



## FAMILY CAREGIVER EDUCATION SERIES

### Can Dementia Be Prevented? How to Reduce Your Risk



**Debbie Emerson, M.S.**  
Community Health Educator  
CARES® Dementia Specialist  
National Council of Certified  
Dementia Practitioners



**Gia Barsell**  
Manager of Dementia Outreach  
PAC™ Advanced Dementia Trainer & Consultant  
National Council of Certified  
Dementia Practitioners

---

## Upcoming Webinar



### Making Decisions About Care Settings: Home vs. Facility

Thursday, March 14, 2024  
10 – 11:30 a.m.; Q and A afterwards

#### Guest Presenter:

Christine Sevier, CEO, Senior Living Advisor

Register online at:  
[www.HopeHospice.com/family](http://www.HopeHospice.com/family)

View previous webinars  
(recordings and resources) at:  
[www.HopeHospice.com/family-past](http://www.HopeHospice.com/family-past)

## Session Agenda

- Underlying Causes of Dementia
- Causes of Brain Atrophy
- Risk Factors
- Genetics 101
- Modifiable Risk Factors
- Q and A
- Optional: Medications



## Everyone can benefit from a focus on brain health

- **Young people ?**  
The earlier you develop healthy habits, the better.
- **Older people ?**  
It's never too late to adopt healthy habits.
- **Those with Mild Cognitive Impairment ?**  
Not everyone with MCI goes on to develop dementia, so anything you do now can only help to preserve your abilities.
- **Those with a dementia diagnosis ?**  
Prioritizing your brain and overall health can help delay further symptoms and improve your quality of life.





To view entire Dementia Basics webinar, visit: [www.HopeHospice.com/family-past](http://www.HopeHospice.com/family-past)

## Dementia Basics

- Dementia is not a disease itself, but a syndrome (group of symptoms) caused by an underlying condition
- The symptoms involve a decline in *cognitive functioning* and *behavioral abilities* that affect one's daily life and independence
- At least two parts of the brain are dying
- It's progressive – the symptoms keep worsening as the brain deteriorates
- It's chronic – not curable or fixable
- It's terminal – ultimately results in death



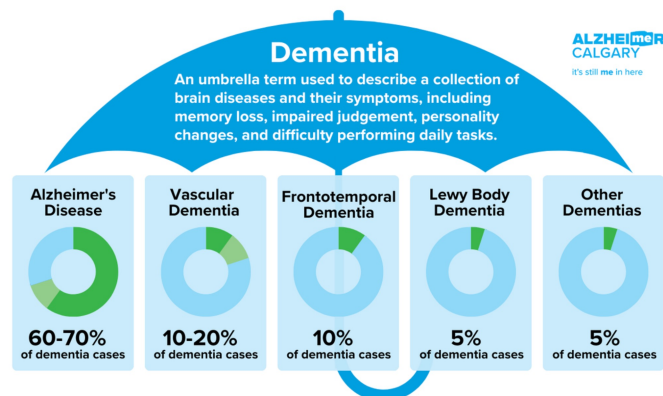
## Common Causes of Dementia

### Neurodegenerative Diseases

- Alzheimer's disease
- Frontotemporal dementia
- Lewy body dementia

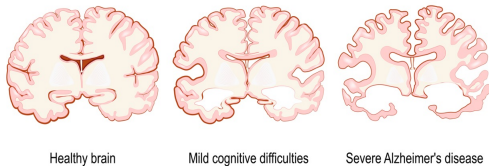
### Sudden brain damage

- Cerebrovascular event (stroke; TIAs)
- Cardiovascular event (cardiac arrest; heart attack)
- Traumatic brain injury
- Brain Infection





## Cerebral Atrophy: Decline and Death of Brain Cells



[www.ClevelandClinic.org](http://www.ClevelandClinic.org)

