

Interventions to reduce cognitive decline with ageing

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25 May 2018

BUDDHAS FORUM

Prevention Strategies

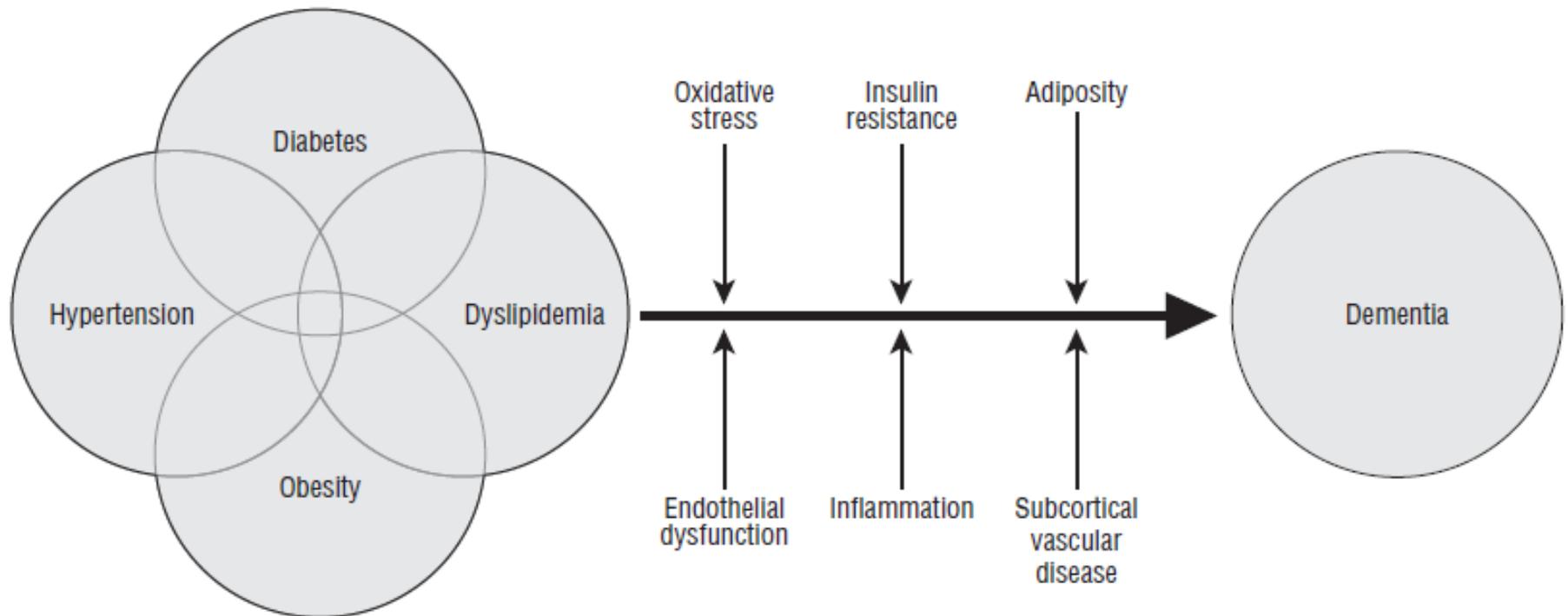
- Vascular risk factor control
- Cognitive activity
- Physical activity
- Social engagement
- Diet
- Sleep
- Treatment of depression

Alzheimer Disease & Vascular dementia

- Rarely occur in isolation
- Share many risk factors and pathologic features with atherosclerosis (coronary, cerebrovascular peripheral vascular disease)
- Presence and severity of cerebrovascular pathologic findings appear to increase the risk and stage of AD for any given level of AD neuropathologic findings
- Modification of vascular risk might reduce the risk of dementia regardless of type:
 - hypertension
 - dyslipidemia
 - diabetes/ hyperglycemia
 - smoking
 - [metabolic syndrome: clustering of abdominal obesity, hypertriglyceridemia, low high density lipoprotein levels, hypertension, and/or hyperglycemia]
- Cholinesterase inhibitors don't delay progression of Alzheimer Disease – they are just symptomatic treatments

“What is good for the heart is good for the brain.”
Global Council on Brain Health, 2018

Possible mechanisms that may explain association between vascular risk factors and risk of developing dementia



Ref: Middleton L and Yaffe K. Promising strategies for the prevention of dementia. Arch Neurol. 2009 Oct; 66(10): 1210–1215. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2762111/>

