

# Under Pressure

## Lowering blood pressure reduces the risk of dementia

*This is another article looking at ways to reduce our risk of dementia. It has been shown that having high blood pressure increases the risk of dementia. This meta-analysis of five randomized controlled trials evaluated the effectiveness of antihypertensive medication in preventing dementia later in life. We know lowering blood pressure is beneficial for heart disease, but how much do we have to lower blood pressure to get dementia benefits? How low is low enough? Does the systolic number matter more than the diastolic number?*

### Abstract

**Aims:** Observational studies indicate U-shaped associations of blood pressure (BP) and incident dementia in older age, but randomized controlled trials of BP-lowering treatment show mixed results on this outcome in hypertensive patients. A pooled individual participant data analysis of five seminal randomized double-blind placebo-controlled trials was undertaken to better define the effects of BP-lowering treatment for the prevention of dementia.

**Methods and results:** Multilevel logistic regression was used to evaluate the treatment effect on incident dementia. Effect modification was assessed for key population characteristics including age, baseline systolic BP, sex, and presence of prior stroke. Mediation analysis was used to quantify the contribution of trial medication and changes in systolic and diastolic BP on risk of dementia. The total sample included 28 008 individuals recruited from 20 countries. After a median follow-up of 4.3 years, there were 861 cases of incident dementia. Multilevel logistic regression reported an adjusted odds ratio 0.87 (95% confidence interval: 0.75, 0.99) in favour of antihypertensive treatment reducing risk of incident dementia with a mean BP lowering of 10/4 mmHg. Further multinomial regression taking account of death as a competing risk found similar results. There was no effect modification by age or sex. Mediation analysis confirmed the greater fall in BP in the actively treated group was associated with a greater reduction in dementia risk.

**Conclusion:** The first single-stage individual patient data meta-analysis from randomized double-blind placebo-controlled clinical trials provides evidence to support benefits of antihypertensive treatment in late-mid and later life to lower the risk of dementia. Questions remain as to the potential for additional BP lowering in those with already well-controlled hypertension and of antihypertensive treatment commenced earlier in the life-course to reduce the long-term risk of dementia.

*We have good data showing that reduction of blood pressure is good for the heart, but is it also good for the brain? This meta-analysis of five studies involved over 28,000 people from 20 countries who were followed for 4.3 years. A change in the Mini-Mental Status Exam (MMSE) to a score of less than 24 was used to document dementia. The group who had their blood pressure managed well was found to have a 13% lower risk of dementia over the follow-up period. I suspect that this difference will become more dramatic over longer periods. The average decrease in blood pressure was 10 mm Hg systolic and 4 mm Hg diastolic. While lower systolic blood pressure was a linear relationship with dementia, diastolic blood pressure had an optimum range between 70-75 mm Hg. Overall, blood pressure less than 140/80 seemed to keep the brain working well and is a good blood pressure goal to reduce the risk of dementia. Optimum levels are likely <130/70-75.*

Ruth Peters, Ying Xu, Oisín Fitzgerald, et al., for the Dementia Risk REDuCTION (DIRECT) collaboration, Blood pressure lowering and prevention of dementia: an individual patient data meta-analysis, *European Heart Journal*, 2022; , ehac584, <https://doi.org/10.1093/eurheartj/ehac584>

