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# **The Role of the Pharmacist in Home Care**

## **Background Paper**

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## EXECUTIVE SUMMARY

Home care is a rapidly expanding sector of the health care system, in which care is becoming increasingly acute and/or complex. In Canada and the United States, the pharmacist's role in home care is largely limited to the provision of infusion therapy. This report focuses on innovative roles for the pharmacist in home care such as clinical, consultative or patient-focused roles.

Most articles in the pharmacy literature describe the potential (versus actual role) of the pharmacist in home care. Our search back to 1970 retrieved only 14 articles that described actual clinical home care practices. There were no descriptions of Canadian practices; the majority were American. Four of the practices were implemented for research purposes only and several others appeared to be pilot or demonstration projects. In six practices, services were provided by pharmacy students (PharmD), residents, fellows or clinical faculty at a University. Four practices were affiliated with hospital-based home programs. Four papers described practices in which the pharmacist acted primarily as a consultant to the home care or community service agency and eight papers described home care practices in which direct patient care was the focus.

Although, only four papers provide credible evidence of the impact of pharmacists' on clinical home care services, their results are encouraging. Medication counseling by pharmacists in the home, increased medication adherence and reduced outpatient clinic visits and physician contacts. A pharmacist-nurse home visit within one week of hospital discharge reduced unplanned readmissions and out-of-hospital deaths. There is some indication in these studies that the benefit may be greater in certain patient groups defined by disease and/or socioeconomic factors.

Identification of these factors are necessary to target groups in which the service would be most cost-effective and to recognize home care as an important area for future research. Another area of interest is the development and evaluation of structured models of home care practice. A defined structure and standardized terminology are necessary if innovative practice models are to be transferred to other pharmacists or settings.

Although no published studies of a pharmacist's clinical home care practice in Canada were found in our literature search, a concurrent study using key informants has identified 31 such practices across Canada. Five of these practices, selected for their geographic and practice setting diversity are described in Part II of this paper.



# PART I: INTRODUCTION AND LITERATURE REVIEW

## INTRODUCTION

Home care has been defined as “an array of services which enables clients, incapacitated in whole or in part, to live at home, often with the effect of preventing, delaying or substituting for long-term care or acute care alternatives.”<sup>1</sup> Home care is included in the *Canada Health Act* as an “extended health care service”. However, each province and territory in Canada provides and publicly funds home care services at its own discretion. Therefore, there is much diversity in publicly funded home care programs across the country. Health Canada’s 1999 review of publicly funded home care programs in Canada<sup>2</sup> identified a set of basic services that is common to all of the programs: client assessment, case coordination, case management, nursing services and home support (personal care, homemaking, Meals-on-Wheels and respite services). It also identified other services offered in some programs only. The following professional services were listed: physiotherapy, occupational therapy, respirology, social work, speech therapy and dietician services. Neither pharmaceutical services nor pharmacists were included.

Public funding for home care in Canada increased at an average rate of 11% per annum in the 1990s.<sup>2</sup> This growth rate greatly exceeded the rate in health care in general.<sup>3</sup> In 1997-98, 3% of Canadians received home care from a publicly funded program. This clientele was diverse in age, health status and medical and social needs. The majority received care on a long-term basis;<sup>2</sup> however, over the last few years, increasing numbers of acute-care patients have been admitted to home care as a consequence of earlier discharge from hospitals.<sup>4</sup>

The increasingly common practice of admitting patients to home care to either reduce or avoid institutional care means that more drugs are being consumed within the home care sector. Moreover, this drug utilization now includes technically complex or potentially toxic drugs that were previously used only in hospitals. When one also takes into account the multiple drug regimens and functional disabilities of many long-term, home care clients, it is clear that people on home care are more likely to require medication management support. Paradoxically, this population, because it is homebound, has less access to a community pharmacist. Responsibility for overseeing medication management is assumed by the home care nurse; however, only 40% of home care clients receive professional nursing services<sup>2</sup> and, in elderly clients who receive only homemaking or personal care services, there are indications that medication management support is inadequate.<sup>5,6</sup>

The development of the patient-centred model of pharmacy practice, called pharmaceutical care, has focused pharmacists on enhancing the quality of drug use and provided a systematic process for doing so. Seeing the need and feeling empowered by this new practice model, many pharmacists are now eager to provide pharmaceutical care in the home, as well as in their pharmacies or health care institutions. For these reasons, it is timely to examine the potential role of the pharmacist in providing medication management support for home care clients.

The purpose of this paper is to present information relevant to establishing a patient-centred or clinical role for the pharmacist in home care. Part I of this background paper defines home care pharmacy and describes the scope of practice. It then reviews the literature on clinical home care practice in pharmacy, summarizing both the practices described and the results of studies that have evaluated the practice impact. Part II of the paper presents five case studies of clinical home care practices in Canada.

## Defining Home Care Pharmacy

Home care pharmacy services might entail any of the following; which we have categorized along a continuum of increasing patient focus:

- 1) **Merchandise Support Services:** provision of home health products and supplies (e.g., ostomy products, incontinence supplies, dressings) and durable medical equipment (e.g., walkers, commodes).
- 2) **Specialized Dispensing Services:** preparation and dispensing of parenteral and other high-tech drugs, administered by a nurse in the home.
- 3) **Clinical Support Services:** provision of consultative services to home care provider agencies at either a patient level or an organizational level. The need for these services is, for the most part, defined by the agency. Services typically include advice on medication-related policies and procedures, drug information and education for agency staff, development or implementation of a quality assurance program for drug therapy, medication reviews, or advising a nurse on an individual patient's therapy.
- 4) **Direct Patient Care Services:** home visits to patients for purposes of medication assessment, management and counseling. The need for these services could be defined by the pharmacist, patient (or more commonly, the patient's family), or another health professional.

Community pharmacists got their start in home care as merchandisers of home health products. Indeed, in a 1999 survey of Canadian pharmacies, three out of four reported having some form of home health care section.<sup>7</sup> With the trend to deinstitutionalization of health care, beginning in the 1980s, high-tech therapies came to be administered in the home and a role for pharmacists in the preparation of sterile products (e.g., injections, infusions and inhalations) was born. Although an expanded role for the pharmacist in home care has been advocated and demonstrated in some sites, the pharmacist's actual role in publicly funded home care programs, both in Canada and the United States, has largely been limited to home infusion.<sup>8</sup> A recent survey of "home care pharmacy practices" in the United States illustrates this point.

Two questionnaires were mailed to the pharmacy manager at accredited home health agencies that provided home infusion therapy.<sup>9</sup> Responses were invited from the pharmacy manager and one other pharmacist at the agency. Respondents were asked to rate the importance and frequency of performance of 47 tasks (listed in Appendix A) in four areas: administrative, clinical, distributive and other. Not surprisingly, given the nature of the sample, results from the almost 400 respondents indicated that the five drug distribution tasks were the most frequently performed. Of the 22 clinical tasks, those relating to the provision of technical and therapeutic expertise to other health professionals were performed more frequently than tasks relating to direct patient support. It is noteworthy that one of the three least frequently performed tasks was "make home visits to assess use and storage of medications and compliance".

