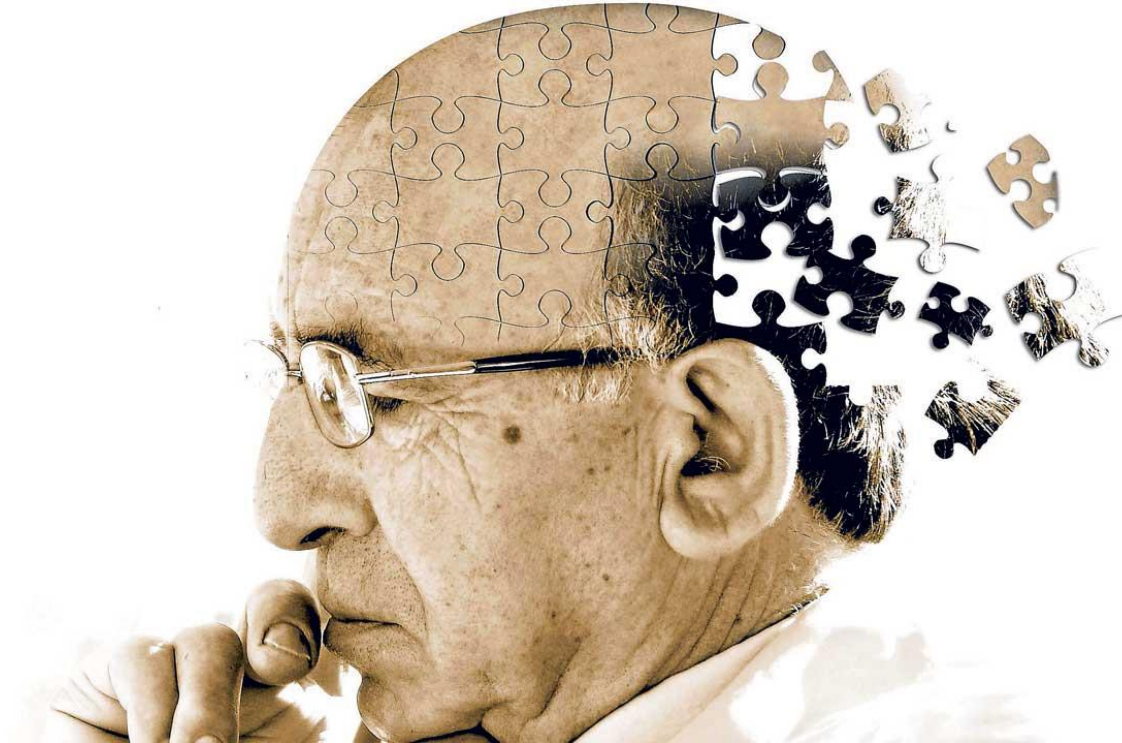


# Aging and Mental Agility

## Alzheimer's and Dementia



Manjunath N. K., Ph.D.,  
Professor and Head  
Anvesasa Research Laboratories  
S-VYASA, Bengaluru

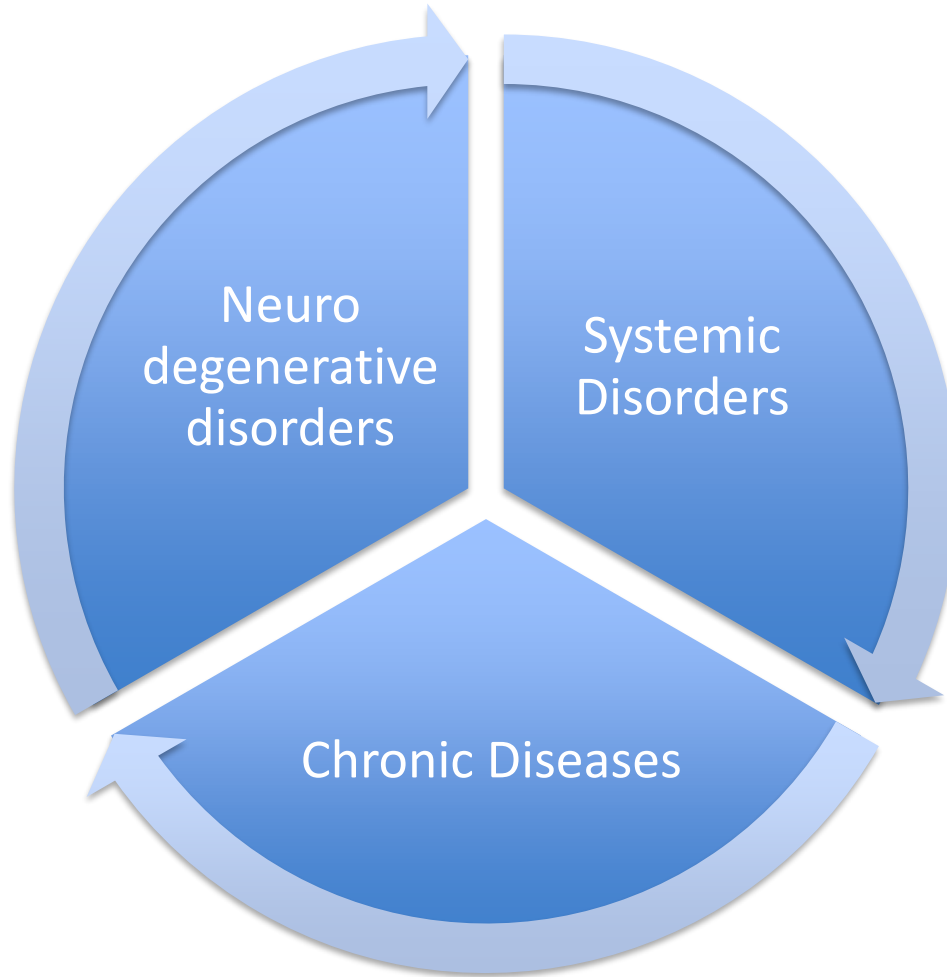
# The best gift we are bestowed with

The ability to Remember



The ability to forget

# Major Health problems



# Aging – a natural consequence

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- **Predictable**
- **Inevitable**
- **Progressive**
- **Variable**



