used to make recommendations in this evidence-based practice guideline is:

A = Evidence from well-designed meta-analysis.

B = Evidence from well-designed controlled trials, both randomized and nonrandomized, with results that consistently support a specific action (e.g., assessment, intervention or treatment).

C = Evidence from observational studies (e.g., correlational, descriptive studies) or controlled trials with inconsistent results.

D = Evidence from expert opinion or multiple case reports.

For example, in this guideline on page 8, a continuation of the “Description of the Intervention” section, a sentence is written as “Optimal effectiveness is achieved by implementing the intervention a minimum of 30 minutes prior to the patient's usual peak level of agitation (Devereaux, 1997; Gallagher, 2011; Gerdner, 1997, 2000, 2005, 2008, 20017; Hall & Buckwalter, 1987; P a r k , 2 0 1 3 ; Park & Pringle-Specht, 2009. Sung, Chang, & Abbey, 2006. Evidence Grade = B)”. This means that the practice recommendation is based upon the evidence from well-designed controlled trials, both randomized and nonrandomized, with results that consistently support a specific action (e.g., assessment, intervention or treatment).

## INTRODUCTION

In 2017, Alzheimer's Association estimated that over 5.5 million Americans have a diagnosis of Alzheimer's disease or related dementias (ADRD). Dementia is characterized by cognitive impairment, a key antecedent to agitation (Beck et al., 1998; Cohen-Mansfield, Culppepper, & Werner, 1995; Fernández et al., 2010; Holtzer et al., 2003; O'Donnell et al., 2007). The presence of agitation or behavioral and psychological symptoms has been reported as high as 90% in those afflicted with ADRD (Fernández, Gobartt, Balaña, the COOPERA Study Group, 2010). One study estimated that community-dwelling persons with Alzheimer's disease exhibited agitation 67.5% of the time (Tractenberg, Weiner, & Thal, 2002).

Agitation negatively impacts quality of life by interfering with delivery of care and social interaction (Banerjee, et al., 2006; Beerens, Zwakhalen, Verbeek, Ruwaard, & Hamers, 2013; Léger et al., 2002, Samus, et al., 2005; Sloane, et al., 2004). In addition, agitation has been correlated with an increased incidence of falls (Marx, Cohen-Mansfield, & Werner, 1990), delayed onset of sleep, and disruption of nighttime sleep (Cohen-Mansfield & Marx, 1990; Cohen-Mansfield, Werner, & Freedman, 1995; McCurry, Gibbons, Logsdon, & Teri, 2004, Rose et al., 2011). Nursing staff has identified agitated behaviors as a major stressor (Brodaty, Draper, & Low, 2003; Kennedy, 2005; Ragneskog, Asplund, Kihlgren, & Norberg, 2001; Ragneskog, Kihlgren, Karlsson, & Astrid, 1993) and may lead to staff "burnout" (McCarty & Drebing, 2002). Behavioral and psychological symptoms such as agitation, has also been associated with family caregiver stress (Fauth, Zarit, Femia, Hoffer, & Stephens, 2006), low secretion rates of immunoglobulin A in saliva with a compromised immune response (Gallager, Phillips, Evans, Der, Hunt, & Carroll, 2008) and depression (Fauth & Gibbons, 2014; Schulz et al. 2008).

The management of chronically confused and agitated patients historically included chemical and physical restraints. However, these approaches may cause adverse physical and psychological effects beyond that of the original agitation (Hardin et al., 1993; Mohr, Petti, & Mohr, 2003; Moretti, Torre, Antonello, & Pizzolato, 2006; Scherder et al., 2009; Schneider, Dagerman, & Insel, 2006; Tinetti, Liu, & Ginter, 1992). These limitations and concerns have led to research on alternative interventions for managing agitation. One such theory-driven intervention, which has been clinically and empirically validated, is individualized or preferred music.

Gerdner (1992) was the first to systematically investigate the use of individualized music as an intervention for agitation in persons with dementia. Findings from this pilot study identified a statistically and clinically significant reduction in agitation during the 30-minute presentation of individualized music and the 60 minutes immediately following. Findings were supported when the study was replicated by Devereaux (1997). Gerdner's pilot became the impetus for additional studies to further investigate the effects of individualized music in persons with dementia (Casby & Holm, 1994; Clark, Lipe, & Bilbrey, 1998; Cohen-Mansfield & Werner, 1997; Thomas, Heitman, & Alexander, 1997).

## MID-RANGE THEORY OF INDIVIDUALIZED MUSIC INTERVENTION

Another important contribution to this area of research is the development of a mid-range theory to explain the effects of individualized music on agitation in persons with dementia

(Gerdner, 1997). (See Figure 1). Cognitive impairment results in a decreased ability to receive and process sensory stimuli, resulting in a progressive decline in the person's stress threshold (Hall & Buckwalter, 1987). As stressors begin to build, the person with dementia experiences anxiety. Agitation is exhibited when the stress threshold is exceeded. (Hall & Buckwalter, 1987).

Persons with ADRD have a decreased ability or an inability to understand verbal language. However, it is believed that receptive and expressive musical abilities are often preserved long after the diminished ability to process or express verbal language. Experts disagree on the hypothesized mechanism by which this occurs (Cuddy & Duffin, 2005; Fornazzari et al., 2006; Simons-Stern, Budson, & Ally, 2010;). Therefore, music may be used as a means of communicating with this population even in the advanced stages of dementia when the person is unable to understand verbal language and has a decreased ability to interpret environmental stimuli).

ADRD is usually associated with short-term memory loss; whereas remote memory often remains surprisingly intact. Therefore, it is theorized that the presentation of carefully selected music, based on personal preference, will provide an opportunity to stimulate remote memory. This changes the focus of attention and provides an interpretable stimulus, overriding stimuli in the environment that is meaningless or confusing.

The elicitation of memories associated with positive feelings (happiness, love, etc.) will have a soothing effect on the person with dementia, which in turn will prevent or alleviate agitation (Gerdner, 1997).

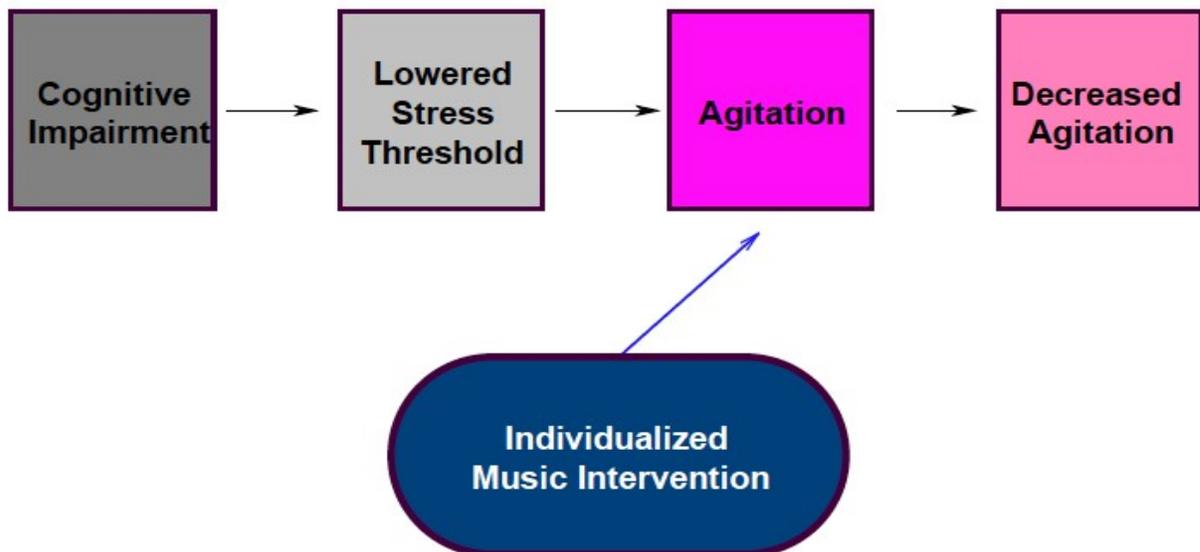


Figure 1. Mid-Range Theory of Individualized Music Intervention.

(Reprinted with permission from Sage Publications.) Gerdner, L., (1997). An Individualized Music Intervention for Agitation. *Journal of the American Psychiatric Nurses Association*, 3(6), p. 178

## Propositions of the Mid-Range Theory of Individualized Music Intervention for Agitation (IMIA)

- The temporal patterning of agitated behaviors in persons with ADRD is often predictable based on the application of the PLST model (Hall & Buckwalter, 1987; Gerdner, Buckwalter, & Hall, 2005).
- Music evokes an individual emotional response with the listener, that is associated with personal memories.
- Response to personal memory is enhanced when music selection is based on the past personal preferences.
- The presentation of an individualized music intervention alleviates agitation in the persons with ADRD.
- There is a positive relationship between the degree of significance that music had in the person's life prior to the onset of cognitive impairment and the effectiveness of the intervention.
- Individualized music intervention is most effective when the intervention is implemented approximately 30 minutes prior to the peak level of agitation.

Gerdner (2000) designed and implemented the first study to test the propositions of the mid-range theory of IMIA. This study used an experimental repeated measures pretest-posttest cross over design to compare the immediate and residual effects of individualized music to classical "relaxation" music relative to baseline on the frequency of agitated behaviors in elderly persons with dementia. Thirty-nine subjects were recruited from six long-term care facilities in Iowa. A modified version of the Cohen-Mansfield Agitation Inventory was used to measure the dependent variable. A repeated measures ANOVA with Bonferroni post hoc test showed a significant reduction in agitation during the presentation of individualized music ( $p < .0001$ ) and the 30 minutes immediately following ( $p < .0001$ ) compared to classical music.

Japanese researchers (Suzuki et al., 2004) expanded the evaluation of preferred music on persons with dementia by including biophysiological, functional, and behavioral outcome measures. The study included 10 subjects with dementia who received preferred music twice per week for 8 weeks (16 sessions). During this corresponding time period, 13 subjects participated in a comparison intervention (games, drawing, pasting pictures). Statistical analysis comparing baseline to one-week post intervention scores revealed that subjects in the experimental group had a statistically significant improvement in the "language" subscale of the Mini Mental State Exam and a statistically significant reduction in "irritability" as measured by the Multidimensional Observational Scale. In addition, there was a statistically significant reduction in salivary chomogranin A (CgA) following session 16. The authors concluded that "the changes in CgA levels supported Gerdner's mid-range theory" (p. 17). No significant findings occurred in the control group across outcome measures.