Cognitive activity

- *Cognitive reserve*: Individual differences in the resilience or adaptability of cognitive processes, such as memory, reasoning and attention, that together help explain why some people are more susceptible than others to age- or disease-related brain changes.
- **Cognitively stimulating activities** can help maintain cognitive abilities and enhance cognitive reserve:
 - engaging in formal or self-initiated informal educational activities
 - continuing to engage in work experiences
 - learning new skills
 - engaging in mentally challenging leisure activities.
- Enhancing cognitive reserve may:
 - allow people to cope better with age-related brain changes
 - reduce a person's risk of developing Alzheimer's disease and reduce the severity of AD symptoms if a person develops the disease;
 - reduce the severity of symptoms of other brain diseases, such as Parkinson's Disease, and lessen the damaging effect of stroke and traumatic brain-injuries.

Ref: Global Council on Brain Health (2017). "Engage Your Brain: GCBH Recommendations on Cognitively Stimulating Activities." https://www.aarp.org/content/dam/aarp/health/brain_health/2017/07/gcbh-cognitively-stimulating-activities-report-english-aarp.doi.10.26419%252Fpia.00001.001.pdf

Cognitive training

- **Individual, group or computerized programs designed to teach strategies and provide guided practice for improving a particular cognitive ability**
- Cognitive training on a specific cognitive ability (e.g., memory, speed of processing, etc.) may improve that specific ability;
 - limited evidence that training focused on one cognitive ability (e.g. memory) significantly improves another cognitive ability (e.g. speed of processing);
 - mixed evidence on whether training on one cognitive ability improves a person's ability to use that skill to maintain or improve function in everyday activities;
 - the more similar the training is to the skills you use in everyday life, the more likely that training will help you in everyday activities.

Cognitive training

- Playing “**brain games**” improves performance at that game but may not improve daily cognitive abilities or functioning in everyday life.
- Training on a specific cognitive ability may improve that ability even when a person has **mild cognitive impairment (MCI)**; no evidence training can improve cognitive ability in dementia (e.g. due to Alzheimer’s disease) or alter the underlying course of the disease.
- Sustaining benefits of cognitive training depends on:
 - Continual application of strategies learned
 - Quality (not quantity) of the activities (incl. novelty, variety, level of engagement, cognitive challenge imposed and degree of enjoyment)
 - Duration of time spent doing the activity

It is beneficial to remain mentally active and to continue learning over the course of your lifespan.

Physical activity

1. Physical activity has a positive impact on brain health.
 - a. A **physically active lifestyle**.(e.g. walking, using the stairs, gardening, etc.) provides benefits for brain health [Epidem: lower risk of cognitive decline].
 - b. **Purposeful exercise** (e.g. brisk walking, cycling, strength training, group exercise classes, etc.) provides benefits for brain health [RCTs: beneficial changes in brain structure and function].
2. In spite of the link between physical activity and brain health, there is not yet sufficient scientific evidence that physical activity can reduce risk of brain diseases that cause dementia (e.g. Alzheimer's disease).

Ref: Global Council on Brain Health (2016). "The Brain-Body Connection: GCBH Recommendations on Physical Activity and Brain Health."

https://www.aarp.org/content/dam/aarp/health/brain_health/2016/05/gcbh-the-brain-body-connection.pdf

Physical activity

There is no consensus on what types of exercises are optimal for brain health.

Purposeful Exercise Moderate to Vigorous Exertion <i>Examples include:</i>	Active Lifestyle An attitude to incorporate movement in day-to-day activities <i>Examples include:</i>
<ul style="list-style-type: none">• Walking at a brisk pace to increase your heart rate• Strength/resistance training (e.g. free weights, squats, lunges)• Aerobic training which raises your heartrate (e.g. cycling, jogging, running, swimming laps, group exercise classes)	<ul style="list-style-type: none">• Walking to work or the store instead of driving• Taking the stairs instead of the elevator• Parking farther away from your destinations• Engaging in hobbies and sports such as active yoga, dancing, gardening

Ref: Global Council on Brain Health (2016). "The Brain-Body Connection: GCBH Recommendations on Physical Activity and Brain Health."

https://www.aarp.org/content/dam/aarp/health/brain_health/2016/05/gcbh-the-brain-body-connection.pdf

