Using the National Institutes of Health (NIH) Stage Model framework, we are conducting a Stage III/IV embedded trial to evaluate the effects of personalized music on agitated behaviors in nursing home (NH) residents with dementia under two research conditions—less pragmatic, more researcher involvement (Stage III) and more pragmatic, less researcher involvement (Stage IV). We are conducting a three-year trial in 81 NHs, with 27 NHs receiving the intervention per year. Behavior frequency is assessed via resident MDS assessments, staff interviews, and direct observations of residents. During the first year, researchers interview NH staff and observe residents with dementia in 54 randomly selected NHs (27 treatment and 27 control, parallel design). MDS assessments are available for all 81 NHs throughout the three-year study (stepped-wedge design). In the 54 NHs in the parallel design, we compare staff interview and NH-conducted resident assessments and, using multiple imputation methods, we impute staff interview data for eligible residents of all 81 NHs in order to estimate the effect of the intervention under the step-wedge design. There are four key features of this trial: 1) combination of parallel and stepped-wedge designs; 2) equilibrating researcher-collected behavior data to NH-collected behavior data to impute research-collected behavior data for some residents; and 3) simulated resident selection process in control facilities to improve comparisons of effects across treatment groups. This design has the potential to shorten the research timeline by iteratively assessing real-world efficacy and large-scale effectiveness. Our design will inform pragmatic testing of other interventions with limited efficacy evidence.

FAMILY CAREGIVER ROLE IN THE LONG-TERM SERVICES AND SUPPORTS OF INDIVIDUALS WITH DEMENTIA OVER TIME
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Family caregivers of persons living with dementia (PLWD) provide disproportionately high levels of care over a long and variable disease course, yet an understanding of the trajectory of care hours provided over time and the contributions of individual family members to overall care is lacking. This study used longitudinal data from the nationally representative Health and Retirement Study in order to compare the hours of care that spouses, children, and other family caregivers provide to those with and without dementia. During the last 10 years of life, family caregivers of PLWD provided nearly three times as many total care hours as compared to others (7,447 vs. 2,653 total hours). While care hours provided to PLWD increased steadily in each of the last 10 years of life (going from 4 hours/week 10 years before death to 33 hours/week the year before death, average annual increase 27%), care hours provided to others remained low and then nearly tripled in the last year of life to 22 hours/week on average. Adult children of PLWD provided 50% of total care hours, while adult children of others provided 41% of care hours. This study provides important insight into the high levels of year-over-year caregiving provided to PLWD by their family caregivers in general and by adult children in particular. Policies to support these caregivers must shift from short-term, episodic support to sustained assistance in acknowledgment of the key role family caregivers play in the long-term services and supports of PLWD.

INTERGENERATIONAL COMMUNICATION AS NON-PHARMACOLOGICAL CARE IN A JAPANESE NURSING HOME
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Statistics shows that Japan now has 28.4% of population aged over 65, which marks the highest in the world. Moreover, one in four over 65 is said to have ADRD or MCI. Traditional family caregiving derived from filial piety is giving way to moving to care facilities in order to reduce a burden on children or get professional care. This suggests that everyday communication for older adults involves younger conversational partners with varying degrees of shared knowledge and experiences. Such intergenerational communication can be challenging and stressful on both sides. To date, empirical studies that observe interactional strategies of both younger caregivers and older adults is unknown. Using 21 recordings of weekly conversational activities (45-60 minutes) led by recreation workers (female, 40s) taken at a nursing home in Japan, this qualitative study demonstrates how (1) sharing of the past and present becomes a learning opportunity for both recreation workers and older participants with ADRD (aged 87-95) , (2) reference to nursing-home living establishes and reaffirms their interpersonal relationship, and (3) intergenerational conversation becomes a tool to express life satisfaction for the older participants. This evidence-based study proposes mundane conversations during recreational activities as part of non-pharmacological person-centered care which serves to improve the quality of life and life satisfaction of older adults at care facilities. It is therefore important to study communicative strategies of professional caregivers since they affect social engagement as well as emotional and psychological well-being of those at the end-of-life stage.

