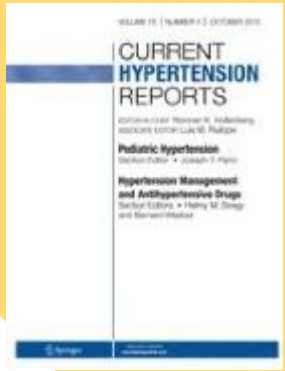
Συσχέτιση των επιπέδων αρτηριακής πίεσης και της γνωσιακής δυσλειτουργίας

Ιωάννης Γριβέας, MD, PhD

Νεφρολόγος

athens-NEPHROLOGY

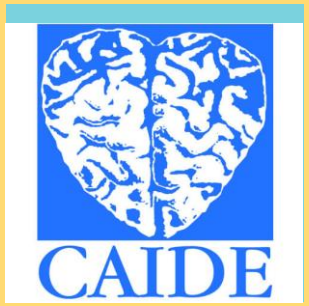
Manolio TA, Olson J, Longstreth WT. Hypertension and cognitive function: pathophysiologic effects of hypertension on the brain. Curr Hypertens Rep 2003;5:255-61



- Hypertension is a serious medical condition that significantly increases the risk of cardiovascular, cerebral, renal, and other organ dysfunction. Cognitive impairment is comparatively less considered to be an adverse effect of hypertension.
- However, accumulating evidence supports the causal role of hypertension in cognitive decline beyond its relationship with stroke

Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden ofhypertension: analysis ofworldwide data. Lancet 2005;365:217-23.

- Cognitive decline in old age is regarded as an irreversible condition due to degenerative changes, and in many cases, it reduces quality of life and is difficult to treat in diagnosed patients .
- However, this cognitive decline is affected by many other factors in addition to normal age-related degenerative changes, and hypertension is one of the most important risk factors because it can be controlled and modified and has a high prevalence

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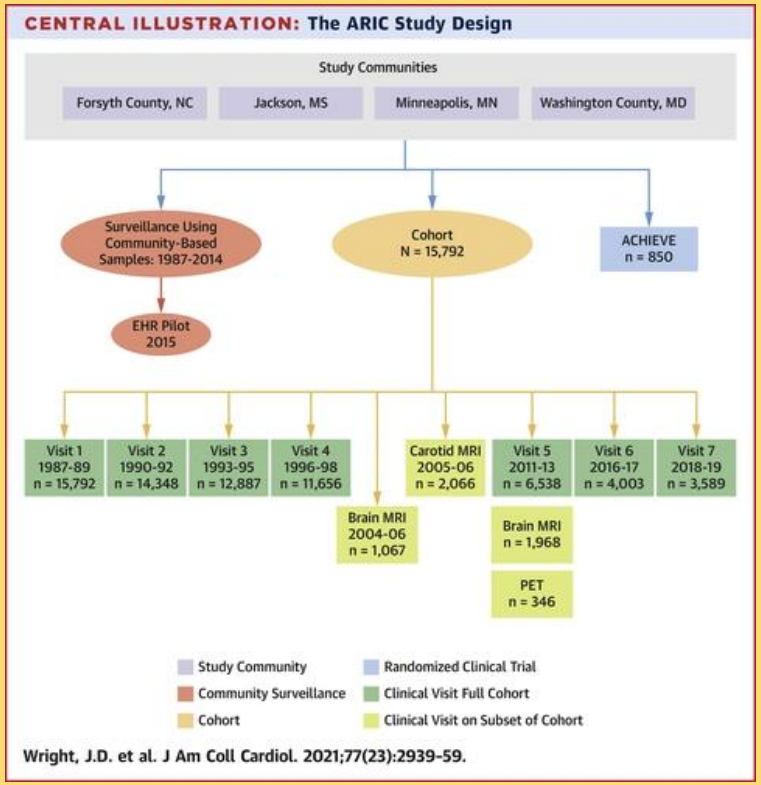
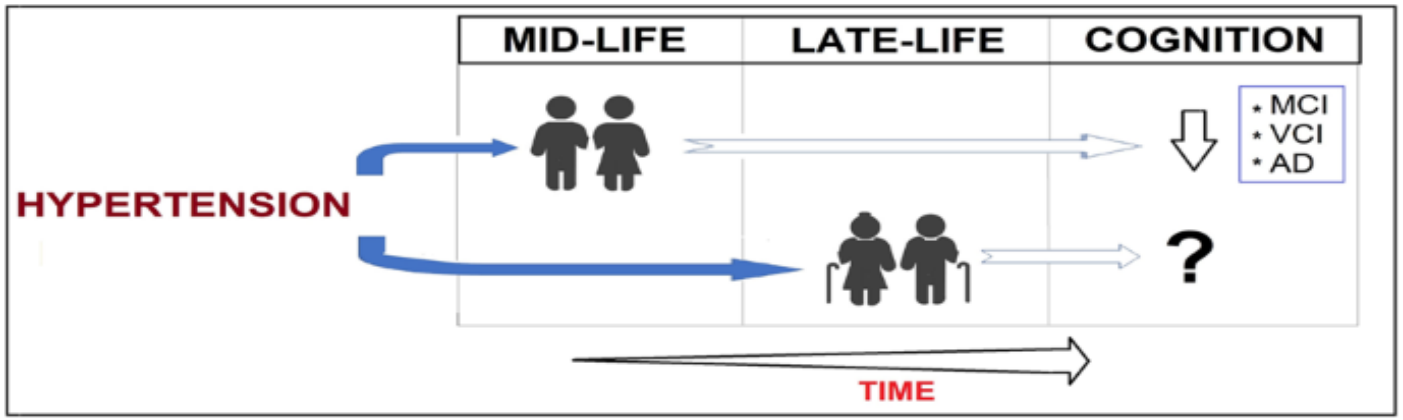
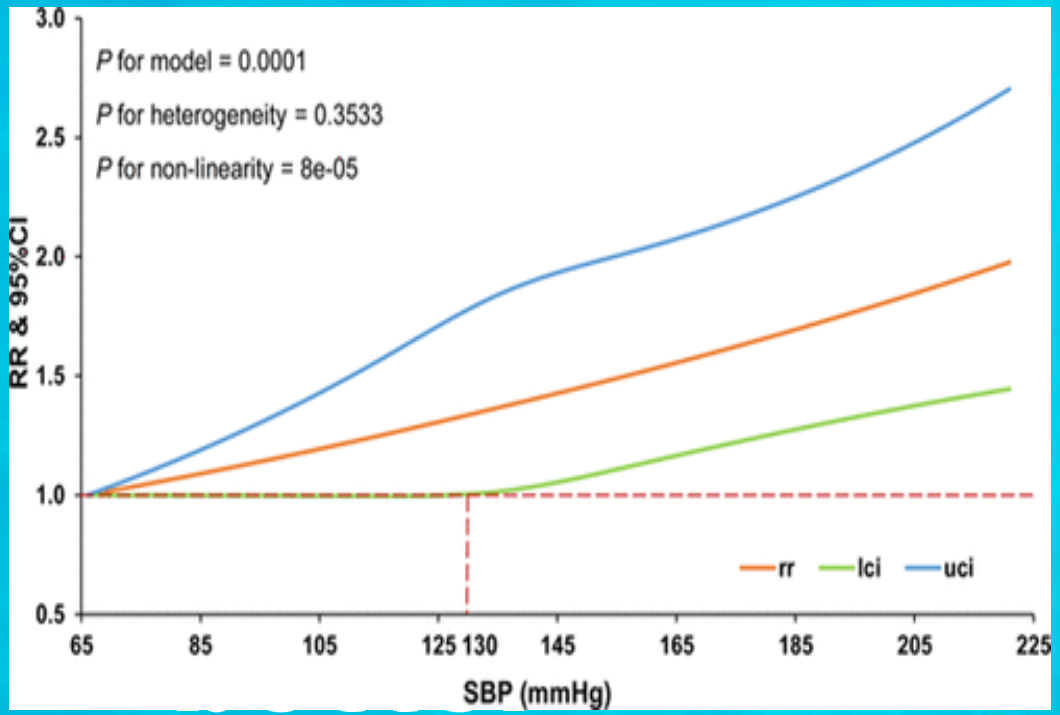
Midlife blood pressure, plasma β amyloid and the risk for Alzheimer's disease: the Honolulu Asia Aging Study



midlife hypertension is a significant predictor of both cognitive dysfunction and morphological changes in the brain





