EE310

LONG-TERM DEMENTIA RISK REDUCTION MAY IMPROVE THE COST-EFFECTIVENESS OF BLOOD PRESSURE LOWERING INTERVENTIONS INCLUDING RENAL DENERVATION

Anne M. Ryschon, MA[1], Jan B Pietzsch, PhD[1], Giovanni L. De Maria, MD[2]

[1] Wing Tech Inc., Menlo Park, CA, USA; [2] John Radcliffe Hospital, Oxford, UK. Contact: jpietzsch@wing-tech.com

Objectives

- Dementia presents a significant direct and indirect cost burden across global settings.[1]
- Contemporary clinical evidence suggests potential reductions in dementia risk with hypertension control.
- This analysis explored the health-economic impact of dementia-risk reduction resulting from improved hypertension (HTN) management achieved with interventions such as renal denervation (RDN) in England.

Methods

- A decision-analytic Markov model for the UK health system was utilized to project dementia incidence, costs, and quality-adjusted life years (QALY) over a lifetime horizon.
- The base case considered an uncontrolled hypertension (HTN) cohort (age 55 years, 19.9% female) compared to a treatment group, with maintained systolic blood pressure (SBP) reductions of 5-10 mmHg over lifetime.[2]
- Cohort survival and dementia risk were informed by age- and sex-specific data for England.[3,4]
- The relationship between change in BP and dementia risk was determined from published literature.[5-7]
- Costs (reported in 2025 pounds) and utilities, specific to dementia severity, were sourced from published literature and discounted 3.5% per annum (**Figure 1, Figure 2**).[8-11]
- Analyses were conducted from both the healthcare payer and societal perspective.
- Sensitivity analyses were performed.