Statements from both the Canadian Society of Hospital Pharmacists (CSHP) and the American Society of Health-System Pharmacists (ASHP) on the pharmacist's role in home care<sup>10,11</sup> may assist in defining home care pharmacy. The CSHP statement is brief; it merely lists the distributive, clinical, consultative, advisory and educational functions of pharmacy services for home health care programs. The stated purpose of the ASHP guidelines is to define the role of the pharmacist in providing pharmaceutical care to patients in the home or alternative-site setting. Home care pharmacy is described as "the provision of specialized, complex pharmaceutical products and clinical assessment and monitoring to patients in their homes", generally for home infusion therapy and other injectable drug therapy and parenteral and enteral nutrition therapy. This is a relatively narrow definition of home care pharmacy that ties it to the route of drug administration. The guidelines go on to describe the pharmacist's responsibilities in 17 areas of home care practice listed below. Collaboration with other home care providers is a recurring theme.

- preadmission assessment
- initial patient database and assessment
- selection of products, devices and ancillary supplies
- development of care plans
- patient education, training and counseling
- clinical monitoring
- effective communication with prescribers, nurses and other health care providers

- communication with the patient and caregiver
- coordination of drug preparation, delivery, storage and administration
- standard precautions for employee and patient safety
- documentation in the home care record
- adverse drug reaction reporting and performance improvement
- participation in clinical drug research in the home
- participation in performance improvement activities
- policies and procedures
- licensure
- training, continuing education and competence

The ASHP also has a Minimum Standard for Home Care Pharmacies<sup>12</sup> that outlines the minimum requirements for the operation and management of pharmaceutical services provided by home care pharmacies in five areas:

- leadership and practice management
- drug information, education and counseling
- care planning, monitoring and continuity
- medication distribution and control
- facilities, equipment and information resources

Home care pharmacies are described as providing “pharmaceutical products and clinical monitoring services to patients of all ages in their homes, including home infusion therapy, oral medications, home hospice pharmaceutical services and parenteral and enteral nutrition”. This is a somewhat broader scope of practice than indicated in the ASHP Guidelines.

Another potential source of guidance as to the pharmacist’s role is the Canadian Council on Health Services Accreditation (CCHSA)’s Standards for Home Care Organizations. However, unlike their United States counterpart, the Joint Commission for the Accreditation of Health Care Organization’s (JCAHCO) Home Care Standards for Accreditation, CCHSA’s standards do not make specific reference either to pharmaceutical services or to medication management within home care.

## **LITERATURE REVIEW**

### **Pharmacists’ Clinical Home Care Practices**

Many health care providers and pharmacists themselves would define home care pharmacy as the provision of home infusion therapy. Clinical services in their view, then, would be those that support appropriate use of home infusion therapy in the home. However, as MacPherson and Ferris have described,<sup>13</sup> pharmacists can offer many other services that address the drug therapy needs of a much broader array of home care clients than those needing short-term, intravenous therapy. These include clinical support services to the home care agency and direct services to the patient (or family), that is, categories three and four in our typology of home care pharmacy services. We define provision of one or both of these categories of services as clinical home care practice. Clinical home care practice is the focus of the remainder of this report. It is an innovative practice area that warrants further development because of its potential to improve patient outcomes and reduce health system costs for this population.

We conducted a review of the literature pertinent to clinical home care practice in pharmacy. Both International Pharmacy Abstracts and Medline databases were searched from 1970 to December 1999 using the terms “pharmac\*” and “community” and “home care” or “hospice” or “palliative care”. We also did secondary searches from the reference lists of articles obtained. Fourteen articles describing actual (versus potential) clinical home care practices were retrieved.

## Practice Descriptions

Selected characteristics of the clinical practices described in these papers are summarized in Table 1. All but two of the practices focused on the elderly, either deliberately or because most program recipients were elderly; in the two remaining practices, participants' age was not specified. Only one practice targeted patients with a specific disease, namely, congestive heart failure.<sup>14</sup> In six of the 14 practices, services were provided by pharmacists affiliated with a School of Pharmacy, that is, clinical faculty, residents, Pharm.D. students or a research fellow.

We attempted to categorize the practice models described on two important dimensions:

- 1) formal linkages with other home health professionals' practices, i.e., solo vs. collaborative practice (with one other health professional) vs. member of a multidisciplinary team
- 2) the direct recipient of the pharmacist's service, i.e., direct patient care practice versus consultative services for home care providers. For some practices the correct categorization was not clear because of insufficient detail in the report. The results of our categorization are included in Table 1.

The specific services provided by the pharmacist depended on the context of the home health program. Practices affiliated with home care or community services programs (n=7) tended to include the following core services:

- periodic review of all medication profiles
- attendance at case conferences
- home visits on nurse request
- drug information service for nurses
- in-service education for nurses

In these practices, the pharmacist functioned primarily as a consultant to direct patient care providers.

**Table 1. Characteristics of Clinical Home Care Practices Described in the Literature**

Practice Characteristic	Number of Practices
Country of Origin	
United States	9 <sup>15-23</sup>
United Kingdom	4 <sup>14,24-26</sup>
Australia	1 <sup>27</sup>
Service Context	
Nonprofit home care agency	1 <sup>20</sup>
Visiting nurse agency	2 <sup>21,22</sup>
Community services program	1 <sup>19</sup>
Congregate housing facility	1 <sup>17</sup>
General practitioners' practices	1 <sup>24</sup>
Hospital-based home care program	3 <sup>15,18,23</sup>
Hospital discharge program	1 <sup>27</sup>
Research	
Geriatric clinic patients with CHF	1 <sup>14</sup>
Determinants of health in elderly	1 <sup>16</sup>
Homebound patients	1 <sup>26</sup>
Elderly post-discharge	1 <sup>25</sup>
Practice Linkages	
Solo practice	5 <sup>14,16,17,25,26</sup>
Collaborative practice	
with nurse	4 <sup>20-22,27</sup>
with physician	1 <sup>24</sup>
Multidisciplinary team	4 <sup>15,18,19,23</sup>
Major Recipient of the Service	
Patient	8 <sup>14,16,17,23-27</sup>
Home care provider	4 <sup>19-22</sup>
Both	2 <sup>18</sup>

In eight practices, the core service was one or more home visits to patients meeting specified criteria (usually age greater than 65 and prescribed more than 3-5 medications). Reports by Fairbrother et al.,<sup>24</sup> Schneider and Barber,<sup>26</sup> Begley et al.,<sup>25</sup> Goodyer et al.,<sup>14</sup> Hsai Der et al.,<sup>23</sup> Joyner et al.,<sup>17</sup> Sidel et al.,<sup>16</sup> and Stewart et al.,<sup>27</sup> described this type of direct patient care model. In the five solo practices, medication counseling and/or compliance monitoring were the focus of the pharmacist's activities. However, the number of home visits and their timing varied widely: weekly home visits for a minimum of three months,<sup>17</sup> four home visits (initial, two weeks, one month and three months),<sup>25</sup> three home visits at 2-4 week intervals,<sup>14</sup> at least two home visits with telephone follow-up as required<sup>16</sup> and two visits one month apart.<sup>26</sup>

The report by Hsai Der et al.<sup>23</sup> described a multidisciplinary home care program for veterans in which the pharmacist assessed the medication regimen and provided medication counseling to the patient in the initial visit, intervened with the prescriber as required and conducted a follow up home visit approximately one month later. Fairbrother et al.<sup>24</sup> described a collaborative practice in which the pharmacist made a single home visit entailing medication regimen review and counseling, followed by a face-to-face discussion with the patient's physician. This demonstration project was carried out in three general practitioners' practices in the United Kingdom and did not involve a home care agency.

