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The AzGS Journal is peer-reviewed publication. Those opinions expressed, and findings from research discussed in articles, however, are those of the author(s) and do not necessarily represent the views or positions of the AzGS.
From the Editor

Welcome to this special edition of the Arizona Geriatrics Society Journal. The creation of the National Alzheimer’s Project Act (NAPA) has committed our nation to eradicate Alzheimer’s disease by 2025. As a partner in this urgent national effort, we have devoted this edition to Alzheimer’s disease and related disorders, providing some of the most exciting information and new research.

In this issue we also continue to feature our Elder Care provider Sheets - practical, evidence based short guides for health science students and clinicians, funded by grants from the Arizona Geriatric Education Center and the Donald W. Reynolds Foundation. We selected six provider sheets from our collection that focus on Alzheimer’s disease and related disorders. Please visit our website http://aging.medicine.arizona.edu for access to our online library of over 70 Elder Care Provider sheets.

As always, we hope that you find this issue educational and valuable!

Mindy J. Fain, MD

The Arizona Geriatrics Society Journal, an official publication of the Arizona Geriatrics Society, is committed to publishing quality manuscripts representing scholarly inquiry into all areas of geriatrics. It is published twice a year. We encourage submissions of all research, best practice, review of literature, and essays.

Manuscripts should be prepared according to the AMA Manual Style: A Guide for Authors and Editors, 10th Edition (2007) and emailed as a Word attachment to Mindy Fain, MD, Journal Editor, at mfain@aging.arizona.edu. The first page should include the title and a 50-100 word abstract. Manuscripts are generally limited to 4,000 words and should not be under consideration for publication elsewhere. Manuscripts are reviewed by members of our interprofessional editorial team whose evaluations will provide a basis for the publication decision. We are committed to a rapid review process. Thank you.

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Thank you!
Alzheimer’s disease constitutes a serious epidemic that will escalate rapidly as our baby boomers age. More than 5 million people in the U.S. have Alzheimer’s disease, and that number could reach nearly 14 million by 2050 (Alzheimer’s Association, 2013). Health care and social service providers, regardless of their specialties, need to be familiar with the disease and its impact on patients and their support networks, as well as basic resources and referrals needed by patients, their family caregivers, and others who assist them.

The Arizona Alzheimer’s Consortium (AAC) is the nation’s leading model of statewide collaboration in Alzheimer’s disease research. The Consortium was established in 1998 and capitalizes on its participating institutions’ complementary strengths in brain imaging, computer science, genomics, the basic and cognitive neurosciences, and clinical and neuropathology research. Our goal is to promote the scientific understanding and early detection of Alzheimer’s disease and to find effective disease-stopping and prevention therapies. Educating Arizona residents about Alzheimer’s disease, research progress in the state, and the resources needed to help patients, families and professionals manage the disease is also critical to the Consortium’s mission. Please visit our website:   http://azalz.org/

This edition of the Arizona Geriatric Society Journal focuses on Alzheimer’s disease. We encourage you to share the information in this issue with your colleagues, and to visit and become familiar with resources such as those listed below.

David W. Coon, PhD
Associate Vice Provost and
Professor, College of Nursing & Health Innovation
Arizona State University
Co-PI, Flinn Foundation Arizona Aging and Cognitive Collaborative Arizona Alzheimer’s Consortium, Education Core

Resources on Alzheimer’s Disease and Related Dementias

The Desert Southwest Chapter of the Alzheimer’s Association http://www.alz.org/dsw/in_my_community_about.asp

An affiliate of the National Alzheimer’s Association, the Desert Southwest Chapter of the Alzheimer’s Association is devoted to providing service and support to people impacted by Alzheimer’s disease, their family members, and their caregivers throughout Arizona and Southern Nevada. The National Alzheimer’s Association also provides an array of information and resources including Health Care Professionals E-News.

http://www.alz.org/health-care-professionals/health-care-clinical-medical-resources.asp

Health Care Professionals E-News In Brief is a quarterly e-newsletter focused on dementia-related clinical guidelines, research and patient care that impact your primary care practice. Upon subscribing you will receive updates of the latest clinical guidelines, studies, resources and Alzheimer’s news that impact your practice and patients.

Get the Facts on Antipsychotic Medication

- Studies show that persons living with dementia who experience behavioral symptoms may be trying to communicate an unmet need.¹
- Antipsychotic medications are not FDA approved to treat behavioral disturbances in persons diagnosed with dementia.²
- Patients with dementia-related, psychosis-like behavior treated with antipsychotic drugs are at an increased risk of death.³

There is a solution! Reach out today.
HSAG is your partner in improving dementia care.

Alzheimer’s Disease in Arizona and Beyond

Marwan N. Sabbagh MD, FAAN

Alzheimer’s disease is a neurodegenerative disorder responsible for a significant and growing population of patients suffering from dementia, with a projected prevalence in the United States alone of 13.2 million patients by 2050. According to the AZ Geriatric Society, the prevalence in AZ is around 175,000 lives with AD.

From the post-mortem assessment of Alzheimer’s-afflicted brains, researchers have identified that the neuropathological hallmarks of the disease include aggregation of beta amyloid in diffuse and neuritic plaques and highly phosphorylated tau proteins in neurofibrillary tangles. These hallmarks of the disease have been used to develop biomarkers.

There is growing evidence that incorporating biomarker data improves confidence in the diagnosis of Alzheimer’s disease (AD). Clinical testing is now supplemented with biomarkers for neurodegeneration, brain b-amyloid, and tau load obtained by positron emission tomography (PET), magnetic resonance imaging (MRI) or cerebrospinal fluid (CSF) measurements. Increased attention has been paid in recent years to brain imaging (MRI) or cerebrospinal fluid (CSF) measurements. By positron emission tomography (PET), magnetic resonance imaging (MRI) or cerebrospinal fluid (CSF) measurements. Florbetapir PET is now available as Amyvid, although at present, it is not reimbursed despite approval. Other amyloid imaging agents that are nearing approval include florbetaben and flutametamol. It is quite possible that in the near future, these amyloid imaging agents might become useful adjuncts in the clinical diagnosis of AD.

Prior to end-stage illness, patients with Alzheimer’s disease experience variable symptomatic trajectories with a common element of progressive cognitive decline over a period of years. Dementia is the most prevalent symptom but often patients also experience changes in mood, increases in aggression, agitation, and psychosis, depleted physical ability and reduction in lifespan. Alzheimer’s disease is especially costly for the caregivers responsible for helping patients manage their disease, and as the number of people afflicted continues to increase in coming years, pressures on the support systems for these patients will also increase.

Compounding this is the lack of disease modifying drugs that alter the eventual outcome. To date, symptomatic medications prevail as the mainstay of treatment options for AD. There have been tremendous investments made to increase the numbers of drugs approved and the targets engaged in an effort to alter the disease course or pathophysiology of AD. Unfortunately, almost all have not met expectations and no new drug (beyond medical foods) has been approved for the treatment of AD in the last decade. Nevertheless, there are a number of new classes of drugs in development to treat and alter the disease. Given the complexity of AD, one might envision a chemotherapeutic like, multi drug regimen to treat AD in the future.

The Cleo Roberts Center for Clinical Research, Sun Health Research Institute, Sun City, AZ, 85351.

References

The Need for Alzheimer’s Caregiver Support Interventions
Cynthia Vargo, MNPs - Central Region Director, Alzheimer’s Association – Desert Southwest Chapter

Introduction
Health care professionals and scientists from around the world meet yearly to present the latest cutting-edge research on Alzheimer’s disease for the annual Alzheimer’s Association International Conference. This is the world’s largest conference of its kind, bringing together researchers from around the world to report and discuss groundbreaking research and information on the cause, diagnosis, treatment and prevention of Alzheimer’s disease and related disorders. There is always a lot of excitement about new studies, including drug advancements that could be potential treatments in the future. But for the average person with Alzheimer’s, or for their caregivers, it’s easy to get lost in the hundreds of abstracts, upcoming clinical trials, failed trials and scientific minutia. For them the need is much more personal and immediate.

The destruction this disease causes - memory loss, mood swings, depression and poor judgment, to name just a few - not only affect current estimates of 5.2 million Americans with Alzheimer’s but also the 15.4 million-plus unpaid men and women who provide more than 17.5 billion hours of unpaid care for them. Symptoms of the disease can manifest themselves differently in each patient, but ultimately most people living with Alzheimer’s will end up unable to function independently. They will have to rely on spouses, siblings, children, friends, neighbors or paid professionals for help. One in nine people age 65 and older (11 percent) has Alzheimer’s disease. Four percent of those with Alzheimer’s are under age 65. About one-third of people age 85 and older have Alzheimer’s disease.

Caregiving for a Person with Alzheimer’s disease
As the number of individuals who are surviving into their 80s, 90s and beyond grows dramatically and the number of “baby boomers” reach age 65, the challenge of caregiving will expand to more and more family members and friends. By 2030, the segment of the U.S. population age 65 and older is expected to make up approximately 20 percent of the total population and in Arizona that number is expected to reach more than 130,000. Eighty percent of the care provided for persons with Alzheimer’s is provided by unpaid caregivers while fewer than 10% of older adults receive all of their care from paid caregivers. Care provided to persons with Alzheimer’s disease and related dementia is wide-ranging and often all-encompassing.

The terms family caregiver, informal caregiver or often just caregiver usually refer to an unpaid family member, friend, or neighbor who provides care to an individual who has an acute or chronic condition and needs support to manage a variety of tasks. Often caregiving includes assistance with activities of daily living such as dressing, eating, bathing and providing transportation to medical appointments. As the disease progresses all persons with Alzheimer’s and related dementia need help for tasks as routine as moving around the house, getting in and out of bed, and managing incontinence. Alzheimer’s disease and related dementias usually progress slowly and most caregivers will spend years caring for their loved one. Caregivers of people with Alzheimer’s and other dementias provide care for a longer period of time, on average, than caregivers of seniors with other medical conditions. At any point in time, 32 percent of family and other unpaid caregivers of people with Alzheimer’s and other dementias have been providing support for 5 years or longer. Many caregivers who live with a person who has Alzheimer’s disease and related dementia provide constant supervision and assistance with all daily activities around the clock. Persons with Alzheimer’s disease usually cannot be left alone because of the risk of wandering and/or engaging in unsafe activities.

Caring for a person with Alzheimer’s disease and related dementia also poses unique and special challenges. People with Alzheimer’s disease lose the ability to understand and communicate effectively and often their personality and behaviors are affected. They require increasing levels of supervision and personal support as the disease progresses requiring caregivers to spend increasing numbers of hours each day and night for their care. The impact on family caregivers often includes increased stress, depression, disruptions to employment, decreased earnings, increased personal health issues, isolation, and relationship challenges with the person with Alzheimer’s disease. These caregiver effects also spill over to those who are long-distance caregivers. It is estimated that 1 out of every 7 persons with Alzheimer’s disease or related dementia lives alone. As society changes and children and parents often do not live in the same neighborhood, city or even state, the challenges of long-distance caregiving have the added burden of travel, including trying to obtain accurate information and communication challenges with local caregivers.

The cost to the health-care system of illness and injury among caregivers is significant. A 1997 study by the National Alliance for Caregiving and the AARP found that 15 percent of all caregivers and 31 percent of those providing the highest levels of care experienced significant physical and emotional stress. One study of spouse caregivers of people who were hospitalized for various diseases found that caregivers of people who were hospitalized for dementia were more likely than caregivers of people who were hospitalized for other diseases to die in the following year. In another study, over a four-year period, caregivers who reported the highest levels of stress had a 63 percent higher risk of dying than non-caregivers.