In 2007, Suzuki and colleagues expanded on the preceding study by incorporating immunoglobulin A (IgA) as well as saliva chromogranin A (CgA) and behavioral outcome measures. The study tested a small group music intervention, based on the music preferences of eight persons with dementia. One person refused saliva sampling and researchers were unable to obtain saliva sampling from a second. The experimental group

was compared to a control group, over a 3-month period. Findings included a statistically significant reduction in salivary CgA with no significant change in IgA. The researchers once again concluded that this finding supports Gerdner's mid-range theory.

### **Anxiety in Relationship to Agitation**

As described by Hall and Buckwalter (1987), anxiety is closely related to agitation. Without intervention, anxiety may escalate to agitation. The subtle cues of cumulative stress are often overlooked, advancing to agitated behaviors that present with increased frequency and intensity (Hall & Buckwalter, 1987; Gerdner, Buckwalter, & Hall, 2005). As previously explained, individualized music should be implemented prior to the peak level of agitation, ideally when the person first begins exhibiting subtle behavioral signs and symptoms (Gerdner, 1997).

Sung and colleagues (2010) conducted a study in Taiwan to evaluate the evidence-based guideline of individualized music on the outcome measure of anxiety. Trained nursing staff implemented the guideline for 23 persons with ADRD, who resided in a long-term care facility. The researchers adapted *The Assessment of Personal Music Preference Questionnaire* (Gerdner, Hartsock, & Buckwalter, 2000) to be culturally meaningful for the Taiwanese and Chinese sample. The outcome variable was measured using the Rating Anxiety in Dementia (RAID) tool (Shanka, Walker, Frost, & Orrell, 1999). It should be noted that some items, such as restlessness, overlap with items represented on the Cohen-Mansfield Agitation Inventory (Cohen-Mansfield, 1986). The intervention was implemented biweekly for six weeks. Statistical analysis was conducted using an ANCOVA. Persons in the experimental group had a significantly lower level of anxious behaviors [ $F=12.15$ ,  $p=0.001$ ] when compared to the control group who received "standard care." More recently, a statistically significant reduction in anxiety while listening to preferred music in elders residing in long-term care in England (Costa, Ockelford, & Hargreaves, 2018).

Similarly, a study conducted by Guétin and colleagues (2009) in France evaluated the effects of preferred music on persons in the early to moderate stages of Alzheimer's disease. Anxiety, as measured by the Hamilton scale, was incorporated as an outcome variable. A significant reduction in anxiety was identified during the implementation of individualized music. This study along with the research conducted by Sung and colleagues (2010) provide support for individualized or preferred music as a means of reducing the outcome variable of anxiety, that without intervention would likely advance to agitation.

### **Translating Research into Practice**

Given the efficacy of the Individualized Music guideline when implemented by research staff, Gerdner (2005) conducted a pilot study to evaluate the effectiveness of this evidence based guideline on chronically confused elders when implemented by trained staff and family within a real-life context. In addition to a quantitative measure of agitation, open-ended interviews were conducted with staff and family to add breadth and depth to the evaluation process. A statistically significant reduction in agitation occurred during the presentation of music with an overall reduction in agitation during the day shift during the 8-week study period and on evening shift during weeks 5-8. The overwhelming majority of staff and family reported a reduction in agitation during the implementation of individualized music, providing convergent validity to these quantitative findings. In addition, staff and family commented that music served as a catalyst for meaningful interaction with others. The elder's positive response served as a facilitator for implementing individualized music.

Researchers in Taiwan also evaluated the use of individualized music when implemented by trained staff in a long-term care facility. Findings were published as two separate articles. In one article, Sung and colleagues (2008) focused on knowledge of and adherence to the evidence-based guideline for individualized music when implemented by 17 nursing staff, working in a long-term care facility in Taiwan. Initial training included an interactive educational program. Ongoing reminders, a local opinion leader, and an audit checklist were used to facilitate and monitor continued adherence to the intervention guideline. Analysis used to compare pre and post-test scores found a statistically significant improvement ( $p < 0.001$ ) in knowledge of the intervention following the training session with a mean compliance of 72%.

In a companion study Sung and colleagues (2006), focused on the resident's response to individualized music when implemented by trained nursing staff. The Cohen-Mansfield Agitation Inventory (Cohen-Mansfield, 1986) was used to measure the dependent variable. The sample included an experimental group ( $n=32$ ) that received individualized music for 30 minutes, twice per week over 6 weeks. The control group ( $n=25$ ) received usual care without music. Findings showed that the experimental group had a statistically significant reduction in overall agitation ( $t = -2.19$ ,  $p < 0.05$ ) and physically non-aggressive behaviors ( $t = -3.75$ ,  $p < 0.0001$ ) compared to the control group.

In another published study, Park and Pringle-Specht (2009) report 20 in-home family caregivers were trained in the use of the evidence-based guideline for individualized music. Outcome measures included the modified Cohen-Mansfield Agitation Inventory (Cohen-Mansfield, 1986). A quasi-experimental design was used in which individualized music was implemented two times per week for two weeks. Statistical analysis identified a significant reduction in agitation during the intervention period compared to baseline and post-intervention periods.

Gallagher (2011) studied the feasibility of training palliative care staff in the use of individualized music for management of agitation, during the advanced stage of dementia. Twenty-four hospice professionals were trained in the evidence-based guideline. Feasibility was assessed through the participants' knowledge and confidence in using the guideline. Findings support the practicality of training multidisciplinary staff in the implementation of individualized music.

### **Evolution of Guideline**

Gerdner authored the first guideline for individualized music in 1996. This publication marks the 6<sup>th</sup> edition of the evidence-based guideline for individualized music and reflects the culmination of evidence over a 22 year period. This seminal work was the impetus for further efforts to test both the mid-range theory and the evidence-based guideline not only in the United States, but also Canada, France, Great Britain, Italy, Japan, Latin America, Norway, Spain, Sweden, and Taiwan. These efforts have resulted in an expanding body of research that supports the use of this intervention for the management of agitation (Casby & Holm, 1994; Clark, Lipe, & Bilbrey, 1998; Cohen-Mansfield & Werner, 1997; Cohen-Mansfield, Libin, & Mark, 2007; Devereaux, 1997; Gallagher, 2011; Gerdner, 1992; Gerdner, 2000; Gerdner, 2005; GERI, 2011.; Gomez, et al., 2017; Janelli Janelli, Kanski, & Wu, 2002; Park, 2013; Park & Pringle-Specht, 2009; Ragneskog, Asplund, Kihlgren, & Norberg, 2001; Sánchez et al., 2016; Ridder, Stige, Qvale, & Gold, 2013; Sung, Chang, & Abbey, 2006; Sung, Chang, & Abbey, 2008; Suzuki et al, 2004; Thomas, Heitman, & Alexander, 1997) and anxiety (Guetin, Portet, Picot et al, 2009; Sung, Chang, & Lee, 2010). Evidence Grade = B). An annotated bibliography of key studies cited here are presented near the

end of this document.

Although anecdotal notes have supported the use of individualized music with regard to an increased quality of life and a positive effect. Empirical evidence has shown the positive effects of individualized music in persons with dementia who are living in long-term care facilities (Burack, Libow, & Jefferson, 2002; Sakamoto, Ando, & Tsutou, 2013) as well as those residing in assisted living facilities (Gentner, 2017). In addition, the use of individualized music for persons with dementia when implemented by family caregivers were reported to provide and increase in quality of life for both the caregiver as well as the person with dementia (Johnson, Rasmussen, Foyil, & Shopland, 2017).

## **PURPOSE**

The purpose of this guideline is to describe strategies for alleviating agitation in elders with dementia through the use of individualized music. The goal of this guideline is to reduce and to prevent the frequency and severity of agitation episodes in elders with dementia.

## **DEFINITION OF TERMS**

### **Individualized Music**

Individualized Music is music that has been integrated into the person's life and is based on personal preference (Gerdner, 1992). If the patient is unable to verbalize personal preference, selections can also be made by knowledgeable family members or close friends.

### **Cognitive Impairment**

The Centers for Disease Control and Prevention (2011) defines cognitive impairment as difficulty "remembering, learning new things, concentrating or making decisions that affect everyday life." The degree of impairment ranges from mild to severe.

### **Agitation**

The construct of agitation is complex, encompassing great variability between behaviors and individuals. In the past the definition most frequently cited in the literature was developed by Cohen-Mansfield and Billig (1986, p. 712) who conceptualizes agitation as "an inappropriate verbal, vocal, or motor activity that is not explained by needs or confusion per se." Although agitation probably results from a combination of needs and confusion, these antecedent conditions are not always apparent (Cohen-Mansfield & Billig, 1986). Based on initial factor analysis, agitation was classified into the following three syndromes (Cohen-Mansfield, Marx, & Rosenthal, 1989):

- Aggressive behavior (e.g., hitting, kicking, cursing)
- Physically nonaggressive behavior (e.g., restlessness, pacing, inappropriate robing or disrobing)
- Verbally agitated behaviors (e.g., complaining, negativism, repetitious phrases)

Subsequent research involving factor analysis led to the refinement of these syndromes by subdividing verbally agitated behaviors into: verbally aggressive (i.e., cursing) and verbally nonaggressive behaviors (i.e., negativism) (Cohen-Mansfield, Werner, Watson, & Pasis, 1995). There remains a strong interrelationship between these subdivisions (Cohen-Mansfield, 2003).

For the purpose identifying the elements and definition of this syndrome, the International Psychocological Association established the Agitation Definition Work Group (ADWG). A combination of electronic, face-to-face, and survey data was analyzed from 928 respondents. From that data the following provision consensus definition of agitation was developed:

- occurring in patients with a cognitive impairment or dementia syndrome;
- exhibiting behavior consistent with emotional distress;
- manifesting excessive motor activity, verbal aggression, or physical aggression;
- evidencing behaviors that cause excess disability and are not solely attributable to another disorder (psychiatric, medical, or substance-related) (Cummings, Mintzer, Brodaty, Sano, Banerjee, Davanand, Gauthier,... Xhong, 2015, p. 7).

This definition facilitates communication and cross-study comparison of agitation (Cummings, Mintzer, Brodaty, Sano, Banerjee, Davanand, Gauthier, ... Xhong, 2015).

