

Lifetime Benefits of LDL-C Control for Dementia Prevention: Findings from Dementia Risk Pooling Project and a Computer Simulation Model



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Ciaran N. Kohli-Lynch¹, Sanaz Sedaghat², Elizabeth Peterson¹, Honyang Ning¹, Rachel Zmora¹, Maxwell Mansolf¹, Yaojie Wang¹, John Stephen¹, Denise Scholtens¹, Amelia Zhang¹, Katherine Giorgio², Alden Gross³, Emily Briceno-Abreu⁴, Deborah A. Levine⁴, Catherine Helmer⁵, Stéphanie Debette⁶, Aïcha Soumaré⁶, M. Arfan Ikram⁷, Sudha Seshadri, MD⁸, Claudia Satizabal⁸, Jayandra Jung Himali⁸, Donald M. Lloyd-Jones⁹, Lenore Launer, Prof¹⁰, David Li¹⁰, Djass Mbangdadjji¹⁰, Farzaneh Sorond¹, Lihui Zhao¹, Oscar Lopez¹¹, Suzanne E. Judd¹², Timothy Hughes, Associate Professor, Gerontology and Geriatric Med¹³, Vilmundur Gudnason¹⁴, Allison E. Aiello¹⁵, Alison E. Fohner¹⁶, Archana Singh-Manoux¹⁷, Norrina B. Allen¹.

¹Department of Preventive Medicine, Northwestern University Feinberg School of Medicine, Chicago, IL, USA, ²School of Public Health, University of Minnesota, Minneapolis, MN, USA, ³Department of Epidemiology, Johns Hopkins School of Public Health, Baltimore, MD, USA, ⁴University of Michigan Medical School, Ann Arbor, MI, USA, ⁵INSERM, University of Bordeaux, Bordeaux, France, ⁶University of Bordeaux, Bordeaux, France, ⁷Erasmus University Medical Center, Rotterdam, Netherlands, ⁸Glenn Biggs Institute for Alzheimer’s and Neurode, University of Texas Health Sciences Center, San Antonio, TX, USA, ⁹Chobanian & Avedisian School of Medicine, Boston University, Boston, MA, USA, ¹⁰National Institute on Aging, Bethesda, MD, USA, ¹¹Department of Neurology, University of Pittsburgh, Pittsburgh, PA, USA, ¹²Department of Neurology, University of Alabama at Birmingham, Birmingham, AL, USA, ¹³Wake Forest University School of Medicine, Winston-Salem, NC, USA, ¹⁴Faculty of Medicine, University of Reykjavik, Reykjavik, Iceland, ¹⁵Department of Epidemiology, Columbia University, New York, NY, USA, ¹⁶School of Public Health, University of Washington, Seattle, WA, USA, ¹⁷INSERM, Université Paris Cité, Paris, France.

What's good for the heart may also be good for the brain: guideline-recommended LDL-C control could prevent thousands of dementia cases while delivering major cardiovascular benefits in the U.S.

Introduction	Methods	Results	Table																								
Neurodegenerative causes of dementia are often accompanied and exacerbated by vascular pathology Elevated levels of low-density lipoprotein cholesterol (LDL-C) causes cardiovascular disease (CVD) and has been linked to increased dementia risk Objectives of this study: (i) Estimate impact of LDL-C on dementia risk (ii) Project long-term benefits of LDL-C control using a decision-analytic model. To achieve these objectives, we leveraged data from the Dementia Risk Pooling Project (DRPP)	Analyzed data from 8 cohorts in the DRPP (AGES, CHS, HAAS, ARIC, SALSA, Framingham, MESA, Whitehall; n=56,539) Cox proportional hazards models estimated the covariate-adjusted relationship between LDL-C (time-weighted average [TWA] from baseline to age 65 years) and dementia. Results used to update the CVD Policy Model, a computer simulation model of CVD in the U.S. population, incorporating dementia outcomes. The model projected changes in life years, quality-adjusted life years (QALYs), dementia, and incident CVD events achieved by maintaining guideline-recommended LDL-C levels (≤130 mg/dL [3.36 mmol/L])	DRPP baselines characteristics mean follow-up 27.1 (11.7) years mean age 58.9 (13.5) years mean LDL-C 132 (41) mg/dL n=29,361 (52%) male n=43,559 (77%) white n=6,551 dementia cases n=18,244 incident CVD events 10 mg/dL increase in TWA LDL-C associated with 4% higher dementia risk (HR: 1.04, 95% CI: 1.01-1.08). CVD Policy Model well-calibrated to external data, replicating national CVD mortality and dementia incidence data. Over lifetime of 500k U.S. adults, maintaining guideline-recommended LDL-C levels would lead to: ~6,400 dementia cases prevented ~9,800 incident CVD events ~170,000 life years gained ~63,500 QALYs gained Failure to account for dementia captures only 62% of life years and 70% of QALYs gained.	<table><tr><th colspan="4">Long-term outcomes associated with LDL-C control, 500,000 U.S. adults</th></tr><tr><th></th><th>Observed LDL-C</th><th>LDL-C Control (≤130 mg/dL)</th><th>Difference</th></tr><tr><td>Incident CVD Events</td><td>270,725</td><td>260,970</td><td>-9,755</td></tr><tr><td>Dementia Cases</td><td>144,010</td><td>137,660</td><td>-6,350</td></tr><tr><td>Life Years</td><td>14,285,435</td><td>14,455,015</td><td>169,580</td></tr><tr><td>QALYs</td><td>7,488,695</td><td>7,552,200</td><td>63,505</td></tr></table> Conclusions Findings underscore the potential benefits of LDL-C control as a strategy for dementia prevention. Failing to account for dementia may lead to substantial underestimation of the health benefits associated with lipid-lowering interventions. Further research should consider the cost-effectiveness of lipid-lowering treatment for dementia prevention. Contact Information Ciaran N Kohli-Lynch, PhD Department of Preventive Medicine Northwestern University Feinberg School of Medicine ciaran.kohli-lynch@northwestern.edu @ceed.bsky.social ALZHEIMER'S ASSOCIATION AAIC>26	Long-term outcomes associated with LDL-C control, 500,000 U.S. adults					Observed LDL-C	LDL-C Control (≤130 mg/dL)	Difference	Incident CVD Events	270,725	260,970	-9,755	Dementia Cases	144,010	137,660	-6,350	Life Years	14,285,435	14,455,015	169,580	QALYs	7,488,695	7,552,200	63,505
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