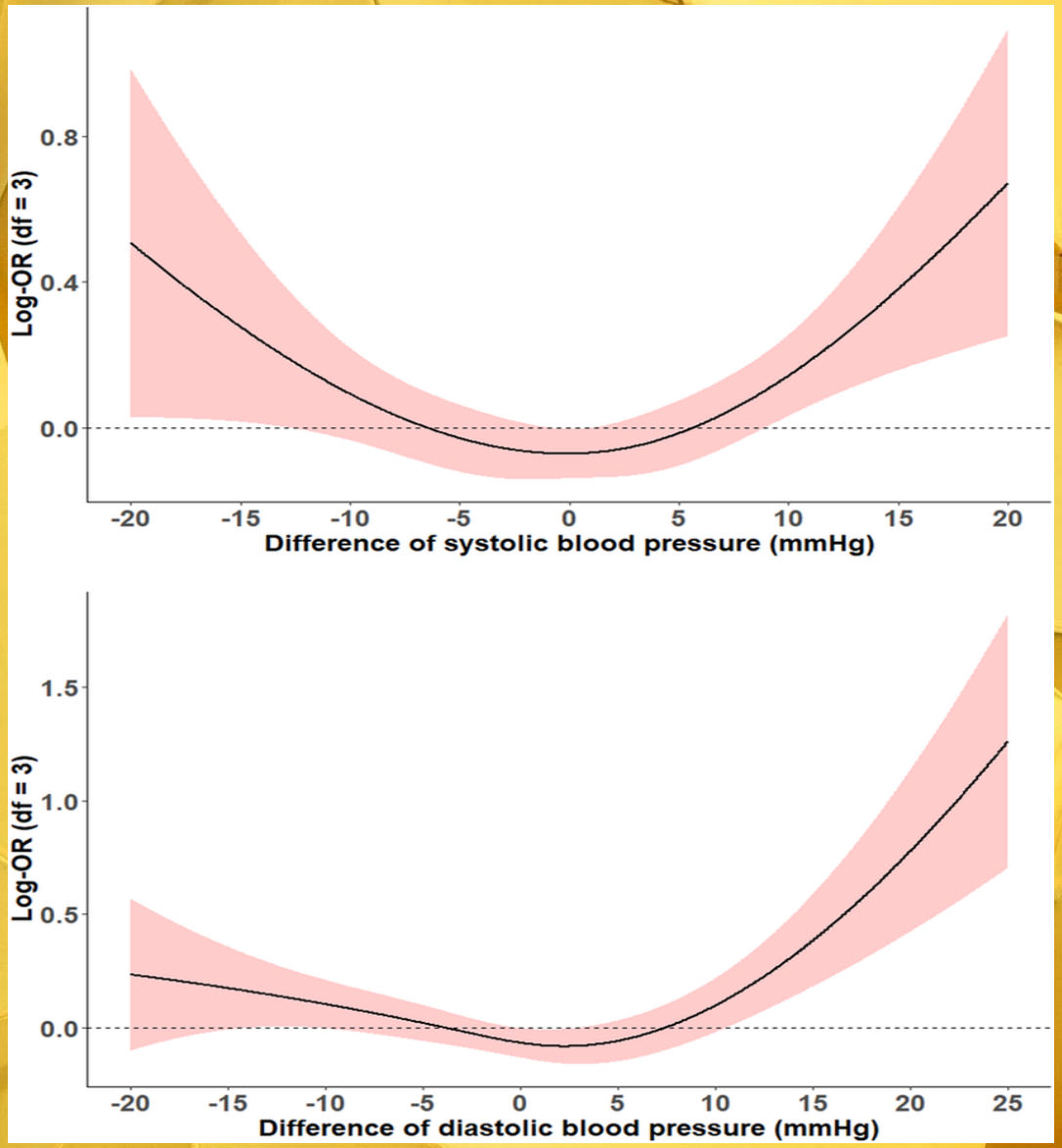
Hypertension

Blood Pressure and Risks of Cognitive Impairment and Dementia
A Systematic Review and Meta-Analysis of 209 Prospective Studies
Ya-Nan Ou, Chen-Chen Tan, Xue-Ning Shen, Wei Xu, Xiao-He Hou, Qiang Dong, Lan Tan and Jin-Tai Yu
26 May 2020, Hypertension. 2020;76:217-225

Kennelly SP, Lawlor BA, Kenny RA. Blood pressure and the risk for dementia: a double edged sword.

Ageing Res Rev 2009;8: 61-70

...to tell the story.



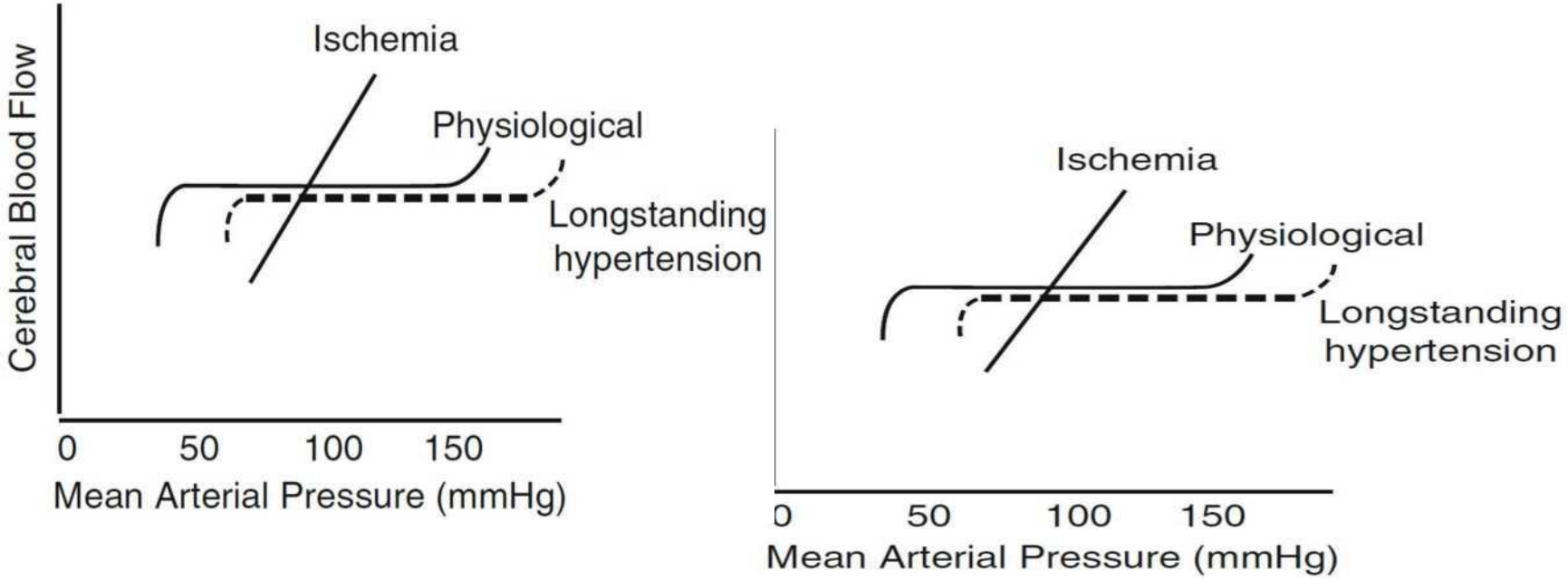


Figure 3. Auto-regulation of cerebral blood flow (CBF). In physiological conditions, CBF is auto-regulated over a wide range of perfusion pressures, from ~50 to 150 mmHg mean arterial pressure. This is shifted to the right in long-standing hypertension because of arteriolar hypertrophy. During acute ischemia, CBF becomes pressure passive, resulting in a marked reduction of CBF if the pressure drops too low. The threshold at which this becomes a problem will be higher for patients with long-standing hypertension, whose CBF auto-regulation is shifted to the right, because of arteriolar thickening. (Reproduced by permission Wolters Kluver from Spence, J.D. Treating hypertension in acute ischemic stroke. ***Hypertension*** 2009, ***54,*** 702-703) [***24***].

Did you know?

A man's best friend...

