

# Using music to improve health and wellbeing of older adults living with dementia and their care partners

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# Objectives

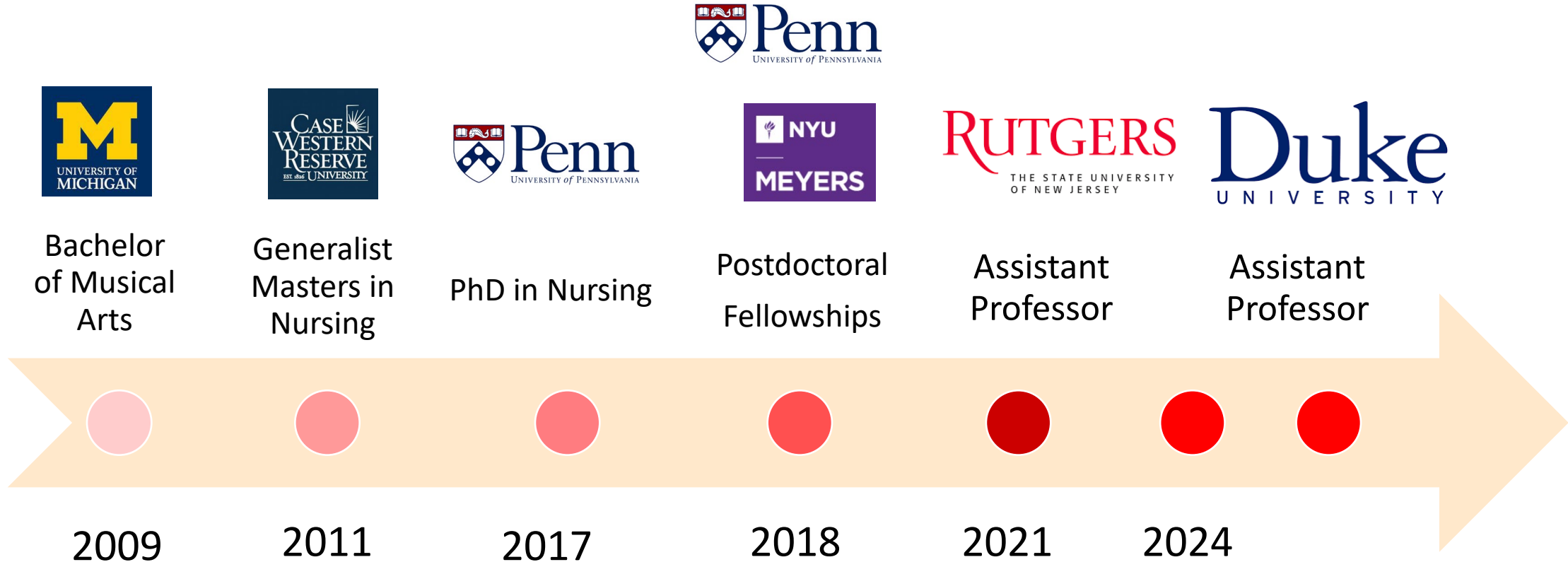
1. To examine mechanisms of music memory and music, as a form of art, in older adults with dementia
2. To explore benefits of music interventions on mental health in older adults
3. To investigate the benefits of other forms of arts on mental health of older adults
4. To present ongoing clinical trials and research in the area of arts and mental health in older adults
5. To discuss practical ways music can be incorporated into the lives of older adults with and without dementia

# Music Upbringing

- Interest to work with older adults
- Music and memories connection



# Career Trajectory



# In the news



HEALTH · Published April 26, 2023 10:06am EDT

## Secret of keeping the brain young? Learn to play a musical instrument, says new study

Long-term musical training could delay, even counteract age-related decline, says study

### healthnews News Family health Longevity Sleep Mental health Beauty Nutrition

Home → News

## How Listening to Music at Work Impacts Productivity



Kimberly Drake  
April 24, 2023



Image by Katcha\_Nascarin via Shutterstock

Scientists explain how the brain interprets music and whether listening to tunes

### Latest news



### FDA Issues Warning on Drug, SARMs

Kimberly Drake April

The agency says production of androgen receptor modulators associated with serious



Musical training in childhood creates additional neural connections that can last a lifetime.

PHOTOGRAPH BY JANINE WIEDEL PHOTOLIBRARY/ALAMY

## Your Aging Brain Will Be in Better Shape If You've Taken Music Lessons

Studies are showing that learning to play an instrument can bring significant improvements in your brain.

6 MINUTE READ

BY DIANE COLE, FOR NATIONAL GEOGRAPHIC



### The Washington Post

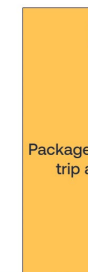
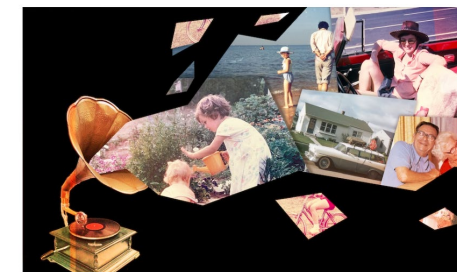


Well-Being Food Fitness Mind Body Life

## Why music causes memories to flood back

She didn't recognize her husband but could still sing every word to an old Simon & Garfunkel song

