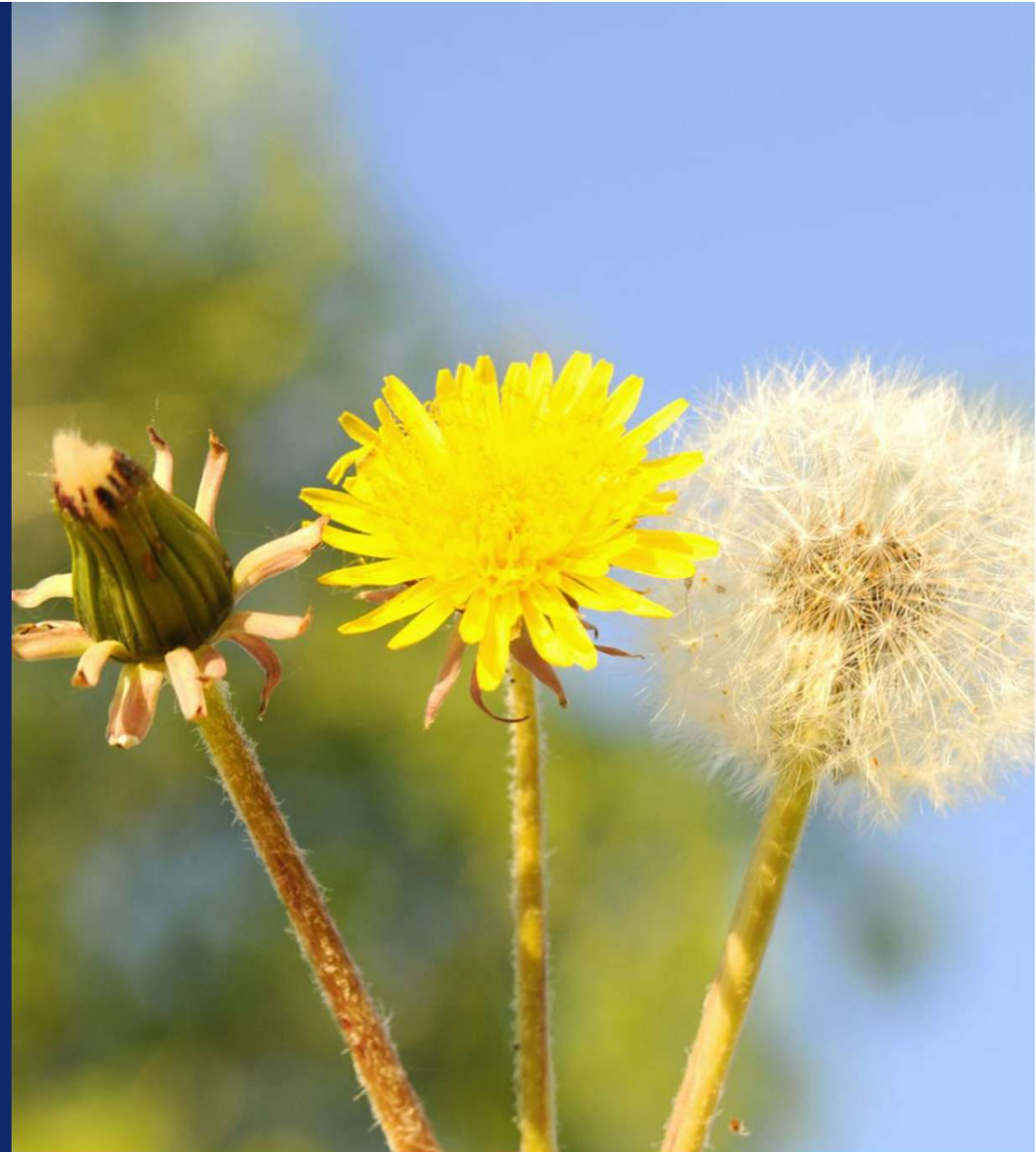




Eliminating Risk Factors and Slowing the Progression of Dementia

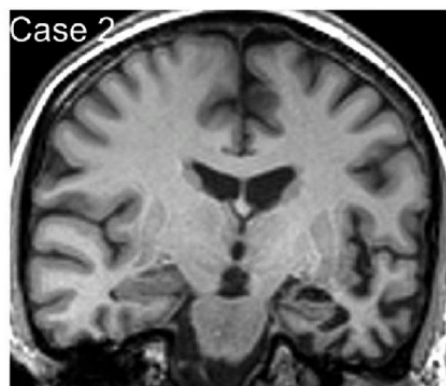
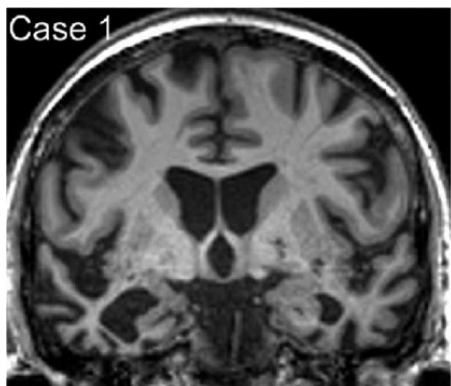
Jennifer Pauldurai, MD, MS
Inova Brain Health and Memory
Disorders Program



Dementia is a state of function where the brain needs help to survive independently and complete daily functions

