How to Boost your

MEMORY

and Prevent

DEMENTIA

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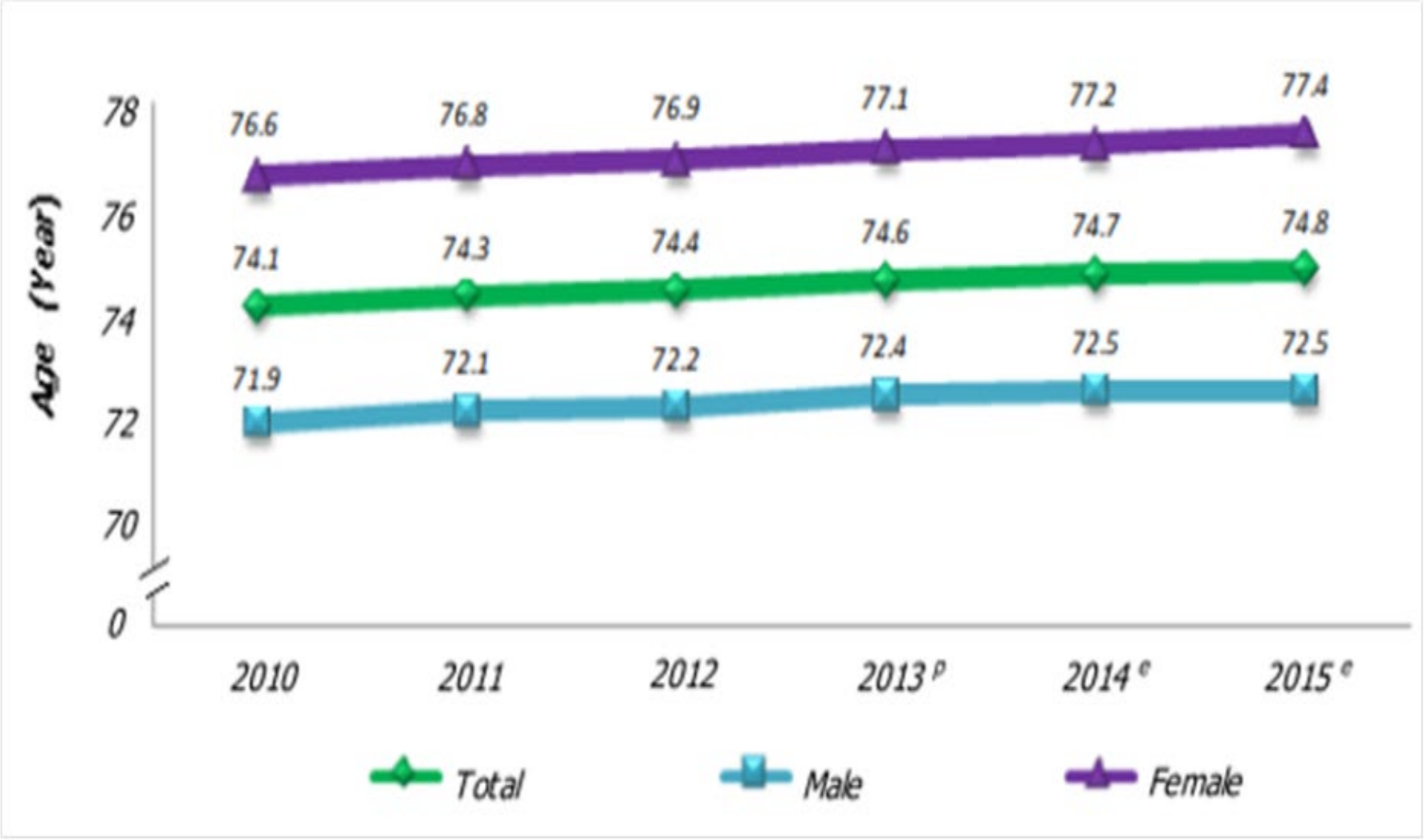
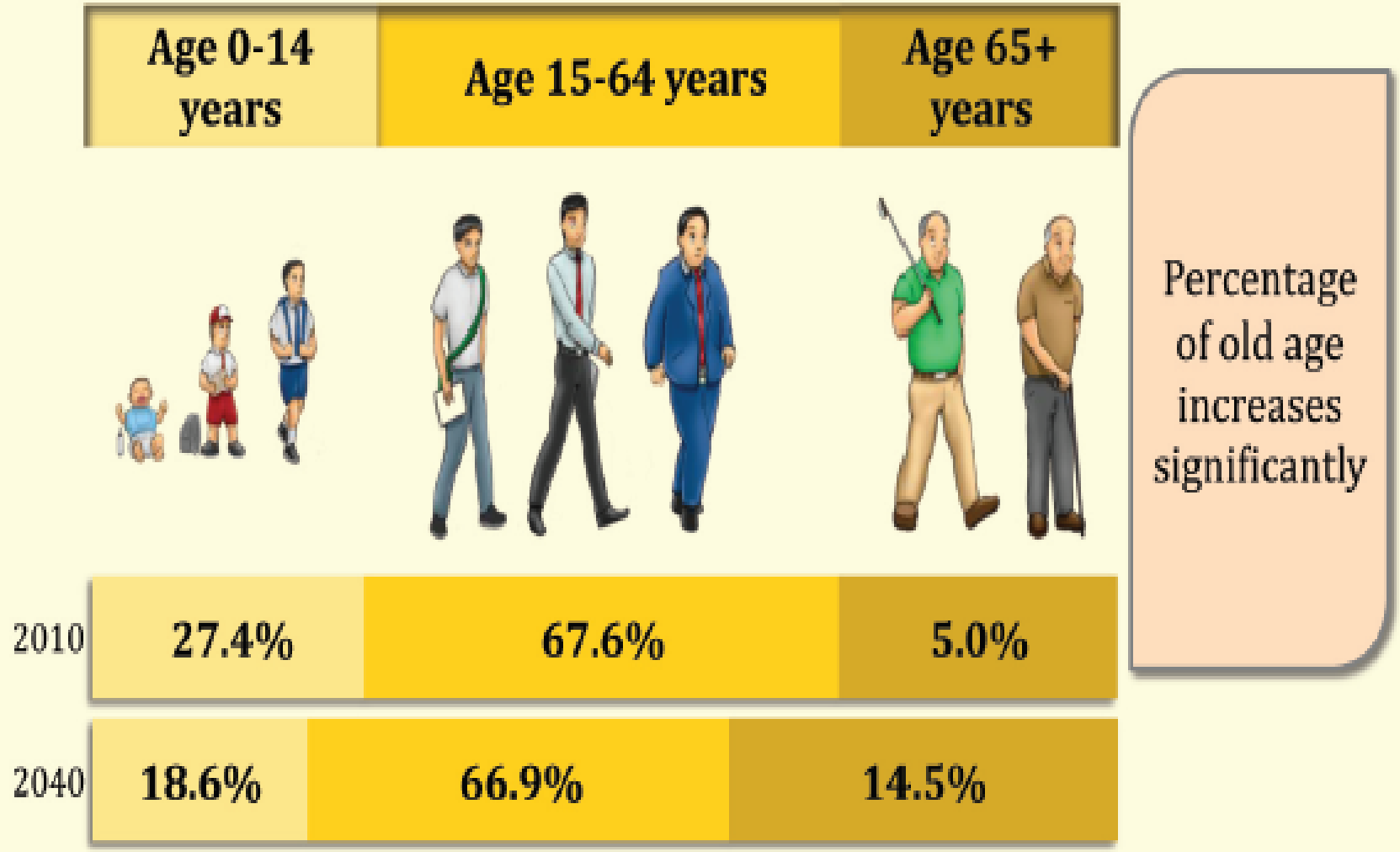
GERIATRICIAN AND PHYSICIAN
SUNWAY MEDICAL CENTRE PENANG
11.3.2023