Caregiving is a complex responsibility that is often underplayed. It is physically, mentally and financially stressful for the caregiver, and often is accompanied by complex emotions such as resentment.
about time and effort expended, depression and the anticipated loss of a loved one and often loss of income. Changes in lifestyle and goals of a caregiver usually involve a significant reorganization of priorities. This usually results in the loss of free time and neglect of friends and hobbies, resulting in social isolation and a decrease in the quality of life for caregivers. Analyses have shown that the levels of anxiety and depression in caregivers are directly related to the hours of care required and the physical and psychological illness scores of the AD patients under their care. Most researchers in the caregiving field conceptualize the care that family members give as assistance with activities of daily living (ADLs) and instrumental activities of daily living (IADLs). But often they do not adequately understand the complexity and stressfulness of caregiving saying that a caregiver assists someone with Alzheimer’s disease with bathing does not reflect the challenges of bathing a person who is resisting a bath; helping with medications does not adequately capture the challenges of medication administration, especially when the person with Alzheimer’s is receiving multiple medications several times a day for many medical concerns, including injections, inhalers, eye drops, and tablets and is uncooperative; having to make life altering decisions on behalf of a loved one who is unable to do so when this type of decision-making is outside of the caregivers usual role. Caregiving for persons with dementia and having the responsibility of observing for early signs of problems, such as medication side effects, are serious tasks and caregivers are often unable to interpret the meaning or the urgency. Moreover, the medical complexity and technologies that are part of home care, and the frustrations of trying to navigate the health care system for support of any kind, is not even part of the ADL/IADL measures. All of these challenges and more result in extreme stress and anxiety for the caregiver.

Caregiver Stress

Studies have been conducted to determine the causes of caregiver stress and ways to reduce this stress. Many of these studies conclude that a primary cause is low levels of information about prevalence, causes, symptoms and management of Alzheimer’s disease. For example, caregivers often complain of a loss of functional communication with persons who have Alzheimer’s disease, and their inability to follow verbal commands. Just having the knowledge that using simple sentences, instead of slow speech, while communicating with persons with Alzheimer’s disease is more effective, has been shown to significantly reduce caregiver stress. Further, the knowledge of other communication strategies such as direct questioning in contrast to parallel questioning has also been shown to reduce the caregivers stress. Parallel questioning refers to addressing issues in an indirect manner that require a more complicated reply, as compared to direct questioning which usually require a “yes” or “no” response.

Another significant problem outlined by caregivers in research is the difficulty in finding adequate resources such as effective and convenient medical and emotional support and community resource support for both the caregiver and persons with Alzheimer’s disease. The value of this is emphasized by two studies that have reported counseling and resource support lead to sustained benefits in reducing depressive symptoms in spouse-caregivers of Alzheimer’s disease patients and another where information on caregiving in Alzheimer’s disease was given and caregivers had fewer depressive symptoms and less anxiety. Findings from many of these studies show that counseling and resource information should be widely available as part of effective, evidence-based interventions for family caregivers.

Despite the importance of information and support to help family caregivers, studies of interventions to increase support for family caregivers have lagged far behind those provided for persons who actually have Alzheimer’s disease and related dementia. A focus on the family as a part of the patient’s therapeutic plan of care is usually absent from interventional research and from general clinical practice as well. Only a few randomized clinical trials of educational interventions directed toward family caregivers have been conducted or published. Many of these interventions measure caregiver burden. Caregiver burden is the physical and emotional strain of caring for an aging or disabled relative. Caregiver burdens can be financial and social as well. Findings from recent intervention studies designed to reduce caregiver burden though are important to note.

- Multi-component interventions, rather than single interventions like support groups or education, significantly reduced burden.
- Other interventions found no reductions in burden, but significant improvements in caregiver knowledge and delayed nursing home admission for care recipients.
- Some studies have found that comprehensive counseling sessions for spouses caring for a person with dementia help reduce depression.
- While ongoing counseling appears to be effective in improving the quality of life for caregivers, even a simple one-to-one telephone call may be effective in helping the caregiver.
- Another study showed that use of an automated, interactive voice-response telephone support system for caregivers reduced burden for those caregivers with a lower sense of control over their situation.
- Davis and colleagues found an unexpected reduction in burden and distress for caregivers receiving friendly, socially supportive phone calls that provided some respite from caregiving, even without in-home caregiver skills training.
- Home visits and enhanced social support also can help reduce caregiver depression.
- One size does not fit all; substantial evidence exists that tells us caregiving experiences of ethnic minority caregivers in the U.S. differ significantly from those of White caregivers. More studies need to address the needs of ethnically diverse caregivers, and some degree of cultural tailoring needs to be researched. Even though studies have found higher prevalence and incidence rates of dementias and Alzheimer’s disease among African Americans and Latinos, while Asian Americans had comparable rates to Whites optimal methods for culturally tailoring psychosocial interventions for ethnic minority caregivers are not well understood.
Overall, research provides substantial evidence that caregivers are hidden patients in need of support and protection from the physical and emotional harm of caregiving. Interventions directed to the family caregiver can serve two purposes. First, interventions can support the caregiver as the intervention recipient, directly reducing caregiver burden and the overall impact on their health and well-being. In this intervention approach, caregivers receive the direct benefit and the person with Alzheimer’s disease benefits secondarily. Second, interventions can be designed to help the caregiver become more knowledgeable of needed skills becoming more competent and confident, resulting in safer and more effective care to the person with Alzheimer’s disease. This can indirectly reduce caregiver stress by reducing a caregiver’s daily load and/or increasing their sense of confidence, certainty and control.

Another crucial part of helping family caregivers is linking them with local support; this is often best done through local Alzheimer’s Associations. Alzheimer’s Associations provide ongoing resource information, emotional support, practical advice, support groups, training programs, help sheets, 24/7 helplines, and useful Web sites. They are powerful advocates for people with dementia and for their families with government and service providers, as well as funding research.

Caregiver Supports and Interventions

As the population of caregivers and persons with Alzheimer’s disease and related dementia continues to increase there has been an increased demand for effective caregiver supports and interventions in Arizona. There have been several caregiver and care recipient focused studies funded in Arizona during the past few years by the U.S. Administration on Aging with David Coon, PhD, as Arizona State University’s Principal Investigator.

1. CarePRO (Care Partners Reaching Out) with partners including Arizona Department of Economic Security, Alzheimer’s Association Desert Southwest Chapter and local area agencies on aging. Each of the 5 CarePRO workshop sessions engages caregivers in workshops that provide education about dementia and its impact on families. Caregivers are trained in ways to manage stress and techniques to help them cope with the disease and communicate better with loved ones suffering from memory loss. The program also includes personalized telephone “coach” calls that help caregivers implement the new skills introduced in the workshops.

2. EPIC (Early stage Partners in Care) with partners including Arizona Department of Economic Security, Alzheimer’s Foundation Desert Southwest Chapter and the Benjamin Rose Institute. The intervention is designed for individuals affected by early memory loss and their care partners together. Participants attend 6 workshops and 1 in-home session to learn strategies to help handle new situations, reduce stress, improve mood, communicate better with each other, and plan for the future.

3. Lifespan Respite Care with partners including Arizona Department of Economic Security, Foundation for Senior Living, the Arizona Caregiver Coalition, and local area agencies on aging. Lifespan Respite Care is a coordinated approach that offers community-based respite care services for family caregivers of adults or children with special needs. Respite care provides short-term care and a period of relief or rest for the caregiver. Services can be provided in the form of in-home respite care or appropriate daycare services when available.

CarePRO and EPIC are currently programs offered by the Alzheimer’s Association Desert Southwest Chapter and the Lifespan Respite program is offered through the Arizona Caregiver Coalition. The agencies and organizations involved in the studies continue to collaborate to ensure program fidelity and to increase the program reach to all areas of Arizona.

Summary

As the numbers of people affected by Alzheimer’s disease increases, maintaining the health of family caregivers by providing effective interventions and supports will become more significant as gaps in the availability of formal supportive services become more acute and widespread. Psychosocial support services, especially those that focus on caregiver coping skills training, are promising interventions for reducing caregiver burden and depression. Reducing caregiver burden can delay and reduce nursing home admissions as well. Family caregivers are integral to quality of life of people with dementia. The high levels of burden and psychological morbidity are well documented, as are factors that predict which caregivers are vulnerable. Interventions can help reduce these effects and improve the quality of life for both the caregiver and persons with Alzheimer’s disease and related dementia. Support for the person with Alzheimer’s requires a comprehensive strategy that includes a partnership between doctors, health care workers, community resource providers and families. Caregivers susceptible to adverse effects can be identified early and could be referred to appropriate interventions before symptoms of caregiver stress appear. Despite the enormous stress, many caregivers take on caregiving voluntarily and speak easily about its rewards. They talk about the blessings and rewards of giving or the growing self-confidence that comes with accomplishing one difficult task after another. Still others feel a sense of fulfillment that comes from meeting the needs of someone they love. Some discover that they are stronger than they thought possible. Many times how well caregivers respond to their challenges depends on how well they are able to care for themselves. So, as the number of persons with Alzheimer’s disease and related dementia continues to grow at frightening rates, the impact on caregivers and their struggles to provide support while juggling children, jobs and other responsibilities will continue to have an alarming effect on society. Focus on care and support interventions for those who are caring for persons with Alzheimer’s and related dementia is becoming more critical. We must focus on finding effective supports for caregivers as well as a cure for Alzheimer’s disease and related dementia.

(Endnotes)
Role of Nutrition in Delay and Prevention of Alzheimer’s Disease

Karla I. Cauldwell, RN, HHC Healthy Together Care Partnership

Background
Alzheimer’s disease (AD) is a growing concern for our community. Currently there are 24 million people affected by dementia worldwide. Approximately 4.6 million new cases are identified each year. By the year 2040 there will be 80 million diagnosed cases of AD. AD is characterized by a decline in cognitive function including memory.

Recognized risk factors include: advanced age, family history, and genetic factor Apolipoprotein E (APOE- e4). While aging and genetics are the greatest risk factors for AD, results from research indicate that insulin resistance and hypercholesterolemia play significant roles in the onset and progression of AD.

A person’s nutritional habits can affect whether they develop insulin resistance or hypercholesterolemia. While little can be done to alter age or the presence of APOE-e 4, there are many actions individuals can take to improve lifestyle habits with the goal of preventing or delaying the onset of AD.

Insulin resistance link to Alzheimer’s as a risk factor
Insulin resistance has been linked as a risk factor for AD. Insulin resistance leads to the shortening of telomeres, and the shortening of telomeres is directly linked to AD. According to the National Institute of Health, a key method to prevent insulin resistance is through lifestyle modifications. Lifestyle changes include decreasing consumption of saturated fat and reducing daily calories consumed.

Hypercholesterolemia link to Alzheimer’s
Individuals with Alzheimer’s disease (AD) have been found to have an excess of amyloid plaque. Hypercholesterolemia increases the amount of amyloid plaque, and higher cholesterol levels have been linked to loss of memory and recall. Experimental animal studies have shown hypercholesterolemia induced by diet increases deposits of beta-amyloid plaque. Deposits of amyloid plaque are linked to the cognition decline in patients with AD.