By Marlene Cimons  
February 26, 2023 at 7:30 a.m. EST

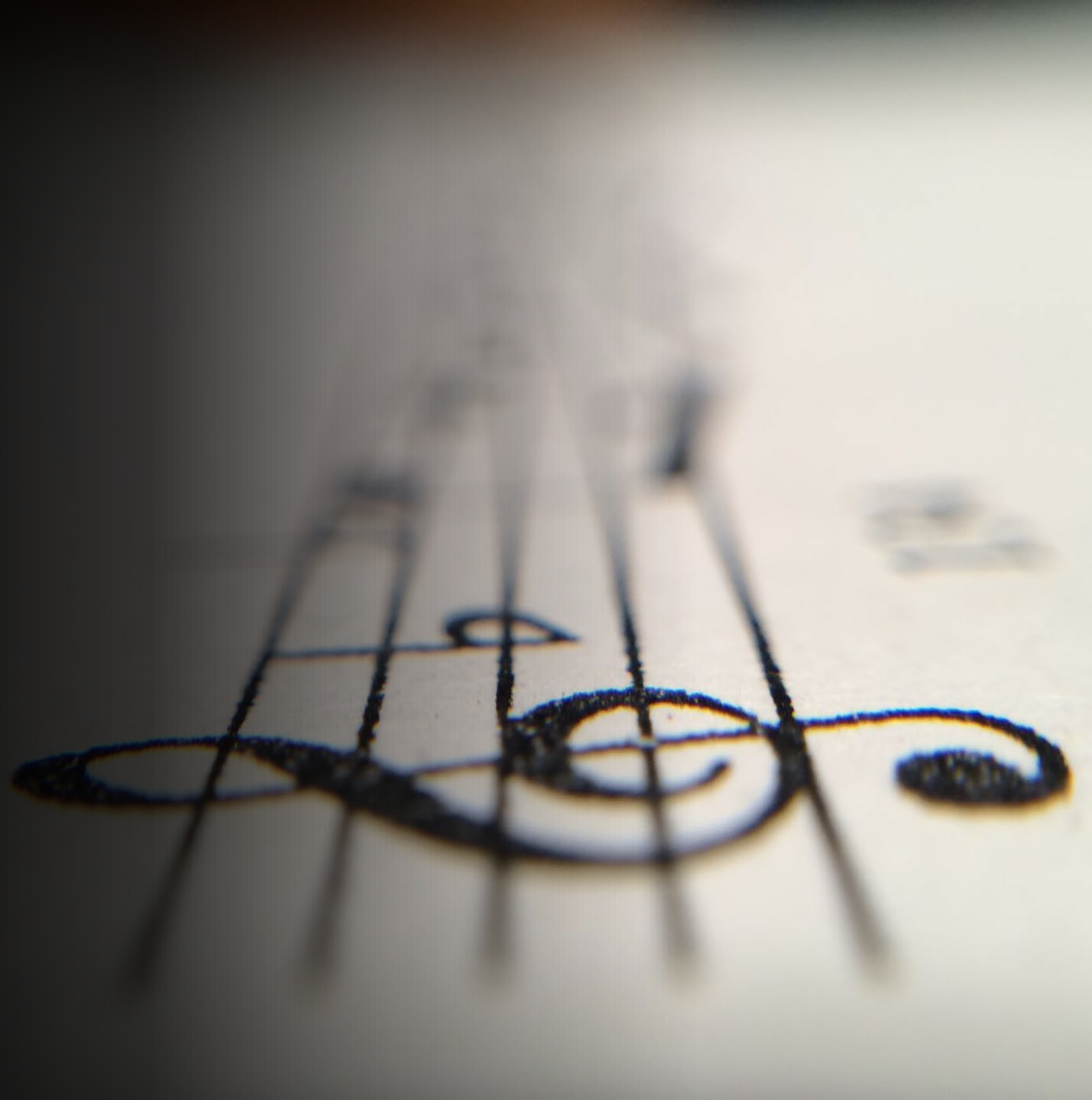




## Background

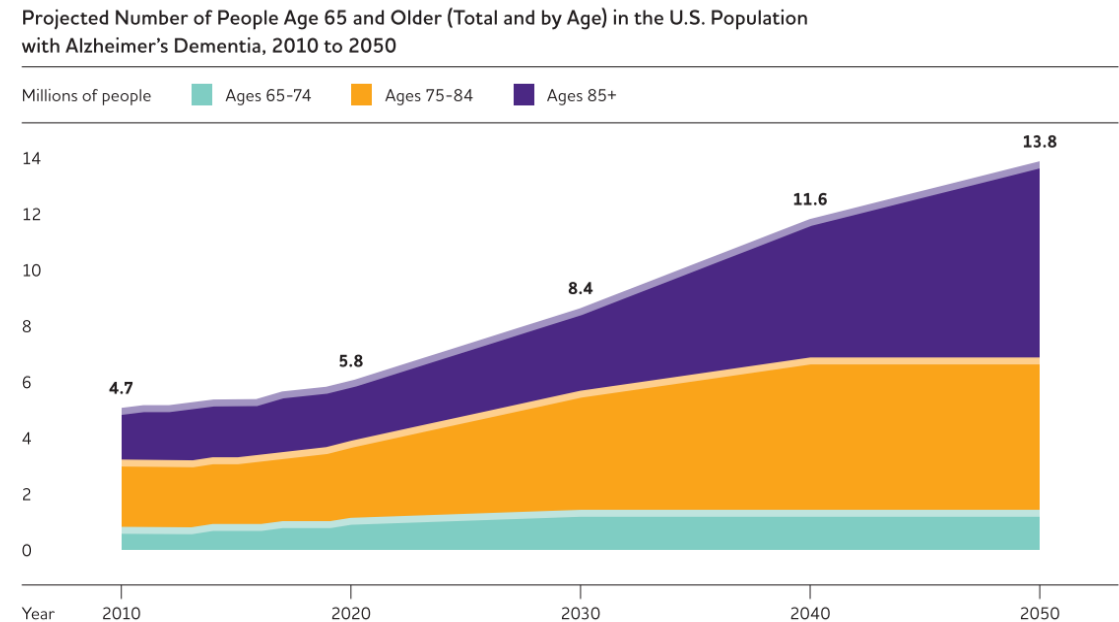
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- Growing scientific interest in how music may help older adults
- Connection with early preferred music of adolescence and young adulthood remains throughout the aging process (Jacobsen et al. *Brain*, 2015)
- Music is a tool to help address bothersome symptoms
- Music interventions include music listening, music therapy, music training