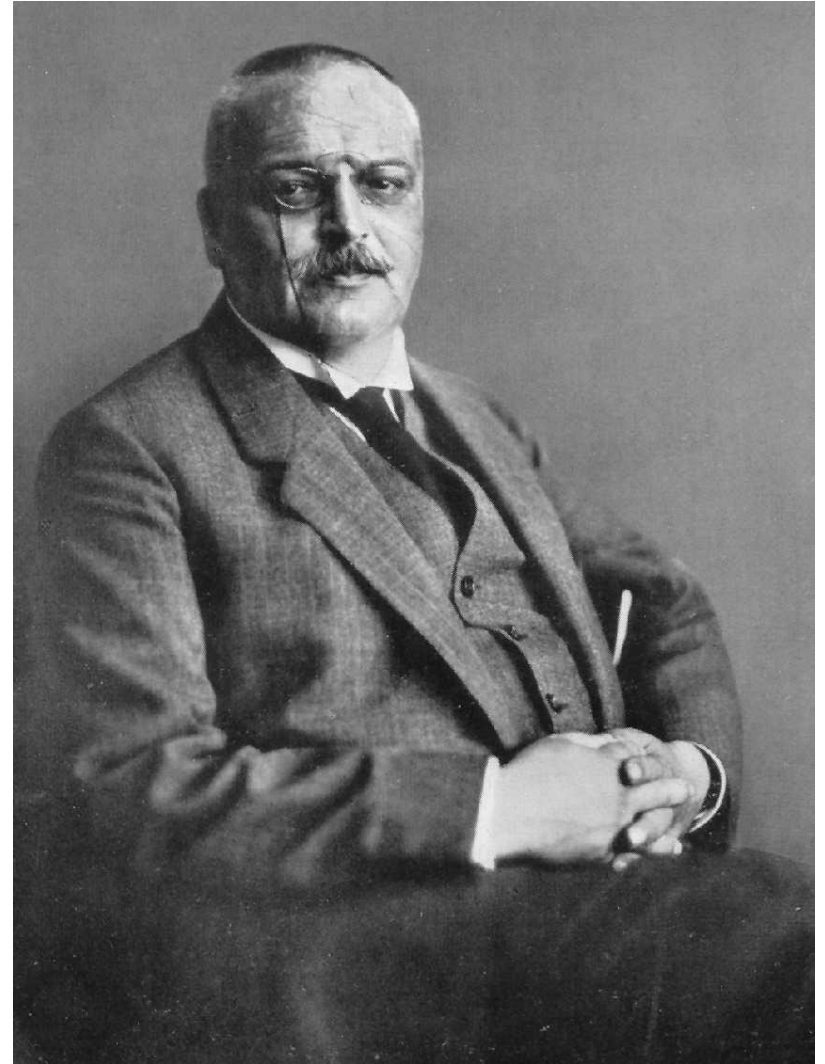


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# Alzheimer's Disease

- An irreversible, progressive brain disorder
- Slowly destroys memory and thinking skills, and
- Eventually the ability to carry out the simplest tasks.
- In most people with Alzheimer's, symptoms first appear after 65 and most common after 85

- Alzheimer's disease is named after Dr. Alois Alzheimer In 1906
- A Psychiatrist from Germany

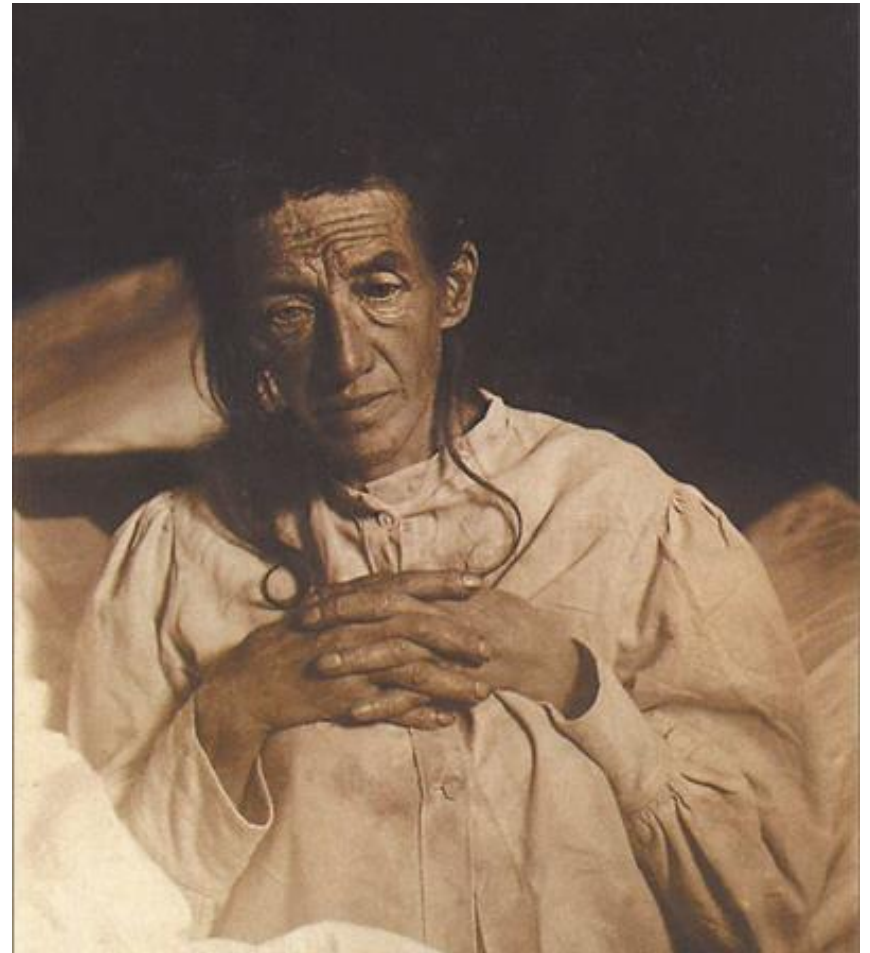


# History

Dr. Alzheimer noticed changes in the brain tissue of a woman who had died of an unusual mental illness. Her symptoms included:

