The complexity of cognitive decline, Part 3

This is the final article in a three-part series on cognitive decline. Part 1 featured information on the cognitive continuum: normal cognition, preclinical issues, mild cognitive impairment, and dementia and its varieties. Part 2 discussed preventing, slowing and possibly reversing cognitive decline and gave special attention to social justice issues.

Genetics and cognition

It once was believed that Alzheimer's disease and other forms of dementia were solely the result of genetics. Unfortunately, this belief is still common, particularly because the disease has been shown to repeat itself in some families through the generations. Individuals who have a close relative with this history are often anxious, watching their own behavior with worry. This in itself has a potentially harmful effect on their health.

That's why it is so important to note that *genetics is not destiny*. There are controllable factors that can make a difference in a person's likelihood of developing Alzheimer's or another form of dementia. Among these factors are lifestyle and environment, which can have an impact on positive genes "turning on" and destructive genes "turning off." In addition, social issues such as poverty, abuse, neglect and drug use may turn on negative genes associated with cognitive decline. Illness and toxic environments also play roles in genes turning off and on.

Nevertheless, it is clear that the apolipoprotein E-4 (APOE-4) gene allele (or variant) carries a propensity for Alzheimer's, whereas APOE-2 appears to be protective. Everyone has two copies of the APOE gene. About half of those with two copies of APOE-4 acquire Alzheimer's. Those with a single copy of APOE-4 have an approximately 18 percent chance of getting the disease. For this reason, some people are afraid to know their APOE-4 status. However, our belief is that "knowledge is power." For those who have the APOE-4 allele, a healthy lifestyle can do much to prevent cognitive loss.

The Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability examined the impact of a healthy lifestyle on neuropsychological tests with APOE-4 carriers compared with noncarriers. To the researchers' surprise, there was a slightly larger improvement in cognition among the APOE-4 group, "even in the presence of APOE-related genetic susceptibility for dementia."

Developmental metabolism

Alena Krejci and Jason M. Tennessen have suggested that developmental metabolism is at the center of growth and health. Metabolism is defined as the conversion of food to fuel energy to run cells, our building blocks of proteins, lipids and enzymes. Moving deeper, the energy of metabolism comes from mitochondria that produce adenosine triphosphate (ATP). We need ATP to talk and to move.

Medicine, psychology and counseling have given minimal attention to the centrality of metabolism, which is one cause of dementia. A smoothly working metabolism leads to developmental plasticity. In 2017, Yashiki Bansal and Anuraq Kuhar found that stress and depression are related to mitochondrial dysfunction and insufficient supply of ATP. In addition, stress injures the function of the gut-brain axis. Dementia can be caused by metabolic disorders. Environmental conditions and lifestyle choices influence metabolism and DNA epigenetic mechanisms. Some examples of stressors include trauma, working on the night shift, obesity, smoking, alcohol, opioids, and other drugs.

What can we do to prevent damaging metabolic disorders? Although complicated, it is invaluable for counselors and clients alike to understand mitochondrial basics and the production of energizing ATP. The Mayo Clinic states that lifestyle is key: physical activity, weight loss, the cessation of smoking, stress management and healthy eating. Because metabolism depends largely on diet, the Mayo Clinic recommends an eating plan that limits unhealthy fats while emphasizing vegetables and whole grains. To fuel energizing ATP and metabolism, exercise is also central. For example, weightlifting aids metabolism while also building strength and endurance.

Hinai Patel and V.H. Patel reported in 2015 that inflammation increases metabolic disturbance. A 25-year study of midlife inflammation by Reinhold Schmidt and colleagues in 2002 found significant associations with dementia in later life. In 2018, Patel and Patel replicated this finding. A healthy metabolism in a healthy body is part of gene action and maintaining cognition.

A new thought for counselors is that effective helping can empower mitochondrial cells to produce energizing ATP, thus facilitating healthy metabolism and mental and physical health across the life span. Research has proved that therapeutic lifestyle changes such as diet and exercise increase ATP. It is time that

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therapeutic lifestyle change becomes as central to counseling as our attachment to theory. Counseling and therapy affect both mind and body.

