# EVALUATION OF A CONSULT PHARMACIST-DELIVERED

# COMPREHENSIVE MEDICATION MANAGEMENT SERVICE

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# Abstract

## Background

In 2010, a pilot program was implemented by the Medication Assessment Consultants (MAC) to provide comprehensive medication management (CMM) services to patients in the community of Saskatoon, Saskatchewan. Clinical pharmacists working as consultants, independent of any retail pharmacy or health system organization, delivered the program. The goal of the MAC CMM service was to optimize therapeutic outcomes for individual patients through improved medication use, and to reduce the risk of adverse drug reactions (ADRs).

## Purpose

The purpose of this study was to evaluate the independent consultant pharmacist model for delivering comprehensive medication management (CMM) services employed by the Medication Assessment Consultants (MAC) pilot program.

## Methods

A program evaluation was performed on MAC, consisting of a document review of program materials (e.g., MAC Policy and Procedure Manual, electronic patient records) along with stakeholder interviews.

The document review consisted of the collection of existing MAC documents, followed by an analysis of the information contained within each document.

Patients, physicians and MAC staff were interviewed using a semi-structured interview approach. Patient and physician interviews were conducted by phone and by an interviewer external to the study. Interviews were continued until saturation was reached. The MAC staff was interviewed in person by the investigator. All interviews were recorded and transcribed verbatim. Thematic analysis was used to identify common themes by having three individuals independently review each group of stakeholder interview transcripts.

## Results

During the 17-month pilot, 53 patients were referred to MAC, mostly from family physicians (79.2%). Patients were elderly (mean 71 years) and mostly female (67.9%). On

average, patients were taking 13.3 medications and had 9.2 medical conditions.  For the 42 patients for whom an assessment was completed, an average of 5.1 drug therapy problems (DTPs) per patient was identified.  The document review revealed that MAC did not achieve all of its internal program objectives (e.g., to generate a consistent flow of patient referrals; to promote the service to physicians and patients; and to improve medication-related short-term outcomes for patients).

All three interview groups reported a high level of satisfaction and support for the program.  Interviewees described various ways in which they felt that they benefitted from the program, including medication regimen optimization (patients), support in dealing with complex medication regimens (physicians), and a strong sense of personal and professional satisfaction and fulfilment (MAC staff).

The evaluation of the MAC program resulted in the identification of several program strengths (e.g., a strong, well-defined patient care process; an accessible service location; MAC pharmacist mentorship and support program), along with opportunities for improvement (e.g., expanded promotional activities; administrative support for the program; implementation of a formal satisfaction survey to obtain regular feedback from key stakeholders).

**Conclusion**

The results of this study suggest the independent consultant pharmacist model for the provision of CMM services has potential to be utilized as a new service delivery model (in addition to community pharmacies and primary health care teams) to provide CMM services in the primary health care system (PHCS).  The study findings have identified several strengths and opportunities for improvement, which may be useful for future attempts at implementing the CMM service model.

## Acknowledgements

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## Dedication

My thesis is dedicated to my parents who have always supported me in all aspects of my life. They are responsible for building a foundation on which I have been able to grow personally, professionally, and academically. I could not have done it without you.

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# List of Abbreviations

ADAPT       Adapting pharmacists' skills and Approaches to maximize Patient's drug Therapy effectiveness

ADR       Adverse drug reaction

BC       British Columbia

BCMMP       British Columbia Medication Management Project

CMM       Comprehensive medication management

CPAS       Client/Patient Access Services

CPhA       Canadian Pharmacists Association

DTP       Drug therapy problem

EMR       Electronic medical record

GAU       Geriatric Assessment Unit

HCP       Health care provider

IMPACT       Integrating Family Medicine and Pharmacy to Advance Primary Care Therapeutics

MAC       Medication Assessment Consultants

OTC       Over-the-counter

PCPCC       Patient-Centered Primary Care Collaborative

PHCS       Primary health care system

PHCT       Primary health care team

PPMI       Pharmacy Practice Models Initiative

SK       Saskatchewan

US       United States

# Chapter 1

# Introduction

## 1.1  Statement of the Problem

Comprehensive medication management (CMM) is a pharmacist-delivered service that has potential to improve medication use in the primary health care system (PHCS).  CMM is defined as:

> "…*professional activities needed to meet the standard of care which ensures each patient's medications (whether they are prescription, non-prescription, alternative, traditional, vitamins, or nutritional supplements) are individually assessed to determine that each medication is appropriate for the medical condition being treated, that the medication is being effective and achieving the goals established, that the medication is safe for the patient in the presence of co-morbidities and other medications the patient may be taking, and the patient is able and willing to take the medications as intended. This assessment is completed in a systematic and comprehensive manner.*" [1]

This process of assessing medications for appropriateness and opportunities for optimization has previously been demonstrated to result in patient benefit.  CMM has been shown to identify previously unrecognized drug therapy problems,[2,3,4,5,6] as well as help patients achieve targeted health measures, such as blood pressure[7] and cholesterol levels.[8]  CMM can also help patients gain better control of their medical conditions resulting in better health outcomes.[9,10,11,12]

In Canada, numerous provinces have attempted to implement pharmacist-delivered CMM with limited success.  Primary health care team (PHCT) initiatives, in which co-located interprofessional teams are assembled, have been implemented on a limited basis in Alberta, Saskatchewan and Ontario to encourage collaboration and help make teams of health care providers (HCPs) more accessible to patients.  Many of these teams have recruited pharmacists who have provided CMM within their respective clinics.[13]  Unfortunately, pharmacists are not always included as members of every PHCT, nor are PHCTs available universally in Canada.  Another approach to improving access to pharmacist-delivered CMM was piloted in both Alberta and British Columbia, in which community pharmacists provided the service.  The pilot projects were named the Alberta Pharmacy Practice Models Initiative (PPMI) and the British Columbia Medication Management Project (BCMMP), respectively.[14, 15]  Both projects were plagued with limited community pharmacist uptake due to time constraints, juggling dispensing

responsibilities with CMM services, and a lack of support from physicians, resulting in the service being delivered to a very small percentage of residents within each province.[16, 17]

It is therefore possible that relying on PHCTs and community pharmacies to provide CMM may result in limited patient access to this service. Consequently, it would be useful to explore an additional service delivery model to facilitate the expanded access to CMM services within Canada.

A consultant pharmacist-delivered CMM program was recently piloted in Saskatoon. The consultant pharmacist model entails a pharmacist working outside of the "traditional" community pharmacist role, but not as a co-located member of an interprofessional team. Consultant pharmacists typically practice as private contractors and are not employees of a pharmacy business (such as a community pharmacy) or a health care institution (such as a health region, clinic or hospital), and are commonly either paid on a fee-for-service basis or daily contract rate. These consultant pharmacists offer clinical services that can take on many forms from educating patients on various health-related issues, to providing drug information, to performing CMM. This model has the potential to expand access to CMM services in Canada, beyond the community pharmacy and PHCT settings.

The new consultant pharmacist-delivered CMM service that was recently piloted in Saskatoon was called the Medication Assessment Consultants (MAC) and it launched in September 2011. MAC provided CMM services to patients in Saskatoon, SK until February 2013. MAC, unlike previous models, positioned a salaried consultant pharmacist in an independent space (i.e., not in a community pharmacy, health centre or physician clinic) to provide CMM services to patients based on referrals from physicians, other HCPs or patient self-referrals. This new program was, to the best of our knowledge, the first of its kind in Canada and the CMM service delivery model had been previously untested in the literature.

1.2 Purpose of the Study

The purpose of this study was to evaluate the independent consultant pharmacist model for delivering CMM services employed by the MAC program.

1.3  Research Questions

The following research questions were defined to achieve the study purpose:

1.	How does the Medication Assessment Consultant (MAC) program operate?

1.1  How is the program promoted, delivered and managed?

1.2  What resources are required to operate the program?

1.3  What challenges exist in the operation of the program?

2.	How is the service utilized?

2.1  How many patients were referred to the program and by whom?

2.2  What were the demographics of the patients who utilized the service, how many medications were they taking, and how many health conditions did they have upon referral to the program?

2.3  How many and what type of drug therapy problems (DTPs) were identified?

3.	What are the program objectives and is MAC achieving those objectives?

4.	What are the stakeholder experiences with MAC and what recommendations, if any, do stakeholders provide to improve the program?

## Chapter 2
## Background and Literature Review

2.1  Challenges Related to Medication Use

The number of medications available in Canada has been increasing dramatically for the past several decades[18] and pharmaceuticals now represent the second largest health expenditure in Canada.[19]  Drug therapy has many benefits including its ability to prolong life and increase its quality, and often drug therapy is more cost-effective and less invasive than surgery and other medical procedures.[18]  Unfortunately, medications also contribute to a significant amount of patient harm,[18] and this risk increases with the number of medications used.  Mannesse et al. demonstrated that the risk of severe or fatal adverse drug reactions (ADRs) increased as the number of medications prescribed increased, and that the simultaneous use of three or more drugs increased the odds of a severe ADR by 9.8 times.[20]  Another retrospective study showed that administering more than six drugs at a time was associated with a higher incidence of fatal ADRs; a total of 38.3% of patients with a fatal ADR were on more than six drugs compared with 28.6% of patients with a nonfatal ADR.[21]  In another Canadian study, Forster et al. discovered that adverse events after hospital discharge due to medication occurred in 16.5% patients within 30 days of discharge.[22]  The evidence also demonstrates that medication harm is preventable in many cases.  One Canadian study found that 24.0% of admissions to a hospital's internal medicine service were found to be a direct result of medications, and over 70% of these medication-related admissions were deemed preventable.[23]  Another Canadian study found that one of every nine emergency department visits in a Canadian hospital was due to medications and over two-thirds were preventable.[24]

Not only is patient harm a concern with medication use, but there are also significant costs associated with the suboptimal use of medications.  In Canada, the total drug expenditure is estimated to have reached $32.0 billion in 2011 and $33.0 billion in 2012, representing annual growth rates of 4.0% and 3.3%, respectively.[25]  Total drug expenditure per capita reached $927 in 2011 and $947 in 2012, representing annual growth rates of 2.9% and 2.2%, respectively.[25]  Of the billions of dollars spent on drugs each year, the estimated cost of misuse, under use, and overuse of medications in Canada and the United States (US) ranges from $2 billion to $9 billion per year.[26, 27]  The impact and the management of ADRs is complex and in the US may cost up

to \$30.1 billion annually.[28]  ADRs may increase costs due to increased hospitalization, prolongation of hospital stay and additional clinical investigations.  In addition, ADRs may trigger 'prescription cascades' when new medications are prescribed for symptoms that are a consequence of another medication, which is often an unrecognized ADR.[28]  Optimizing the use of medications and preventing ADRs has the potential to result in a significant amount of cost savings for both governments and individual patients.

## 2.2  The Role of the Pharmacist in the Primary Health Care System (PHCS)

There is an opportunity for pharmacists to play a lead role in improving medication use, preventing ADRs, and reducing drug-related morbidity in the PHCS.  Evidence from multiple studies suggests that pharmacists can improve the safety of the medication-use system, and increase the rational use of medicines in primary health care.[18, 29, 30, 31, 32, 33, 34]  Unfortunately, many sources have highlighted the fact that pharmacists are a highly underutilized health resource, whose role needs to be expanded to improve medication management in the PHCS.[35, 36, 37] The Romanow Report specifically noted that,

> *"Pharmacists can play an increasingly important role as part of the primary health care team, working with patients to ensure they are using medications appropriately and providing information to both physicians and patients about the effectiveness and appropriateness of certain drugs for certain conditions."* [26]

In Canada, both the *Blueprint for Pharmacy* and the *Moving Forward: Pharmacy Human Resources for the Future* documents conclude that it is time for the role of the pharmacist to evolve and move toward a more patient-centred model of care.[18, 36]

## 2.3  Patient-Centred Care

Generally speaking, patient-centred care is organized and prioritized around an individual patient.[38]  This model of care involves HCPs working with patients to identify and satisfy a range of patient needs and preferences.[38]  This approach to care supports the active involvement of patients, and possibly their families, in decision-making about individual options for treatment by respecting the patient's values, preferences and expressed needs.[39]

2.4  Comprehensive Medication Management (CMM)

CMM improves medication use and reduces the risk of medication-related is ADRs.[2, 3, 4, 5, 6, 10, 12]  CMM is defined as:

> *"The standard of care that ensures each patient's medications are individually assessed to determine that each medication is: appropriate for the patient, effective for the medical condition, safe given the co-morbidities and other medications being taken, and able to be taken by the patient as intended" (p.5).* [40]

Comprehensive medication management (CMM) is an example of pharmacist-delivered patient-centred care focused on the patient's medication experience, which consists of concerns related to medications, preferences for treatment, as well as beliefs and behaviours associated with medications.[1]  The overall goal of CMM is to optimize therapeutic outcomes through improved medication use and to reduce the risk of adverse events, including ADRs.[2]  Practically speaking, CMM occurs when a pharmacist (working collaboratively with the patient's family physician) takes responsibility for the management of medications by meeting with patients regularly to perform comprehensive assessments of their drug therapy needs, and develop care plans that ensure the patient's drug therapy needs are met, and resolve the any DTPs that were identified. Pharmacists who provide CMM typically meet with patients in an office-based setting (or in a private counselling room) on an appointment basis.