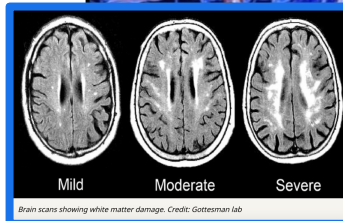
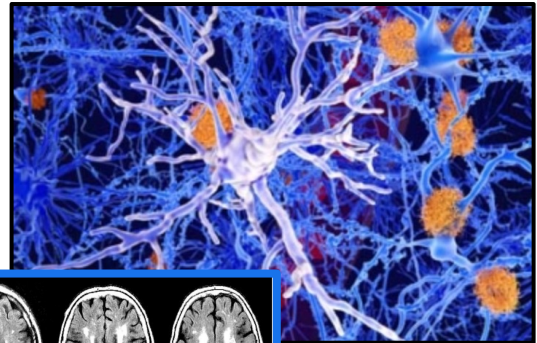
### What causes cerebral (brain) atrophy?

- Chronic inflammation
- Beta-amyloid & Tau (abnormal build-up of proteins)
- Lewy bodies (abnormal protein)
- Oxygen deprivation
- Alcohol abuse
- Severe head injuries
- Aging



## Chronic Inflammation

- Can rapidly degenerate the brain
- Can be measured by biomarkers in blood
- White matter – responsible for transmitting messages (neurons, synapses)
- Plays a role in the disease process of many life-threatening conditions
- Possible causes of inflammation
  - Heart disease
  - Diabetes
  - High blood pressure
  - Infections (ex., Hepatitis C, HIV)
  - Poor diet



Brain scans showing white matter damage. Credit: Gottesman lab

Source: Johns Hopkins Medicine

---

## Amyloid $\beta$ & Tau Proteins

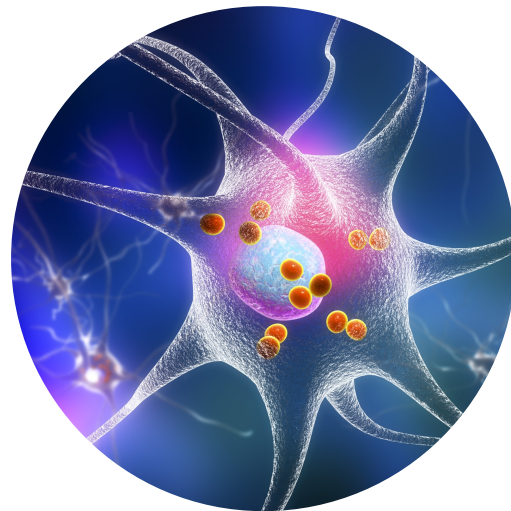
- Beta-amyloid plaques can lodge between neurons (brain cells)
- Tau proteins form neurofibrillary tangles within the neurons
- Abnormal build up causes damage and death to brain cells
- Detected by specialized PET scan or examination of cerebrospinal fluid; blood test in development
- Both present in Alzheimer's dementia
- Not everyone with beta-amyloid plaques will develop Alzheimer's dementia
- Tau is also present in Frontotemporal degeneration (FTD)




---

## Lewy Bodies

- Abnormal protein deposits in brain (alpha-synuclein)
  - Cognitive issues
  - Visual hallucinations
  - Fluctuating alertness
  - Motor impairments
- Present in Lewy Body dementia and Parkinson's disease





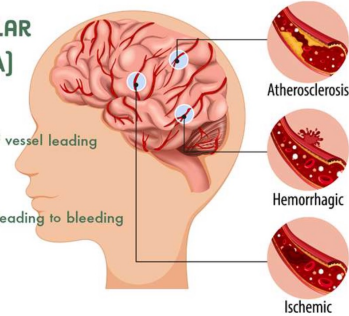
## Oxygen Deprivation

- Cerebral hypoxia
- Cerebrovascular accident (stroke)
  - Ischemic (most common)
  - Hemorrhagic
- Cardiovascular event (cardiac arrest, heart attack)
- Respiratory problems
  - Emphysema (COPD)
  - Choking
  - Drowning
- Carbon monoxide poisoning; air pollution
- Oxygen deprivation can cause vascular dementia