Chart 1: Life expectancy at birth, Malaysia, 2010-2015





Source : Department of Statistics Malaysia. 2016.

NORMAL AGING?

Changes with ageing

CNS
- Neuronal loss
- Cochlear degeneration
- Increased lens rigidity
- Lens opacification
- Anterior horn cell loss
- Dorsal column loss
- Slowed reaction times

Respiratory system
- Reduced lung elasticity and alveolar support
- Increased chest wall rigidity
- Increased V/Q mismatch
- Reduced cough and ciliary action

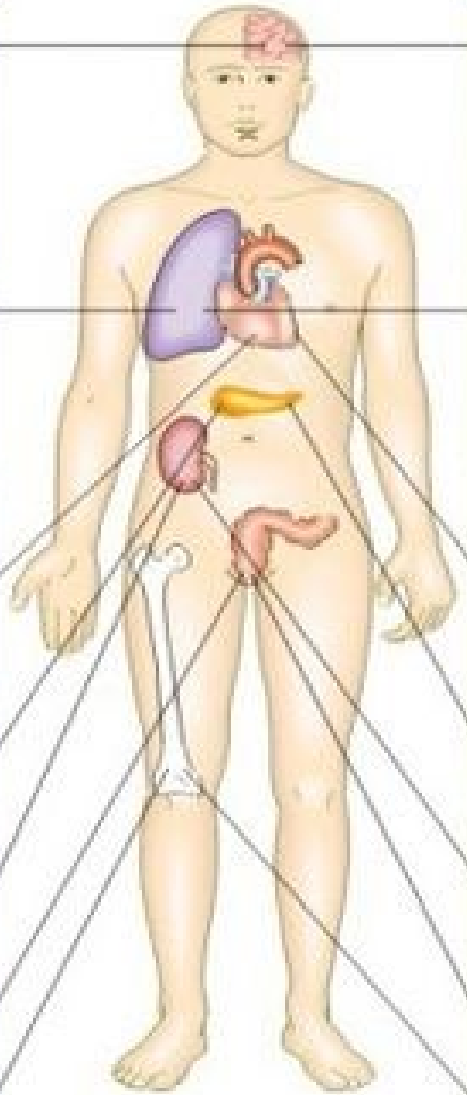
Cardiovascular system
- Reduced maximum heart rate
- Dilatation of aorta
- Reduced elasticity of conduit/capacitance vessels
- Reduced number of pacing myocytes in sinoatrial node

Endocrine system
- Deterioration in pancreatic β-cell function

Renal system
- Loss of nephrons
- Reduced glomerular filtration rate
- Reduced tubular function

Gastrointestinal system
- Reduced motility

Bones
- Reduced bone mineral density



Clinical consequences

CNS
- Increased risk of delirium
- Presbyacusis/high-tone hearing loss
- Presbyopia/abnormal near vision
- Cataract
- Muscle weakness and wasting
- Reduced position and vibration sense
- Increased risk of falls

Respiratory system
- Reduced vital capacity and peak expiratory flow
- Increased residual volume
- Reduced inspiratory reserve volume
- Reduced arterial oxygen saturation
- Increased risk of infection

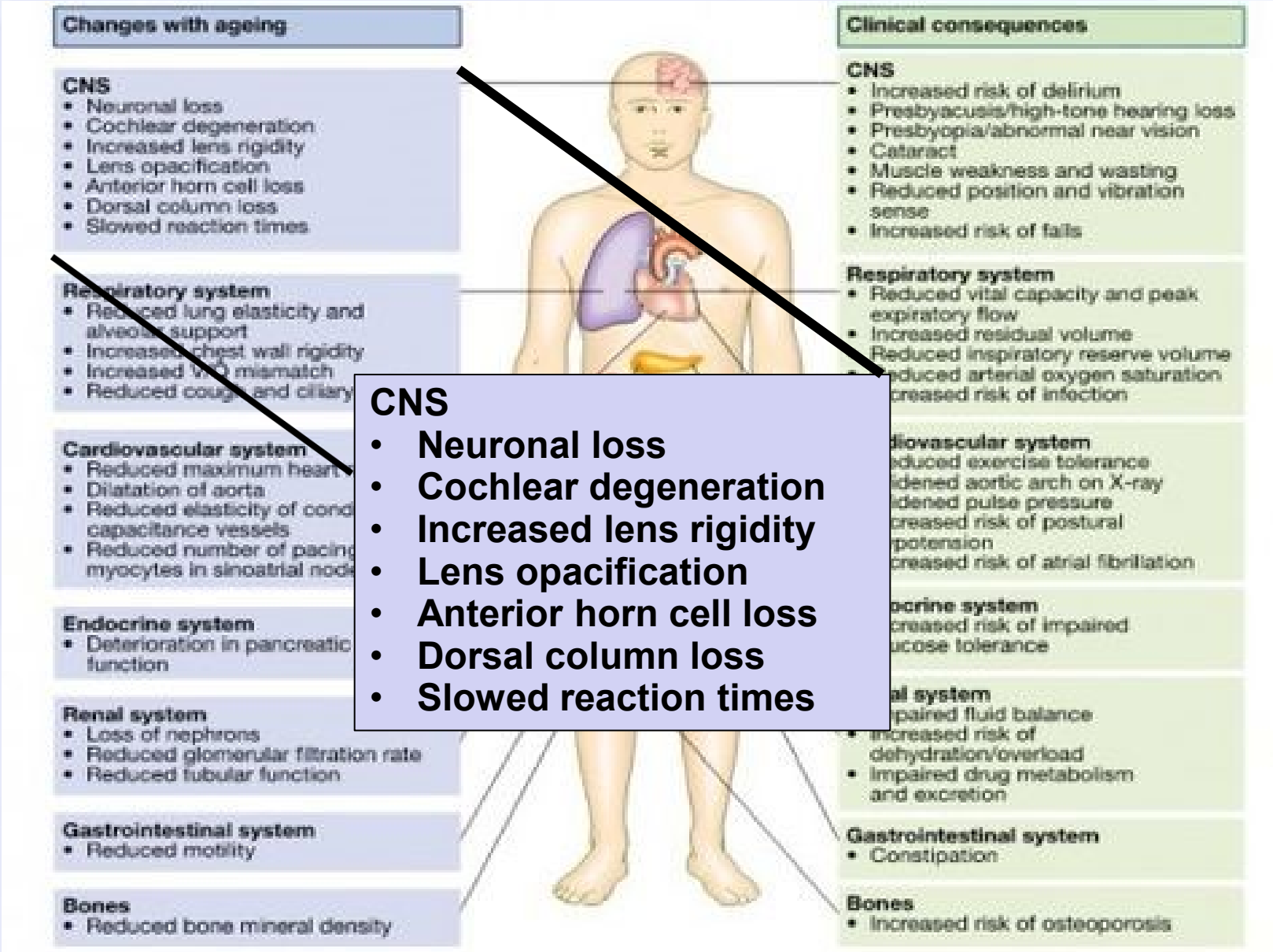
Cardiovascular system
- Reduced exercise tolerance
- Widened aortic arch on X-ray
- Widened pulse pressure
- Increased risk of postural hypotension
- Increased risk of atrial fibrillation