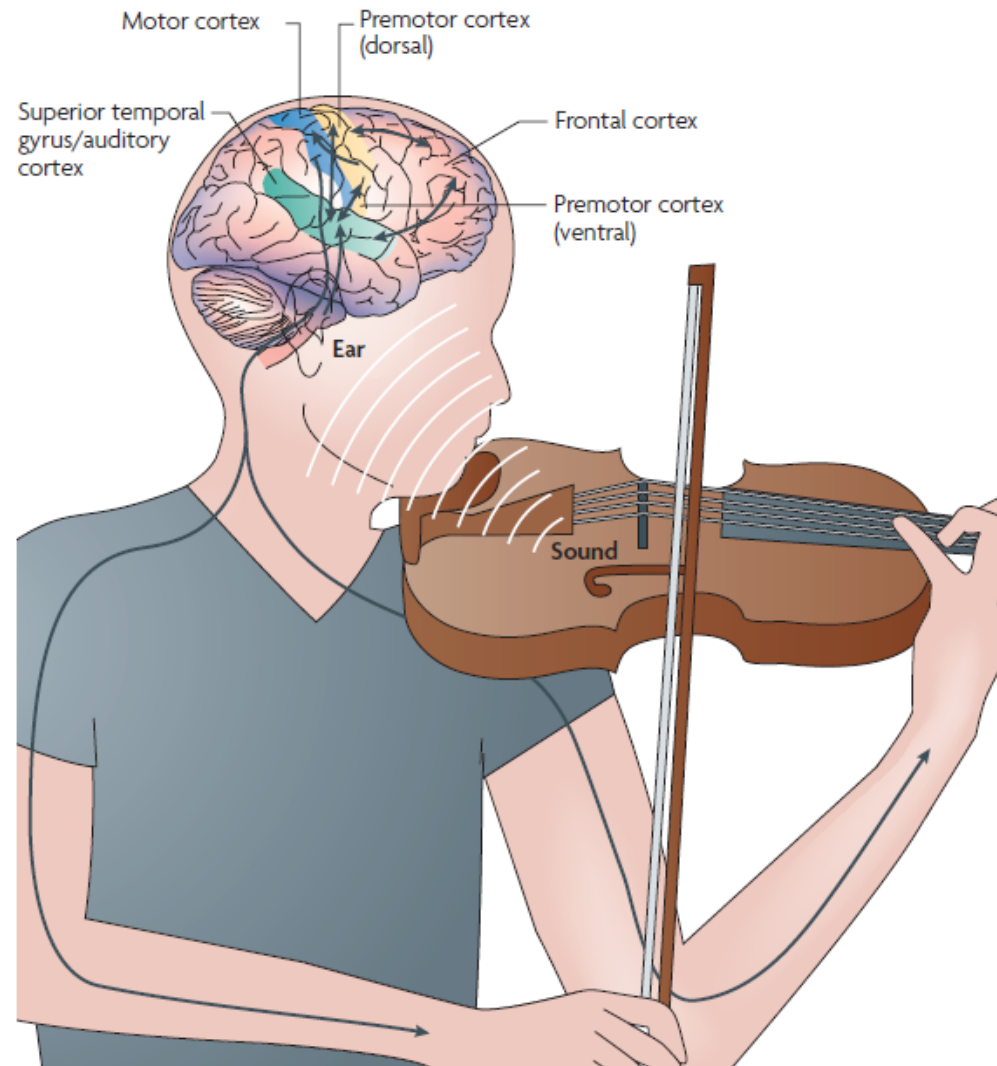
# Significance

- Characteristics of dementia
  - Complex attention, executive function, learning and memory, language, perceptual motor function, and social cognition
- 5.8 million Americans age 65 and older are living with Alzheimer's dementia
- Alzheimer's disease accounts for 60% to 80% of all cases
- One in 10 people age 65 and older has Alzheimer's dementia



Hebert LE, Weuve J, Scherr PA, Evans DA. Alzheimer disease in the United States (2010-2050) estimated using the 2010 Census. *Neurology* 2013;80(19):1778-83.  
Alzheimer's Association 2020 Alzheimer's Disease Facts and Figures

# Background





# Background

- Longitudinal studies
  - Participation in leisure activities (i.e. reading, playing board games, **playing musical instruments**, and dancing) is associated with **decreased risk for dementia** (Verghese et al., 2023, 2006)
  - Participation in musical activities (i.e., playing a musical instrument, karaoke and choir or folk singing) is associated with decreased risk of dementia among Japanese older women (Arafa et al., 2021)
- Cross-sectional studies
  - **Older musicians** did better on different **cognitive tests** compared to **non-musicians** (Strong & Mast, 2019; Hanna-Pladdy & MacKay, 2011; Bottcher et al., 2022)
    - Verbal working memory, verbal immediate recall, visuospatial judgment, global cognition, controlling for the level of general lifestyle activity

# Example #1

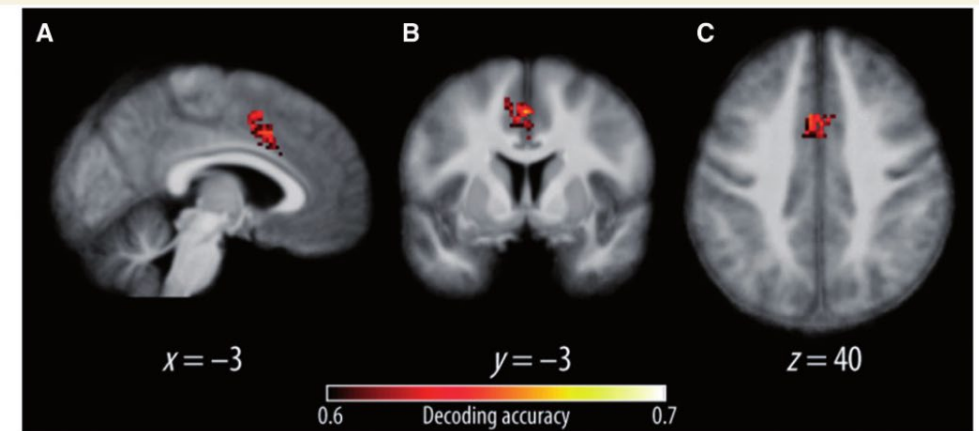


# Why is music preserved in dementia?

- Amyloid accumulation -> hypometabolism -> cortical atrophy
- First study: N =32 normal health young adults -> identify brain regions that encode long-term musical memory
- Areas: caudal anterior cingulate and the ventral pre-supplementary motor area
- Second study: N=20 patients with Alzheimer's disease and N=34 healthy older adults
- Results: regions identified to encode musical memory corresponded to areas that showed substantially minimal cortical atrophy

## Why musical memory can be preserved in advanced Alzheimer's disease

Jörn-Henrik Jacobsen,<sup>1,2</sup> Johannes Stelzer,<sup>1,3,4</sup> Thomas Hans Fritz,<sup>1,5,6</sup> Gael Chételat,<sup>7,8,9,10</sup> Renaud La Joie<sup>7,8,9,10</sup> and Robert Turner<sup>1</sup>

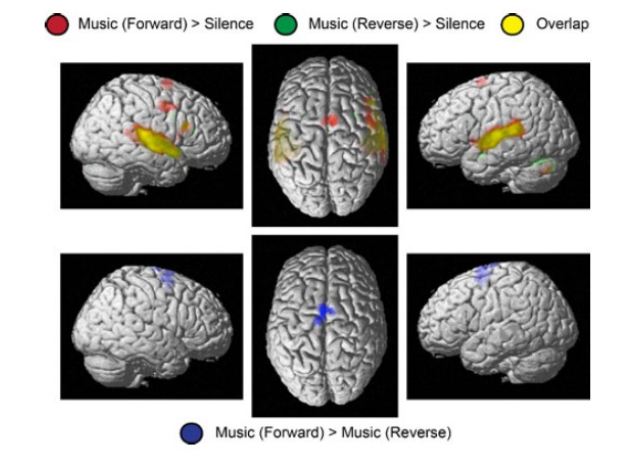


# More evidence

## Increased Functional Connectivity After Listening to Favored Music in Adults With Alzheimer Dementia

J.B. King<sup>1,2</sup>, K.G. Jones<sup>1</sup>, E. Goldberg<sup>3</sup>, M. Rollins<sup>2</sup>, K. MacNamee<sup>4</sup>, C. Moffit<sup>4</sup>, S.R. Naidu<sup>5</sup>, M.A. Ferguson<sup>6</sup>, E. Garcia-Leavitt<sup>7</sup>, J. Amaro<sup>7</sup>, K.R. Breitenbach<sup>8</sup>, J.M. Watson<sup>4,9</sup>, R.K. Gurgel<sup>5,10</sup>, J.S. Anderson<sup>1,2,11</sup>, N.L. Foster<sup>7,12</sup>

- N=17 older adults with Alzheimer's disease
- Scanned brain of individuals following a personalized music listening program
- Activation in supplementary motor area, a region that has been associated with memory for familiar music that is typically spared in early Alzheimer disease.