### CEREBROVASCULAR ACCIDENT (CVA)

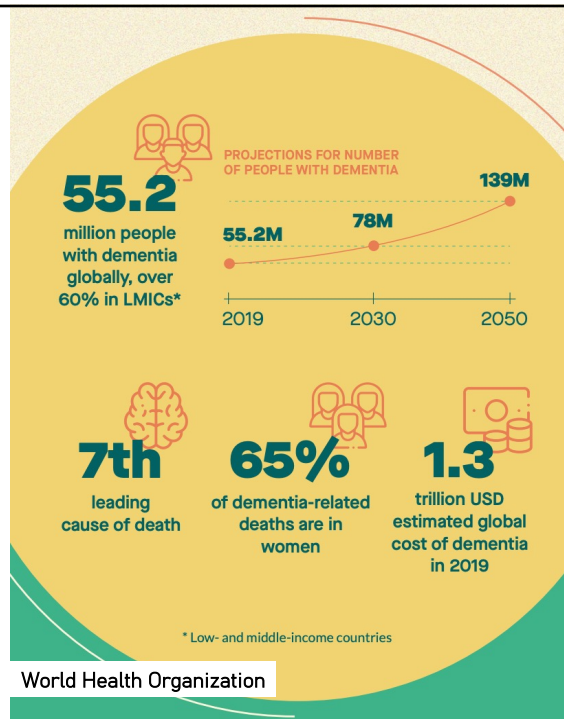
Ischemic stroke: Blockage or narrowing of vessel leading to reduced blood flow

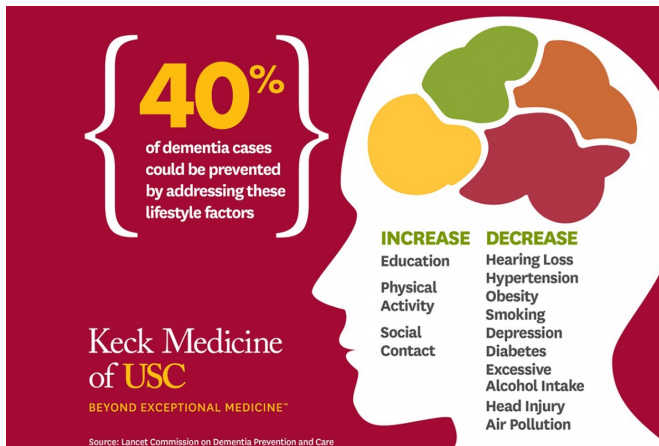
Hemorrhagic stroke: Rupture of blood vessels leading to bleeding around brain tissue



## Goals of Identifying Dementia Risk Factors

- Engage in early interventions and lifestyle changes that may help reduce risk or delay the onset of dementia
- Increase likelihood of maintaining cognitive abilities for as long as possible
- Allows for better management of existing conditions
- Helps in developing public health strategies to reduce the overall prevalence of neurodegenerative diseases
- Provides a focus for research into prevention and treatment
- Contributes to overall health and wellness of population





## Dementia Risk Score Models

- Predict dementia risk in individuals
- Several different models used to identify varying risk factors
- Limited generalizability of risk factors
  - Geographic location; ethnicity; socio-economic status
  - Age of group studied
  - Method of assessment (cognitive tests, biomarkers, etc.)
- Unlikely that a model will emerge that can be applied to all population groups

## Risk Factors for Dementia

### Non-Modifiable (60%)

- Age
- Genetics
- Family history
- (Gender – women are more likely to have dementia than men)

#### Sources:

- Alzheimer's Association Facts and Figures (2023)
- Centers for Disease Control & Prevention (CDC)
- Lancet Commission Report (2020)
- National Academy of Medicine
- UK Biobank Dementia Risk Score

### Potentially Modifiable (40%)

- |                       |                          |
|-----------------------|--------------------------|
| ▪ Obesity             | ▪ Binge drinking         |
| ▪ High blood pressure | ▪ Social isolation       |
| ▪ History of stroke   | ▪ Low level of education |
| ▪ Diabetes            | ▪ Head injury (TBI)      |
| ▪ Depression          | ▪ Economic disadvantage  |
| ▪ Smoking (current)   | ▪ Air pollution          |
| ▪ Hearing loss        |                          |

**Note:** Prevalence of risk factors varies by demographic characteristics, including race, ethnicity, socioeconomic status

## Age is the #1 risk factor for developing dementia

... followed by genetics

Although age increases risk, dementia is not a normal part of aging, and aging is not itself a cause of dementia.