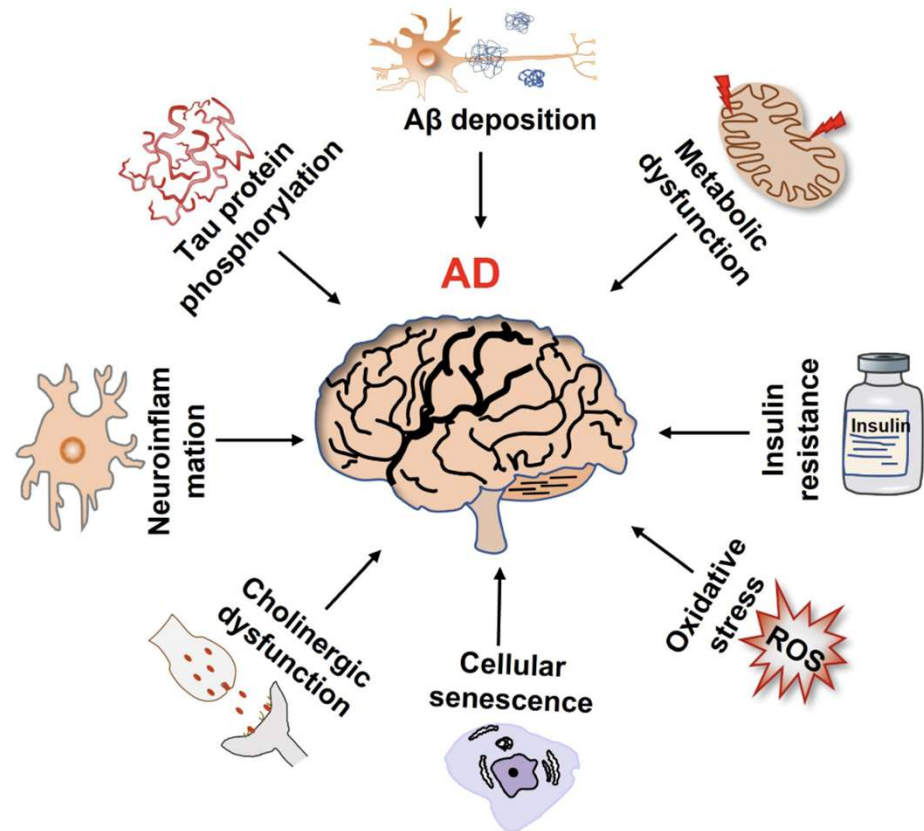
Dementia can be caused by different diseases and dysfunctions:

Alzheimer's Disease	Frontotemporal Disease	Stroke or Vascular Disease
Parkinson's Disease	Lewy Body Disease	Long-standing Psychiatric Disease
Brain Infections	Repeated Head Trauma	Hydrocephalus



These abnormal collections of plaque or infection are never an isolated problem.

There is also dysfunction of blood flow, blood vessel integrity, inflammation, strength of cell connections. This causes a systemic breakdown in normal brain function.





Getting the dysfunction back to function is how we prevent dementia and other brain disease from causing significant burden on the brain. There is no single magic pill. We work to keep the brain working.

6 Healthy Brain Habits

- 1 Be Social**
Keep in touch with friends and family don't let yourself get self-isolated.
- 2 Engage Your Brain**
Find ways to stimulate your thinking and explore new interests and hobbies.
- 3 Manage Stress**
Practice relaxation, and maintain a daily schedule.
- 4 Ongoing Exercise**
Move throughout the day aim to reach 2 and a half hours of moderate physical activity a week.
- 5 Restorative Sleep**
Get 7 to 8 hours of restful sleep every day.
- 6 Eat Right**
Choose a nutritious heart healthy diet including fish veggies fruits.

For information on resources in your area, contact your local Area Agency on Aging or the Alzheimer's Association.

 To find your Area Agency on Aging, call 1-800-552-3402
Alzheimer's Association 24/7 Helpline: 1-800-272-3900 