There is a growing body of literature supporting the benefits of CMM.  Several studies based in Canada, the US and Australia have shown that this service, when provided by pharmacists, leads to a significant number of DTPs being identified and resolved (e.g., patients experiencing severe medication side effects; patients taking inappropriate drugs; patients who require drugs but are not receiving them).  These studies have produced similar rates of DTP identification with a mean of 2.3 to 2.8 DTPs identified per patient.[3, 5, 6]

A specific example of pharmacist-led CMM delivery Canada was the Integrating Family Medicine and Pharmacy to Advance Primary Care Therapeutics (IMPACT) study, which aimed to improve drug therapy using a collaborative care model that integrated pharmacists (performing CMM) into PHCTs.[4]  This multi-site demonstration project involved seven pharmacists, approximately 70 family physicians and covered approximately 150,000 patients.[4] Over the course of the 24 months of the project, a comprehensive medication assessment was completed for 969 patients.[4]  Overall, a total of 3,974 DTPs were identified resulting in an average of 4.4 DTPs per patient.[4]

CMM has also been associated with a reduction in morbidity associated with heart failure.[12] Ponniah et al. performed a systematic literature review and found various randomized controlled trials that demonstrated significantly fewer hospital readmissions for heart failure in the CMM intervention group as compared with the control group (24% vs. 59%, p<0.05) over a 12-month period.[12, 41]

Patients with Parkinson's disease also appear to benefit from CMM. In a 2012 study by Schröder et al., CMM improved the symptom-related impairment of health status (assessed using the 23-item Parkinson's Scale Total Score) in patients with Parkinson's disease.[10] This study also demonstrated a significant decrease in the proportion of patients receiving inappropriate drugs. In the intervention group, there was a significant decrease over eight months in the proportion of patients over 70 years of age receiving inappropriate drugs as defined by the Beers List (42.9 % at baseline to 24.3 % at 8 months, p<0.01).[10]

2.5  Acknowledgement of the Importance of Implementing CMM

Implementation of CMM within the PHCS has been identified as a priority in several jurisdictions within both Canada and the US. In Canada, two projects have been undertaken in both Alberta and British Columbia (BC) in an attempt to implement CMM. Such large initiatives indicate that some Canadian health care system decision-makers recognize the importance of implementing CMM in Canada. Each project is described in greater detail in the Section 2.6 entitled '*Recent Attempts Implementing CMM in Canada*'.

The Patient-Centered Primary Care Collaborative (PCPCC) is an American organization that describes itself as an "open forum where health care stakeholders freely communicate and work together to improve the quality of care and ultimately the health of all Americans."[40] The PCPCC recognizes the value of CMM and as a result developed a 25 page guide entitled: "*The Patient-Centered Medical Home: Integrating Comprehensive Medication Management to Optimize Patient Outcomes*" that discusses the rationale for including CMM services in integrated patient-centred care. Both Canadian and American health agencies recognize the potential benefits of CMM and have made this service a priority in their messages to stakeholders highlighting the benefits of CMM for patients and the health care system as a whole.

## 2.6  Recent Attempts to Implement CMM in Canada

## 2.6.1  Community Pharmacies

*Alberta's Pharmacy Practice Models Initiative (PPMI)*

In 2008, Alberta Health and Wellness launched an action plan to make the PHCS more efficient and effective.[42]  As part of this plan, they provided funding to organize a demonstration project, involving the implementation and evaluation of CMM in community pharmacies.[14]

When the initiative was completed in 2010, it was the largest pilot project in Canadian history that attempted to provide CMM within community pharmacies using existing employees of the pharmacies.[16]  During the period from March 1, 2009 until June 30, 2010, participants engaged a total of 18,623 patients in 33,993 encounters, resulting in the resolution of 39,517 DTPs.[42]

Despite receiving remuneration for providing the service and a significant amount of support and training, over 95% of pharmacists in the study did not provide the service for a single patient.[16]  On average, the pharmacists who did provide the service only provided care for fewer than five patients per month due to various barriers such as limited time to provide CMM services while also tending to dispensing responsibilities, along with a lack of support from physicians.[16]

*British Columbia Medication Management Project* (*BCMMP*)

Shortly after the conclusion of the Alberta PPMI, BC began the pilot phase of their medication management project, BCMMP, in September 2010.  The purpose of the project was to improve patient care, health outcomes, and sustainability of the health care system by having pharmacists provide CMM to patients in the community pharmacy setting.[43]  The project allowed pharmacists to bill for their CMM services at rates that were adjusted based on the complexity of the patient encounter,[17] in the same manner as the Alberta PPMI.

On January 31, 2012 the data collection phase came to an end after 17 months.  Similar to the PPMI, the BCMMP had limited pharmacist uptake resulting in the service being provided to very few patients, even fewer than the Alberta PPMI.  Of the 1,116 community pharmacies in BC that were eligible to participate in the BCMMP in 2012,[44] only 111 (~10%) actively participated in the project.[17]  Of the 3,927 community pharmacists in BC in 2012,[44] only 243

(~6%) were active (or provided CMM services) in the BCMMP.[17]  In this project, pharmacists noted that providing both CMM services in addition to performing dispensing activities was a significant barrier in the provision of CMM services.[17]

2.6.2  Primary Health Care Teams (PHCTs)

A PHCT is an interprofessional group of HCPs who are responsible for delivering a range of health services and health programs targeting both medical and non-medical determinants of health through a collaborative model of care.[45]  PHCTs can be composed of numerous combinations of HCPs including physicians, pharmacists, nurse practitioners, social workers, dietitians, and many other specialties.  Saskatchewan, Alberta and Ontario formally utilize this model of health care delivery on a provincial level and have assembled significant numbers of PHCTs.[49, 50, 51]

Within a PHCT, pharmacists have an important role to play in providing CMM, amongst other services, for the team and its patients.  Unfortunately, pharmacists are not always present on the PHCTs in Alberta, Saskatchewan and Ontario.  In Alberta, only 50 pharmacists (~1.3%) of the approximately 3,800 registered pharmacists work on a PHCT.[46, 47, 48]  In Saskatchewan, only 27.4% of the 90 PHCTs have a pharmacist on the team, and most are available only one day per week.[55]  Of the 1452 practising pharmacists in Saskatchewan only 1.7% work in PHCTs.[49]  In Ontario, approximately 1.3% of practicing pharmacists work in a PHCT.[50, 51]

An additional limitation of the PHCT model for delivering CMM is that very few patients in Canada receive care from a PHCT and most utilize traditional family physician practices (without a pharmacist who provides CMM).  Only three provinces formally utilize this interprofessional model of a PHCT, and in the three provinces (Alberta, Saskatchewan and Ontario), the limited availability of PHCTs prevents access to all residents.  In Alberta, the goal was to have 80% of all Albertans receiving care from PHCT teams by 2011.[52]  Currently, there are only about 40 PHCTs operating throughout Alberta.[52]  In Saskatchewan, the Ministry of Health had planned to have 100% of Saskatchewan residents receiving care from an integrated PHCT team by 2012,[53] yet only 33% of residents currently have access to a PHCT.[54,55]  In Ontario, from 2005 to 2010, 170 PHCTs had been created across the province, which were estimated to improve access to health care for more than 2.7 million Ontarians.[50]  The most recent Statistics Canada data estimate the population of the province of Ontario to be

approximately 13.5 million,[54] meaning that only 20% of the Ontario residents have access to a PHCT. In August 2010, the Ontario government announced 30 more teams bringing the total number of PHCTs in Ontario to 200.[50]  While PHCTs are accessible to some Canadians, those with access most certainly represent the minority.

2.7  CMM Implementation in Canada: What are the barriers?

As described in Section 2.6, none of the previous attempts at implementing CMM into community pharmacy practice in Canada have led to widespread availability of the service. Clearly there are barriers that are preventing pharmacists from providing CMM in this setting.

Two of the barriers noted in the Alberta PPMI were: time and effort to provide the service to patients and properly document in the patient record, while simultaneously tending to regular dispensing services; and the lack of support from physicians.[16]

The BCMMP noted similar barriers.  Pharmacists also indicated that juggling their dispensing responsibilities with CMM services, was a significant barrier.[17]  Other barriers included: identifying and resolving medication management issues with complex patients; developing therapeutic relationships with patients; establishing a medication management practice; and building confidence in making recommendations.[17]

Community pharmacies have historically only received remuneration for providing a drug product (and not a clinical service such as CMM).  As a result, community pharmacy owners and managers have developed a very efficient workflow and physical workspace to support the dispensation of a drug product, but not a clinical service like CMM.  A BC pharmacist, who participated in the BCMMP, was quoted:

> "*Delivering enhanced pharmacy services requires each pharmacy to invest considerable time, effort and resources.  But fundamentally it requires the business model to be reassessed and developed so that providing these services is profitable and sustainable*" (*p.21*). [17]

Adjusting this practice model to allow for the provision of CMM has proven to be difficult, which is supported by one of the findings of the PPMI project that the primary barrier to CMM provision was the need to alter their existing workflow to allow for the time to provide

patient care. One pharmacist stated, *"the pharmacy gets so busy (filling prescriptions) that I am mentally not prepared to sit down and discuss drug therapy problems with patients."* [16]

Although the PHCT practice model has been implemented in some parts of Canada, the widespread expansion of this model has been extremely slow. Even within the three provinces that have embraced this team-based model of primary health care service delivery, not all patients in the provinces receive care from these teams, and not all teams have funding to hire a pharmacist.

It is unlikely that the majority of people in the Canadian PHCS will have access to CMM if the service continues to be provided exclusively by pharmacists who work as employees of community pharmacies or pharmacists who work as integrated members of PHCTs. The identification of additional delivery models to provide CMM could assist in improving the availability of the service.

Recently, a consultant pharmacist-delivered CMM service was created in Saskatoon, SK (called Medication Assessment Consultants or MAC), which is a model for delivering the service that has not previously been evaluated in the literature.


## 2.8  The Evaluation of the Consultant Pharmacist-Delivered CMM Service Model

The independent consultant pharmacist model involves a pharmacist working outside of the "traditional" community pharmacist role, but not as a co-located member of an interprofessional team. Independent consultant pharmacists typically practice as private contractors and are not employees of a pharmacy business (such as a community pharmacy) or a health care institution (such as a health region, physician clinic or hospital), and are commonly either paid on a fee-for-service basis or daily contract rate. Pharmacists working as consultant pharmacists offer a variety of clinical services from educating patients on various health-related issues, to providing drug information, to performing CMM. The independent consultant model has been previously utilized by pharmacists to provide focused clinical services such as asthma education and women's health consultations,[56, 35] but it has not been previously evaluated for the provision of CMM in the primary health care system.

An opportunity to evaluate the consultant pharmacist-delivered CMM service model recently presented itself when a CMM service (called Medication Assessment Consultants or MAC) was piloted in Saskatoon from September 2011 to February 2013. MAC, unlike any of

the previously tested models in the literature, positioned a consultant pharmacist in an independent space to provide CMM services to patients within the surrounding community.  The purpose of this study was to evaluate the independent consultant pharmacist model for delivering CMM services employed by the MAC program.

# Chapter 3
## Methodology

3.1 <u>Study Design</u>

The study design was a focused program evaluation, which examined the MAC program's operation between September 2011 and February 2013.

Program evaluation is defined as the systematic gathering, analysis and reporting of data about a program to assist in decision-making.[57] A program can be defined as "any series of activities, supported by a group of resources, intended to achieve specific outcomes among particular target groups." [57] Programs can be of varying sizes, and can include projects, special initiatives, pilots, campaigns, or clinical services.[57] The MAC program fits well into this definition of a program as it was a pilot project of a clinical service (CMM) designed to achieve the specific outcome of optimizing drug therapy.

A program evaluation is intended to produce information about the performance of a program in achieving its objectives.[58] Program evaluations enable researchers to describe the intended program, document what was actually implemented, describe participant characteristics, and demonstrate the impact of the program.[57]

This MAC program evaluation consisted of a document review (methodology described in the next section), along with one-on-one interviews with the three main MAC stakeholder groups: patients, physicians, and staff (pharmacists and the program director). This evaluation was performed for internal program quality improvement purposes to help inform the program staff of areas of strength and areas for improvement related to service delivery.

The use of a mixed-methods approach consisting of multiple types of data (quantitative and qualitative), as well as multiple sources of data (documents and stakeholder interviews), enabled findings to be crosschecked and substantiated between the various sources to increase the credibility of the study's findings. This process is formally termed *triangulation* in evaluation research.[59] The aim of triangulation is to select multiple data sources and analysis techniques that have different biases and strengths, which improves the trustworthiness of the results when convergence is observed across these multiple sources.

## 3.2  Document Review

Document review is a method of collecting data by reviewing existing documents from the program that is being evaluated.[60] Documents may include reports, program logs, performance ratings, funding proposals, meeting minutes, newsletters, and marketing materials.[60] A document review can produce various types of information when used for the purpose of performing an evaluation and is important when the evaluation questions focus on whether the initiative was implemented as planned and who the participants were.[59, 60] The purpose of the document review in this study was threefold: (1) to gather background information on the MAC program to understand and describe its operation including its promotion, delivery and management in order to answer the first research question related to how the MAC program operates; (2) to determine how the service was utilized and describe various factors related to the patient referrals including the number and sources of referrals, patient demographics, and DTPs identified in order to answer the second research question related to service utilization; and, (3) to determine if the actual service delivery aligned with the program's objectives in order to answer the third research question related to the achievement of the program's objectives.

