

Lifelong Learning:

A Key Weapon in Delaware's Fight Against Cognitive Decline

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The fear of cognitive decline increases with advancing years of age. No one wants to experience even mild memory loss, let alone the more severe symptoms of major neurocognitive disorder. Also known as dementia, major neurocognitive disorder's effects include impaired memory and learning, problem-solving and reasoning, language, social interaction and behavior. Early symptoms include problems recalling recent events, difficulty finding the right words, altered mood and initiative, difficulty completing normal tasks, confusion, difficulty following story lines, a failing sense of direction, being repetitive and struggling to adapt to change. Ultimately, these changes lead to loss of independence.

No current medical treatment cures dementia. What is now known is that risk may be reduced and onset delayed. Lifestyle choices and brain-healthy behaviors make a difference. The brain can create new brain cells and connections throughout life. This highly significant discovery is relatively new. Now what is needed is for individuals, families and programs in the community to encourage experiences which promote cognitive fitness.

Demographic trends in Delaware project that the prevalence of dementia will increase since the number of older adults is growing and age is the most important risk factor for dementia. Just under 400,000 residents of Delaware, almost 40 per cent of the population, are 50 and older. Delaware's general population's median age of 41.1 is almost three years higher than the overall U.S. median age. Delaware ranked fifth among all U.S. states in age, with 81,000 Delawareans age 65 and over. That amounts to 18.5 per cent of the state's population. The proportion of Delaware's population that is 60 and older is increasing more rapidly than other components of the population. Estimates project that 28.4 percent of Delaware's population will be 60 and older by the year 2030, an increase of 41 percent from 2012.¹

What is Dementia?

Dementia is an acquired disorder of cognition, and cognition includes a range of faculties necessary to get along in the world. Dementia brings on a loss of cognitive functioning sufficient to interfere significantly with independence. Activities that previously were enjoyable and meaningful cannot be continued. As dementia progresses, full-time care may become necessary. Six areas of cognition are typically considered by clinicians diagnosing dementia. Some skills may be more impaired than others: *Complex attention* refers to the ability to sustain focus and switch between tasks. *Learning and memory* include acquisition of new memories and recall of past events. *Executive function* refers to skills that enable planning, organizing, remembering, prioritizing and paying attention to tasks. *Language* includes understanding and expressing in both spoken and written forms. *Perceptual-motor function* incorporates spatial awareness and spatial reasoning, for example the ability to follow driving directions. *Social cognition* involves the understanding of others' non-verbal communications to enhance interactions.²

Alzheimer's Disease

Many medical conditions can result in dementia, but Alzheimer's Disease (AD) is considered the most frequent among older adults. Not everyone with dementia has AD but AD is the most well-known and common form of dementia. AD affects over six million people in the United States. By 2050, that figure may increase to more than 14 million. Symptoms include a decline in memory, changes in thinking skills, poor judgment and reasoning skills, decreased focus and attention and changes in language and communication skills. This irreversible degeneration of the brain disrupts memory, cognition, personality, and other functions. It eventually leads to death as the brain and body fail. AD is the sixth leading cause of death in the United States. The number of new cases of Alzheimer's increases dramatically with age. In 2011, the average annual incidence in people age 65 to 74 was 0.4%. In people age 75 to 84 the annual incidence was 3.2% and for age 85 and older, the incidence was 7.6%. Because of the increasing number of people age 65 and older, the annual number of new cases of Alzheimer's and other dementias is projected to double by 2050. In Delaware, projected number of Alzheimer's cases is 19,000 in 2020 with an expected 23,000 in 2025, a 21.1% increase.³

Early Research to Lower the Risk of Dementia

Understanding how the brain works is essential for understanding what happens with dementia. Until the 1960's, brain cells were believed to decline with age but never to increase. Then an important discovery was made which would have highly significant impact. Dr. Marion Diamond, a professor at University of California in Berkley, provided the first hard evidence demonstrating the brain's neuroplasticity, that is, its ability to develop and grow even in adulthood. She shattered the old paradigm of understanding the brain as a static and unchangeable organ that simply degenerated with advancing age. She began studying the brains of lab rats. Rats raised alone, in small and desolate cages, had more trouble navigating a maze than did rats that were raised in "enriched" cages with toys and rat playmates. Studying their brains under a microscope, Dr. Diamond found that the cerebral cortices of the rats in "enriched" cages were about six percent thicker than the rats in the "impoverished" cages.⁴

These findings, published in 1964, were a pivotal contribution to the long-running debate between nature and nurture, which seeks to determine the extent to which a person is shaped by their genes or by their life experiences. Dr. Diamond showed that the structural components of the cerebral cortex can be altered by either enriched or impoverished environments at any age, from prenatal to extremely old age. Inspired by Dr. Diamond's discoveries, scientists have continued studies on the effects of enriched environments.