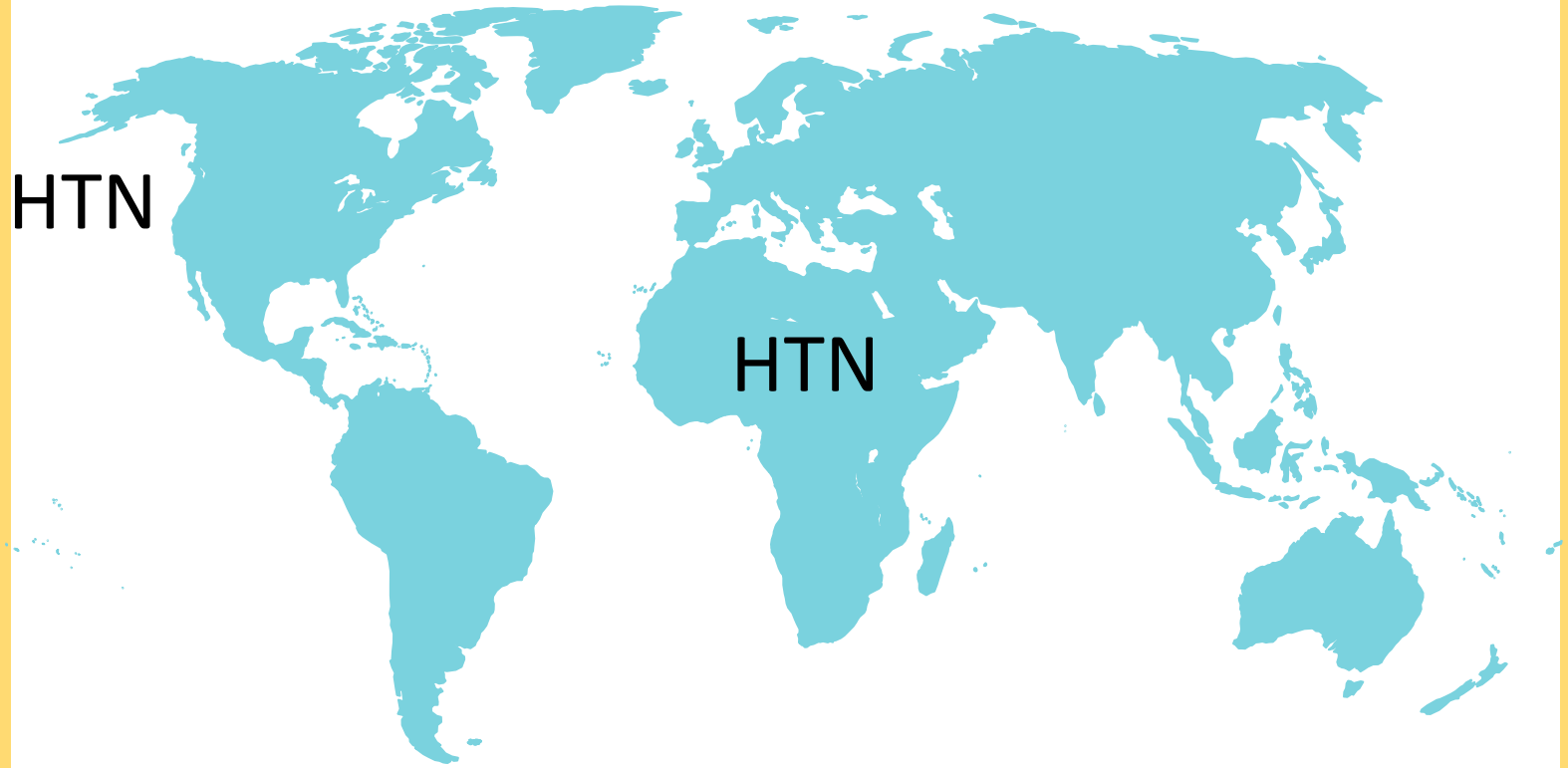
- Hypertension, especially in older adults, substantially increases the risk of Vascular cognitive impairment and exacerbates the pathogenesis of Alzheimer's disease

Hypertension-induced cognitive impairment: from pathophysiology to public health
Zoltan Ungvari1·2·3· Peter Toth'·2·4, Stefano Tarantini1·2·3· Calin I. Prodan 5·6,
*Farzaneh Sorond 7· Bela Merkely8 and Anna Csiszar1·9^*

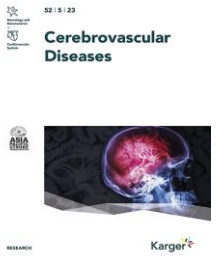
NATURE REVIEWS | N E P H R O L O G Y VOLUME 17 | O C TO B E R 2 0 2 1 | 6 3 9

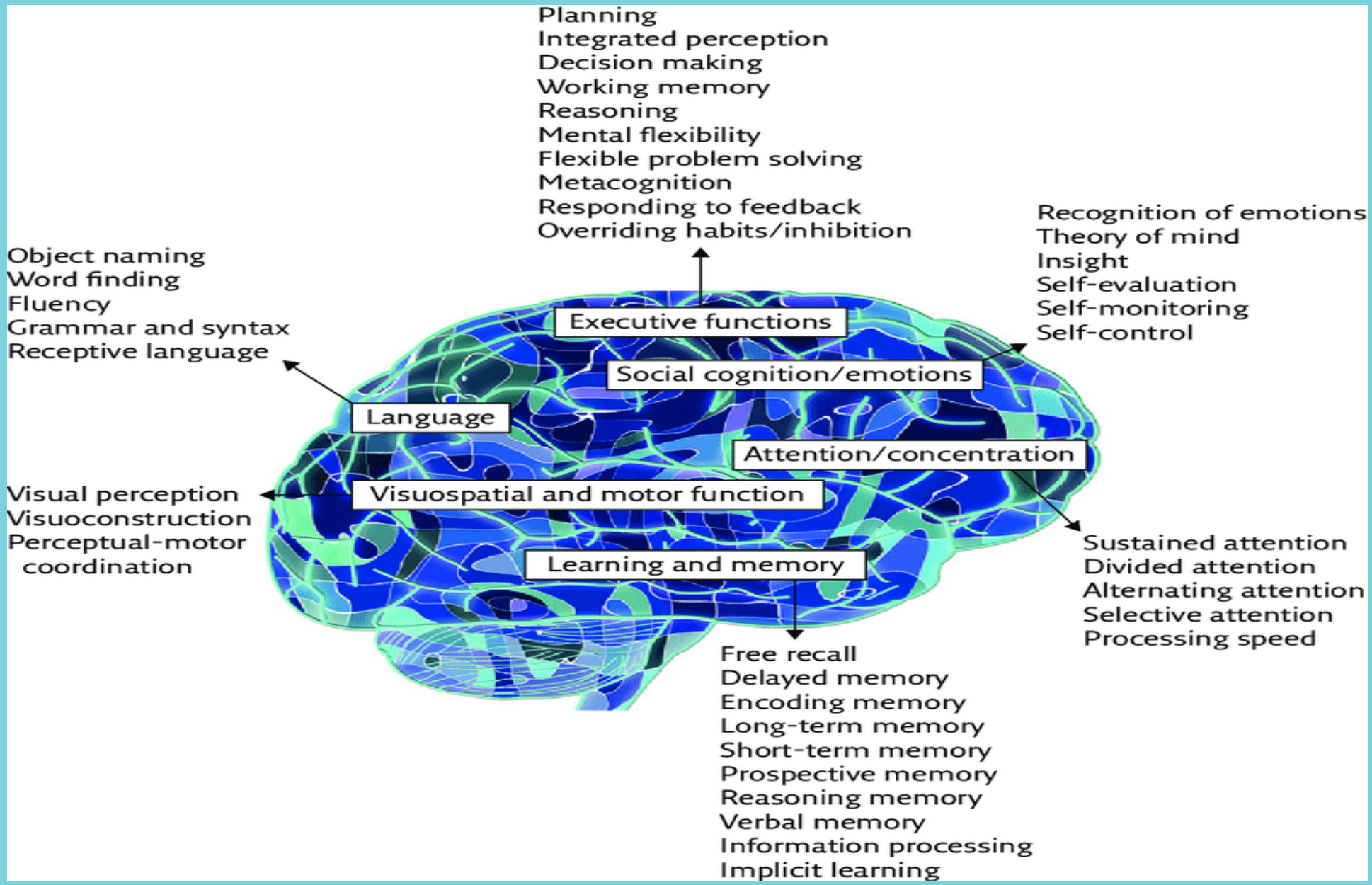
Mmm, can I fit in?...

- hypertension itself is a disease of ageing.
- ageing is associated with the generalized impairment of several homeostatic mechanisms, including regulation of cerebral blood flow and microvascular pressure.
- ageing is associated with impaired cellular stress resilience, which exacerbates cellular and molecular damage resulting from hypertension-induce haemodynamic and oxidative stress.
- several key cellular and molecular mechanisms, including oxidative stress, endothelial dysfunction, inflammatory processes and blood-brain barrier (BBB) dysfunction, are common to vascular ageing and hypertension-induced vascular dysfunction and end organ damage.