## 3.2.1  Document Identification and Collection

The first step in the document review methodology was to identify and collect all relevant documents.[60] The purpose of this initial step was to determine the types of documents that existed and to determine which documents would help in answering the research questions.[60] Four categories of documents related to the MAC program were identified for review: *The MAC Policy and Procedure Manual*, MAC promotional materials, the patient medical record and the pharmacist scheduling tool (web-based Google Calendar). The *MAC Policy and Procedure Manual* contained numerous documents utilized in the operation of the program. Once the documents from *The MAC Policy and Procedure Manual*, as well as all MAC promotional materials were identified, they were collected and summarized into a table, which allowed for the organization of the information contained within all of the identified documents. Since the MAC patient medical record contained personal health information, in order to ensure the confidentiality of the patients, each patient file was de-identified and assigned a number to ensure any identifiable information such as name, health services number or address, would not be collected. This information was summarized into a second table to again facilitate the

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organization of the data. A separate table was required for the patient data because the MAC patient medical record contained patient information that needed to be collected for each individual patient, and then quantified. The collected data from the medical record included: patient sex and year of birth, the referral source (e.g., physician, nurse, etc), the number of medications as well as the number of health conditions the patient had at his or her first MAC appointment, and the number of DTPs identified by the pharmacist as part of the CMM provision. The DTPs were further scrutinized to determine which of the eight DTP categories each fell into. The eight categories included: (1) unnecessary drug therapy; (2) needs additional drug therapy; (3) wrong / inappropriate / ineffective drug; (4) dosage too low; (5) adverse drug reaction; (6) dose too high; (7) not following instructions / non-adherence; and (8) non-drug recommendations (e.g., request for lab tests).

### 3.2.2 Data Analysis

In analysing the MAC program's documents, it was important to identify and confirm the purpose of each document along with the type of information each contained.[60] In order to accomplish this task, the investigator reviewed each document noting the content of the document, and its purpose. The investigator was also a service provider for MAC, so her familiarity with the documents eliminated the need to confirm the information with a member of the MAC team. The investigator's role in delivering the MAC services is explained further in the section entitled *Researcher's* Story (Section 3.4).

Determining the accuracy of the documents was also an important step in the document review process.[60] This step was most relevant for the patient medical record since the data was entered by different pharmacists on multiple occasions, resulting in information that may have been uniquely or inconsistently documented by the different pharmacists. The investigator and one of the MAC pharmacists analysed the patient medical record independently to confirm and agree on the accuracy of the following data: (1) the number of medications and health conditions for each patient referred to MAC; and (2) the number and category of DTPs identified per patient assessed by a MAC pharmacist. Any discrepancies that were identified were discussed and resolved.

*Statistical Analysis*

Descriptive statistics were used to describe the demographic data of patients who utilized the service. All patient demographic data were analysed using *SPSS 20.0* (SPSS Inc, Chicago, Ill).

### 3.3  Stakeholder Interviews

Three key stakeholder groups were identified for interviews: (1) patients, (2) physicians, and (3) MAC staff. One-on-one semi-structured interviews were conducted with members of each stakeholder group using a unique interview guide for each group. A semi-structured interview is a qualitative method of inquiry that combines a pre-determined set of open-ended questions (questions that prompt discussion) with the opportunity for the interviewer to explore particular themes, and to ask follow-up questions to further probe and clarify responses.[59, 61, 62] A semi-structured interview does not limit respondents to a set of pre-determined answers, unlike a structured questionnaire.[61] Semi-structured interviews are used to understand how programs or interventions work, and how they could be improved.[61] It also allows respondents to discuss and raise issues that the investigator may not have prospectively considered.[61]

The purpose of the interviews was to gain insight into the experiences of the stakeholders involved with MAC in order to answer both the fourth research question not addressed by the document review (related to stakeholder recommendations), along with the first research question related to challenges in the program operation. These interviews were necessary to determine the unique perspectives and experiences of all three stakeholder groups who played key roles in the MAC program to determine the aspects of the program that were working well, as well as those that may require alteration to help optimize service delivery.

### 3.3.1  Selection of Interviewees

*Inclusion Criteria*

*Patients*

To be included patients must have attended all scheduled MAC appointments (in person or via telephone). The inclusion criteria ensured that the pool of potential interview participants would be composed of individuals who had experienced the full MAC service process enabling these individuals to comment on the entire service as it was intended to be delivered.

*Physicians*

        To be included physicians must have referred at least one patient to MAC, and that patient must have attended all of his or her scheduled appointments. Similar to the *Patient Inclusion Criteria*, the intent was to ensure that potential physician interviewees experienced a complete encounter with the program including receiving a consult letter related to their patients' drug therapy regimens, allowing the physicians to accurately comment on their experiences with the service.

*MAC staff*

        All MAC staff were invited to participate in the interviews.

*Sample Selection and Sample Size*

*Patients and Physicians*

        A list of patients and physicians who met the inclusion criteria was provided to the interviewer by the investigator, and the interviewer contacted potential interviewees by randomly selecting individuals on the list provided.

        Interviews with both stakeholder groups were intended to continue until saturation was reached. Saturation was defined in this study as the point in the data collection when each successive interview failed to produce new information that added additional insights to the research questions.[59, 63, 64] The interviewer notified the investigator when he felt saturation of the interview data was reached. It was at this point that all the interview transcriptions were reviewed by the investigator and her academic advisor to confirm together if saturation had in fact been reached. Interviews were stopped when data saturation was reached.

*MAC Staff*

        Due to the small number of individuals who composed the MAC staff, along with the unique experiences of each pharmacist, it was determined that it would be important to capture the experiences of all of the staff members. The investigator intended to perform interviews will all three MAC staff.

3.3.2  Interview Guides

The development process for the interview guides involved multiple stages.  The initial stage entailed a search of the literature to determine if an interview guide already existed to help direct questioning during the evaluation of a CMM service.  Since no interview guides were identified, the investigator developed the interview guides.  To determine what type of information was required from each stakeholder group, the investigator and her academic advisor met on several occasions to discuss the issue to allow for the development of the interview questions.  Due to the absence of literature on the evaluation of a consultant pharmacist-delivered CMM service, the investigator and her academic supervisor first had to determine what information needed to be gathered by the interviews.  From this point, interview questions could be developed to obtain this data from interviewees.  The final decision on the inclusion of specific questions was based on consensus.  For example, the investigator and her academic advisor decided that based on the research question related to the operation of MAC, they wanted to know how the service was promoted to stakeholders.  For the patient interview guide specifically, the question "How did you find out about the service?" was then developed.  Once all three interview guides were developed, they were comprehensively reviewed by the investigator and her academic advisor.  In addition, the patient interview guide was reviewed by an additional member of the research advisory committee.  This process resulted in the creation of three unique interview guides (Appendix A, B, C).

The final step in the interview guide development was to pilot test both the patient and physician interview guides.  This was accomplished by having the interviewer perform a test interview with a faculty member of the College of Pharmacy and Nutrition not involved in the project that has an expertise in telephone interviews.  The interviewer performed an interview with the faculty member using both the patient and physician interview guide.  The faculty member provided feedback to improve the clarity of some of the questions.  The interview guides were revised based on this feedback.

3.3.3  Interview Administration and Data Collection

*Patients and Physicians*

Patients and physicians were interviewed by telephone.  The interviewer who conducted all of the interviews was a pharmacist who had previous experience performing semi-structured

interviews, but was not a member of the research advisory committee, and was not involved in the MAC program service delivery.

Patient and physician participants who met the inclusion criteria were contacted by phone by the interviewer to request their participation. Potential physician participants were sent a fax a few days prior to the initial phone contact to inform them that the interviewer would be calling to request their participation in the study. Using an *Invitation to Participate* script, the interviewer obtained verbal informed consent from participants prior to starting the interview. A copy of the *Invitation to Participate* script is included in Appendix D (patient invitation) and Appendix E (physician invitation). The interviewer also collected the participants' mailing addresses so that detailed information about the study, along with investigator contact information could be sent to participants. See Appendix F for the *Patient Participant Information* sheet and Appendix G for the *Physician Participant Information* sheet. Participants who provided informed consent and completed an interview were mailed a $20 gift card as a token of appreciation for their participation.

In order to ensure the quality and standardization of the interviews, the interviewer was informed about the details of the study and the purpose of the interviews. To ensure that the interviewer was asking the interview questions correctly, and probing interviewees appropriately, the investigator and her academic advisor reviewed the transcriptions of the first patient and physician interviews to ensure the interviewer was following the expected interview protocol. Feedback was provided to the interviewer, prior to completing subsequent interviews, to ensure he was eliciting the appropriate information through further questioning and probing.

To protect the confidentiality of the patients and physicians, each interview was recorded and a transcribed verbatim externally, but with the removal of any identifiers such as names and locations.

*MAC Staff*

MAC staff members were contacted directly by the investigator (who was also a MAC staff member) and asked to participate. See Appendix H for the *MAC Staff Participant Information* sheet. MAC staff interview participants received a copy of the interview guide prior to the interview to allow them to review and reflect upon their responses. The MAC staff interviews were conducted in person by the investigator at a time and location deemed

convenient for the participants. The interviews were audio recorded and transcribed verbatim by the investigator. The investigator, as a MAC staff member, responded to her interview questions in writing.

3.3.4  Data Analysis

Thematic analysis was used to identify common themes from the three sets of interview transcripts. The first step in the analysis was to reduce the quantity of information through thematic coding.[59] The purpose of the coding was to better understand the interaction of stakeholders with the MAC program by reducing the interview data into themes that explained the stakeholder experience.

Various transcript analysers manually coded the transcripts using highlighters to identify key statements and common themes. Three individuals, one of whom was always the investigator, independently reviewed each group of stakeholder interviews. Patient and physician interviews were reviewed by the investigator, the MAC program director, and a member of the faculty of the College of Pharmacy and Nutrition (who was not a member of the research team or involved in MAC program service delivery). The MAC staff interviews were reviewed by the investigator, the interviewer from the patient and physician interviews, and the same faculty member who reviewed the patient and physician interviews. This mix of analysts was chosen based on their varied experience and expertise. Three of the analysts were pharmacists, each with varying clinical experience. The investigator and the MAC program director provided a familiarity of the program in the analysis of the transcripts; the faculty member, who was a non-pharmacist, provided a non-clinical perspective along with qualitative research expertise.

All three transcript analysers read through the transcripts independently, highlighting the relevant or emerging themes in categories of interest that related back to the research questions. The transcript analysers were asked to identify text that related to: (1) what worked well; what could be improved and what challenges were identified; (2) suggestions made for improvements; and, (3) any other emerging themes that the analyst felt were relevant, but that were not captured by the previous three categories (see Appendix I for *Instructions for Interview Transcript Analysers*). This thematic analysis was performed using open coding and line-by-line analysis. This form of coding involves a close examination of data, phrase-by-phrase and sometimes

word-by-word, with a comparison of the data for similarities and differences related to the pre-defined categories.[65] Data that were found to be conceptually similar in nature or related in meaning, were then grouped into major categories of information, [64, 65] for example, identifying what worked well or did not work well related to the CMM service.

This process left the transcript analysers with transcripts containing text that was highlighted in various colours each signifying different categories (or themes) of information. Once the transcript analysers had completed the coding of the transcripts, they met as a group to discuss their findings and to develop and agree on the final common themes. During the discussion, the transcript analysers revealed the themes they had each independently identified in the transcripts. If all three analysers had identified the same theme, that theme was then accepted. If not all three analysers identified the same theme, a discussion ensued to determine if, upon further review, a consensus could be reached regarding the existence of each theme or the wording of the theme. If all three transcript analysers agreed to accept the debated theme, the theme was then accepted. If all three transcript analysers did not agree that the theme was an accurate reflection of the interviewees' comments, then it was discarded. The process was repeated for each of the three stakeholder groups and a list of identified themes and sub-themes was generated.

Once themes were defined within each stakeholder group by the transcript analysers, the investigator, along her academic advisor reviewed the interview transcripts comprehensively. The purpose of this review was to audit and verify the identified themes. These two individuals read through all the transcripts to determine if the previously identified themes were accurate and unanimously agreed to any adjustments that needed to be made to the themes. Once this process was complete, the investigator and her academic advisor generated the final list of themes along with their sub-themes (where applicable).

### 3.3.5  Trustworthiness

Several steps were taken to ensure the trustworthiness of the data and the data analysis, using a model proposed by Guba in 1981. The process involves the identification of four aspects of trustworthiness that are relevant to both quantitative and qualitative studies: credibility, transferability, dependability, and confirmability.[66, 67, 68]

Credibility helps determine how congruent the findings are with relation to the real world and is one of the most important factors in establishing trustworthiness.[67] One step to ensure credibility of data is to develop an early familiarity with the culture of participating organizations before the first data collection dialogues take place.[66, 67, 68] Since the investigator was a pharmacist who directly provided the service within the program being evaluated, and had previous experience with delivering a similar service, a familiarity of the culture of physicians, patients and pharmacists was already present. Another step that can be utilized to ensure credibility is triangulation.[66, 67] As previously mentioned, triangulation entails using various data collection and analysis methods, and possibly obtaining supporting data from documents to help verify particular details that participants have supplied.[67] The mixed methods approach of this study enabled the investigator to collect information through the application of a document review as well as through stakeholder interviews. Triangulation was achieved within the interviewing process through the involvement of a wide range of study participants where individual viewpoints and experiences can be verified against others,[67] as well as during the interview transcript analysis by utilizing multiple different transcript analysers who had to come to an agreement on the common themes. Patients, physicians and pharmacists, each with unique experiences with the service, were interviewed to provide view points from all the stakeholders groups.

When performing stakeholder interviews, it is recommended that strategies are implemented to ensure honest responses from interviewees.[67] This can be achieved by providing potential participants with the opportunity to refuse to participate in the project so as to ensure that the data collection sessions involve only those who are genuinely willing to take part, and who are prepared to offer data freely, and that they are aware that they have the right to withdraw from the study at any point.[67] When initially contacted by the interviewer, stakeholders were invited to participate in the interviews and were also informed of their right to withdraw at any time should they agree to be interviewed. The final step taken to ensure credibility was peer scrutiny of the research project over the duration of the project.[67] The investigator's research advisory committee reviewed the research proposal and study results to ensure appropriate research methods were implemented and followed.