Research into aging and cognitive decline has identified 12 key risk-increasing factors that can be altered by lifestyle choices and interventions. Low education and limited social contact, as suggested by Dr. Diamond's discoveries, are important members of this list. The other risk factors are hypertension, hearing impairment, smoking, obesity, depression, physical inactivity, diabetes, excessive alcohol consumption, traumatic brain injury and air pollution.⁵ Lifelong learning opportunities help to fight cognitive decline through increasing mental stimulation and social interaction.

Mental Stimulation

Current research on mental stimulation has demonstrated the ability of neural networks in the brain to change through growth and reorganization. These changes, called neuroplasticity, range from individual neuron pathways making new connections to more extensive systematic adjustments such as cortical remapping. Examples of neuroplasticity include circuit and network changes that result from learning a new ability, environmental influences, practice, and psychological stress. Plasticity is more limited in an older brain, but remains an important contributor to development, learning, memory, and recovery from brain damage.

Cognitive reserve, or brain reserve capacity, is the term used to describe the greater functional resilience and resistance to cognitive decline possessed by people with higher baseline IQ, education, or occupational attainment. The findings of a study which explored the association between lifespan cognitive reserve and dementia risk indicated that high lifespan cognitive reserve is associated with a reduction in dementia risk, even in the presence of high levels of brain pathology.⁶ Multiple studies have confirmed that people with lower education have a higher risk for developing dementia.

Socialization

People are inherently social creatures who form organizations that extend beyond the individual. These structures evolved hand in hand with behavioral, neural, hormonal, cellular, and genetic mechanisms to support them because the consequent social behaviors helped these organisms survive, reproduce, and care for offspring sufficiently long that they too reproduced.⁷ Human beings are adversely affected by loneliness, which has been shown to reduce life span and quality of life. One study of Perceived Social Isolation and Cognition found that loneliness was associated with poor overall cognitive performance, faster cognitive decline, a higher sensitivity to social threats and an increase in depression.⁸ Another study on loneliness and social isolation confirmed their association with lower cognitive function.⁹ Enhancing social participation and maintaining emotionally supportive relationships can help to prevent cognitive decline and reduce the risk for dementia.

Resources in Delaware to Promote Mental Fitness

Delaware residents are fortunate in having a variety of resources available to promote cognitive stimulation and social engagement. Choosing a program depends on interests, background, current abilities and living location. Playing tennis, for example, requires higher levels of physical dexterity. Seated Yoga offers movement but requires less physical dexterity.

A Guide to Services for Older Delawareans and Persons with Disabilities (Delaware Health and Social Services 2016-2017) offers many options for mental stimulation. This guide is available online at www.delawareADRC.com. At that internet site, select “Senior Centers” for a listing to find twenty-four Senior Centers in New Castle County, nine in Kent County and thirteen in Sussex County. Senior Centers offer a range of engaging experiences including recreational programs, exercise classes and topical programs to stimulate the mind and body. Games are fun and offer stimulation. Some centers have swimming pools. Meals in the Senior Centers provide nourishment and opportunities for social connections.¹⁰

Another selection at www.delawareADRC.com is “Education,” where 54 options for opportunities in different educational areas are currently listed. “Volunteerism” is another choice

and many options are available. Volunteer opportunities can also be found through churches and other organizations. Still another option for social engagement in Delaware is to choose “Recreational/Social,” which currently lists 50 opportunities for different physically and socially interactive activities.

For some Delawareans, the Osher Lifelong Learning Institute at the University of Delaware (OLLI) offers an outstanding opportunity for adults age 50 and older to increase their cognitive and social engagement. Although all states now have lifelong learning programs, Delaware’s program is one of the largest and oldest of such programs, having begun in 1980. New members often indicate they learned of OLLI from a friend who had enjoyed OLLI’s programs. Course listings and other information is available at www.oli.udel.edu. Members of Lifelong Learning increase their cognitive fitness through their participation in courses and social connections through their interactions with other members.

Osher Lifelong Learning New Castle County

Between 2000 and 2019, the number of OLLI members in Wilmington taking classes has ranged from 2,100 to 2,400 per semester. Courses numbered around 65 plus 40 extracurricular activities for 14-week semesters. All instructors are volunteers and many members volunteer on committees. The program stimulates the brain in a multitude of dimensions and fosters socialization among members. History is a favorite course choice. Twenty-six courses covering both history in the United States and in other countries are offered. Participation in performing arts is excellent for stimulating multiple parts of the brain. Fifty-three courses are offered in music, including a Concert Band with about 75 members and a Chorus with about 65 members. Among the other musical groups are a Chamber Choir and Madrigals group, an orchestra, and ensembles for the study and performance of guitar, jazz, and rock music. Instruction is provided for people with various skill levels.