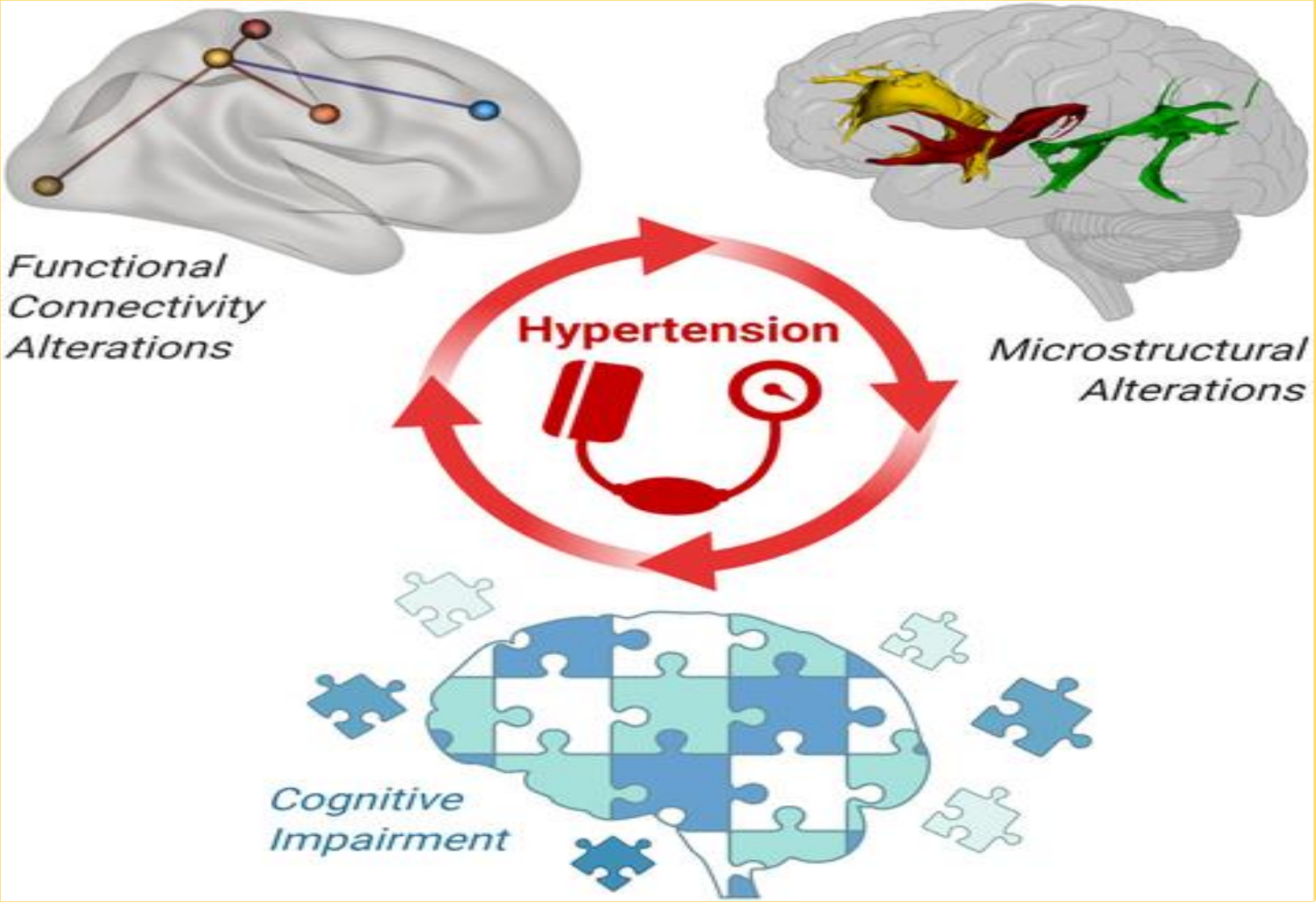


The factors that underlie racial disparities in hypertension and hypertension-related diseases are likely to be related to social determinants of health, including education, social support, family income, employment and access to health services, which lead to differences in factors, including hypertension awareness, access to treatment, medication adherence and modifiable lifestyle factors includingphysical activity, smoking, alcohol consumption and dietary habits such as sodium and potassium intake.





Desmond DW. Cognition and white matter lesions. Cerebro- vasc Dis 2002;13(Suppl 2):53-7



Blood Pressure and Risks of Cognitive Impairment and Dementia
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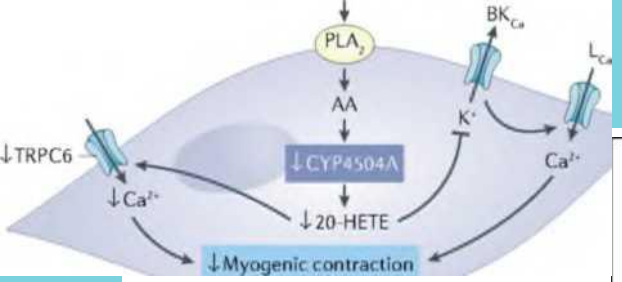
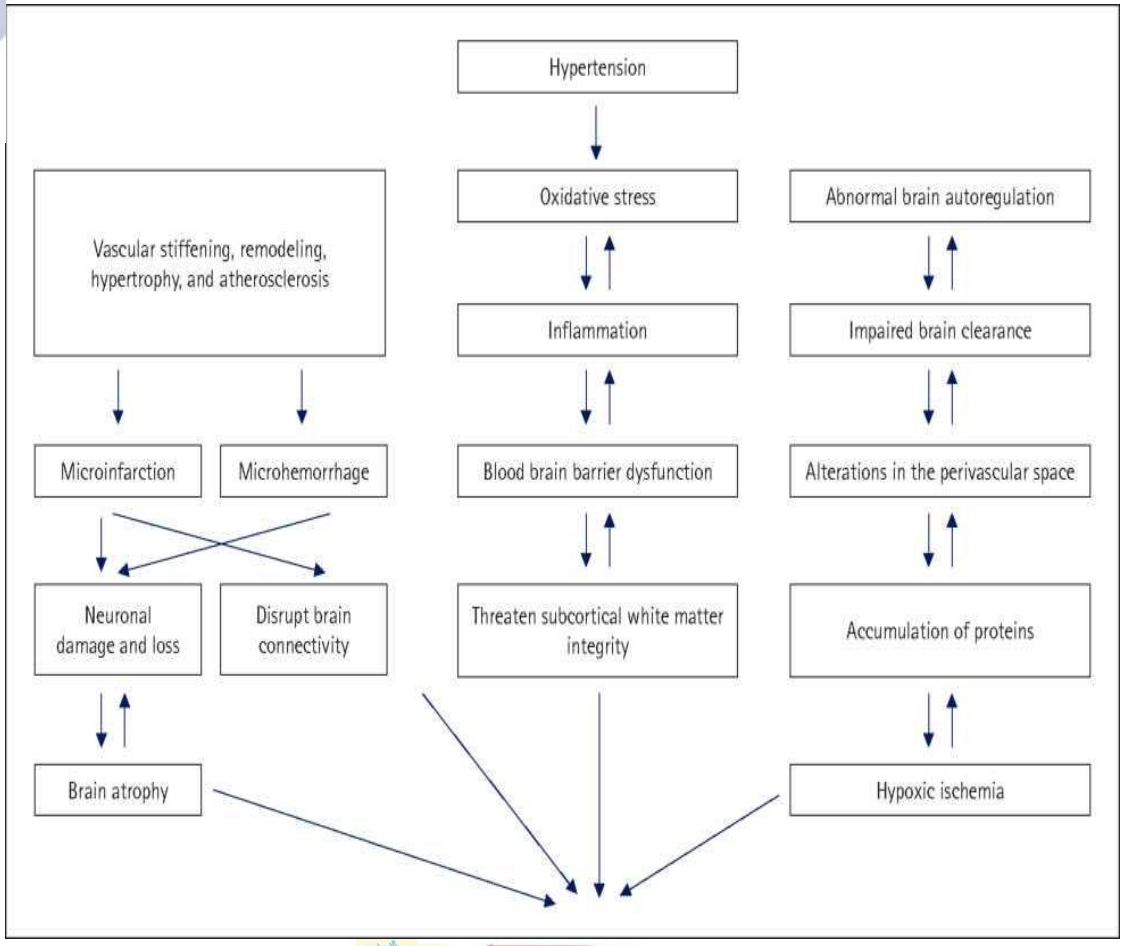
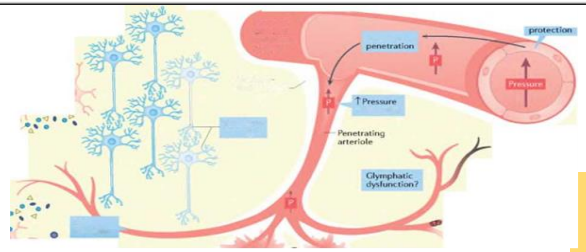






Hypertension and cognitive dysfunction: a narrative review

Eun-Jin Cheon
Department of Psychiatry, Yeungnam University College of Medicine, Daegu, Korea