- memory loss,
- language problems, and
- unpredictable behavior.

he examined her brain and found many abnormal clump and tangled bundles of fibers





# Prevalence

- Alzheimer's disease is currently ranked as the sixth leading cause of death in the United States, but recent estimates indicate that the disorder may rank third, just behind heart disease and cancer, as a cause of death for older people.
- 1 in 10 above 65 years and 1 in 2 after 85 years are known to suffer from Alzheimer's

# Dementia

- Alzheimer's is the most common cause of dementia among older adults.
- Loss of cognitive functioning thinking,
- Remembering,
- Reasoning
- and behavioral abilities
- to such an extent that it interferes with a person's daily life and activities.

# Dementia

- The causes of dementia can vary, depending on the types of brain changes that may be taking place.
- Other dementias include:
- Lewy body dementia,
- frontotemporal disorders, and
- vascular dementia.
- some people have both Alzheimer's disease and vascular dementia

# FORGETFULNESS - The seven warning signs:



1.



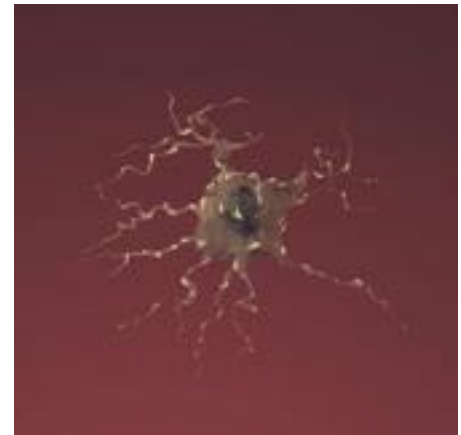
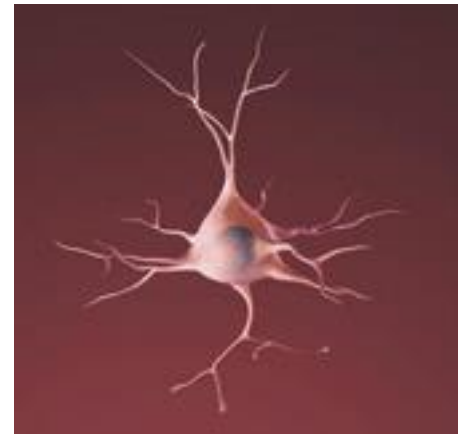
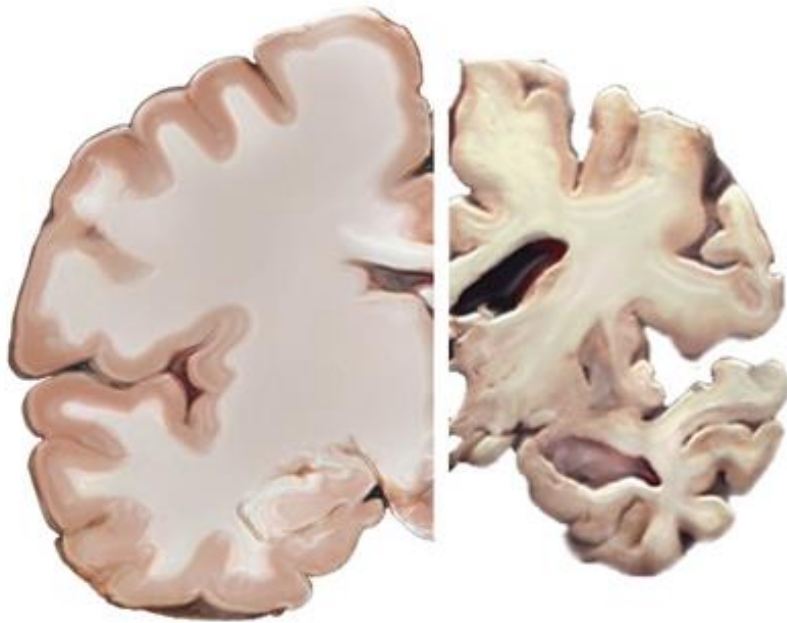
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# Changes in the brain

Healthy  
Brain

Severe  
Alzheimer's



# The process

- **Amyloid plaques**
- **Neurofibrillary tangles**
- **Loss of neuronal connections and cell death.**