The second aspect related to trustworthiness of data is transferability.[66, 67, 68] Transferability occurs when the investigator ensures that sufficient contextual information about

the phenomenon under investigation is provided to enable the reader to relate the findings to his or her own position.[67, 68]  After reading the description within the research report of the context in which the work was undertaken (e.g., a description of the MAC program), readers must determine if they can be confident in transferring the results and conclusions presented to other situations.[67, 68]  In order for this to be possible, it is important that the investigator provides a sufficiently thick or detailed description of the phenomenon under investigation to allow readers to have a proper understanding of it.[67]  The document review provided a detailed description of the program and its operation, and the patient data collected allows the reader to understand the demographics of those who utilized the service.  This information should allow for a reader to confidently decide if the results are transferable to his or her own situation.

The third step in ensuring the trustworthiness of the data is to demonstrate dependability.[66, 67, 68]  To ensure dependability of the data, the process or methods within the study should be reported in detail, thereby enabling a future investigator to repeat the work, if not necessarily to gain the same results.[67, 68]  The methodology of this study have been described in detail above, and the data collection tools have been included to enable future investigators to apply them in a similar study.

The final step in establishing trustworthiness is confirmability.[66, 67, 68]  Confirmability of data involves taking steps to help ensure that the work's findings are the result of the experiences and ideas of the informants, rather than the characteristics and preferences (or biases) of the investigator.[67]  This process is strengthened through the use of triangulation and reflexivity.[66, 67]  Triangulation was previously addressed. Reflexivity was examined in the *Researcher's Story* in Section 3.4.


3.4  Researcher's Story

My interest in the research of pharmacist practice models comes from short, yet varied career as a pharmacist.  After completing a Bachelor's of Science majoring in Psychology, I pursued my Bachelor's of Science in Pharmacy.  As an undergraduate, I was not sure which practice environment best suited me, but was always drawn toward the pharmaceutical industry.  After having the opportunity to work with a small pharmaceutical company for a summer, I decided that I had not found my passion and wondered where my career as a pharmacist was headed.  Upon the promise of generous funding to help support me through my undergraduate

degree, I signed a two-year contract with Shoppers Drug Mart. My contract with Shoppers Drug Mart took me to Prince Albert, SK in 2008, which was a small community serving approximately 45,000 people. I found myself working in an extremely busy store with a strong focus on checking prescriptions and fighting with insurance plans. I quickly became dissatisfied with my work. Fortunately, I was given the opportunity to work in the neighbouring physicians' clinic one day a week. I found it very rewarding to work closely with the patients and physicians. Over time, I found that the physicians gained more trust in my skills and began coming to me with questions related to a variety of health conditions and their related drug therapy. During the time I was working in the physicians' clinic, I was also fortunate enough to join the provincial pharmacist advocacy body (Pharmacists Association of Saskatchewan) as a board member. In this role I also became passionate about advocating for the expanded role of pharmacists as I felt pharmacists were not being utilized to their full potential. I felt so fulfilled working directly with physicians and patients, and I wanted all pharmacists to have this opportunity. It was then that I decided to return to school to pursue a Master's of Science in Pharmacy. As I began to explore my research options, the opportunity to participate in the evaluation of a new pharmacist practice model was extremely appealing. I wanted to focus my research on a topic that I was passionate about and that would have practical application to my profession.

My research project was developed to evaluate a new model for delivering CMM in primary care that had not yet been previously tested in Canada, and which was being developed and implemented under the supervision of my academic advisor. Because I was a practicing pharmacist and there was limited funding to hire a dedicated pharmacist for the pilot project, I became one of the service providers for MAC, along with my role as program evaluation investigator. Due to my passion for the profession and desire to demonstrate that pharmacists can be useful in a variety of settings, I had to be cautious to ensure my potential bias would not enter into my evaluation. Several precautions were taken to keep my personal opinions and biases in check. The quantitative data derived from patient medical records were double checked by a different pharmacist who was hired to assist in the delivery of the service, but who was not a member of the research advisory committee. Interview questions in the semi-structured interview guides were reviewed by individuals external to the program to avoid any bias or influence in the questions. The interviews were also performed by an external third party who

was not involved in the service delivery or the research advisory committee.  Similarly, patient and physician interviews were transcribed and anonymized by an external transcriptionist.  Finally, the transcribed interviews were analysed by multiple individuals and included individuals external to the research advisory committee with no formal link to the research project.

## 3.5  Ethical Considerations

On November 15, 2012 a research ethics application was submitted to the University of Saskatchewan Behavioural Research Ethics Board.  The research project was approved but deemed exempt from a comprehensive ethics board review on November 27, 2012 (BEH 12-317).  The exemption was granted due to the project's focus on program evaluation activities for the purpose of internal assessment and quality improvement.

**Chapter 4**

**Results**

<u>4.1  Document Review and Analysis</u>

The documents analysed in the document review fell into four main categories:

(1) documents contained within the *MAC Policy and Procedure Manual*;

(2) promotional materials;

(3) the patient medical records; and,

(4) pharmacist scheduling tool (Google Calendar)

Appendix J contains a comprehensive list of all the documents identified and analysed for the document review including the name of each document, the purpose of the document, and the type of information contained within the document.  Table 1 provides an overview of all of the documents in Appendix J that were utilized in the final analysis, highlighting the type of data that was analysed within each document.

*Table 1: Overview of Document Review Analysis*

| Documents Identified | Data Analysed |
|---|---|
| **MAC Policy and Procedure Manual** | |
| MAC Policy and Procedure Manual | • Description of the MAC program (including the program objectives)<br>• MAC pharmacist job description<br>• Patient recruitment strategy and description of how the program was promoted to various stakeholder groups<br>• Description of the patient referral process<br>• Description of the patient appointment format and the process for patient care provision (i.e., CMM) by MAC pharmacists<br>• List of resources required to deliver the service |
| **MAC Promotional Materials** | |
| Patient brochure<br>Promotional poster for physicians<br>Miscellaneous documents (e.g., photos of conference displays)<br>Physician referral form | • Types of promotional materials used<br>• Intended targets of promotional materials |
| **Patient Medical Records** | |
| Electronic patient records (one for each patient referred to MAC)<br><br>Web-based, shared, secure electronic data storage service (i.e, shared drive) | • Patient referrals (quantity and sources)<br>• Patient demographics, allergies, medication lists, list of medical conditions, laboratory results, and other relevant health information collected during the patient care process<br>• Drug therapy problems identified by MAC pharmacists (type and quantity identified) |
| **Pharmacist Scheduling Tool (Google Calendar)** | |
| Shared pharmacist calendar | • Date of scheduled appointments |

4.1.1  Description of Service Delivery and Program Operation

The first research question posed was: "*How does the Medication Assessment Consultant program operate?*"  This research question was designed to describe the program, its operation, its delivery, and its management.  It also was intended to determine the resources required to operate the program.  The following sub-sections outline these various attributes of the MAC program, which were determined through the document review data analysis.

4.1.1.1  Medication Assessment Consultants or MAC

MAC was a consultant pharmacist-delivered CMM service.  This means that the pharmacists were hired (and paid an hourly salary) as independent consultants, rather than employees of a community pharmacy, health region, hospital, or clinic.

MAC was a mobile service and was able to deliver care in a large variety of locations, if required.  While MAC operated primary out of dedicated office-space (located in the Learning Centre of a Co-op Grocery Store), it was created so that it could travel to various locations that were convenient to the community.  MAC pharmacists were equipped with a laptop with independent Internet access (using a mobile Internet stick).  Pharmacists utilized a secure web-based electronic medical record (EMR) to document their care and all patient documents not stored in the EMR (e.g., referral forms, medication lists, consult letters, faxes from physicians) were scanned and stored into a secure web-based data storage service.  MAC pharmacists were also equipped with a *BpTRU*<sup>©</sup> blood pressure monitor, a portable printer, and a cellular phone.

4.1.1.2  Purpose of MAC

MAC was created to provide access to CMM services for any HCP or patient in Saskatoon, SK.  The goal of a CMM service is to optimize therapeutic outcomes through improved medication use and to reduce the risk of ADRs.

The program's service objectives are listed below:

1. To generate a consistent flow of patient referrals to occupy a pharmacist for two days per week (including patient interviews, researching the literature, documentation, and other related clinical service activities)
   o Specific MAC goal: To receive four new patient referrals per week, and perform four follow-up appointments per week.

2. To promote the service to physicians and eventually patients (*no specific timeframes or targets for the type or frequency of promotional activities were pre-defined*)

3. To improve medication-related short-term outcomes for patients, as evidenced by:
   - o The number of DTPs identified and resolved per patient (*no specific target was pre-defined in MAC documents*)
   - o Description the types of DTPs identified by the pharmacist (*no specific target was pre-defined in MAC documents*)

4.1.1.3  MAC Operation and Funding

MAC was run by the College of Pharmacy and Nutrition at the University of Saskatchewan and began accepting patient referrals in September 2011.  It was funded by a grant from the Drug Plan and Extended Benefits Branch of the Saskatchewan Ministry of Health.

4.1.1.4  MAC Staff

MAC staff was composed of a program director and two pharmacists. The program director was also a full-time faculty member in the College of Pharmacy and Nutrition at the University of Saskatchewan.  MAC had no dedicated administrative staff or secretarial support. The two pharmacists were each responsible for providing the CMM service on a one-day-per-week basis.  The pharmacists each had other primary employment.  They both also had additional training beyond a baccalaureate pharmacy degree, which was a requirement listed in the *MAC Pharmacist Job Description, Responsibilities and Qualifications* found in the *MAC Policy and Procedure Manual*.  One pharmacist had completed an acute care hospital residency and the other had completed the ADAPT Patient Care Skills Development program (by Canadian Pharmacists Association).

4.1.1.5  Reporting Structure

The reporting structure was such that all the pharmacists reported directly to the program director.  The program director was then responsible to report to the Dean of the College of Pharmacy and Nutrition.

4.1.1.6  Service Location

  The service was provided in the Learning Centre of a Co-op Grocery Store located on 8<sup>th</sup> Street (a centrally located area) in Saskatoon, SK.  This space was located within the grocery store and was available for community-based programs free of charge.  The room was large, completely enclosed and private.  It contained tables and chairs that could be arranged in any formation users desired.  The Learning Centre booking was facilitated through the staff in the Co-op pharmacy, which was located directly across from the Learning Centre.  The space could be booked Monday through Friday between the hours of 9:00 a.m. and 10:00 p.m.  On the weekends, the room was available from 9:00 a.m. to 6:00 p.m. on Saturdays and 10:00 a.m. to 6:00 p.m. on Sundays.  The Co-op Grocery Store offered a large parking lot with free parking.  It also did not have any stairs or elevations in the parking lot or within the building.

4.1.1.7  Sources of Patient Referrals

  Referrals to MAC were accepted from any HCP, patient (by self-referral), caregiver or family member.

*Physicians and Other HCP Referrals*

  Physician and other HCP referrals were made using a one page referral form (Appendix K), which asked for the contact information of the physician, the name and contact information for the patient, reason for referral, and for all relevant lab results and medical history.  This information, along with the referral form, was sent to MAC via a private fax line and was received by the MAC program director.

*Patient Self-Referrals and Non-HCP Referrals*

  Patients self-referred by contacting the MAC office directly by phone to book an appointment.  Non-HCPs, such as caregivers and family members, were also able to refer people to the service by phoning MAC.

4.1.1.8  MAC Patient Appointment Booking Process

  Patients referred by fax were contacted by telephone to arrange for an appointment. After the appointment was booked, the MAC program director mailed an informational brochure

(Appendix L) to the patient reminding them of the time and date of his or her appointment and which pharmacist the patient would be meeting with.  The brochure also explained the MAC program, what the patient could expect at his or her first appointment, and what to bring (e.g., all his or her medications).

MAC did not have a dedicated scheduling system for managing and coordinating staff pharmacist schedules along with patient appointments, but rather utilized Google Calendar for both of these purposes.

4.1.1.9  MAC Patient Appointment Format / Patient Care Process

The CMM service was typically provided over a series of three appointments that lasted 15 to 45 minutes.  The goal of the first appointment was to collect a detailed medication history from the patient including current and past medication use, medical conditions, medication allergies and intolerances, in addition to other lifestyle and social demographic information. This appointment always occurred in person.  Additional patient information was generally requested from the patient's family physician following the first appointment (e.g., problem or diagnosis list, lab tests, diagnostic tests, specialist consult letters, clinical progress notes) that the pharmacist would require to complete the assessment.  The second appointment generally occurred one to two weeks after the initial appointment and was either completed in-person or by phone (for less complex cases).  The goal of the second appointment was to collect additional information from the patient regarding his or her medical conditions (e.g., level of disease control, symptom history) that could not be collected from the information that was requested from the family physician after the initial appointment, allowing the pharmacist to complete his or her assessment.  For less complex patients, these first two appointments were sometimes combined into one.  The goal of the third appointment (which usually took place over the phone as it was often much shorter than the first two appointments) was to discuss the findings or recommendations of the assessment with the patient.  Individualized medication education and adherence support was provided, as required, during all of the appointments.  After all three appointments were complete, a detailed consultation letter was sent to the family physician.  If recommendations were made to change the patient's medication regimen, the patient was asked to make an appointment with the family physician to discuss the proposed recommendations. MAC pharmacists followed-up with the patients as often as necessary after the medication

assessment was complete, depending on the number of recommendations that were made, and whether or not all recommendations could be implemented at once. All physician and patient communications were recorded in the MAC EMR.

### 4.1.1.10 MAC Patient Assessment Process

The pharmacists utilized various tools during the provision of the service. The foundation of the service was the pharmaceutical care process.[1] Pharmaceutical care is defined as *"a practice in which the practitioner takes responsibility for a patient's drug-related needs, and is held accountable for this commitment."* [1] This process was supported through the use of a standardized form (see Appendix M for the *Medication Review Form*). The use of a standardized form ensured the pharmacist gathered all relevant information from the patient and that the assessment process utilized by each pharmacist was similar and comprehensive.