Studies Linking Alzheimer’s disease (AD) with Nutrition
The Chicago Health and Aging Project (CHAP) started in 1993 studying the connection between nutrition and AD. A total of 6158 residents participated in the study. The CHAP study found that intake of saturated fat doubled the risk of AD. CHAP also found that participants that consumed polyunsaturated fats decreased their chances of getting AD. CHAP specifically studied the outcome of participants who consumed fish once a week or did not consume fish during the week. The study found the consumption of fish at least once a week reduced the risk of AD by 12%.

The Rotterdam and New York study found a parallel relationship between the amounts of saturated fat consumed and the extent of cognitive decline. The higher the amount of fat consumed, the higher rates of Alzheimer disease.

The Kungs Holms Study revealed that one of the major risk factors for AD included hypertension. In their study of healthy elders it was determined that a healthy diet, exercise and stress reduction helped lower blood pressure which in turn reduced the rates of cognitive decline.

Two recent studies from Columbia University shed new light on the relationship between nutrition and AD. The first indicated that individuals consuming a Mediterranean diet could prevent or delay Alzheimer’s disease. The second study that included 192 community habitants with AD demonstrated that individuals with AD who adhered to a Mediterranean diet added several years to their prognosis.

A study from Kaiser Permanente found a direct correlation between higher levels of fat, especially in the middle section of the body, to increased rates of Alzheimer’s disease. Those who limited their caloric intake and maintained a lower BMI had less incidences of AD.

Nutrition components for a healthy brain
A key component for a healthy brain diet is omega-3 fatty acid. Foods containing omega-3 include most fish, cod liver oil, flax seed oil, pumpkin seeds, and walnuts, and many foods are now fortified with omega-3’s. Some vegetables containing alpha-linolenic acid (ALA), one form of omega 3, includes; kale, brussel sprouts, mint, parsley and spinach. Added benefits of including green vegetables are the antioxidants, fiber, vitamins, and minerals.

Antioxidants are believed to be an essential component for brain health. Antioxidants have been shown to reduce oxidative stress that often contributes to the development of AD and laboratory studies have indicated vitamin C and vitamin E to be the most essential antioxidants. Foods rich in vitamin C include; strawberries, citrus fruits, guava, chili peppers, bell peppers, kale, parsley, cherries, tomatoes, cantaloupe, and many others. Both the CHAP and Rotterdam study found a lower risk of AD with the inclusion of foods rich in vitamin E. Foods containing vitamin E include; almonds, sunflower seeds, whole grains, egg yolk, collard greens, avocados, apples, and melon.

Several studies have shown the Mediterranean diet to include nutrients essential for brain health. Mediterranean diets include: colorful vegetables; legumes; olive oil; fruits; fish; and whole grains. The Mediterranean diet is rich in omega-3, fiber, antioxidants, and lower in calories compared to the standard American diet.

What not to include in a healthy brain diet
Very similar to diabetic and heart healthy diets, a healthy brain diet will exclude many items that are excluded in diabetic and cardiac diets. It is important to reduce the amount of saturated
fats from animal products. It is best to eat less processed foods and more whole foods. It is also essential to reduce calorie rich foods and replace with nutrient dense foods.

**Successful implementation of a healthy diet**

The relationship between diet and Alzheimer’s disease (AD) is similar to the relationship between diet and Cardiovascular Disease or Type 2 Diabetes. However, knowing that consuming a diet based primarily in vegetables, legumes, whole grains, fruits, and unsaturated fats contributes to brain wellness is not enough. For some time it has been known that a healthy diet contributes to cardiac and endocrine health, and yet it remains a challenge for patients to implement a healthy diet. Like cardiac, endocrine, brain, and overall wellness it is important to acknowledge the effect of nutrition in wellness. It is important to find a way to help patients create lasting change.

In the health community, primary care providers, nurses, social workers, and case managers can partner to help the patient succeed. It is imperative to get to know the patient and their health beliefs. Getting to know the patient’s background will pay high dividends. By knowing what the patient prioritizes it can help create a successful education session based on the patient’s needs. Educating the patient to make a link between the foods they ingest and not only their brain health, but their overall health, can help the patient to change for the better.

One program in particular helped patients to affect their brain health through lifestyle modifications encouraged by their primary care provider. The primary care provider used motivational interviewing to help the patient set individual goals that mattered to them. The patients that participated in this study were successful in implementing small changes that led to decreasing their cholesterol and losing weight to prevent AD. The key to this program was following up and individualized care that motivated the patient to create a healthier lifestyle.12

**Conclusion**

Nutrition plays a role in the development, delay and prevention of Alzheimer’s disease (AD). Along with age and genetic factors it has been proven that hypercholesterolemia and insulin resistance contribute to the onset of AD. Nutrition choices can either contribute or prevent hypercholesterolemia and insulin resistance. Diets similar to the Mediterranean diet create the best brain health outcomes.

Knowing what foods contribute the most to brain health must be matched with adequate support and education to help individuals create lasting change in their eating habits. Helping the individual to make choices that are best suited for him/her will contribute to the greatest possible success. Eating a nutritious diet not only benefits brain wellness and the prevention of AD, but also helps to prevent many other lifestyle induced diseases.

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**Healthy Brain-Yummy Salad**

This salad is filled with ingredients that will contribute not only to your brain health but your overall well-being. It is filled with color, nutrients, fiber, antioxidants, and JOY.

- Serves 4
- 1 bunch romaine cut
- 1 cup of spinach
- 1 cup grape tomatoes
- 1 sliced English cucumber
- 1 cup garbanzo beans from can or cooked
- 2 tablespoons olive oil
- 1 tablespoon of balsamic vinegar
- 1 clove of garlic crushed
- 1 teaspoon of nutritional yeast
- Pinch of sea salt
- Sprinkle of dried cranberries
- ¼ cup raw sunflower seeds

In a bowl marinate the garbanzo beans, olive oil, balsamic vinegar, garlic, nutritional yeast, and pinch of sea salt. While the beans are marinating prepare the salad items and mix into a salad bowl. Pour the garbanzo beans and marinade over the salad and sprinkle raw sunflower seeds and dried cranberries over the top of the salad. ENJOY!!

**References**

Kirtan Kriya Yoga Meditation:  
A New Dimension In Alzheimer’s Prevention

Dharma Singh Khalsa, M.D.  
Founding President and Medical Director  
Alzheimer’s Research and Prevention Foundation

This is a critically important time in the field of Alzheimer’s prevention. Memory loss and Alzheimer’s affects over 5 million people in America and many more world-wide. According to the Alzheimer’s Association, (Alzheimer’s Association 2013) these figures are expected to sky-rocket with the continuing aging of the population. Indeed, at the moment, every 68 seconds someone is diagnosed with Alzheimer’s; it is our 6th leading cause of death; costs society over $150 billion a year; and there are over 10 million unpaid caregivers. Last year, President Barack Obama signed the National Alzheimer’s Project Act (NAPA), with the goal of eradicating Alzheimer’s by 2025. He also mentioned it in his first State of The Union for his second term in January 2013.

As mainstream medicine searches for a drug solution, this article reveals the emerging research on a scientifically studied, simple to do, low cost yoga meditation called Kirtan Kriya that impacts positively brain and memory function as well as cellular health and genetic expression. Kirtan Kriya belongs in the conversation on Alzheimer’s prevention, right alongside diet, exercise, mental stimulation, and social activity.

Stress and the Brain
Today’s lifestyle is very stressful and stress is detrimental to optimal brain function and may lead to memory loss. Stress stimulates the adrenal cortex to release the hormone cortisol, which acts to kill brain cells in the hippocampus; the brain’s primary memory center. (Sapolsky, 1992; McEwen and Sapolsky, 1992, Lupien, 2009).

Other studies show decreased memory performance and a higher risk of Alzheimer’s in people who are injected with stress levels of cortisol, report higher levels of work-related stress, have stress-prone personalities, and suffered from early childhood stress such as abuse, trauma, and neglect (Crow 2007, Wilson 2003, Peavy 2007, Borenstein 2007, Felitti 1998, Anda, Felitti, Bremmer, et al. 2006).

In contrast, meditation has been shown to lower cortisol levels (Alexander, Langer, Newman, Chandler, & Davies, 1989). Beyond that, neuroimaging studies with such scanning techniques as magnetic resonance imaging (MRI), positron emission tomography (PET), and single photon emission computed tomography (SPECT), have provided evidence that meditation has direct benefits on the brain. These include increased activity in the hippocampus (Lazar 2000); increased cortical thickness (Lazar 2005, Newberg 2010); diminished loss of brain volume with age (Newberg 2001); and enhanced activity in the prefrontal cortex (Newberg 2010). This last finding is especially significant because the prefrontal cortex is associated with attention, concentration, focus, decision making, and short term memory.

This extensive menu of benefits from meditation is available at a relatively low cost (patient’s time) and generally no side effects, resulting in a high benefit-to-cost ratio, not only for the patient, but for society.

The meditation technique that the Alzheimer’s Research and Prevention Foundation (ARPF) has studied exclusively since 2001 is called Kirtan Kriya (KK) from the Kundalini Yoga tradition as taught by the Master, Yogi Bhajan (1929-2004). KK is attractive because it can be performed even by those whose memory has some impairment, and the benefits accrue from the very first practice session, based upon our research. Before unveiling the research in detail in the next section, I will first describe how KK is done (Khalsa 2001).

Kirtan Kriya (KK) Meditation
Kirtan Kriya is a 12-minute singing exercise that people have been practicing for thousands of years. A kirtan is a song. Kriya refers to a specific set of movements. In the Eastern meditation tradition, kriyas are used to help bring the body, mind, and emotions into balance, thus creating healing. Kirtan Kriya may therefore be regarded as a singing meditation exercise for greater attention, concentration, improved memory, better mood, and, as will be revealed, enhanced genetic expression and telomere length (Moss 2012, Lavretsky 2012).

KK brings together several actions: breath work, singing or chanting, finger movements (mudras), and visualization. Hence, it is a multifaceted, multisensory exercise that engages the whole brain and increases cerebral blood flow.

Posture. The practitioner can sit comfortably in a chair with their feet flat on the floor. Alternatively, one can sit on the floor with legs crossed, although older adults are not likely to choose this option. The essence of the posture is to be comfortable and sit with the spine straight with only the natural curvature.

Breath. The person simply breathes naturally as the meditation unfolds.
Eyes. Eyes are closed.

The Chant, or Mantra. The chant uses the sounds, Saa, Taa, Naa, Maa. These ancient primal sounds from Sanskrit, taken together, mean "my true identity" or "my highest self." The tune to which these sounds are sung is the first four notes of the familiar children's song, "Mary had a Little Lamb." That is, the notes are "Mar-y had a." See Figure 1.

The Mudras, or Finger Movements. The thumb is touched to each of the other four fingers in sequence. Both hands perform the same mudra set simultaneously. Figure 1 illustrates.

On Saa, touch the index fingers of each hand to the thumbs.
On Taa, touch your middle fingers to your thumbs.
On Naa, touch your ring fingers to your thumbs.
On Maa, touch your little fingers to your thumbs.
Always go forward in sequence: thumb to index finger, middle finger, ring finger, and pinky; never go backwards.

The Visualization. Visualize energy coming down from above into the middle of the top of the head, proceeding straight down into your brain, and then changing to a lateral direction so that it comes out of your head at a point in the middle of your forehead, in the center lined up with the nose (the spot referred to as "the third eye" in some Eastern traditions). Hence, the energy is visualized as following the path of a capital letter “L.” One may think of this action as sweeping through like a broom. See Figure 2.