# The 4 fold issue

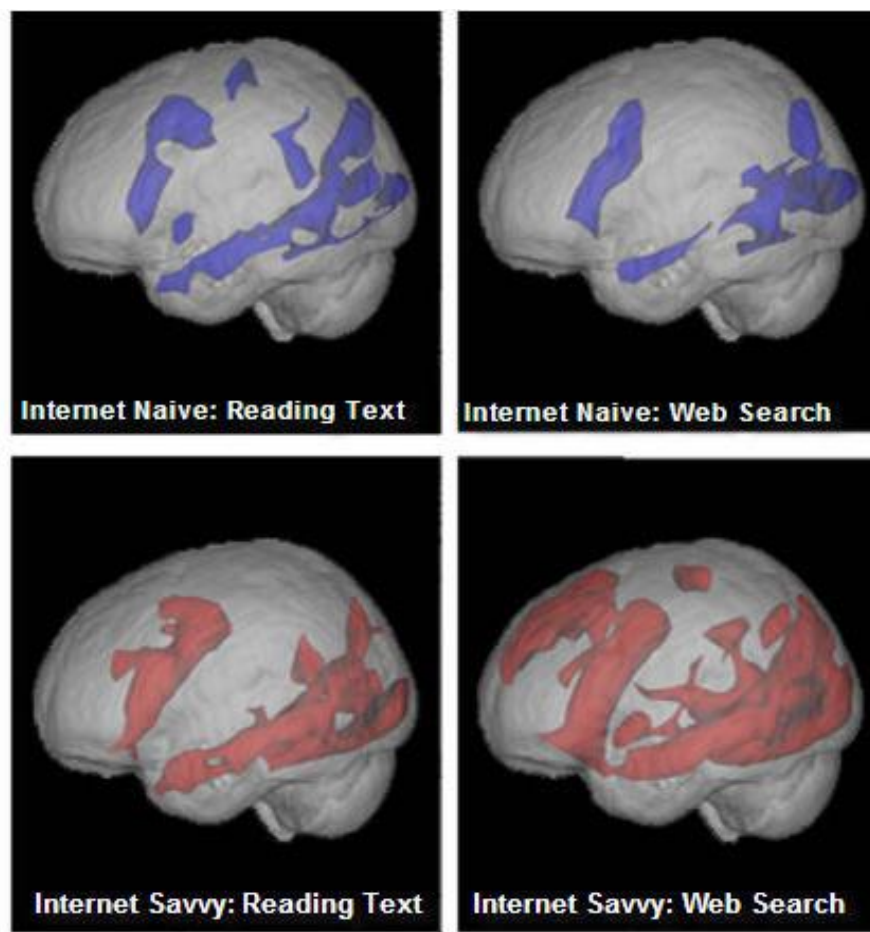
- Aging related memory loss
- Mild cognitive impairment
- Alzheimer's Disease
- Dementia



# Even being honest may not work

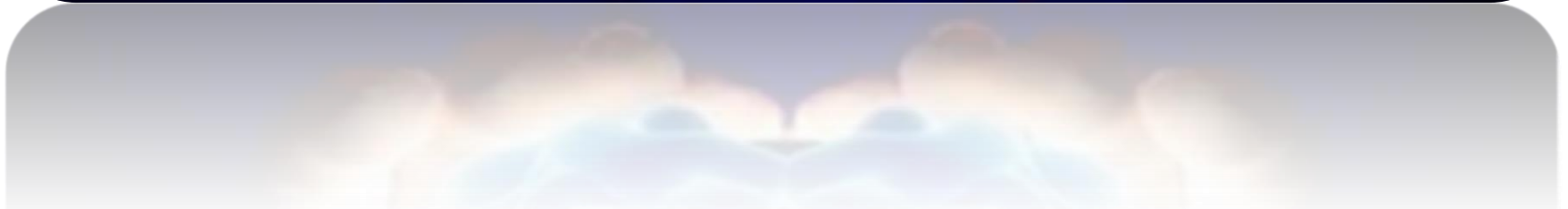


# Google brain



# Prevention through Yoga

## **SECRETS TO A HEALTHY BRAIN**



# Smruthi

- *Smruthi one of the Citta Vruthi's*
- *Anubhuthavishaya Asmpramosha ha Smruthihi*
- *Dhyayatovishayan pumsaha.....Smruthi bramshat  
buddhi nashaha.....Pranashyathe*
- *Vasanas and Samskaras*

**CANCALATA - MULTIPLE SUBJECTS**  
**(MIND)**

**MULTIPLE THOUGHTS**

**EKAGRATA - SINGLE SUBJECT**  
**(INTELLECT)**

**MULTIPLE THOUGHTS**

**DHÁRANA - SINGLE THOUGHT**  
**(MEMORY)**

# Yoga in Alzheimer's Disease

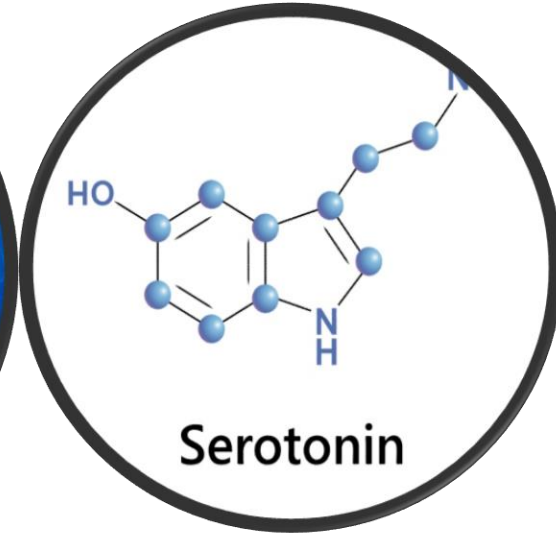
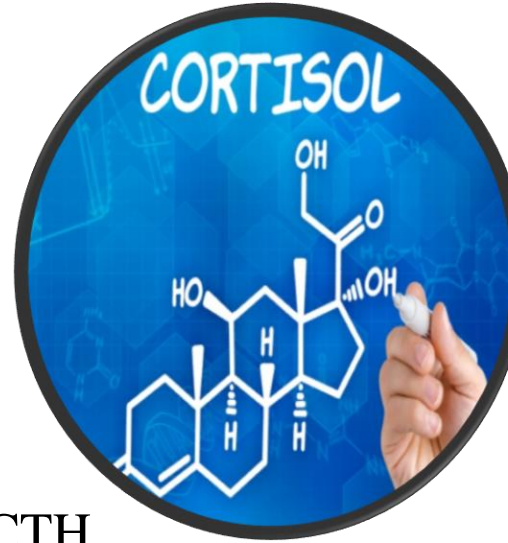
- Stress increases cortisol which is toxic to hippocampal cells (normal memory function)
- A stress induced hypercortisolemia can aggravate Alzheimer's
- Regular practice of meditation produces stress reduction that reduces serum cortisol. Hence, provide benefit in patients with Alzheimer's

*[Ann Indian Acad Neurol. 2012;15(4): 247–54.]*

# Yoga in Age Related Degeneration

## In Elder:

- Cortisol & adrenocorticotrophic hormone (ACTH) raised
- Brain-derived neurotrophic factor (BDNF), serotonin & dopamine lowered



## Yoga:

- Significantly reduces cortisol; ACTH
- Increases serotonin, dopamine & BDNF
- Hence, Yoga helps in prevention of age-related degeneration

• [Age (Dordr). 2014;36(4):9683.]