The impact of lifestyle on cognition

The Nun Study of Aging and Alzheimer's Disease is considered to be one of the most definitive and useful studies of dementia. It was the first study to demonstrate the importance of lifestyle for preventing cognitive decline.

Beginning in 1986, David Snowdon studied 678 members of the School Sisters of Notre Dame, age 75 and older (including some older than 100), located in Mankato, Minnesota. Snowdon's team reviewed the nuns' autobiographical essays from when they had first joined the order, then administered memory and cognitive tests regularly. Some of the nuns in their 90s were highly functional, whereas others in their 70s were already severely disabled. Even a few of the nuns who were over 100 remained active in the convent.

The nuns agreed, upon their deaths, to have their brains microscopically examined for signs of Alzheimer's disease.

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Many of these nuns had functioned normally throughout their lifetimes despite being found later, on autopsy, to have indicators for Alzheimer's. The research is ongoing (despite Snowdon's retirement in 2008), with more than 1,000 participants. The early research, for the first 15 years of the study, is best summarized in Snowdon's 2001 book, *Aging With Grace: What the Nun Study Teaches Us About Leading Longer, Healthier and More Meaningful Lives.*

Some example findings of the Mankato nun study thus far:

- Degree of pathology: There were a number of asymptomatic Alzheimer's disease subjects characterized by preserved cognition before death despite substantial pathology at autopsy.
- Autobiographies, language and higher education: More sophisticated sentences and complex writing were predictive of less cognitive loss.
- Diet, smoking, no alcohol, exercise, sleep: None of the study participants were smokers. Not smoking is a protective factor in maintaining metabolism and cognition.

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- Socialization: This is an important factor in maintaining cognition.
- Reading: Reading during early life and adulthood was determined to be a protective factor.
- Positive attitude: Optimism, positive reframing, spirituality and making room for joy appeared to be important factors in healthy cognitive functioning.

Counseling and therapy recommendations

As Roy T. Bennett reminds us in *The Light in the Heart*, "What helps you persevere is your resilience and commitment."

As always, developing a trusting working relationship with our clients and their families is central. Awareness, knowledge and action skills around cognitive decline in its many varieties are essential. Optimism and hope for your clients will be communicated through your interviewing style. And a multicultural/social justice mentality is required if you are to fully meet the needs of all your clients.

Resilience, at its most basic level, is the ability to recover and "bounce back"

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from adversity. Your clients' resilience can be challenged by adverse childhood experiences, bullying, racial and sexual harassment or assault, and many other factors. Each of these factors can cultivate a feeling of hopelessness that leads to illness and later-in-life cognitive decline.

Cognitive reserve refers to brain reserves, often indicated by the size of the hippocampus and cognitive functioning. Well-developed cognitive reserve comes primarily from the richness of experience and opportunity across one's life span. Cognitive reserve can slow cognitive decline and reduce the risk of dementia.

Many lifestyle factors are associated with positive aging, the building of cognitive reserve and the development of resilience.

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Mental health and cognitive reserve:

- Optimism and hopefulness
- Emotional regulation
- Cognitive challenge, change, starting new activities (e.g., music, sports, bridge)
- Gratitude
- A self-narrative of success rather than failure
- Sense of purpose and meaning
- Pride in cultural heritage

Social connection and support:

- Strong, committed, close relationships
- Helping others (community, religious institution, social action)
- Engagement in cultural practices
- Engagement in spiritual practices
- Limiting screen time

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Physical health:

- Ability to engage in activities of daily living
- Flexible, healthy metabolism
- Meditation, yoga and exercise
- Nutrition and positive diet focused on vegetables, low carbohydrates and good fats
- Sleep quality (a sleep study and the absence of sleep apnea can be important)
- Avoidance of smoking, alcohol and drugs
- Limited medication with appropriate medical care and supervision

Building cognitive reserve and planning to prevent, slow and possibly reverse cognitive decline should be the goal. Although traditional counseling theories are useful, the new plan is to become more proactive and help clients see and act on what they can do to develop more cognitive reserve and better general health. This means emphasizing a wellness approach that starts with pregnancy, fetal development, birth and childhood. Ideally, the community will provide safety, health and mental health services, effective schools, adequate housing and food. The role that religious institutions and communities, organizations, and volunteering play in furthering community needs more attention in our client sessions because all of these elements can improve mental and physical health. There is evidence that helping others is one route toward achieving better mental health and a satisfying life.