## INDIVIDUALS AT RISK FOR AGITATION

Clinical and research findings have identified the following as risk factors for agitation:

- Patients with cognitive impairment as found in persons with Alzheimer's disease and related dementias (ADRD) (Algase et al., 1996; Cohen-Mansfield, Billig, Lipson, Rosenthal, & Pawlson, 1990; Cohen-Mansfield, Culpepper, & Werner, 1995; Cohen-Mansfield, Marx, & Rosenthal, 1990; Fernández et al., 2010; Holtzer et al., 2003; O'Donnell et al., 2007. Evidence Grade = B).
- Patients suffering from fatigue or diminished reserve (Algase et al., 1996; Gerdner, Buckwalter, & Hall, 2005; Hall & Buckwalter, 1987. Evidence Grade = C).
- Patients who have recently experienced a change of environment, caregiver, or routine (Gerdner et al., 2005; Hall & Buckwalter, 1987. Evidence Grade = C).
- Patients who experience pain or infection (Algase et al., 1996; Cohen-Mansfield, Billig et al., 1990; Cohen-Mansfield, Werner, & Marx, 1994; Ferrell, Ferrell, & Rivera, 1995; Gerdner et al., 2005; Husebo, Ballard, Sandvik, Nilsen, & Aarsland, 2011; Ragneskog, Gerdner, Josefsson, & Kihlgren, 1998; Zkbei, Hagegi, Armstrong-Esther, & Aho, 2005). Evidence Grade = B).
- Patients who experience an overwhelming influx of external stimuli (e.g., television, public address systems, large crowds) (Algase et al., 1996; Gerdner et al., 2005; Hall & Buckwalter, 1987; Nelson, 1995; Ragneskog et al., 1998; Struble & Sivertsen, 1987. Evidence Grade = B).
- Patients who are deprived of environmental stimuli (Cohen-Mansfield, Werner, & Marx, 1990; Cohen-Mansfield & Werner, 1995; Struble & Sivertson, 1987; Ragneskog et al., 1998. Evidence Grade = B).

## ASSESSMENT CRITERIA

The Individualized Music intervention guideline is indicated for agitation associated with ADRD. Patients should be monitored over a period of time (e.g., one week) to determine the presence of agitation and any possible temporal patterning. For example, does the patient usually become agitated by mid-afternoon? Behavior monitoring may be achieved by direct observation, patient record audit, or a standardized instrument for measuring agitation. This information will assist in identifying persons at risk for agitation and determining the most appropriate time to intervene.

During the assessment phase, clinicians should be alert to factors in the environment (e.g., excessive noise) that may cause the person to be agitated. When possible these factors should be eliminated. It is important to note that agitation, secondary to a medical condition, requires treatment of the underlying cause. Under these circumstances, the Individualized Music guideline may be used in conjunction with the prescribed treatment.

It is recommended that the person be able to hear a normal speaking voice at a distance of approximately 1-1/2 feet, to benefit from this intervention. Impaired hearing may result in the distortion of sound which in itself may be a source of irritation.

The expected effect of individualized music is dependent on the identification and implementation of music based on the patient's specific music preference. Individualized music may not be appropriate for everyone. For example, it may not be effective in persons who have not had an appreciation for music. A positive correlation is expected between the degree of significance that music had in the person's life prior to the onset of cognitive impairment and the effectiveness of the intervention (Clark et al., 1998; Cohen-Mansfield & Werner, 1997; Devereaux, 1997; Gallagher, 2011; Gerdner, 1992, 1997, 2000, 2005, 2008; Janelli, Kanski, & Wu, 2002; Lipe, 1991; Thomas et al., 1997. Evidence Grade = B).

## DESCRIPTION OF THE INTERVENTION

Individualized Music, as an intervention, is relatively inexpensive and requires minimal time expenditure. Following instruction by nursing staff, music may be implemented by nursing assistants, activity staff, and other health care professionals (Gallagher, 2011; Gerdner, 2005; Sung Chang, & Abbey, 2008; Sung, Chang, & Lee, 2010; Evidence Grade = B). The intervention is also versatile and can be implemented in a variety of settings (e.g., long-term care, adult day care, community settings, and acute care settings).

There is also growing recognition for the need to include family members in the planning and implementation of care (Buckwalter, Smith, Maas, & Kelley, 1998; Sury, Burns, & Brodaty, 2013). A knowledgeable family member may provide valuable information to guide the selection of individualized music.

Following instruction, individualized music may also be implemented by family members during home care (Park, 2013; Park & Pringle-Specht, 2009) or while visiting their loved one in a nursing home (Gerdner, 2005. Evidence Grade = B) and in assisted living (Gentner, 2017).

After determining those patients who are at greatest risk for agitation and ensuring that treatable causes of agitation, such as pain or new onset illness, are ruled out, the following steps or guidelines may be used in implementing individualized music:

1. Individualized music selection in accordance with patient preferences (Clark, Lipe, & Billrey, 1998; Devereaux, 1997; Gallagher, 2011; Gentner, 2017; Gerdner, 1992, 1997, 2000, 2005, 2008; Gomez, et al., 2017; Janelli, Kanski, & Wu, 2002; Park, 2013; Park & Pringle-Specht, 2009; Ragneskog, Asplund, Kilhgren, & Norberg, 2001; Sung, Chang, & Abbey, 2006; Sung, Chang, & Lee, 2010; Suzuki, Kananori, Watanabe, Nagasawa, Kojima, et al. 2007; Evidence Grade = B).
  - Determine the significance of music prior to the patient's onset of cognitive impairment (Cohn-Mansfield, Marx, Thein, Dakheel-Ali, 2010; Devereaux, 1997; Gallagher, 2011; Gentner, 2017; Gerdner, 1992; 1997; 2000; 2005; Gerdner & Swanson, 1993; Ing, 2016; Lipe, 1991; Park & Pringle-Specht 2009. Evidence Grade = B).
  - Interview patient to determine music preferences. Information should be as specific as possible. For example, specific song titles, performers, preference for instrumental versus vocal music, preference for type of instrumental music (piano, flute, guitar) (Clark et al., 1998; Devereaux, 1997; Gentner, 2017; Gerdner, 1992, 1997, 2000, 2005, 2008; Park, 2013; Park & Pringle-Specht, 2009; Thomas, Heitman, & Alexander, 1997. Evidence Grade = B). The patient's ethnic and religious background may influence this preference (Gerdner, 1997, 2000, 2005, 2008, 2009, 2015; Park, 2013; Ragneskog, Asplund, Kihlgren & Norberg, 2001; Sung, 2006; Sung, Chang, & Lee, 2010; Suzuki et al., 2004; Suzuki, Kanamori, Nagasawa, Tokiko, & Takayuki, 2007. Evidence Grade = B). The **Assessment of Personal Music Preference (Patient Version)** (See Appendix A) was designed to assist in the selection of individualized music.
  - If the patient is unable to provide this information due to cognitive impairment, interview a family member who is knowledgeable about the patient's music preference (Gentner, 2017; Gerdner, 1992, 2000, 2005; Ing, 2016; Park, 2013; Park & Pringle-Specht, 2009; Sung, Chang, & Abbey, 2006; Sung, Chang, & Lee, 2010; Thomas, Heitman, & Alexander, 1997. Evidence Grade = B). The **Assessment of Personal Music Preference (Family Version)** (See Appendix A) was designed with this purpose in mind.
  - With permission, music may be obtained from the patient's personal music collection. As finances permit, the facility may gradually begin building a diverse library collection for use by patients (Gerdner, 1992, 2000, 2005; Park & Pringle-Specht, 2009; Sung, Chang, & Abbey, 2006; Sung, Chang, & Lee, 2010. Evidence Grade = B). Importantly, technologies, such as MP3 players and iPods, provide added flexibility in creating and storing individualized music libraries. However,
2. Optimal effectiveness is achieved by implementing the intervention a minimum of 30 minutes prior to the patient's usual peak level of agitation (Costa, Ockelford, & Hargreaves, 2018; Devereaux, 1997; Gallagher, 2011; Gerdner, 1997, 2000, 2005, 2008; Hall & Buckwalter, 1987; Park, 2013; Park & Pringle-Specht, 2009. Sung, Chang, & Abbey, 2006. Evidence Grade = B).
  - Patients at risk need to be observed closely for signs of agitation and for any specific

causal factors in agitation episodes.

3. Play the music selections using the following procedure:

Traditionally this guideline has been implemented using an audio cassette/compact disc player (Clark, Lipe, & Billbrey, 1998; Gerdner, 1997, 2000, 2005; Ing, 2016; Park, 2013; Park & Pringle-Specht, 2009). With the advancement of technology, MP3 players and iPods provide other mediums for delivering music. Gentner (2107) tested this guideline with MP3 players using a personalized playlist via an iTunes account with residents living in an assisted living facility.

*NOTE: The technology to play the music should be individualized based on circumstances specific to the individualized needs of the person. This is a multifaceted intervention that not simply address the individualized selection of music, but focuses on individualized needs of the persons with dementia (Gerdner & Buckwalter, 2017).*

- Each music intervention session should last approximately 30 minutes in a location where the patient spends the majority of his or her time (Gallagher, 2011; Gentner, 2017; Gerdner, 1992, 1997, 2000, 2005, 2008; Park, 2013; Park & Pringle-Specht, 2009; Sung, Chang, & Abbey, 2006. Evidence Grade = B). Moving the patient to a new location may in itself be a source of agitation.
  - The volume or loudness of music must be set at an appropriate level (Gallagher, 2011; Gentner 2017 Gerdner, 1992, 1997, 2000, 2005; Park, 2013; Park & Pringle-Specht, 2009; Sung, Chang, & Abbey, 2006; 2008; Sung, Chang, & Lee, 2010. Evidence Grade = B).
  - Music is generally presented “free field” (Gerdner, 1992, 1997, 2000, 2005; Park, 2013; Park & Pringle-Specht, 2009; Sung, Chang, & Abbey, 2006. Evidence Grade = B). However, if the music becomes disturbing to others in the immediate environment it may be possible to administer the music via headphones (Gerdner, 2005) or if the patient prefers music may be administered per headphones (Janelli, Kanski, & Wu, 2002) Evidence Grade = D). Caution should be taken to insure that volume is set at an appropriate level. It is also important to assess the person’s tolerance to headphones since their use may be discomforting or confusing to persons with advanced dementia.
4. An ongoing assessment should be conducted to determine the patient's response to the music intervention (Clark et al., 1998; Cohen-Mansfield & Werner, 1997; Devereaux, 1997; Gerdner, 1992, 1997, 2000, 2005; Park, 2013; Park & Pringle-Specht, 2009; Sung, Chang, & Abbey, 2006; Sung, Chang, & Lee, 2010. Evidence Grade = B) • Monitor the patient while the music is playing to ensure that agitation does not increase or confusion becomes more pronounced. The patient's agitation and/or confusion should be minimized through the music selection.
- If the patient begins exhibiting an increased frequency of agitation with the onset of music, the music should be stopped immediately. Family should be consulted to reassess the patient’s personal music preference in an effort to determine the cause of the patient’s response. An alternative music selection will be made with assistance of the family. The second musical selection will be played on another day. If the patient responds negatively to the alternate music the intervention will be discontinued.