Hypertension

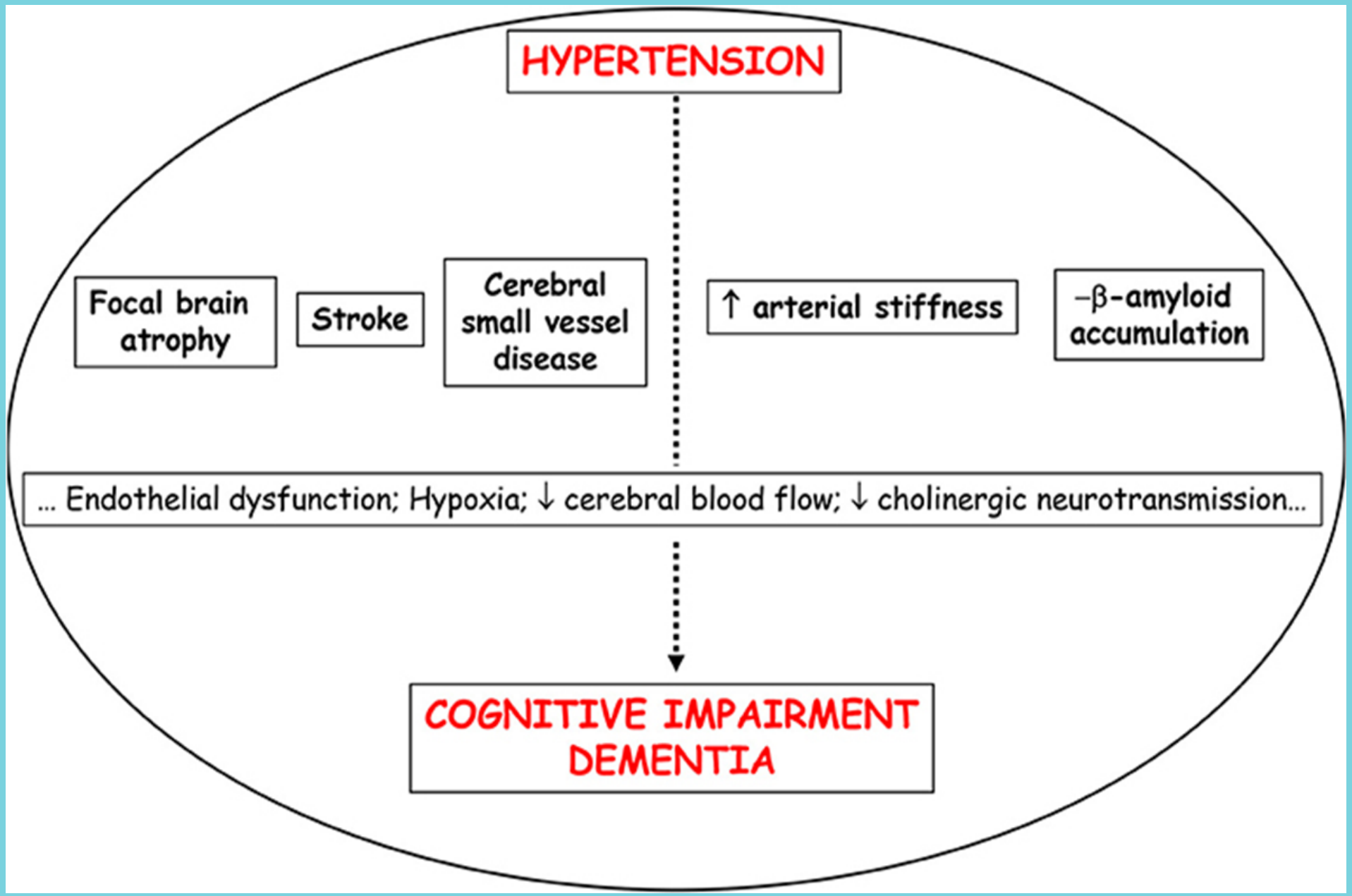
Ischemia or hemorrhage

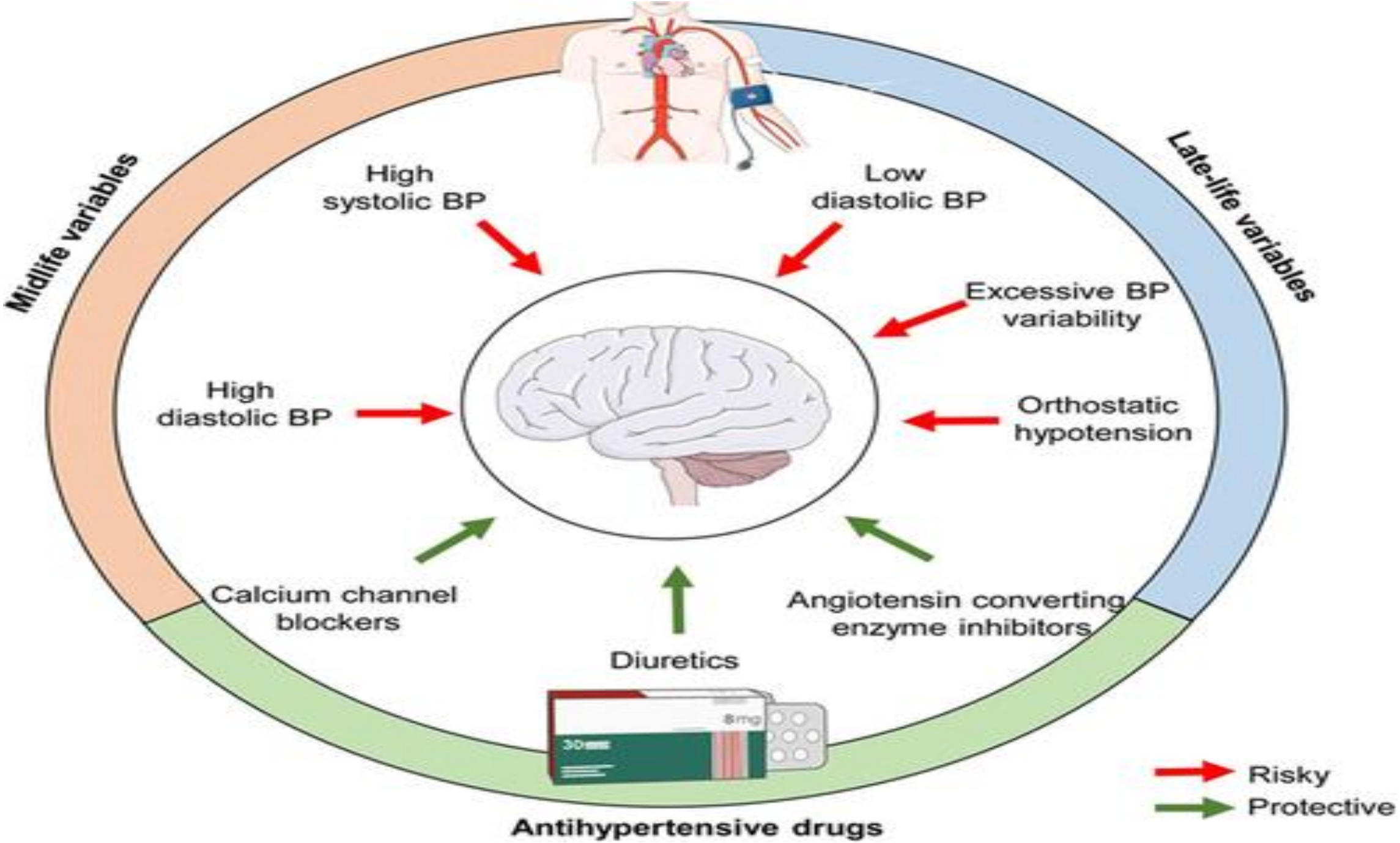
White matter disease

Focal brain atrophy

Dementia

Amyloid accumulation





A meta-analysis that included 12 randomized controlled trials with 92,135 participants, showed that blood pressure lowering with antihypertensive drugs was associated with a reduced risk of incident dementia or cognitive Impairment.

This meta-analysis highlighted a key problem: the association of hypertension with neurocognitive syndromes, mediated through chronic cerebromicrovascular pathological alterations, has an extended time lag between cause and clinical consequence.

Observational studies with extended follow-up periods (>10 years) are therefore required to evaluate the effects of anti-hypertensive treatments on neurocognitive outcomes. Taken together, the existing evidence strongly suggests that effective control of hypertension offers an opportunity to delay and possibly prevent the pathogenesis of VCI and dementia, and AD.

Hughes, D. et al. Association of blood pressure lowering with incident dementia or cognitive impairment: a systematic review and meta-analysis.
JAMA 3 2 3 , 1 9 3 4 - 1 9 4 4 (2020).

- The optimal SBP targets for prevention of dementia are a subject of debate.

- The SPRINT trial showed that in ambulatory adults with hypertension, more intensive blood pressure control (target SBP of <120 mmHg versus <140 mmHg) did not result in significant cognitive benefits
- An important factor to consider is that, owing to the adaptive rightward shift of the cerebral autoregulatory curve in hypertension, aggressive lowering of perfusion pressure might result in cerebral hypoperfusion and consequential negative effects on the brain. U-shaped associations between blood pressure and cognitive function in elderly patients have been reported.
- Blood pressure that is too low in old age is a risk factor for cognitive impairment.

- These findings draw attention to potential risks associated with overtreating hypertension in elderly patients and highlight the importance of individualized blood pressure management for prevention of cognitive impairment.

Did you know?

While concerns have raised over cerebral perfusion, blood flow and BP levels in the elderly, particularly following a stroke, there is limited evidence whether the prevention of dementia or slowing cognitive decline is associated with the BP reduction per se or specific drug properties

The risk of dementia increased two to five times following stroke indicating it is a critical contributor in this scenario

In autopsy research, patients with neurological features of AD and >1 lacunar stroke in the thalamus, basal ganglia, or deep white matter had a 20 times higher risk of clinical dementia comparing to AD patients without infarcts.

