

**ADVERSE EVENTS
AMONG
WINNIPEG HOME CARE CLIENTS**

BY

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A Thesis submitted to
the Faculty of Graduate Studies
in Partial Fulfillment of the Requirements for the Degree of

MASTER OF PUBLIC ADMINISTRATION

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“Adverse Events Among Winnipeg Home Care Clients”

BY

Keir Johnson

**A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University of
Manitoba in partial fulfillment of the requirement of the degree
Of
MASTER OF PUBLIC ADMINISTRATION**

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Abstract

The topic of patient safety has recently received considerable attention in Canada, the United States, and several other countries. Most studies in this area, however, focus exclusively on hospitals, with few investigating the safety of other health care sectors, such as home care. The integrating theme for this study is that no part of the health care system, including home care, is free of adverse events (AEs). Before measuring patient safety in home care, this study sought to translate hospital-centric patient safety concepts to the home care environment. A context-appropriate approach to measure AEs in home care was developed—this used chart reviews prompted by a mixed screening process—and these methods were applied to a sample of clients from the Winnipeg Health Region to describe the incidence, type, severity, cause, preventability and ameliorability of AEs in home care.

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Abbreviations

ADE	Adverse Drug Event
ADL	Activities of Daily Living
AE	Adverse Event
CMS	Centres for Medicare and Medicaid Services (U.S.)
CTS	Community Therapy Services
DSS	Direct Service Staff
HMPS	Harvard Medical Practice Study
IADL	Instrumental Activities of Daily Living
IHI	Institute for Healthcare Improvement
IOM	Institute Of Medicine
JCAHO	Joint Commission on Accreditation of Healthcare Organizations
MDS-HC	Minimum Data Set for Home Care
OASIS	Outcome and Assessment Information Set
OBQM	Outcome-Based Quality Monitoring
OT	Occupational Therapy
PCH	Personal Care Home
PHIA	Personal Health Information Act
PHIN	Personal Health Identification Number
PT	Physical Therapy
RAI-HC	Resident Assessment Instrument for Home Care
WRHA	Winnipeg Regional Health Authority

1. INTRODUCTION

The topic of patient safety has recently received considerable attention, with prominent studies in Canada,¹ the United States^{2,3} and other countries examining this critical health care issue. A recent Canadian study found that 7.5% of hospital admissions resulted in an adverse event (AE)—defined as “unintended injuries or complications resulting in death, disability or prolonged hospital stay that arise from health care management”⁴ and not the patient’s underlying condition. This study estimates that in Canada between 9,000 and 24,000 hospital patients die each year due to preventable medical errors.⁵ These types of studies have drawn public attention to the issue; governments have taken action by creating patient safety institutes to improve the situation.⁶ However, these studies capture only part of the picture since hospitals are only part of the broader health care system. The well-known Canadian Adverse Event Study notes that “[a]dditional research is also needed into the incidence and types of AEs beyond the acute care hospital setting.”⁷ The pivotal American report *To Err is Human* by the Institute of Medicine

¹ Ross Baker et al., “The Canadian Adverse Event Study: the incidence of adverse events among hospital patients in Canada,” *Canadian Medical Association Journal* 170(11) (2004): 1678-86.

² TA Brennan et al., “Incidence of adverse events and negligence in hospitalized patients: results of the Harvard Medical Practice Study I,” *New England Journal of Medicine* 324 (1991): 370–7.

³ Eric J. Thomas et al. “Incidence and types of adverse events and negligent care in Utah and Colorado,” *Medical Care* 38 (2000): 261–71.

⁴ Baker et al.

⁵ Medical errors are not only caused by physicians; indeed, all health care staff can cause a medical error.

⁶ The federal government created the Canadian Patient Safety Institute (see <http://www.hc-sc.gc.ca/english/care/cpsi.html>) in 2002 and the Manitoba government established the Manitoba Institute for Patient Safety in 2004 (<http://www.mbips.ca/>).

⁷ Baker et al., 1685.

(IOM) notes that “with the exception of medication-related events... little if any research has focused on errors or AEs occurring outside the hospital setting.”⁸ Indeed, little if any research has been done on AEs in physician’s offices, clinics, public health, mental health, long term care, or home care.