The Sequence.

1. Chant the sounds Saa Taa Naa Maa while also performing the mudras with the fingers of both hands. At the same time, visualize the sound flowing in through the top of your head and out the middle of your forehead in an L shape.
2. For two minutes, sing out loud.
3. For the next two minutes, sing in a stage whisper.
4. For the next four minutes, say the sound silently to yourself.
5. Then whisper the chant for two minutes and then out loud for two minutes, for a total of twelve minutes.
6. To come out of the exercise, inhale very deeply, stretch your hands above your head, and then bring them down slowly in a sweeping motion as you exhale.

Effects of KK Meditation on Brain and Cognition
According to Kundalini Yoga tradition, there are several mechanisms by which Kirtan Kriya conveys its benefits. The use of the tongue in Kirtan Kriya during the chanting is believed to stimulate the 84 acupuncture meridian points on the roof of the mouth in a certain permutation and combination that sends a signal to the hypothalamus, as well as to the brain itself. It is believed that practicing KK may also rejuvenate the brain synapse by increasing important brain chemicals, such as acetylcholine, norepinephrine, dopamine, and so on (Khalsa 2001, Newberg 2003).

The dense nerve endings in the fingertips, lips, and tongue are associated with a high level of representation in the motor and sensory areas of the brain. Therefore, when the practitioner utilizes the fingertips in conjunction with the sound, specific areas in the brain, as seen on SPECT scans, are activated. Khalsa (2009) showed particular cerebral blood flow changes during the practice of Kirtan Kriya. As shown in Figure 3, the frontal lobes exhibited increased cerebral blood flow. The posterior cingulate gyrus was also activated, as shown in Figure 4. This is significant, because the posterior cingulate is one of the first areas that demonstrate decreased activity on a scan when one develops Alzheimer’s disease. It is my hypothesis, therefore, that consistent practice of the KK meditation and the concomitant activation of the posterior cingulate gyrus, may lead to a decreased risk for cognitive decline and Alzheimer’s disease.
Preventing Alzheimer’s in 12 Minutes a Day?

Figure 4: Activation of the Posterior Cingulate. Could the increase in Cerebral Blood Flow to the PCG on a regular basis enhance its function, slow its degeneration, and prevent Alzheimer’s?

Newberg, Wintering, and Khalsa, (2010) described positive effects of Kirtan Kriya on cognitive function and cerebral blood flow in subjects with memory loss. Significantly, this is the first study in which meditation has been explored in people diagnosed specifically with memory impairment. In our study, participants with memory loss were referred to the study by the neurology department and either practiced KK for 12 minutes per day (the experimental group) or listened to music for an equal amount of time (the comparison group). The 15 experimental participants ranged in age from 52 to 77 (mean 64, s.d. 8). Their MMSE scores ranged from 16 to 30. Seven had mild age-associated memory impairment (i.e., SCI), five had MCI, and three had a diagnosis of AD and moderate impairment. However, one of those with AD, whose MMSE score was 16, was found to be incapable of following the directions for performing the meditation and her data was not included further in the results. Thus, 14 participants constituted the final experimentation group, two of whom had AD. The experimental group participants were individually instructed in how to perform the KK meditation. The training began with a 20 minute video of one of the investigators explaining and demonstrating the technique. The participant was then asked to perform KK for a 12-minute period while being supervised by one of the researchers. Participants were told to perform the 12-minute KK practice daily for eight weeks, and provided a CD of the technique.

The comparison group comprised two people with MCI and three with age-associated memory impairment (SCI), for a total of five participants who ranged from 56 to 79 years old (mean 65, s.d .10). The mean MMSE score was 29 (s.d. 1). They were to listen daily to a CD on which had been recorded 12 minutes of two Mozart violin concertos.

The participants in the experimental group kept a practice log revealing a high degree of compliance (75%, on average). Participants were scanned (SPECT) both on the first day at which they had been instructed, and at the follow-up session after 8-weeks of at-home practice. They were also given a battery of neuropsychological tests on both occasions.

The testing demonstrated a significant improvement in scores on a verbal fluency test, Animal Naming, and a test of divided attention, Trailmaking, Part B. Both of these neuropsychological tests tap into executive functioning and memory skills.

Subjectively, the experimental participants also reported improvement in their overall memory functioning. This is important given Reisberg’s (2010) findings that people with Subjective Cognitive are at higher risk for progression to Mild Cognitive Impairment and later Alzheimer’s disease.

As can be seen in the scans below in Figure 5 and Figure 6, from Newberg (2010), KK practice produced a difference in activation in the frontal lobe, posterior cingulate gyrus, and anterior cingulate gyrus, both the first time the subjects practiced the meditation and more prominently after eight weeks of doing the meditation only 12 minutes a day. As MacLullich’s (2006) finding on the association between the anterior cingulate cortex and the body's ability to regulate stress, this enhancing activity of the anterior cingulate gyrus could improve hypothalamic-pituitary-adrenal axis function, and normalize the stress response so that less cortisol bathes the hippocampus. Moreover, of interest is that the recent Super Ager study revealed that the oldest old who maintained optimal memory function had a larger anterior cingulate gyrus and cerebral cortex; these same two findings were seen in people who practiced KK (Newberg 2010, Harrison 2012).
Figure 6: Compared to the first time the patients practiced KK, after 8 weeks the arrow reveals a marked increase in frontal lobe activity, signifying improvements in attention, concentration and focus.

Additionally, it was shown that KK enhanced mood, energy, and well being in those subjects with memory loss (Newberg 2012). This is important, because other meditation techniques require extensive training and long meditation periods. Our work showed that doing Kirtan Kriya for only 12 minutes a day creates a great impact on optimal mental function.

**Anti-aging Effect**

Beyond the above studies, additional research on KK demonstrated a profound anti-aging effect on the brain when practiced over the long term in that the cerebral cortex of long term practitioners was larger than non-meditators (Newberg 2010).

**Kirtan Kriya Makes Cells Younger**

We’ve also completed research on highly stressed family dementia caregivers examining the effects of KK on mental health, cognitive functioning, and immune cell telomerase activity. In this study, the experimental group did KK for 12 minutes a day for 8 weeks while the control group listened to relaxation music (Lavretsky 2012). The outcome of this study showed that the KK group had significantly lower levels of depressive symptoms, and greater improvement of mental health and memory functioning compared with the control group. Moreover, the KK group showed a 43% improvement in telomerase activity compared with 3.7% in the relaxation group, as seen in Figure 7. These findings suggest an improvement in stress-induced cellular aging. Younger cells mean a healthier and longer life with better brain function.

This study also revealed an up regulation of 19 genes related to positive immune function and a down regulation of 49 genes associated with inflammation such as pro-inflammatory cytokines (Black 2012).

Additionally, 9 of the subjects were randomized to receive FDG-Pet Scans at baseline and post-intervention. These scans showed significant differences between the KK group and the relaxation group in the bilateral cerebellum during the visualization part of KK signifying that different aspects of the practice activate different parts of the brain. Other anatomical locations were also activated in a significantly different manner (Pomykla 2012).

**What’s New in KK Research?**

We are conducting two new research studies Yoga and Kirtan Kriya in people with Mild Cognitive Impairment or MCI, which may lead to Alzheimer’s.

We have also partnered with the Ministry of Health and Welfare in Helsinki, Finland and The Karolinska Institute in Stockholm, Sweden, for the largest study in history on the prevention of Alzheimer’s called the FINGER Study, it will involve over 1,000 subjects.

KK is being shared at many senior centers and groups throughout the country (Hartman-Stein 2013).

**Conclusion**

Mitigating the biochemical effects of stress on the body and brain is an important, although rarely discussed, target of prevention for Alzheimer's disease. Meditation has been shown to lower anxiety and stress as well as create a variety of other positive health outcomes. However, because of their difficulty and time required, most meditation techniques appear to be unattractive to be learned anew by older adults and too complex to be utilized by those whose memory is already compromised. This paper describes the use of Kirtan Kriya, which has been successfully employed in studies of people with memory loss and highly stressed caregivers, both populations of which who are at risk for the development of Alzheimer’s disease. Participants reported that it was enjoyable and subjectively beneficial, including a improved cognition, decreased depression, improved mood, enhanced energy, less inflammation, down regulation of inflammatory genes, up regulation of immune system genes and an increase of telomerase of 44%; the largest ever recorded. Directed to practice it daily over a period of eight weeks, participants did indeed practice it 75% of the days, on average. We found (Newberg et al. 2010) objective evidence of memory loss reversal. Kirtan Kriya meditation improves a number of aspects of psychological well-being, spiritual-well being and enhanced cognitive function and mental health.

Most noteworthy are the facts that this was a self-directed training program using a CD, after only a brief one-on-one instruction; the amount of time necessary was only 12 minutes a day for 8 weeks for these results to be observable; it is both a
practical and a low cost intervention; has no side effects, and does not interfere with medications.

The practice of Kirtan Kriya, an easy, cost effective and side-effect free yoga meditation should be part of the conversation along with diet and exercise to maintain a sharp brain with age and prevent Alzheimer’s disease. KK can be easily learned and practiced at home with a CD with no special training required. The CD is available at www.alzheimersprevention.org.

References


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Not All Dementia is Alzheimer’s Disease
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Alzheimer’s disease is a common problem that is appropriately garnering both public and professional attention. As attention to Alzheimer’s increases, however, there is a risk that other causes of dementia-like illnesses will be overlooked, including the 10-15% of these cases that may be reversible. Examples of dementia-like illnesses that may be confused with Alzheimer’s disease are shown in Table 1.

There are four features of dementia-like illnesses that should raise concern about causes other than Alzheimer’s disease. They include (1) speed of onset, (2) age of onset, (3) the patient’s cognitive and neurological profile, and (4) a medical history that might indicate a non-Alzheimer’s cause.

**Speed of Onset and Progression**
The more rapid the onset, the less likely a dementia-like condition is Alzheimer’s disease. Examples of conditions confused with Alzheimer’s but which have a more rapid-onset or progression range from delirium to mercury toxicity (Table 1).

**Age at Onset**
The younger the age at onset, the greater the chance of a non-Alzheimer’s dementia. This is particularly true if there is no family history of early-onset Alzheimer’s.

**Cognitive and Neurological profile**
Alzheimer’s disease is a slowly progressive disorder that begins by affecting memory and gradually affects other domains including executive skills and naming. Anosognosia (lack of awareness of one’s disability) may also develop, as may personality changes; but, gait and non-neurological functions are usually spared. Patterns different than this should raise the possibility of a non-Alzheimer’s dementia.