The final "tool" utilized during the assessment process was a collaborative approach to managing challenging patient cases. This was accomplished through discussions with the patient themselves, and possibly a caregiver, and the patient's physician and/or community pharmacist. MAC pharmacists would also occasionally have team discussions when developing the care plan for particularly complex patients with multiple medication and health conditions. The MAC team discussions involved at minimum, the MAC program director and the pharmacist who met with the patient to be discussed. Often, a third member of the team would join in on the discussion.

### 4.1.1.11 MAC Documentation Process

All patient encounters were documented in an EMR. When MAC launched in September of 2011, the pharmacists utilized an EMR called *Assurance*©. This web-based EMR was used for the first few months as its cumbersome nature made it very time-consuming and difficult for the pharmacists to use efficiently. It was eventually replaced with a simplified process in which electronic copies of all patient documents, MAC pharmacists' progress notes and care plans, and consultation letters sent to physicians, were saved on a secure server that was accessible from any internet enabled device.

<u>4.1.1.12  Description of MAC Service Promotion</u>

*Patient Recruitment Strategy*

MAC was a new service to the city of Saskatoon and the MAC team had planned on developing ongoing promotion of the program to ensure that the stakeholders were aware of its existence and were reminded that it was available to support them.  While the *MAC Policy and Procedure Manual* stated that ongoing promotion would be vital to the success of the service, promotional efforts were strong in late 2011 and early 2012, but slowed significantly later into 2012 and were no longer being pursued at all by late 2012 and early 2013.  The specific promotional activities, along with the dates they were performed, are discussed in the sections that follow.

*Physician-Focused Promotion*

Physician-focused promotion was recommended to be "ongoing" in the *MAC Policy and Procedure Manual*.  This manual indicated that various methods of promoting the MAC service to physicians would be used, including:

- In-office physician educational detailing sessions
- Setting up an informational booth at continuing medical education conferences
- Presentations at physician group meetings
- Direct mail outs to individual family physicians and group practices

Table 2 summarizes the physician-focused promotional activities that actually took place and when they occurred.

*Table 2: Physician-Focused Promotional Activities*

| Date | Promotional Activity |
|---|---|
| Sept 12, 2011 | Physician detailing session at Kenderdine Medical Clinic (6 physicians participated) |
| Sept 26, 2011 | Presentation at the Family Medicine Executive Meeting (35 physicians were in attendance) |
| November 1, 2011 | Mail out to all family physicians in Saskatoon (included a copy of the referral form [Appendix K], a promotional poster [Appendix N], and a copy of frequently asked questions [Appendix O]) |
| November 25 to 26, 2011 | Informational booth at a continuing medical education conference in Saskatoon (Practical Management of Common Medical Problems) |
| January 10, 2012 | Physician detailing session at Lakeside Medical Clinic (11 physicians participated) |
| January 19, 2012 | Physician detailing session at Erindale Medical Centre (6 physicians participated) |
| January 25, 2012 | Physician detailing session at Queen Street Medical Group (number of physicians in attendance was not available) |
| Mar 2 to 3, 2012 | Information booth at a continuing medical education conference (Peter & Anna Zbeetnoff Memorial Drug Therapy Decision Making) |
| April 11, 2012 | Physician detailing session to individual family physician (1 physician participated) |

*Health Care Provider-Focused Promotion (non-physicians)*

HCP-focused promotion was also recommended to be "ongoing" in the *MAC Policy and Procedure Manual*. It indicated that various methods of promoting MAC to non-physician HCPs would be used, including:

- Explore partnerships with Saskatoon Health Region programs that may appreciate CMM support (e.g., Home Care, Geriatric Assessment Program, etc.)
- Emails to professional organizations (e.g., pharmacy organizations such as Pharmacists Association of Saskatchewan)

The MAC CMM service partnered with the Saskatoon Health Region Client/Patient Access Services (CPAS) in March 2012, which is a service that triages Health Region operated home support services (e.g., Home Care). The partnership involved Home Care nurses identifying clients who were deemed at risk of a fall due to their medications, who were subsequently referred to MAC using a customized referral form (Appendix P). No other partnerships with health region programs were identified.

No evidence of formal promotional communications (i.e., letters, faxes) to non-physician professional organizations was identified in the document review; however, this analysis did not review less formal forms of communication such as personal emails, phone calls or informal meetings.

*Patient-Focused Promotion*

Patient-focused promotion was also recommended in the *MAC Policy and Procedure Manual*. It indicated that different methods of promoting MAC to potential patients would be used, including posters in seniors' high-rises, physician offices, and community centres; advertisements in senior-focused publications and shopping centres; information booths in locations with a high traffic of seniors (e.g., in malls located in close proximity to numerous retirement complexes).

In analysing the various MAC documents, there is no evidence that any patient-focused promotion took place. This finding was crossed-referenced with the results from the stakeholder interviews (Section 4.2) to confirm its accuracy. Patient-focused promotional activities were not

identified in the stakeholder interviews either, suggesting these promotional activities did not in fact take place.

4.1.1.13  Service Equipment and Other Related Resources Utilized to Operate MAC

Various pieces of service equipment and other resources were utilized in the provision of the CMM service.  Each item or resource played an important role and served a unique purpose (see Table 3).

*Table 3: Service Equipment Utilized and Its Purpose*

| Operational Equipment/Resources Utilized | Purpose of the Equipment/Resource |
|---|---|
| Secure web-based EMR | To securely store patient information |
| Laptop computer | To allow access to the EMR and other electronic resources |
| Internet stick (i.e., remote access to internet) | To facilitate a connection to electronic resources |
| Printer | To print patient consult notes and other documents |
| Mobile phone | For both incoming and outgoing calls to patients, physicians and MAC staff |
| Fax machine | To communicate with physicians (e.g., fax them the consult notes, receive lab data from physicians, etc.) |
| Document shredder | To securely discard of any printed materials that contained patient information |
| Document scanner | To facilitate the electronic storage of printed materials |
| *BpTRU*© blood pressure monitor | To allow the pharmacists to accurately measure patient's blood pressure |
| Private office space for patient appointments | To conduct the service and ensure patient privacy |

4.1.2.  Service Utilization and Patient Data

The second research question was "*How is the service utilized?*"  This question was intended to identify how many patient referrals MAC received, along with the source of the referrals and a detailed description of patient demographics, as well as the number and type of DTPs identified by the MAC pharmacists.

The results of the data analysis from this portion of the document review are described in detail in the following sub-sections and are summarized in Appendix Q.

4.1.2.1  Referral Numbers and Referral Sources

*Time Period of Referrals*

The MAC program accepted referrals between September 2011 and February 2013 (total of 17 months).  The first patient was referred on September 8th, 2011 and the final referral included in the data collection occurred on January 15th, 2013.

*Total Number of Referrals*

The total number of patients referred to the service (over 17 months) was 53.

*Sources of Referrals*

The majority of patient referrals to the program were made by family physicians (n=42, 79.2%).  The additional referrals came from home care staff (n=7, 13.2%) and patient self-referrals (n=4, 7.6%).

Twenty-three different physicians referred at least one patient.  The majority of physicians (n=13, 56.5%) who utilized the service only referred a single patient.  However, 21.7% (n=5) of physicians referred two patients, 8.7% (n=2) referred three patients and 13.0% (n=3) referred four or more patients.  The most patients referred by a single physician were five.

4.1.2.2  Patient Demographics, Medications and Health Conditions

The patients who were referred to the program were mostly female (n=36, 67.9%).  Patients ranged in age from 42 to 95 years (mean = 71 years).

The number of medications that patients were taking at their first appointment ranged from two to 31 (including prescription and over-the-counter medications, vitamin and mineral

supplements, and natural products), with a mean of 13.3. See Table 4 for a summary of the number of medications being taken by patients at first appointment.

*Table 4: Number of Medications per Patient*

| Number of Medications Recorded at First Appointment | Number (%) of Patients |
| --- | --- |
| 2-5 | 5 (10.2%) |
| 6-10 | 15 (30.6%) |
| 11-15 | 10 (20.4%) |
| 16-20 | 10 (20.4%) |
| 21-25 | 7 (14.3%) |
| >25 | 2 (4.1%) |

The results in Table 4 account for 49 of the 53 referred patients. Three patients declined participation in the program soon after referral, so their medication list was not collected. One of these three patients who declined participation did so because he was recently assessed at the Geriatric Assessment Unit (GAU) (where comprehensive medication assessments are performed by an interdisciplinary team), but the reasons for the other two patients declining is not known. The fourth patient whose data is not included in Table 4 was referred to MAC by CPAS and only attended his first appointment (reason unknown for why he did not return to complete his assessment). The patient was a poor historian and had recently switched to a new physician who did not have access to his previous health information; therefore his medication list could also not be confirmed.

The number of health conditions or diagnoses per patient ranged from two to 21 (mean = 9.2). See Table 5 for a summary.

*Table 5: Number of Health Condition or Diagnoses per Patient*

| Number of Health Conditions/Diagnoses | Number (%) of Patients |
|---|---|
| 2-5 | 14 (28.6%) |
| 6-10 | 17 (34.7%) |
| 11-15 | 12 (24.5%) |
| 16-20 | 5 (10.2%) |
| >20 | 1 (2.0%) |

Again, this information account for 49 of the 53 referred patients.  Missing data can be explained with the same rationale as the above medication data (Table 4) as it applies to the same four patients whose data is missing in that section.

4.1.2.3  Drug Therapy Problems (DTPs) Identified

A total of 215 DTPs were identified for the 42 patients (range of 0 to 13 DTPs per patient; mean of 5.1 per patient) for whom an assessment was completed and a consult note was sent to the physician.  Assessments were not completed for 11 of the 53 patients (20.8%) who were referred to MAC (and consequently consult notes were not sent to physicians, making it impossible to assess the number of DTPs identified) for the following reasons: patient declined participation in the service (n=3); patient unable to attend all appointments (four of whom lived greater than two hours outside of Saskatoon) (n=5); physicians did not forward adequate relevant medical history, preventing pharmacist from completing assessment (n=3).

DTPs were categorized into one of eight categories (Table 6).  DTPs in the "Non-Drug Recommendations" category were exclusively related to the pharmacist requesting additional laboratory tests to monitor high-risk drug therapy.

*Table 6: Drug Therapy Problems Identified Within Pharmacist Recommendations*

| Drug Therapy Problem | Number (%) of Individual DTPs within the Pharmacist Recommendations |
|---|---|
| Unnecessary Drug Therapy | 56 (26.0%) |
| Needs Additional Drug Therapy | 53 (24.7%) |
| Wrong Drug | 38 (17.7%) |
| Dosage Too Low | 13 (6.0%) |
| Adverse Drug Reaction | 11 (5.2%) |
| Dose Too High | 18 (8.4%) |
| Not Following Instructions / Adherence | 1 (0.5%) |
| Non-Drug Recommendations | 25 (11.6%) |
| **Total** | **215** |

4.2  Stakeholder Perspectives

Interviews were completed with nine patients, five physicians and all three MAC staff (which consisted of two pharmacists and the program director).  Saturation of the data was observed in the physician and patient groups, so interviews were halted after five and nine interviews respectively.  The themes identified in the interviews with each stakeholder group are presented in the following sub-sections.

4.2.1 Overview of Identified Themes

Below is in an overview of all the themes and sub-themes identified in the stakeholder interviews.

*Table 7: Summary of Themes Identified in the Stakeholder Interviews*

| Theme | Sub-Theme | Patient | Physician | MAC |
|---|---|:---:|:---:|:---:|
| Service Delivery | Appointment Process | X | | |
| | Service Location | X | X | X |
| | Strong Patient Care Process | | X | |
| | Supports a Collaborative Approach | | X | |
| | Physician Communication | | | X |
| | Patient Communication | | | X |
| Satisfaction and Support | | X | X | X |
| Benefit to the Patient | Overcoming Drug Coverage Barriers | X | X | X |
| | Medication Regimen Optimization | X | X | |
| | Patient Education | X | X | |
| Benefit to Health Care Providers | | | X | X |
| Complex Patient Environment | | | | X |
| Service Promotion | | | X | X |
| Internal Operations | Coordination | | | X |
| | Pharmacist Skills | | | X |
| | Logistics | | | X |

## 4.2.2  Patients

Three themes were identified in the patient interviews, which were:

1. Service Delivery
2. Satisfaction and Support
3. Benefit to the Patient

4.2.2.1  Theme #1: Service Delivery

Patient interviewees frequently discussed their perceptions and feedback regarding the manner in which the MAC service was delivered.  Overall, interviewees were happy and satisfied with the way the service was delivered.  Interviewee comments regarding MAC service delivery were most commonly related to two sub-themes: 1) the appointment process and 2) the location of the service.

*Sub-Theme #1: Appointment Process*

When discussing the appointment process, patient interviewees stated that they were appreciative that not all appointments required an in-person visit (i.e., some follow-up was performed by telephone).  Interviewees thought the referral process and appointment format was convenient and worked well for them, and that they experienced very little delay between referral and their first appointment.

> *"Well what I appreciated, was that I could do some more over the phone…That just saved me money, also.  It saved me going."* (PT90)

> *"Well it [time from referral to first appointment] was quite short actually.  It was probably less than 2 weeks."*  (PT87)

> *"The whole process went a hell of a lot faster than I thought it would be."* (PT87)

Patients were happy with the appointment process and did not identify any concerns with how the appointments were booked, the number and length of appointments, and the timing of the appointments.

*Sub-Theme #2: Service Location*

Patient interviewees commonly stated that they were pleased with the fact that the MAC service was provided at an accessible location that was centrally located, easy to get to by car or public transit, and with plenty of free parking.  Many specifically mentioned that they were happy that the service was not located at a hospital, where many outpatient clinics in Saskatoon are commonly located.