Endocrine system
- Increased risk of impaired glucose tolerance

Renal system
- Impaired fluid balance
- Increased risk of dehydration/overload
- Impaired drug metabolism and excretion

Gastrointestinal system
- Constipation

Bones
- Increased risk of osteoporosis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AGE RELATED CHANGES

RSS/Rotterdam Scan Study

Normal brain aging

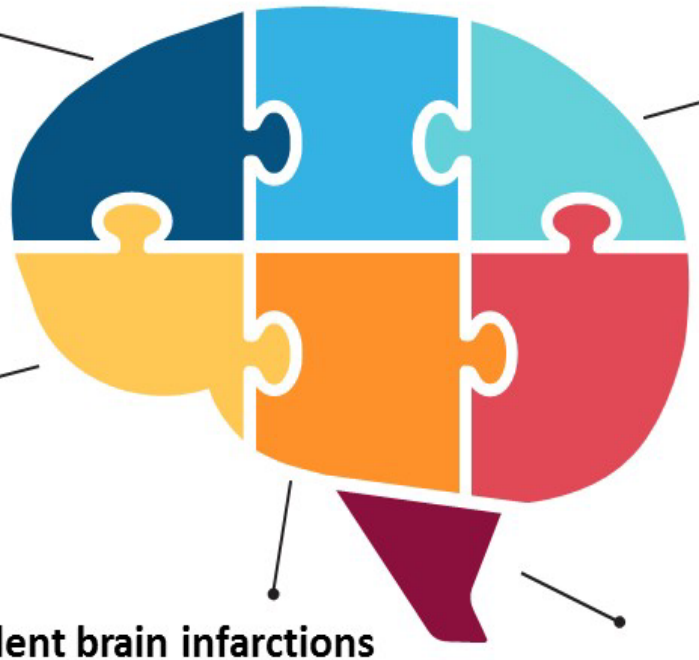
EUROPEAN CONGRESS OF RADIOLOGY ECR2020

Enlarged perivascular spaces

- Locations: inferior basal ganglia, centrum semiovale, mesencephalon, subinsular region.

Brain atrophy

- Mild and symmetric ventricular enlargement with proportionate prominence of the subaracnoid spaces **= ex-vacuum hydrocephalus**.
- Thinning of the grey matter and decreased white matter volume.
- **Volumetry** by image analysis algorithms for tissue and structure quantification aid in distinguishing normal from abnormal atrophy.



Cerebral microbleeds

- Hypointense on T2* or SWI (susceptibility-weighted images)
- Differential with Ca^{2+} or deoxygenated blood in veins.
- Other causes for microbleeds: RT, head trauma.

Iron deposition

- Hypointense on T2* or SWI
- Locations: Globus pallidus, pars reticulata of substantia nigra, dentate nucleus, putamen.
- Caudate and thalamus rarely affected.

White matter hyperintensities

- On T2-wi or FLAIR. Hypodense on CT.
- Few, scattered nonconfluent or diffuse areas, bilateral. Locations: periventricular and centrum semiovale / subcortical WM.
- Thin, periventricular hyperintense rim around lateral ventricles or frontal horns.

Silent brain infarctions

- Lacunes, cortical microinfarcts, small cerebellar infarcts.
- "Silent" by definition = w/o clinical symptoms or subtle cognitive deficit.

Intracranial arterial Ca^{2+}

- On the intracranial part of the internal carotid artery (i.e. carotid siphon)

Clínica Universidad de Navarra

Source: https://epos.myesr.org/posterimage/esr/ecr2020/155555/mediagallery/884339

The Normal Aging Brain

- Volume decreases 7cm^3 per year after age 65
- Cerebral blood flow decreases 5-20%
- Neuronal loss most prominent in the cerebellum and cerebral cortex
- Accumulation of lipofuscin and neurofibrillary tangles/senile plaques

The Normal Aging Brain

- Episodic and working memory, executive functions – affected
- Processing speed decreases
- Attention span decrease
- Problem solving, reasoning about unfamiliar things, processing and learning new information, and attending to and manipulating one's environment – decline
- Language abilities(verbal fluency and the ability to name objects) – decline(after 70)