- Music that is pleasing to one person may be annoying to another. Therefore, other patients in the immediate area should be assessed for their response to the music (e.g., agitation).

## EVALUATION OF PATIENT OUTCOMES AND PROCESS FACTORS

In order to evaluate the use of this guideline and to determine if agitation among high risk patients has been managed effectively, both process and outcome factors should be evaluated. The successful implementation of a new clinical innovation, such as the Individualized Music Intervention, depends on the use of a structured monitoring system that includes evaluating patient outcomes and staff and organizational issues that may facilitate or obstruct its use. An outcomes monitor can help detect if the desired clinical outcomes are achieved and a process monitor, such as the one included with this guideline, can help detect knowledge-based or organizational-based problems that clinicians may have in fully implementing the guideline. Thus, a monitoring system is the last link in a successful program of implementation of evidence-based nursing care.

### Outcome Factors

The following clinical outcome factors are expected with the consistent and appropriate use of the individualized music guideline:

- Decreased frequency of agitation or disruptive behaviors
- Decreased combativeness
- Decreased use of psychotropic drugs
- Decreased use of physical restraints
- Decreased likelihood of elopement or attempt to elope

In light of data from pilot work, there is a need to evaluate quality of life outcomes measures such as:

- Positive affect
- Expressed satisfaction
- Meaningful interaction with others

For this guideline, direct observation, patient record audit, or a standardized assessment instrument such as the Cohen-Mansfield Inventory or the Disruptive Behavior Scale may be used to evaluate whether agitation, combative behavior, or elopement behaviors have decreased. Psychometric properties have been established for both of the following instruments in this population of patients.

The **Cohen-Mansfield Agitation Inventory** (Cohen-Mansfield, 1986) was designed to assess the frequency of 30 agitated behaviors over a two-week period of time (See Appendix B). The frequencies of each behavior are classified into level scores ranging from 1 to 7. A score of one indicates the nonoccurrence of identified agitated behaviors and seven indicates that the specific agitated behavior is exhibited several times per hour.

For further information regarding the Cohen-Mansfield Agitation Inventory, please contact:

Dr. Jiska Cohen-Mansfield  
School of Public Health, Sackler Faculty of Medicine  
Tel-Aviv University  
Co-Director, Minerva Center for Interdisciplinary Studies of  
the End of Life Psychology; Gerontology; Health Promotion.

The Disruptive Behavior Scale (DBS) measures the frequency and severity of 45 disruptive behaviors during each shift (Beck et al., 1997). Beck and colleagues (1997) conceptually define disruptive behavior as that which results in negative consequences for the resident, caregiver, or other residents. This instrument is available from the authors (Beck et al., 1997).

The secondary purpose of this guideline is to assist in the improvement of the functional quality of life of patients who experience episodes of agitation and/or confusion. Through patient record audit and interviews, incidence and severity of difficulties (defined as: presence and severity of secondary behavioral symptoms; level of function; incidents regarding safety, such as elopement and combative episodes; and physical and chemical restraint use) can be measured. The **Agitation Quality Improvement Monitor** (See Appendix C) will assist in the tracking of outcomes expected from clinical use of this intervention. Please use this monitor on a weekly basis during the intervention period for each patient receiving the guideline. Keep in mind that some of the questions on the Agitation Quality Improvement Monitor may not be appropriate for persons with advanced stages of dementia. When a patient is unable to verbally indicate his or her feelings due to advanced dementia, indicate this in the comment section of the monitor as a justified variation.

It is important to keep in mind that one should use the same method of evaluating agitation before and after the initiation of the Individualized Music intervention. Timing of these evaluations may differ across settings. You may modify the time frame as necessary for your setting.

### **Process Factors**

Process factors are those factors related to the staff's knowledge and confidence in implementing the guideline. The **Individualized Music Intervention Knowledge Assessment Test** (See Appendix D) should be assessed as part of the initial training session for use of this guideline. For example the test may be used as a pre-test and post-test to assess learning.

An example of a process monitor, the **Process Evaluation Monitor** (See Appendix E) may be used to determine the staff's understanding of the Individualized Music guideline and to assess the support received for carrying out the guideline on the unit. Nurses are asked to complete this form one month following the use of this guideline.

## APPENDIX A

### ASSESSMENT OF PERSONAL MUSIC PREFERENCE

©Linda A. Gerdner, Jane Hartsock, & Kathleen C. Buckwalter, 2000)

The *Assessment of Personal Music Preference* (APMP) questionnaire was designed to obtain detailed information regarding personal music preference and identify the importance of music in the person's life during independent living. This information may be used to assist in the selection of individualized music. This questionnaire is the culmination of the authors' clinical and research expertise in this area (Gerdner, 1992, 1997, 2000; Gerdner & Swanson, 1993). It takes approximately 15 minutes to complete. A revised version of this instrument was developed which may be completed by a knowledgeable family member when the patient is unable to answer the questions due to cognitive impairment. Following its development, the APMP questionnaire was further evaluated in a study in which individualized music was implemented by trained staff and family members (Gerdner, 2005), trained family within the home environment (Park, 2013; Park & Pringle-Specht, 2009), trained caregivers in assisted living (Gentner, 2017) and registered nurses in assisted living (Ing, 2016).

**ASSESSMENT OF PERSONAL MUSIC PREFERENCE (PATIENT VERSION)**

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Music is often a very important part of people's lives. Please complete the following based on your personal music preference.

Before illness, how important a role did music play in your life?

1. Very Important  
 2. Moderately Important  
 3. Slightly Important  
 4. Not Important

Do/did you play a musical instrument?

If yes, please specify (examples: piano, guitar).

Do/did you enjoy singing?

If yes, please specify (examples: around-the house, church choir).

Do/did you enjoy dancing?

If yes, please specify (examples: attended dance lessons, participated in dance contests)

The following is a list of different types of music. Please indicate your three (3) most favorite types with 1 being the most favorite, 2 the next, and 3 the third favorite.

1. Country and Western  
 2. Classical  
 3. Spiritual/Religious  
 4. Big Band/Swing  
 5. Folk  
 6. Blues  
 7. Jazz  
 8. Rock and Roll  
 9. Easy Listening  
 10. Cultural or Ethnic Specific (examples: Czech polkas, Ravi Shankar Indian sitar)  
 11. Other: \_\_\_\_\_

*Please put a check (✓) beside the most correct choice to the following questions.*

What form does your favorite music take?

1. Vocal  
 2. Instrumental  
 3. Both

Please identify specific songs/selections which make you feel happy.

Please identify specific artist(s)/performers(s) that you enjoy listening to the most.

Please identify specific albums, audio-cassette tapes, or compact discs contained in your personal music library.

**ASSESSMENT OF PERSONAL MUSIC PREFERENCE (FAMILY VERSION)**

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Music is often a very important part of people's lives. Please complete the questionnaire based on your knowledge of your family member's music preference.

Before illness, how important a role did music play in his/her life?

- \_\_\_\_\_ 1. Very Important  
 \_\_\_\_\_ 2. Moderately Important  
 \_\_\_\_\_ 3. Slightly Important  
 \_\_\_\_\_ 4. Not Important

Does/did he/she play a musical instrument?

If yes, please specify (examples: piano, guitar).

Does/did he/she enjoy singing?

If yes, please specify (examples: around-the house, church choir).

Does/did he/she enjoy dancing?

If yes, please specify (examples: attended dance lessons, participated in dance contests)

The following is a list of different types of music. Please indicate the individual's three (3) most favorite types with 1 being the most favorite, 2 the next, and 3 the third favorite.

- \_\_\_\_\_ 1. Country and Western  
 \_\_\_\_\_ 2. Classical  
 \_\_\_\_\_ 3. Spiritual/Religious  
 \_\_\_\_\_ 4. Big Band/Swing  
 \_\_\_\_\_ 5. Folk  
 \_\_\_\_\_ 6. Blues  
 \_\_\_\_\_ 7. Jazz  
 \_\_\_\_\_ 8. Rock and Roll  
 \_\_\_\_\_ 9. Easy Listening  
 \_\_\_\_\_ 10. Cultural or Ethnic Specific (examples: Czech polkas, Ravi Shankar Indian sitar)  
 \_\_\_\_\_ 11. Other: \_\_\_\_\_

*Please put a check (✓) beside the most correct choice to the following questions.*

What form does the individual's favorite music take?

- 1. Vocal
- 2. Instrumental
- 3. Both

Please identify specific songs/selections that make your family member feel happy.

Please identify specific artist(s)/performers(s) that the individual enjoyed/enjoys listening to the most.

Please identify specific albums, audio-cassette tapes, or compact discs contained in your family member's personal music library.

## APPENDIX B

### COHEN-MANSFIELD AGITATION INVENTORY

(© Cohen-Mansfield, 1986)

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The purpose of the Cohen-Mansfield Agitation Inventory is to assess the frequency of manifestations of agitated behaviors in elderly persons. The Cohen-Mansfield Agitation Inventory (CMAI) is a 29-item instrument designed to assess the frequency of agitated behaviors over a two-week period (Cohen-Mansfield et al., 1989). Users should obtain the CMAI manual before using the tool, and can contact Dr. Jiska Cohen-Mansfield at [cohen-mansfield@hebrew-home.org](mailto:cohen-mansfield@hebrew-home.org). The frequency of each behavior is rated on a scale of 1-7. A score of one indicates the behavior never occurred during the previous two weeks. A score of seven indicates the behavior occurred several times an hour over the previous two weeks. For each patient receiving the Individualized Music for Elders with Dementia guideline intervention, please complete the Cohen-Mansfield Agitation Inventory on the following page. This inventory should be completed at baseline (before guideline is started with a patient) and then every two weeks. For each patient receiving the intervention, please keep a record of the changes observed in his or her medical record. The purpose of this inventory is to track the patient's level of agitation over time and while being exposed to individualized music sessions. The intended primary outcome of this guideline is a reduction in the number of agitation episodes and the severity of such episodes.

Agitation is operationally defined by Cohen-Mansfield and Billig (1986) as: Inappropriate verbal, vocal, or motor activity that is not judged by an outside observer to result directly from the needs or confusion of the agitated individual. Agitation is not a diagnostic term, but rather a term used by clinicians for a group of symptoms that may reflect an underlying disorder.

Agitated behavior is always socially inappropriate, and can be manifested in three ways:

- (a) It may be abusive or aggressive toward self or others.
- (b) It may be appropriate behavior performed with inappropriate frequency, such as constantly asking questions.
- (c) It may be inappropriate according to social standards for the specific situation, as in taking off clothes in the activity room.