### Alzheimer's Disease (by age)

65 to 74	5.0%
75 to 84	13.1%
85+	33.3%

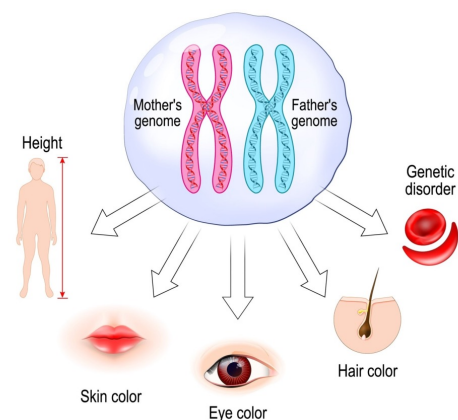
### Vascular Dementia

- Prior to age 65 – uncommon
- After age 65 – risk doubles every two years



## Genetics 101

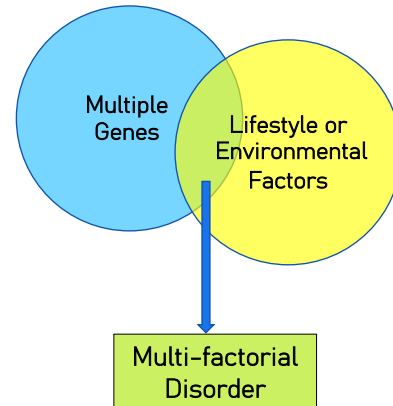
- What are genes?
  - DNA (deoxyribonucleic acid)
  - Building blocks of human body
  - Humans have over 20,000 different genes
  - Two copies of each gene; one from each parent
  - Determine traits and characteristics
  - Gene variants
- Genes can play a role in the development of diseases – risk variants
  - Single-gene diseases – rare aka familial or deterministic genes
  - Complex or multi-gene diseases





## Multi-gene Diseases and Dementia

- Nearly all cases of dementia are a result of a complex (multi-gene) disease – genes may increase risk of developing dementia, but don't cause it directly
- Dementia is caused by combination of factors:
  - Non-genetic (lifestyle/environmental factors)
  - Genetic (dementia risk variants)
- Not possible to directly inherit dementia when it's caused by a complex disease
- However, someone who has dementia risk variants is at a higher risk of developing dementia than someone who does not have risk variants . . .  
 . . . but that person still may not develop dementia



## Dementias with a Genetic Component

### Alzheimer's disease

- Early Onset
  - Prior to age 60
  - ~5% of cases
  - single gene disease (autosomal dominant)
- Later Onset
  - After age 65
  - Multi-gene disease
- APOE-e4 gene: linked to 40-65% of AD cases

### Frontotemporal dementia



## Dementias with a Genetic Component

### Alzheimer's disease

- Early Onset
  - Prior to age 60
  - ~5% of cases
  - single gene disease (autosomal dominant)
- Later Onset
  - After age 65
  - Multi-gene disease
- APOE-e4 gene: linked to 40-65% of AD cases

### Frontotemporal dementia

- Frontotemporal degeneration
- Onset between ages 45-65
- Behavioral and personality changes
- Aphasia (language disorder)
- Most cases have unknown cause
- 1 in 3 cases familial

Alzheimer's Disease Genetics Fact Sheet - National Institutes on Health

## Genetics vs. Family History

- **Genetics**
  - Genes passed from parents to children that influence traits, characteristics, and potential health risks
  - Molecular level
- **Family History**
  - Record of family's health conditions and diseases
  - Includes parents, siblings, grandparents, and other blood relatives
  - Family history not necessary to develop Alzheimer's
  - But those with a first-degree relative with Alzheimer's are more likely to develop it than those who do not
  - Those with more than one first-degree relative have even higher risk
  - When diseases run in families, non-genetic factors may also play a role