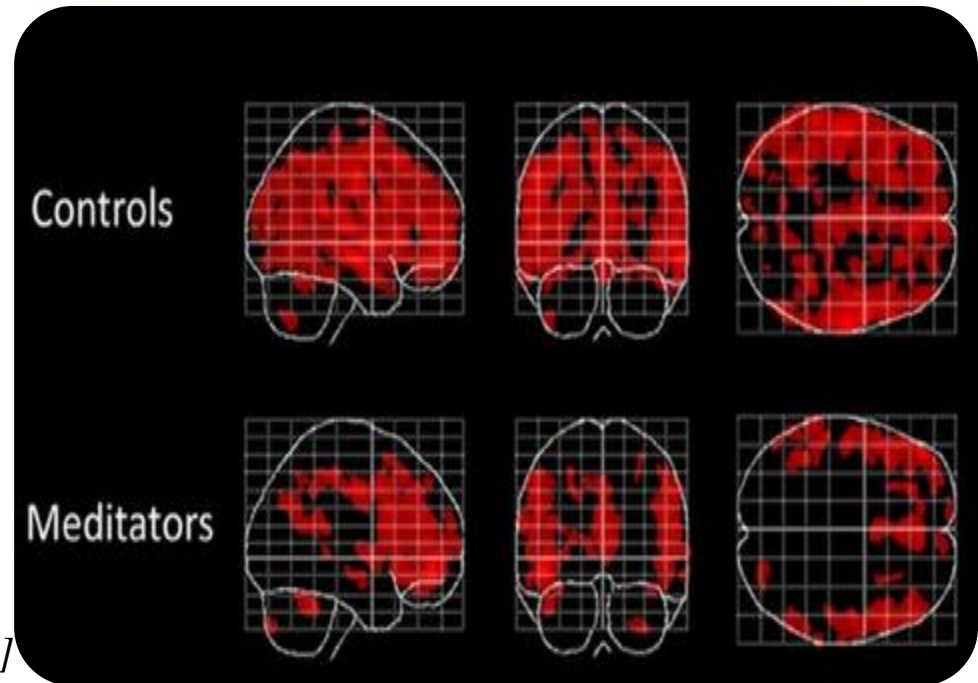
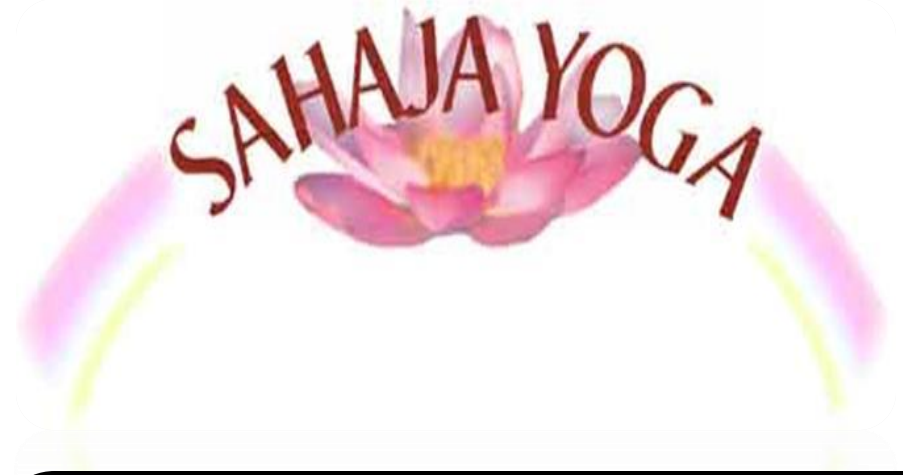
- Yoga is a promising intervention for neurodegenerative diseases.

*[Integr Med (Encinitas). 2014;13(3):33-9.]*

- **Long-term Sahaja Yoga Meditation:**

- Increases overall grey matter volume
- Regional enlargement in several right hemispheric cortical & subcortical brain regions
- Associated with sustained
- attention, self-control, compassion & interoceptive perception.

- *[PLoS One. 2016;11(3):e0150757.]*





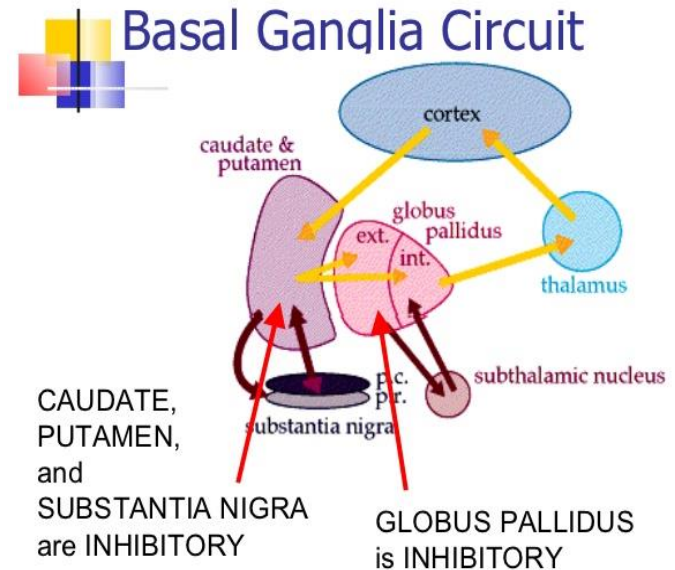
- Yoga practitioners have stronger functional connectivity within basal ganglia cortico-thalamic feedback loops than non-practitioners

*[Front Hum Neurosci. 2015;9:137.]*

During meditation: it became localized to the right inferior frontal cortex/right insula and right middle/superior temporal cortex.