**Medical History**
A patient’s medical history and medications should be considered. Many medical conditions, ranging from cerebrovascular disease to drug side effects, can cause a dementia-like illness that is confused with Alzheimer’s.

| Table 1. Examples of Dementia-Like Illnesses that Can Be Confused with Alzheimer’s Disease |
|---------------------------------|----------------|----------------|----------------|
| **Speed of Onset**              | **Acute**     | **Subacute**   | **Chronic**    |
| Degenerative                    | Delirium      | ALS-dementia with hypoventilation | See Table 2   |
| Infectious                      | Viral encephalitis | Fungal meningitis       | Neurosyphilis |
| Inflammation                    | Disseminated Encephalomyelitis | Paraneoplastic syndrome | Autoimmune encephalopathy |
| Neoplastic                      | Obstructive hydrocephalus | Glioblastoma       | Orbitofrontal meningioma |
| Nutritional                     | Wernicke-Korsakoff |                    | Vitamin B12 deficiency |
| Psychiatric                     | Acute psychosis | Inadequately controlled psychosis | Severe depression |
| Toxic                           | Drug or alcohol Intoxication | Mercury toxicity   | Polypharmacy |
| Traumatic                       | Acute head injury | Subdural hematoma | Chronic traumatic encephalopathy |
| Vascular                        | Acute stroke | Disseminated intravascular coagulation | Vascular dementia |

**TIPS FOR RECOGNIZING NON-ALZHEIMER'S DEMENTIA SYNDROMES**
- When patients are being evaluated because of cognitive impairment, consider causes other than Alzheimer’s disease when the impairment develops at a young age, when it develops over a short period of time, or when a movement disorder, including gait disorder, is a predominant symptom.
- Always consider potentially reversible causes of cognitive impairment, like drug side effects, infection, depression, nutritional deficiencies, and delirium.
Reversible Imitators of Alzheimer’s Disease
Although reversible causes account for only 10-15% of cases of dementia-like illnesses, it is essential not to overlook them. The following cases illustrate real patients who were labeled as having Alzheimer’s dementia, but who subsequently turned out to have a reversible medical condition.

Case 1: Drug Toxicity A 72-year-old man with a history of bipolar disorder presented with a 7-month history of memory loss that was preceded by two years of impaired gait. He scored 18/30 on a Mini-Mental State Exam (MMSE). He was on a stable dose of lithium for years but blood work showed an elevated level. After 3 days off lithium his cognitive function and gait returned to normal.

Case 2: Infection A 66-year-old man with diabetes developed progressive memory and gait difficulties over two months. Brain imaging showed ventricular enlargement suggesting normal-pressure hydrocephalus, but the patient failed to improve after serial spinal taps. Spinal fluid cultures grew Coccidioides immitis that responded to fluconazole and his cognition and gait returned to normal.

Case 3: Depression A 74-year-old woman developed personality changes, apathy, and difficulty with memory during the year following the death of her husband. Over the year she withdrew from social activities, and she reported difficulty participating in conversation and was sleeping poorly. Her MMSE score was 23/30, but she didn’t seem to put effort into answering the questions. Her score on the Geriatric Depression Scale (GDS) was 23/30, indicating moderate-severe depression. A trial of antidepressant medication was initiated and over a period of two months, the patient’s cognitive status returned to normal.

Comment All three cases were atypical for Alzheimer’s disease because the onset of symptoms was too rapid. In addition, cases 1 and 2 involved a recent-onset gait disorder, which is an indicator that Alzheimer’s disease is not the cause of a patient’s cognitive decline. In case 3, the patient had depression - an important diagnosis to exclude because it can sometimes mimic the cognitive impairment seen in dementia.

Non-Reversible Causes of Dementia
Although Alzheimer’s disease is the most common and well-known form of dementia, accounting for about 70% of cases, several other degenerative neurological disorders can cause irreversible dementia and are often confused with Alzheimer’s disease. The most common of these disorders is vascular dementia (now called vascular cognitive impairment), which accounts for about 15-20% of dementia cases and is often mixed with Alzheimer’s. Other common syndromes include Lewy body dementia and fronto-temporal dementia, each accounting for about 10% of cases. Key characteristics of these syndromes are shown in Table 2. Although not reversible, recognizing these conditions allows for more accurate prognosis and more effective use of symptom-modifying medications.

<table>
<thead>
<tr>
<th>Syndrome</th>
<th>Key Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vascular Dementia</td>
<td>- Risk factors for cerebrovascular disease - Cerebrovascular disease on brain imaging - Psychomotor retardation w/slowed gait</td>
</tr>
<tr>
<td>Lewy Body Dementia</td>
<td>- New-onset of hallucinations - Dream-enactment behaviors (e.g., yelling, kicking, spitting, flailing during REM sleep) - Parkinson-like movement disorder</td>
</tr>
<tr>
<td>Fronto-Temporal Dementia</td>
<td>- Frontotemporal atrophy on imaging (see figure) - Behavioral variants: apathy, social withdrawal, disinhibition (lack of social tact) - Semantic variant (trouble finding words)</td>
</tr>
</tbody>
</table>

References and Resources

ACOVE Quality Indicators
If a vulnerable elder presents with symptoms of dementia, THEN the physician should review the patient’s medication list for initiation of medications that might correspond chronologically to the onset of dementia symptoms.

If a vulnerable elder has dementia, THEN he or she should be screened for depression during the initial evaluation.

Interprofessional care improves the outcomes of older adults with complex health problems
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Amyloid Imaging for Alzheimer’s Disease

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In April 2011, the US Food and Drug Administration (FDA) approved florbetapir (trade name Amyvid), the first drug for the imaging of beta-amyloid plaque in the brain. Beta-amyloid plaques in the brain are the hallmark of Alzheimer’s disease (AD). Previously, making a definitive diagnosis of Alzheimer’s disease required post-mortem autopsy of the brain to evaluate for amyloid plaque using a special stain and a microscope. With florbetapir, the presence of amyloid plaque can now be detected non-invasively in live patients during a positron emission tomography/computed tomography (CT/PET) scan.

Florbetapir is labeled with radioactivity and when injected intravenously, the florbetapir binds to amyloid in the brain and the radioactive label allows localization. The radioactivity decreases by half every 2 hours. Given this rapid decay, no special radiation precautions are required. The typical PET/CT scan with florbetapir delivers approximately the same amount of radiation as 3 years of background radiation.

After florbetapir is injected, it is allowed to circulate for 30 minutes. The patient then lies down in a PET/CT scanner (Figure 1). A CT scan of the head is performed in a few seconds and is followed by a ten-minute PET scan. The radiologist then views the three-dimensional image of the brain as slices. Normal scans will show accumulation of radiolabelled florbetapir only in the white matter (Figure 2), while abnormal scans with significant amounts of amyloid plaque will show radioactivity in the white and gray matter out to the periphery of the brain (Figure 3). Although the popular press often displays images of florbetapir scans in color, in routine practice radiologists evaluate the scans in black-and-white.

Although approved by the FDA, florbetapir imaging for AD is not currently covered by Medicare. Most other health plans also do not provide coverage for the scans.

Figure 1. High-Resolution PET/CT Scanner

One reason for the lack of coverage is concern about the costs (about $3,000 per scan) that will be generated by extensive use of this imaging to diagnose AD when no therapy is approved to slow or stop the disease after it has been diagnosed.

Concern has also been expressed that a positive florbetapir scan does not by itself provide a definitive diagnosis of AD. For example, some cognitively normal older adults will have a positive scan, even though they do not have and may never develop AD. Patients who have Lewy body dementia (LBD) may also have a positive scan when amyloid is present in the brain, even though AD is not the primary cause of the patient’s dementia. In such cases, a dopamine transporter (DaT) scan can help sort out the basis for the patient’s cognitive dysfunction.

Conversely, a negative scan means that a patient has little or no amyloid plaque at the time of the scan. But, it does not mean that the patient will never develop amyloid plaque in the future.

TIPS FOR USE OF AMYLOID IMAGING FOR DIAGNOSIS ALZHEIMER’S DISEASE

- Keep in mind that currently, Medicare and most health insurance plans will not pay for amyloid scans. So, only order them if they will change the plan of care.
- A patient with a typical presentation of Alzheimer’s disease (AD) does not usually require amyloid imaging for confirmation of the diagnosis.
- Consider ordering an amyloid scan if it would be useful to identify the presence of amyloid, and thus confirm or exclude a diagnosis of AD in patients who present with Alzheimer’s-like dementia at a younger-than-expected age, in patients with mild cognitive impairment who do not meet criteria for AD, and in those with an unclear diagnosis.
Still, there are several clinical situations in which florbetapir scans have potential utility. One is when a patient exhibits findings of AD at a younger-than-expected age (such as a patient with a presenilin-1 mutation). A second is to determine if a patient with mild cognitive impairment who does not meet criteria for AD is simply demonstrating normal age-related memory changes or if the patient is in the early stages of AD. The third is when a patient’s presentation has a differential diagnosis that includes conditions such as frontotemporal dementia, primary progressive aphasia, or posterior cortical atrophy/visual-variant Alzheimer’s syndrome, and the correct diagnosis is unclear. In all of these situations, the presence of significant amyloid on PET/CT would suggest that amyloid pathology is causing the patient’s cognitive impairment, regardless of the clinical presentation.

The other potential use of florbetapir scans is for research on new AD treatments. To determine the efficacy of such treatments, it will be essential to confirm that research subjects do, in fact, have AD. Detection of amyloid with a florbetapir scan will provide that confirmation. Similarly, when studying therapies designed to target amyloid plaque with the intention of slowing the progression of AD, serial florbetapir scans will permit longitudinal assessment of therapeutic outcome.

References and Resources

ACOVE Quality Indicators
If a vulnerable elder is admitted to a hospital or is new to a physician practice, THEN multidimensional assessment of cognitive ability and assessment of functional status should be documented.

Interprofessional care improves the outcomes of older adults with complex health problems

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The Role of Physical Exercise in Cognitive Function

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The fear of memory loss leading to Alzheimer’s disease (AD) is a great concern of older Americans, yet to date there has been no effective method of prevention and few effective treatments for AD. Recent and accumulating evidence demonstrates that it is not just the body that benefits from exercise, but the brain, too. Although there is no current evidence that regular physical exercise can actually prevent AD, several prospective observational studies have found that physically active older adults may be less prone to cognitive decline and have a lower prevalence of AD than those who are sedentary. The physical benefits of regular aerobic exercise, including reducing the risk of cardiovascular disease and diabetes, strengthening the bones and muscles, and reducing stress, are well known. The benefits of aerobic exercise on cognitive function are less well known, but may include improved executive function (the ability to think abstractly and to plan, initiate, sequence, and monitor), multi-tasking, task switching, selective attention, and working memory, along with an increase in the volume of brain structures important for memory.

Exercise and Cognitive Impairment

Aerobic exercise can improve memory, reasoning, judgment and thinking skills for older adults with mild cognitive impairment (MCI). A 2013 study from the University of Maryland School of Public Health showed that an exercise intervention in older adults ages 60-88) with MCI (improved memory recall and brain function as measured by functional MRI (fMRI) neuroimaging. After just 12 weeks of a moderate exercise program, subjects improved their neural efficiency -- using fewer neural resources to perform memory tasks, compared to baseline. A 2012 study at University of California Irvine study showed a single 6-minute interval of moderately intense exercise improved memory in individuals with memory deficits, an effect postulated to be related to the exercise-related release of norepinephrine, known to play a role in memory modulation.

In particular, executive functioning seems to be susceptible to improvements induced by physical activity, implying a specific exercise effect on higher cognition rather than on other basic cognitive domains. Indeed, there is emerging evidence that executive function is the critical “cognitive component” that is important when facing real life mobility tasks that are complex and challenging. The strongest exercise effects on executive function have been noted for combined aerobic exercise and strength training and for more intensive exercise. Dual-task studies indicate that both attention and control of executive functions can be improved when performing a cognitive and a motor task simultaneously (e.g., walking while counting backwards), even in patients with early to moderate dementia. Recent evidence also points to dancing as a “natural” intervention combining exercise and cognitive challenge. However, specific recommendations for optimal dual tasking exercise regimens are lacking and further studies are required.

Research has demonstrated that even acutely impaired geriatric inpatients with dementia are able to carry out and benefit from some forms of exercise, dispelling the often held view that they are unable to participate in rehabilitation program.