The practice described by Stewart et al.<sup>27</sup> was the most comprehensive, reflecting the fact that the home visit was performed jointly by the pharmacist and nurse. Pharmacist activities during the single home visit included compliance and knowledge assessment for all patients and as required followed-up with:

- remedial counseling
- compliance device and reminder card
- caregiver instruction on intensified monitoring
- referral to a community pharmacist for ongoing monitoring

The nurse assessed patients for clinical deterioration and reviewed psychosocial status to determine the need for additional community-based support. After the home visit, the nurse contacted each patient's primary care physician to discuss the need for further remedial action and/or follow-up.

## **Predominant Models of Clinical Home Care Practice**

### **Pharmacist as Consultant to the Home Care Nurse**

Several articles in our literature review described a collaborative practice model for pharmacist and home care nurse, in which the pharmacist acted as an expert consultant to the nurse. The authors of one article went so far as to state that "a good collaboration between nursing and pharmacy is likely to be a key determinant in the quality of the medication services delivered by the [home care] agency".<sup>28</sup>

A recent article by Brown et al.<sup>29</sup> described a highly elaborated version of this type of model. Designed for Medicare/Medicaid-covered home health programs in the United States the model is currently being evaluated in a randomized, controlled trial. In this model, the nurse undertakes surveillance for 15 medication problems selected for their clinical importance, prevalence among the elderly and ease of identification and resolution in the home health setting. Most of the problems are defined by a set of clinical symptoms or signs; two are defined by medication history alone. Structured procedures for identifying and addressing each problem have been developed. A drug utilization review coordinator, who is a clinical pharmacist, coordinates implementation of the procedures. Activities entail educating the home health nurse about medications and use of the guidelines; clarification of procedures for specific problems; provision of additional clinical consultation for complex patients and if necessary, discussion of problems with physicians. In this model, unless the problem is unusually complex, it is the nurse's responsibility to present identified problems to the physician.

## Pharmacist as Direct Patient Care Provider

Other clinical home care practices described in our literature review involved the pharmacist making home visits to provide direct patient care. During this visit, the pharmacist interviews the patient and/or family member, inspects medication containers and storage, assesses the medication regimen and develops a pharmaceutical care plan. Typically, the pharmacist also implements the plan by providing medication counseling, providing compliance packaging or aids, intervening with the physician to change prescriptions and following up with the patient by telephone, repeat visit or by enlisting the services of the nurse.<sup>30</sup> Candidates for this service has been identified by the pharmacist, home care provider, physician or family member usually have a suspected medication-related problem in the process of reviewing the prescription profile or by a home care provider, physician or family member. A study of pharmacist services based on this model has recently been completed in Ontario.<sup>31</sup> Over an 18-month period, 237 home care clients age 60 or older and either taking four or more medications, or with a chronic condition (e.g., coronary artery disease, asthma, chronic obstructive pulmonary disease, diabetes, or congestive heart failure) received a pharmacist home visit and, on average, one follow-up phone call. Preliminary results indicate that 262 drug-related problems were identified in these clients.<sup>a</sup>

A pharmacist with home infusion program experience has suggested that the pharmacist can provide pharmaceutical care without going into the home.<sup>32</sup> Required information can be obtained from the patient and nurse over the telephone. This may be a more valid assertion for patients on short-term, high-tech therapy with a nurse in the home, than it is for elderly patients with chronic health problems, declining functional capacities and possibly no other health professional making home visits.<sup>b</sup>

## Impact of Pharmacists' Clinical Home Care Practice

Eleven papers provided evaluative data on clinical home care practices; the other three simply described the practice. Five of the 11 evaluative studies were randomized controlled trials; the other six<sup>15,17,21-23,26</sup> were case studies that, for the most part, simply tabulated the drug-related problems detected and interventions made. Since the case study design produces the weakest evidence of effectiveness, these six studies are not discussed further.

The five randomized controlled trials<sup>20</sup> assessed the impact of the pharmacist's clinical services on health outcomes and/or health care utilization. Health outcomes were examined in the studies by Goodyer et al.<sup>14</sup> and Stewart et al.<sup>27</sup> Goodyer et al. found a weak, but statistically significant, improvement in clinical outcomes. Stewart et al. found a statistically significant reduction in unplanned readmissions and out-of-hospital deaths. It is noteworthy that congestive heart failure patients were both the sole target group in the study by Goodyer et al. and the largest diagnostic subgroup in the study by Stewart et al.<sup>33</sup>

Studies by Sidel et al.,<sup>16</sup> Begley et al.,<sup>25</sup> Stewart et al.,<sup>27</sup> and Williams et al.<sup>20</sup> measured impact on health care utilization. Sidel et al. found a statistically significant reduction in outpatient clinic visits, Begley et al. found that fewer patients consulted their physician and Stewart et al. found significant reductions in unplanned hospital admissions, emergency room visits and length of hospital stay. The study by Williams et al., however, had significant design flaws; its results are therefore not reported. The four methodologically acceptable studies are described in detail in Appendix B.

Overall, the most impressive evidence of a positive impact of pharmacist clinical services comes from the study by Stewart et al.<sup>27</sup> The study was well designed (having been preceded by a pilot study with 90 patients) and the effect found was an important one, that is, a reduction in unplanned admissions and out-of-hospital deaths. It is particularly impressive that these outcomes were achieved with just one home visit. Although relatively brief, the intervention had several virtues: it was multifaceted, brought to bear the complementary skills of two professional disciplines (i.e., nursing and pharmacy), involved the informal caregiver and established continuity of care with the community pharmacist and the family physician.

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<sup>a</sup> Personal communication, Denis O'Donnell, Oct. 26, 1999, The Community Care Pharmacist Study

<sup>b</sup> 35% of clients in publicly-funded home care programs in Canada receive no professional services.<sup>2</sup>

A significant limitation of these studies, in terms of assessing the clinical role of the pharmacist, is that none described medication regimen assessment by the pharmacist. This might be understandable in the study by Stewart et al., if this function had already been performed during the acute hospital admission. However, for elderly patients admitted to home health programs from the community, there is a strong likelihood of inappropriate prescribing<sup>34-43</sup> that must be addressed before medication counseling programs are undertaken.

## Conclusion

Home care pharmacy can be defined in numerous ways. This paper categorizes home care pharmacy services, along a continuum of increasing patient focus, into merchandise support services, specialized dispensing services, clinical support services and direct patient care services. It proposes that clinical support services and direct patient care services constitute patient-centred or clinical home care practice and that clinical home care practice presents an important but unfulfilled role for the pharmacist, with potential benefits for the patient and the health care system.

The literature on clinical home care practice in pharmacy is limited; however, this is also true of health services research, of any type, that either describes, or seeks to improve, medication use in home health care settings.<sup>29</sup> We found only four studies that provided credible evidence of the impact of pharmacists' clinical home care services. Their results, however, are encouraging. Medication counseling by pharmacists in the home increased medication adherence and reduced outpatient clinic visits and contacts with physicians. A pharmacist-nurse home visit within one week of hospital discharge reduced unplanned readmissions and out-of-hospital deaths.

There was some indication in these studies that benefit may be greater in patient groups defined by disease and/or socioeconomic factors. Identification of those most likely to benefit is important to obtaining the maximum cost-effectiveness from the service and, thus, is an important area for future research. Another important area for future work is the development and evaluation of structured models of home care practice; a defined structure is necessary if a practice model is to be transferred to other pharmacists or settings. The work of both Stewart et al.<sup>27</sup> and Brown et al.<sup>29</sup> is important in this regard, as are current demonstration and research projects in Ontario.<sup>31,44</sup>

Finally, although there is limited research on the impact of pharmacists' clinical home care practice, outcomes evidence from the ambulatory care setting is likely to generalize to the home care setting. Therefore, this body of literature<sup>45-48</sup> should also be consulted when considering the justification, implementation or funding of clinical pharmacy services in home care.