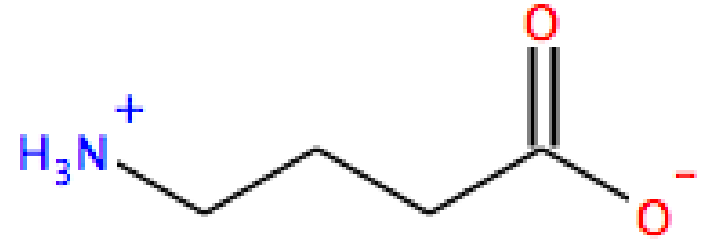
- Right inferior frontal activation was directly associated with the subjective depth of the mental silence experience.

*[J Altern Complement Med. 2015;21(3):175-9.]*



- Yoga produces acute increases in thalamic GABA levels & improvements in mood and anxiety

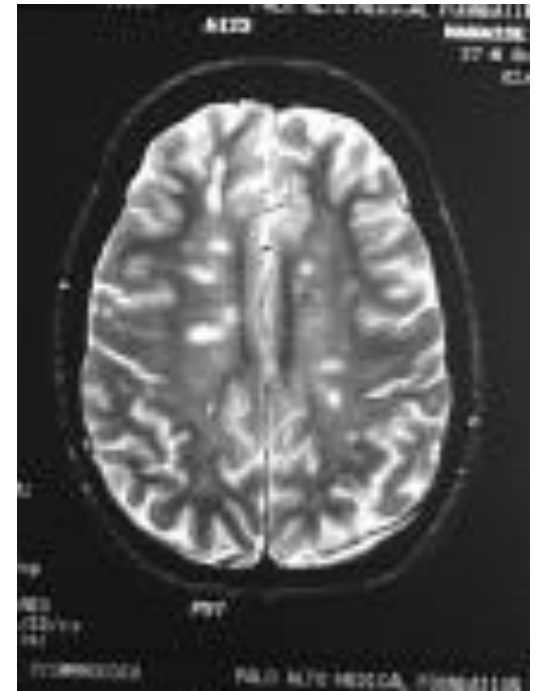
*[J Altern Complement Med.  
2010;16(11):1145-52.]*



Gamma-aminobutyric acid (GABA)

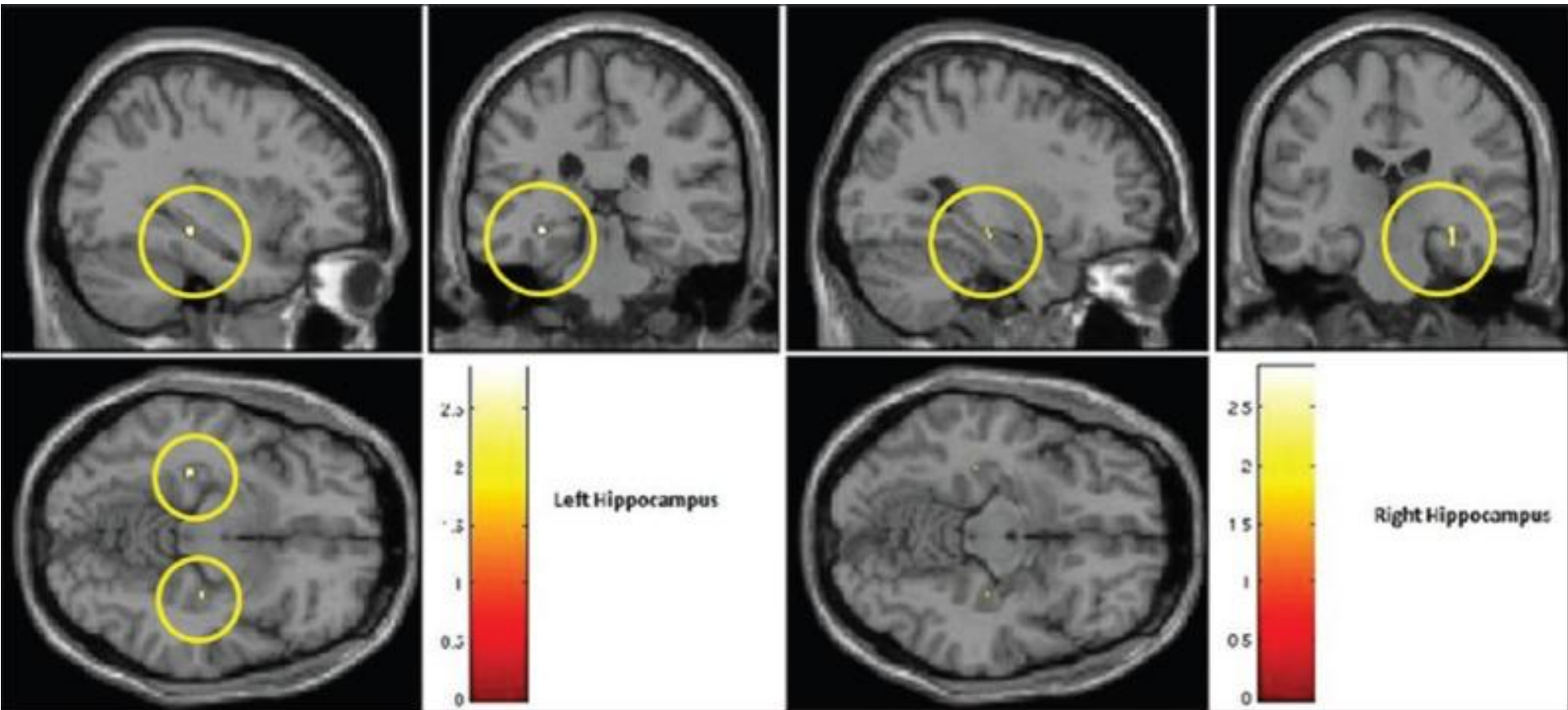
# Structural changes in the brain

- Increased thickness in cortical areas related to attention as well as increased subcortical gray matter in right insula and hippocampus in long-term meditators



Neuroreport. 2005 Nov 28;16(17):1893-7.