Although arterial hypertension plays a causative role in cerebral small vessel disease including lacunar infarcts further studies need to determine whether maintaining BP control may prevent from lacunar infarcts and associated cognitive dysfunction and dementia.

Hypertension and cognitive dysfunction in elderly: blood pressure management for this global burden
Marijana Tadic[1]*, Cesare Cuspidi[2] and Dagmara Hering[3]

Tadic et al. BMC Cardiovascular Disorders (2016) 16:208

BMC

Did you know?

longitudinal Milan Geriatrics 75+ Cohort Study Mossello E, Pieraccioli M, Nesti N, Bulgaresi M, Lorenzi C, Caleri V, Tonon E, Cavallini MC, Baroncini C, Di Bari M, Baldasseroni S, Cantini C, Biagini CA, Marchionni N, Ungar A. Effects of low blood pressure in cognitively impaired elderly patients treated with antihypertensive drugs. JAMA Intern Med. 2015;175(4):578-85

Patients with impaired functional and cognitive status may benefit from higher BP levels, this however merits further clinical research.

Mossello E, Pieraccioli M, Nesti N, Bulgaresi M, Lorenzi C, Caleri V, Tonon E, Cavallini MC, Baroncini C, Di Bari M, Baldasseroni S, Cantini C, Biagini CA, Marchionni N, Ungar A. Effects of low blood pressure in cognitively impaired elderly patients treated with antihypertensive drugs. JAMA Intern Med. 2015;175(4):578-85.

The independent association between low daytime SBP (<128 mmHg) and a progression of cognitive decline in patients with dementia and cognitive impairment has been recently demonstrated in another study cohort (mean age 79 ± 5), this however was not observed in subjects with low SBP without antihypertensive treatment

Hypertension and cognitive dysfunction in elderly: blood pressure management for this global burden
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BMC

Did you know?

only survivors of major adverse vascular events can provide the opportunities for investigators to observe the relationship between BP and cognition impairment.

While the role of ethnicity on cognitive decline has not yet been established, a recent meta-analysis that included 28,477 participants revealed that hypertensive African Americans are at the highest risk of cognitive limitations (11 %, p = 0.01) when compared to nonhypertensive African Americans and non-African Americans .

Recent SPRINT trial showed that the more intensive systolic BP targets of <120 mmHg in non-diabetic subjects are superior over the standard systolic BP target of <140mmHg

In the elderly patients (>75 years), intensive treatment was more effective than standard BP lowering (HR 0.67; 95 %: 0.51-0.86) [36]. This suggests that the target systolic BP should be <120 mmHg in the elderly patients. Interestingly, the lower systolic BP target was beneficial for both the fit elderly and the frail elderly. However, the highest benefit was in elderly with average fit status

Hypertension and cognitive dysfunction in elderly: blood pressure management for this global burden

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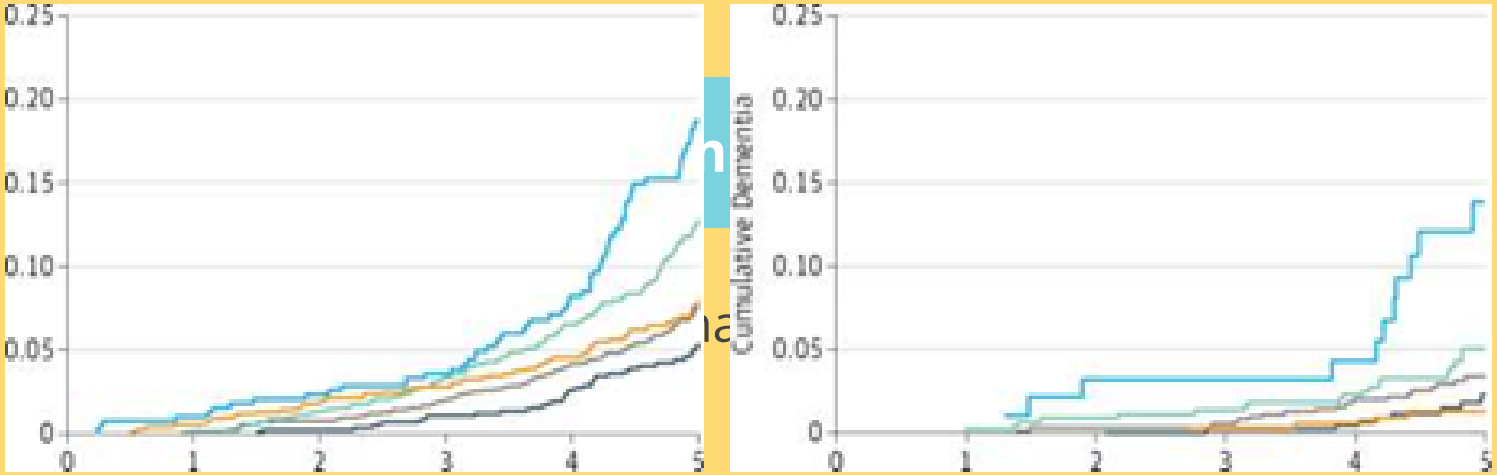
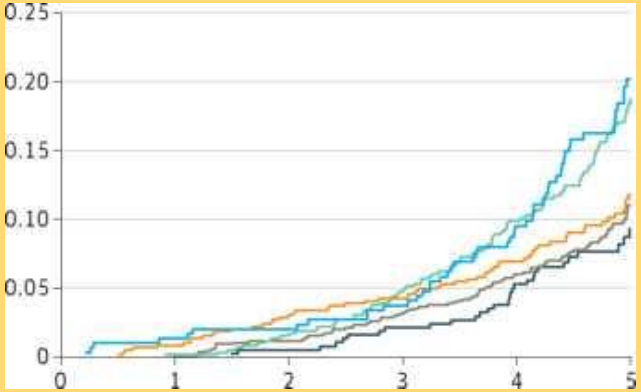
Did you know?



4761 participants 1987-2017, 6 visits



JAMA | Original Investigation

Association of Midlife to Late-Life Blood Pressure Patterns With Incident Dementia

Keenan A. Walker, PhD; A. Richey Sharrett, MD, DrPH; Aozhou Wu, PhD, MHS; Andrea L. C. Schneider, MD, PhD; Marilyn Albert, PhD; Pamela L. Lutsey, PhD, MPH; Karen Bandeen-Roche, PhD; Josef Coresh, MD, PhD; Alden L. Gross, PhD, MHS; B. Gwen Windham, MD, MHS; David S. Knopman, MD; Melinda C. Power, ScD; Andreea M. Rawlings, PhD, MS; Thomas H. Mosley, PhD; Rebecca F. Gottesman, MD, PhD

g Editorial page 512
g Related article page 524
n Video and Supplemental content

JAMA. 2019;322(6):535-545. doi:10.1001/jama.2019.10575

Association between blood pressure levels and cognitive impairment in older women: a prospective analysis of the Women's Health Initiative Memory Study

Longjian Liu, Kathleen M Hayden, Nathalie S May, Bernhard Haring, Zuolu Liu, Victor W Henderson, Jiu-Chiuan Chen, Edward J Gracely, ylvia Wassertheil-Smoller, Stephen R Rapp

Lancet Healthy Longev 2022;
3: e42-53

7207 women 65-79 years, 1999-2019

2023 ESH Guidelines for the management of arterial hypertension
The Task Force for the management of arterial hypertension of the European Society of Hypertension
Endorsed by the International Society of Hypertension (ISH) and the European Renal Association (ERA)

- In the last 25 years, the incidence of dementia has sizably increased, mainly because of the increase in population aging. Dementia is more frequent in women than in men and is the fifth most common cause of death in the world. Several epidemiological and clinical studies have shown that hypertension in midlife predicts cognitive decline and both Alzheimer's disease and vascular dementia in older patients. Furthermore, long-term cumulative BP is independently associated with subsequent cognitive decline and incident dementia among cognitively healthy adults.
- In hypertensive patients, routine clinical assessment should include attention to possible cognitive impairment, at least in those aged 65 years and older. Evidence on the beneficial effects of BP-lowering on cognitive decline has been conflicting for years.

2023 ESH Guidelines for the management of arterial hypertension
The Task Force for the management of arterial hypertension of the European Society of Hypertension
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- However, a recent meta-analysis of five RCTs (28 008 patients) used multilevel logistic regression of pooled individual participant data to evaluate the treatment effect on incident dementia. During a median FU of 4.3 years, antihypertensive treatment reduced the risk of incident dementia by 13% with a mean SBP/DBP lowering of 10/4 mmHg. In addition, several studies have shown that strict BP control, i.e. SBP <130 mmHg, reduces the progression of cerebral white matter lesions and the decrease in global cognitive performance.
- The question if some antihypertensive drugs or strategies are better than others in preventing cognitive decline and dementia is still under debate. Several observational studies and data from international registries suggested that ARBs, DHP-CCBs and Thiazide/Thiazide-like diuretics may be better than ACEis, non-DHP-CCBs and BBs in reducing the progression of cognitive decline and the incidence of dementia. This suggestion seems to be supported by a very recent post hoc analysis of two RCTs, the PreDIVA trial and the SPRINT-MIND trial. Further prospective controlled trials designed to confirm these observations are warranted. Current evidence supports the recommendation to implement antihypertensive treatment and pursue strict BP control in late-mid and later life to lower the risk of cognitive decline and dementia.