## Genetic Testing?

“Routine genetic testing of healthy individuals for risk of Alzheimer’s or other dementias is not advised until an individual has received genetic counseling and understands the information necessary to make an informed decision, including the social and economic factors that could be impacted by having this genetic information. **Genes are only one factor.** At this time, genetic tests that determine susceptibility or risk for Alzheimer’s or other dementias are primarily of value in a research setting or for clinical trials.”

To find a genetic counselor, visit  
National Society of Genetic Counselors [www.nsgc.org](http://www.nsgc.org)



Testing may be advised by a medical specialist if:

- A person has symptoms at an early age and there is a strong family history of early-onset Alzheimer’s
- A person already has a diagnosis of Mild Cognitive Impairment or early-stage Alzheimer’s and is considering one of the newer disease-modifying treatments

Alzheimer’s Association, Genetic Testing, 2023



## Maintaining a Healthy Weight

- **Obesity**
  - Body Mass Index (BMI) >30
  - Lowers body’s resilience to damage in brain caused by Alzheimer’s
  - Leads to chronic inflammation in body and brain
  - Increases risk of diabetes and hypertension; vascular dementia
  - Obesity in mid-life carries greatest risk
- **Benefits of a healthy weight**
  - Helps reduce stress and depression
  - Encourages one to be more socially and physically active
  - May reduce risk of dementia
- **Healthy Eating Plans**
  - Mediterranean diet
  - MIND diet (Mediterranean-DASH Intervention for Neurodegenerative Delay)
  - DASH diet (Dietary Approaches to Stop Hypertension)
  - Anti-inflammatory diet
  - Portfolio diet (cholesterol)



## Regular Physical Activity

### Moderate-intensity Aerobic

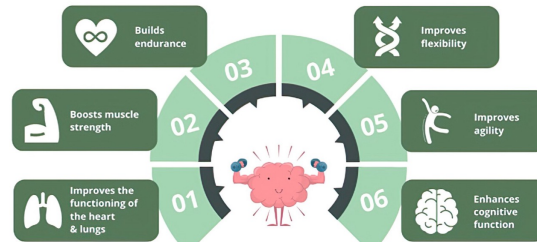
(increases heart rate)

- Brisk walking; hiking
- Swimming; water aerobics
- Dancing
- Cycling
- Tennis or pickleball (doubles)
- Housework

### Strength-building activity

- Lifting weights
- Resistance bands
- Yoga, tai chi, or Pilates
- Vigorous gardening

### EFFECTS OF EXERCISE ON DEMENTIA



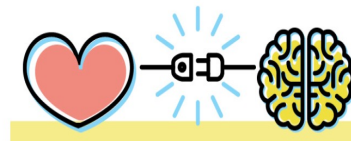
### Frequency

- Strength-building: 2+ days per week
- Aerobic
  - 5 days per week
  - 20-30 minutes per session
  - OK to break up into shorter sessions




## Preventative Medicine

- Get regular physical check-ups and blood labs
  - Monitor and treat high blood pressure
  - Keep cholesterol levels in check
  - Monitor and treat diabetes
  - Monitor weight
  - Schedule cancer screenings
  - Screen for cognitive decline
- Stay current on vaccines: pneumonia, flu, shingles, RSV, COVID-19
- Get hearing tested
- Diagnose and treat sleep apnea and depression



*What's good for the heart  
is good for the brain!*



## Depression

Does depression cause dementia or is a person depressed because they have a dementia diagnosis?  
Some hypotheses:









- As brain cells (neurons) begin to deteriorate, or atrophy, the areas in the brain that are associated with mood begin to become affected.
- As people with mild or early-stage dementia begin to notice symptoms, they respond by becoming depressed.
- The inflammatory changes in the brain that are associated with mood disorders make it more likely for dementia to develop.