The Normal Aging Brain

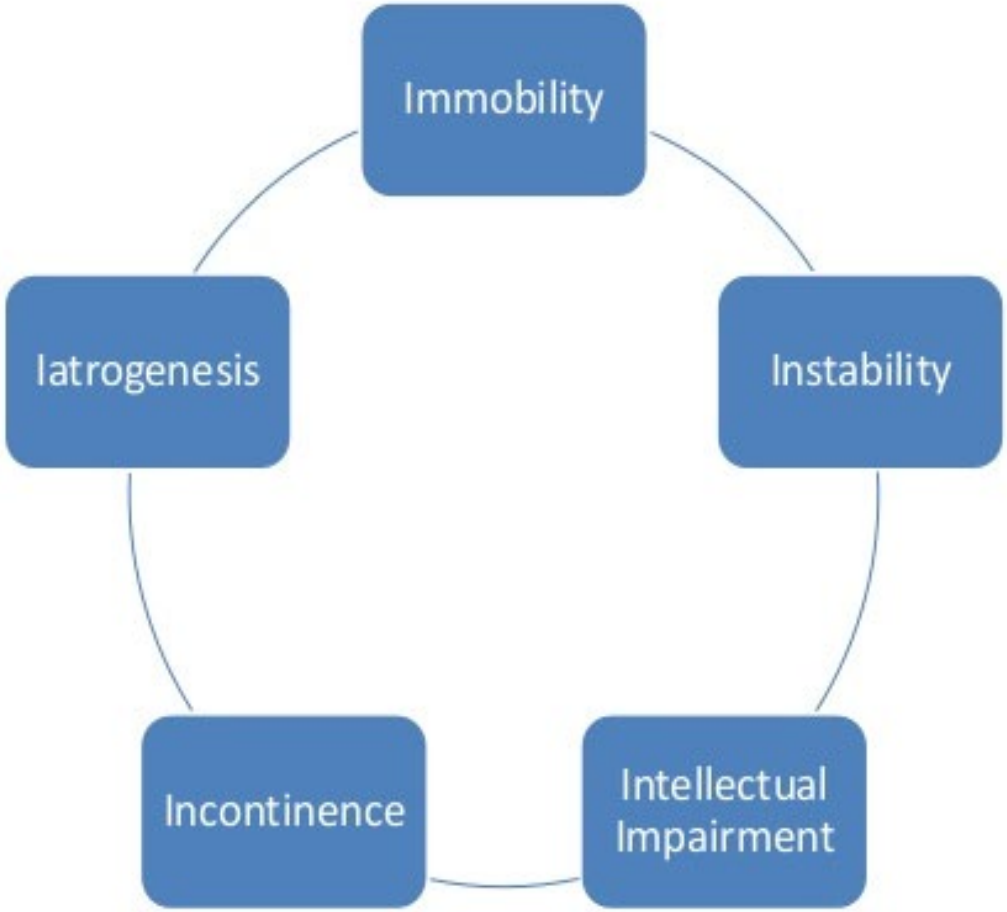
- Skills, ability, and knowledge that are overlearned, well-practiced and familiar – stable
- Ability to recognize familiar objects and faces – stable

In Reality…

- The successfully aging 95yo individual remains able to function in society, the workplace, and/or at home.

- Few real-life situations require performance at maximum levels, especially with time pressure or acquired knowledge.

GIANTS OF GERIATRICS (Isaacs 1970)



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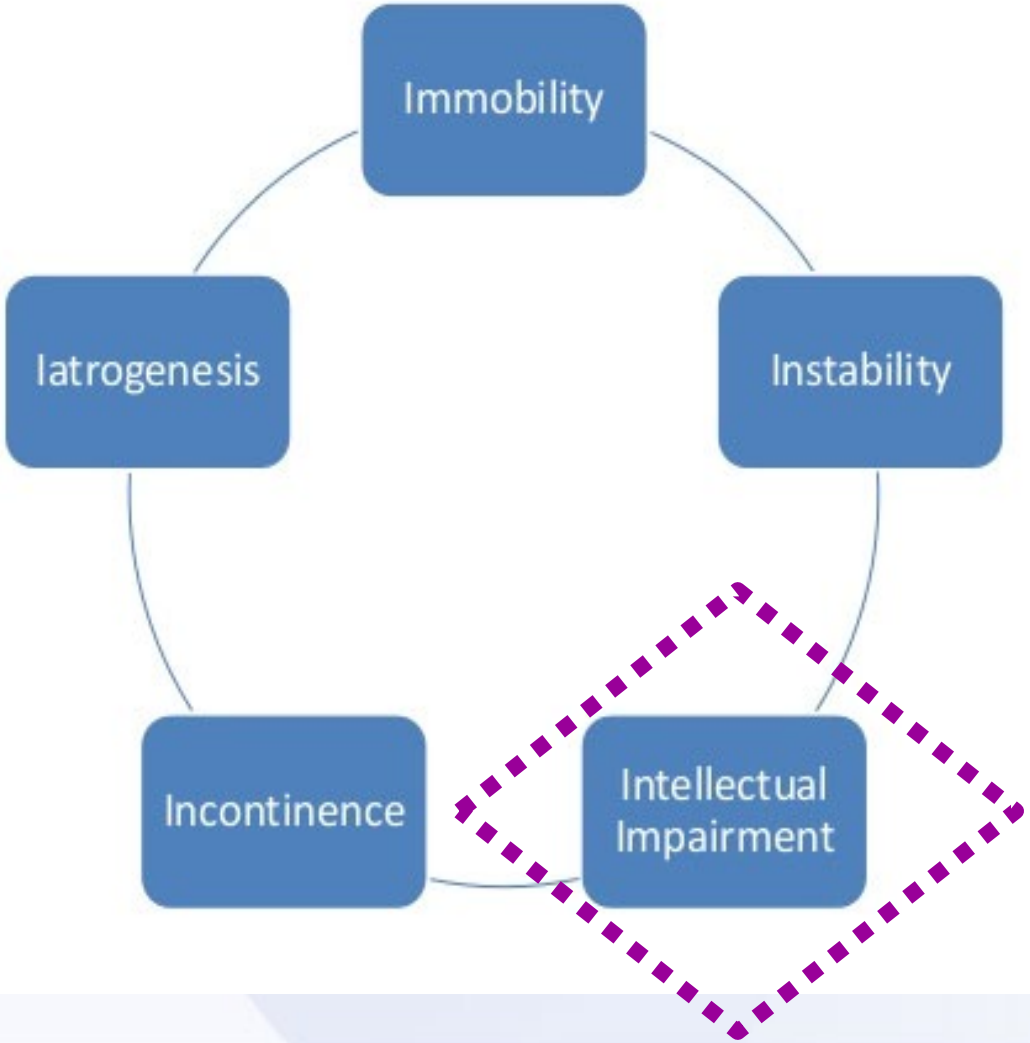