Did you know?

While the contribution of hypertension to cognitive dysfunction and dementia is well-recognized, the use of antihypertensive approaches for the prevention of cognitive decline continues to be debated.

In view of the global burden of hypertension, the aging population, the low quality of life associated with cognitive decline and/or dementia resulting in increasing costs to health care systems, there is rationale for improving BP control.

Special attention should focused on the treatment of midlife hypertension which is likely to reduce the incidence of dementia in late-life which is beyond cardiac, renal and vascular protection.

Combination of two or more antihypertensive agents is preferable to monotherapy due to additive and synergistic effects on BP control, prevention of stroke and possibly cognitive impairment

Hypertension and cognitive dysfunction in elderly: blood pressure management for this global burden
Marijana Tadic[1]*, Cesare Cuspidi[2] and Dagmara Hering[3]
Tadic et al. BMC Cardiovascular Disorders (2016) 16:208

Did you know?

Notably, cautious hypertension management is required in the elderly and very old frail subjects as per the recent expert opinion recommendations.

Given that there is potential for (1) increasing incidence of dementia and mortality in old elderly with low BP achieved with antihypertensive drug therapy and (2) worsening further prognosis in hypertensive patients with existing impaired cognition, a therapeutic approach in this cohort needs to be established.

Cognitive tests should be implemented into clinical practice, particularly in the old hypertensives prior to commencing therapy.

Hypertension and cognitive dysfunction in elderly: blood pressure management for this global burden
Marijana Tadic[1]*, Cesare Cuspidi[2] and Dagmara Hering[3]

Tadic et al. BMC Cardiovascular Disorders (2016) 16:208

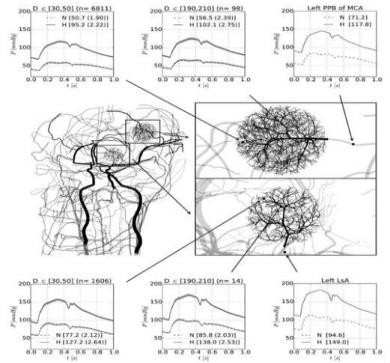
Hypertension and Cognitive Function – It's Not All in the Numbers
Last Updated: January 23, 2023

- The first of Hill's criteria addresses the strength of the association, i.e., the degree to which hypertension is associated with impaired cognition. Although generally consistent, there is surprisingly limited data showing that the presence of hypertension is strongly associated with the degree of cognitive impairment or decline.

- The second of Hill's criteria focuses on the consistency of the relationship among studies. The heterogeneity noted above compromises assessment of the consistency of the hypertension-cognition association. For example, in later life, some studies suggest a beneficial impact of high blood pressure on cognition whereas others find a harmful effect. The most consistent relationship among studies is between blood pressure in midlife and cognitive performance in mid- and late-life.

American Heart Association.

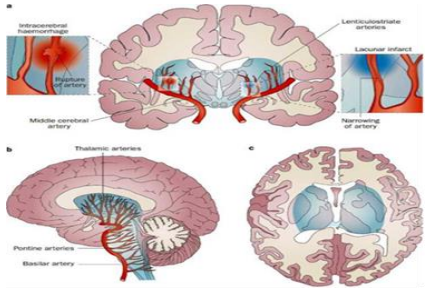
Hypertension and Cognitive Function – It's Not All in the Numbers
Last Updated: January 23, 2023



- Heterogeneity also affects assessment of the specificity of the relationship between hypertension and cognition. The causes of dementia, however, are clearly multifactorial. Hypertension may be a contributing cause, but it is not the only cause. The relative contributions of different potential risk factors for cognitive impairment and dementia can be difficult to tease apart.
- There is evidence that hypertension is often present in patients who later develop cognitive impairments.
- There are only limited data evaluating the correlation between the degree of hypertension and the occurrence or degree of cognitive impairment

American Heart Association.

Hypertension and Cognitive Function – It's Not All in the Numbers
Last Updated: January 23, 2023



- Hypertension leads to structural changes in vessel walls in addition to impairments in vascular regulation that can result in vascular insufficiency in subcortical and deep brain regions, including the white matter. Hypertension may also increase the accumulation of amyloid- and accumulated amyloid-? may affect cerebrovascular regulatory mechanisms.
- The pathophysiological effects of hypertension, its impact on biomarkers such as MRI brain imaging reflecting vascular injury, and evidence of the temporal relationship between the detection of hypertension and the development of deficits reflected by cognitive tests.
- **The most exacting of Hill's criteria is experiment; i.e., do interventions aimed at altering or eliminating a risk factor affect the frequency or magnitude of an outcome? Even if an effect is found, however, this alone is not conclusive. The AHA writing group concluded that data from clinical trials did not allow conclusive recommendations about treating hypertension at any age to protect cognition.**

American Heart Association.

Hypertension and Cognitive Function – It's Not All in the Numbers
Last Updated: January 23, 2023

- There is not, however, another putative risk factor analogous to hypertension.

- **The AHA writing group identified several major gaps in current knowledge and important directions for future research. Unlike the clear causal relationship between increasing usual blood pressure and increasing stroke risk, the relationship between blood pressure and cognition is less clear. Stressing the importance of knowledge of blood pressure numbers is a central public health message and a critical component of the overall strategy for improving cardiovascular health. Although taken together the data are highly suggestive, adding preservation of cognition as another benefit of better blood pressure control awaits further study.**

American Heart Association.

Take home message-Future…

Optimization of blood pressure in patients with hypertension is expected to have a substantial public health impact owing to prevention of VCI and AD, even in the short term.

Diurnal blood pressure loads are associated with lower cognitive performance in hypertensive adults aged 60-75 years, highlighting the importance of controlling blood pressure variability.

Combinations of pharmaceutical treatments and lifestyle interventions that lower blood pressure together with interventions that reduce blood pressure variability and prevent sudden surges in systolic pressure should be assessed in randomized clinical trials with clearly designed cognitive end points.
Trials of combination treatments that have long periods of follow-up and investigate microvascular end points as well as cognition as primary outcome measures will be very informative.

Systematic, standardized neurocognitive testing of patients enrolled in these studies is also important.

Older patients with hypertension might also benefit from therapies that specifically target microvascular contributions to VCI and/or AD. Strategies that reverse cerebromicrovascular rarefaction, prevent small vessel rupture and the genesis of microhaemorrhages and protect the BBB are still in their infancy. Although preclinical and clinical data suggest that calcium antagonists, ACE inhibitors and Ang II receptor blockers might have protective effects on microvessel structure and microvascular network architecture in the peripheral. circulation, further studies are needed to test their effects, alone or in combination, on the cerebral microcirculation of patients with hypertension.

Re-purposing existing drugs with microvascular protective effects (such as statins and metformin) and targeting promising novel molecular pathways and mechanisms involved in cerebromicrovascular ageing that have been identified by geroscience research might also help to improve cognitive health in older adults with hypertension.

Thank you!

Do you have any questions?

WWW.Athens-nephrology.gr

circulation178, further studies are needed to test their effects, alone or in combination, on the cerebral microcirculation of patients with hypertension. Re-purposing existing drugs with microvascular protective effects (such as statins and metformin) and targeting promising novel molecular pathways and mechanisms involved in cerebromicrovascular ageing that have been identified by geroscience research might also help to improve cognitive health in older adults with hypertension.

Hello! I’m...

Here is where you introduce yourself.

You can add your name, title and a little background. Right click the image and replace it for your own.

01

We will talk about this first.

Add a brief introduction of your section here.

Let’s dive in and get to know some interesting facts about animals!

Clearly, animals know more than we think, and think a great deal more than we know.

— Irene M. Pepperberg

Some facts about my cats.

Of my cats are adorable.

100%

Traveled by plane. Twice!

25%

Are females.

75%

Let’s review some facts.

Elephants

Elephants can sense storms.

Pandas

Pandas don’t hibernate.

Dogs

Dogs can smell your feelings.

Kangaroos

There are more kangaroos than humans in Australia.

Cats

Cats use their whiskers as feelers to determine if a space is too small to squeeze through.

Koalas

Koalas are even more lazy than cats.

And this is a timeline or process

Monday

Lorem ipsum dolor sit amet, consectetuer adipiscing elit.

Tuesday

Lorem ipsum dolor sit amet, consectetuer adipiscing elit.