Foreign language study provides another excellent means of stimulating the brain. OLLI members can choose from 38 courses in eight languages. Exercise classes at OLLI include swimming, cardio, balance, Tai Chi, and various levels of Yoga including Chair Yoga. OLLI also offers special lectures, travel, and opportunities for socialization at lunch, cookie socials and other events. The mental stimulation and socialization offered in grade and high school, and then in college, now continues for lifelong learners.

OLLI’s Summer Program offers four weeks of classes in July. For Summer 2019, 47 courses were offered. The highest number of classes were offered in History, General Studies, Literature and Health and Wellness which included Pilates and Yoga.

The Music Committee decided to do a study asking participants in Wilmington OLLI Chorus how they benefited from their experience. In Spring Semester 2008, a one-page form was distributed to the 72 members including the request “list the three most important benefits you feel you receive from participating in the Chorus.” Qualitative analysis resulted in the identification of eight categories:

1. Opportunity to sing with peers 72%
2. Friendship 64%
3. Learn new music 53%
4. Professional leadership 43%

5. Singing beautiful music 38%
6. Singing makes me feel happy 34%
7. Enjoy performing for appreciative audiences 30%
8. Singing improves my health 23%

Responses from participants indicated that mental stimulation and socialization were indeed an important part of their experience. Other comments supported the benefits of chorus. Members selected Chorus from 225 course choices, often remaining involved over many years. The average length of lifelong learning program membership was 8.1 years while the average for years in the chorus was 6.8 years. The longest chorus participation was 30 years reported by an 86-year-old. Singing is beneficial for health reasons because it expands the lungs and increases the flow of oxygen to the body and the brain.¹¹

Osher Lifelong Learning Kent and Sussex Counties

The Lewes/Dover OLLI serves Kent and Sussex Counties. The Lewes program began in 1989 and in 2010 in Dover. The same catalog advertises classes for Kent and Sussex counties with classes meeting in multiple locations. In Fall Semester of 2019, 166 courses were offered in Lewes/Ocean View and 43 in Dover. History, Humanities, Health and Psychology, Life Skills and Recreation were the most popular courses. Lectures outside of classes were popular. During the summer of 2019, 71 instructors taught 48 classes in Lewes and 24 in Dover.

Learning Lifelong Can Reduce the Risk of Developing Dementia

In addition to experiencing the joy of continued learning and social engagement, those who engage in lifelong mentally and socially stimulating activities reduce their risk for cognitive decline.³ Participating in social events, reading, dancing, playing board games, creating art, playing an instrument, and other activities that require mental and social engagement stimulate cognitive fitness. OLLI Lifelong Learning offers opportunities in all of these areas and other opportunities are available in the community.

OLLI continued to offer its members life-enriching experiences even during the COVID-19 pandemic. In March of 2020, when the pandemic put an end to in-person classes, OLLI instructors and participants quickly learned to use Zoom. Remote communication allowed the offering of 215 classes and participation of 1,934 members during the Spring 2021 Semester. Classes on Zoom have allowed statewide participation. For Summer 2021 and Fall 2021 some classes will resume at former locations but most classes will now also be offered on Zoom. Even during a Pandemic, continued social connection and cognitive stimulation remain important for well-being and brain health.¹²

Delaware's Challenge to Fight Dementia

For the fitness of Delaware's large aging population, participation in mind expanding opportunities and social engagement is very important. Resources are available and new opportunities continue to develop despite the obstacles imposed by the pandemic. Preserving cognitive health for Delaware's older adults is an important goal that can be promoted through healthy lifestyle choices including cognitive stimulation and social engagement. In this way, the sad consequences of cognitive decline can be delayed or diminished.

Resources

Mental Fitness Websites

www.brainwaves.com

www.braingle.com

www.gamesforthebrain.com

www.games.aarp.org

Exercises and games contribute to developing mental skills by helping build mental stamina for sustained concentration and focusing attention. The exercises include verbal, spatial and logic stimulation so that new challenges will improve memory, creativity, and use of words to build links among brain cells. These options require knowing how to operate a computer but they do not require ability to walk or use transportation.

www.DelawareADRC.com

Search “Education” “Senior Centers” “Volunteerism” “Recreational/Social Activities”

www.oli.udel.edu

Select OLLI Wilmington or OLLI Kent/Sussex for classes and other educational activities at the Osher Lifelong Learning Institute at the University of Delaware

www.asaging.org/mindalert

American Society on Aging offers free online training and educational resources to help older adults maintain and enhance cognitive and mental function. The purpose is to train professionals to implement cognitive stimulating programs translating research related to enhancing cognitive function to cognitive health promotion activities. A wide range of topics is included including brain health, songwriting, meditation, storytelling and music as brainfood.

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