Because there are no descriptions of Canadian clinical home care practices in the literature, Part II of this paper presents case studies of five current practices in Canada, to illustrate the feasibility of pharmacists' clinical home care practice in the context of the Canadian health care system.

# **PART II**

## **CASE STUDIES OF CANADIAN HOME CARE PHARMACY PRACTICES**

The case studies in this background paper were selected from home care pharmacy practices identified for purposes of another study.<sup>49</sup> The methods used in that study for identifying these practices and for case writing are described below.

### **METHODS**

#### **Sample**

Canadian community pharmacists with clinical home care practices were identified by contacting key pharmacy informants across Canada.<sup>c</sup> These informants included the Director of Research, PD, at the Canadian Pharmacists Association, one or more pharmacy practice or pharmacy administration faculty members at each Faculty of Pharmacy in Canada, provincial pharmacy associations and head offices of franchise and chain pharmacy corporations. Pharmacists suggested by these key informants were then contacted and asked to identify other pharmacists with similar practices (a process called snowball sampling).

During the initial telephone call to the pharmacist we determined whether the following eligibility criteria for clinical services were met: 1) pharmacist home visits are conducted for clinical purposes versus for prescription drug delivery and associated routine counseling 2) at least one pharmacist home visit is made per week and 3) home visit services are documented. These criteria were based on the premise that, for health care providers and insurers, a pharmacy's credibility as a provider of clinical home care services would depend on consistent provision of the service and documented evidence that the service had been provided.

Key informants provided the names of 96 pharmacies or pharmacists across Canada believed to provide clinical home care services. Eighty-four were contacted and 31 determined to be eligible for the study. Twenty-three of those eligible were invited to participate and 16 both agreed to participate and completed the fax survey and follow up telephone interview. Five cases were selected for this report. Three are community pharmacy-based practices, representing eastern, central and western regions of the country, including both independent and chain pharmacies. Two are specialty practices: one based in a community hospital and the other in a community health centre.

#### **Data Collection Procedures**

The content and structure of our case studies were modeled after the case studies in the US Office of the Inspector General's study of the clinical role of community Pharmacists.<sup>50</sup> Data were collected using a combination of procedures: fax questionnaire, follow-up telephone interview and pharmacy documents (e.g., promotional materials and service documentation forms).

The 10-page questionnaire was developed after reviewing the characteristics of home care practices described in the literature. It contained both forced-choice and open-ended questions eliciting descriptions of the pharmacy the pharmacist and the home care practice. In addition, respondents were asked to identify factors that led to the establishment of the home care practice and that were either facilitators or barriers to the practice.

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<sup>c</sup> A key informant method was chosen, rather than a national mail survey of licensed community pharmacies, because preliminary enquiries had led us to believe that these types of practices were rare. The only data we have found on the prevalence of home care practice in Canada comes from a 1999 survey of community pharmacies in Alberta, which found that 39% did home visits of less than 10 minutes to discuss medication issues.<sup>51</sup>

The questionnaire was reviewed for content validity by members of the research team, including a pharmacist with a large home care practice. The follow-up interview was used to clarify responses to open-ended questions in the questionnaire. It was approximately 30 minutes in length. Both the questionnaire and interview protocol were pilot tested in three home care practices.

## **Case Analysis**

Using the information sources identified above, cases were written in a standardized format. One member of the team wrote the first draft of the case and another reviewed it; either the first author or the reviewer was the person who had conducted the telephone interview. The case was then revised and sent to the pharmacist respondent, with areas of ambiguity, vagueness, conflicting information and missing information highlighted. The respondent was asked to address these comments and questions, to validate the accuracy of the case, in general and to submit printed materials used in marketing or documenting the home care service. Upon receipt of the corrected case and practice-related documents from the respondent, the case was reviewed and revised by the research team.

## **Issues in Identifying Home Care Practices**

The first challenge in studying clinical home care practices in pharmacy is to develop operational criteria by which these practices can be identified. While we believe we were successful in selecting three specific and measurable criteria, we recognize that they are arbitrary. Thus, by applying the criteria, we have excluded some practices that others would say do qualify; however, for those practices that we did include, the evidence of commitment to home care practice is unarguable.

A second challenge is to obtain reliable information about the extent to which pharmacy practices meet the selected operational criteria. In both the screening interviews and the completed questionnaires in our study, responses to questions about the number of home visits per month were based primarily on self-estimates rather than on data extracted from pharmacy records. In three cases, the practice passed our telephone screen for the minimum number of visits only to provide an estimate in the completed questionnaire that did not meet the minimum. Thus, practices that qualified initially were subsequently found not to qualify.

Because of the above issues, we caution future researchers in this area to give careful attention to unambiguous articulation of practice and service definitions and to confirming respondents' estimates and descriptions of service activities with recorded data or printed materials whenever possible.

# **PHARMACY PRACTICE A**

## **1. Practice Characteristics**

This independent pharmacy, located in a mid-sized Alberta city, dispenses from 2,500 to 4,999 prescriptions monthly. It has two separate sites: one a 5,000 sq. ft. pharmacy and the other a 10,000 sq. ft. home health store. The pharmacy employs four full-time equivalent (FTE) pharmacists, three FTE technicians, four nurses and one social worker.

The pharmacy's value-added services include a disease management program for newly diagnosed patients with asthma, hypertension and diabetes; a callback program for antibiotic prescriptions; drug regimen review for all new clients; patient medication management assessment; and a home health products advice program. Pharmacists use computer technology to support their patient counseling activities, downloading information from the Internet as required and to monitor drug therapy. A software package called the QS1 Datasystem supports their callback and disease management programs.

The owner/manager of the pharmacy obtained her B.Sc. in pharmacy seven years ago and opened the Pharmacy three years ago. She has a specialty certificate in geriatrics and is also a certified Airway

Surgical Appliance Technician. She is a member of the Canadian Pharmacists Association and a Fellow of the American Society of Consultant Pharmacists.

## **2. Home Care Services**

Home visits are conducted as a component of three programs in which the pharmacy participates: a wellness program for seniors, a community follow up program for renal and anorexia patients and the pharmacy's home support service for clients at high risk of medication-related problems. In total, the pharmacy makes 80 home visits a month. Each home visit client receives, on average, five visits.

Since 1994, the pharmacy has participated in an interdisciplinary program offered in Health and Wellness Centres located in eight seniors' apartment buildings. The interdisciplinary team includes nurses, a social worker, dietician, foot care specialist, physiotherapist, occupational therapist and respiratory therapist. Each holds office hours in the center. The pharmacist provides individual consultations to seniors' on their drug therapy, sometimes in the seniors' apartment. A pharmaceutical care process is followed.

The pharmacy partners with four area hospitals and a dialysis nurse to provide a community follow up service for patients discharged from its renal and anorexia programs. The pharmacy receives a fax copy of the discharge care plan that includes a summary of medications prescribed and monitoring required. The pharmacist visits the patient's home to assess the medication regimen and the patient's adherence to it. Treatment goals are established and a monitoring plan developed, using the QS1 Datasystem. Depending on patient needs, medications may be dispensed on a daily, weekly or monthly basis. Deliveries are made by the pharmacist so that compliance can be monitored. Clinical follow up, if needed, is done by the pharmacy's nurse.