**The latest:** There is a link between those who have had depression for years, and a two-fold increase in risk for developing dementia.


**The bottom line:** Be vigilant about seeking treatment for dementia – with psychotherapy, medications, or both.


### Depression

The symptoms of depression can vary slightly depending on the type and can range from mild to severe. In general, symptoms include:

 <b>Low energy.</b>	 <b>Feeling very sad or hopeless.</b>	 <b>Thoughts of self-harm or suicide.</b>
 <b>Irritability.</b>	 <b>Changes in eating behavior.</b>	 <b>Sleep changes.</b>
 <b>Loss of interest in hobbies and activities.</b>		 <b>Difficulty concentrating or making decisions.</b>

 Cleveland Clinic





## Building Cognitive Reserve

### What is cognitive reserve?

- Brain's ability to find alternate ways of completing a task to compensate for cognitive decline
- Unable to produce new brain cells (neurons), but able to form new neural pathways
- Brain's resistance to damage
- Can delay symptoms of dementia
- May cut dementia risk by up to 40%
- Constantly challenging the brain makes it work more efficiently
- Continues to build throughout life

### How is cognitive reserve increased?

- Make "deposits" into our brain bank
- Develop a lifetime of education and curiosity
- Engage in mentally challenging activities
- Stay socially engaged
- Find creative hobbies
- Be physically active
- Do things that make you think
- It's never too late to start

Alzheimer's Disease Facts and Figures 2023;  
Harvard Health Publishing-Cognitive Reserve 2022



## Education (K-12)

Formal education serves as a protective factor

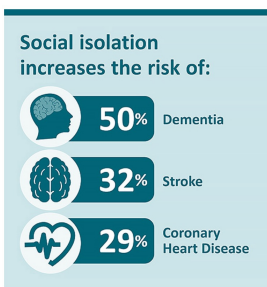
- Builds cognitive reserve
- Sustains cognitive function in mid- and late-life and may delay development of dementia symptoms
- Education linked with improved socioeconomic status (SES)
  - Income, education, occupation, financial security, and perceived social status
  - Lower SES is associated with:
    - being less physically active
    - a higher risk of diabetes and hypertension
    - reduced access to medical care and treatments
    - Increased risk of smoking
    - decreased access to healthy foods that support brain and cardiovascular health
    - limited access to physically safe housing and employment



2023 Alzheimer's Disease Facts and Figures



## Social Isolation



National Academies of Sciences, Engineering, and Medicine/CDC (2020)

- Little day-to-day contact with others
- Few fulfilling relationships; lack a sense of belonging
- Loneliness can affect health by increasing the risks for:
  - dementia
  - poor nutrition
  - lack of exercise
  - poor sleep
  - smoking and alcohol use
  - depression
  - heart disease & stroke

### Social engagement

- Supports brain health; may delay onset of dementia
- Helps to build cognitive reserve
- Better quality of life; sense of purpose
- Reduces stress; better sleep
- Encourages physical activity
- Associated with reduced rates of disability and mortality

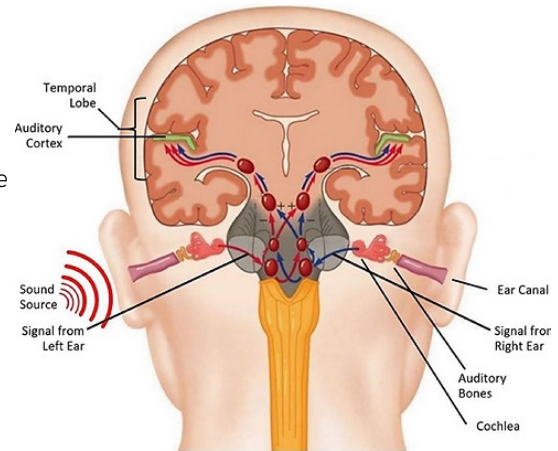
### What to do?