**TO USE THE INVENTORY:** Please read each of the behaviors, and check how often (from 1 – 7) each behavior was observed for the patient during the previous two weeks. When a behavior has occurred rarely during one week, and more frequently during another, try to average over the past two weeks to obtain the frequency which best reflects its occurrence.

If the person to be rated manifests an inappropriate behavior that is close to a behavior on the Cohen-Mansfield Agitation Inventory, but not spelled out exactly, add it to that category. For example, if a person squeaks, and this behavior is not listed, use the category of “making strange noises,” even though it is not included in the examples. Recognize that it is impossible

to include all possible examples, but each line is intended to capture a group of closely related behaviors.

Do not try to judge if the behavior can be explained or not, just rate the frequency at which it actually occurs.

**TO SCORE PATIENT'S LEVEL OF AGITATION:** The Cohen-Mansfield Inventory assesses a diverse group of behaviors. Calculating a total score (by summing the circled numbers) may identify an overall agitation score whereby a higher score represents more agitation over the previous two weeks, though this total score does not allow for understanding changes in specific forms of agitation. That is, some of the behaviors on the inventory are more harmful to the patient and to others than are other behaviors. Perhaps examining the scores for each behavioral group (Aggressive Behavior; Physically Nonaggressive Behavior; Verbally Agitated Behavior) is more important for your setting and for the particular patient. Regardless of the method chosen for calculating scores, overall agitation should reduce following implementation of this Individualized Music guideline.

For detailed information about the CMAI, assessment instructions, and other versions of the CMAI, please contact:

Dr. Jiska Cohen-Mansfield  
 School of Public Health, Sackler Faculty of Medicine  
 Tel-Aviv University  
 Co-Director, Minerva Center for Interdisciplinary Studies of  
 the End of Life Psychology; Gerontology; Health Promotion.

**PLEASE MAKE COPIES of the Cohen-Mansfield Agitation Inventory on the following page and place them in the medical record of patients receiving the Individualized Music intervention.**

**REFERENCE:**

Cohen-Mansfield, J., Marx, M.S., & Rosenthal, A.S. (1989). A description of agitation in a nursing home. *Journal of Gerontology*, 44(3), M77-M84. Reprinted with permission from Dr. Jiska Cohen-Mansfield.

**COHEN-MANSFIELD AGITATION INVENTORY**

(© Cohen-Mansfield, 1986)

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Date \_\_\_\_\_

Patient \_\_\_\_\_

Completed By \_\_\_\_\_

	Never	Less than once a week	Once or twice a week	Several times a week	Once or twice a day	Several times a day	Several times an hour
<b>BEHAVIOR</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
Pace, aimless wandering	1	2	3	4	5	6	7
Inappropriate dress or disrobing	1	2	3	4	5	6	7
Spitting (include at meals)	1	2	3	4	5	6	7
Cursing or verbal aggression	1	2	3	4	5	6	7
Constant unwarranted request for attention or help	1	2	3	4	5	6	7
Repetitive sentences or questions	1	2	3	4	5	6	7
Hitting (including self)	1	2	3	4	5	6	7
Kicking	1	2	3	4	5	6	7
Grabbing onto people	1	2	3	4	5	6	7
Pushing	1	2	3	4	5	6	7
Throwing things	1	2	3	4	5	6	7
Strange noises (weird laughter or crying)	1	2	3	4	5	6	7
Screaming	1	2	3	4	5	6	7
Biting	1	2	3	4	5	6	7
Scratching	1	2	3	4	5	6	7

<b>BEHAVIOR</b>	<b>Never</b>	<b>Less than once a week</b>	<b>Once or twice a week</b>	<b>Several times a week</b>	<b>Once or twice a day</b>	<b>Several times a day</b>	<b>Several times an hour</b>
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
Trying to get to a different place (e.g., out of the room, building)	1	2	3	4	5	6	7
Intentional falling	1	2	3	4	5	6	7
Complaining	1	2	3	4	5	6	7
Negativism	1	2	3	4	5	6	7
Eating/drinking inappropriate substances	1	2	3	4	5	6	7
Hurt self or other (cigarette, hot water, etc.)	1	2	3	4	5	6	7
Handling things inappropriately	1	2	3	4	5	6	7
Hiding things	1	2	3	4	5	6	7
Hoarding things	1	2	3	4	5	6	7
Tearing things or destroying property	1	2	3	4	5	6	7
Performing repetitious mannerisms	1	2	3	4	5	6	7
Making verbal sexual advances	1	2	3	4	5	6	7
Making physical sexual advances	1	2	3	4	5	6	7
General restlessness	1	2	3	4	5	6	7
Strange movements making faces	1	2	3	4	5	6	7

**Total Score (Add all numbers) \_\_\_\_\_**

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## APPENDIX C AGITATION QUALITY IMPROVEMENT MONITOR

For each patient receiving the Individualized Music guideline intervention, please complete the monitor on the following page. This monitor should be completed on a weekly basis. For each patient receiving the intervention, please keep a record of the changes observed in his or her patient records.

**PLEASE MAKE A COPY OF THE MONITOR on the next page and place it in the chart of each patient who is receiving the Individualized Music guideline. The outcomes on this monitor should be assessed and recorded for each patient on a weekly basis.**

**TO USE THE MONITOR:** Place the appropriate key criteria next to the five separate outcomes for each patient assessment. We have provided a total of eight boxes, which represent the first eight weeks of the use of this guideline. Once the chart has been completed, please make another copy of the blank form and begin numbering the new chart at Week 9.

The example below is for the first outcome (Patient Interview) and displays the various criteria keys:

### (EXAMPLE):

Criteria Key
Y=Yes/met criteria
N=No/criteria not met
J=Justified Variation/patient not included in the monitor (Note <i>why</i> patient is not included.)

Please place the appropriate key next to the outcomes for each assessment period.

<i>Outcomes</i>	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Patient's verbal and nonverbal response reveals that patient is feeling secure and safe.	N	N	N	N	Y	Y	Y	Y

### AGITATION QUALITY IMPROVEMENT MONITOR

Criteria Key
<b>Y=Yes</b> /met criteria
<b>N=No</b> /criteria not met
<b>J=Justified Variation</b> /patient not included in the monitor (Note <i>why</i> patient is not included.)

Please place the appropriate key next to the outcomes for each assessment period.

<i>Outcomes</i>	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Patient's verbal and nonverbal response reveals that patient is feeling secure and safe.								
Patient's verbal and nonverbal response reveals that patient is feeling more functional.								
Patient's Cohen-Mansfield Inventory scores are/have declined and/or remain low.								
Patient records reveal no use of chemical or physical restraint use.								
Patient records reveal no agitation incident reports.								
Comments:  Week 1: _____  Week 2: _____  Week 3: _____  Week 4: _____  Week 5: _____  Week 6: _____  Week 7: _____  Week 8: _____								

**APPENDIX D**  
**INDIVIDUALIZED MUSIC INTERVENTION**  
**KNOWLEDGE ASSESSMENT TEST**

The individual who will be overseeing the use of this evidence-based guideline should be the only one with access to this test key. Following proper education of staff, with regard to this guideline, each nurse who will use the Individualized Music intervention should be given an opportunity to take this test. Please do not use this test as part of the nurse's typical evaluation, but instead this test should be used as a **learning tool only**. Please have each nurse take this test without the key present, and once he/she is done, let him or her code how many questions they answered correctly and incorrectly. Guidance in determining why he/she answered as they did can also be part of the learning process.

**INDIVIDUALIZED MUSIC INTERVENTION**  
**KNOWLEDGE ASSESSMENT KEY**

1. C
2. D
3. B
4. C
5. A
6. B
7. D
8. A
9. C
10. B

**INDIVIDUALIZED MUSIC INTERVENTION  
KNOWLEDGE ASSESSMENT TEST**

1. Individualized music is defined as music that is:
  - A. A preferred general category of music (e.g., classical, country/western)
  - B. Designed for relaxation
  - C. Based on personal preference which includes identification of specific performers and song titles
  - D. Associated with the era in which the patient was a young adult
  
2. Which of the following supports the theoretical framework for the effects of Individualized Music intervention for agitation (IMIA)?
  - A. It is believed that receptive and expressive musical abilities are preserved in individuals with ADRD long after their ability to process or express verbal language
  - B. Elicitation of memories associated with positive feelings has a soothing effect on the person with ADRD, which in turn prevents or alleviates agitation
  - C. Music changes the focus of attention and provides an interpretable stimulus, overriding meaningless or confusing stimuli in the environment
  - D. All of the above
  
3. Overall assessment to determine the appropriateness of using individualized music as an alternative intervention includes all of the following EXCEPT:
  - A. Hear a normal speaking voice at an approximate distance of 1 1/2 feet
  - B. The person's ability to play a musical instrument or sing
  - C. Assess temporal patterning in an effort to determine the most appropriate time for prescribed intervention
  - D. Determine the importance of music in the person's life prior to the onset of dementia
  
4. Individualized music is NOT appropriate as an alternative intervention for the management of agitation in cognitively impaired persons with
  - A. Increased difficulty in interpreting environmental stimuli
  - B. Fatigue
  - C. Pain
  - D. A deprivation or lack of environmental stimuli
  
5. Assessment of individualized music includes all of the following EXCEPT:
  - A. The ability to understand verbal language
  - B. Consideration to ethnic and religious background

- C. Prior music interests (i.e., sang in church choir, played a musical instrument)
  - D. Determination of specific music preferences (i.e., song titles, performers)
6. Individualized music may be used on an “as needed” (PRN) basis by:
- A. Waiting to intervene until the peak level of agitation
  - B. Implementing when the person first begins exhibiting signs of increased anxiety
  - C. Implementing every 3-4 hours
  - D. Playing for 2-3 hours at a time
7. The following clinical outcomes factors are expected with the consistent and appropriate use of Individualized Music guideline:
- A. Decreased agitation
  - B. Decreased use of psychotropic drugs
  - C. Decreased use of physical restraints
  - D. All of the above
8. When music is being played the patient, for whom the music was intended, should be monitored as well as other patients in the immediate area.
- A. True
  - B. False
9. If the patient exhibits an increase in agitation:
- A. Continue to play the music, since it takes longer for someone with dementia to process music
  - B. Stop the music with no further attempts to implement music
  - C. Stop the music, reassess music preference, and try again using a different musical selection at a later date
  - D. Increase the volume since the patient might be hard-of-hearing
10. Family members (select the correct statement):
- A. Should not be burdened with assisting in the planning and implementation of activities for the patient
  - B. Have valuable information regarding the personal likes and dislikes of the patient
  - C. Do not have the knowledge or skill necessary to make a meaningful contribution when care is transferred to a long-term care facility
  - D. Mainly serve to increase staff’s work-load by being critical and demanding

## APPENDIX E

### PROCESS EVALUATION MONITOR

The purpose of this monitor is to evaluate perceived knowledge and support of nurses or other individuals who are using the Individualized Music intervention. Once staff or other persons using the guideline complete this Process Evaluation Monitor, the individual in charge of implementing the guideline needs to review the form with each person. For the nine questions, please tally the responses provided by adding up the numbers circled. For example, if Question 1 is answered "2" and Question 2 is answered "3" and Question 3 is answered "4" the nurse's score for those three questions (2+3+4) equals 9. The highest total score possible on this monitor is 36, while the lowest score possible is 9. Nurses who have higher scores on this monitor are indicating that they are well-equipped to implement the guideline, and understand its use and purpose. On the other hand, nurses who have relatively low scores are in need of more training and/or support in the use of the guideline.