## Example #2



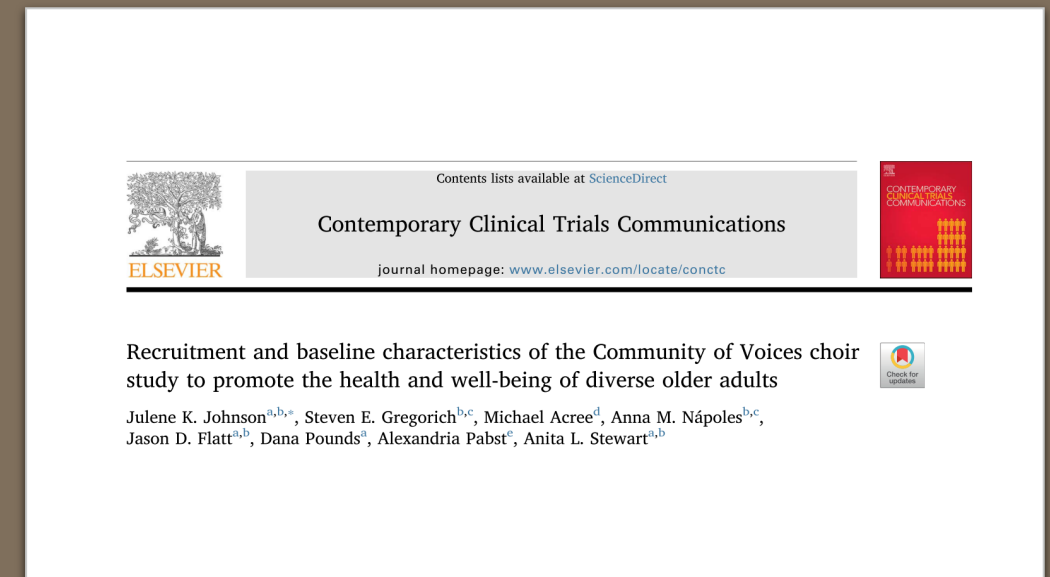
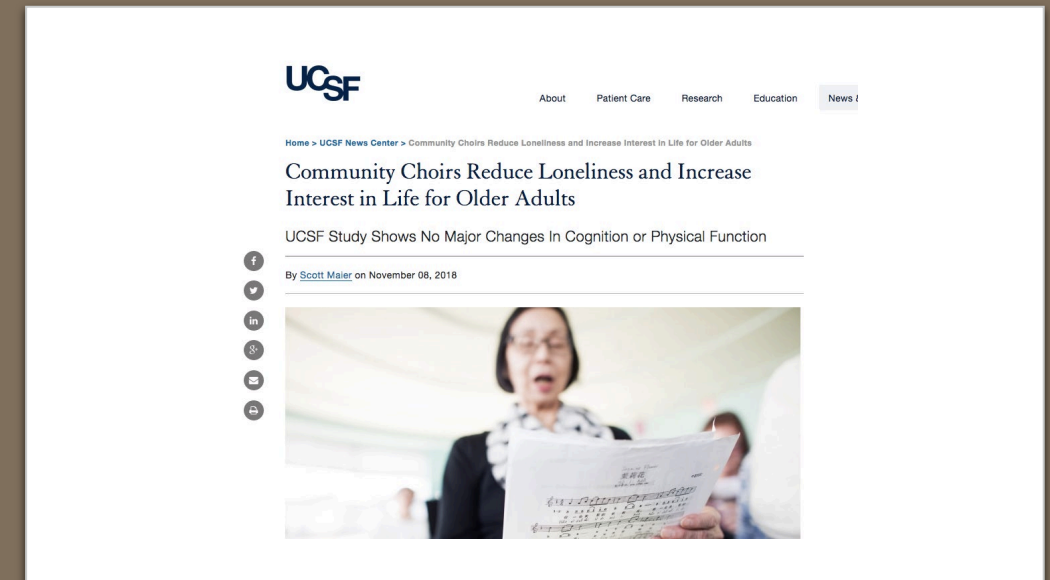
# Theories (or mechanisms) behind music and dementia

- Music => mentally stimulating activity
- Cognitive reserve model
- Neuroplasticity
- Emotional response to familiar music
- Social aspects of music (decreased isolation)
- Music training- highly specialized skill, requires practice and dedication
- Vs music listening - passive
- Is there one “correct” mechanism?



# Benefits of singing in older adults

- Community Choirs to Promote Healthy Aging and Independence of Older Adults (UCSF)
- N=390
- Randomized Clinical Trial
- English and Spanish
- Results: at 6 months, decrease in loneliness and increase in interest in life



# Community of Voices



# Benefits of music

- Improved mood
- Better sleep
- Less stress
- Improved symptoms of dementia
- Less anxiety
- Less agitation
- Less aggression



# Benefits of singing in older adults

- Let us join our voices: a qualitative exploration of singing in urban, community-dwelling older adults
  - Qualitative descriptive study
  - Location: 3 PACE programs in Philadelphia
  - 19 participants
  - 3 focus groups
- Results:
- Main theme: “Something for us to do that we love”
  - Two subthemes, “Joyful time together” and “Uplifting Experience Performing for Others.”