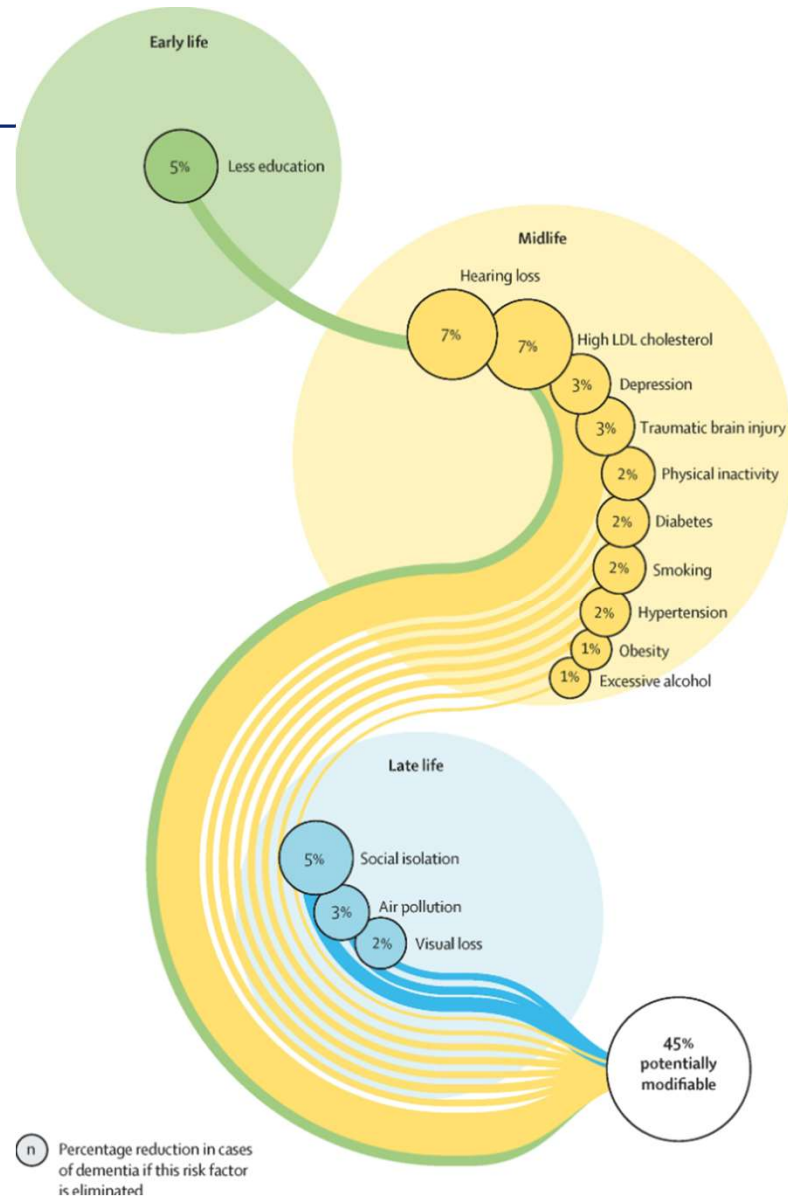
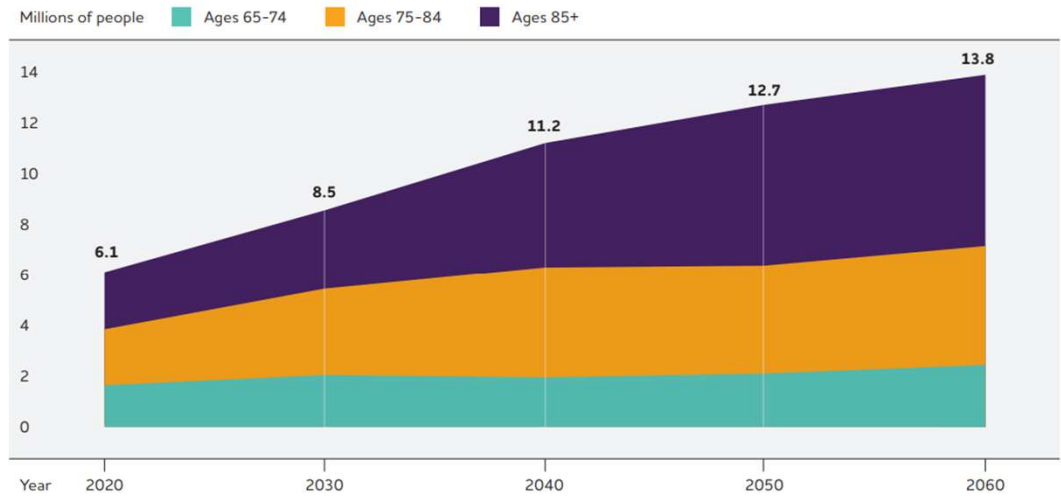
The information on this tipsheet is taken from *Virginia Dementia Road Map: A Guide for People Impacted by Dementia*.
Download your copy of the Road Map by scanning the QR code or visit: vda.virginia.gov/DementiaCapableVA.htm