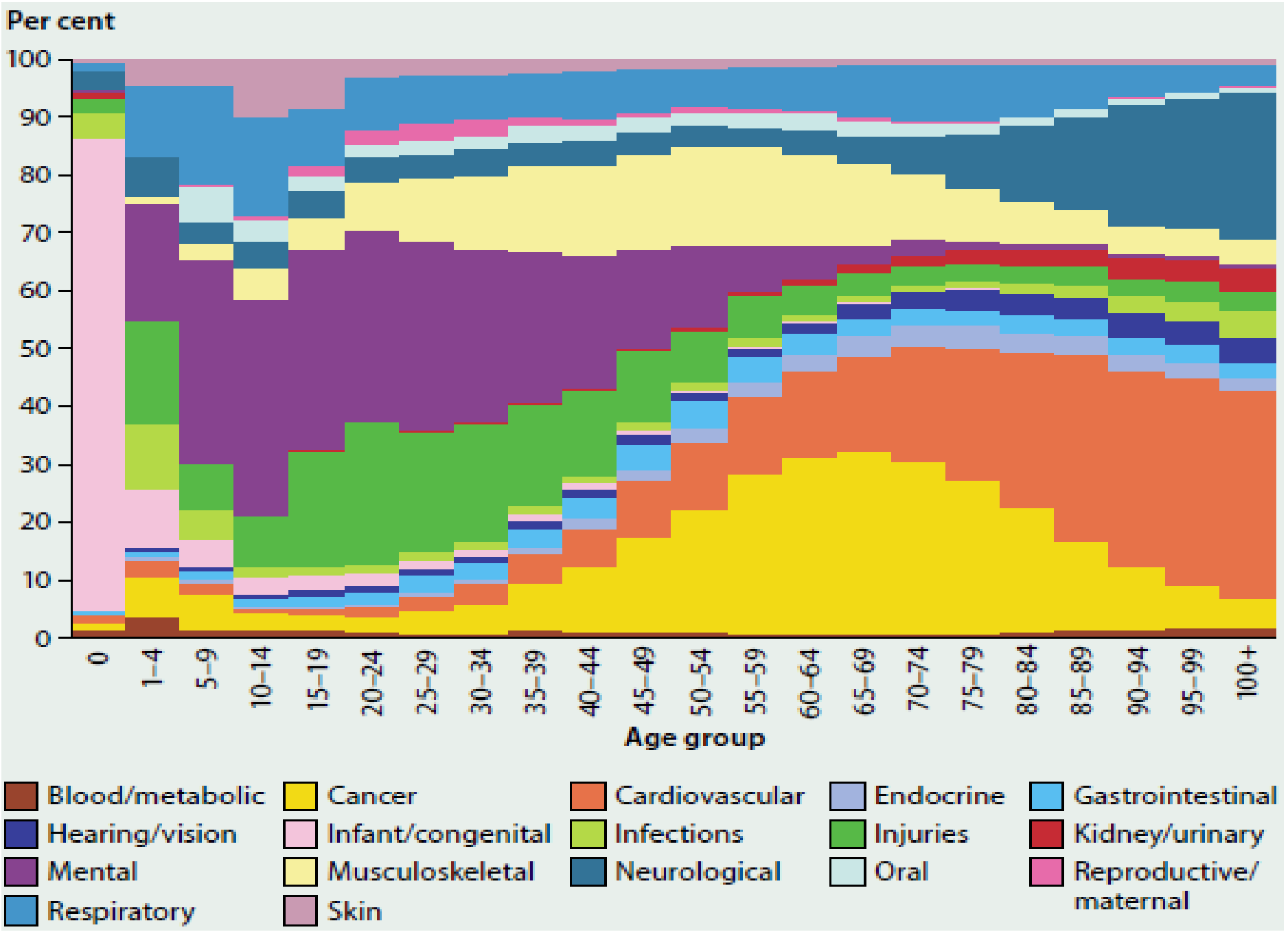

Source: Australian Burden of Disease Study 2011

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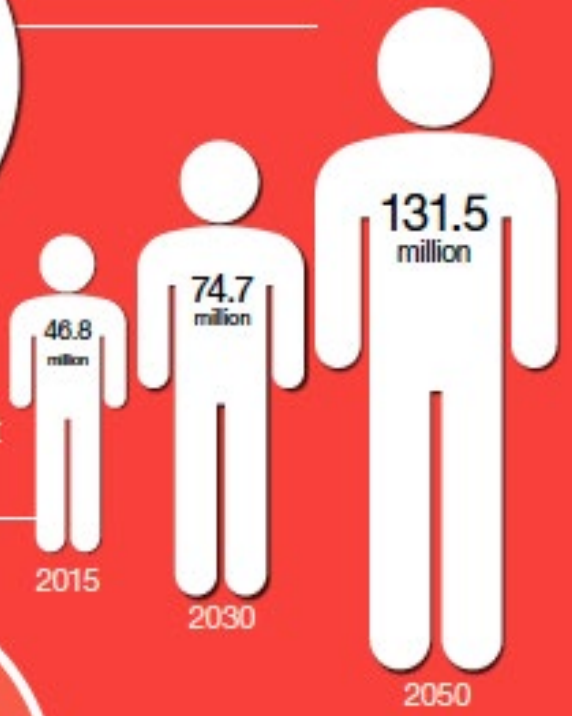
INFOGRAPHIC

The global impact of dementia

Around the world, there will be 9.9 million new cases of dementia in 2015,

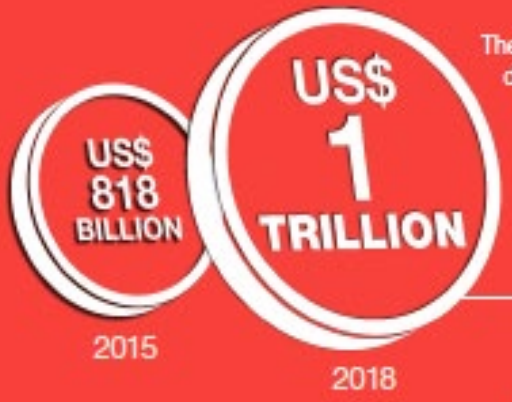
one every 3 seconds



46.8 million people worldwide are living with dementia in 2015.

This number will almost double every 20 years.

Much of the increase will take place in low and middle income countries (LMICs): in 2015, 58% of all people with dementia live in LMICs, rising to 63% in 2030 and 68% in 2050.



The total estimated worldwide cost of dementia in 2015 is US$ 818 billion. By 2018, dementia will become a trillion dollar disease, rising to

US$ 2 trillion by 2030

If global dementia care were a country, it would be the

18th largest economy

in the world exceeding the market values of companies such as Apple and Google

(source: Forbes 2015 ranking)

This map shows the estimated number of people living with dementia in each world region in 2015.