Figure 1 *Annual Dementia Costs, by severity (2025 pounds)*

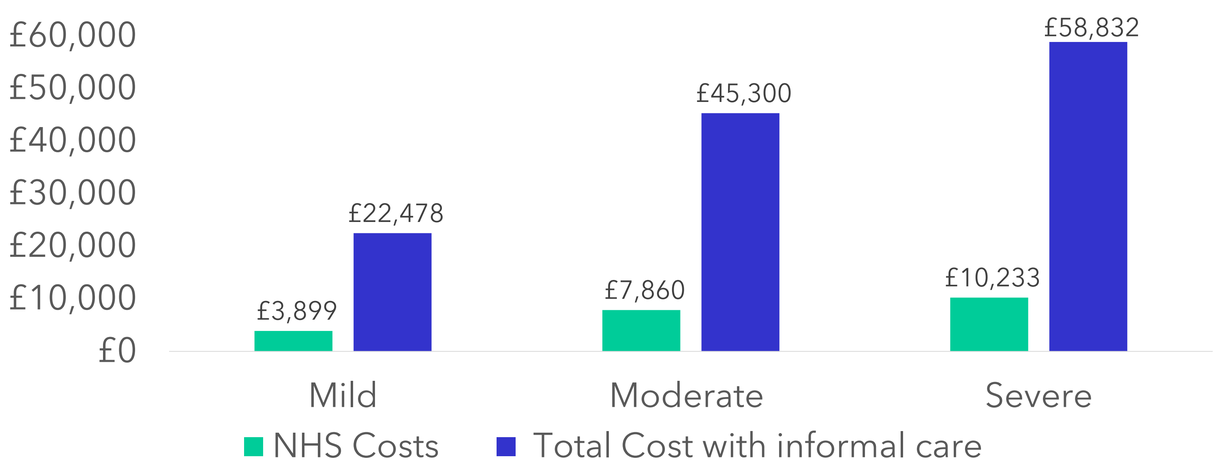


Figure 2: *Utility decrement by dementia severity*