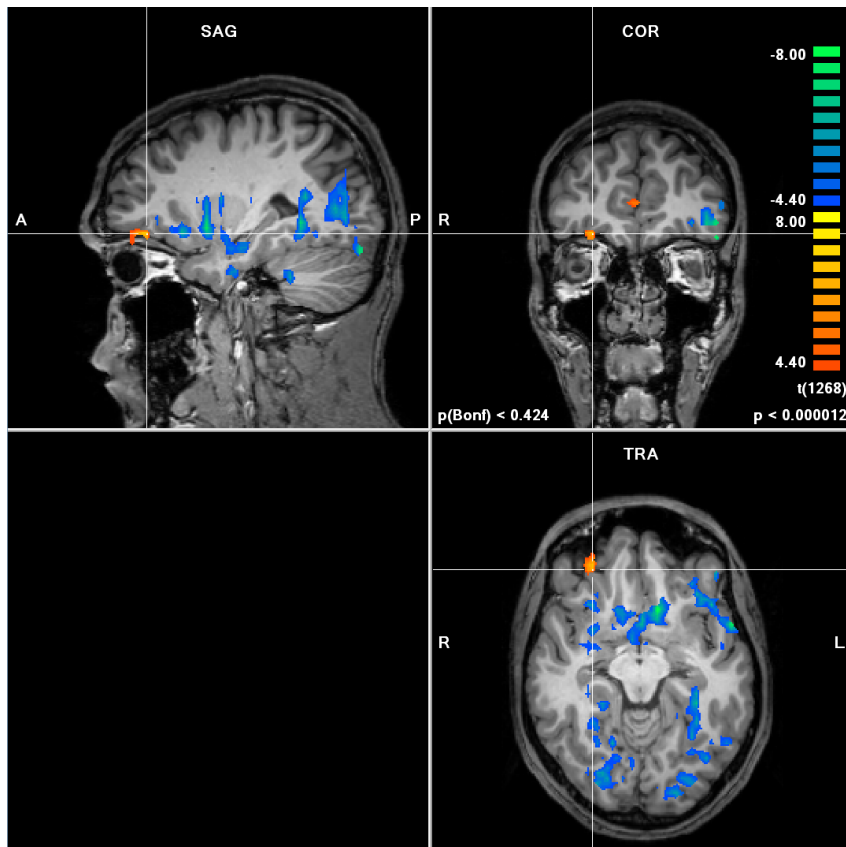
# Volume of hippocampus increases



Voxel based morphometric analysis of the effects of yoga practice in healthy elderly (demonstrates significant increase in bilateral hippocampus gray matter volume after 6 months of yoga practice [indicated by the yellow circle])

Indian J Psychiatry. 2013 Jul; 55(Suppl 3): S394–S396.