We must now involve more countries and regions in the global action on dementia.

CAN WE PREVENT DEMENTIA?

Genetic Risk Factors

- Early onset – *autosomal dominant* inheritance

: amyloid precursor protein(*APP*), presenilin 1(*PSEN1*), presenilin 2(*PSEN2*).

- Late onset – more complex

: *APOE* – may be modified by gender, race and vascular risk factors

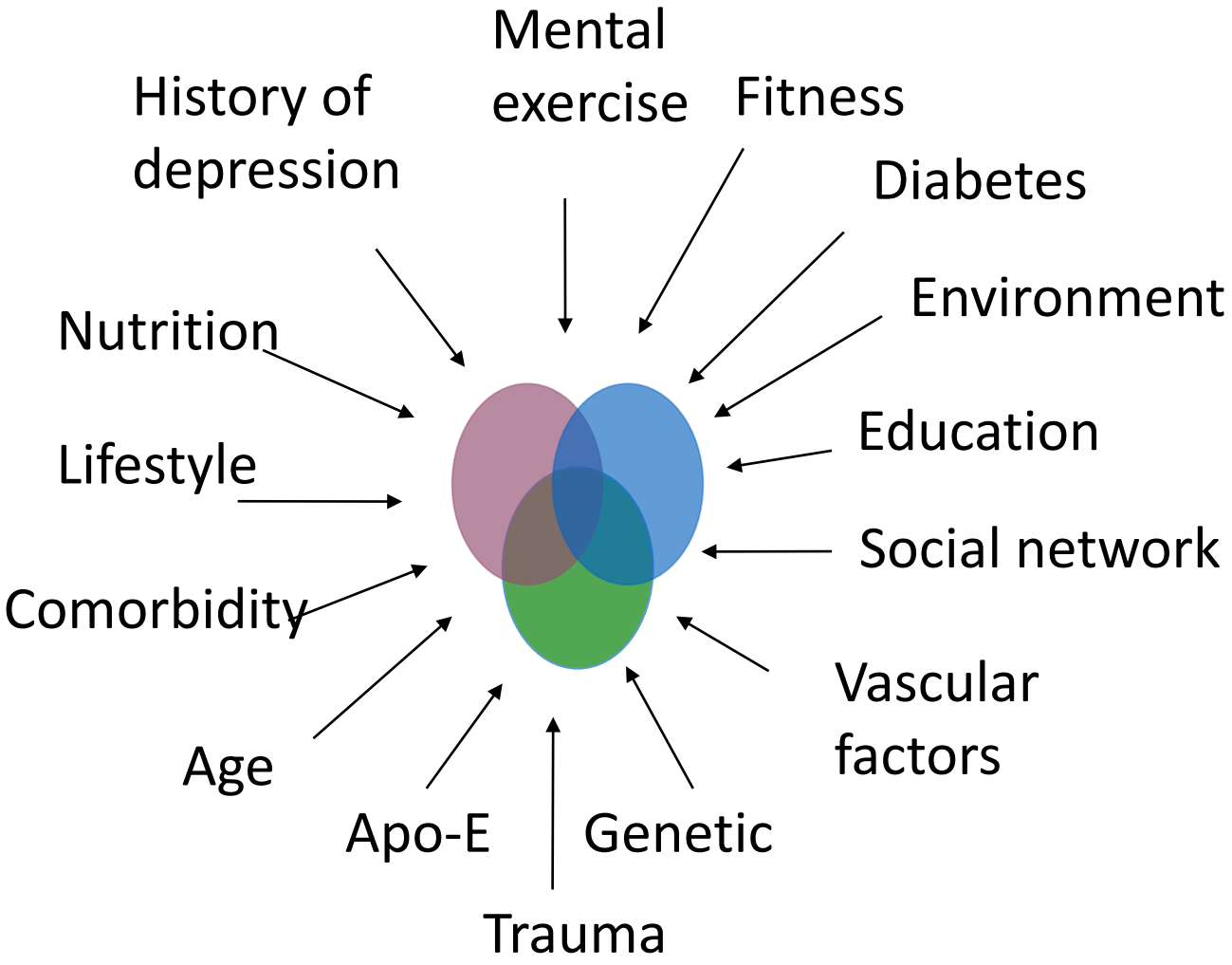
- Family history -

1st degree relative -10-30% increased risk

*similar risk if patient developed late (85yo or older)