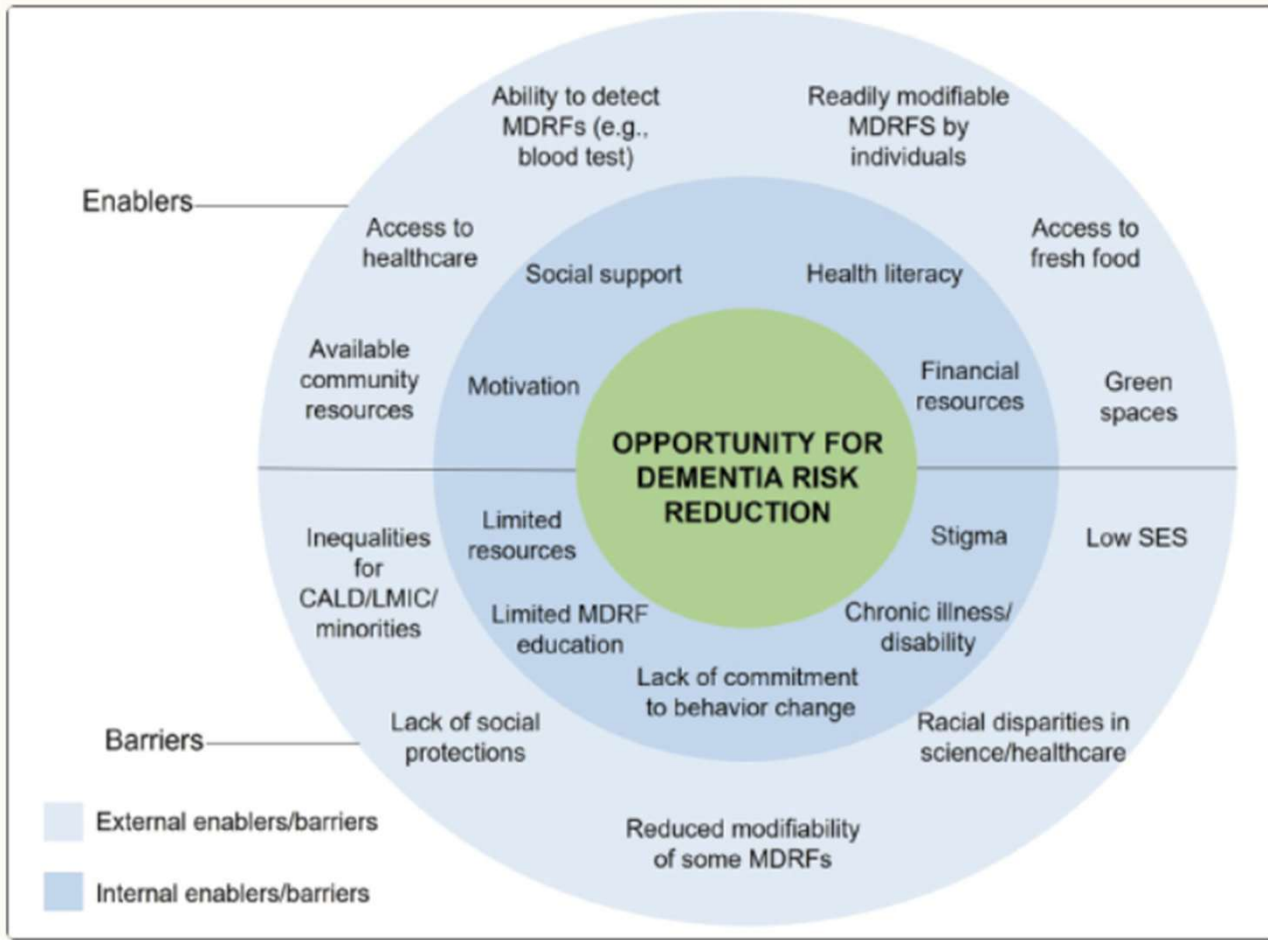
 HealthyBrainVA.com

As we get older, we are at greater risk of developing dementia.

However, most of the risk factors for dementia do not start at old age, and many of these risk factors are potentially modifiable.

FIGURE 7
 Projected Number of People Age 65 and Older (Total and by Age) in the U.S. Population with Alzheimer's Dementia, 2020 to 2060





While there are no 100% proven methods of preventing dementia, we can intentionally screen for and treat the modifiable risk factors of brain health throughout life.

• J Prev Alzheimers Dis. 2023 Oct 4;11(1):22-37. doi: [10.14283/jpad.2023.119](https://doi.org/10.14283/jpad.2023.119)

How Modifiable Are Modifiable Dementia Risk Factors? A Framework for Considering the Modifiability of Dementia Risk Factors

[Lisa Bransby](#) ^{1,6*}, [E Rosenich](#) ¹, [P Maruff](#) ^{1,2,3}, [YY Lim](#) ¹

• Author information • Article notes • Copyright and License information

PMCID: PMC10995020 PMID: [38230714](https://pubmed.ncbi.nlm.nih.gov/38230714/)

Brain Health in Utero

Embryonal neurons start developing at 4 weeks; we continue developing new brain cells until about 18 months; pruning continues lifelong with ~100 billion neurons, and ~100 trillion synapses.

Exposures to stress can be **chemical** (education), **environmental** (smoke, noise), **psychological** (anxiety, depression) or **socioeconomic**.



Discovering the Brain

by Sandra Ackerman for the Institute of Medicine,
National Academy of Sciences
ISBN: 0-309-57230-4, 194 pages, 6 x 9, (1992)

This PDF is available from the National Academies Press at:
<http://www.nap.edu/catalog/1785.html>

Maternal influences on fetal brain development: The role of nutrition, infection and stress, and the potential for intergenerational consequences

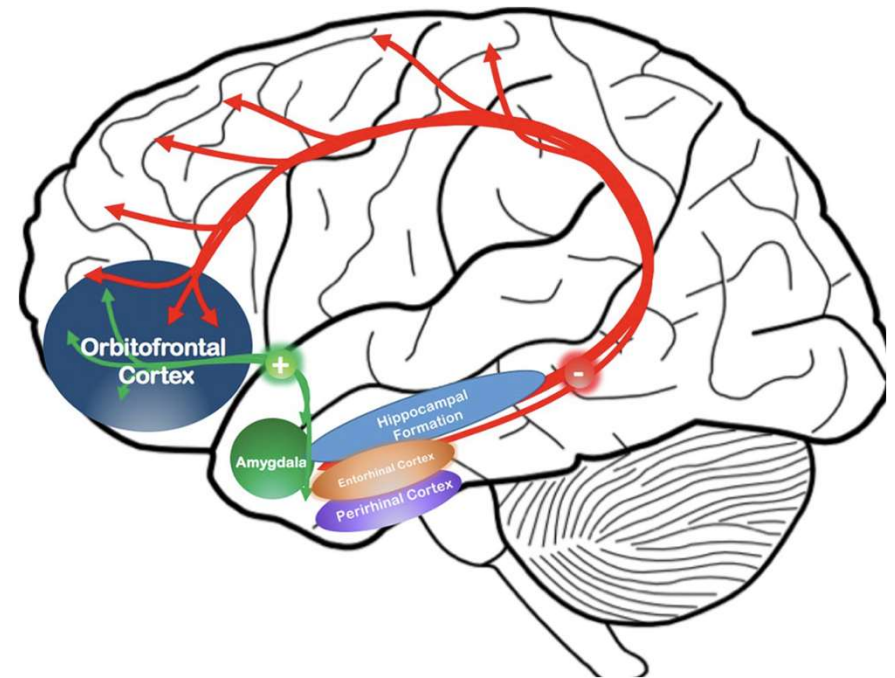
Eamon Fitzgerald, Kahyee Hor, Amanda J. Drake*

University/British Heart Foundation Centre for Cardiovascular Science, University of Edinburgh, The Queen's Medical Research Institute, 47 Little France Crescent, Edinburgh EH16 4TJ, UK

Brain Health in Utero

This in utero fetal programming lays the groundwork for developing chronic neuropsychiatric conditions later in life.