**PLEASE MAKE A COPY OF THE MONITOR on the next page and ask each individual who uses the guideline to complete it approximately one month following his/her initial education and use of this guideline.**

### PROCESS EVALUATION MONITOR

**Directions:** Please circle the number that best describes your perception about your use of the Individualized Music intervention.

		Strongly Disagree	Disagree	Agree	Strongly Agree
1.	I feel knowledgeable to carry out the Individualized Music intervention.	1	2	3	4
2.	Implementing the guideline enhances the quality of patient care.	1	2	3	4
3.	I feel supported in my efforts to implement the Individualized Music intervention.	1	2	3	4
4.	I feel well prepared to carry out the Individualized Music intervention guideline with the assistance from others knowledgeable about the guideline.	1	2	3	4
5.	I am able to help the patient and/or family select music preferences.	1	2	3	4
6.	I am able to identify and carry out the essential activities of the Individualized Music intervention.	1	2	3	4
7.	I had enough time to learn about how to do the Individualized Music intervention before I needed to implement it.	1	2	3	4
8.	We are managing agitation better with the use of the Individualized Music intervention.	1	2	3	4
9.	The Individualized Music intervention enables me to meet agitation management needs of most patients.	1	2	3	4

## APPENDIX F

## \SUPPLEMENTAL TRAINING AND EDUCATIONAL RESOURCES

## Supplemental on-line training programs

Continuing efforts are underway to promote and support the use of individualized music by clinicians. For example, Gerdner collaborated with Sigma Theta Tau International and the John A. Hartford Foundation for the development of a free interactive on-line continuing educational module to assist nurses in the assessment, implementation, and evaluation of individualized music. The module was first incorporated into the on-line continuing education program in 2004 with subsequent updates in 2008, and 2017.

The module includes a case example, based on a real-life incident with names changed to protect confidentiality. The case example highlights the need to consider cultural background when assessing musical preference. It involves an Italian American woman who spoke minimal English. Her preferred music includes recordings of Dean Martin singing Italian songs. Nurse participants of the module are asked to complete an evaluation of the course. The overwhelming majority rated the content as excellent and reported that it would help them in their practice. If a member of Sigma Theta Tau, the module may be free of charge with an accompanying quiz. Continuing educations are also awarded for successful completion of module. The reference and website follows:

Gerdner, L. A. (updated 2017). Reducing Agitation in Elders with Dementia [1.5 CEU's] Sigma Theta Tau International Honor Society of Nursing / The John A. Hartford Foundation Online Continuing Education Program. Available at <https://www.nursingknowledge.org/reducing-agitation-in-elders-with-dementia.html>

In addition, a learning module was created on the use of individualized music for the Stanford Geriatric Education Center at Stanford University. Refer to the following citation and weblink:

Gerdner, L. A. (March 2015). Individualized Music for Persons with ADRD. Stanford Geriatric Education Center. Stanford University School of Medicine. <http://sgcec.stanford.edu/Individualized-Music-in-Persons-with-ADRD.html>

The New York State Department of Health developed a series of free multi-disciplinary on-line training modules referred to as the *Electronic Dementia Guide for Excellence* (EDGE) that includes a module developed by Dr. Gerdner on the use of individualized music. The module provides specific guidelines for the development of a 45-minute in-service, including learning objectives and a PowerPoint presentation. A sample case study is provided to assist the learner in the application of this knowledge for the assessment, implementation, and evaluation of individualized music. The module is reported to be one of the most popular in the EDGE series.

Gerdner, L. A. (April 2006). Intervention: Individualized music. In J. Ronch (Ed.) *The Electronic Dementia Guide for Excellence (EDGE) Project*. Funded by The New York State Department of Health. [http://www.health.state.ny.us/diseases/conditions/dementia/edge/interventions/indiv\\_music/index.htm](http://www.health.state.ny.us/diseases/conditions/dementia/edge/interventions/indiv_music/index.htm)

## International NPTherapies Project

To learn more about the national and international impact of Dr. Linda A. Gerdner's pioneering work on Individualized Music refer to the televised interview conducted on web TV by Dr. Alfredo Raglio. The weblink is provided below:

<http://vimeo.com/63811378>

## APPENDIX G

## Translation of Evidence-Based Guideline into Children's Picture Book

Research indicates that the signs and symptoms associated with dementia adversely affect communication and relationships between afflicted grandparents and their grandchildren (Creasey, Myers, & Epperson, 1989; Werner, 2001). A child's response to a person with Alzheimer's disease will vary depending on factors such as: the child's age, the number of other children in the family, the closeness of the relationship between the child and the afflicted person, the availability of other family members, and the cultural background of the child (Cohen & Eisdorfer, 2001).

Overall, children should be encouraged to ask questions, express feelings openly (Mace & Rabins, 2006) and remain involved with the person at a level that is appropriate to the child's ability and understanding (Cohen & Eisdorfer, 2001). Illustrated children's books with stories that describe children's reactions to Alzheimer's disease can be used to model ways for them to interact with people who have the disease (Cohen & Eisdorfer, 2001; Mace & Rabins, 2006).

Basic principles of the evidence-based guideline of individualized have been translated into a picture book for children and their family (Gerdner & illustrations by Gearino, 2017). The book, currently in press, is authored by Gerdner and is targeted for children aged 8 to 12 years of age. However, the underlying message of understanding and compassion transcends to persons of all ages. The story entitled, *Musical Memories*, is about Gabrielle and her grandmother who has Alzheimer's disease. It provides an honest and respectful depiction of an older person with this disease. The story is unique in that it reflects our current knowledge and understanding of the disease. The story goes beyond the issue of short-term memory to address antecedents of anxiety progressing to agitation. *Musical Memories* promotes a problem solving approach that models the use of a simple intergenerational activity (listening to music) to empower the child in maintaining a relationship with her grandmother. Author notes, located at the end of the book, directly relate to and build upon the story content to strengthen the educational value of the book. (Refer to Gerdner & Buckwalter, 2013).

A website (see below) has been created that provides free resources to health care professionals, family caregivers and teachers and well as children. A supplemental question answer form has been developed to enhance the educational value of the book.

<https://gerdnerlinda.wixsite.com/musicalmemories>

A soft bound version of the book is available through Amazon.com. A hard copy version is available through the author at the above website.

## REFERENCES

Key: (R)=Research

(L)=Literature

(N)=National Guidelines

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**ANNOTATED BIBLIOGRAPHY  
INDIVIDUALIZED MUSIC  
GUIDELINE**

**Clark, M. E., Lipe, A. W., & Bilbrey, M. (1998). Use of music to decrease aggressive behaviors in people with dementia. *Journal of Gerontological Nursing, 24(7), 10-17.***

The purpose of this study was to examine the effects of preferred music in decreasing the occurrences of aggressive behavior in persons with dementia during bathing episodes. The convenience sample was comprised of 18 persons, age 55 to 95, with severe cognitive impairment. Subjects were randomly scheduled for observation during bath time under either a control (no music) or an experimental condition in which selections of preferred music were played via an audiotape recorder during the bathing episode. Following a two-week (10 episodes) observation period, conditions were reversed. A total of 20 observations were recorded for each individual (10 control, 10 experimental). There was a clinically significant reduction in 12 of 15 identified aggressive behaviors. A two-tailed t-test for dependent measure showed a statistically significant reduction ( $p < 0.05$ ) in the total number of aggressive behaviors and for hitting behavior during the music condition as compared to the control. In addition, caregivers frequently reported improved affect and a general increase in cooperation with bathing during the music condition.

**Cohen-Mansfield, J., & Werner, P. (1997). Management of verbally disruptive behaviors in nursing home residents. *Journal of Gerontology. Series A, Biological Sciences and Medical Sciences, 52A(6), M369-377.***

The purpose of this study was to assess the effectiveness of three interventions to a control (no intervention) on the frequency of verbally disruptive behaviors in 32 persons residing in a long-term care facility. The interventions were: (1) presentation of a videotape of a family member talking to the older person, (2) in vivo social interaction, and (3) use of preferred music.

Participants were assigned to four groups. Each group contained the three interventions and one "no-treatment" condition. The order of treatment was altered for each group. Each treatment continued for two consecutive weeks and was followed by a one-week "wash-out" period. Data were collected before, during, and after the interventions using audio taped recording, the Screaming Behavioral Mapping Instrument, and the Cohen-Mansfield Agitation Inventory (items specific to verbally disruptive behavior). Analysis revealed that verbally disruptive behaviors decreased by 56% during the social interaction, 46% during the videotape, 31% during preferred music, and 16% during the no-intervention.

**Devereaux, M. A. (1997). *The effects of individualized music on cognitively impaired nursing home residents exhibiting agitation.* Unpublished master's thesis, College of St. Catherine, St. Paul, Minnesota.**

Devereaux conducted a modified replication of Gerdner's study (1992). A quasi-experimental one-group pretest/post test was used to evaluate the effects of individualized music on the frequency of agitation. The study consisted of a convenience sample of five female subjects (mean age 90 years) residing in a skilled nursing home. The frequency of agitation was measured using the Modified Cohen-Mansfield Agitation Inventory. Baseline data was collected during week one. Using recommendations from the original study, the time of intervention was individualized based on each subject's peak level of agitation. Individualized music was played for 30 minutes on five consecutive days during week two. The post intervention observation period was extended to 90 minutes. Paired t-test revealed a significant decrease in agitated behaviors during the intervention period and the 90 minutes immediately following the intervention.

**Gallagher, M. (2011). Evaluating a protocol to train hospice staff in administering individualized music. *International Journal of Palliative Nursing*, 17(4), 196-201.**

Gallagher (2011) studied the feasibility of training palliative care staff in the use of individualized music for management of agitation, during the advanced stage of dementia. Twenty-four hospice professionals were trained in the evidence-based protocol. Feasibility was assessed through the participants' knowledge and confidence in using the protocol. Findings support the practicality of training multidisciplinary staff in the implementation of individualized music.