≥2 sibilings – 3x increased risk

RISK FACTORS FOR A DEMENTIA

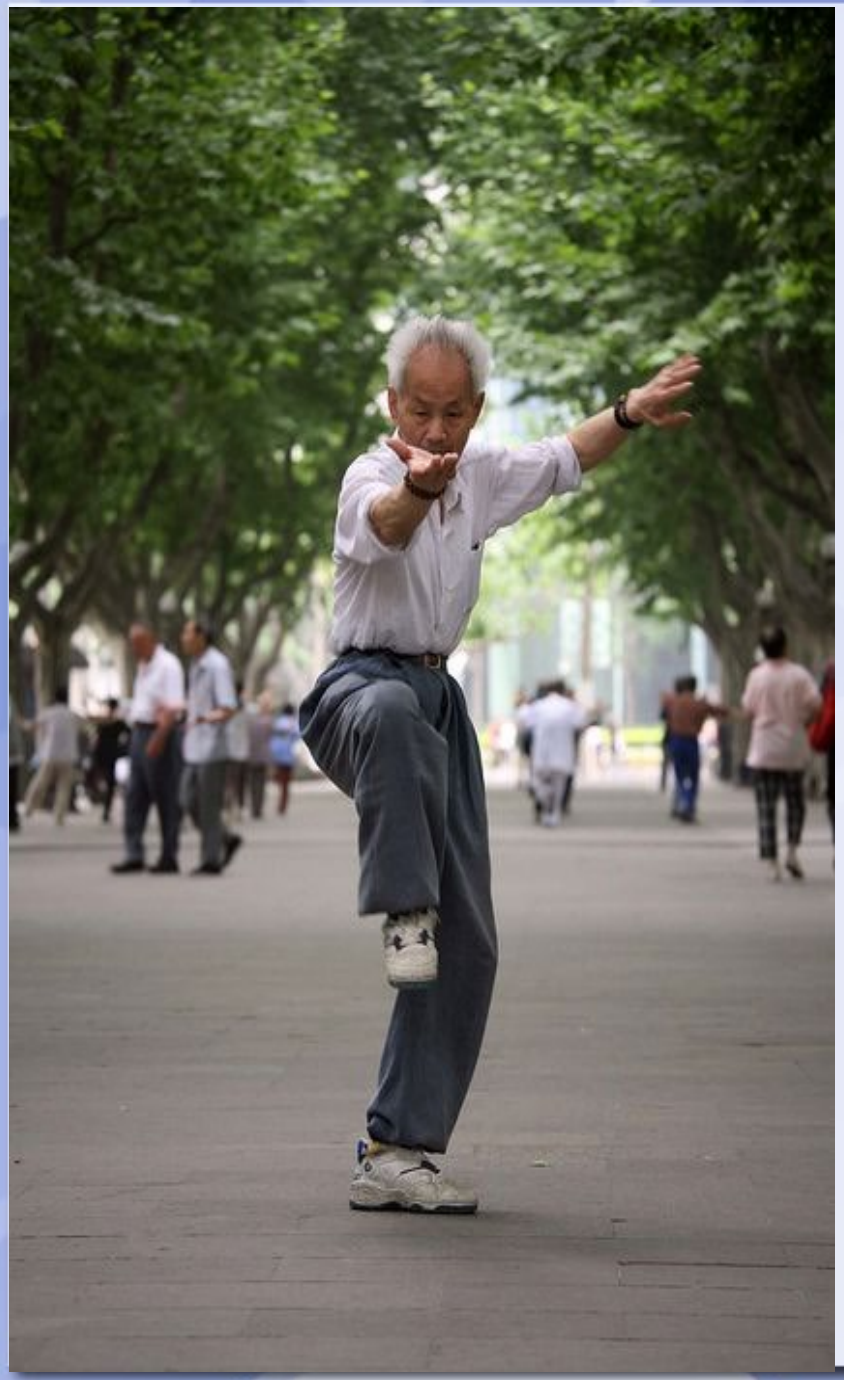


LIFESTYLE

BMI AND WEIGHT MANAGEMENT

- Adults aged <65 years should maintain or lose weight through an appropriate balance of physical activity, caloric intake and formal behavioural programmes when indicated to maintain/achieve a BMI between 18.5 and 24.9kg/m^2
- Adults aged >65 years should not be too skinny
- Adults aged >65 years with a trend of weight loss should be closely monitored for their cognitive status

Source: Yu J-T, Xu W, Tan C-C, et al. J Neurol Neurosurg Psychiatry 2020;0:1-9.



PHYSICAL EXERCISE

- Individuals, especially those aged ≥65 years, should stick to regular physical exercise

Source: Yu J-T, Xu W, Tan C-C, et al. J Neurol Neurosurg Psychiatry 2020;0:1-9.

COGNITIVE ACTIVITY

- Mentally stimulating activities should be encouraged, such as reading, playing chess, etc.

Source: Yu J-T, Xu W, Tan C-C, et al. J Neurol Neurosurg Psychiatry 2020;0:1-9.

SMOKING

- People should not smoke and should avoid environmental tobacco smoke. Counselling, nicotine replacement and other pharmacotherapy as indicated should be provided in conjunction with a behavioural programme or formal smoking cessation programme.

Source: Yu J-T, Xu W, Tan C-C, et al. J Neurol Neurosurg Psychiatry 2020;0:1-9.

SLEEP

- Get sufficient and good quality sleep and consult a doctor or receive treatment when you have problem with sleep.

Source: Yu J-T, Xu W, Tan C-C, et al. J Neurol Neurosurg Psychiatry 2020;0:1-9.

COMORBIDITIES

DIABETES

- Stay away from diabetes via a healthier lifestyle and diabetic patients should be closely monitored for their cognitive decline.

Source: Yu J-T, Xu W, Tan C-C, et al. J Neurol Neurosurg Psychiatry 2020;0:1-9.

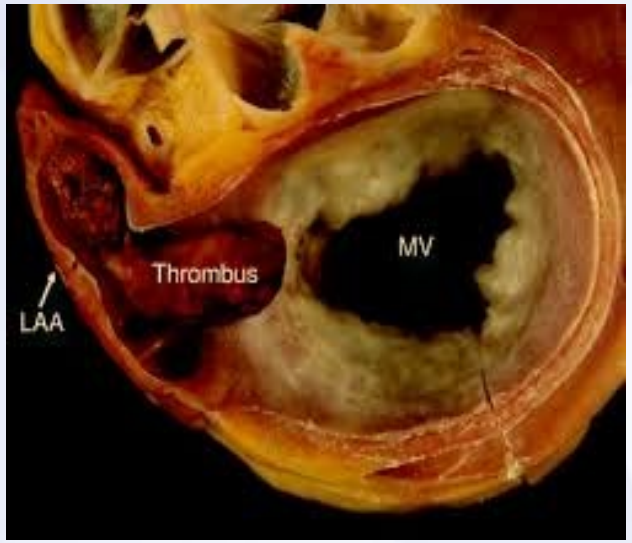
BLOOD PRESSURE

- Individuals aged <65 years should avoid hypertension via a healthier lifestyle.
- Individuals with orthostatic hypertension should be closely monitored for their cognition

Source: Yu J-T, Xu W, Tan C-C, et al. J Neurol Neurosurg Psychiatry 2020;0:1-9.

ATRIAL FIBRILLATION

- Maintain a good cardiovascular condition and manage atrial fibrillation using pharmaceuticals.



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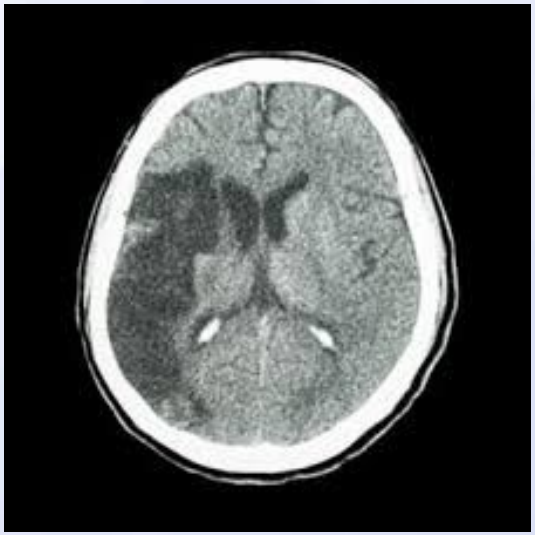


CEREBROVASCULAR DISEASE (CVD)

- Maintain a good condition of the cerebral vessels via a healthier lifestyle or medications to avoid atherosclerosis, low cerebral perfusion and any cerebrovascular disease. Individuals with stroke, especially cerebral microbleeding, should be carefully monitored for their cognitive change and take preventive measures as indicated to protect cognition.