Chronic epigenetic modifications (histones, DNA methylation) reshape the formation and functions of the amygdala, prefrontal cortex, and hippocampus.



Effects of Prenatal Stress on Behavior, Cognition, and Psychopathology: A Comprehensive Review

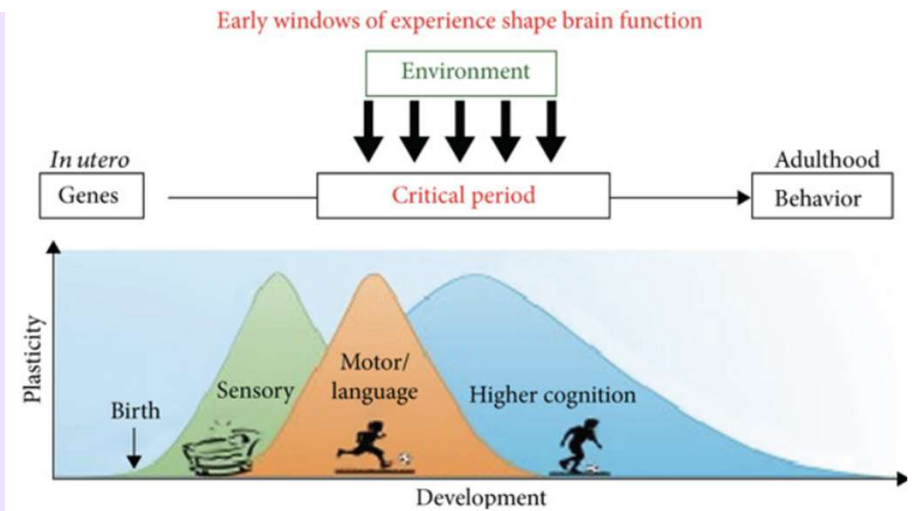
Aniket Jagtap¹, Balasaheb Jagtap², Rajlaxmi Jagtap³, Yashwant Lamture⁴, Kavita Gomase⁵

1. Surgery, Jawaharlal Nehru Medical College, Datta Meghe Institute of Higher Education and Research, Wardha, IND
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Brain Health in Childhood

Rapid growth, plasticity, and maturation of sensory and motor systems. This is when sensory inputs are learned, and response pathways are configured (ie, habits and fears)

Influences on your children can include **adversities, repetitive head injury, parental education and socioeconomic status** (learned behavioral responses), **food insufficiency and adiposity, physical activity** (cardiovascular health), and **cognitive stimulation.**



A lifetime perspective on risk factors for cognitive decline with a special focus on early events

H. Georg Kuhn^{a,*}, Simon Skau^{a,b}, Jenny Nyberg^a

^a Department of Clinical Neuroscience, Institute of Neuroscience and Physiology, University of Gothenburg, Gothenburg, Sweden
^b Department of Pedagogical, Curricular and Professional Studies, University of Gothenburg, Gothenburg, Sweden

Neural Plasticity / Volume 2019, Issue 1 / 1676285

Review Article | [Open Access](#) |

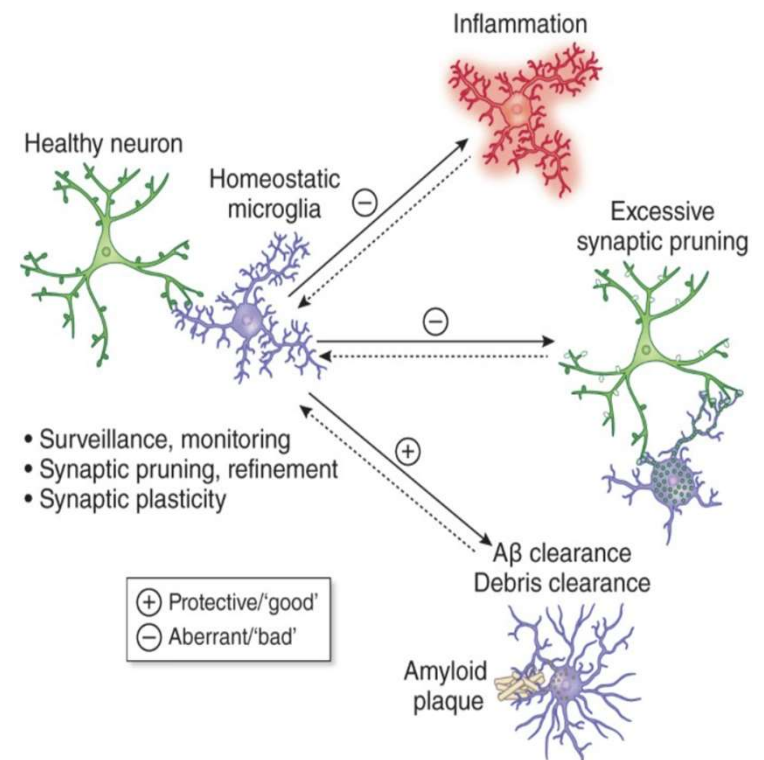
How Early Experience Shapes Human Development: The Case of Psychosocial Deprivation

Charles A. Nelson III, Charles H. Zeanah, Nathan A. Fox

Brain Health in Childhood

Plasticity continues into adolescence with the added component of higher-order cortical reasoning (decision-making, planning). Prefrontal choices can be good or bad for long-term development.