The bottom line is that exercise may have a preventive and ameliorating effect on cognitive decline (in addition to helping to maintain strength, balance, and flexibility). Regardless of the fitness level, most older adults can likely benefit from, and may well be able to perform, some sort of exercise regimen.

TIPS FOR DEALING WITH PHYSICAL ACTIVITY AS AN APPROACH TO IMPROVE COGNITIVE FUNCTION

- Recommend that all older adults participate in regular physical activity.
- For those who are physically fit, recommend at least 150 minutes per week of moderate-intensity activity, 75 minutes of vigorous intensity activity, or a combination of the two.
- For those who lack sufficient fitness for moderate- or vigorous-intensity activity, recommend activities of which they are capable. The goal is to avoid being sedentary.
- Include muscle strengthening and flexibility training in the activity regimen.
ELDER CARE

How Does it Work?

While observational studies have demonstrated an association between exercise and preserved cognition in older adults, causation has not been unequivocally demonstrated. If there is a causal mechanism, any of several mechanisms could be involved.

For example, a number of studies have been conducted to examine the effect of exercise on human brain structure and function. Research using fMRI have demonstrated that increased cerebral blood volume in the dentate gyrus of the hippocampus, a center involved in memory, occurs in association with improvements in cardiorespiratory fitness and performance in verbal learning and memory. Other mechanisms might include stimulation of neuroplasticity, improving neuronal function, up-regulating growth factors, increasing neuroendocrine response to stress, decreasing neuro-inflammation, and/or reducing neuro-pathologic load. Improvements related to dual-task performance might be due to a better coordination of cognitive resources and improved attention-control strategies. Non-human animal research has had similar findings and has contributed to our understanding of neurocognitive plasticity in humans.

However, many unanswered questions remain in the field of exercise neuroscience. Nonetheless, there is accumulating evidence that physical exercise has benefit. It should be encouraged in all older adults, including those with mild cognitive impairment and dementia.

How Much Physical Activity Do Older Adults Require?

Current recommendations are that adults age 65 years or older who are generally fit and have no limiting health conditions should do a least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity activity throughout the week, or an equivalent combination of moderate- and vigorous-intensity activity. It is thought that aerobic activity can be broken up into smaller chunks of time during the day, as long as they are at least 10 minutes each. If chronic conditions preclude activity at the recommended minimum amount, older adults should perform physical activities as tolerated to avoid being sedentary. In addition to aerobic activities, exercise prescriptions for older adults should also include muscle strengthening and flexibility exercises performed at least twice weekly.

In summary, older adults gain substantial health benefits from regular physical activity, including potential positive effects on cognitive performance.

References and Resources


Interprofessional care improves the outcomes of older adults with complex health problems

Editors: Rosemary Browne, MD; Mindy Fain, MD; and Barry D. Weiss, MD

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Supported by: Donald W. Reynolds Foundation, Arizona Geriatric Education Center and Arizona Center on Aging
Hospice Care for Patients with Dementia
Alfred W. Kasznick, PhD, Departments of Psychology, Neurology, and Psychiatry, University of Arizona
Evan V. Kligman, MD, Department of Family and Community Medicine, University of Arizona

Alzheimer's disease (AD) usually appears after age 65. It has a progressive course and gradually destroys memory, reasoning, judgment, and speech. Eventually, the ability to perform even the simplest task is lost. The end of life for patients with dementia is similar to the end of life with many other chronic illnesses. Patients demonstrate an overall decline in functional status, lack of desire to eat or drink, withdrawal from social interaction, and confusion in sleep-wake states. Death is usually presaged by a mottling of the limbs, uncontrollable jaw movements, and ultimately a death rattle.

Hospice and palliative care services are underused by patients with dementia in comparison to use by patients with other life-ending illnesses. The reasons for the low rate of hospice care for dementia patients are not fully understood.

Hospice Care for Dementia - Why?
Over 70 percent of people with end-stage dementia live at home and are cared for by family and other caregivers. New research suggests that hospice involvement in the care of these patients may increase their life expectancy. More importantly, however, hospice care improves quality of life for both the patient and the patient's family members and caregivers.

For example, a recent survey of family members of patients who died with dementia found that when hospice care was provided, family members were 51% less likely to report unmet needs or concerns about quality of care in comparison to families of patients who did not receive hospice care. A similar percentage was less likely to report an unmet need for pain management, and also less likely to have wanted more emotional support before their loved one’s death. Family members also rated the peacefulness and quality of dying more positively when hospice care was involved.

Hospice Care for Dementia - When?
Eligibility criteria have been established for when hospice care is appropriate for patients with dementia. These criteria are listed in Table 1. Once these eligibility requirements are met, Medicare and most insurance plans will cover a wide variety of hospice services (Table 2).

| Table 1. Hospice Eligibility Criteria for People with Dementia |
|-------------------|----------------------------------------------------------------|
| All of the following: |        |
| Unable to ambulate without assistance |        |
| Unable to dress without assistance |        |
| Unable to bathe without assistance |        |
| Urinary or fecal incontinence intermittent or constant |        |
| No consistent meaningful verbal communication; speech is limited to six or fewer intelligible words or only stereotypical phrases | |
| One of the following within the past 12 months: |        |
| Aspiration pneumonia |        |
| Pyelonephritis or upper urinary tract infection |        |
| Septicemia |        |
| Decubitus ulcers, multiple, stage 3-4 |        |
| Fever, recurrent after antibiotics |        |
| Inability to maintain sufficient fluid and calorie intake with 10% weight loss during the previous six months or serum albumin <2.5 g/dL |        |

HOSPICE CARE

Table 2. Hospice Benefits Covered by Medicare and Most Insurance Plans for Patients with Dementia

<table>
<thead>
<tr>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician services</td>
</tr>
<tr>
<td>Nursing care</td>
</tr>
<tr>
<td>Medical equipment and supplies</td>
</tr>
<tr>
<td>Medications for symptom management and pain relief</td>
</tr>
<tr>
<td>Short-term inpatient hospice care, including respite care</td>
</tr>
<tr>
<td>Home health aide and homemaker services</td>
</tr>
<tr>
<td>Medical social services and spiritual counseling</td>
</tr>
<tr>
<td>Dietary counseling</td>
</tr>
<tr>
<td>Bereavement counseling</td>
</tr>
</tbody>
</table>


Hospice Care for Dementia - What?

Hospice care provides a philosophy rather than a location for care. It supports the physical, psychosocial, and spiritual needs of dementia patients and their families. A hospice interdisciplinary team (physician, nurse, spiritual counselor, social worker, home health aide, volunteer, bereavement coordinator, and other therapists as needed, such as massage therapist) follow patients in their homes, assisted living or skilled nursing facilities, and ultimately, for some, in inpatient units for end-stage hospice care.

Palliative care for those with dementia is in many ways similar to palliative care for other life-ending conditions. It focuses on relieving symptoms such as pain, shortness of breath, fatigue, nausea, loss of appetite, and difficulty sleeping.

For patients with dementia, however, palliative care also monitors for and addresses dementia-related psychological and behavioral disorders that may impair quality of life for the patients or their families. Such behaviors are particularly common in the later stages of AD. Although depression generally decreases with progression of AD, other behaviors, such as agitation, aggression, and delusions, may increase. The presence of these emotional and behavioral difficulties is associated with greater caregiver distress and a higher rate of nursing home placement.

Thus, part of palliative care for patients with dementia involves identifying illness-related and environmental factors that contribute to these behaviors and, when possible, eliminating them. These factors are listed in Table 3. Other approaches to behavioral problems in patients with AD are discussed in the Elder Care on "Communicating with Patients who have Dementia" which can be viewed at [http://www.reynolds.med.arizona.edu/EduProducts/providerSheets/Dementia%20Patients%20-%20Communication.pdf](http://www.reynolds.med.arizona.edu/EduProducts/providerSheets/Dementia%20Patients%20-%20Communication.pdf)

<table>
<thead>
<tr>
<th>Illness-Related Factors</th>
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</thead>
<tbody>
<tr>
<td>Constipation</td>
</tr>
<tr>
<td>Urinary Retention</td>
</tr>
<tr>
<td>Fatigue</td>
</tr>
<tr>
<td>Impaired vision and hearing</td>
</tr>
<tr>
<td>Inability to interpret words or actions</td>
</tr>
<tr>
<td>Infections</td>
</tr>
<tr>
<td>Pain</td>
</tr>
<tr>
<td>Medication side effects</td>
</tr>
<tr>
<td>Visual hallucinations</td>
</tr>
</tbody>
</table>

Environmental Factors

<table>
<thead>
<tr>
<th>Feeling vulnerable and insecure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inability to recognize noises or people</td>
</tr>
<tr>
<td>Excessive noise level</td>
</tr>
<tr>
<td>Sensory overload, including too many people</td>
</tr>
<tr>
<td>Startling noises</td>
</tr>
<tr>
<td>Sudden movements</td>
</tr>
<tr>
<td>Forced to engage in personal hygiene behavior, i.e.: take a bath or shower</td>
</tr>
</tbody>
</table>

References and Resources


Morrow A. [Palliative care for dementia](http://dying.about.com/od/neurological/a/dementia.htm).


ACOVE Quality Indicators

If a vulnerable older with dementia has a caregiver (and, if capable, the patient assents), THEN the physician should discuss or refer the patient and caregiver for discussion about patient safety, provide education on how to deal with conflicts at home, and inform them about community resources for dementia.

Interprofessional care improves the outcomes of older adults with complex health problems

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Communicating with Patients who have Dementia

Jane Harwood, PhD, Department of Communication, University of Arizona

Our goal in interacting with people who have dementia is to communicate with them in patient-centered ways that support the effective transmission of information, decrease uncertainty and anxiety, and enhance their self-respect. We should maximize their abilities and allow them to experience successful interaction on their own terms.

It is important to remember that dementias are typically progressive. In the early stage symptoms may be minor, and effective communication with patients in this stage of dementia would differ little from effective communication with any individual. As the disease progresses, however, communication strategies specific to dementia become necessary.

Different dementias have different effects on communication. Most of this Elder Care focuses on Alzheimer’s Dementia (AD). The kinds of naming and vocabulary problems experienced by people with AD are often less notable in people with other types of dementia, which may show different communication problems.

People with dementia are often depersonalized, seen as less than human as a function of their age and functional impairments. As a result of low expectations, poor social environments, and poor communication, these individuals can end up with levels of disability that exceed what is attributable to their disease. The person inside is still capable of experiencing emotions, and capable of growth and new achievements. Their potential can be maximized by treating them as whole human beings, able to undertake meaningful endeavors.

Simplify Talk. Simplified speech can often be beneficial to people with dementia. In particular, keeping sentence structures simple is helpful. Multi-clause sentences that branch in different directions are challenging for many older adults, and may be impossible to understand for those with severe cognitive impairments.

Avoid Patronizing Talk. Some aspects of simplified talk, however, may hurt comprehension. “Baby talk” is a style of talk that includes super short sentences, childish vocabulary (“choo-choo” instead of “train”), pet names (“sweetie”) and babyish intonation. There is no evidence that use of such communication is effective.

In addition to being perceived as disrespectful, a patronizing style actually reduces cooperativeness and can make administering care more difficult. As illustrated in the Figure on the reverse side of the page, nursing home residents with dementia are more likely to resist care when prior communication from a caregiver has been patronizing.