Original Research

## A Qualitative Exploration of Choral Singing in Community-dwelling Older Adults

Western Journal of Nursing Research

1–18

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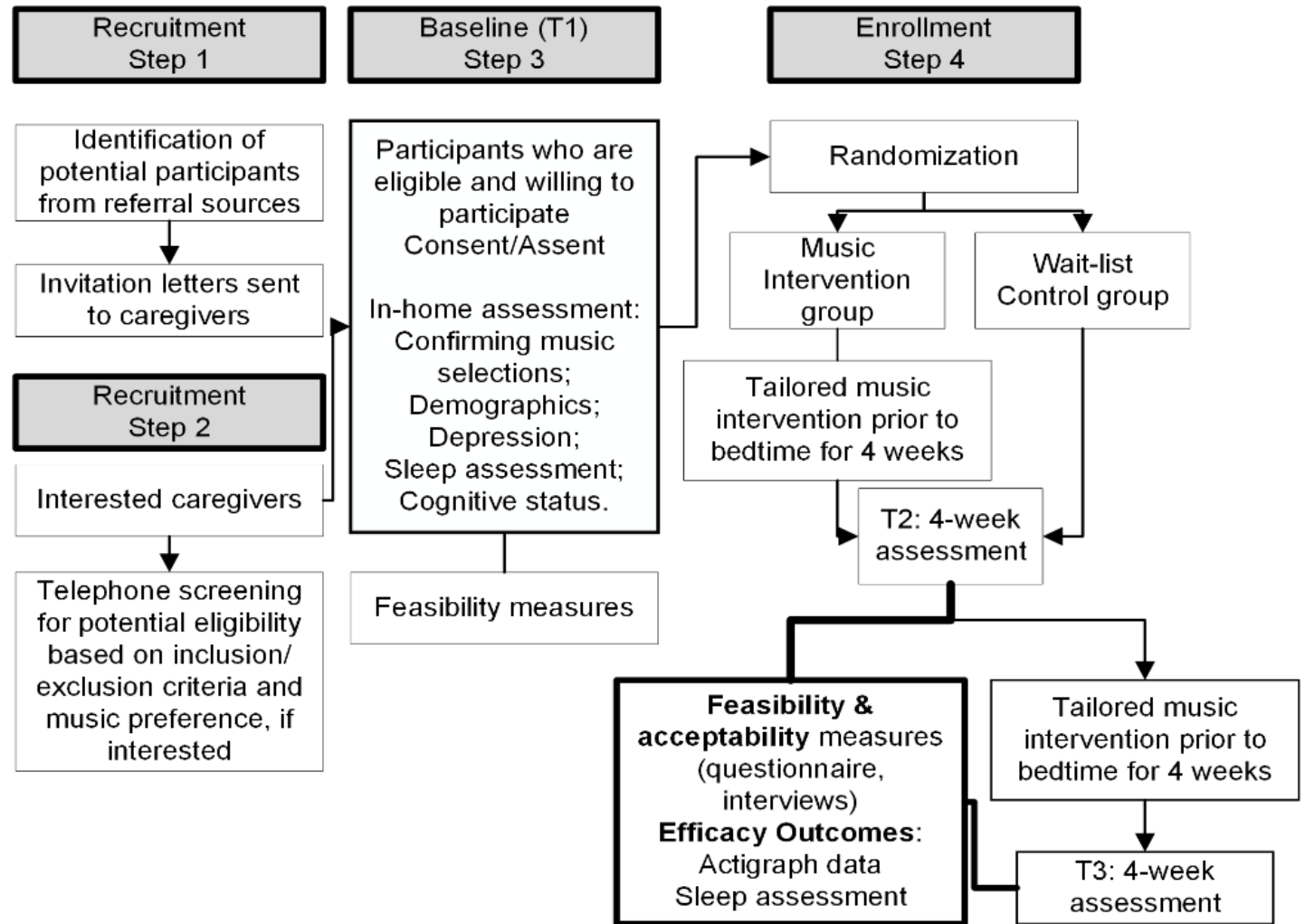
journals.sagepub.com/home/wjn



Darina V. Petrovsky<sup>1</sup> , Justine S. Sefcik<sup>1</sup>,  
and Pamela Z. Cacchione<sup>1</sup>



The feasibility of a tailored music intervention to reduce symptoms of sleep disruption in older adults with dementia



# Results

- N = 33 community-dwelling older adults (60+) with a diagnosis of dementia or self-reported memory problems with Clinical Dementia Rating Score at least 0.5 and their formal or informal caregivers
- Tailored music for sleep was mostly feasible (based on screening, enrollment, recruitment and attrition rates), acceptable, as evidenced by qualitative data

	RATE	NUMBER OF DYADS	%
Screening		37 out of 138	26
Enrollment		33 out of 37	89.1
Attrition		3 out of 33	9
Recruitment (dyads per month)		3	-



## Results – Qualitative Data

- “I think it’s a great sleep aide. I never was one to take medication for sleeping, but when you can’t...when I couldn’t sleep, I really enjoy listening to soft music to lull me asleep” (African-American, 66-year-old female).
- Participants indicated need to (i) improve technology that delivered tailored music to be more user friendly for persons living with dementia, and (ii) find ways to decrease caregiver burden associated with data collection.

Petrovsky DV, Bradt J, McPhillips MV, Sefcik JS, Gitlin LN, Hodgson NA. Tailored Music Listening in Persons With Dementia: A Feasibility Randomized Clinical Trial. *American Journal of Alzheimer’s Disease & Other Dementias*®. 2023;38. doi:10.1177/15333175231186728

# What about other forms of arts?

- Theater improvising to cope with dementia
  - The Memory Ensemble at Northwestern University
  - Collaboration between the Mesulam Center for Cognitive Neurology and Alzheimer's Disease and the Lookingglass Theatre Company
- Improvisational theater is a form of acting in which actors use techniques to perform spontaneously.
- Improvements in mood, decreases in anxiety, and increases in sense of belonging, normalcy, and de-stigmatization



**HHS Public Access**

Author manuscript

*Res Drama Educ.* Author manuscript; available in PMC 2018 December 14.

Published in final edited form as:

*Res Drama Educ.* 2017 ; 22(3): 420–426. doi:10.1080/13569783.2017.1326806.

**The Memory Ensemble: improvising connections among performance, disability, and ageing**

Christine Mary Dunford<sup>a,b</sup>, Hailee M. Yoshizaki-Gibbons<sup>c</sup>, and Darby Morhardt<sup>d</sup>

*Current Topics in Research*

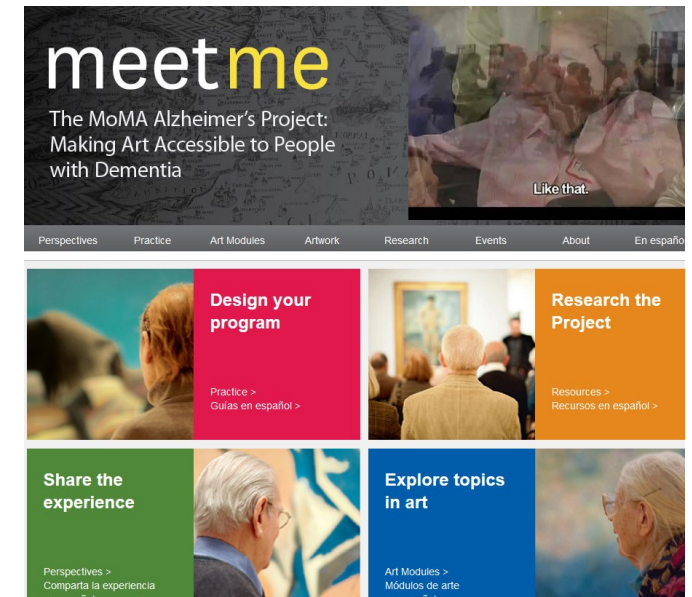
**Subjective Experiences of an Art Museum Engagement Activity for Persons With Early-Stage Alzheimer's Disease and Their Family Caregivers**

Jason D. Flatt, PhD<sup>1</sup>, Amy Liptak, BSN, RN<sup>2</sup>,  
Mary Ann Oakley, MA<sup>3,4</sup>, Jessica Gogan, MA<sup>5</sup>,  
Tresa Varner, MFA<sup>6</sup>, and Jennifer H. Lingler, PhD, CRNP<sup>2</sup>

American Journal of Alzheimer's  
Disease & Other Dementias®  
2015, Vol. 30(4) 380-389  
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sagepub.com/journalsPermissions.nav  
DOI: 10.1177/1533317514549953  
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# Other forms of arts

