

Nutrition and Brain Health

NUTRITION CONNECTION



Nutrition strategies to maximize brain health in older adults

As adults age, losing their cognitive abilities can often feel more frightening than losing physical abilities. In addition to issues like dementia, the brain also plays a role in pressing mental health concerns like depression. While a decline in some aspects of mental wellness is expected with age, there are certain nutrition steps that can be taken to maximize brain health in older adults.

WHAT IS BRAIN HEALTH?

The brain is responsible for so many aspects of everyday life—thoughts, memory, perceptions, emotions, movement, and more. Unfortunately, there’s no universal definition for the term “brain health.” However, researchers in *BMJ* describe it as “the preservation of optimal brain integrity and mental

and cognitive function and the absence of overt neurological disorders.”

According to the American Heart Association, three in every five Americans will develop a brain condition in their lifetime. Subtle indicators of cognitive decline can start in early adulthood, so it’s important for all adults to take steps to protect their brain health for long-lasting optimal function.

Factors that influence brain health include smoking status, exercise levels, brain-stimulating activities, certain health indicators, and diet. That last factor is clearly where a CDM, CFPP plays a role.



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NUTRITION AND THE BRAIN

Numerous studies have linked a nutritious diet to better brain health, but the specific mechanisms behind this are not yet known. Theories include that healthy diets may better regulate oxidative stress, control inflammation, or affect certain processes in the brain. In one study, a nutritious diet was also associated with larger brain volume, indicating its effects may be related to brain structure too.

According to Maggie Moon, MS, RD, best-selling author of *The MIND Diet*, a brain health decline could also be due to specific nutrient deficiencies. Moon notes, “It may be less common, but it’s possible that brain health issues are caused by frank deficiencies in certain nutrients like magnesium, zinc, B-vitamins, omega-3 fats, and vitamin D. If that’s the case, then dietary changes will definitely help.”

While we don’t know all the ways the diet impacts the brain, there is ample research indicating the beneficial effect of certain types of foods and nutrients. Here are six examples:



For example, a study in *Nutrients* found that eating about 1.3 servings per day of green leafy vegetables was associated with a slower rate of cognitive decline in older adults. In fact, those who consistently ate that amount were estimated to have brains approximately 11 years younger than those with the lowest intake.

Similarly, research in *Neuropsychiatric disease and treatment* found that eating green vegetables daily was linked to lower odds of cognitive impairment among adults over age 55. An earlier study in the *Annals of neurology* found similar results: vegetable intake was associated with slower cognitive decline among women; this was particularly strong for green leafy vegetables and cruciferous vegetables.

THE MAY-JUNE EDGE will feature a higher-level continuation of this article. The next installment, which will be continuing competence level III, will dive deeper into specific clinical conditions like Alzheimer’s disease, depression, and other factors that impact brain health.

Water

Water is essential to brain function, so proper hydration is paramount. Elderly adults (and children) are more susceptible to negative impacts of dehydration, with impaired cognition being one effect. It’s possible that the brains of older adults are not able to manage dehydration as well, and cognitive tasks become more demanding. Since the thirst mechanism is often decreased in older adults, it’s essential to encourage enough fluid each day.

Vegetables

Vegetable intake—especially green leafy vegetables—is a particularly important part of brain health, supported by abundant research.

It’s unclear exactly why leafy green vegetables exhibit such a powerful effect. It could be related to the combination of nutrients, like folate, beta-carotene, and lutein. In addition, the naturally-occurring nitrates in leafy greens may help increase blood flow to the brain.

Antioxidant-Rich Foods

The brain is quite susceptible to oxidative stress. This occurs when there is an imbalance between free radicals—oxygen-containing molecules that are unstable—and antioxidants, which counteract their effects. This imbalance can lead to damage in tissues and organs, including the brain.

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According to Moon, oxidative stress and inflammation “have been implicated in everything from anxiety to Alzheimer’s.”

By eating a diet rich in antioxidants, we can help reduce the risk of these oxidative stress scenarios. Antioxidants include certain Vitamins (like Vitamin C and E) as well as other compounds found specifically in plant foods.

Berries contain some of the highest levels of antioxidants. Nuts, olive oil, vegetables, and beans also contain high levels.