Chronification of lifestyle choices (snacking) imprints on behavioral pathways. Altered synapse density, differentiation of excitatory/inhibitory neurons.



Review Article | Published: 01 September 2017

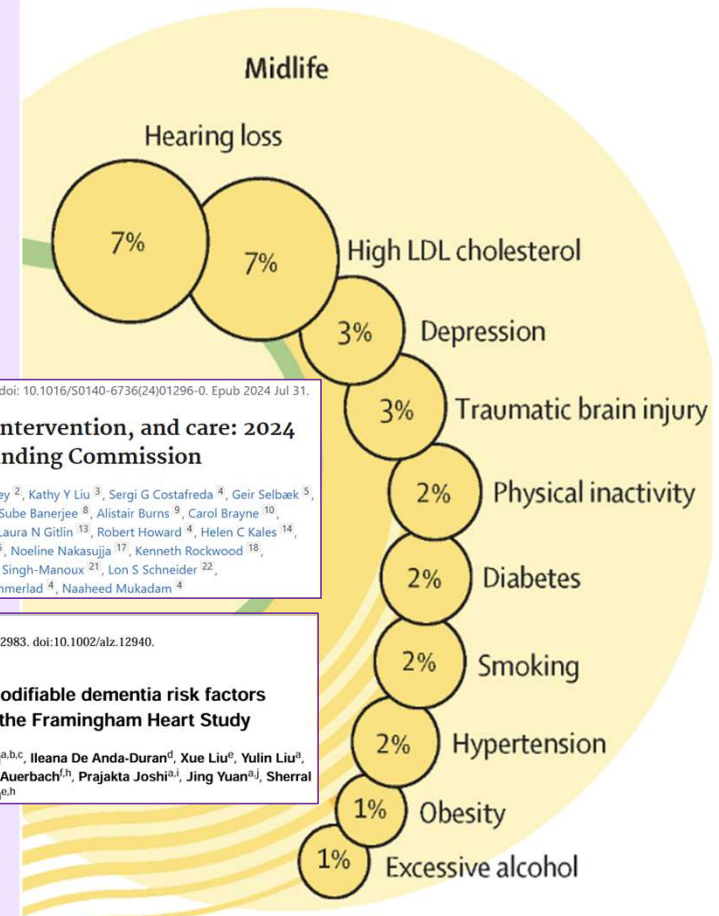
Microglia emerge as central players in brain disease

Michael W Salter & Beth Stevens

Nature Medicine 23, 1018–1027 (2017) | [Cite this article](#)

Brain Health in Adulthood

1. Lower educational attainment (< high school)
2. Traumatic brain injuries with LOC
3. Hearing Loss
4. LDL cholesterol
5. Depression
6. Smoking and Excess Alcohol
7. Diabetes
8. Hypertension
9. Obesity
10. Physical Inactivity



> Lancet. 2024 Aug 10;404(10452):572-628. doi: 10.1016/S0140-6736(24)01296-0. Epub 2024 Jul 31.

Dementia prevention, intervention, and care: 2024 report of the Lancet standing Commission

THE LANCET
 Gill Livingston¹, Jonathan Huntley², Kathy Y Liu³, Sergi G Costafreda⁴, Geir Selbaek⁵, Suvarna Alladi⁶, David Ames⁷, Sube Banerjee⁸, Alistair Burns⁹, Carol Brayne¹⁰, Nick C Fox¹¹, Cleusa P Ferri¹², Laura N Gitlin¹³, Robert Howard⁴, Helen C Kales¹⁴, Mika Kivimäki¹⁵, Eric B Larson¹⁶, Noeline Nakasujja¹⁷, Kenneth Rockwood¹⁸, Quincy Samus¹⁹, Kokoro Shirai²⁰, Archana Singh-Manoux²¹, Lon S Schneider²², Sebastian Walsh¹⁰, Yao Yao²³, Andrew Sommerlad⁴, Naaheed Mukadam⁴

Published in final edited form as:
Alzheimers Dement. 2023 July ; 19(7): 2975-2983. doi:10.1002/alz.12940.

Examination of potentially modifiable dementia risk factors across the adult life course: the Framingham Heart Study

Phillip H. Hwang^{a,1}, Ting Fang Alvin Ang^{a,b,c}, Ileana De Anda-Duran^d, Xue Liu^e, Yulin Liu^a, Ashita Gurnani^f, Jesse Mez^{g,h}, Sanford Auerbach^{f,h}, Prajakta Joshi^{a,i}, Jing Yuan^{a,j}, Sherral Devine^{a,h}, Rhoda Au^{a,b,c,f,g,h}, Chunyu Liu^{a,h}