Home care is an integral and growing component of the universal health care system in Manitoba. Its broad aims are to maintain independent living at home and to prevent, delay or shorten institutionalization (both hospital and long term care).⁹ Approximately 16% of seniors in Winnipeg use home care services.¹⁰ With an aging population, the numbers using this program will continue to grow.¹¹ A literature search, the results of which are included in chapter two, found that few studies have looked at home care client safety. Of the studies that examine AEs or errors outside of hospital, some focus on hospital patients after discharge who may or may not have been receiving home care. Others look at home care clients but examine only medication-related events—this is only one type of AE. Only one study considered a variety of AEs in the home care setting, but the study reported *potential* adverse events for American home care agencies that typically serve clients for short periods of time (i.e. post-acute). Furthermore, it was conducted in the United States, which has quite a different health care system than Canada. Clearly, there is a gap in research and knowledge about the safety of home care.

⁸ Linda T. Kohn, Janet Corrigan, and Molla S. Donaldson, eds., *To err is human: building a safer health system* (Washington, DC: National Academy Press, 1999), 29.

⁹ Noralou P. Roos et al., “A Look at Home Care in Manitoba” Manitoba Centre for Health Policy and Evaluation, August 2001. Retrieved 25-SEP-2004 at <http://www.umanitoba.ca/centres/mchp/reports/pdfs/homecare.pdf>

¹⁰ Ibid., based on 1998/99 population data.

¹¹ By 2026, seniors will account for 21% of the population, compared to 13% in 2000 (Statistics Canada, “Population projections: 2000 to 2026,” *The Daily*, Tuesday, Mar 13 2001).

This thesis seeks to fill that gap by examining data from the Home Care program delivered by the Winnipeg Regional Health Authority (WRHA).

Patient safety studies have been invaluable in advancing quality improvement in hospitals; hopefully the results of this investigation will have a similar impact on home care. The integrating theme for this study is that no part of the health care system, including home care, is free of adverse events. In order to minimize potential harm to home care clients, policy makers and care providers need valid and reliable evidence on the frequency, types, severity, causes and preventability of events that harm clients.

The study has three goals. First, it will attempt to tailor patient safety concepts and terms to the home care context. The traditional concepts may not directly translate to home care given that it is quite different from hospital care—care is less controlled, delivered in varying unfamiliar environments, and relies heavily on client and family action as well as other health care providers (i.e. family physicians). Clear, unambiguous definitions are critical to developing an appropriate methodology and to interpreting results.

Second, the thesis will develop a methodology to screen and measure AEs in the home care setting. While chart reviews are the “gold standard” for screening and determining AE rates in the hospital—this approach has also drawn strong criticism—many other approaches have been employed, including patient and provider interviews, voluntary incident reporting and observation studies. Moreover, some studies are prospective in design while others are retrospective. Just as appropriate definitions must be established

for the home care context, an appropriate methodology must be developed to identify and describe AEs in home care.

The third and final goal of this thesis is to apply the methodology and collect, measure and analyze data to determine the incidence, type, severity, preventability and ameliorability (severity of could have been reduced through better care) of AEs in home care. This information will be useful to improving the safety and quality of care for home care clients.

To accomplish these three goals, the study will proceed as follows. Chapter two reviews relevant literature in this field of study. Specifically, this chapter explores the more well-known hospital-focused patient safety studies and relevant non-hospital studies, and considers methodological approaches to measuring adverse events and errors. This chapter is important to ground the study and understand both the broader body of work, the need for this study, and discuss key patient safety concepts. Chapter three is devoted to examining these key concepts in more detail and seeks to meet the first goal of the study—translating hospital-centric patient safety concepts to the home care context. This topic requires the attention of an entire chapter as a clear and appropriate definition is critical to a successful study. Drawing on both secondary sources and the results of qualitative research, this chapter develops a definition for “adverse event” that is more appropriate to home care and grounds the rest of the study.