Social engagement

- Interacting with others;
- Feeling connected to other people;
- Doing purposeful activities with others; and/or
- Maintaining meaningful social relationships

Structural Components (the features of social connectedness)	Functional Components (the nature of interactions)	Quality Components (individuals' experience)
<ul style="list-style-type: none"> • Composition of group: age, gender, cultural diversity • Duration of contact • Frequency of contact • Individual vs. group activity • Presence or absence: family or friends, partner, spouses, neighbors • Size of group (s) • Type 	<ul style="list-style-type: none"> • Complexity (emotional and behavioral dimensions) • Instrumental support • Emotional support • Intensity • Intergenerational dynamic (transfer of knowledge) • Reciprocity • Variety 	<ul style="list-style-type: none"> • Fun/ Novelty • Joyfulness • Meaningfulness/ Purposefulness • Satisfaction with ties • Sense of belonging • Sense of social well-being • Supportiveness

- Global Council on Brain Health (GCBH): The Brain and Social Connectedness: GCBH Recommendations on Social Engagement and Brain Health, 2017
- [Ref: https://www.aarp.org/content/dam/aarp/health/brain_health/2017/02/gcbh-social-engagement-report.pdf](https://www.aarp.org/content/dam/aarp/health/brain_health/2017/02/gcbh-social-engagement-report.pdf)

Social engagement

Social engagement helps maintain thinking skills and slows cognitive decline in later life.

- lower risk of cognitive decline and dementia.

Not yet sufficient scientific evidence to conclude that social engagement can reduce the risk of brain diseases that cause dementia.

- Global Council on Brain Health (GCBH): The Brain and Social Connectedness: GCBH Recommendations on Social Engagement and Brain Health, 2017
- **Ref:** https://www.aarp.org/content/dam/aarp/health/brain_health/2017/02/gcbh-social-engagement-report.pdf

Diet

A. ENCOURAGE:	B. INCLUDE:	C. LIMIT:
<ul style="list-style-type: none"> • Berries (not juice) • Fresh vegetables (in particular leafy greens) • Healthy fats (such as those found in oils, including extra virgin olive oil) • Nuts (a high calorie food, so limit to a moderate amount) • Fish and seafood 	<ul style="list-style-type: none"> • Beans and other legumes • Fruits (in addition to berries, previously mentioned) • Low fat dairy, such as yogurt • Poultry • Grains 	<ul style="list-style-type: none"> • Fried food • Pastries • Processed foods • Red meat • Red meat products • Whole fat dairy, such as cheese and butter • Salt

Ref: Global Council on Brain Health (2018). Brain-Food GCBH Recommendations on Nourishing Your Brain Health.

https://www.aarp.org/content/dam/aarp/health/brain_health/2018/01/gcbh-nourishing-your-brain-health-report-english-aarp.doi.10.26419%252Fpia.00019.001.pdf

Diet

2. Minimise/moderate alcohol

(don't start drinking in order to protect your brain health; drink in moderation; it is unclear whether there is any beneficial level of consumption for brain health.)

3. Eat whole, non-processed foods

(limits unintentional intake of excessive salt, sugar, and saturated fats, which often appear in processed, packaged and fried foods)

4. Be cautious with chocolate

(Cocoa flavanols good, but cocoa-rich products are generally high calorie because they often include sugar and high fat dairy products -> weight gain)

5. Avoid trans fatty acids

(which often appear in processed, packaged, baked and fried foods, e.g. doughnuts, cakes, pie crusts, biscuits, frozen pizza, biscuits, crackers, stick & tub margarine and other spreads)

Ref: Global Council on Brain Health (2018). Brain-Food GCBH Recommendations on Nourishing Your Brain Health.

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Dietary Patterns

No single food is key to good brain health, but rather a combination of healthy foods is likely to help protect the brain.

Mediterranean diet (Greece, Italy and Spain): high intake of monounsaturated fat (with extra virgin olive oil as the main source), vegetables, fruits, plant proteins, whole grains and fish; low consumption of red meat, refined grains and sweets; moderate intake of wine ; can lower risk of cardiovascular disease and help manage diabetes.