**Gentner, D. J. (2017). Music and dementia: A caregiver's perspective of the effects of individualized music programming on quality of life for seniors living in assisted living. Doctoral Dissertation. St. John Fisher College, School of Education: Pittsford, NY.**

**Available online at:**

**[https://fisherpub.sjfc.edu/cgi/viewcontent.cgi?article=1308&context=education\\_etd](https://fisherpub.sjfc.edu/cgi/viewcontent.cgi?article=1308&context=education_etd)**

A 6-week, longitudinal pilot study evaluated the effects of individualized music on the quality of life in persons with dementia residing in an assisted living facility. The *Assessment of Personal Music Preference Questionnaire* was used to identify the selection of music for implementation of the individualized music guideline. The dependent variable was measured using the Alzheimer's Disease Related Quality of Life Instrument. Findings indicated a statistically significant increase in quality of life from baseline through the final assessment.

**Gerdner, L. A. (1992). *The effects of individualized music on elderly patients who are confused and agitated*. Master's thesis, University of Iowa, Iowa City.**

Gerdner used a pre-experimental one-group pretest/post-test design to investigate the immediate and one-hour residual effects of individualized music on agitated behaviors in elderly patients who were confused. The nonprobability, convenience sample consisted of five Caucasian widows (mean age 90.8 years), residing in a nursing home. Results of the Mini Mental State Exam yielded a mean score of 6 (severely cognitively impaired). Data were collected for each subject during two consecutive weeks (5 days/week). The first week

of data collection established baseline information and included direct observation and documentation of frequency of agitated behaviors exhibited from 3:30 p.m. to 5:00 p.m., using the Modified Cohen-Mansfield Agitation Inventory. Interventions occurred during the second week, from 3:30 to 4:00 p.m. Music was presented "free field" per audio cassette tape. Selections for individualized music were based on responses to the Modified Hartsock Music Preference Questionnaire. Subjects were too cognitively impaired to directly answer the questions; consequently, a family member was asked to complete the questionnaire to the best of his/her ability regarding the subject's preference to music. The time of intervention was estimated to precede the peak level of agitation. The patients' behavior was observed and documented during the intervention and the hour immediately following (4:00 – 5:00 p.m.). Analysis was conducted using a dependent t-test, with an alpha level of .05 to establish significance. Differences between baseline assessment and the corresponding intervention period were not statistically significant. The differences during the post-intervention period were in the hypothesized direction and are statistically significant ( $t = -3.5$ ,  $p .05$ ). This result may be due to the amount of time required to process the music and elicit relaxation. Findings suggest the potential of individualized music as an alternative approach to the management of elderly patients who are confused and agitated.

**Gerdner, L. A., & Swanson, L. A. (1993). Effects of individualized music on elderly patients who are confused and agitated. *Archives of Psychiatric Nursing*, 7(5), 282-291.**

The progressively lowered stress threshold model in conjunction with an identified theoretical framework provides a basis for the use of individualized music in individuals with dementia of the Alzheimer's type. A case study approach is used to explore the effects of individualized music in five elderly patients who are confused and agitated and residing in a long-term care facility. The Modified Cohen-Mansfield Agitation Inventory is used to measure the outcome. The immediate and one-hour residual effects suggest the potential of individualized music as an alternative approach to the management of agitation in confused elderly patients.

**Gerdner, L. (1997). An individualized music intervention for agitation. *Journal of the American Psychiatric Nurses Association*, 3(6), 177-184.**

Persons with cognitive impairment as in Alzheimer's disease and related dementias have a progressive decline in their stress threshold. Agitation results when this stress threshold is exceeded. A proposed mid-range theory incorporates these elements to discuss the use of individualized music to alleviate agitation. Music may provide a method of communicating with this population even in advanced stages when the person is unable to understand verbal language and has decreased ability to interpret environmental stimuli. It is predicted that the presentation of music carefully selected for meaningfulness to the person during his or her younger years will stimulate memory for remote events, and elicitation of memories associated with positive feelings will have a soothing effect and will alleviate or decrease agitated behaviors. Results from a pilot study and preliminary findings from a study currently underway are provided as beginning efforts to support this mid-range theory.

**Gerdner, L. A. (1998). *Individualized vs. classical music on agitation in Alzheimer's disease and related disorders*. Doctoral Dissertation; The University of Iowa; Iowa City, Iowa.**

Elderly confusion and agitation are crucial nursing problems. Limitations and concerns related to the current management of these behaviors suggest the need to investigate alternative nursing interventions. One such intervention is music. The purpose of this study was to test Gerdner's mid-range theory of individualized music intervention for agitation (IMIA). An experimental repeated measures pretest-posttest cross over design was used to compare the immediate and 30 minute residual effects of individualized music to classical "relaxation" music relative to baseline on the frequency of agitated behaviors in elderly persons with Alzheimer's disease and related disorders (ADRD). Thirty-nine subjects were recruited from six long-term care facilities in Iowa. The sample was comprised of 30 females and 9 males (mean age of 82 years) with severe cognitive impairment. Each subject was studied over an 18-week period.

Baseline data were collected during the initial three weeks. The selection of individualized music was based on findings from the Modified Hartsock Music Preference Questionnaire (Family Version). Group A received individualized music for six weeks followed by a two-week "washout" period and six weeks of classical "relaxation" music. Group B received the same guideline but in reverse order. Music interventions were presented "free field" for 30 minutes, two times per week. The time of intervention was individualized based on application of the Progressively Lowered Stress Threshold Model. The dependent variable was measured using the Modified Cohen-Mansfield Agitation Inventory. A repeated measures analysis of variance with Bonferroni post hoc test revealed a significant decrease in the frequency of agitated behaviors during the 30-minute presentation of individualized music compared to the 30-minute presentation of classical "relaxation" music relative to baseline. In addition, there was a significant decrease in the frequency of agitation during the 30 minutes immediately following the presentation of individualized music compared to the 30 minutes immediately following classical "relaxation" music relative to baseline. Anecdotal notes were also collected on each subject, providing a rich source of data to inform quantitative findings. Six case studies are presented which reflect the immediate and residual effects of the music interventions. The cases were selected to provide a cross-representation with regard to gender, degree of cognitive impairment, ethnicity, and the importance of music prior to the onset of cognitive impairment. Overall findings are discussed as they relate to theory testing (specific to each proposition). Implications of these findings for nursing practice, education, and research are discussed.

**Gerdner, L. A. (2000). Effects of individualized vs. classical "relaxation" music on the frequency of agitation in elderly persons with Alzheimer's disease and related disorders. *International Psychogeriatrics*, 12(1), 49-65.**

This paper received a 1999 International Psychogeriatrics Association/Bayer Research Award. The article represents the published findings of the above cited dissertation (Gerdner, 1998).

**Gerdner, L. A. (2005). Use of individualized music by trained staff and family: Translating research into practice. *Journal of Gerontological Nursing*, 31 (6), 22-30.**

This pilot study used a mixed methodology to evaluate the effectiveness of individualized

music, for the management of agitation in eight subjects when implemented by trained staff and family. Baseline data were collected by CNAs over a four-week period using the Cohen-Mansfield Agitation Inventory (CMAI) to determine the overall level of agitation on day and evening shifts. Following this period the PI, primary investigator, conducted a structured education program on individualized music to nursing staff (RNs, LPNs, CNAs) and family members of subjects enrolled in this pilot study. To promote and sustain the use of this intervention, an experiential method of learning was used. Each participating staff and family member received a \$15 gift certificate to purchase an audiocassette or compact disc of preferred music. A portable stereo sound system was placed in the employee lounge to promote personal use of music for relaxation during breaks. Following the training session, family members completed the Assessment of Music Preference Questionnaire to determine music selection for the subject. Trained CNAs administered individualized music as an alternative intervention for agitation during the subsequent two months. Music was presented “free field” on a portable audio cassette/CD player for 30 minutes daily at a time selected to precede the subject’s peak level of agitation. Individualized music was also implemented on an “as needed” basis by staff and family when the subject began exhibiting anxious or agitated behaviors. The Agitation Visual Analog Scale (AVAS) was used to evaluate the perceived degree of agitation immediately before and after the intervention. The CMAI was completed weekly, during the two-month intervention period. In addition, staff and family were interviewed at scheduled interviews to learn their perception of the subject’s response and to identify barriers and facilitators for implementing this intervention. Findings reveal a statistically significant reduction in agitation during the presentation of music and an overall reduction in agitation was found on day shifts during weeks 1-8 and on evening shifts during weeks 5-8. Staff/family interviews provided convergent validity of findings. Music also promoted meaningful interaction between the resident and others. The subject’s positive response to the music served as a facilitator for implementation. Head phones were used on one subject when it was discovered that the selected music was annoying to her roommate.

**Janelli, L., Kanski, G., & Wu, Y. (2002). Individualized music—a different approach to the restraint use. *Rehabilitation Nursing, 27(6), 221-226.***

This pilot study explored the use of individualized music as an alternative to using physical restraints with hospitalized patients. The diagnoses of subjects included: stroke cardiac disease, gastrointestinal disorders, respiratory disease, cancer, or orthopedic problems requiring surgery. Forty subjects were randomly assigned to either the experimental group (individualized music) or the control group (no music). Music was administered via padded head phones. Observed behaviors were recorded on the Restraint-Music Response Instrument (RMRI) developed by the investigator. RMRI consisted of 22 positive behaviors (e.g., humming, smiling) and 18 negative behaviors (e.g., squirming, yelling). Observations were made at baseline and periodically throughout the intervention phase (both with and without restraints).

Data were analyzed using a t-test for equality of means. There was a significant difference ( $p < .01$ ) in behaviors during the intervention phase. Patients who listened to preferred music had more positive behaviors than patients who were out of restraints but not exposed to music. *Note: A description of the participants in this study did not specify a diagnosis of dementia. A description of the sample did however state that, “a few [participants] were*

not alert to time and place.” It therefore, appears as though the guideline may have been adapted for persons with acute confusion who were exhibited behaviors requiring the application of physical restraints. Clarification regarding these issues is warranted to determine more precisely the implications for future research.

**Lipe, A. W. (1991). Using music therapy to enhance the quality of life in a client with Alzheimer's dementia: Case study. *Music Therapy Perspectives, 9*, 102-105.**

Lipe used a case study to assess the effects of music on a female patient diagnosed with Alzheimer's disease, severe visual agnosia, and apraxia. Administration of the Mini Mental State Exam revealed a score of one. The patient had a history of extreme agitation, manifested by yelling, shouting and becoming combative towards staff. Selected music was based on the patient's personal music preference that included the categories of jazz and "Big Band". Music sessions were conducted during a 15 to 20 minute interval of time, once a week over four years. The patient consistently responded positively to the presentation of music based on personal preference.