*"Oh it was much better [location of the Co-op versus the hospital]. That was a great place to be. Besides that the parking is free. At the university hospital you almost have to take out a bank loan to park there."* (PT87)

*"… and the fact it was at the Co-op and you did not have to go to [the hospital] and pay a fortune and all that too helps."* (PT92)

However, interviewees noted that it was not easy to find the location of the MAC office within the main building, as there was not sufficient signage to guide them.

*"I got there earlier, I know that the taxi driver took me right to the area, but it was an open room it was not chair and table organized or that type. I sort of wondered if I was in the right place or not. It would be good if there was some way of being absolutely sure you are in the right place."* (PT90)

## 4.2.2.2 Theme #2: Satisfaction and Support

Patients expressed overall satisfaction with the MAC service and many had strong opinions that the service should continue to receive financial support to remain operational. Specifically, patient interviewees indicated that they had a positive experience when interacting with a MAC pharmacist. Interviewees described their interactions with the pharmacists as very professional. The patient comments indicate that the MAC pharmacists were patient-centred in their approach, had strong interpersonal skills, and were capable of creating a positive environment while building a relationship with the patients.

*"Your assessors were great people… They were great."* (PT87)

*"… I just felt respected and you know, they even asked if I needed to take a drink or something."* (PT90)

*"…the two people that interviewed me and took down the information, I thought that they were very professional and I kind of got a feeling that they knew what they were talking about and another comment, my doctor thinks highly of them."* (PT96)

*"Oh it was great friendliness, and respect, they did not put down my ideas and my opinions about things. I was very impressed with each one of them."* (PT98)

The patient interviewees also indicated that they valued the service. They felt that it helped to prevent potential medication harm, that the pharmacists were able to address their

concerns in a timely fashion, and that the service had an impact on short-term outcomes including their quality of life.  Patients also stated that they appreciated the fact that the MAC pharmacists followed up after the initial appointments to determine if the desired outcomes of the recommended changes to drug therapy were occurring as planned.

> *"…like I say I got a lot of revisions that worked and was relieved that someone was listening to me for a change.  Like I said I went through 6 months of hell and anyone who loses 60lbs due to diarrhea, nausea and you know throwing up, there is something really wrong.  I did not get it from my own doctor so that is why I asked to go because I knew."* (PT92)

> *"I thought it was excellent… I was amazed at their dedication to calling me and seeing how things turned out."* (PT98)

Overall, patient interviewees were happy with the service and the interaction they experienced with the MAC pharmacists.  The interviewees had a positive experience with the MAC service and were very satisfied and supportive of it.

> *"It has been such a good experience.  The things that were wrong got straightened out."* (PT92)

> *"Like I said, let's just say I was very satisfied and have no complaints."* (PT95)

4.2.2.3  Theme #3: Benefit to the Patient

Patients commonly spoke about the benefits that they believed the MAC service had on their health and their medication regimens.  Interviewee comments regarding patient benefits most commonly related to three sub-themes: 1) overcoming drug coverage barriers, 2) medication regimen optimization, and 3) patient education.

*Sub-Theme #1: Overcoming Drug Coverage Barriers*

Patient interviewees indicated that the MAC pharmacists assisted them in dealing with drug coverage challenges.  Where other HCPs had attempted to assist the patients with drug coverage barriers and had no success, the MAC pharmacists were often able to attain coverage.

*"Well because of what they did, somehow they were able to get me a certain medication covered for me. My pharmacist had tried and they could not get it covered but [the MAC pharmacist] somehow got it covered for me."* (PT90)


*Sub-Theme #2: Medication Regimen Optimization*

Patient interviewees provided insight into the impact the service had on their short-term clinical outcomes and their quality of life. Through the optimization of patients' medication therapy, the MAC pharmacists were able have a significant impact on the quality of life for some patients. These improved outcomes occurred very soon after the implementation of the recommendations. Through the identification of DTPs and the optimization of the medications being used to treat the various health conditions, the MAC pharmacists were able to assist many patients in regaining control of their symptoms and addressing problematic medication-related adverse effects.


*"They took me off the atenolol. As soon as they took that off on the one day the next day I could walk 40 feet and not get dizzy instead of 3 feet… I had been taking that stuff for a long time. All of a sudden it was gone and I felt like a human being again." (PT87)*

*"…thank the [MAC pharmacists] because prior to that I could not walk from the kitchen to the car without having to stop 3 times." (PT87)*

*"[The MAC pharmacist] had sent his recommendations to [my physician]. She thought that they were great. Since then on the 20th, I have lost about 25lbs. I was up a pound today, but I lost 25 pounds since the 20th." (PT87)*

*"Oh yes [I think I benefitted from the service] because I was being over medicated beyond words. My blood pressure was out of control, I had chronic diarrhea to the extreme I was scared of leaving the house at times. I was nauseated, and this was all due to the medications I was on. I had gout last March and they had me on 2 gout medicines which they were over dosing me to the extreme. I lost 50lbs because of mismanagement of my drugs." (PT92)*

*"It was good they did it though because we had picked up on the fact I needed Fosamax to help prevent having breaking bones…I had originally been on it and then some doctor in the past took me off of it. Nobody picked up on the fact that I should be back on it again. So it was good that they have [the MAC service]. I feel a lot safer now." (PT90)*

*Sub-Theme #3: Patient Education*

Through their interaction with a MAC pharmacist, patient interviewees indicated that they gained a better understanding of the medications they were using. Patients were able to discuss and learn about the indications for, and benefits of, their current medications, as well as potential side effects.

> *"Well, I learned about a lot of the pills I am taking, and aware of why I am taking them, and the side effects…"* (PT96)

> *"… my sister had bought some things just on her own or ordered them from TV ads and stuff, and she explained why that is not such a good idea, and gave her the name of a better known product that would take the place of that. That was helpful because my sister was very gullible with this stuff on TV."* (PT89)

> *"Yes and my doctor was certainly happy about it because she felt she did not have enough knowledge about everything."* (PT90)

4.2.3  Physicians

Five themes were identified in the physician interviews, which were:

1. Service Delivery
2. Satisfaction and Support
3. Benefit to the Patient
4. Benefit to Health Care Providers
5. Service Promotion

Three of the themes identified in the physician interviews, S*ervice Delivery*, *Satisfaction and Support*, and *Benefit to the Patient*, were also identified in the patient interviews (as discussed in the previous section, 4.2.2).

4.2.3.1  Theme #1: Service Delivery

Physician interviewees frequently discussed their perceptions regarding the manner in which the MAC service was delivered. Overall, physician interviewees were happy with the way the service was delivered, and their comments regarding MAC service delivery related to three sub-themes: 1) a strong patient care process, 2) that MAC supports a collaborative approach, and 3) the service location.

*Sub-Theme #1: Strong Patient Care Process*

Various aspects of the patient care process were mentioned by the physician interviewees. They noted that MAC utilized an empathetic, patient-centred approach during the patient assessments, which the physicians found to be quite thorough. The physician interviewees also indicated that the CMM service provided practical recommendations that were presented in a clear and logical manner allowing physicians to easily follow and implement them. The interviewees also commented on their communications with the MAC pharmacists, which were described as both effective and timely. The physician interviewees also indicated that they felt the MAC pharmacists created a positive environment for patients to openly discuss their medications and related concerns.

> *"The letters that are coming back are very concise and logical so it is an easy*
> *visit with the patients."* (MD101)

> *"...everyone was really nice and friendly and listened to them."* (MD86)

> *"I feel that the patients were approached in a very respectful, non-judgmental manner*
> *and it is very important because some people become quite sensitive when they are on a*
> *number of medications, and you know have had the lecture, and that type of thing. So I*
> *think the approach and the nature of the consultations are very, very well done."*
> (MD102)

The physicians were also appreciative that the service delivery involved follow-up with patients once the implementation of the recommendations had begun.

> *"Yes everyone got excellent follow up."* (MD91)

Physician interviewees noted that the patient assessments involved a very detailed medication history and as a result, produced practical recommendations.

> *"The pharmacist recommendations have been awesome."* (MD91)

> *"...I have seen some good recommendations,..."* (MD102)

The organization and presentation of the information contained in the MAC consult note allowed physicians to easily follow and implement the plan. The physicians also commented on

the value of being provided with alternate drug therapy options within the recommendations, should the initial recommendation not be effective.

> *"They are very thorough and go through a very detailed medication history, and then giving some first suggestions and then also saying if that does not work we would recommend this as a second choice, and then also reaching follow up. Which I thought was great."* (MD86)

> *"I think the way the consult came back, there was a number of options for different decision directions that could be made, and within each direction there was very step wise instructions, first of do this and then if this response is not achieved then try this. So it was very nice in terms of how it was laid out which from my end of it trying to implement some of these changes, it made it very easy."* (MD101)

Pharmacist-physician communication was noted by interviewees to be a strength of the service. Physicians felt that they received the recommendations in a reasonable time frame. Interviewees also specifically mentioned that it was not a problem to contact the MAC pharmacist when needed.

> *"…the feedback has been so prompt I have not felt the need to specifically phone [the MAC pharmacists]."* (MD102)

> *"Well for one of my patients, the pharmacist had sort of come up with something, and called me that day."* (MD86)

*Sub-Theme #2: Supports a Collaborative Approach*

Physician interviewees indicated that the MAC service supported a collaborative approach to patient care by involving both the patient and the physician in medication therapy decisions. The physicians viewed this collaborative and interprofessional approach to patient care as a program strength. In one instance, a physician reported that he/she, the MAC pharmacist and the patient all came together to work through the patient's various medication-related problems as a team, and that he/she valued this experience.

> *"Because I got to meet with both the patient and the pharmacist together, think that it was good, and that it was a good team approach."* (MD97)

*Sub-Theme #3: Service Location*

Physician interviewees, similar to the patient interviewees, frequently stated that they were pleased with the MAC service location and noted that it was a great site for patients to attend due to its central location and accessibility.

4.2.3.2  Theme #2: Satisfaction and Support

Similar to the patient interviewees, the physician interviewees expressed overall satisfaction with MAC and stated that the service should continue to receive financial support to remain operational, or even possibly expanded.  Physicians indicated that if the service were to continue beyond a pilot project, that they would continue to refer patients to the service.

> *"I really cannot tell you enough how much I think the program is awesome."* (MD91)

> *"It has been an amazing experience.  I like it."* (MD91)

> *"…I totally support [MAC] going on."* (MD97)

> *"…and in one particular circumstance a patient of one of my colleagues who was on a long term medical leave as a result of surgery and I had taken over a couple of her patients to manage in her absence.  On her return, she had a comment like "what on earth did you do, he is fabulous", so you know it was not just patients it was colleagues who were super pleased with things that I had done.  But, I had to give credit because it was not actually me."* (MD101)

> *"I just hope they can get the continued funding, because on our end of it, it is a huge help for sure."* (MD101)

4.2.3.3  Theme #3: Benefit to the Patient

Similar to the patient interviewees, physicians indicated that their patients experienced an improvement in health outcomes as a result of the MAC service.  They also felt that their patients had a positive experience with MAC.

> *"Well it was a very positive experience for the patient, and she was very appreciative."* (MD97)

> *"I think everything was very practical and the outcomes were very good."* (MD101)

Three sub-themes related to patient benefits were noted in the physician interviews (which were exactly the same as the three sub-themes in the patient interviews): 1) overcoming drug coverage barriers, 2) medication regimen optimization, and 3) patient education.

*Sub-Theme #1: Overcoming Drug Coverage Barriers*

The physician interviewees noted that the MAC service was able to assist patients in addressing and overcoming drug coverage barriers. This ensured that patients were able to access the medications prescribed to them by their physicians when cost was a barrier to treatment.

> *"We were trying to find an anti-nauseant for one of my patients, [the MAC pharmacist] …was able to get my patient the drug that day and we thought it was going to take some time before we would be able to get her onto a stronger anti-nauseant medication. So that was fantastic."* (MD86)

*Sub-Theme #2: Medication Regimen Optimization*

When discussing the benefits to patients, the physicians commonly indicated that the MAC pharmacists were able to help optimize the medication regimens of patients through dose adjustments, recommendations for the initiation or discontinuation of medications, or the simplification of regimens.

> *"…a lot of the times the medications were adjusted up or down, changed."* (MD91)

> *"It cleaned [the patients' medications] up, so less chance for interaction and side effects, that sort of thing."* (MD102)

These actions resulted in improved medication-related care for patients, through the management of side effects and confirmed safety of medications, as alluded to by the physicians.

> *"… people I have referred have done amazingly well."* (MD91)

> *"…it is nice to have someone who has experience with how all this interacts and are helping us to keep things clean and tidy, and functional, and safe."* (MD101)

*Sub-Theme #3: Patient Education*

The final patient benefit identified by the physician interviewees was related to patient education.  The physicians felt that the service provided in-depth medication education to their patients, which they perceived as being valuable.  Physician interviewees mentioned that the education given to patients was comprehensive, useful, unbiased, and supported the appropriate use of medications.  Physicians also commented that the information provided to patients eased the implementation of changes related to the medication optimization since the patients had already received the necessary education along with an explanation of the rationale for medication changes from a MAC pharmacist.

> *"… they provided some good education for her about her medications, and why she was taking them, and what they were for."* (MD86)

> *"Obviously [the MAC pharmacist] spent time with them that I do not have, or that some other pharmacist did not spend with them to explain what their medications were for, and how to use it appropriately."* (MD91)

4.2.3.4  Theme #4: Benefit to Health Care Providers

The physician interviewees described the various ways in which they benefitted personally and professionally from their involvement with MAC.  Physicians indicated that they often struggle with time constraints when dealing with complex patients who have lengthy and detailed medical histories.  In such circumstances, the physicians reported that they felt MAC supported them by sorting through the medication-related information with the patient to determine suitable treatment options.