The final three chapters are dedicated to measuring home care client safety. Based on the review of methodological approaches in the literature review, Chapter four begins with a

discussion of the potential methods and which is most suitable for this study. The remainder of this chapter describes the methodology that is used for this study, meeting the second goal of developing a home care-specific method for measuring adverse events. Chapter five presents the results of the investigation and reports any methods-related issues. The sixth and final chapter offers a discussion of the results and methods, and final comments. Together, the final two chapters meet the third goal of the thesis—collecting, measuring and analyzing data to determine the incidence, type, severity, cause preventability and ameliorability of AEs in home care.

ABOUT HOME CARE

In the City of Winnipeg, Manitoba, the Winnipeg Regional Health Authority (WRHA) oversees the operation of a range of health services, including six hospitals, 39 personal care homes and 20 community health offices.¹² The WRHA is responsible for the delivery of acute care, long-term care, public health, primary care, mental health, and home care to approximately 750,000 people.

As part of the WRHA portfolio, the Home Care program is provincially mandated and seeks to “help people live at home, remaining independent for as long as possible, thereby avoiding or delaying the need for individuals to go into long term care facilities.”¹³ Home Care’s mandate is to “provide effective, reliable and responsive

¹² Winnipeg Regional Health Authority. “About Us.” Web site, accessed 20-JAN-05, <http://www.wrha.mb.ca/aboutus/>

¹³ Winnipeg Regional Health Authority. “Home Care.” Web site, accessed 15-NOV-04, http://www.wrha.mb.ca/findcare/careincom/home_care.php. Also, see Noralou Roos *et al.* “A Look at Home Care in Manitoba” Manitoba Centre for Health Policy and Evaluation, August 2001. Available online at <http://www.umanitoba.ca/centres/mchp/reports/pdfs/homecare.pdf>

community health care services to support independent living, develop appropriate care options with clients and/or family and facilitate admission into long term care facilities when living in the community is no longer possible.”¹⁴ Home Care was established in Manitoba in 1974, and “is the oldest comprehensive, province-wide, universal home care program in Canada.”¹⁵

The WRHA Home Care program has two main components: nursing-coordinated, which typically focuses on clients with a short term, nursing-only need, and community-coordinated, which accounts for the vast majority of clients who generally use the service for an extended period. This study focuses only on community-coordinated Home Care. The program offers a variety of services to meet the needs of its clients, including assistance with some instrumental activities of daily living (IADLs, including household maintenance, laundry and cooking), activities of daily living (ADLs, including bathing, personal hygiene, dressing, locomotion, transferring, toileting, and eating), and nursing services (such as medication administration, wound care, etc).

Home Care services are based on assessed need and are offered to supplement supports available to the client through their informal network (i.e. family and friends) and other community organizations; thus provision of services is fragmented and often shared among several of these providers. Appropriately, coordination, information and referral are important services delivered by Home Care. Various other services, such as

¹⁴ Ibid.

¹⁵ Manitoba Health. “Manitoba Home Care Program.” Retrieved 25-FEB-2005 from <http://www.gov.mb.ca/health/homecare/index.html>

occupational and physical therapy and social activities, are also available and delivered through partner organizations. When community-based care is no longer a viable option for the client, Home Care facilitates nursing home placement, generally referred to as *personal care homes* (PCHs) in Manitoba.¹⁶

The WRHA Home Care program has used the standardized comprehensive assessment tool, called the MDS-HC (Minimum Data Set for Home Care), for over three years.¹⁷

This assessment tool was developed by interRAI, a non-profit organization of researchers from over 20 countries dedicated to improving the care of the elderly, frail, and disabled. InterRAI has developed tools for a variety of care settings, including home care, long term care, mental health, and palliative care. The assessment and its associated indicators undergo rigorous research and testing to ensure reliability and validity.¹⁸

The MDS-HC is not simply an assessment tool, but also promotes evidence-based decision-making at both the practice and organizational planning level by including care planning protocols, outcome measures, quality indicators and resource utilization groups—the assessment and these indicators are collectively referred to as the RAI-HC (Resident Assessment Instrument for Home Care). These indicators are all calculated using data collected in the assessment tool.