Healthy Fats

The brain itself consists of a considerable amount of fat, and needs fat to function. Most adults get plenty of overall fat in the diet, but not enough of certain healthy fats, like omega-3s.

One type of omega-3, known as DHA, is very important for brain development and cognitive function. DHA is found primarily in fatty fish, like salmon. The body can convert another type of omega-3 called ALA (found in foods like walnuts and flaxseed) into DHA, but this process isn’t as efficient as eating DHA-rich foods directly. As such, regular fish consumption is a smart choice for brain health.

Other types of healthy fats may also be involved in brain function. For example, olive oil is a fat-rich food that has been linked to brain health. An analysis of participants in the PREDIMED study found that olive oil consumption was linked to better verbal memory.

Olive oil also contains hundreds of antioxidants and polyphenols. One of these, called oleocanthal, was shown in an animal study to increase clearance of certain proteins from the brain. Excessive clumps of such proteins are linked to cognitive decline, so oleocanthal may play a role in preventing those effects.

Whole Grains

Whole grains are also linked to brain health. For example, the Bogalusa Heart Study tracked a group of young adults through midlife and found whole grain intake was associated with better cognitive function at the end of the study.

Just like other foods, the exact relationship between whole grains and the brain is unknown. One theory is that whole grains are a good source of Vitamin E, an antioxidant vitamin that can battle oxidative stress in the brain. Another theory is that whole grains provide fiber which may feed gut bacteria, and this indirectly impacts brain health. Whole grains are also a good source of

Vitamin B6; low levels of this vitamin have been linked to poor mood regulation and depressive symptoms.

Nuts

While the research on nuts is not as strong as some other food categories, several studies have linked nut consumption to overall cognitive health. A JAMA study found nuts were connected to better memory. An analysis of those in the PREDIMED study also found that walnuts specifically were linked to better working memory. Nuts may reduce oxidative stress and inflammation, and also contain specific healthy fats that may prolong brain health.

BRAIN-BOOSTING MEAL PATTERN: THE ‘MIND’ DIET

Based on all the research on nutrition and brain health, a specific dietary pattern called The MIND Diet was developed by researchers. This eating pattern—fully known as the Mediterranean-DASH Intervention for Neurodegenerative Delay Diet—is a neuroprotective diet.

It combines principles from the Mediterranean diet, the Dietary Approaches to Stop Hypertension (DASH) diet, and the evidence mentioned above linking specific types of foods to brain health. The resulting meal pattern recommends specific nutritious food categories to include regularly.

Research supports the MIND diet for brain health. One study looked at older adults and assessed how closely their diet aligned with the MIND recommendations. Those individuals whose diet most closely aligned had slower rates of cognitive decline. In fact, their brains were estimated to be about 7.5 years younger than the brains of those whose diets least matched the MIND guidelines.

The same authors also investigated the link between the MIND diet and Alzheimer’s disease. Participants whose diet most closely matched MIND guidelines were less likely to develop Alzheimer’s.

PRACTICAL APPLICATIONS

It may seem overwhelming at first to consider implementing an eating pattern like this at your facility. Try looking at your current weekly menu and tallying up the servings of the healthy food categories mentioned in the MIND Diet. You may be surprised how close you are to meeting many of these recommendations!

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MIND DIET RECOMMENDATIONS

The MIND Diet focuses on 10 food categories that support brain health, as well as five food categories to limit. The latter include red meat, butter and margarine, cheese, pastries and sweets, and fried/fast food.

Rather than think about what to limit, though, it's much easier to focus on all the delicious foods to include! Here are nine of the brain-healthy food groups that are part of the MIND diet, along with the recommended weekly servings. Under each group, you can find examples of foods to consider including on your menu.

1. Leafy green vegetables: at least 6 servings per week

- Kale
- Spinach
- Cabbage
- Collard Greens
- Swiss Chard
- Butter Lettuce

2. Other vegetables: at least 1 serving per day

- Bell Peppers
- Broccoli
- Mushrooms
- Brussels Sprouts
- Squash
- Beets
- Cauliflower
- Eggplant

3. Berries: at least 2 servings per week

- Strawberries
- Blackberries
- Blueberries
- Cranberries
- Raspberries

4. Whole grains: at least 3 servings per day

- Barley
- Oats
- Farro
- Whole Wheat
- Brown Rice
- Sorghum

5. Fish: 1 serving per week; not fried

- Haddock
- Tuna
- Cod
- Sardines
- Salmon
- Anchovies

6. Poultry: 2 servings per week; not fried

- Chicken
- Turkey
- (whole or ground)
- (whole or ground)