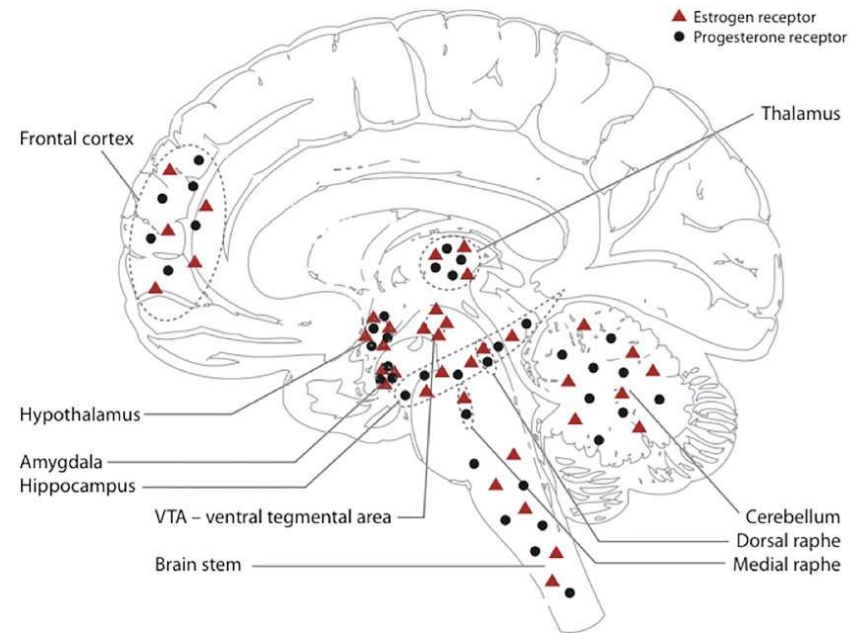
Brain Health in Menopause

Women have a great risk of developing dementia, even after controlling for age, education, and other variables.

Menopause disrupts estrogen balance.

Estrogen is pivotal to maintaining learning, memory processing, and storage. E2 receptors are prevalent in the hippocampus, amygdala and other points in the Papez Circuit.

- Vasomotor symptoms
- Sleep disruptions
- Chronic pain and stress signaling



Comparative Study > Neuroscience, 2000;95(2):233-42, doi: 10.1016/v0306-4522(99)00443-1.

The human forebrain has discrete estrogen receptor alpha messenger RNA expression: high levels in the amygdaloid complex

M K Osterlund¹, E Keller, V L Hurd

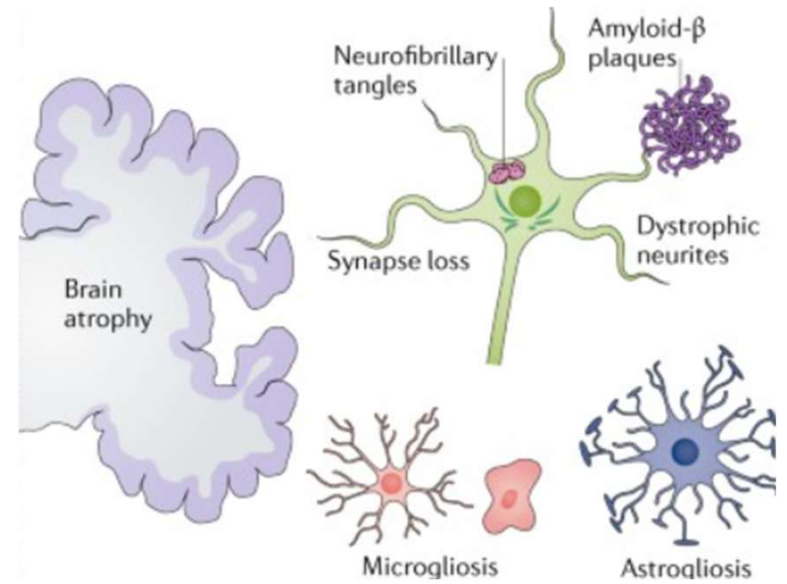
Affiliations + expand

PMID: 10658612 DOI: 10.1016/v0306-4522(99)00443-1

Brain Health in Late Adulthood (> 65yo)

It is not too late to modify a risk factor, even later in life. These variables were shown to have greatest impact in the advanced years.