¹⁶ Case Coordinators complete an Application and Assessment for Personal Care Home (PCH). This application is reviewed at “panel” to ensure that placement in a PCH is the most appropriate option for the individual. For a brief but complete overview of the services of Home Care see the Guide to the Manitoba Home Care Program at <http://www.gov.mb.ca/health/homecare/guide.html>

¹⁷ MDS-HC was implemented regionally after a one-site pilot project. An evaluation report that led to the selection of this tool is available at <http://www.gov.mb.ca/health/homecare/assessment.html>

¹⁸ Visit interRAI’s web site at <http://www.interrai.org>

2. REVIEW OF THE LITERATURE

A search for relevant journal articles was conducted using PubMed, CINAHL, and Google Scholar. A general Internet search was performed as several web sites have been created for patient safety-related organizations that contain invaluable resources. The review also included some previously-known sources, such as major books and web sites. The search, which had no date restrictions, was conducted in late 2004 and continued, ongoing, until May, 2005.

The general literature review is separated into three sections. The first section presents the most significant patient safety studies; these studies focus on adverse events exclusively in the hospital setting. The next section reviews relevant studies that examine AEs outside of hospital. Finally, the last section will review various patient safety methods drawing on literature that evaluates relevant measurement methodologies.

PATIENT SAFETY LITERATURE

As discussed earlier, the majority of adverse event and medical error research concentrates on hospitals. Patient safety research really began with a now well-known study published in 1991.¹⁹ This study, commonly referred to as the Harvard Medical Practice Study (HMPS), reviewed about 30,000 randomly selected patients discharged in 1984 from 51 randomly selected New York state hospitals. The charts were screened by

¹⁹ Brennan et al.

nurses and medical records analysts for potential AEs using a set screening criteria. Physicians then reviewed the screened in charts. This study revealed that 3.7% of admissions suffered an AE and that 58% of those were due to negligence or substandard care; in other words 58% of the adverse events were preventable. This study is referenced often for the results, and just as often for its methods. It has been noted that "this review process has become the benchmark method for research on adverse events in hospitals."²⁰ Indeed, the methods were used in a study of AEs in Colorado and Utah hospital patients discharged in 1992.²¹ This study sampled about 15,000 discharges and found that 2.9% of patients experienced an AE, with 53% of those rated as preventable.

While these studies' findings are clearly important, they were largely ignored until the pivotal IOM report *To Err is Human*. Based on the two studies mentioned above, the report estimates that in the United States 44,000-98,000 hospital patients die each year due to preventable AEs, noting that even if one considers the low estimate of 44,000, it still outnumbers deaths from either motor vehicle accidents or breast cancer.²² The IOM report drew widespread attention to the issue of patient safety and research in this area subsequently exploded, with several researchers replicating the American studies in other countries and exploring ways of improving the situation. Most recently, the Institute for Healthcare Improvement (IHI) launched its "100K campaign," seeking to sign up hospitals to commit to six interventions known to reduce preventable hospital deaths.²³

²⁰ Ross Baker, "Commentary: Harvard Medical Practice Review," *Quality and Safety in Health Care* 13 (2004): 151-152.

²¹ Thomas et al.

²² Kohn, Corrigan, and Donaldson, 26.

²³ Visit IHI's web site at <http://www.ihl.org> for more information. Since the campaign was launched in late 2004, over 2,000 American hospitals have signed up for the campaign, as well as hospitals around the

Ultimately, the campaign seeks to save 100,000 lives. A similar campaign, Safer Healthcare Now!, was recently launched in Canada, replicating the six strategies proposed by IHI.²⁴

The methods used in the HMPS have certainly served as a gold standard, with studies in Britain, Australia, New Zealand, Denmark, and more recently in Canada utilizing a very similar approach. The Canadian Adverse Events Study sampled 4,164 discharges from 20 hospitals in five provinces in 2000 (British Columbia, Alberta, Ontario, Quebec and Nova Scotia).²⁵ The study discovered that 7.5% of hospital admissions suffered an AE. They also found that 41.6% of AEs were preventable, meaning that overall, between 2.5% and 3.3% of admissions had a preventable AE. The researchers estimate that between 9,250 and 23,750 hospital deaths in 2000 are associated with a preventable AE. It is important to note that the chart review method used in these studies have been criticized for several reasons, which will be discussed in the methodology section of the literature review.