Repetition. Repetition is helpful if individuals with dementia have trouble grasping an idea or processing a sentence the first time they hear it. Repetition increases the chance they will understand. But, rather than repeating an exchange word for word, phrase the idea in a new way. This can also help when a patient has concomitant hearing loss and difficulty perceiving certain consonants.

Elaboration. In patients with AD, long-term memory becomes harder to access. Ideas and knowledge are still present, but the pathways to reach that knowledge become tangled and blocked. Elaborating on a topic by rephrasing and expressing the same idea using different words can often open up an alternate route to a memory and, therefore, comprehension of a conversation. As memory impairment increases, music, smells, and sensory input can also assist in evoking memories.

Take Time. Allowing pauses in conversation, being willing to repeat and elaborate, and waiting for a response all signal an openness to the conversational partner. These actions also allow the extra time they need to make connections and generate a response.

Allow Choice. Even simple choices (“Would you like X or Y?”) grant personhood to the partner, and offer opportunities for control in a life that is often lacking such opportunities.

TIPS FOR COMMUNICATION WITH PATIENTS WHO HAVE DEMENTIA

• DO use personalized communication, repetition and elaboration, closed-ended (yes-no) questions, and present one idea at a time.
• DO NOT use patronizing talk, sentences with incomplete thoughts, pet names or babyish vocabulary, controlling or corrective talk, or have rushed conversations.
Be Concrete Abstract vocabulary, metaphors, colloquialisms, and plays on words are unlikely to be successful. People with dementia respond to specific, concrete language, particularly language rich in concrete nouns and people’s actual names, rather than pet names or “he” or “she.”

Table 1. Effective Verbal Strategies for Communicating with Patients who Have Dementia

- Use Right Branching Sentences - put the main subject/object at the beginning of a sentence and avoid starting a sentence with subordinating conjunctions, e.g.: if, although, unless, as long as, because, before. For example, instead of saying “if you want to eat dinner now, please sit in this chair,” say “Please sit in this chair to eat dinner now.”
- Avoid multi-clause sentences. For example, instead of saying “I went to the store and bought some milk and then stopped by to visit,” say “I went to the store. I bought some milk. Now I’m here to visit you.”
- Use intonation to make intent clear, e.g., if you are asking a question, make sure it sounds like a question.
- Encourage the patient to point and gesture by saying “Can you point to what you want?”

Table 2. Effective Non-Verbal Strategies for Communicating with Patients who Have Dementia

- Orient to the person, keep your body and face turned towards them.
- Seek eye contact and use appropriate touching.
- Face patients at their level; use facial expressions to get point across.
- Smile and remain calm.
- Attend carefully to your partner’s nonverbal expression; it might be clearer than their verbal statements.
- There is no need to talk very slowly, but pause between ideas to avoid overload.
- Point, gesture and use props to help the patient understand you.

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Resilience in Aging
Erica S. Edwards, MSW, Morrison Institute for Public Policy, Arizona State University
John Hall, PhD and Alex Zautra, PhD, Resilience Solutions Group, Arizona State University

The concept of resilience in aging was born out of the "paradox of old age." The paradox is that in spite of losses and physical declines experienced in later life, older adults report feeling content, and they have lower rates of psychopathology than the general population. Researchers have argued that this is due to resilience, and that an understanding of resilience can lead to new health promotion strategies that yield healthier, happier people and communities.

What is Resilience?
Resilience is the result of successful adaptation to adversity. It is revealed by an individual’s ability to cope and recover from crises, sustain a sense of purpose and vitality, and emerge stronger from stressful experiences. Resilience is a dynamic characteristic that may shift according to the circumstance.

Indeed, it can be manifest in many forms: as an outcome of physical or mental recovery from a traumatic event; as a trait that describes an individual’s enduring ability to cope; or as a process of recovering from a stressful event and moving forward. No matter how resilience is viewed, the resources that lead to resilience can result in positive outcomes. (Table 1).

Although resilience is seldom associated with older adults because they experience loss and decline, older adults actually have a higher level of subjective well-being than individuals in any other age group. “Resilience thinking” in older adults gives them the ability to recover from adversity, thrive with a sustained purpose, and grow in a world of turmoil, change, and chronic illness. It is a regenerative capacity that maintains health and function in the face of loss, disability, or disease. The three hallmarks of resilience are shown in Table 2.

Resilience thinking allows older adults to accept the wear and tear of aging, while also dealing with problems and crises – like losing a loved one, spousal caregiving, or acquiring a disability – in ways that leave them feeling stronger than they would have been if they had not encountered those crises. In resilience thinking, failure leads to growth.

Assessing Resilience
By assessing older adults using a resilience perspective, strengths of an individual can be highlighted. The goal of such an assessment is to determine if an individual has the characteristics that predict positive outcomes when dealing with stressors and calamity, and to suggest the need to encourage resilience if those characteristics are absent. Several of these characteristics are shown in Table 3. Specific questions that can be asked to help assess an individual’s resilience are shown in Table 4.

### Table 1. Examples of Resilience Resources and Hypothesized Outcomes

<table>
<thead>
<tr>
<th>Resilience Resource</th>
<th>Hypothesized Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological</td>
<td></td>
</tr>
<tr>
<td>Coping capacity</td>
<td>Prevention of disability following injury</td>
</tr>
<tr>
<td>Emotional awareness and clarity</td>
<td>High levels of emotion differentiation and complexity</td>
</tr>
<tr>
<td>Sense of purpose</td>
<td>Sustained elevations in positive emotion and hope</td>
</tr>
<tr>
<td>Social connection/affiliation</td>
<td>Social meaning and value sustained under stress</td>
</tr>
<tr>
<td>Social support network</td>
<td>Less depression and anxiety following loss</td>
</tr>
<tr>
<td>Physiological</td>
<td></td>
</tr>
<tr>
<td>Cardiac health</td>
<td>Recovery following stress</td>
</tr>
<tr>
<td>Immune competence</td>
<td>Rapid immune response to acute illness/injury</td>
</tr>
</tbody>
</table>

**TIPS ABOUT RESILIENCE IN OLDER ADULTS**

- Despite losses and physical decline, older adults report feeling content and have less psychopathology than the remainder of the population. This is thought to be due to resilience’s successful adaption to adversity.
- An individual’s “resilience thinking” can be assessed by asking questions about life philosophy, and about characteristics and behaviors that lead to resilience (Tables 3 and 4).
- Older adults should be encouraged to participate in activities that build resilience, like joining a social group, developing a family communication plan, starting a stress management program, exercising, and/or beginning a volunteer position, job, or new hobby.
Table 2. Three Hallmarks of Resilience

Recovery: Rebounding from stress and returning to a balanced state of well-being. Nearly everyone knows someone who has returned from a crisis as strong, or perhaps stronger than before, and often better able to prevent or deal with future negative situations.

Sustained purpose: The capacity to continue to move forward is enabled with having vested interests in causes or activities and avoiding boredom and complacency.

Growth: Emerging stronger from stressful experiences. Failure creates a new model of resilience capacities.

How Can We Promote Resilience?
Those who live the longest have been found to be resilient. Since most older adults are interested in a long and happy life, clinicians can share information with and teach older adults about the resilience process. For example, the evidence from neuropsychology disproves the myth that “you cannot teach an old dog new tricks.” Rather, older adults should be encouraged to engage in new activities and make new friendships. Clinicians caring for older adults should discuss with them, write them prescriptions, or outline plans for activities that build resilience, such as joining a social group, developing a family communication plan, starting a stress management program, exercising, and/or beginning a volunteer position, job, or new hobby.

Table 3. Characteristics and Behaviors that Lead to Resilience

- Optimism and effective coping styles: Responses to crises are more often seen from the “silver lining” point of view, rather than from despair. These factors are more important to obtaining happiness in aging than perfect health.

- Personal connections: Happily engaged with family and friends, close-knit communities, or at paid or unpaid work.

- Sense of purpose: Involved in an activity or a function that gives life meaning. This factor affects optimism and how one looks to the future.

- Self-efficacy: Ability to handle one’s own problems; flexibility; adaptability.

- Healthy diet/active lifestyle: The healthier and more active older adults are, the more factors of resilience they possess and vice versa. The relationship is bi-directional.

Table 4. Sample Questions for Assessing Resilience

1. Why do you think you have lived such a long life?
2. What is your life philosophy?
3. How would you describe your relationships with your friends/family/neighbors?
4. What do you do when you face difficulties in your life?
5. What does being healthy mean to you?
6. How do you handle change in your life?
7. Are you satisfied with your life?
8. What are you the most proud of?
9. Are there lessons to learn from life’s difficulties, or should we just “grin and bear it?”
10. Are there any benefits that come from stress?

Final Comments
The resilience process builds individual strengths and competencies. Through personal connections, older adults learn about their potentials and gifts from others, which increases their self-efficacy and perseverance in the face of adversity. The meaningful relationships they have with friends and family provide them resources to adapt to adversity, and their engagement in meaningful activities gives them purpose and the motivation to persevere, and continue to learn. As a result, resilient older adults have a positive attitude and forward-looking outlook that we should promote across all populations.

References and Resources
Resilience Solutions Group. http://resilience.osu.edu/

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Supported by: Donald W. Reynolds Foundation, Arizona Geriatric Education Center and Arizona Center on Aging
2013
ALZHEIMER’S DISEASE
FACTS AND FIGURES

ALZHEIMER’S DISEASE IS THE SIXTH LEADING CAUSE OF DEATH IN THE UNITED STATES. MORE THAN 5 MILLION AMERICANS ARE LIVING WITH THE DISEASE.

In 2013, an estimated 450,000 people in the United States will die with Alzheimer’s.

Since 2000, deaths from Alzheimer’s have risen 68 percent—while deaths from other major diseases have decreased.

1 in 3 seniors dies with Alzheimer’s or another dementia.

NEARLY 15 PERCENT OF CAREGIVERS FOR PEOPLE WITH ALZHEIMER’S OR ANOTHER DEMENTIA ARE LONG-DISTANCE CAREGIVERS.

OUT-OF-POCKET EXPENSES FOR LONG-DISTANCE CAREGIVERS ARE NEARLY TWICE AS MUCH AS LOCAL CAREGIVERS.

IN 2012, CAREGIVERS PROVIDED OVER 17 BILLION HOURS OF UNPAID CARE VALUED AT MORE THAN $216 BILLION.

There are more than 15 million caregivers of people with Alzheimer’s and other dementias.

In 2013, Alzheimer’s will cost the nation $203 billion. This number is expected to rise to $1.2 trillion by 2050.

Someone develops Alzheimer’s every 68 seconds.

alzheimer's association®
Alzheimer’s Disease Caregivers

With Alzheimer’s disease, it is not just those with the disease who suffer. It’s also their caregivers – a job that usually falls on family and friends.

- In 2012, 15.4 million family members and friends provided 17.5 billion hours of unpaid care to people with Alzheimer’s and other dementias, at an economic value of over $216 billion.

- Of the unpaid Alzheimer’s and dementia caregivers, 75 percent have been providing care for at least a year, and one-third have been providing care for five or more years.

- Nearly one-third of Alzheimer’s and dementia caregivers are “sandwich generation” caregivers – caring for both someone with the disease and a child or grandchild.

Caring for people with Alzheimer’s and other dementias is often very personal and very intrusive.

- Over half of the caregivers of people with Alzheimer’s and other dementias provide help to the care recipient in getting in and out of bed; 40 percent help with getting dressed.

- About one-third of Alzheimer’s caregivers provide help getting to and from the toilet, bathing, managing incontinence and feeding.