1. Social Isolation
2. Vision Loss
3. Air Pollution

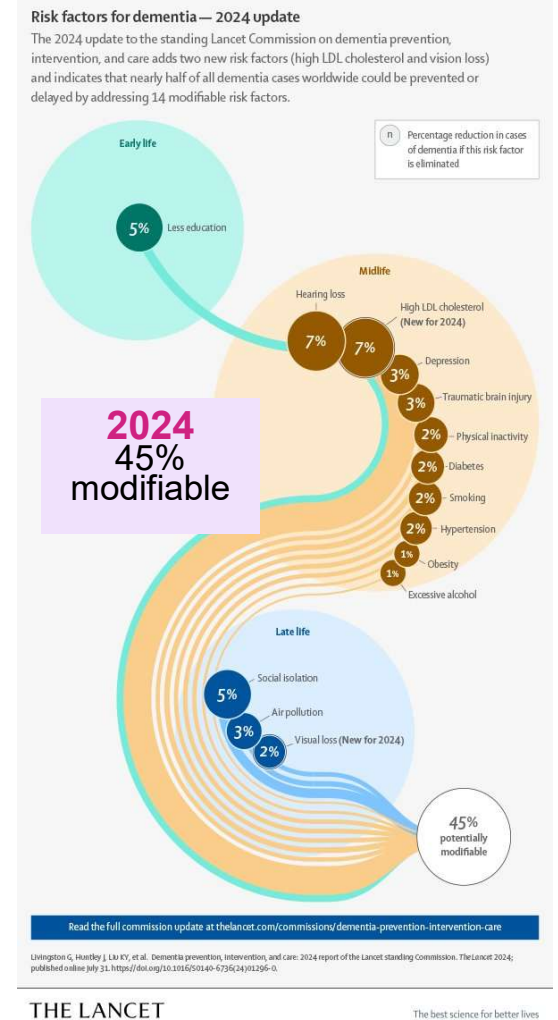
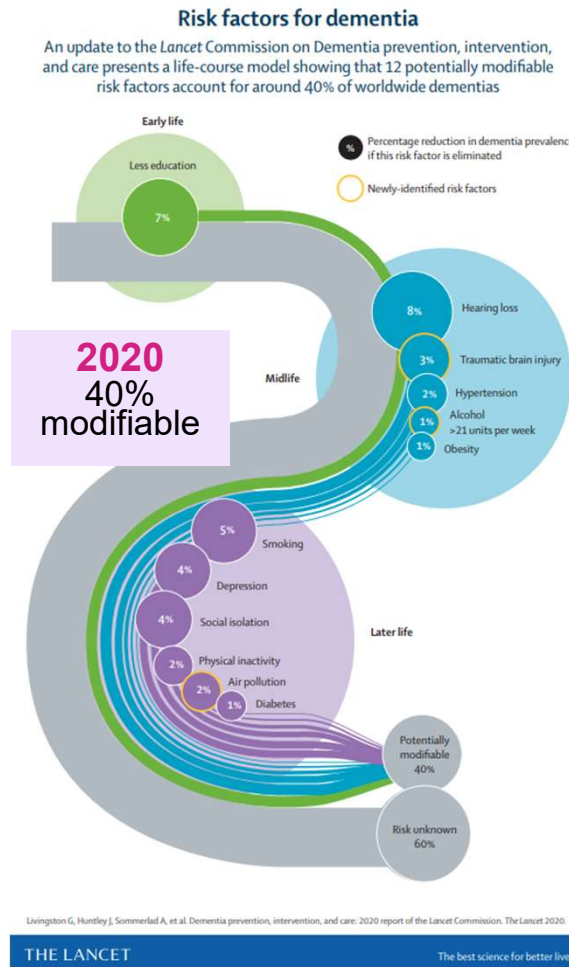
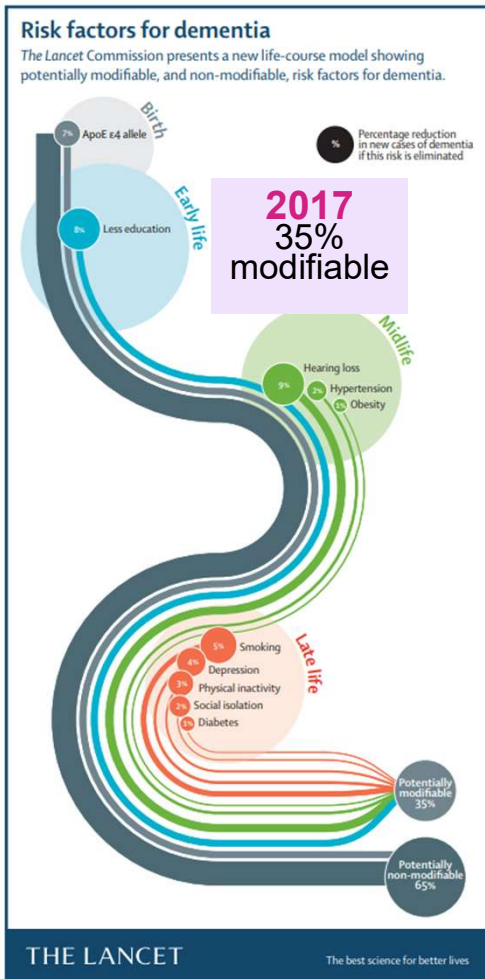


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Lancet Commission on Dementia Prevention





These interventions are not 100% preventions or cures, but unfortunately nothing is. Making every choice intentional and brain-protective allows the brain to fight off the dysfunctions that lead to dementia.

6 Healthy Brain Habits

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Keep in touch with friends and family don't let yourself get self-isolated.
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Find ways to stimulate your thinking and explore new interests and hobbies.
- 3 Manage Stress**

Practice relaxation, and maintain a daily schedule.
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VDH VIRGINIA DEPARTMENT OF HEALTH
HealthyBrainVA.com

1. Social Engagement

Find new ways to connect with others.

- New hobby, new meet-up, volunteer group
 - Expressions, idioms, sarcasm, cultural ideas, emotional response, and non-verbal communication.
 - Experience different perspectives and ideas

2. Cognitive Engagement

Find new skills or hobbies to learn.

- Travel, read a new book, complete a home project
 - Language, communication, problem solving, memory
 - Experience new, complex ideas that we are forced to practice and apply

3. Manage Stress

Make the brain feel safe and balanced.

- Too much activity can be stressful. Balance rest, play, work, and allow the brain to process life.
 - Process threat and non-threat, allowing a decrease in defense systems
 - Finding joy and positivity lessens chemical and physiologic stress signals.

4. Physical Engagement

Challenging moderate exercises for thirty minutes daily.

- Find an activity that is interesting, but still pushes you to an elevated heart rate
- Try to incorporate movement into your day, sedentary lifestyles increase illness.
- Moderate exercises are activities where you cannot hold a comfortable convo

5. Restorative Sleep

Aim for consistent 7-8 hours of sleep nightly.

- Sleep hygiene includes control of stimulating activities, phones, news that precede sleep
 - Aim for 1 hour no screens, 3 hours no exercise, 6 hours no caffeine before bed.
 - Nap no more than 30 minutes during the day.
 - Take natural or prescribed sleep aides to help maintain sleep, magnesium oxide, valerian root, melatonin.

6. Nutrition

Fuel the brain only with nutrition that it needs, limit extra.

- Processed foods, toxins (alcohol, smoking), sugar, add layers of “work for the brain.” Aim for plant-based, low processing, low sugar meal choices.
 - MIND Diet, Mediterranean
 - Supplement vitamins as needed and avoid dehydration. Limit alcoholic and sweet beverages.



Eliminating Risk Factors and Slowing the Progression of Dementia

Jennifer Pauldurai, MD, MS
Inova Brain Health and Memory
Disorders Program