The pharmacy's home support service is typically offered to clients on multiple medications who appear to be confused about their regimen, who are cognitively impaired, or who contact the pharmacy frequently with questions. The service consists of a home visit and interview, medication regimen assessment, compliance evaluation, drug education, development of a pharmaceutical care plan, monitoring and follow-up as needed. The pharmacist and registered nurse (RN) work as a team; the RN does the initial and follow-up visits as required, while the pharmacist sets up the pharmaceutical care plan and provides medication counseling.

Home care services are documented on a standardized form. The original is kept in the patient's home and a notation is made on the pharmacy's computer using QS1 software. Recommendations are sent to the home care nurse and prescribing physician by fax.

### **Service Recipients**

Physicians are responsible for almost half of referrals, with a similar number from nurses. Perhaps 2% come from hospital pharmacists who are aware of the pharmacy's programs and services. The three main reasons for home visits have been patient noncompliance, polypharmacy and cognitive impairment. The mix of patients receiving home visits is estimated as 45% frail elderly, 30% diabetic, 25% psychiatric and 20% renal, with many patients having more than one problem approximately 90% are receiving publicly-funded home care.

### **Reimbursement**

The pharmacy does not charge for its consultative services. In cases where it is determined that the patient should be dispensed a smaller supply of prescribed drugs more frequently, additional dispensing fee revenues are obtained; this helps to support the cost of the home visit program.

### **Evaluation of Home Care Services**

The drug-related problems identified and clinical outcomes are recorded for each client (e.g., blood pressure, serum cholesterol and number of asthma attacks); however, statistics are not compiled. Letters of appreciation from patients and health professionals are kept on file.

### **3. Factors Enabling and Hindering the Provision of Home Care Services in this Practice**

The impetus for the home care service came from the owner/manager's observation that she was often dealing with "high needs" patients who had difficulty accessing the pharmacist's clinical services. At the same time, health care cuts had resulted in reduced monitoring of patients by home care nurses, creating a receptive environment for pharmacist services in the home. A key enabling factor was having a registered nurse on staff to assist with patient follow-up and physician contact. Also, the nurse was often instrumental in convincing home care nurses to accept the pharmacist's recommendations.

Reimbursement for home services and physician and nurse cooperation are seen as the most important barriers to the home care service, followed by travel time to patients' homes and limited time to spend with patients. The pharmacy has found ways to overcome some of these barriers. Pharmacists have gained physician cooperation by being persistent in pursuing communication, using both telephone and fax. Sometimes the pharmacy asks a geriatrician to intervene with an uncooperative prescriber. A tactic for managing the limited time for each home visit has been to plan the objectives of each visit in advance.

## **PHARMACY PRACTICE B**

### **1. Practice Characteristics**

This clinical practice is located in a medical/dental clinic in a large British Columbia city. It was implemented in 1997 as a four-hour per week volunteer position. In 1999 it became a 20-hour per week position, paid by the clinic.

The pharmacist provides a full range of consultative services at the clinic to clients on an appointment basis, or when requested by the physician. These include compliance assessments, patient education and training (glucose monitoring, smoking cessation, lifestyle counseling), medication regimen reviews and monitoring of drug therapy. Consultations are typically provided to patients with asthma, chronic obstructive lung disease, hypertension, osteoporosis, depression or menopausal issues.

The pharmacist also provides drug information to clinic physicians. She has been in community pharmacy practice for over 25 years and has 20 years experience in making home visits. She is a member of the Canadian Pharmacists Association.

### **2. Home Care Services**

The pharmacist makes four-six home visits per month, with the average patient receiving two-four visits. Generally, the pharmacist makes home visits alone, although occasionally she will be accompanied by a physician, home care nurse, medical student or pharmacy student.

The pharmacist's compliance assessment and intervention service includes a home observation and interview component. Physicians may refer patients for this service if a patient is symptomatic despite being on medications or if medication containers contain unused medications. The pharmacist identifies patients if during a clinic encounter they appear uncertain about how they take their medications. If the patient lives alone, one or more repeat home visits may be made as required. If compliance remains an issue despite the pharmacist's intervention, the pharmacist may refer the patient to home care or long-term care agencies. If the patient has family or care provider support, the pharmacist will follow-up with them by telephone after the home visit.

Any of the pharmacist's clinical services will be provided in the home if requested by the physician. Home medication reviews are most commonly conducted for patients with chronic nonmalignant pain on narcotics, uncontrolled hypertension, hypercholesterolemia, asthma, diabetes, unresolved depression or anxiety disorder, osteoporosis, or more than five medications. Training in the use of inhalers or glucose monitoring may be provided in the home if patients are not mobile. Also, pharmacist follow-up on

changes recommended to a patient's drug therapy may occur either by calling the patient or by making a home visit. In the future, the pharmacist plans to do follow-up blood pressure measures in the home for all patients started on new antihypertensive therapy.

During the home visit, the pharmacist completes a pharmaceutical care work-up, which is filed in the patient's clinic chart. The work-up includes personal data (e.g., age, gender, weight, nutrition), clinical conditions and medication history, as well as an assessment of current drug regimen, a description of pharmacy services rendered, recommendations for changes in therapy or lifestyle and patient outcomes. A note is also written in the progress notes of the patient's clinic chart.

### **Service Recipients**

Approximately half of the clients who receive home visits are identified by the pharmacist when reviewing clinic records and interacting with patients at the clinic. Selection criteria include documented dementia, noncompliance, adverse drug reactions or polypharmacy. The remainder of home visit clients are referred by clinic physicians (90%) or pharmacists (10%) at the community pharmacy where the clinic pharmacist works part-time. Approximately 80% of the clients visited are frail elderly, 10% have diabetes and 10% have psychiatric conditions. About half are receiving publicly-funded home care services.

### **Evaluation of Services**

The pharmacist documents numbers of telephone calls made, drug information questions answered, pharmaceutical care work-ups done and interventions made.

## **3. Factors Enabling and Hindering Provision of Home Care Service in this Practice**

When the pharmacist joined the clinic, she identified a special need among elderly clients who did not get adequate medication-related support and do not ask for help. She noted that home care nurses often identified medication noncompliance, but many failed to identify other drug-related problems due to lack of training in pharmacology and therapeutics. Funding is the greatest barrier to the program; it is guaranteed only on a year-to-year basis.

# **PHARMACY PRACTICE C**

## **1. Practice Characteristics**

This home care practice is based in a community hospital with 200 acute beds and 300 extended care beds, located in a small city in British Columbia. The pharmacist provides consultative home care services as part of the hospital's seamless care program known as Enhanced Care Management (ECM). The objectives of the program are to prevent non-acute admissions and readmission's and to assist timely discharge. The ECM program is staffed by a coordinator, nurse clinician, social worker, dietician, social worker and pharmacist. The pharmacist provides pharmaceutical care to patients with ongoing medication-related needs who are discharged from the hospital into the community, or who are at home but at risk for a medication-related hospital admission. A special focus of the ECM program is its respiratory rehabilitation program; the pharmacist's role in this five week educational program is to provide education on medications.

The pharmacist is a graduate of the University of British Columbia who has completed a residency in hospital pharmacy. He has worked for seven years at this hospital and has four years experience providing home care pharmacy services. He is a member of the Canadian Society of Hospital Pharmacists.

## **2. Home Care Services**

Approximately 80% of the pharmacist's time is dedicated to clinical home care services. The pharmacist makes approximately 25 home visits per months with each patient receiving 1.2 visits on average. Patients selected to receive a home visit are those on complicated drug regimens and demonstrate either poor understanding of the regimen, noncompliance, or have little or no home support.