In short, the best method of preventing and reducing cognitive decline is a developmental approach across a person's life span that includes awareness of the importance of metabolic balance. The upper 10 to 30 percent of our society has the best opportunities for preventing cognitive decline and maintaining positive mental and physical health. Thus, counselors' awareness of social and economic inequities is critical. Multicultural awareness and community social action are becoming more central to effective counseling and therapy practice.

Counseling sessions are very much about relationship. Research by Dean Ornish and others has found that socialization may be the most important factor of all for health and long life. Thus, we need to enable clients and families to change cognitions and emotions and develop better relationships. Once again, we are back to Carl Rogers' word — *relationship* — or what some call "working alliance." Through the counseling relationship, clients can increase their positive social contacts. Socialization is a key preventive agent in the pursuit of mental and physical health.

Series summary

The most important point of this series is that cognitive decline is much more complex than usually presented. Rather than simply "Alzheimer's, yes or no?" the truth is a continuum ranging from normal decline to preclinical issues and then on to mild cognitive impairment. Specifics and research associated with each were discussed in Part 1 (November 2018).

The potential of preventing, slowing and even reversing cognitive decline was the focus of Part 2 (January). Research was presented from several settings and from the recent studies of Dale Bredesen, who focuses on reversing cognitive decline. Part 2 also included research on the association between social inequality and the development of cognitive decline. Data was presented showing that serious cognitive decline is more common among those who are poor and among people of color.

Part 3 has emphasized a health approach to cognitive decline because, here, it is clear that we can make a critical difference in preventing and slowing cognitive decline. The breakthrough Mankato nun study provides the groundwork for prevention. We now know that our clients could possibly have Alzheimer's disease without apparent signs of decline in cognitive functioning. Results from this study are fully in accord with more recent work on prevention, slowing and even reversing cognitive decline.

Suggestions for follow-up

Metabolism: We recommend the following two articles as means of introducing readers to basic concepts that are becoming central in understanding how lifestyle through the years is ever more important to the counseling field:

- "Metabolic challenges in mental health" by Tammie Lee Demler, *U.S. Pharmacist* (*uspharmacist.com/article/metabolic-challenges-in-mental-health*)
- "Metabolism in time and space — exploring the frontier of developmental biology" by Alena Krejci and Jason M. Tennessen, *Development* (*dev.biologists.org/content/144/18/3193*)

Mayo Clinic on prevention and treatment: The Mayo Clinic offers an important and promising series of short articles. There are some interesting parallels between Bredesen's findings (Part 2) and the Mayo Clinic. Start with this article on the Mediterranean diet: *tinyurl.com/MayoClinicMedDiet.* Then follow the arrows at the bottom of the article to read additional articles on music and Alzheimer's, exercise, prevention strategies, bilingualism, diet, vitamin D, head injury, sundowning (late-day confusion), early stage detection and folic acid supplements.

Lifestyle counseling and therapeutic lifestyle changes: In the 2014 book *Intentional Interviewing and Counseling: Facilitating Client Development in a Multicultural Society*, we, along with our co-author, Carlos Zalaquett, present our view of lifestyle counseling and provide integrated attention to social justice/multicultural issues. In the book, we offer a series of therapeutic lifestyle change instruments, handouts and PowerPoints for improving client lifestyle. ❖

Allen E. Ivey and Mary Bradford Ivey are best known for their research and writing on multiculturalism/social justice and their years of work on microcounseling's listening and action skills, now with co-author Carlos Zalaquett. Many articles on neuroscience, microskills and multiculturalism can be found on their joint website: *allenivey.com*. Contact them at *allenivey@gmail.com* and *mary.b.ivey@gmail.com*, respectively.

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