> *"For my complex patients in particular, it is so hard to find the time to look through all their old records and find out what medications they have been on, and what their reactions have been, and do all of the research to find out what else we can try.  It is such a nice service.  I would be very sad if it was gone."* (MD86)

Physicians also reported circumstances in which they were dealing with acute medical problems making them unable to focus on medication optimization, a situation in which the MAC pharmacists were also able to support physicians by researching and suggesting the best

treatments to physicians.  This process improved physician confidence by reassuring them that their patients' medication therapy was optimized.

> *"And I feel like my management with her is often to put out fires, and it was kind of hard for me to say well what are the gaps in her care.  It has been kind of overwhelming. When I sent her to the consultants, [the MAC pharmacist] found that she was not on a treatment for osteoporosis and they recommended [one].  I thought that was really beneficial because just between everything else going on with her, I do not know if I would have gotten there for quite some time."* (MD86)

Physician interviewees commented on the benefits of having access to an expert opinion when it came to adjusting medications to ensure that the medications and corresponding dosages were appropriate, to confirm that drug interactions were managed, and that the medications could be used safely and effectively.

The physicians also viewed the information in the MAC pharmacists' recommendations as a form of personal professional medication education, suggesting that they learned something from every patient referral that could be applied to other patients in their practice. This further improved physician confidence in the medication management of their patients.

> *"Yes what they gave me for one patient will carry over to another patient… So it is a nice refresher as well.  So it helps us to learn and the patients as well."* (MD102)

4.2.3.5  Theme #5: Service Promotion

Physician interviewees indicated that while they were highly supportive of the program, they often forgot to refer many patients who likely would have benefitted.  They emphasized the fact that they would have appreciated a reminder to help cue them to refer patients to the program.  They also indicated that the promotion of the MAC program could be improved and provided some feedback related to how this could be achieved.

The physician interviewees recommended using multiple different types of promotional materials to help increase the awareness of the program to both patients and referring physicians (e.g., posters in the waiting rooms and exam rooms).  They also felt that a patient brochure or pamphlet would be valuable to help explain to patients what could be expected from the service, where the service is located, and how to prepare for the first appointment.  The physicians

explained that a promotional brochure or pamphlet would serve not only to explain the service to patients, but would also help remind physicians to refer patients.

> *"I think there could be a little more publicity about it. Maybe a poster in a physician office that they can put on a wall in the waiting room while they are sitting and reflecting, even in the exam rooms that might help. Because sometimes we are not even thinking about potential side effects, but if that was a visual inside the office, I think it would be helpful."* (MD102)

> *"A little brochure that says you will contact them, but here is where they are located, and this is what they can expect from the interview, and to bring all the medications with them. Something simple. Plus if we had some kind of a little pamphlet that we could have would help us to remember to send to you."* (MD91)

Physicians also recommended that community pharmacists could help identify patients for referral to MAC based on pre-defined criteria, such as a specified number of medications.

### 4.2.4  MAC Staff

Seven themes were identified in the MAC pharmacist and program director interviews, which were:

1. Service Delivery
2. Satisfaction and Support
3. Benefit to the Patient
4. Benefit to Health Care Providers
5. Complex Patient Environment
6. Service Promotion
7. Internal Operations

Three of the themes were previously identified in the both the patient and physician interviews: S*ervice Delivery*, *Benefit to the Patient*, and *Satisfaction and Support*. An additional two themes identified in the MAC staff interviews, *Benefit to Health Care Providers*, and *Service Promotion*, were also identified in the physician interviews. An overview of all the identified themes from the stakeholder interviews is provided in Section 4.2.4.

<u>4.2.4.1  Theme #1: Service Delivery</u>

MAC staff interviewees discussed their perceptions of the service delivery in great detail. The MAC staff also provided specific advice regarding how the CMM service could be improved, while highlighting the aspects of the service that they felt worked well.  Overall, interviewees were satisfied with the way they delivered the service.  Interviewee comments regarding MAC service delivery related to three sub-themes: 1) physician communication, 2) patient communication, and 3) service location.

*Sub-Theme #1: Physician Communication*

When it came to communicating with physicians, the MAC pharmacists indicated that the written form of communication (i.e., faxes) worked best for sharing their recommendations with physicians.  The written communications allowed the MAC pharmacists to effectively organize their recommendations, and also acted as an integral part of the patient record.  The only difficulty reported by the MAC pharmacists was the challenge of keeping the notes to a reasonable length.

> *"Communicating in writing, often via fax, might be what worked best when it came to communicating with physicians."* (MAC2)

> *"Using written forms of communication also helped created a sort of patient encounter record."* (MAC2)

The pharmacists reported that patient assessments often resulted in multiple physician communications, which often involved a request for additional patient information.  The interviewees indicated that usually physicians promptly and consistently responded to requests for additional patient information.  This is confirmed by data from the document review (Sec 4.1.2.3), which found that only 3/53 (5.7%) of patient referrals lacked adequate information from the physician, resulting in an incomplete assessment.

> *"I often was pleasantly surprised by how quickly a physician might reply to a faxed request or return a phone call."*  (MAC2)

> *"Using a mix of written and phone call communication certainly is key, especially when you need to 'speed things up'."* (MAC2)

*Sub-Theme #2: Patient Communication*

The MAC staff reported that patients were often introduced to the MAC program for the first time through a patient brochure, which was sent to them via the mail. Sending out a patient brochure that explained what the MAC CMM service entailed and what patients could expect during their appointments, prior to their first appointment, helped patients better understand and value the service, according to the MAC interviewees. The MAC staff felt that the brochure may also have helped address any unanswered questions related to the program. They also believed that the patient brochure assisted in making patients feel more at ease with the new experience of attending a CMM service.

> *"When I mentioned to patients that I was planning on sending them a brochure that would remind them of the appointment time, and the location, and the service and everything - they felt quite relieved because when I think I phoned them it was a lot of information to provide over the phone."* (MAC1)

When it came to patient encounters, the MAC pharmacists stated that meeting with the patients in person was the best way to communicate. The interviewees also commented that face-to-face interactions allowed the patient and pharmacist to develop a relationship more effectively.

> *"I believe meeting with the patients in person on the first appointment is essential to creating a relationship of trust."* (MAC3)
>
> *"I have had very positive experiences communicating with patients. I think they are all very pleased to have the opportunity to sit down with someone to speak at length about their drug therapy."* (MAC3)

While the importance of meeting patients in person, especially for a first appointment, was highlighted as being valuable to MAC pharmacists, they also felt that follow-up was an important part of the service. The MAC pharmacists noted that brief phone calls could be made to patients to follow-up and that these calls were often quick, easy to perform and quite valuable.

Another comment made by the MAC staff was that they thought it was not easy for patients to contact them for unscheduled questions or concerns outside of the formal appointments, due to the part-time nature of the service. The MAC staff indicated that

contacting the patients could also be a challenge. Connecting with patients via phone was reported to sometimes be difficult without any dedicated administrative support.

Finally, the MAC pharmacists also suggested that it would be beneficial to provide patients with a detailed list of their medications and important health history that they can keep with them, which was not a service that was typically provided for patients referred to MAC.

*Sub-Theme #3: Service Location*

The final topic that was noted within the theme of *Service Delivery* during the pharmacist interviews (which was also mentioned by physician and patient interviewees) was regarding the service location. The pharmacists had several critical comments to make about the room in which they provided the service at the Co-op. They felt the room was too large and consequently felt cold and uninviting (although this was not mentioned by patient interviewees who attended appointments in the room). They also did not like the fact that it was a public space that had multiple users, which required that they set up the room with tables, chairs and other equipment prior to each clinic day. The room also lacked good office furniture and an ideal waiting area. The pharmacists felt that the service would benefit from a dedicated service delivery location to help eliminate the need to repeatedly set up the shared space.

> *"The room at the Co-op was good enough but not ideal. I wouldn't say it was comfortable per se, but it did the trick…it was slightly irritating to have to listen to overhead pages in a grocery store. Temperature control was also sometimes a challenge…"* (MAC2)

> *"… the room itself wasn't optimal. It was really big, it was cold - it was used by multiple people and groups, so the pharmacist would have to set everything up when they got there. It was a public space, it wasn't an office, there was no good office furniture. I don't think it looked nice."* (MAC1)

The MAC staff also had positive comments regarding the service location, similar to patients and physicians. They liked that it was centrally located, that it had lots of free parking, and was wheelchair accessible. It also came free of charge, which was important considering the budget of MAC was very limited.

*"I think the location was awesome in that it was centrally located, and a place everyone knew where it was. There was tons of free parking, there were no steps – so if you're in a wheelchair – you couldn't get a much more accessible location, I don't think – and it was free so that was great."* (MAC1)

The MAC staff made several comments related to how they would alter the service delivery space in order to make it an 'ideal' space. They recommended avoiding any stairs or a long walk to the service room, if at all possible, since most of the patients were elderly. The MAC staff were mindful of the importance of a comfortable chair for patients that was easy to get in and out of, along with convenient access to amenities, such as a washroom. They also recommended providing a comfortable waiting area for patients.

4.2.4.2 Theme #2: Satisfaction and Support

Similar to physician and patient interviewees, MAC staff reported overall satisfaction and support for the MAC program. While the MAC pharmacists were satisfied with and supportive of the service, they recommended that it would have been valuable to seek regular physician feedback related to MAC services. The pharmacists felt that the service lacked a formal satisfaction survey or quality assurance / evaluation process. It was recommended that the MAC service should regularly seek physician feedback regarding various aspects of the service. They also suggested that physicians who are not referring to the service could be asked for their reasons for not utilizing the service.

*"I would love to see a more post-assessment feedback from physicians. Either through phone call discussion, or by fax/email simply stating if the assessment was valuable and or how physician and patient have decided to implement recommendations."* (MAC3)

The MAC pharmacists also reported personal and professional satisfaction and fulfilment through their involvement as members of the MAC team. Improving the health of their patients through the assessment and resulting optimization of medications was rewarding for the MAC pharmacists.

*"There is nothing more rewarding than fixing a problem for a patient that actually impacts their life in a way that is significant enough to say you've improved their quality of life."* (MAC2)

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*"The best part is when a patient thanks you for solving a problem no one else could, or thanks you for making their life better."* (MAC2)

*"Obviously, it's pretty amazing when a patient comes back to you and says 'meeting with you has changed my life'."* (MAC3)

Not only was the MAC staff satisfied with their involvement in the CMM service, their interviews support the earlier finding that patients were also quite satisfied with their experience.

*"…one of the first things [patients] said when they phoned was how awesome the pharmacist was, what a great service this is, how wonderful they think it is that this is available..."* (MAC1)

### 4.2.4.3  Theme #3: Benefit to the Patient

The MAC staff felt that the patients who were referred to MAC were appropriately complex to require the service.  In addition, similar to physician and patient interviewees, they stated that they believed the patient's health status improved as a result of the service.  The pharmacists observed on several occasions where individual patient's symptoms, risk factors or self-reported quality of life improved as a direct result of their interventions.

*"It seems that physicians tended to send us their 'train wrecks' however and these folks, and physicians, really needed our help."* (MAC2)

*"The biggest impact on patients came from two situations – either a patient's condition wasn't controlled and we addressed that – and these situations were life altering symptoms like uncontrolled pain, severe and debilitating nausea causing weight loss.  Or the other situation was that a drug was causing an adverse effect that was affecting quality of life – one patient had such severe diarrhea that she was limited in leaving the house and had also suffered significant weight loss."* (MAC2)

The MAC staff interviews offered several quotes to support the finding that patients' quality of life was improved as a result of the service, and that drug therapy regimens were optimized.

*"I think for some patients, it truly changed their lives for the better. I can think of one patient in particular who was suffering from an adverse event and it was really affecting her life. We addressed that problem and she was then able to do things she hadn't been able to do for a long time."* (MAC2)

*"...some patients who had uncontrollable life-changing adverse effects, saw the reversal or the diminution of those adverse effects after seeing a MAC pharmacist which impacts their day to day."* (MAC3)

#### 4.2.4.4  Theme #4: Benefit to Health Care Providers

The MAC pharmacists reported that the physicians appeared to appreciate the service they were providing (which was confirmed in the physician interviews). The pharmacists were able to support physicians by addressing complex drug therapy regimens and by dedicating time to sorting through and collecting a detailed medication history from the patients. The MAC pharmacists were then able to offer solutions to the identified DTPs. As a result, the pharmacists felt that physicians were able to spend more time addressing non-medication-related patient concerns, and that patients received a greater depth of care.

*"I think we helped physicians who didn't know what to do next in terms of drug therapy, physicians who didn't have time to do a thorough examination of medications and physicians who just needed a second opinion on how to approach a drug therapy problem. It certainly would save them time in the end and help them ensure that their patient is getting the best possible care through the optimization of their medications."* (MAC2)

*"...but I had physicians comment on, sort of spontaneously, about how much they appreciated the service – if I happened to see one or if for whatever reason they send a following referral - so I did get some informal feedback from the doctors about how valuable they saw the service to be ."* (MAC1)

#### 4.2.4.5  Theme #5: Complex Patient Environment

The MAC pharmacists reported that the program involved a complex patient environment in which a large majority of the patients referred to the service had multiple health conditions, were taking multiple medications, and as a result often had numerous DTPs. This often challenged the MAC pharmacists to come up with the best course of action in terms of addressing the various DTPs that had been identified. Presenting information in a way that

patients could easily understand was highlighted as a challenge due to the complex patient environment.