# Brain areas active during meditation

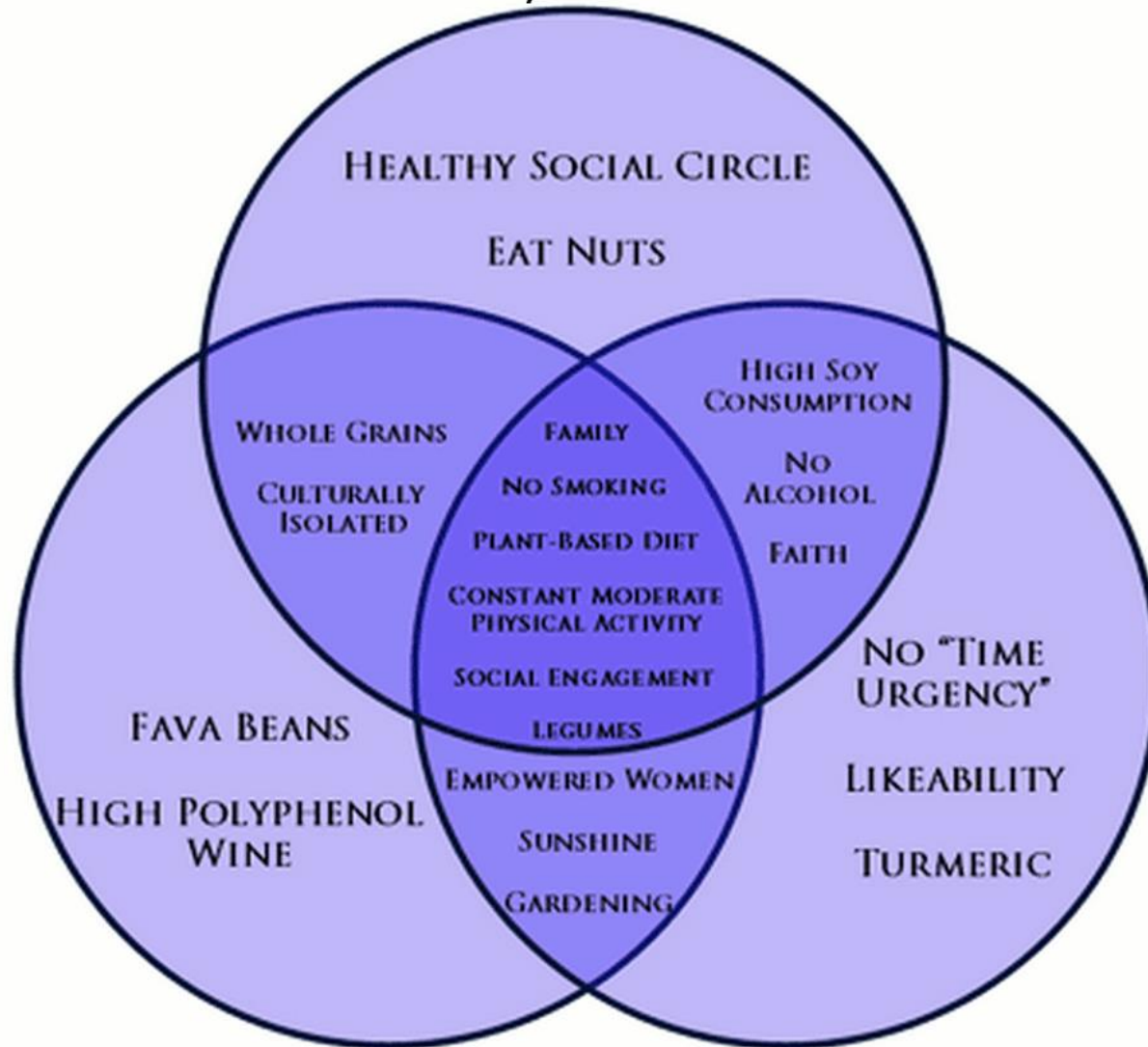


- Evoked Potential studies
  - Diencephalon
- Imaging studies –
  - Anterior Cingulate
  - Dorso-lateral Prefrontal Cortex
  - Regions of limbic systems
    - Int J Psychophysiol. 2011 May;80(2):103-11
    - J Altern Complement Med. 2010 Dec;16(12):1253-8

- Yoga is as effective as memory enhancement training in improving functional connectivity in relation to verbal memory performance in subject with mild cognitive impairment

*[J Alzheimers Dis. 2016;52(2):673-84.]*

## Loma Linda, United States



Sardinia,  
Italy

Okinawa,  
Japan



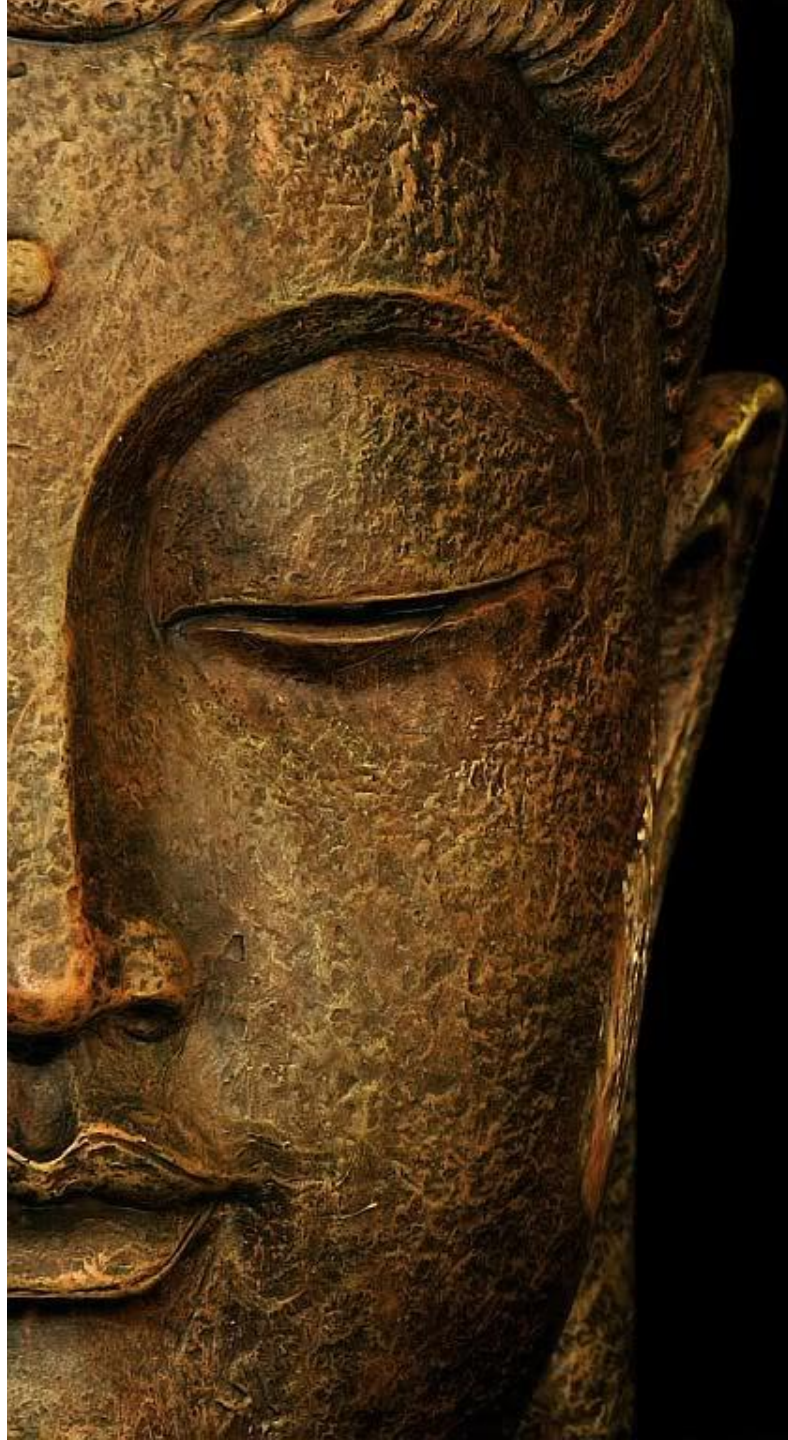




"It's not forgetting things completely  
that bothers me - it's remembering  
that I've forgotten to remember  
something that drives me mad!"



JOHN FRY.



*Life is short, live it  
Love is rare, grab it  
Anger is bad, dump it  
Fear is awful, face it  
Memories are sweet,  
cherish it*