- Visual arts: Meet me at MoMA
- In 2006 MoMA decided to develop programming for older adults with Alzheimer's disease
- Groups are small in size, usually no more than eight people with dementia plus their family members and caregivers, for a total of sixteen people.
- About fifteen to twenty minutes spent at each artwork.
- Several discussion questions are posed to engage participants in observing, describing, interpreting, and connecting to the works and to each other.
- Main result: improved mood for both people with Alzheimer's disease and care partners

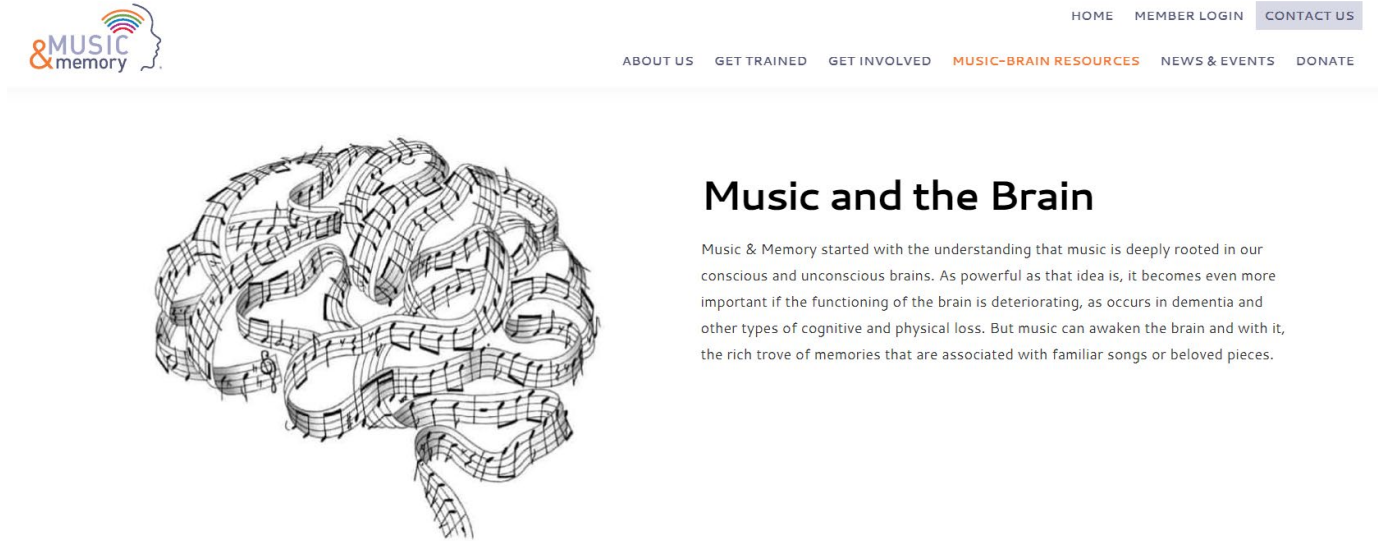




# Examples of Current Arts- Based Programs

# Example #1

- Musicandmemory.org
- Website contains links to free downloadable guides
- Latest research in this area
- Practical guidance on how to select a champion for Music & Memory in your institution



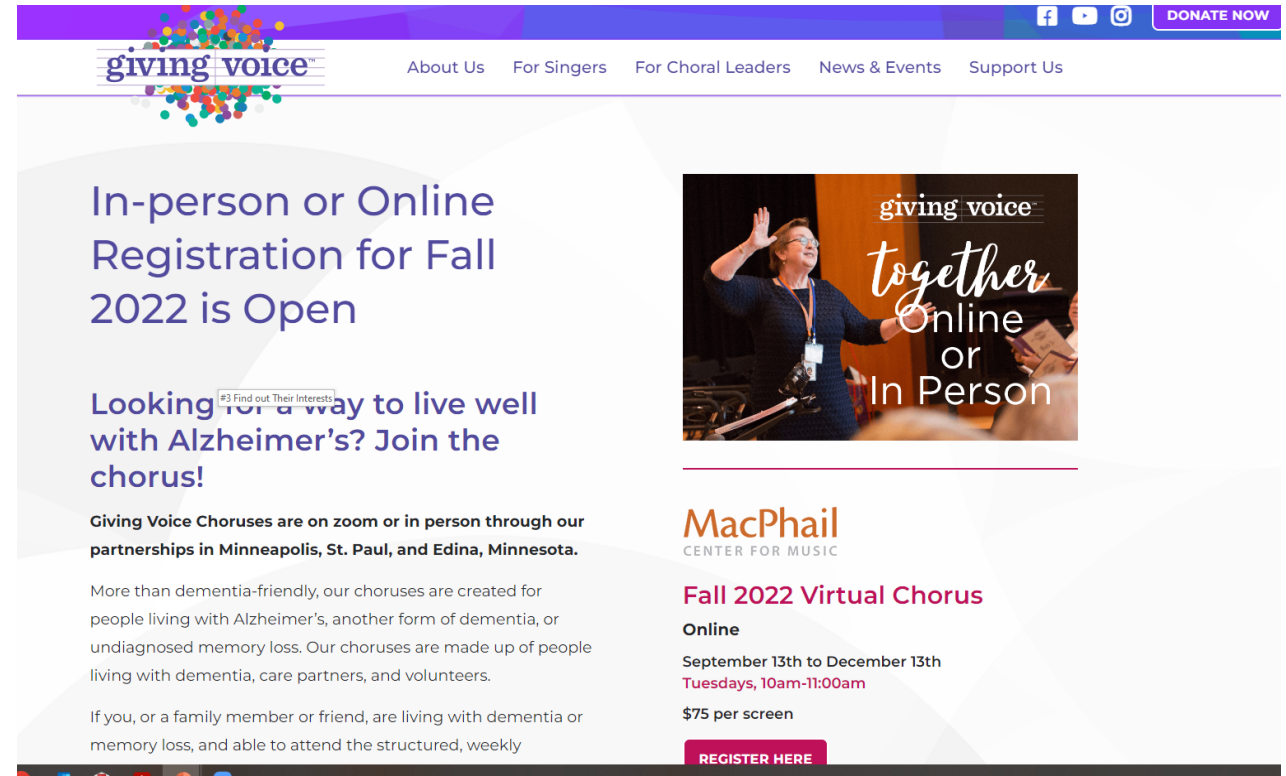
## Music and the Brain

Music & Memory started with the understanding that music is deeply rooted in our conscious and unconscious brains. As powerful as that idea is, it becomes even more important if the functioning of the brain is deteriorating, as occurs in dementia and other types of cognitive and physical loss. But music can awaken the brain and with it, the rich trove of memories that are associated with familiar songs or beloved pieces.