Compliance assessment and drug regimen review are the primary services. The pharmacist evaluates compliance by examining provincial drug plan refill records and conducting pill counts and a patient interview in the home. Interventions include patient education and arranging for Dosette<sup>®</sup> or bubble pack dispensing by the patient's community pharmacy. Usually, follow up is by telephone call one or two weeks after the initial visit. Those who are still unsure or are confused about the regimen may receive a follow-up visit.

Medication reviews are typically provided to patients with multiple disease states (e.g., cardiovascular disease, diabetes, COPD, osteoarthritis), or those 75 years of age or older. The pharmacist reviews the drug regimen, then interviews the patient, conducts a medication cabinet cleanup, organizes medications and arranges for compliance aids as needed. A follow-up call or visit is made in one or two weeks to evaluate progress.

The pharmacist documents services rendered on the "ECM Consultation Form", which is used by all members of the ECM team. In addition, the pharmacist keeps a minichart on all his home care patients. Information recorded includes: personal data, clinical information (e.g., diagnosis, medical history), current medication profile, drug regimen assessment, service rendered, monitoring plan, outcomes achieved and laboratory results. The pharmacist sends the referring physician a fax report of the patient consultation. Other physicians receive a report when the pharmacist wishes to make a prescribing recommendation to them. The home care nurse is usually updated via a telephone call.

Periodically, the pharmacist gives educational inservices to home support workers and home care nurses, for example, on herbal/alternative medicines.

### **Service Recipients**

Referrals for a pharmacist home visit originate from the hospital health care team (38%), community physicians (37%) and home care nurses (25%). The three main reasons for referrals are polypharmacy, noncompliance with prescribed regimens and repeat hospitalizations or emergency room visits. Approximately 90% of the patients are frail elderly, 10% have diabetes and 5% are on palliative care, with some having more than one problem.

### **Evaluation of Home Care Services**

The pharmacist compiles data on the numbers of home visits, follow-ups, blood pressure checks performed, drug-related problems identified, recommendations made to physicians and to patients and percentage of recommendations accepted by the prescriber or patient. For the past two years, ECM patients have been surveyed by telephone about their satisfaction with the program.

The pharmacist submits his statistics annually to the ECM program administrator. Data from different team members are then compiled and sent to the provincial government to justify renewal of funding.

## **3. Factors Enabling and Hindering Provision of Home Care Services**

The ECM program was initiated by the hospital in an attempt to decrease length of hospital stay and utilization of acute care services and is sustained by funding from the provincial Ministry of Health. Key factors in program success are support from home care providers, the multidisciplinary nature of the ECM team (which ensures that clients' diverse needs can be met), and links with long-term care services.

Acceptance by community physicians has been an obstacle, in that not all use the service and some may not accept the pharmacist's recommendations. As well, it took time for the pharmacist to become accepted as a valued member of the team. However, through education and a record of successful interventions, the pharmacist was able to convince other team members of his value in identifying and resolving drug-related problems.

# PHARMACY PRACTICE D

## 1. Pharmacy Characteristics

This is a busy franchise pharmacy (monthly prescription volume >10,000) in a large Quebec city. The pharmacy is a methadone dispensing center, holds “clinic days” for various medical conditions; has disease management programs for hypertension, diabetes, Alzheimer disease, osteoporosis, asthma and chronic obstructive pulmonary disease; and does “callbacks” to follow-up on therapeutic problems identified by pharmacists.

The pharmacy is a field work site for the Masters in Community Pharmacy program at the University of Montreal. The owner/manager has ten years experience in community pharmacy and has been at this for 3.5 years. In addition to his pharmacy degree, he holds a MBA degree. His professional memberships include the Canadian Pharmacists Association, the American Society of Health System Pharmacists and the American Society of Consultant Pharmacists.

## 2. Home Care Services

Five to ten home visits are done per month. Each home patient receives, on average, two visits. Home visits are made, in lieu of a “callback”, to follow up on identified drug-related problems such as noncompliance, poor understanding of the medication regimen or side effects. Elderly, confused patients who live alone are those most likely to receive a home visit. All home visits include a pharmaceutical care work-up.

Home care visits are documented in the patient’s medication profile in the pharmacy computer in free text format. The profile includes information on demographics, medical history, medication history, current medication profile, drug-related problem list, description of home care services rendered, monitoring plan, outcomes and time spent providing consultative home care services. In cases where a “pharmaceutical opinion”<sup>d</sup> is rendered, it is documented on a standardized Régie de l’Assurance-Maladie du Quebec (RAMQ) form. One copy is kept on file in the pharmacy and one copy is sent to the prescribing physician.

### Service Recipients

The majority (90%) of home care clients are identified by the pharmacists; 7% are referred by family physicians and 3% by the hospital pharmacy. The three top reasons for home visits are polypharmacy, cognitive impairment and noncompliance. Approximately half of home care clients are frail elderly, 40% have psychiatric diagnoses, 5% have diabetes, 1% are postoperative and 1% are receiving palliative care.

### Reimbursement

The pharmacy does not charge the patient a fee for its home care services. It is able to cover some of its costs via the Apotex “It’s Time to Talk ” grant program. Glucose meter training is reimbursed at a rate of \$15 by some meter manufacturers. In cases where a home care service results in a “pharmaceutical opinion” or “refusal to fill”, these fees (\$15.45 and \$7.00 respectively) are claimed from the provincial drug plan (RAMQ).

### Evaluation of Home Care Services

For 18 months, the pharmacy has been compiling statistics on pharmacists’ interventions (using a list of 27 specific interventions), “refusals to fill” and “pharmaceutical opinions”. These are collated on a monthly basis and the data forwarded to the central franchise office. At present, the plan is to take this information to third party payers in order to lobby for reimbursement for cognitive services. Data on home visit clients are not separately tabulated.

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<sup>d</sup> A pharmacist-initiated opinion on the pharmacotherapeutic regimen of a patient, provided in writing to the prescriber. This service is reimbursed by the Quebec drug plan, providing that the opinion involves a drug that is covered by the plan and is consistent with one of the opinion categories on the approved list.

### **3. Factors Enabling and Hindering the Provision of Home Care Services in this Practice**

The owner/manager instituted a consultative home care service because of his personal commitment to pharmacists' provision of cognitive services. The presence of pharmacy residents and students is a key factor enabling service provision; development of new services is an educational objective of these training programs. Also, the owner allocates a portion of his operating budget for the provision of home services, which he believes will increase business in general and thereby provide a good return on investment.

The primary barriers to the provision of home services are reimbursement, cooperation from other health care providers and the difficulty in obtaining contracts with group residential homes. By slowly introducing the notion of patient-specific therapeutic goals and making high quality interventions, this pharmacy has been able, in the owner's opinion, to demonstrate to physicians and home care nurses the value of its consultative services. Pharmacists are motivated and empowered to provide consultative services by being provided with financial support to attend educational conferences and by being rewarded with a share of the "pharmaceutical opinion" fee. Indeed, one of the pharmacy staff was given the pharmacist of the year award by a pharmacy association, for commitment to professional service.

## **PHARMACY PRACTICE E**

### **1. Practice Characteristics**

This independent pharmacy, located in a New Brunswick city, dispenses 7,500 to 10,000 prescriptions monthly. The owners aim to provide patient-focused care in a professional atmosphere. As a result, the pharmacy has recently installed three counselling booths, which permit private discussion of patients' medication-related needs and problems. Value-added services include training in asthma device management (e.g., inhalers, Aerochamber™); full medication reviews upon request from physicians, patients, or family members; and a computerized glucose monitoring service for the management of diabetes, using "Medi-Sense" software.