MAYBE SHE'LL MAKE SOME FRIENDS?: FAMILY MEMBERS CULTIVATING INTIMACY IN ASSISTED LIVING
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Intimacy continues to be important in later life, including for older adults in long-term care settings such as assisted living (AL). Our past work shows that intimacy is a multi-dimensional process and can involve a variety of partners. Drawing on data from the qualitative longitudinal “Convoys of Care” study (R01AG044368), we extend this research to examine the role family members play in cultivating intimacy and close relationships of AL residents. Using a grounded theory approach, we analyzed 2,224 hours of participant observation, and formal interviews with 28 assisted living residents (aged 58-96) and their formal and informal care partners (n=114) from four diverse AL communities. Findings show that family members can play integral roles in
residents’ experiences with intimacy, directly as relationship partners, and by facilitating or impeding residents’ contacts with others. Family members cultivated residents’ intimacy opportunities and experiences by direct engagement, resident advocacy, to non-involvement and disengagement. Family members’ roles in cultivating intimacy fluctuated over time, increasing at times of health concerns and family change. Perceptive family members considered older adults’ intimacy preferences when cultivating their intimate relationships. Family members concerned for the safety of their loved one sometimes acted as “gatekeepers” to intimacy by interfering in intimate relationships. We conclude with a discussion of implications for policy and practice aimed at improving the intimacy process and opportunities for older adults receiving long-term care.

**USING THE LIFE STORY BOOK WITH MENTALLY ALERT RESIDENTS OF NURSING HOMES**

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Depression and lack of meaning in life (MIL) are common among residents of nursing homes (NHs) and contribute to a reduction in overall health and well-being. Life Story Book (LSB), a reminiscence intervention, is designed to provide a person with the opportunity to review their past and capture their life stories and photographs into a book. LSB has demonstrated positive outcomes for residents of NHs with dementia, yet little is known for residents without dementia. A switching replication design was used to examine the effects of LSB among 21 mentally alert residents from two NHs (NH-A and NH-B) in Houston, Texas. Participants in NH-A received three weeks of the LSB intervention, while NH-B received three weeks of care-as-usual; the intervention was then switched. The GDS-12R and the MIL questionnaire (MLQ) were used to measure depressive symptoms and MIL respectively. Participants from NH-A (n =11) and NH-B (n = 10) had a mean age of 75 years (SD =11.34); 81% female; 52% non-Hispanic white and 33% African American. Results from a one-way MANCOVA found no statistically significant difference on the GDS-12R and MLQ (F(3, 14) = 2.50, p = .102; Wilks’ Lambda = .652; η2 = .35). Further analyses comparing the pre-intervention and post-intervention scores for the entire sample (N =21) found a significant reduction in depressive symptoms (M = 2.67; SD = 2.52) and (M =1.67, SD = 2.29); (t (20) = 2.21, p = 0.039). The potential benefits of LSB for mentally alert residents of NHs warrants further research.

**ALL-CAUSE DEMENTIA PREDICTION BY MACHINE LEARNING: THE HEALTH, AGING, AND BODY COMPOSITION STUDY**

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There are several shortcomings of the currently available risk prediction models for dementia. We developed a risk prediction model for dementia using machine-learning approach and compared its performance with traditional approaches. Data were from the Health, Aging, and Body Composition Study, comprising 3,075 older adults (at least 70 years). Dementia was defined as (1) use of a prescribed dementia medication, (2) adjudicated dementia diagnosis, or (3) a race-stratified cognitive decline>1.5 SDs from the baseline mean. We selected 275 predictors collected from questionnaires, imaging data, performance testing, and biospecimen. We used random survival forest (RSF) to build the full model and rank the importance of predictors. Subsequently, we built parsimonious models with top-20 predictors using RSF and Cox regression. A dementia risk score was developed using top-ranked variables. We used the C-statistic for performance evaluation. Over a median of 11.4 years of follow-up, 659 dementias (21.4%) occurred. The RSF model (both including and top-20 variables) showed a higher C-statistic than the regression model. Digit symbol score, physical performance battery, finger tapping score, weight change since age 50, serum adiponectin, and APOE genotype were the top-6 variables. We created a dementia risk score (0-10) using the top-6 variables. A 1-unit increase in the risk score was associated with an 8% higher risk of dementia. The risk score demonstrated good discrimination (C-statistic=0.75). Machine learning methods offered improvement over traditional approaches in predicting dementia. The risk prediction score derived from a parsimonious model had good prediction performance.

**BUILDING, TESTING, AND LEARNING FROM NETWORK MODELS OF HUMAN AGING**

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We have developed computational models of human aging that are based on complex networks of interactions between health attributes of individuals. Our “generic network model” (GNM) captures the population level exponential increase of mortality with age in Gompertz’s law together with the exponential decrease of health as measured by the frailty index (FI). Our GNM includes only random accumulation of damage, with no programmed aging. Our GNM allows large populations of model individuals to be quickly generated with detailed individual health trajectories. This allows us to explore individual damage propagation in detail. To facilitate comparison with observational data, we have also developed and tested new approaches to binarizing continuous-valued health data. To extract the most information out of available cross-sectional or longitudinal data, we have also reconstructed interactions from generalized network models that can predict individual health trajectories and mortality.

**COMBINING FRONTAL TDCS WITH WALKING REHABILITATION TO ENHANCE MOBILITY AND COGNITION: A PILOT CLINICAL TRIAL**

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