**Journal of Diabetes Science and Technology** Volume 5, Issue 3, May 2011 © Diabetes Technology Society

# Cost-Effectiveness of Implementing the Chronic Care Model for Diabetes Care in a Military Population

Shihchen Kuo, R.Ph., M.S.C.P.,<sup>1,2</sup> Cindy L. Bryce, Ph.D.,<sup>2,3</sup> Janice C. Zgibor, R.Ph., Ph.D.,<sup>1,4</sup> Donna L. Wolf, Ph.D.,<sup>5</sup> Mark S. Roberts, M.D., M.P.P.,<sup>2,3</sup> and Kenneth J. Smith, M.D., M.S.<sup>3</sup>

## Abstract

### Background:

Applying the chronic care model (CCM) for diabetes management helps improve health outcomes and patient care. The CCM was implemented at U.S. Air Force Wilford Hall Medical Center through the Diabetes Outreach Clinic (DOC) in 2006, but its cost-effectiveness in this setting is unknown.

### Methods:

We constructed a Markov decision model to estimate DOC cost-effectiveness compared with usual care (UC) over a 20-year period. Based on empirical, post-intervention demographic and clinical data, we applied United Kingdom Prospective Diabetes Study risk equations to predict long-term probabilities of developing microvascular or macrovascular complications. Health care system and societal perspectives were considered, discounting costs and benefits at 3% annually. Intervention costs and outcomes were obtained from military data, while other costs, disease progression data, and utilities were drawn from published literature.

### Results:

From a health care system perspective, the DOC cost \$45,495 per quality-adjusted life-year (QALY) compared with UC; from a societal perspective, the DOC compared with UC cost \$42,051/QALY (when the model started with the uncomplicated diabetes cohort), \$61,243/QALY (when starting with the DOC cohort), or \$61,813/QALY (when starting with the UC cohort). In one-way sensitivity analyses, results were most sensitive to yearly costs for specialty care visits. In probabilistic sensitivity analysis, the DOC was favored in 51% of model iterations using an acceptability threshold of \$50,000/QALY and in 72% at a threshold of \$100,000/QALY.

### Conclusions:

The DOC strategy for diabetes care, performed with the CCM methodology in a military population, appears to be economically reasonable compared with UC.

J Diabetes Sci Technol 2011;5(3):501-513

Author Affiliations: <sup>1</sup>Department of Epidemiology, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, Pennsylvania; <sup>2</sup>Department of Health Policy and Management, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, Pennsylvania; <sup>3</sup>Section of Decision Sciences and Clinical Systems Modeling, School of Medicine, University of Pittsburgh, Pittsburgh, Pennsylvania; <sup>4</sup>Center for Aging and Population Health, University of Pittsburgh, Pittsburgh,

Abbreviations: (A1C) glycated hemoglobin, (CCM) chronic care model, (DOC) Diabetes Outreach Clinic, (ICER) incremental cost-effectiveness ratio, (MHS) Military Health System, (QALY) quality-adjusted life-year, (UC) usual care, (UKPDS) United Kingdom Prospective Diabetes Study, (WHMC) Wilford Hall Medical Center

Keywords: chronic care model, cost-effectiveness, diabetes care, Markov decision model, military population

Corresponding Author: Shihchen Stanley Kuo, R.Ph., M.S.C.P., Department of Epidemiology, Graduate School of Public Health, University of Pittsburgh, CRHC Parkvale Annex, 3520 Forbes Avenue, First Floor, Pittsburgh, PA 15213; email address <u>shk26@pitt.edu</u>