- Join a club or team; volunteer
- Take a class at a local college or community center, in-person or online
- Get involved with a church group
- Find ways to be responsive, supportive, and grateful to others
- Nurture relationships with family and friends



## Hearing Loss

- More than 50% of those over age 70 have hearing loss that requires hearing aids
- Treating hearing loss may slow cognitive decline by nearly 50% in those at risk for dementia
- May contribute to brain atrophy (shrinkage)
- Associated with social isolation, which is a known risk factor for dementia
- Contributes to balance and walking problems
- Using hearing aids can help preserve cognition and brain's ability to process sounds, including speech
- Hearing aids are becoming more affordable and are covered by many insurances



## Alcohol Consumption

- Long-term, excessive alcohol consumption damages the brain:
  - Reduces volume in parts of brain that transmit messages (white matter)
  - Atrophy in parts of brain involved in memory
  - Sharp decline in thinking skills
  - Alcohol-related Brain Damage (ARBD)
- Moderate drinking is not a risk factor
- Drinking alcohol in moderation has **not** been shown to offer significant protection against dementia
- Recommended that alcohol consumption in mid- and later-life be reduced as much as possible
- Tolerance is reduced as we age

### Drinking in moderation

Men: 2 drinks or less per day  
Women: 1 drink or less per day

### Heavy drinking

Men: 5+ on any day or 15/wk  
Women: 4+ on any day or 8/wk

### Binge drinking

Men: 5+ drinks in 2 hours  
Women: 4+ drinks in 2 hours

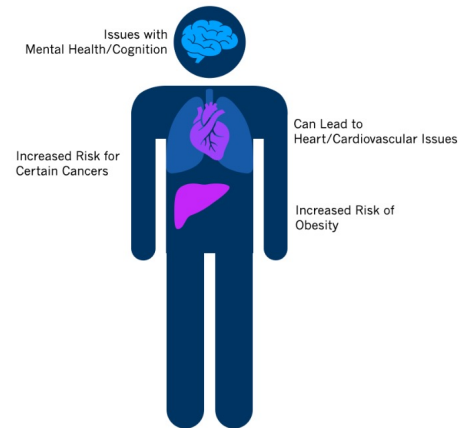




## Is sleep a risk factor?

- Sleep is an important and busy biological state
  - Process and lock in new memories
  - Toxic amyloid is cleared from brain during sleep
  - Body uses sleep as a time to repair
- Can increase risk of obesity, cardiovascular issues, and depression
- Important to diagnose and treat sleep apnea
- 7-9 hours is ideal for adults
- Chronic use of some sleep medications by the elderly has been linked to increased dementia risk
- Does poor sleep increase dementia risk, or does dementia lead to poor sleep?

## Lack of Sleep



## Smoking

- Exposes lungs, and ultimately heart, blood vessels, and brain to toxic chemicals
- Increases risk of cardiovascular problems, increasing risk of vascular dementia and Alzheimer's disease
- Also accelerates atherosclerosis
- Toxins can cause inflammation and stress in the body's cells
- Dementia risk from second-hand smoke nearly as great

## Air Pollution

- Gases, chemical compounds, metals and tiny particles (particulate matter)
- Strong link between air pollution and heart and lung health
- Effect on brain health needs more study
- Other risk factors are known to have a greater influence on dementia





Dementia is not just about genetics or family history  
– you have control over 40% of the risk factors

Just because you have the APOE gene or amyloid  
build-up doesn't mean that you will get Alzheimer's

Heart health = brain health  
(Vascular dementia accounts for 10-20% of dementia cases)

A multi-domain approach is the best strategy

Become a lifelong learner –  
increase your cognitive reserve

It's never too early or too late to start reducing  
your risk of developing dementia



Webinar recording and resources posted  
on: [www.HopeHospice.com/family-past](http://www.HopeHospice.com/family-past)

Don't forget to complete the online evaluation  
upon leaving the webinar – or when you get  
the link in the follow-up email tomorrow

**THANK YOU !**

[debbiee@hopehospice.com](mailto:debbiee@hopehospice.com)

[giab@hopehospice.com](mailto:giab@hopehospice.com)