7. Beans: 4 servings per week

- Black Beans
- Pinto Beans
- Lima Beans
- Edamame
- Kidney Beans
- (Green Soybeans)

8. Nuts: 5 servings per week

- Almonds
- Cashews
- Pistachios
- Pecans
- Walnuts

9. Olive Oil: use as a main source of fat; can be used for:

- Low-Heat Cooking
- Marinades
- Salad Dressings
- Dipping Bread

What About Wine?

The tenth healthy food category is wine, which is perhaps the most confusing when applying the MIND Diet to certain populations.

The diet recommends one 5-ounce glass of wine per day for adults. Wine contains polyphenols and moderate intake has been associated in some research with better cognitive outcomes.

However, high intake may cause adverse effects on cognition, both acutely and chronically. In addition, some individuals may be on medications that are contraindicated with alcohol.

Different facilities have different policies on alcohol intake. Some assisted living facilities may offer residents a happy hour, while other facilities might prohibit alcohol from being served. Policies at long-term nursing care facilities are often different than those at assisted living facilities.

The most important thing to know is that wine does not have to be part of the MIND diet to still reap benefits, according to Moon. She notes, "Even the top performers in the MIND diet studies didn't follow the diet pattern completely. At about 85 percent compliance, the top group slowed their brain aging by 7.5 years and cut their risk of Alzheimer's in half. That tells me that there's a lot of benefit to following the MIND diet pattern, even without one of the factors, like the wine."

The take-home message: While older adults living in certain situations may choose to drink wine, it's not necessary to recommend drinking. People can still reap benefits of the overall diet without it.

For the categories where the menu falls a bit short—what is one small change you could test implementing to improve that? Don't feel the need to overhaul everything or follow the MIND Diet exactly. Instead, work at this from a small change approach, using your insider knowledge of residents' food preferences and your culinary creativity to drive change.

As Moon says, "The great thing about the MIND diet is that there are no outlandish foods required. It's broad enough that it can be applied to a variety of preferences. Start with foods that are familiar in a given food group. If introducing "brain foods" means adding new foods to residents that are resistant to new things, you could try adding them to blended soups, smoothies, and sauces with familiar flavor profiles."

With a little creativity, you can easily adjust your menus to include various brain-boosting foods to support mental health needs. **E**

Look for Part 2 of "Nutrition and Brain Health" in the May-June Edge.



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CE Questions | NUTRITION CONNECTION



This Level II article assumes that the reader has a foundation of basic concepts of the topic. The desired outcome is to enhance knowledge and facilitate application of knowledge to practice.

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1. According to the American Heart Association, what proportion of Americans will develop a brain condition at some point in their lives?
 - A. 1 out of 5 people
 - B. 3 out of 5 people
 - C. 4 out of 5 people
2. Which type of vegetable, if eaten daily, would likely have the biggest impact on brain health (based on what we know about specific sub-categories of vegetables in the research)?
 - A. Mushrooms
 - B. Red bell pepper
 - C. Kale
3. Which of the following components in the diet helps to counteract excessive amounts of free radicals (oxygen-containing molecules that are unstable)?
 - A. Antioxidants
 - B. Water
 - C. Calcium
4. Which food would be the best source of the omega-3 fatty acid DHA?
 - A. Salmon
 - B. Walnuts
 - C. Kale
5. Which of the following is *not* a current theory for how whole grains may impact brain health?
 - A. They contain fiber, which may impact brain health via the actions on gut bacteria
 - B. They contain Vitamin E, an antioxidant vitamin that may reduce oxidative stress
 - C. They contain high levels of dietary nitrates, which may improve blood flow to the brain
6. In research, the individuals whose diets most closely matched MIND guidelines were found to have brains about how many years cognitively younger?
 - A. 5.5 years
 - B. 7.5 years
 - C. 15 years
7. Which of the following is true when it comes to the MIND Diet and wine?
 - A. There are no risks to consuming alcohol
 - B. The diet recommends two glasses of wine per day
 - C. Individuals do not have to drink wine to still reap many benefits of the diet

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