

Evidence Synthesis

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Topic

In older adults aged 55-80, how does early, regular screening of hypertension affect incidence of stroke, compared with those who only receive screening on occasional medical consultations?

Introduction

The relationship between hypertension management and stroke prevention in older adults is well established. However, key questions remain around optimal blood pressure (BP) targets, the effect of systematic early screening versus opportunistic detection, and real-world implementation in the elderly, particularly those aged 55-80 and above. Here, we synthesize evidence from five relevant studies to address these issues.

Identification of PICO

Population Older adults aged 55-80.

Intervention Regular screening of hypertension, implemented mainly by the measurement of blood pressure, with follow-up actions.

Control Those who only receive occasional screening of hypertension, i.e., those who only receive blood pressure tests as requested by the doctor during occasional medical consultations.

Outcome Effects on the incidence of stroke.

Evidence collected

A search was performed on NIH PubMed, through using the following keywords

- Hypertension
- Hypertension screening
- Stroke
- Ischemic stroke
- Intracerebral hemorrhage stroke
- Subarachnoid hemorrhage

The following results are obtained.

1. BP Target Intensiveness and Stroke Reduction (Falk et al., 2024¹)

¹ Falk, J. M., Froentjes, L., Kirkwood, J. E., Heran, B. S., Kolber, M. R., Allan, G. M., Korownyk, C. S., & Garrison, S. R. (2024). Higher blood pressure targets for hypertension in older adults. The Cochrane

A recent Cochrane review and meta-analysis incorporating four RCTs including 16,732 adults aged ≥ 65 found that lowering BP to conventional targets ($<140/90$ mmHg) significantly reduced stroke incidence and serious cardiovascular events compared to less aggressive targets ($<150-160/95-105$ mmHg). The benefit was robust, although the effect on all-cause mortality remained unclear. Notably, evidence remains scarce for those above 80 or the frail, and studies did not directly compare systematic early screening to usual care.

Key Point: Tight BP control in older adults reduces stroke risk, but direct evidence on the value of initiating treatment earlier or through more proactive screening is limited.

2. Undertreatment in the Oldest Old (Klungel et al., 2000²)

A Dutch observational study highlighted considerable undertreatment of hypertension, especially in adults >80 , with about 55% of older hypertensives left untreated. A substantial fraction of strokes in both under-80 and over-80 populations were attributable to lack of treatment. This underscores the impact of missed detection and/or intervention opportunities.

Key Point: Systematic, early identification and treatment of hypertension might prevent a large proportion of strokes in older age groups; real-world gaps in detection/treatment are significant.

3. RCT Evidence: Impact of BP Control (Perry et al., 2000, SHEP³)

The SHEP trial demonstrated that treating isolated systolic hypertension in people aged ≥ 60 led to marked reductions in both ischemic and hemorrhagic strokes. Achieving study-defined BP goals correlated with lower stroke incidence.

Key Point: Appropriate hypertension treatment, when delivered and maintained, is highly effective at preventing stroke in elderly individuals, reinforcing the clinical rationale for early identification.

4. Predictive Value of BP Measures (Zheng et al., 2019⁴)

A large prospective cohort from rural China identified systolic BP and mean arterial pressure as the best

database of systematic reviews, 12(12), CD011575. <https://doi.org/10.1002/14651858.CD011575.pub3>

2 Klungel, O. H., Stricker, B. H., Breteler, M. M., Seidell, J. C., & de Boer, A. (2000). Onderbehandeling van hypertensie en het risico op beroerte bij de oudste ouderen [Undertreatment of hypertension and the risk of stroke in the oldest old]. Tijdschrift voor gerontologie en geriatrie, 31(3), 119-122.

3 Perry, H. M., Jr, Davis, B. R., Price, T. R., Applegate, W. B., Fields, W. S., Guralnik, J. M., Kuller, L., Pressel, S., Stamler, J., & Probstfield, J. L. (2000). Effect of treating isolated systolic hypertension on the risk of developing various types and subtypes of stroke: the Systolic Hypertension in the Elderly Program (SHEP). JAMA, 284(4), 465-471. <https://doi.org/10.1001/jama.284.4.465>

4 Zheng, J., Sun, Z., Guo, X., Xie, Y., Sun, Y., & Zheng, L. (2019). Blood pressure predictors of stroke in rural Chinese dwellers with hypertension: a large-scale prospective cohort study. BMC cardiovascular disorders, 19(1), 206. <https://doi.org/10.1186/s12872-019-1186-0>

predictors for future stroke among hypertensive adults (mean age ~56). The study reinforces the importance of ongoing BP monitoring in risk stratification.

Key Point: Serial BP measurements are critical for predicting and preventing stroke, suggesting the utility of more systematic BP surveillance in at-risk populations.