RELEVANT NON-HOSPITAL LITERATURE

Of the studies focusing on adverse events outside of the hospital setting, a few focused on hospital patients after discharge.²⁶ These studies conducted a telephone interview with

World. Winnipeg's St. Boniface Hospital and Health Science Centre are among the international hospitals who have committed to the IHI campaign.

²⁴ Visit the web site for Safer Healthcare Now! at <http://www.saferhealthcarenow.ca> to learn more about the Canadian campaign, which was launched in April, 2005.

²⁵ Baker et al., "The Canadian Adverse Event Study."

²⁶ Alan J. Forster et al., "Adverse events among medical patients after discharge from hospital," *Canadian Medical Association Journal* 170(3) (2004): 345-9, and Alan J. Forster et al., "The Incidence and Severity of Adverse Events Affecting Patients after Discharge from the Hospital," *Annals of Internal Medicine* 138 (2003): 161-167.

patients discharged during a specific follow-up time-period. The results of the interviews, combined with data from electronic health records, were reviewed independently by two physicians using a technique similar to the HMPS review approach. One study found an AE rate of 19.0%, with 30.5% of AEs rated as preventable and 31.6% rated as ameliorable (severity could have been reduced through better care).²⁷ The other study, sampling discharges from a Canadian hospital, found an AE rate of 23.2%, with 27.6% of AEs rated as preventable and 22.4% rated as ameliorable. In both studies, the most common type of AE was an adverse drug event (ADE). These two studies offer important information about patient safety in the home environment, although the AEs resulted from the care received during hospital stay or the discharge planned by the hospital. While these results cannot be relied upon to estimate the home care AE rate—a recent study discovered that only 20% of long stay hospital discharges in Winnipeg receive home care²⁸—the definitions and approaches are useful to this investigation.

Of the studies that examined home care clients, the vast majority focus specifically on medication-related events. One study focused on ADEs in elderly home care patients following hospital discharge.²⁹ This study used methods similar to the post-discharge investigations mentioned earlier, conducting telephone interviews with patients to determine if an AE had occurred, but was limited to those hospital discharges who

²⁷ Forster et al., "Incidence and Severity..."

²⁸ Anita Kozyrszjy et al., "Discharge Outcomes for Long-Stay Patients in Winnipeg Acute Care Hospitals," Manitoba Centre for Health Policy, January 2003. Retrieved 24-SEP-2004 at http://www.umanitoba.ca/centres/mchp/reports/pdfs/lstay_03.pdf

²⁹ Shelly L. Gray, Jane E. Mahoney, and David K. Blough. "Adverse Drug Events in Elderly Patients Receiving Home Health Services Following Hospital Discharge," *Annals of Pharmacotherapy* 33 (1999): 1147-53.

received home care. The researchers found that 20.1% of participants experienced an ADE. Most ADEs affected the gastrointestinal system (symptoms of nausea, diarrhea, constipation) and the central nervous system (symptoms of dizziness, fatigue, confusion).

Another home care ADE study surveyed direct service nurses in six American states to determine the prevalence of ADEs.³⁰ Focus groups with nurses revealed that patients do not always take prescribed medications, or may not follow the prescription directions correctly; the results of these focus groups were used to create the survey. This study found that five percent of patients experienced an ADE. This number is significantly lower than other studies, possibly because it was based on a general retrospective survey of direct care nurses asked to recall ADEs. Many of the ADEs affected the gastrointestinal system and the central nervous system, as was noted in the previous study. Nurses' responses to the survey revealed two broad categories of ADE causes. The first category was system issues, such as poor communication, inadequate hospital discharge preparation, and the number of providers involved. The other category was the nature of the patient (or client), including variables such as the presence of a family caregiver, cognitive abilities of the patient, ability to afford medications, knowledge about prescriptions, and choice to follow or not follow drug regimens.