Source: Yu J-T, Xu W, Tan C-C, et al. J Neurol Neurosurg Psychiatry 2020;0:1-9.

HEAD TRAUMA

- Protect your head from injuries.

Source: Yu J-T, Xu W, Tan C-C, et al. J Neurol Neurosurg Psychiatry 2020;0:1-9.

FRAILTY

- Stay healthy and strong in late life. Those with increasing frailty should be especially monitored for their cognition.

Source: Yu J-T, Xu W, Tan C-C, et al. J Neurol Neurosurg Psychiatry 2020;0:1-9.

DEPRESSION

- Maintain a good condition of mental health and closely keep an eye on the cognitive status for those with depressive symptoms.

Source: Yu J-T, Xu W, Tan C-C, et al. J Neurol Neurosurg Psychiatry 2020;0:1-9.

STRESS

- Relax your mind and avoid daily stress.

Source: Yu J-T, Xu W, Tan C-C, et al. J Neurol Neurosurg Psychiatry 2020;0:1-9.

OTHER DOMAINS

- **EDUCATION**

Receive as much education as possible in early life

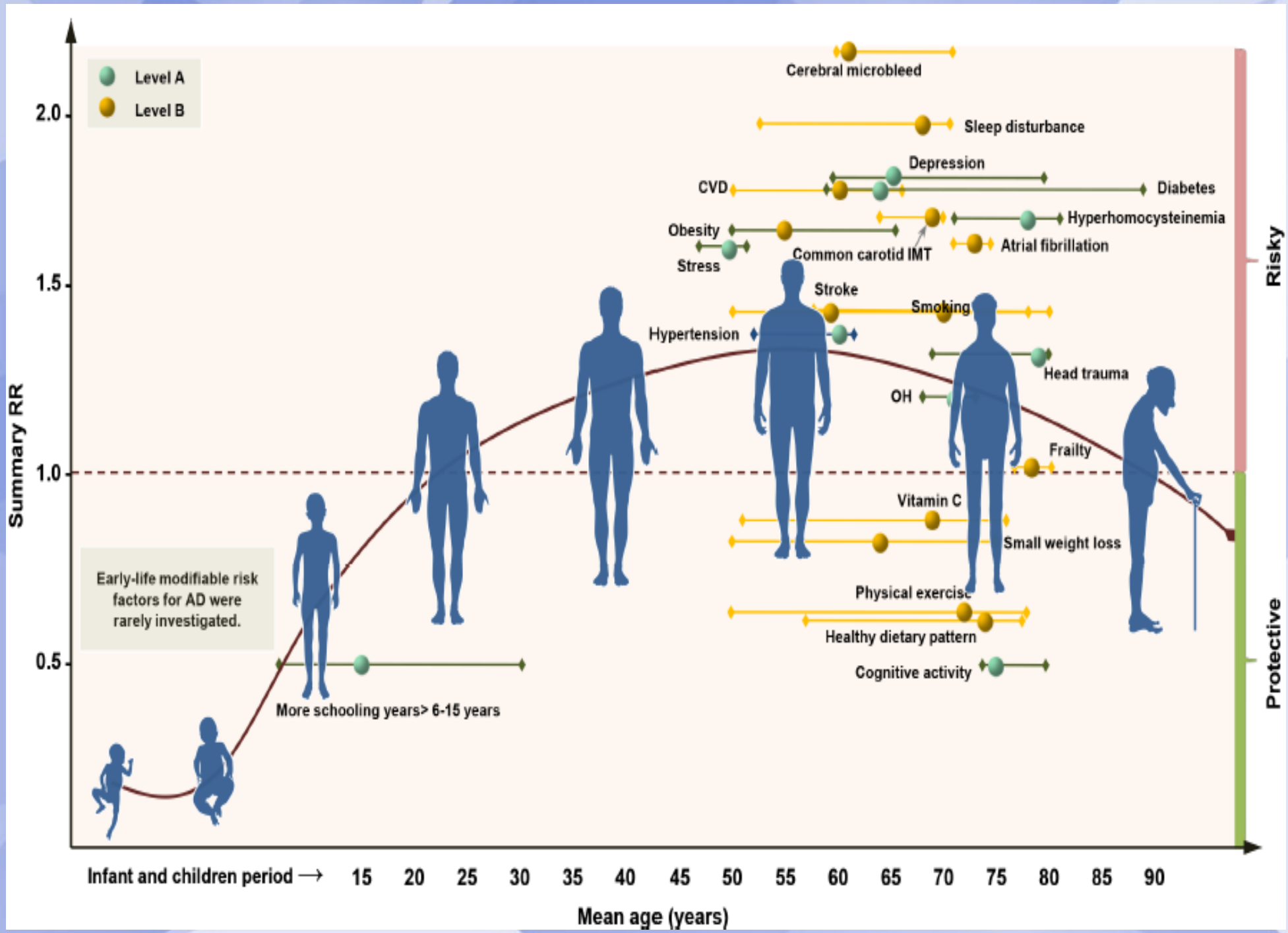
- **HYPERHOMOCYSTEINAEMIA**

Have a regular blood examination for homocysteine level. Individuals with hyperhomocysteinaemia should be treated with vitamin B and/or folic acid and followed with a focus on cognition.

- **VITAMIN C**

Vitamin C in the diet or taken as supplements might help.

Source: Yu J-T, Xu W, Tan C-C, et al. J Neurol Neurosurg Psychiatry 2020;0:1-9.



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SUMMARY

- The normal aging brain involves structural changes as well as decline in certain cognitive domains
- However, in general, age related cognitive decline should not prevent the older person to function normally in society
- Dementia is an acquired loss of cognition in multiple cognitive domains sufficiently severe to affect social or occupational function.
- Prevention consists of targetting risk factors that are associated with risk of dementia.

Living with Dementia

Agree
Never Argue

Redirect
Never Reason

Distract
Never Shame

Reassure
Never Lecture

Reminisce
Never Say Remember

Repeat
Never say "I told you So"

Ask
Never Command

Ten Absolutes For Caregivers

Never argue, instead agree
Never reason, instead divert
Never shame, instead distract
Never lecture, instead reassure
Never say "remember," instead reminisce
Never say "I told you so," instead repeat, regroup
Never say "you can't," instead say "let's do this"
Never command or demand, instead ask or model
Never condescend, instead encourage and praise
Never force, instead reinforce

A friend passed this along from her Alzheimer's support group

www.incareofdad.com

THANk YOU