5. Home vs. Clinic BP - Prognostic Value (Yasui et al., 2010⁵)

This study compared home versus clinic BP monitoring in Japanese hypertensives and found that home BP far better predicted stroke, especially in treated individuals. Stroke risk increased linearly with home BP levels, underscoring the predictive utility of regular, self-initiated BP measurements.

Key Point: Regular, structured BP monitoring (even at home) allows better risk assessment and could contribute to earlier intervention, potentially lowering stroke incidence.

Literature Table

The following literature table was created from 5 of the most relevant results.

AUTHOR(S)	YEAR	STUDY DESIGN	POPULATION	MAIN FINDINGS	LIMITATIONS
Falk JM, Froentjes L, Kirkwood JE, Heran BS, et al.	2024	Systematic Review / Meta-analysis	Older adults with hypertension (≥ 65 years, 4 RCTs, 16,732 participants)	Lower blood pressure targets (<140/90 mmHg) reduce stroke and likely reduce serious cardiovascular events in older adults with hypertension, but unclear effect on all-cause mortality.	Largely based on RCTs with limited evidence for those aged >80 or the frail; does not directly assess effect of screening frequency, only BP targets and outcomes.

⁵ Yasui, D., Asayama, K., Ohkubo, T., Kikuya, M., Kanno, A., Hara, A., Hirose, T., Obara, T., Metoki, H., Inoue, R., Totsune, K., Hoshi, H., Satoh, H., & Imai, Y. (2010). Stroke risk in treated hypertension based on home blood pressure: the Ohasama study. *American journal of hypertension*, 23(5), 508–514. <https://doi.org/10.1038/ajh.2010.15>

AUTHOR(S)	YEAR	STUDY DE-SIGN	POPULATION	MAIN FINDINGS	LIMITATIONS
Klungel OH, Stricker BH, Breteler MM, Seidell JC, de Boer A	2000	Retrospective, observational	Hypertensives in the Neth- erlands, age stratified <80, ≥ 80 years	High rates of undertreatment of hypertension in the "oldest old" (≥ 80); many strokes attributable to untreated hypertension, particularly in this age group.	Observational; only correlates treatment and stroke rates; causality un- clear; reasons for undertreat- ment or missed screening not assessed.
Perry HM Jr, Davis BR, Price TR, Applegate WB, et al.	2000	RCT (SHEP), secondary anal- ysis	4,736 men and women, ≥ 60 years, isolated systolic hyper- tension	Antihyperten- sive treatment significantly reduced inci- dence of total, ischemic, and hemorrhagic strokes; bene- fit seen when systolic BP treatment goals attained.	Did not investi- gate impact of frequency/tim- ing of hyperten- sion detection; focused on treatment but not screening/ early identifica- tion per se.
Zheng J, Sun Z, Guo X, Xie Y, et al.	2019	Prospective cohort study	5,097 rural Chinese adults with hyperten- sion (mean age ~ 56)	Systolic BP and mean arterial pressure are better predic- tors of stroke risk than other BP measures.	Focuses on BP parameter com- parisons, not screening strat- egies; limited generalizabil- ity to all older populations; frequency/ context of BP measurement not explored.

AUTHOR(S)	YEAR	STUDY DESIGN	POPULATION	MAIN FINDINGS	LIMITATIONS
Yasui D, Asayama K, Ohkubo T, Kikuya M, et al.	2010	Prospective cohort / observational	2,390 Japanese adults ≥ 35 (treated and untreated hypertensives)	Home blood pressure better predicts stroke risk than casual (clinic) BP, especially in treated hypertensives; higher home BP strongly associated with stroke risk.	Observational; did not address effect of systematic early screening, only setting/method of BP measurement; possible unmeasured confounders (adherence, self-report error, etc).

Integrated Synthesis

Consensus

Proactive identification and treatment of hypertension in older adults substantially reduces stroke risk. Undertreatment and infrequent screening, especially among the very old, leave substantial preventable stroke burden.

Strength of Evidence

Multiple RCTs and cohort studies consistently show BP control reduces stroke risk in older adults. Observational data corroborate that missed or delayed detection/treatment leads to avoidable strokes.

Gaps and Practice Implications

Few studies directly contrast systematic, early BP screening with care-as-usual (opportunistic detection during clinic visits).

Evidence on the best way to implement population-wide BP monitoring (e.g., frequency, modality, target subgroups) in those aged 55–80, especially >80 and frail, is limited.

Home/self-monitoring is a promising avenue for earlier detection and intervention.

Conclusion

The evidence robustly supports aggressive detection and management of hypertension to prevent stroke in older adults. Realizing further gains in stroke prevention likely depends on closing current detection/treatment gaps—particularly via systematic early screening or self-monitoring—in the growing elderly population. Future retrospective and prospective studies should clarify which screening strategies most efficiently reduce strokes in these groups.