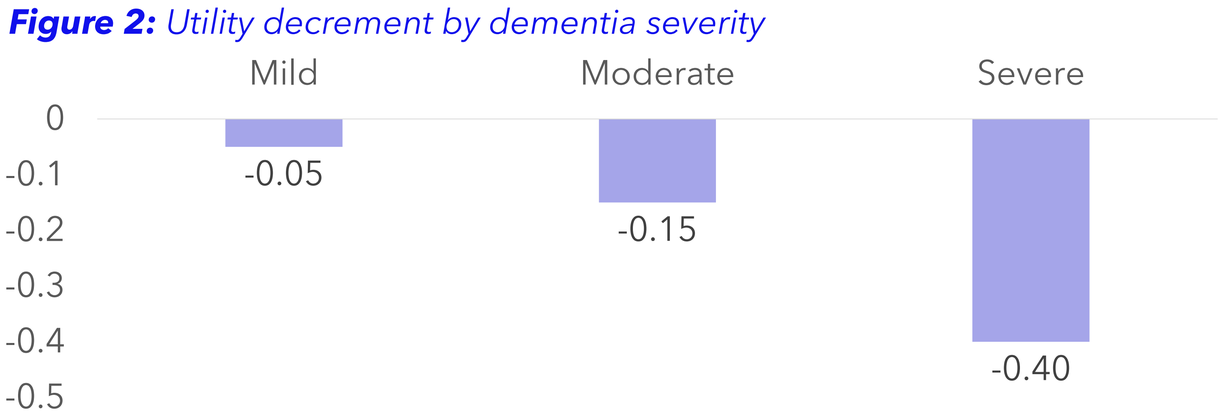


Figure 3 *Cumulative Projected Lifetime Incidence of Dementia*

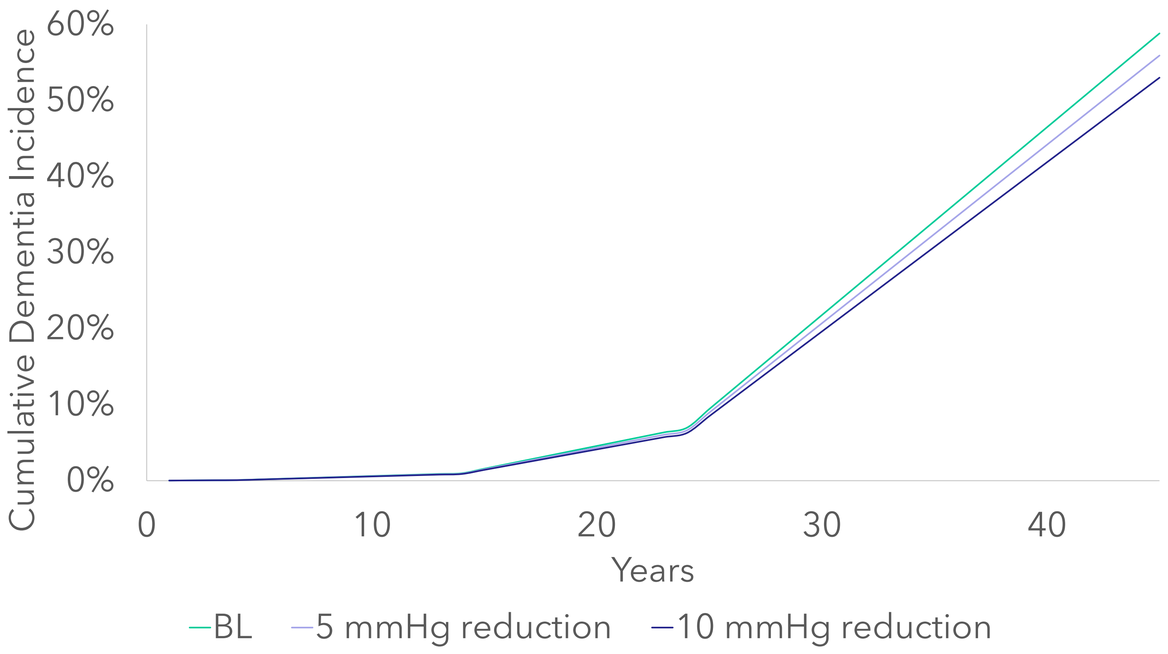
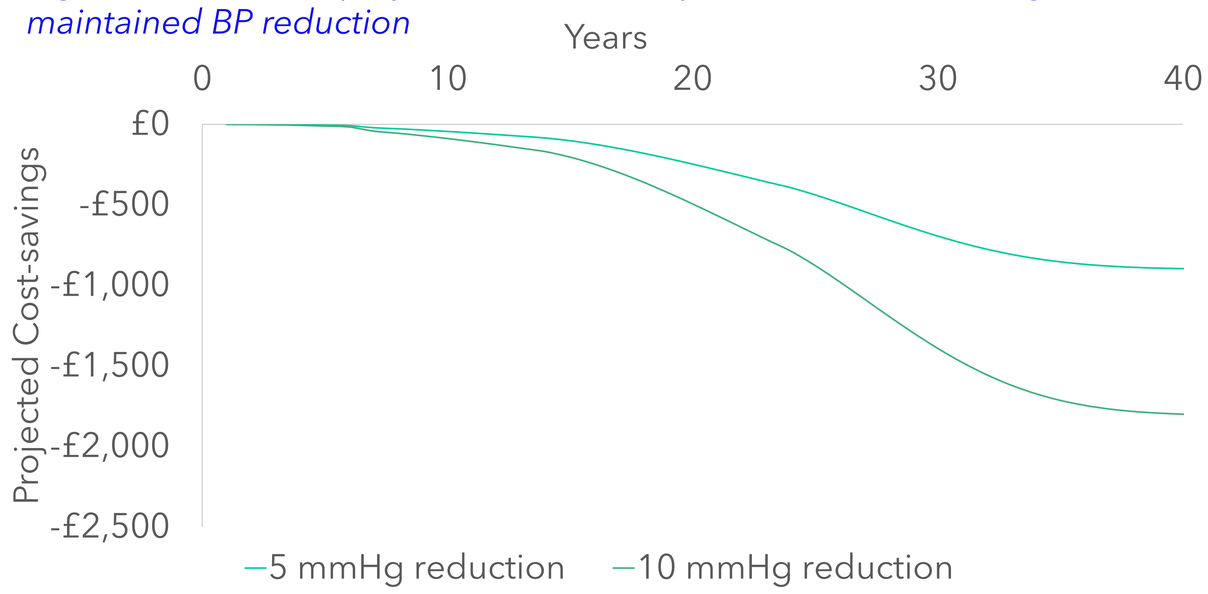


