

Financial impact of medication reviews by clinical pharmacists to reduce in-hospital adverse drug events: a return-on-investment analysis

Mégane Jermini^{1,2}; Caroline Fonzo-Christe¹; Katherine Blondon³; Christelle Milaire⁴; Jérôme Stirnemann⁵; Pascal Bonnabry²; Bertrand Guignard¹

¹ Pharmacy, Geneva University Hospitals, Geneva, Switzerland; ² Institute of Pharmaceutical Sciences of Western Switzerland, School of Pharmaceutical Sciences, University of Geneva, Geneva, Switzerland; ³ Medical and Quality Directorate, Geneva University Hospitals, Geneva, Switzerland; ⁴ Finance Department, Geneva University Hospitals, Geneva, Switzerland; ⁵ Division of General Internal Medicine, Department of Medicine, Geneva University Hospitals, Geneva, Switzerland

Purpose: Adverse drug events contribute to rising health care costs. Clinical pharmacists can reduce their risks by identifying and solving drug-related problems (DRPs) through medication review. We aimed to develop an economic model to determine whether medication reviews performed by clinical pharmacists could lead to a reduction in health care costs associated with the prevention of potential adverse drug events.

Method: Two pharmacists performed medication reviews during ward rounds in an internal medicine setting over one year. Avoided costs were estimated by monetizing five categories of DRPs (improper drug selection, drug interactions, untreated indications, inadequate dosages, and drug use without an indication). An expert panel assessed potential adverse drug events and their probabilities of occurrence for 20 randomly selected DRPs in each category. The costs of adverse drug events were extracted from internal hospital financial data. A partial economic study from a hospital perspective then estimated the annual costs avoided by resolving DRPs identified by 3 part-time clinical pharmacists (0.9 full-time equivalent) from 2019 to 2020. The return on investment (ROI) of medication review was calculated.

Results: The estimated annual avoided costs associated with the potential adverse drug events induced by 676 DRPs detected was € 304,170. The cost of a 0.9 full-time equivalent clinical pharmacist was € 112,408. Extrapolated to 1 full-time equivalent, the annual net savings was € 213,069 or an ROI of 1–1.71. Sensitivity analyses showed that the economic model was robust.

Conclusion: This economic model revealed the positive financial impact and favorable return on investment of a medication review intervention performed by clinical pharmacists. These findings should encourage the future deployment of a pharmacist-led adverse drug events prevention program.

Published in *Int J Clin Pharm.* 2024; 46(2): 496–505
doi: 10.1007/s11096-023-01683-w

Contact: megane.jermini@gmail.com / megane.jermini@hug.ch