Life Expectancy Gains from the Treatment of High Blood Pressure for Persons at Varying Baseline Risk of Cardiovascular Disease: A Systematic Review

Monika Roy, MD, Mehul A. Dalal, MD, MSc, R. Scott Braithwaite, MD, MSc

**Background:** Hypertension treatment guidelines recommend treatment to pre-specified blood pressure targets regardless of baseline cardiovascular disease (CVD) risk. To inform risk-based guideline development, we aimed to systematically identify risk-stratified estimates of the absolute benefit of treating high blood pressure.

**Methods:** We searched MEDLINE and EMBASE using MeSH and keyword search terms. We selected studies that 1) evaluate benefits from treating according to current recommendations 2) report life-years gained as an outcome. We included English language studies published between 1997 and 2007. Two authors independently performed title, abstract, full text and bibliographic review. From the selected articles we abstracted data about model characteristics, key assumptions, and risk-stratified estimates of life-expectancy gains. To standardize risk assessment we estimated Framingham risk scores from information available in each selected publication.

**Results:** Our search yielded 254 publications and five met our selection criteria. Four studies used Markov models and one used an epidemiologic model to estimate life-years gained (LYG) from treating hypertension. We found substantial differences in assumptions made to estimate effectiveness of therapy and estimates of life-years gained for persons of similar CVD risk. Within studies we found the benefits from treating hypertension greater for younger persons and those at higher risk for CVD.

**Conclusion:** Although variability in estimates of benefit may be attributable to differences in study assumptions, the selected studies show a consistently greater benefit for treating hypertension in younger and higher-risk persons. Guideline developers may choose to highlight these differences in future recommendations.