# Example #2

- Online choirs
- Givingvoicechorus.org
- Can join virtually on in-person for a small fee



The screenshot shows the homepage of the Giving Voice website. The header features the 'giving voice' logo with a colorful dot pattern, navigation links for 'About Us', 'For Singers', 'For Choral Leaders', 'News & Events', and 'Support Us', and a 'DONATE NOW' button. The main content area has a large heading 'In-person or Online Registration for Fall 2022 is Open'. Below this is a subheading 'Looking for a way to live well with Alzheimer's? Join the chorus!' with a small tagline '#3 Find out Their Interests'. The text describes that Giving Voice Choruses are on zoom or in person through partnerships in Minneapolis, St. Paul, and Edina, Minnesota. It also mentions that the choruses are dementia-friendly and made up of people living with dementia, care partners, and volunteers. A section for 'MacPhail CENTER FOR MUSIC' promotes the 'Fall 2022 Virtual Chorus' online, running from September 13th to December 13th, Tuesdays, 10am-11:00am, for \$75 per screen. A 'REGISTER HERE' button is at the bottom.

**giving voice**

About Us For Singers For Choral Leaders News & Events Support Us

**giving voice**

*together*  
Online  
or  
In Person

**MacPhail**  
CENTER FOR MUSIC

**Fall 2022 Virtual Chorus**

**Online**

September 13th to December 13th  
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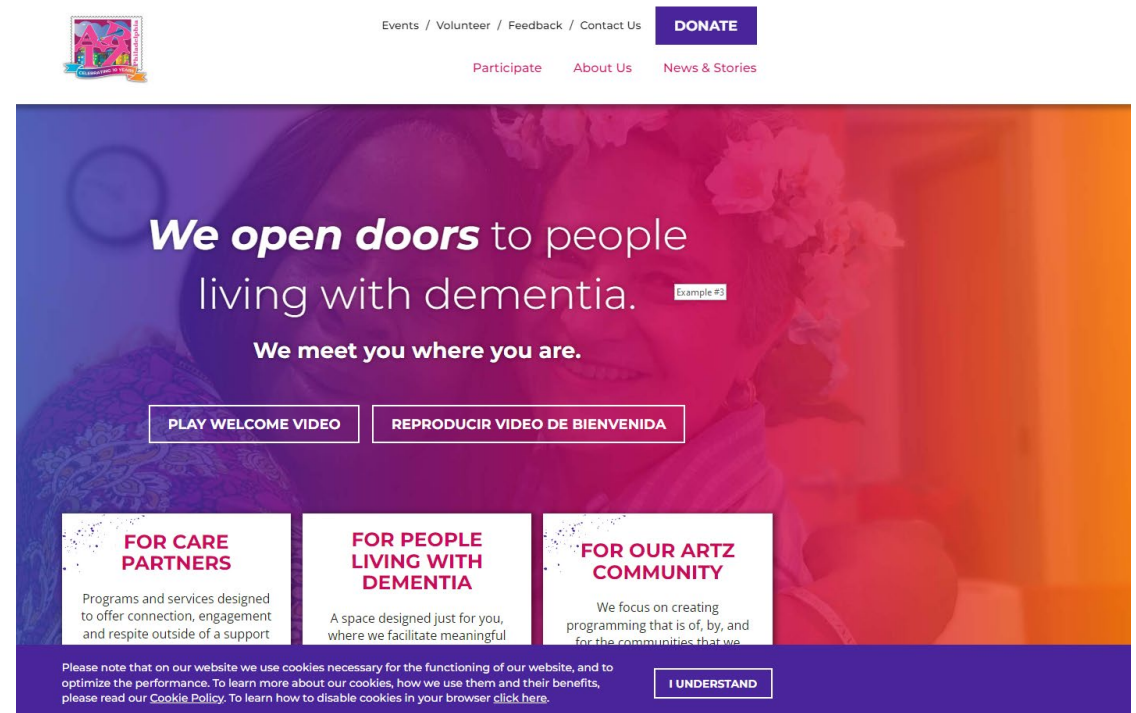
\$75 per screen

**REGISTER HERE**



# Example #3

- ARTZphilly.org
- The Nasher Museum Reflections Tour
- Strong social and expressive arts components



# Ongoing trials

- Interventions to attenuate **cognitive decline** – Piano training for older adults with mild cognitive impairment
- Music and Memory: a Pragmatic trial for **nursing home residents with Alzheimer's disease**
- Songmaking in a **Group** (SING): Music, Hallucinations & Predictive Coding
- Sing for Your Saunter: Using Self-Generated Rhythmic Cues to Enhance Gait in **Parkinson's**
- Music Appreciation After **Cochlear Implantation**
- Music **Training**, Bilingualism and Executive Functioning
- Decreasing **Delirium** Through Music (DDM) in **Critically Ill Older Adults**
- Investigating the Neural Mechanisms Underlying Language Recovery Through Rhythm Therapy in **Aphasia**

<https://www.nih.gov/sound-health/>  
<https://reneefleming.com/advocacy/music-and-the-mind/>  
<https://soundhealth.ucsf.edu/>





Talking Music and Science with Yo-Yo Ma

Posted on December 8th, 2016 by Dr. Francis Collins



It's not every day that an amateur guitar picker gets to play a duet with an internationally renowned classical cellist. But that was my thrill this week as I joined Yo-Yo Ma in a creative interpretation of the traditional song, "How Can I Keep from Singing?" Our short jam session capped off Mr. Ma's appearance as this year's J. Edward Rall Cultural Lecture.

<https://www.nih.gov/sound-health/>  
<https://reneefleming.com/advocacy/music-and-the-mind/>  
<https://soundhealth.ucsf.edu/>



Francis Collins, soprano and Kennedy Center Artistic Advisor at Large Renée Fleming, CNN's chief medical correspondent Dr. Sanjay Gupta, and NIH Director Dr. Francis Collins at the second Sound Health Music and the Mind event on September 7, 2018.

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A Scientist Who Bends Musical Notes

Posted on August 28th, 2018 by Dr. Francis Collins



As a pioneer in cancer immunotherapy, Jim Allison has spent decades tackling major scientific challenges. So it's interesting that Allison would consider one of the top five moments in his life jamming onstage with country star Willie Nelson. Yes, in addition to being a top-flight scientist at the University of Texas MD Anderson Cancer Center, Houston, Allison plays a mean harmonica.

<https://www.nih.gov/sound-health/>  
<https://reneefleming.com/advocacy/music-and-the-mind/>  
<https://soundhealth.ucsf.edu/>



Francis Collins, soprano and Kennedy Center Artistic Advisor at Large Renée Fleming, CNN's chief medical correspondent Dr. Sanjay Gupta, and NIH Director Dr. Francis Collins at the second Sound Health Music and the Mind event on September 7, 2018.