Wednesday

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Thursday

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Friday

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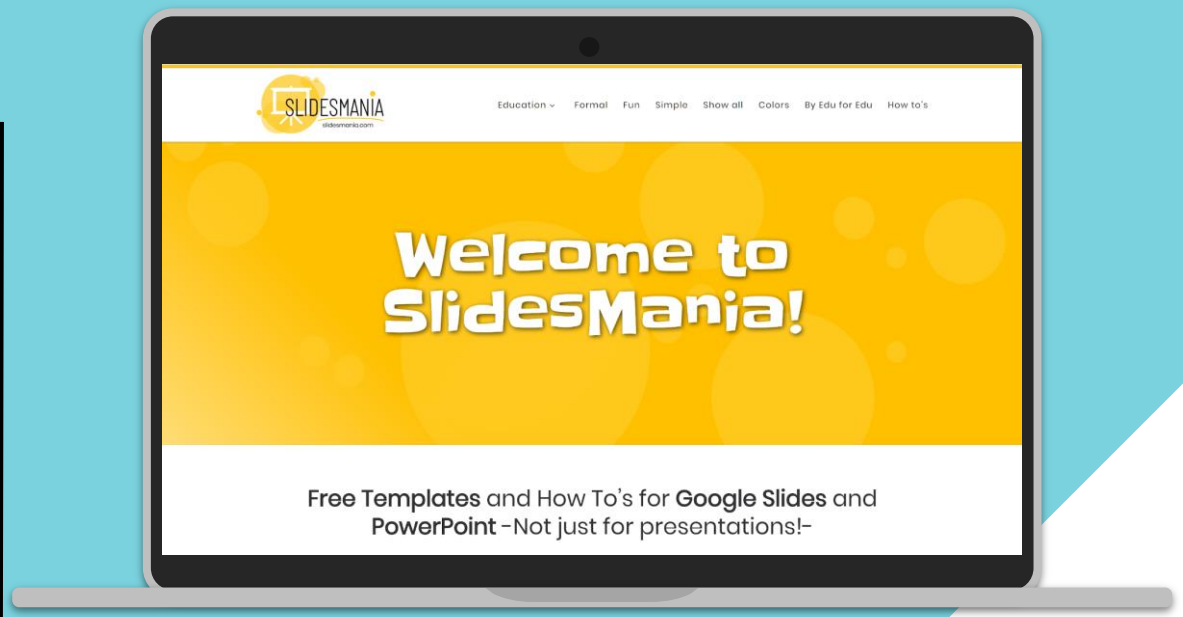
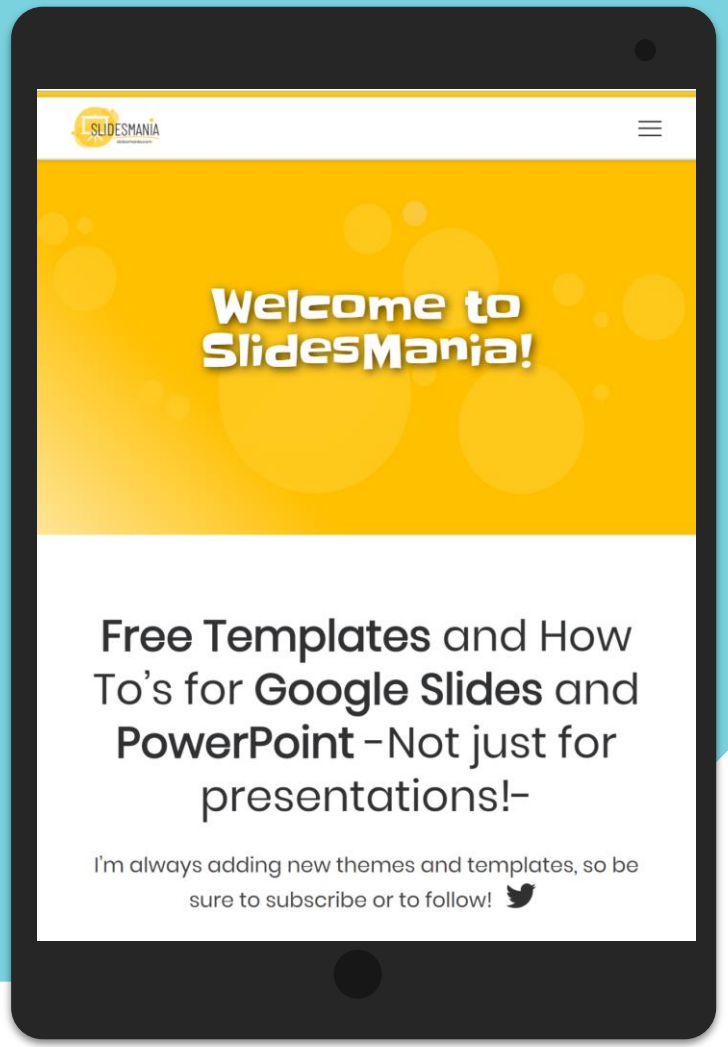


Presenting a website?

If you are presenting a website, an internet product or an app, you can place a screenshot of it here.

Presenting an app?

If you are presenting a website, an internet product or an app, you can place a screenshot of it here.



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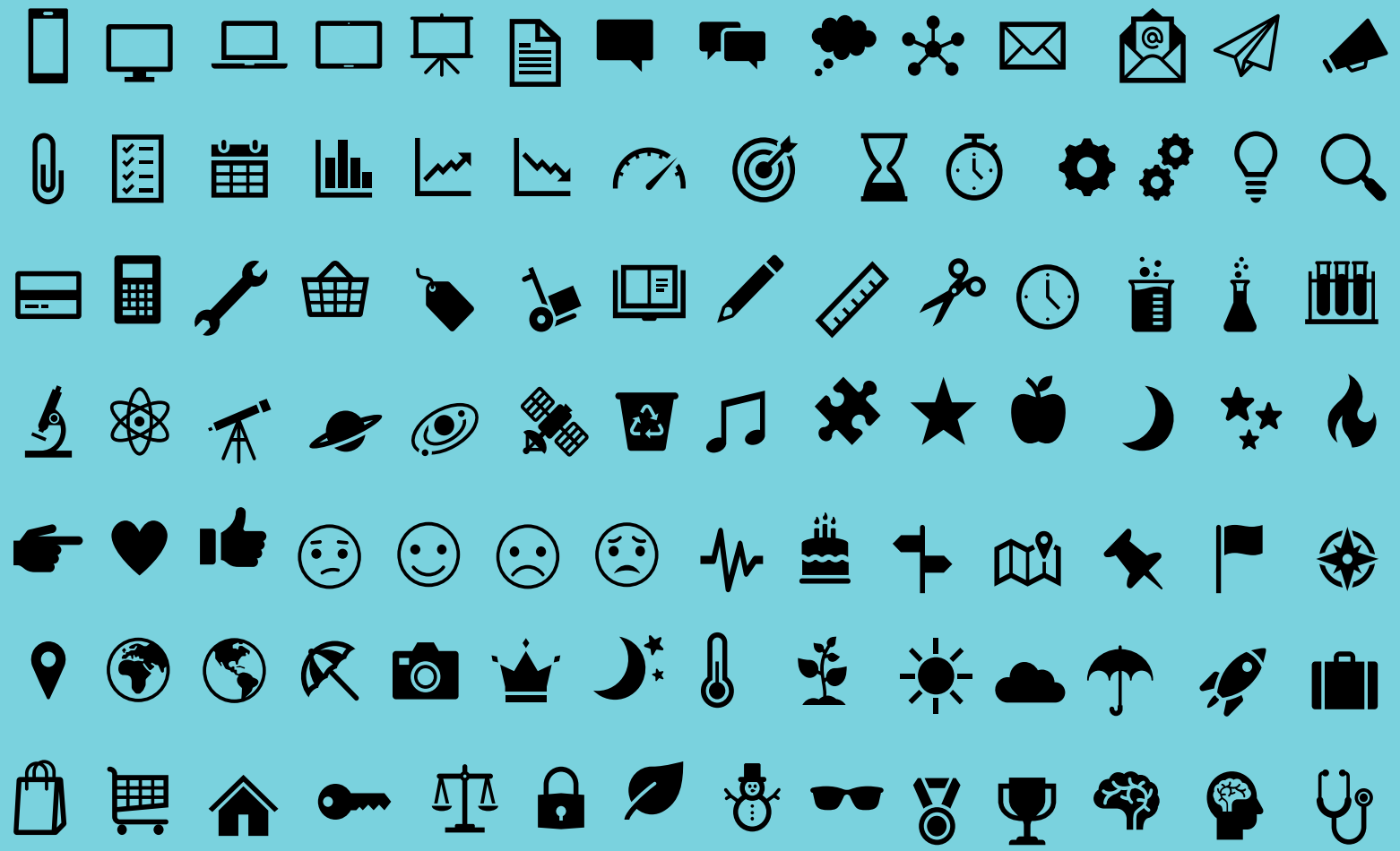

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