The pharmacist owner, who provides the home care service, received her B.Sc. in pharmacy in the United States and became licensed in New Brunswick shortly thereafter. She has practiced at the present pharmacy for 16 years, becoming a co-owner about seven years ago. She has a certificate in specialty compounding from the Professional Compounding Centers of America and has been involved in home care for the past eight years. Her professional memberships include the Canadian Pharmacists Association, the American Pharmacists Association and the American Society of Consultant Pharmacists.

### **2. Home Care Services**

The pharmacist holds medication education and training sessions (e.g., for home blood glucose monitoring or inhaler administration) at seniors' residences. Patients have their medication regimen and medication administration technique assessed and questions answered. Follow up, for those who are interested, is done at three days, one week and one month either in the home or over the phone.

The compliance program entails a home visit in which the drug regimen is evaluated and compliance assessed. The physician is contacted to verify medications, a dosing schedule is established and the patient or caregiver are counseled. Patients are then put on a "pill pack" program, whereby their medications are dispensed in monthly blister packages. Follow up with the patient and/or caregiver occurs in the pharmacy one month later.

Medication regimen reviews are conducted by appointment for patients who receive blister packaged medication, every three months and when therapy is changed. The pharmacist reviews the medication regimen and verifies it with the physician, ascertains the patient's medication taking routine and then develops a regimen appropriate for the patient.

Individual patient requests for in-depth consultation on topics such as hormone replacement and nutritional therapy are handled by appointment. A questionnaire to evaluate knowledge may be administered, the patient interviewed, the medication regimen assessed and recommendations made. Both the patient and the prescriber are provided with a copy of the assessment and recommendations. Follow up may be by phone or in the home.

The pharmacy holds medication education days twice a year for nurses and other health care professionals; home care providers are included. The topics have ranged from wound care, foot care, glucose monitoring to vitamin therapy. Occasionally, the pharmacist holds individual consultations with home care nurses in the community room of a seniors' residence to discuss specific issues, such as switching insulin administration from syringes to pens.

Patient assessments and pharmacist home care activities are documented and filed in patient charts in the pharmacy. Home visits are also noted in the patient's profile in the pharmacy computer. A summary of the pharmacist's consultation and recommendations for changes to the patient's drug regimen are communicated to the physician by letter, handwritten note or phone call. Documentation may also be sent to the homecare nurse and family, as appropriate.

### **Service Recipients**

Referrals are received from physicians (50%), nurses (20%) and patients or their families (30%). The three most common reasons for referral have been noncompliance with prescribed regimens, polypharmacy and living alone. The breakdown of patient types is roughly 80% frail elderly, 20% diabetic, 20% palliative care, 10% psychiatric, 1% post-operative surgical and 1% HIV/AIDS (with some patients having more than one of these conditions). Approximately 70% are receiving publicly-funded home care services.

### **Reimbursement**

The pharmacy charges the patient a \$25 setup fee for its compliance program. Other services are provided at a rate of \$45 per half-hour. Patient education and training are free services considered to be part of the usual and customary dispensing service provided to all clients of the pharmacy. When patients are unable to pay home service fees, the pharmacy uses the Apotex It's Time to Talk™ grant program to subsidize the cost of home visits.

### **Evaluation of Home Care Services**

Clinical outcomes are documented for all patients receiving consultative services; however, the data have not been compiled.

## **3. Factors Enabling and Hindering the Provision of Home Care Services in this Practice**

The home care service was implemented because the owners saw the need to provide more comprehensive care for their primarily elderly patients, many of whom had limited mobility. Home care seemed to be an excellent place to start. Reimbursement has been the most important barrier to the service. Travel time to patients' homes is another barrier. Staff discomfort at their lack of experience and expertise has been overcome through education and training.

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## APPENDIX A

### Inventory of Home Care Pharmacy Tasks<sup>9</sup>

#### Administrative Tasks

1. Develop or maintain inventory control system
2. Design or implement pharmacy security system
3. Establish or update policies and procedures
4. Hire, orient, train, or evaluate staff
5. Provide specialized training within home care company
6. Attend continuing-education programs
7. Supervise technicians
8. Maintain a reference library
9. Participate in quality assessment or improvement program
10. Design or maintain clean room
11. Ensure compliance with laws and JCAHO standards

#### Clinical Tasks

12. Monitor and report adverse drug reactions
13. Participate in patient-selection process
14. Communicate with prescriber about drug therapy regimen
15. Evaluate drug therapy regimen for appropriateness
16. Assess i.v.-access device for appropriateness
17. Select infusion-control device
18. Document patient information related to therapy
19. Develop and update patient-specific written care plan
20. Recommend change in therapy on basis of patient information

21. Participate in interdisciplinary patient care conference
22. Communicate to ensure continuity of care
23. Participate in hospital rounds
24. Compound injectable medications
25. Evaluate therapy before provision
26. Document interactions with others
27. Prepare/update medication profiles
28. Counsel patients by telephone
29. Counsel patients through direct contact
30. Prepare written drug information
31. Provide emergency care
32. Prepare discharge summaries
33. Make home visits

#### Distributive Tasks

34. Process medication orders
35. Supervise and verify compounding
36. Review stability and compatibility
37. Check medications
38. Coordinate with others for timely delivery

#### Other Tasks

39. Network to maintain referral sources
40. Plan or monitor financial affairs
41. Participate in sales and marketing
42. Serve on clinical advisory board
43. Provide drug information for non-clinical staff
44. Operate within budget
45. Present posters at home care meetings
46. Supervise education and training of residents or students
47. Teach home care topics at pharmacy schools

## APPENDIX B

### Abstracts of Four Randomized, Controlled Trials of Pharmacists' Home Visits

1. **Begley S, Livingstone C, Hodges N, Williamson V. Impact of domiciliary pharmacy visit on medication management in an elderly population. *International Journal of Pharmacy Practice* 1997;5 (Sept):111-121.**

**Begley S, Livingstone C, Hodges N, Williamson V. Evaluation of pharmacist interventions during domiciliary visits. *Pharmaceutical Journal* 1996; 257:R41-42.**

**Purpose:** To determine the effects of patient counseling during four domiciliary visits on medication management by elderly patients recently discharged from hospital

**Subjects:** Participants meeting the following inclusion criteria were recruited by hospital pharmacists at three hospitals within two district health authorities in the United Kingdom: age 75 or older; prescribed three or more different drugs; at least twice daily dosage for one or more drugs; under the care of a participating consultant; returning to their own home after discharge.

**Study Design:** Enrolled patients were randomized to an intervention group receiving home visits and counseling, a control group receiving visits only, or a no visit control group. 190 patients completed the study: 61 in the intervention group, 63 in the control visit group and 66 in the no visit control group. Pharmacist interventions were evaluated by a review panel consisting of a pharmacist, a clinical pharmacologist and a physician.

**Pharmacist Service:** Patients were visited in their own homes one to two days after discharge by the investigator, with subsequent visits at two weeks, one month, three months and 12 months. At each visit, a structured patient interview covered the following: medication information, drug knowledge, mental test, medication management and compliance with the medication regimen. A manual dexterity test and pill counts were also performed. The pharmacist then counseled the patient on medication administration and storage. Pharmacist interventions to address identified drug-related problems were recorded.

**Measures of Effect:** Number of prescribed drugs, drug knowledge, drug storage practices, number of hoarded drugs, contacts with health care providers, medication compliance; appropriateness of intervention.

**Results:** The pharmacist's consultative home service did not change the number of prescribed drugs or mean drug knowledge scores; however, it did reduce the proportion of patients storing their drugs inappropriately or hoarding drugs, as well as the proportion contacting their physician. Furthermore, mean compliance scores and the proportion of compliers increased in the intervention group.