Thomas Cheever,<sup>1,11</sup> Anna Taylor,<sup>1,11</sup> Robert Finkelstein,<sup>1,\*</sup> Emmeline Edwards,<sup>1,\*</sup> Laura Thomas,<sup>1</sup> Joke Bradt,<sup>2</sup> Steven J. Holochwost,<sup>3</sup> Julene K. Johnson,<sup>4</sup> Charles Limb,<sup>5</sup> Aniruddh D. Patel,<sup>6,7</sup> Nim Tottenham,<sup>8</sup> Sunil Iyengar,<sup>9</sup> Deborah Rutter,<sup>10</sup> Renée Fleming,<sup>10</sup> and Francis S. Collins<sup>1</sup>

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<sup>4</sup>Institute for Health & Aging, University of California, San Francisco, CA, USA

<sup>5</sup>Department of Otolaryngology—Head and Neck Surgery, University of California, San Francisco, CA, USA

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<sup>7</sup>Azrieli Program in Brain, Mind, & Consciousness, Canadian Institute for Advanced Research (CIFAR), Toronto, Canada

<sup>8</sup>Department of Psychology, Columbia University, NY, USA

<sup>9</sup>National Endowment for the Arts, Washington, DC, USA

<sup>10</sup>John F. Kennedy Center for the Performing Arts, Washington, DC, USA

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<https://doi.org/10.1016/j.neuron.2018.02.004>

# Discussion

- **Basic and Mechanistic**
  - Establish what neural circuits are involved in the interaction between music and the brain
  - Investigate which neural pathways are enhanced by musical training
- **Translational and Clinical**
  - Better integrate mechanistic understanding with music therapy approaches
  - Develop and validate biomarkers for music interventions
- **Methods and Outcomes**
  - Develop methods to integrate brain-based measurements with musical activities
  - Conduct longitudinal and ancillary studies to assess outcomes of music interventions on timescales matching developmental trajectories
- **Capacity Building and Infrastructure**
  - Promote multidisciplinary research and capacity building through networks and collaborative studies involving neuroscientists, music therapists, musicians, and biomedical, behavioral, or social scientists



# Discussion

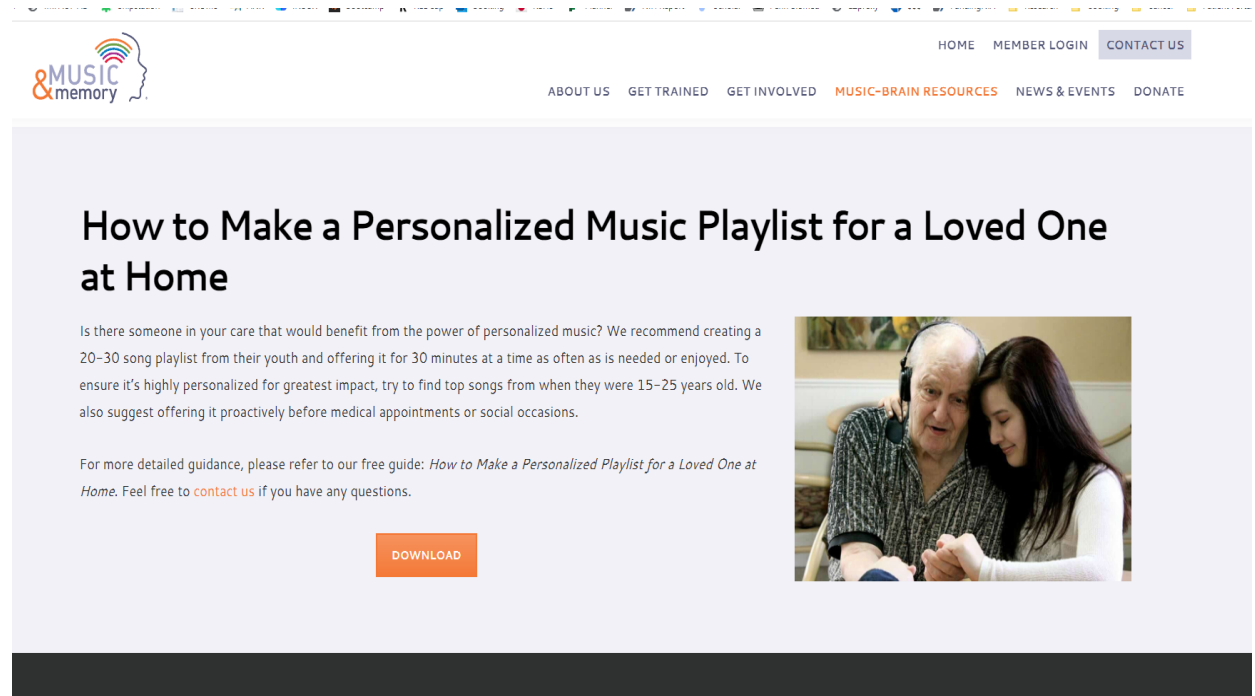
- Momentum for exploring sound, mental health, and aging
- What can we do *now*?
- What can we say to patients, older adults and caregivers *now*?
- Establishing collaborations between neuroscientists, music therapists, health professionals, and music interventionists is essential

# 3 Practical Ways to Incorporate Music



# #1: Create a personalized playlist

- Find out from family members what music an individual likes
- Ask them about their preferred genre
- Musical genres vary from person to person
- Musical taste can vary across the lifespan



The screenshot shows the homepage of the &MUSIC memory website. The header includes the logo on the left and navigation links (HOME, MEMBER LOGIN, CONTACT US) on the right. Below the header is a secondary navigation bar with links: ABOUT US, GET TRAINED, GET INVOLVED, MUSIC-BRAIN RESOURCES (highlighted in orange), NEWS & EVENTS, and DONATE. The main content area features a large heading: "How to Make a Personalized Music Playlist for a Loved One at Home". Below this heading is a paragraph of text explaining the benefits of personalized music and providing instructions on how to create a playlist. To the right of the text is a photograph of an elderly man wearing headphones and a young woman sitting next to him, looking at a device. Below the text is an orange "DOWNLOAD" button.

**&MUSIC memory**

HOME MEMBER LOGIN CONTACT US


ABOUT US GET TRAINED GET INVOLVED **MUSIC-BRAIN RESOURCES** NEWS & EVENTS DONATE

## How to Make a Personalized Music Playlist for a Loved One at Home

Is there someone in your care that would benefit from the power of personalized music? We recommend creating a 20–30 song playlist from their youth and offering it for 30 minutes at a time as often as is needed or enjoyed. To ensure it's highly personalized for greatest impact, try to find top songs from when they were 15–25 years old. We also suggest offering it proactively before medical appointments or social occasions.

For more detailed guidance, please refer to our free guide: *How to Make a Personalized Playlist for a Loved One at Home*. Feel free to [contact us](#) if you have any questions.

**DOWNLOAD**







## #2: Involve Older Adults in Music

- These activities can include singing in a (virtual) choir
- Song-making
- Music therapy if available
- Learning a new instrument
- Participating in religious activities
- Intergenerational music
  - Collaborate with a local music school program



# #3 Find out Their Interests

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- Ask older adults (or their family members) about their interests
- Find out about what they did as an adult
- Music can accompany other leisure activities, such as drawing, journal writing, knitting, folding clothes and social gatherings
- Invest in dementia friendly (easy to operate) music devices and speakers





# Thank you!

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- [Duke.is/Petrovsky](https://duke.is/Petrovsky)