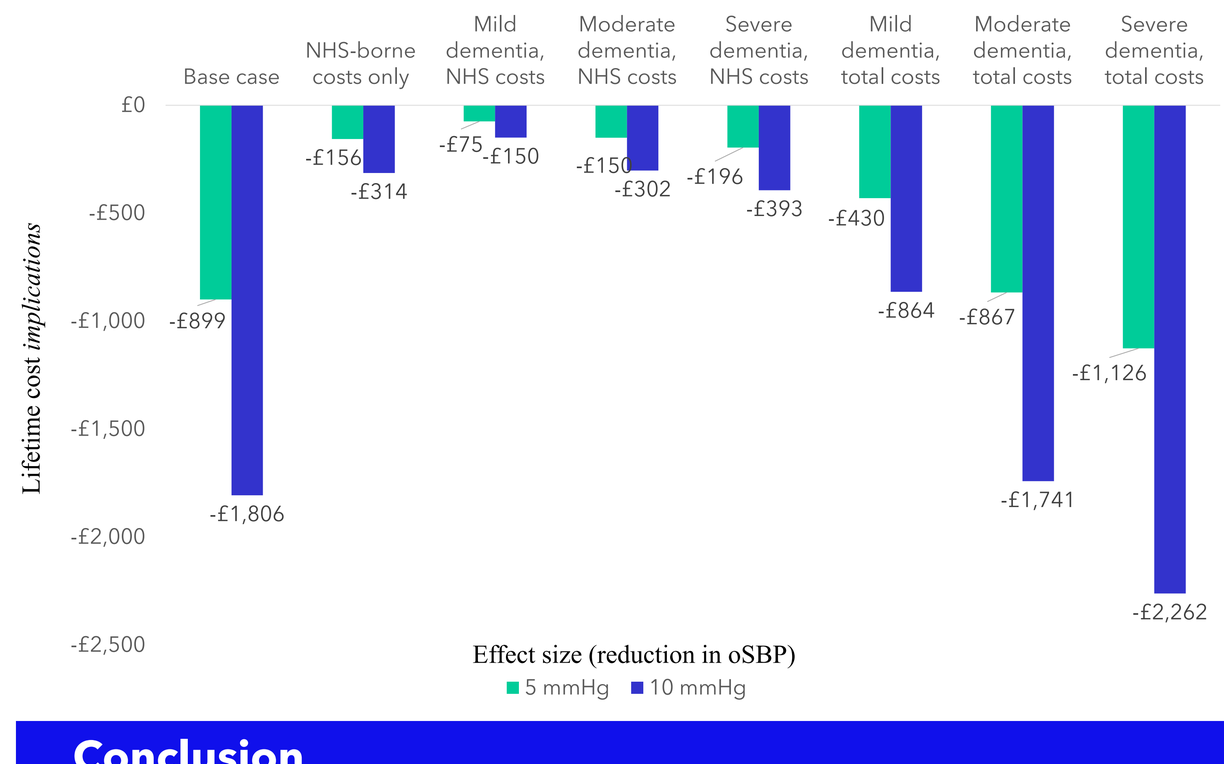
Figure 4 *Base Case projected Dementia-specific total cost-savings, with maintained BP reduction*



Results

- Over lifetime, the cumulative projected lifetime dementia risk was 58.8% (**Figure 3**).
- A maintained reduction in SBP, ranging from 5-10 mmHg, corresponded to 2.9-5.8% reductions in absolute dementia risk over lifetime.
- The decrement in quality-of-life (utility) in patients with dementia was 0.24.
- Under the base case assumptions, a 5- and 10-mmHg BP reduction corresponded to lifetime cost-savings of £156 and £899, and £314 and £1,806 from the payer and societal perspectives, and a QALY gain of 0.012 and 0.024, respectively (**Figure 4**).
- Projected cost-savings and QALY gain ranged from £75-1,138 and 0.002-0.006 and £150-2,287 and 0.005-0.012, for a 5- and 10-mmHg reduction (**Figure 5**).
- These added benefits can be expected to further improve the cost-effectiveness of RDN.

Figure 5 *Projected lifetime dementia cost-savings across scenarios*



Conclusion

Reductions in dementia risk resulting from improved BP control may provide meaningful additional health economic value, particularly at the population level, that have not been routinely captured in cost-effectiveness analyses of BP lowering interventions including RDN. Further research is warranted to confirm these exploratory findings.

References:

[1] Alzheimer's Society. "The Economic Impact of Dementia". 2024.
[2] Sharp et al., EHJ-QCCO. 2024
[3] Adesuyan et al. Alzheimer's Dement. 2023.
[4] Office for National Statistics (ONS). National life tables – life expectancy in the UK: 2022-2024. 2026.
[5] Peters et al. Eur Heart J. 2022.
[6] Hughes et al. JAMA. 2020.
[7] Reboussin et al. Neurology. 2025.
[8] Wittenberg et al. Int J Psychiatry. 2019.
[9] NICE. "Dementia: assessment, management and Support for people living wiht dementia and their Carers". 2025.
[10] Landeiro et al. Alzheimers Res Ther. 2020.
[11] NICE. "NICE health technology evaluations: The manual" 2022.

Disclosures: *Funding support by Medtronic Inc.*