Nordic diet (Denmark, Finland, Iceland, Norway, Sweden): local plant-based foods, such as fruits and vegetables, as well as meat, fish and oils; cf. Mediterranean diet - differences in types of individual fruits, vegetables and cereal, cooking methods, and type and quantity of oil (canola oil)

DASH (Dietary Approaches to Stop Hypertension) diet: low sodium and portion size ; improves blood pressure, blood lipids, etc.; a plant-focused diet, rich in fruits, vegetables and nuts, with low-fat and nonfat dairy, lean meats, fish, and poultry, mostly whole grains, and heart healthy fats.

Dietary Patterns

Okinawan diet (Ryukyu Islands, Japan): yellow, orange and green vegetables; includes soy and legumes and low amounts of meat, refined grains, sugar, salt or dairy; large percentage of sweet potatoes, rel'y less rice and fish; eat until 80% full.

MIND (Mediterranean – DASH Intervention for Neurodegenerative Delay) diet: abundance of vegetables, whole grains and a daily glass of wine; green leafy vegetables six times a week, other vegetables at least once a day and two or more servings a week of berries; snacking on nuts most days, eating beans every other day, poultry twice a week and fish at least once a week; limit eating unhealthy foods, such as butter, cheese, and fried or fast food; blueberries and leafy greens.

Ref: Global Council on Brain Health (2018). Brain-Food GCBH Recommendations on Nourishing Your Brain Health.

https://www.aarp.org/content/dam/aarp/health/brain_health/2018/01/gcbh-nourishing-your-brain-health-report-english-aarp.doi.10.26419%252Fpia.00019.001.pdf

MyPlate for Older Adults

Fruits & Vegetables

Whole fruits and vegetables are rich in important nutrients and fiber. Choose fruits and vegetables with deeply colored flesh. Choose canned varieties that are packed in their own juices or low-sodium.

Healthy Oils

Liquid vegetable oils and soft margarines provide important fatty acids and some fat-soluble vitamins.

Herbs & Spices

Use a variety of herbs and spices to enhance flavor of foods and reduce the need to add salt.



Fluids

Drink plenty of fluids. Fluids can come from water, tea, coffee, soups, and fruits and vegetables.

Grains

Whole grain and fortified foods are good sources of fiber and B vitamins.

Dairy

Fat-free and low-fat milk, cheeses and yogurts provide protein, calcium and other important nutrients.

Protein

Protein rich foods provide many important nutrients. Choose a variety including nuts, beans, fish, lean meat and poultry.



Remember to Stay Active!

Treatment of depression

(& anxiety)

- People (especially older adults) with depression have reduced cognitive performance.
- Higher incidence of depression in dementia patients
 - ~30% in vascular dementia and in Alzheimer's disease
 - >40% in the dementia associated with Parkinson's and Huntington's diseases
- Depression as a risk factor for dementia or a prodromal symptom?
- depression is associated with elevated cortisol levels, which may directly damage the hippocampus and increase risk of dementia
- people with depression have enhanced deposition of amyloid plaques
- treatment of depression also seems to improve cognitive function in people who are depressed, but may not return cognition to normal levels.
- Does the treatment of depression decrease the risk of dementia among people with depressive symptoms?

Ref's:

Middleton L and Yaffe K. Promising strategies for the prevention of dementia. Arch Neurol. 2009 Oct; 66(10): 1210–1215. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2762111/>

Kitching D. Depression in dementia. Aust Prescr. 2015 Dec; 38(6): 209–2011. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4674029/>

Sleep

1. Sleep is essential to overall mental and physical health and well-being.
 - a. **Sleep is vital** to brain health, including **cognitive function**.
 - b. Sleeping on average for **7 - 8 hours each day** is related to **better brain and physical health in older people**.
2. Sleep-wake cycle: the ability to sleep depends both on how long one has been awake and on the internal clock in the brain.
 - a. **A regular sleep-wake schedule** is related to better sleep and better brain health.
 - b. **Regular daily exposure to light and physical activity** supports good sleep.

Ref: Global Council on Brain Health (2016). "The Brain-Sleep Connection: GCBH Recommendations on Sleep and Brain Health."

https://www.aarp.org/content/dam/aarp/health/brain_health/2017/01/gcbh-sleep-and-brain-health-report-english-aarp.doi.10.26419%252Fpia.00014.001.pdf

Take home messages

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- Cognitive activity
- Physical activity
- Social engagement
- Diet
- Sleep
- Treatment of depression

References/Resources

Middleton L and Yaffe K. Promising strategies for the prevention of dementia. Arch Neurol. 2009 Oct; 66(10): 1210–1215. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2762111/>

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