Forty-seven interventions accounted for an intervention rate of 3.3% relative to the number of prescribed drugs. Compliance interventions were most frequent (53%). In 55% of interventions the pharmacist attempted to contact the prescriber. 83% of interventions were fully implemented and 13% rejected. In the opinion of the review panel, 89% of the interventions should have improved the patient's clinical status.

2. **Goodyer LI, Miskelly F, Milligan P. Does encouraging good compliance improve patients' clinical condition in heart failure? *British Journal of Clinical Pharmacology* 1995; 49(4):173-6.**

**Purpose:** To determine whether improved compliance by intensive medication counseling by a pharmacist can influence measures of heart failure.

**Subjects:** 100 elderly patients (> 70 years of age) with chronic stable heart failure who were responsible for administering their own medications were recruited from outpatient clinics in the Medicine for the Elderly Department at Charing Cross Hospital, London. Patients were excluded if they were cognitively impaired or if they suffered from Parkinson's, arthritis or hemiparesis. Patients were also excluded if the heart condition was not the primary cause of their shortness of breath or poor exercise tolerance.

**Pharmacist Service:** Patients were randomly assigned to groups receiving either a three-month counseling program or no counseling. The pharmacist made three home visits to each patient in both the intervention and control groups. During the first and third visit, medication compliance and knowledge were assessed. In the intervention group, medication counseling was also provided at all three visits. The pharmacist used a standard written protocol employing verbal counseling, medication calendars and information leaflets.

**Measures of Effect:** At the first and third home visits, compliance was measured by tablet count and medication knowledge by a questionnaire. Objective measures of heart failure included exercise test time, weight, pulse, jugular venous distension, pulmonary and ankle edema; subjective measures included symptoms of breathlessness and health-related quality of life (as measured by the Nottingham Health Profile). Both types of measures were made prior to randomization and at two-four weeks after the last home visit.

**Results:** There was a significant improvement in compliance (from 61% to 93%) and knowledge in the intervention group compared to the control group. Exercise capacity, edema and the subjective measure of breathlessness were significantly different in intervention and control groups; health-related quality of life was not. The effects obtained were similar to those of a "weak drug".

**Comment:** Whereas a significant effect on compliance was obtained, the effect on clinical outcomes was weak, causing the investigators to doubt the potential for improved compliance to produce a clinically relevant benefit in elderly patients with heart failure. It should be noted, however, that there is no mention of the pharmacist performing a medication review prior to counseling. Enhanced compliance can be presumed to have a beneficial effect on health only if the medication regimen is appropriate to begin with.

3. **Sidel VW, Beizer JL, Lisi-Fazio D, Kleinmann K, Wenston J, Thomas C, Kelman HR. Controlled study of the impact of educational home visits by pharmacists to high-risk older patients. *Journal of Community Health* 1990; 15(3):163-74.**

**Purpose:** To assess the impact of in-home pharmacist intervention in identifying and correcting problems associated with medication use.

**Study Context:** This study was performed as one of five subprojects of the Norwood-Montefiore Aging Study, a multidisciplinary research program with the goal of identifying the determinants of health and health-related problems among an urban ambulatory population of older people.

**Subjects:** Predominantly white, non-hispanic, adults  $\geq 65$  years of age at high risk for medication-related problems, according to a risk assessment profile, living in New York City. 141 patients were randomly assigned to the intervention group and 143 into the control group; home visits were performed in 113 in the intervention group.

**Pharmacist Service:** The pharmacist performed the risk assessment profile interview on all patients, usually in the patient's home. Subsequently, patients were randomized to intervention or control groups. The intervention group received a home visit by the pharmacist at least twice in a six to 11 month period. Telephone follow-ups were conducted as needed. During the home visit, the pharmacist:

- reviewed individually tailored informational materials with the patient and caregivers
- contacted the physician if necessary
- counseled on OTC medication use
- cleaned the medicine cabinet
- encouraged good medication taking practices
- advised patients on vaccinations
- stressed the importance of communication with the physician and the pharmacist

**Measures of Effect:** Medication-related risk was assessed with a risk assessment profile consisting of 71 questions in nine categories, administered prior to randomization and after the six-11 month intervention period. A weighted risk scale was developed from selected profile items. The core survey from the parent Aging Study, administered every six months, provided measures of health care utilization.

**Results:** The intervention did not improve the risk score nor did it affect specific knowledge, attitudes or practices with regard to medications; however, patients in the intervention group had significantly fewer outpatient clinic visits, but not physician office visits.

**Comments:** The impact on ambulatory care visits suggest that pharmacists' visits may have been substituting for outpatient clinic visits, either because they fulfilled the social need that sometimes prompts an outpatient visit or because they dealt directly with a drug-related problem at hand.

**4. Stewart S, Pearson S, Luke CG, Horowitz JD. Effect of home-based intervention on unplanned readmissions and out-of-hospital deaths. *Journal of the American Geriatrics Society* 1998; 46:174-80.**

**Purpose:** To evaluate the effect of a home-based intervention on the frequency of unplanned readmissions and out-of-hospital deaths among patients discharged home from acute hospital care.

**Subjects:** 762 medical and surgical patients discharged home from a tertiary referral hospital in Adelaide, Australia and prescribed a medication regimen for a chronic condition, were enrolled in the trial. Mean age was 66, socioeconomic status low and average number of medications was five. Seventy-three per cent had an unplanned admission within the prior six months.

**Study Design:** Patients were stratified by type of admission and randomized to an intervention or control group. The control group received usual care, which included a followup appointment with their primary care physician and/or hospital physician within two weeks of discharge. Intervention group activities are described below.

**Measures of Effect:** The primary endpoint was combined number of unplanned admissions and out-of-hospital deaths six months after the index admission. Secondary endpoints included unplanned admissions, out-of-hospital deaths, total deaths, emergency room visits, days in hospital and costs of care. Health-related quality of life (SF-36) was measured in a random sample of study participants.

**Pharmacist Service:** Patients were counselled by the pharmacist and/or nurse before discharge. Those at high risk of readmission (presence of more than one out of five predetermined risk factors) received a single home visit (by the nurse and pharmacist) one week after discharge. The objectives of the home visit were to: one) optimize home medication management two) detect otherwise hidden problems three) increase patient/caregiver vigilance for impending crisis and four) improve liaison with community-based services. During the visit, the pharmacist performed a pill count to assess compliance and administered a medication knowledge questionnaire. For those patients with poor compliance or medication knowledge, a combination of the following was provided: 1) remedial counseling; two) introduction of a compliance device and/or daily routine; three) incremental monitoring by caregivers; four) provision of a medication reminder card; five) referral to a community pharmacist for regular review of potential problems.

**Results:** 314 patients in the intervention group were judged to be at high risk and received the home visit (56 refused the visit), at which time 44% were found to be noncompliant and 96% demonstrated inadequate medication knowledge, levels no different from the control group. The intervention had a statistically significant effect on all primary and secondary endpoints except costs of care. There was a trend for hospital-based costs during follow-up to be lower in the intervention group ( $p=.10$ ). The cost of providing the service was estimated at \$190 (Aust.). No effect was detected on health-related quality of life.

**Comments:** Although medication knowledge and compliance were not study endpoints (they were assessed to determine what services should be provided during the home visit), it is noteworthy that they were not enhanced by discharge counseling. This finding casts doubt on the benefit of hospital pharmacy discharge counseling programs in an elderly population.