- Nearly 28 percent of Alzheimer’s and dementia caregivers say that the individual with the disease needs the most help with activities such as getting dressed, taking a shower and going to the bathroom.

Proportion of Alzheimer’s Caregivers Who Provide Help with Daily Activities

- Getting in and out of bed: 54%
- Dressing: 40%
- Getting to and from the toilet: 32%
- Bathing: 31%
- Managing incontinence and diapers: 31%
- Feeding: 31%
Caring for an individual with Alzheimer’s disease creates or aggravates the health problems of a caregiver.

- Those who care for someone with Alzheimer’s or another dementia are 3.5 times more likely than caregivers of people without these conditions to say that the greatest difficulty associated with caregiving is that it creates or aggravates their own health problems.

- More than 60 percent of Alzheimer’s and dementia caregivers rate the emotional stress of caregiving as high or very high. More than one-third of family caregivers of people with Alzheimer’s and other dementias report symptoms of depression.

- One study found that spouse caregivers of people hospitalized for dementia (compared to people hospitalized for other conditions) were more likely to die in the following year, even after accounting for the age of the spouse caregiver.

- The physical and emotional impact of caregiving on Alzheimer’s and other dementia caregivers resulted in an estimated $9.1 billion in increased caregiver health costs in 2012.

### Alzheimer's and Dementia Care Costs

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td></td>
<td>$203 Billion</td>
<td>$216 Billion</td>
</tr>
</tbody>
</table>

Caring for an individual with Alzheimer’s has a negative effect on employment, income and financial security.

- Among Alzheimer’s and dementia caregivers who are employed full or part time, 65 percent said they had to go in late, leave early or take time off because of their caregiving responsibilities.

- If the individual with Alzheimer’s disease has behavioral symptoms, their family caregivers are 68 percent more likely than caregivers of other older people to reduce their hours or quit work.

- 20 percent of female caregivers believe they have been penalized at work because of the need to care for someone with Alzheimer’s.

- According to a 2004 study, half of unpaid non-spouse caregivers of people with Alzheimer’s and other dementias have caregiving-related out-of-pocket expenses averaging $300 per month (in 2012 dollars).
Over 5 million Americans are living with Alzheimer’s, and as many as 16 million will have the disease in 2050. Nearly one in every three seniors who dies each year has Alzheimer’s or another dementia. The cost of caring for those with Alzheimer’s and other dementias is estimated to total $203 billion in 2013, increasing to $1.2 trillion (in today’s dollars) by mid-century.

### Number of People Aged 65 and Older with Alzheimer’s by Age

<table>
<thead>
<tr>
<th>Year</th>
<th>65-74</th>
<th>75-84</th>
<th>85+</th>
<th>Total</th>
<th>% change from 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>5,400</td>
<td>43,000</td>
<td>29,000</td>
<td>78,000</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>5,400</td>
<td>47,000</td>
<td>45,000</td>
<td>97,000</td>
<td>24%</td>
</tr>
<tr>
<td>2020</td>
<td>7,900</td>
<td>54,000</td>
<td>52,000</td>
<td>110,000</td>
<td>41%</td>
</tr>
<tr>
<td>2025</td>
<td>9,300</td>
<td>68,000</td>
<td>57,000</td>
<td>130,000</td>
<td>67%</td>
</tr>
</tbody>
</table>

### Number of Alzheimer’s and Dementia Caregivers, Hours of Unpaid Care, and Costs of Caregiving

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Caregivers (in thousands)</th>
<th>Total Hours of Unpaid Care (in millions)</th>
<th>Total Value of Unpaid Care (in millions)</th>
<th>Higher Health Costs of Caregivers (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>298</td>
<td>340</td>
<td>$4,055</td>
<td>N/A</td>
</tr>
<tr>
<td>2011</td>
<td>298</td>
<td>339</td>
<td>$4,114</td>
<td>$135</td>
</tr>
<tr>
<td>2012</td>
<td>303</td>
<td>345</td>
<td>$4,250</td>
<td>$143</td>
</tr>
</tbody>
</table>

### Percentage Change in Number with Alzheimer’s Disease Compared to 2000

- 2010: 24%
- 2020: 41%
- 2025: 67%

### Cognitive Impairment in Nursing Home Residents, 2009

- Level of Cognitive Impairment:
  - severe/moderate: 28%
  - mild/very mild: 48%
  - none: 24%

**Total**: 41,703

### Number of Deaths Due to Alzheimer’s Disease in 2010

- 2,327

For more information, view the 2013 Alzheimer’s Disease Facts and Figures report at alz.org/facts.
Arizona Geriatric Education Center

The Health Resources and Services Administration (HRSA), an agency of the US Department of Health and Human Services, funds Geriatric Education Centers (GEC) across the nation to provide interdisciplinary training of health professions faculty, students and practitioners in the diagnosis, treatment and prevention of disease, disability and other health problems of the elderly. Due to our innovative programs, renowned interprofessional faculty and statewide partnerships we have successfully competed for a GEC in Arizona 4 times!! The primary goal of our Arizona Geriatric Education Center (AzGEC) is to help build an expanded, diverse, and prepared interprofessional geriatric workforce in Arizona to meet the special healthcare needs of older adults, especially the frail.

There is a great need for our AzGEC, as Arizona is rapidly growing, with growth especially pronounced among older adults in ethnic minority groups and those living in rural and underserved areas. Many of these elders have multiple complex health problems, and poor function and quality of life, and will use a disproportionate share of health care resources with high associated costs. The AzGEC is integrally involved in geriatric education and training, clinical demonstration and care, biology of aging and aging health services research, community engagement, and aging policy integrating linkages to the Administration on Aging, National Institute on Aging, Department of Veterans Affairs, and other Health Resources and Services Administration programs. Our AzGEC is a statewide consortium, including the University of Arizona Health Sciences Center, Arizona State University, and the Southern Arizona VA Healthcare Center. Through these partnerships we provide interprofessional education and training of health science students, nurses, NPs, PAs, physicians, pharmacists, public health and social workers to provide quality care of seniors in Arizona, across the continuum.

Interprofessional Senior Mentor Program

The Interprofessional Senior Mentor Program (IPSM P) is offered to University of Arizona and Arizona State University health science students, and is designed to increase their exposure to healthy older adults by allowing them to get to know an older adult in a non-clinical environment. This out-of-classroom experience pairs each student with a socially and physically active 65+ year-old community-dwelling adult who will be their senior mentor for a semester. They meet 3-4 times for approximately 2-3 hours each visit. Each meeting has activities aimed to increase the student’s geriatric knowledge, reduce stereotypes about aging and add meaning to their geriatric curriculum content, thus improving the way future health professionals care for older adults. The students also participate in one Interprofessional Team Meeting for a case review. This relaxed and engaging roundtable discussion allows them to increase their knowledge of the roles and expertise of other health professionals and learn the importance of team health care. During the spring semester of 2013, our program brought together 40 mentor/student pairs in Tucson and 11 mentor/student pairs in Phoenix. We received glowing reviews from all parties and are continuing to expand this very successful program.
EDUCATIONAL PROGRAMS

Advances in Aging Lecture Series

3rd Friday of every month, 12:00pm – 1:00pm

Schedule and location may be viewed at:
http://www.azgec.med.arizona.edu/html/news_events.html

View live at:  http://streaming.biocom.arizona.edu/home/
Past lectures archived at:  http://streaming.biocom.arizona.edu/categories/?id=5

Contact Laura Vitkus at lvitkus@aging.arizona.edu or (520) 626-5800 for more information

Interprofessional Certificate in Aging Services Program

Online, Self-Paced
4 Core Courses + 2 Electives or Internship

This non-academic program is designed to provide knowledge of aging issues for anyone working with older adults

Core Courses:  The Aging Mind and Body
Society and Aging
Legal and Financial Issues of Aging
Navigating the Health Care System and Aging Network

Electives:  Communicating Effectively with Older Adults
Social Engagement: Keeping Older Adults Connected
Healthy Aging

http://outreachcollege.arizona.edu/programs-courses/professional-certificates

Contact Karen D'Huyvetter at kdhuyvetter@aging.arizona.edu or (520) 626-5808 for more information
The University of Arizona Center on Aging
strives to improve the quality of living and function of
Arizona’s older adults through innovative programs in
research, education and clinical care

We are proud to collaborate with our partners across the state

**Research:** Combining cutting-edge research through our biology of aging, clinical, epidemiologic, and health services programs, we bring the bench to the bedside and back again to improve the quality of life and functional longevity of older adults.

Of special note are our Immunobiology and GeriMetrics Programs: Immunobiology research explores age-related changes in inflammation, immunity, bone, muscle, and fat biology. GeriMetrics uses innovative bioengineering tools to address common geriatric conditions and syndromes including imbalance and falls, cognitive deficits, pressure ulcers, polypharmacy management, self-care deficits and frailty.

**Education and Training:** We provide training and continuing education in aging issues to health science students and working professionals across the state. Our Interprofessional Arizona Geriatric Education Center and Reynolds Program in Applied Geriatrics help to prepare our state’s workforce in caring for Arizona’s older adults.

**Clinical Care:** We connect older adults with geriatricians and palliative care specialists – providers who are trained to meet the specific needs of aging adults.
Graduate Education Opportunities

The 2012 *U.S. News & World Report* survey of America’s best graduate schools ranks the College of Nursing and Health Innovation 21st out of 467, or the top 4%, of graduate nursing programs in the nation.

- **Master of Healthcare Innovation (MHI)** is a fully online program that brings together information from innovation and change theory, leadership, entrepreneurship, application technology, and system design programs, to create innovative solutions to the challenges in health care.

- **Master of Science, Clinical Research Management** (MS-CRM) is a fully online program that prepares graduates to lead complex global clinical research operations at multiple types of employer settings in the rapidly growing clinical research industry.

- **Master of Science, Nurse Educator** is a pathway designed to prepare the new and experienced nurse to meet demands of the changing health care environment. The program is learner-centered, clinically focused, population-specific, and designed for those who initially choose a career as a nurse educator, as well as for nurses in practice who want to make a change.

- **Doctor of Nursing Practice (DNP)** program is focused on improving health care through facilitating a culture of best practice, and providing the additional skills necessary to develop advance practice nursing leaders for the future. Post Baccalaureate and Post Master’s DNP advanced practice specialties include:
  - Adult-Gerontology Nurse Practitioner
  - Family Psychiatric Mental Health Nurse Practitioner
  - Family Nurse Practitioner
  - Neonatal Nurse Practitioner
  - Pediatric Nurse Practitioner
  - Women’s Health Nurse Practitioner
  - Innovation Leadership

- **PhD degree in Nursing & Healthcare Innovation** is designed for scholars who wish to pursue careers as leaders in health policy, education and research. The degree will also help to address a national need for faculty and researchers who are increasingly in short supply.

For additional information, https://nursingandhealth.asu.edu/programs
The AzGS mission is to advance the best healthcare practices for older Arizonans by supporting the education of interprofessional geriatric health providers.

7th Annual Spring Geriatric Mental Health & Aging Conference

Wednesday, April 16 @
Black Canyon Conference Center in Phoenix &
Thursday, April 24th @
Handmaker Jewish Services for the Aging in Tucson

* * *

5th Annual Summer Interprofessional Conference

July in Flagstaff—Exact Date & Location to be determined

* * *

26th Annual Fall Symposium

November in Phoenix —Date & Location to be determined

Save these dates!