**Norberg, A., Melin, E., & Asplund, K. (1986). Reactions to music, touch, and object presentation in the final stage of dementia: An exploratory study. *International Journal of Nursing Studies, 23*(4), 315-323.**

This study compared the effects of music, touch, and object presentation on two patients in the final stage of dementia. Sessions were implemented for 90 minutes, alternating between one and two times per day, for twelve consecutive days. The first patient exhibited muscular rigidity with occasional spasmodic jerks, and had been mute for one year. The second patient was "very limp" and "often lay babbling incomprehensibly". Early musical preferences were determined by interviews with family members and music was administered by audiocassette tapes and earphones. Touch was implemented systematically through small circular stroking movements on the patients' forehead, cheeks, ears, neck, shoulders, back, forearms, hands, feet, and lower legs. Object presentation consisted of trials to stimulate the patient's auditory, tactile, olfactory, and visual senses. This was achieved by allowing the subject to smell, touch and see an object while the researcher discussed it. Evaluation of the patients' responses included assessment of eyelid movements, mouth and head movements, pulse and respirations. Subjects responded differently to music than the two other forms of stimulation. While researchers found no objective methods available to assess this emotional reaction, it was their subjective impression that patients reacted more positively to music.

**Park, H. (2013). The effect of individualized music on agitation for home-dwelling persons with dementia. *Open Journal of Nursing, 3*, 453-459. doi.org/10.4236/ojn.2013.36061**

A one group pre-test / post-test design was used to evaluate the effects of individualized music on agitation in 26 in-home persons with dementia. The intervention was delivered two times per week, for a total of four sessions. Per the evidence-based guideline, individualized music played for 30 minutes prior to the estimated “peak” level of agitation. Each person’s level of agitation was monitored: 30 minutes prior to the intervention,

during the 30-minute intervention and 30 minutes immediately following the intervention. Findings reported a statistically significant reduction in agitation while playing individualized music compared to baseline ( $t=3.70$ ,  $p<.001$ ).

**Park H., & Pringle-Specht J. K. (2009). Effect of individualized music on agitation in individuals with dementia who live at home. *Journal of Gerontological Nursing*, 35(8), 47-55. doi: 10.3928/00989134-20090706-01**

Twenty in-home caregivers were trained in the use of the evidence-based guideline for individualized music. Outcome measures included the modified Cohen-Mansfield Agitation Inventory (Cohen-Mansfield, 1986). A quasi-experimental design was used in which individualized music was implemented two times per week for two weeks. Statistical analysis identified a significant reduction in agitation during the intervention period compared to baseline and post-intervention periods.

**Ragneskog, H., Asplund, K., Kihlgren, M., & Norberg, A. (2001). Individualized music played for agitated patients with dementia: Analysis of video-recorded sessions. *International Journal of Nursing Practice*, 7, 146-155.**

Researchers from Sweden and Norway evaluated the effects of individualized music in reducing agitation in four subjects with dementia. Subjects were video recorded during periods of no music, classical music, and individualized music. Individualized music selections were chosen after interviewing the patients, the patients' next of kin, and the nursing staff. The comparison intervention involved a New Age recording of classical music (Pachelbel) and ocean sounds.

Video recordings were analyzed by using the Facial Action Coding System (FACS). Two subjects became notably calmer and two became marginally calmer during individualized music sessions compared to baseline and classical music intervention. The researchers emphasize the importance of correctly identifying the personal music preference on the outcomes of this intervention.

**Sung, H-C, Chang, A. M., & Abbey J. (2008). An implementation programme to improve nursing home staff's knowledge of and adherence to an individualized music protocol. *Journal of Clinical Nursing*, 17, 2573–2579. doi: 10.1111/j.1365-2702.2007.02010.x**

Researchers in Taiwan evaluated the use of individualized music when implemented by trained staff in a long-term care facility. Findings were published as two separate articles. In one article, Sung and colleagues (2008) focused on knowledge of and adherence to the evidence-based protocol for individualized music when implemented by 17 nursing staff, working in a long-term care facility in Taiwan. Initial training included an interactive educational program. Ongoing reminders, a local opinion leader, and an audit checklist were used to facilitate and monitor continued adherence to the intervention protocol. Analysis used to compare pre and post-test scores found a statistically significant improvement ( $p<0.001$ ) in knowledge of the intervention following the training session with a mean compliance of 72%.

**Sung, H., Chang, A.M., & Abbey J. (2006). The effects of preferred music on agitation of older people with dementia in Taiwan. *International Journal of Geriatric Psychiatry*, 21(10), 999- 1000. doi:10.1002/gps.1585**

In a companion study Sung and colleagues focused on the resident's response to individualized music when implemented by trained nursing staff. The Cohen-Mansfield Agitation Inventory (Cohen-Mansfield, 1986) was used to measure the dependent variable. The sample included an experimental group (n=32) that received individualized music for 30 minutes, twice per week over 6 weeks. The control group (n=25) received usual care without music. Findings showed that the experimental group had a statistically significant reduction in overall agitation ( $t = -2.19, p < 0.05$ ) and physically non-aggressive behaviors ( $t = -3.75, p < 0.0001$ ) compared to the control group.

**Sung, HC, Chang, A. M., & Lee, W. L. (2010). A preferred music listening intervention to reduce anxiety in older adults with dementia in nursing homes. *Journal of Clinical Nursing*, 19(7-8), 1056-64. doi:10.1111/j.1365-2702.2009.03016.x]**

Sung and colleagues conducted a study in Taiwan to evaluate the evidence-based guideline of individualized music on the outcome measure of anxiety. Trained nursing staff implemented the guideline for 23 persons with ADRD, who resided in a long-term care facility. The researchers adapted *The Assessment of Personal Music Preference Questionnaire* (Gerdner, Hartsock, & Buckwalter, 2000) to be culturally meaningful for the Taiwanese and Chinese sample. The outcome variable was measured using the Rating Anxiety in Dementia (RAID) tool. It should be noted that some items such as restlessness overlap with items represented on the Cohen-Mansfield Agitation Inventory (Cohen-Mansfield, 1986). The intervention was implemented biweekly for six weeks. Statistical analysis was conducted using an ANCOVA. Persons in the experimental group had a significantly lower level of anxious behaviors [ $F=12.15, p=0.001$ ] when compared to the control group who received "standard care."

**Suzuki, M., Kanamori, M., Watanabe, M., Nagasawa, S, Kojima, E., Ooshiro, H., & Nakahara, D. (2004). Behavioral and endocrinological evaluation of music therapy for elderly patients with dementia. *Nursing and Health Sciences*, 6, 11-18.**

Japanese researchers used an endocrinological measurement of CgA in addition to functional and behavioral measures for the purpose of evaluating the effects of preferred music in persons with dementia. The study included an experimental group consisting of 10 subjects with dementia who received preferred music twice per week for 8 weeks (16 sessions). During this corresponding time period, thirteen subjects participated in a comparison intervention of physical activities (games, drawing, pasting pictures). The following evaluation measures were conducted at baseline and one-week following the intervention period: Mini-Mental State Examination (MMSE), N type Mental States (NM scale) and N type Activities of Daily Living (N-ADL), Multidimensional Observation Scale (MOSES). In addition, salivary CgA was collected immediately pre and post intervention during sessions 1, 8, and 16. Differences between pre- and post-intervention scores for the MMSE, NM scale and N-ADL were compared using a paired *t*-test. Findings showed that

subjects in the experimental group had a statistically significant improvement in the “language” subscale of the MMSE ( $p=0.01$ ) and a statistically significant reduction in “irritability” as measured by the MOSES ( $p=0.0001$ ). Changes in CgA were analyzed using a one-way repeated measure ANOVA. The experimental group had a statistically significant reduction in salivary CgA following session 16 ( $p=0.048$ ). The authors concluded, “the changes in CgA levels supported Gerdner’s mid-range theory.” No significant findings occurred in the control group across outcome measures.

**Suzuki, M., Kanamori, M., Nagasawa, S., Tokiko, I., Takayuki, S. (2007). Music therapy-induced changes in behavioral evaluations, and saliva chromogranin A and immunoglobulin A concentrations in elderly patients with senile dementia. *Geriatrics & Gerontology International*, 7(1), 61-71. doi: 10.1111/j.1447-0594.2007.00374.x**

In 2007, Suzuki and colleagues expanded on the preceding study by incorporating immunoglobulin A (IgA) as well as saliva chromogranin A (CgA) and behavioral outcome measures. The study tested a small group music intervention, based on the music preferences of eight persons with dementia. One person refused saliva sampling and researchers were unable to obtain saliva sampling from a second. The experimental group was compared to a control group, over a 3-month period. Findings included a statistically significant reduction in salivary CgA with no significant change in IgA. The researchers once again concluded that this findings support Gerdner’s mid-range theory.

**Thomas, D. W., Heitman, R. J., & Alexander, T. (1997). The effects of music on bathing cooperation for residents with dementia. *Journal of Music Therapy*, 34(4), 246-259.**

The purpose of this study was to evaluate the effects of music on bathing cooperation in a convenience sample of 14 residents with dementia of the Alzheimer's type. Subjects were selected based on (a) resistant behaviors to bathing and (b) having a premorbid interest in music as disclosed by family members. Music selections were based on the subject’s personal preference as reported by a family member. Subjects ranged in age from 69 to 86, had a moderate degree of cognitive impairment. A quasi-experimental design was employed with each subject receiving three pretreatment observations (baseline), three treatment observations, and three post-treatment observations. An adapted version of the Cohen- Mansfield Agitation Inventory was used to measure the four domains of agitation (aggressive behavior, physically nonaggressive behavior, hiding/hoarding behavior). Data were analyzed using Cochran's Q nonparametric test for related samples to determine if matched sets of frequencies for dependent variables differed significantly among the nine recording times. The results of the data analysis showed no significant differences among the nine recording times for the dependent variables of hiding/hoarding ( $Q = 6.700, p = .570$ ), physically nonaggressive behavior ( $Q = 7.600; p = .473$ ), and verbally agitated behavior ( $Q = 34.511, p = .000$ ).

Significance was found with the independent variable of aggressive behavior. Results of this study suggest that the discretionary use of music may have some effect on delaying the onset of more severe forms of agitation. Furthermore, reducing physical aggressiveness may have the dual effect of improving the patients’ quality of life while also increasing job satisfaction among primary care providers.

### **CONTACT INFORMATION**

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