Several studies were located that looked at *potentially* inappropriate medication use among the elderly. All of these studies employed one or more of several explicit criteria

³⁰ Carol Hall Ellenbeker, Susan C. Frazier, and Sharon Verney, "Nurses' Observations and Experiences of Problems and Adverse Effects of Medication Management in Home Care," *Geriatric Nursing* 25, no. 3 (2004): 164-170.

that have been developed to identify potentially inappropriate medications with a high risk for adverse events. Before discussing these studies, a brief introduction to these protocols will be provided. The Beers Criteria, first developed by Dr. Mark Beers et al. in 1991, has twice been updated to reflect changes in both drugs (i.e. new drugs) and research about medications that may discover harmful drug-related affects.³¹ The Criteria lists medications that are themselves potentially inappropriate and medications that are inappropriate when a specific disease or condition is present. The medication list was developed using a consensus panel (a modified Delphi approach) of pharmacy, medicine and gerontology experts. A Canadian Criteria (or McLeod Criteria) has also been developed, modeled after the Beers Criteria.³² Using a consensus panel approach similar to Beers et al., the Canadian Criteria includes drugs that are generally contraindicated for seniors, potential drug-disease interactions and potential drug-drug interactions. Finally, the Home Health Criteria, which was also developed by an expert panel, identified patterns of medication use combined with relevant signs and symptoms that suggest a potential ADE.³³ There are numerous studies that have employed one or more of these criteria; the most relevant are presented below.

³¹ Mark H. Beers et al. "Explicit Criteria for Determining Inappropriate Medication Use in Nursing Home Residents." *Archive of Internal Medicine* 151 (1991): 1825-1832; Mark H. Beers. "Explicit Criteria for Determining Potentially Inappropriate Medication Use by the Elderly." *Archive of Internal Medicine* 157 (1997): 1531-1536; Donna M. Fick et al. "Updating the Beers Criteria for Potentially Inappropriate Medication Use in Older Adults." *Archive of Internal Medicine* 163 (2003): 2716-2724.

³² Peter J. McLeod et al. "Defining inappropriate practices in prescribing for elderly people: a national consensus panel." *Canadian Medical Association Journal* 156, no. 3 (1997): 385-391.

³³ Nancy J. Brown et al. "A Model for Improving Medication Use in Home Health Care Patients." *Journal of the American Pharmaceutical Association* 38, no. 6 (1998): 696-702.

Sarah Meredith et al. studied 6,718 home care clients aged 65 and over from two of the largest home healthcare agencies in the United States.³⁴ The researchers used two sets of criteria to identify potentially inappropriate medication use—the Beers Criteria (1997) and the Home Health Criteria. Thirty percent of the study subjects were taking potentially inappropriate medications according to either criteria; 19% of all clients were identified using the Home Health Criteria and 17% using the Beers Criteria (some clients were identified by both). The study also found that the prevalence of possible medication errors increased with the number of medications taken.

The 1997 Beers Criteria was also used to study a sample of 2,193 home care clients in the Miami, Florida area.³⁵ This home care sample was part of a Medicaid-supported managed care program and all clients had to be eligible for nursing home placement. This home care program acted to avoid or delay institutionalization by providing many of the same services as Home Care in Winnipeg. Using the Beers Criteria, the researchers found that 39.7% of clients were taking at least one potentially inappropriate medication, and 10.4% were prescribed two or more.

The 1997 and 2003 Beers Criteria and Canadian Criteria were used to study potentially inappropriate medication use among European home care clients.³⁶ This study used only the contraindicated medications for the elderly from both Criteria, excluding the sections

³⁴ Sarah Meredith et al. "Possible Medication Errors in Home Healthcare Patients," *Journal of the American Geriatric Society* 49 (2001): 719-724.

³⁵ Adam G. Golden et al. "Inappropriate Medication Prescribing in Homebound Older Adults." *Journal of the American Geriatrics Society* 47, no. 8 (1999): 948-953.

³⁶ Daniela Fialová et al. "Potentially Inappropriate Medication Use Among Elderly Home Care Patients in Europe." *Journal of the American Medical Association* 293, no. 11 (2005): 1348-1358.