4.2.4.6  Theme #6: Service Promotion

The MAC staff felt that overall patient referral numbers were too low and that more referrals were desired.  Similar to physician interviewees, they stated that an improved and expanded promotion plan was probably required to increase referrals and ensure the success of the service, and they provided specific feedback related to how this could be improved.  In terms of physician-focused promotional activities, a variety of promotional materials and methods, including conference booths, mail outs, attending physician meetings, and offering physician office detailing sessions, were identified in the MAC staff interviews as options that could be employed to help promote MAC better.  The MAC staff believed that a combination of different promotional materials were important, which is consistent with the comments provided by physician interviewees.

> *"And I think as far as promotion down the road, I think you need to use a variety of all these things all the time because this service is always going to be about promotion – if people don't know about it, they're not going to come to it."* (MAC1)

The MAC staff also discussed how they felt that the service should have been promoted to HCPs other than just physicians, and that in the future, the target audience should also include pharmacists, particularly those in working in community pharmacies.

The MAC pharmacists also specified that the service should have been promoted directly to patients who might self-refer to the service.  Seniors groups were identified as an ideal audience to target.  The MAC pharmacists believed that by placing brochures in physician waiting rooms, the awareness of the service among potential patients could have been increased.  Also, mail outs to seniors groups, brochures in seniors' high rises, and advertisements in senior-directed publications were cited as excellent opportunities for promotion directly to patients.

> *"I think individual patients would probably be better at identifying whether or not they would, not only appreciate the service, but benefit from the service if part of the promotion was explaining what the service was and generally who should be seen or who would benefit."* (MAC1)

'Service branding' was also identified by the MAC staff as being an important aspect to promotion.  The MAC interviewees stated that the MAC brand was valuable and that the MAC staff took measures to help establish this brand by ensuring it was on all the promotional and communication materials.  The MAC staff felt that with time, the MAC brand would gain recognition among physicians increasing both the credibility of the service and ideally the utilization of the service.

> *"I think having a 'branded' letterhead was helpful in communicating with any stakeholder and that in time that brand would gain more recognition.  To see 'MAC' across the top of the consult note would help the receiver identify its source, and potential importance, right away upon first glance."* (MAC2)

> *"I think it's all about brand recognition really and the more you're visible at multiple places like this, the more they're going to remember you and the more credible you will be."* (MAC1)

### 4.2.4.7  Theme #7: Internal Operations

Within the final identified theme of internal operations, three sub-themes were emphasized including: 1) coordination, 2) pharmacist skills, and 3) logistics.

*Sub-Theme #1: Coordination*

To facilitate the mobility of the service, and support the shared role of service delivery by the two different pharmacists, service equipment (e.g., laptop, *BpTRU$^©$* monitor, etc.) was shared within the MAC team and often required MAC staff to coordinate the transfer of the equipment between pharmacists.  The MAC pharmacists commented that the successful management of shared equipment was a challenge as each pharmacist offered services on a different day requiring that the equipment be passed from one pharmacist to the other.  Since the program did not have a permanent service delivery space, the shared equipment could not be left in the service delivery room (it was used by multiple groups), and the equipment had to be left in a secured area to protect patient data.

*Sub-Theme #2: Pharmacist Skills*

Various pharmacist skills, attributes and training were identified as being essential to the MAC program, and were credited (by MAC staff) for the success of the program. Being capable of staying current with pharmacotherapy literature was one pharmacist attribute that was mentioned by the MAC staff as being important. To help stay current, the pharmacists recommended attending provincial conferences that focus on drug therapy and/or the management of various medical conditions. It was also felt that the successful delivery of the service was not completely dependent upon the pharmacist's drug knowledge, but also upon his or her problem-solving skills. Additional pharmacist training such as a hospital residency, Pharm D program, CPhA ADAPT program, or any training that supports the development of problem solving skills related to complex patients, were thought to be beneficial in the opinion of the MAC pharmacists and program director (and both pharmacists had additional training in these areas). Being proficient in defining a focused clinical question, knowing how to search out the required medical information, as well as critically appraise the evidence in order to effectively address a patient's DTPs, were other pharmacist skills that the MAC staff deemed necessary in the delivery of a successful service. Additional pharmacist attributes identified during the MAC staff interviews that contributed to success of the service delivery included: common sense, an ability to effectively communicate with both physicians and patients, and the ability to self-assess and request additional support when needed. The MAC staff believed that a successful MAC pharmacist would have to be confident, assertive, and comfortable being self-directed as well as working independently. The program director felt that the two MAC pharmacists had all of these skills and attributes and credited the success of the service to this fact. It was recommended that any future staffing decisions should consider these important factors when selecting pharmacists to provide the service.

> *"The pharmacists in MAC need a very strong set of professional skills, I don't mean therapeutic knowledge, but professional skills around patient interviewing and the patient care process, and identifying patient drug therapy problems, creating care plans, all of that sort of process related professional pharmacist skills - absolutely need to be strong for this practice, not because you're working very independently but because the patients are incredibly complex."* (MAC1)

Further comments made by the MAC staff interviewees related to the ideal pharmacist candidate for the delivery of CMM highlighted the value of experience delivering CMM services. It was noted that with experience, a pharmacist becomes more proficient at delivering the service, which can involve a very complex patient environment requiring various skills in order to be proficient.

The MAC staff also discussed how they served as a support to one another when dealing with complex patients. Having support from a colleague, in which one could discuss difficult patient cases, was identified as being very valuable to the MAC pharmacists.

> *"Having a support team in place to help you deal with complex patients is also important. Having a sounding board to bounce ideas off of, or make sure you haven't missed anything will certainly be beneficial to both the pharmacist and the patients."* (MAC2)

*Sub-Theme #3: Logistics*

Numerous comments and suggestions were made by the MAC staff regarding service logistics. The first centred on the booking of patient appointments. The staff felt that Google Calendar worked well to schedule patient appointments and pharmacist work hours since it was easy to use and access. The main challenge of using Google Calendar was that it did not meet privacy and data security standards, which required MAC staff to assign patients random numbers within the Google Calendar schedule, rather than using their actual names.

The booking of patient appointments by phone was identified as being the preferred method of communicating versus sending a letter informing patients that they have been referred to MAC. The MAC staff indicated that calling patients also allowed for better tracking of which patient had or had not been booked. However, the MAC staff felt that it would have been very helpful to have administrative support to assist with booking patient appointments.

A second logistical comment that was identified in the pharmacist interviews was the importance of a standardized and clearly defined appointment process and format. MAC had a standardized appointment format and interviewees felt that this ensured that all pharmacists were providing a consistently high quality service and allowed pharmacists new to the service to easily know what was required of them at each patient encounter. The standardized process was also

acknowledged for ensuring that the pharmacist was thorough and did not miss any key information in the encounter.

Another logistical challenge reported by the MAC staff was the EMR. The EMR used initially, *Assurance*[©], was described as being cumbersome, time-consuming and complex, requiring very detailed information to be entered into the patient record using a specific format through a defined sequence of prompts. These software attributes made it difficult for the pharmacists to become proficient in entering data during a patient encounter. The MAC staff stated that the success of any CMM service is dependent upon on a good documentation process, which required them to discontinue their use of *Assurance*[©] and move to using standardized data collection forms. The MAC staff indicated that it would be beneficial to ensure that a user-friendly EMR was utilized in a future program offering.

> *"Being proficient in your documentation software is certainly vital to keep the appointment on track and ensuring that you've captured all the necessary information in the appropriate places."* (MAC2)

The MAC CMM services were delivered on a part-time basis (two pharmacists each working the equivalent of one day a week). The MAC staff recognized that the part-time provision of the service was not ideal as it made communication with both patients and physicians difficult. A full-time program with a dedicated pharmacist was recommended to alleviate both the communication and the aforementioned scheduling issues.

> *"The only way to do this is to have a full-time person who can take responsibility Monday to Friday for patient phone calls, provide more consistency of service and so they aren't distracted by other employment priorities."* (MAC1)

## Chapter 5

## Discussion

5.1  Interpretation of the Program Evaluation Findings

5.1.1  Triangulation of the Results

To improve the trustworthiness of the findings, a mixed methods approach was applied that utilized multiple types of data (both quantitative and qualitative) that were collected from multiple sources through a document review and stakeholder interviews.  The multiple data types and sources offered different biases and strengths which helped improve the trustworthiness of the results.  In addition, multiple data analysts were used to interpret the qualitative data, including non-pharmacists who were not members of the research team, to limit the effects of researcher bias and to further strengthen the trustworthiness of the themes that were identified in the study.

The most significant example of triangulation of the findings was apparent when several consistent themes were identified (by multiple data analysts) across different stakeholder interview groups.  Three of the seven final themes were common across all three stakeholder group interviews, which included: service delivery; high levels of satisfaction and support; and benefits of the program to the patients.  Two additional themes were consistent between the physician and MAC staff interviews (benefits of the program to HCPs, and service promotion).  Considering that five of the seven themes were confirmed across more than one stakeholder group, the data from the interviews is likely quite credible and trustworthy.

Triangulation of results was also noted between the qualitative and quantitative data.  For example, MAC interviewees stated that communication with physicians was strong and that requests for additional patient information from the family doctor's medical chart were typically granted without delay.  This was confirmed by the document review, which found that only 5.7% of patient referrals lacked adequate information from the physician to complete the assessment.  In addition, all three-stakeholder groups described the benefits that patients received from the MAC program, primarily as a result of optimized medication regimens and improved health status.  This qualitative finding was also confirmed by the document review, which found that MAC pharmacists identified, on average, more than five DTPs during each medication assessment.  In another example of triangulation, both physicians and MAC staff noted that the

program required an expanded promotional plan to be successful in the future, which is consistent with the document review data that found evidence of very limited and sporadic promotional activities during the 17 months of the pilot project.

Consequently, the consistency of the findings across multiple data sources and data analysts suggests that the results of this study are trustworthy and credible.

5.1.2 MAC Program Objectives

One of the four research questions that this study aimed to answer was to identify the specific MAC program objectives and to assess if these objectives were achieved. As identified in Section 4.1.1.2, the MAC program objectives were identified to be:

1. To generate a consistent flow of referrals to occupy a pharmacist for two days per week (including research, documentation, and other related service activities)
   o Goal: To receive four new referrals per week, and perform four follow-up appointments per week.
2. To promote the service to physicians (and eventually patients)
3. To improve medication-related short-term outcomes for patients, as evidenced by:
   o The number of DTPs identified and resolved per patient referred
   o Description the types of DTPs identified by the pharmacist

The results of this study suggest that the first MAC program objective was not successfully achieved. Over the 17-month evaluation period in which MAC was operational (September 2011 to February 2013), only 53 new patient referrals were received. If MAC were to have met its first objective, it would have needed to receive approximately 292 referrals (73 weeks of service x 4 new referrals per week).

There are two possible explanations for why MAC did not achieve this first objective. First, the findings suggest that the MAC program may have been inadequately promoted to both physicians and the general public, possibly resulting in a limited awareness of the program. The program evaluation found that promotional activities that focused on physicians were frequent and multi-faceted during the initial launch of the program, but were essentially non-existent by the end of the pilot. Similarly, the program evaluation found that although MAC staff had planned to promote the service directly to the general public, no evidence of patient-focused

promotional activities were identified in the evaluation. This is supported by the fact that physician and MAC staff interviewees provided clear and consistent feedback that MAC could have been promoted better.

Additional data that support the theory that the MAC program did not achieve its first objective because of poor program promotion came from the physician interviewees who indicated that while they were supportive of the program and satisfied with the service, often forgot to refer many patients who likely would have benefitted. They emphasized the fact that they would have appreciated a reminder to help cue them to refer more patients to the service.

An alternate explanation for the low referral numbers is a possible lack of support for, or dissatisfaction with, the MAC service amongst the large group of stakeholders who did not participate in the stakeholder interviews. The interviews excluded physicians who did not refer patients to the MAC service, and only 23 of the more than 250 family physicians in Saskatoon referred a patient to the service. Consequently, it is plausible that the positive responses from the physicians who were selected for interviews do not represent the views of the majority of physicians in Saskatoon, who may have been unsupportive of the service. In addition, patients who declined the service or did not attend all of their appointments, were excluded from the study, which also may have systematically eliminated individuals who may not have been satisfied with or supportive of the service.

The small number of stakeholder interviews that were performed further raises suspicion that a representative sample of viewpoints may not have been collected and that the low referral numbers could be explained by a lack of support for, or dissatisfaction with, the MAC service amongst the large group of stakeholders who did not participate in the stakeholder interviews. Although the interviews were continued until data saturation was observed, which is a commonly utilized and accepted methodology utilized in program evaluation research, a very small number of interviews were ultimately completed (five physicians interviews and nine patient interviews), raising the possibility that the interviews failed to include the views of those who were dissatisfied with their MAC service experience, but who were not interested in volunteering for an interview.

The finding that 56.6% of physicians who referred to MAC only referred a single patient provides additional support to the possibility that some physicians might not have been happy with the program and consequently did not refer multiple patients. Unfortunately, since the

interviews were blinded, it is not possible to determine if the five physicians who participated in the study interviews (and who were very satisfied with and supportive of MAC) were those who referred a single patient or multiple patients. Consequently, it is not possible to confirm from the results of this study if there was a large number of stakeholders who were dissatisfied with, or not supportive of the program, which resulted in referral rates that did not meet MAC targets.

The results of this study suggest that the second MAC program objective, which focused on promotion of the MAC service, was also not successfully achieved. Physician-focused promotion was found to be frequent and multi-faceted during the initial months of the pilot, but by the end it was very sporadic. In addition, there was no evidence that promotion directed toward patients or other HCPs was performed. Both physician and MAC staff interviewees also consistently remarked about the inadequate promotional plan and the need for improvement in this area.

For the final MAC program objective associated with medication-related short-term outcomes, the results of this study suggest that it was successfully achieved, at least for the 42 patients for whom an assessment was completed. This conclusion can be made based on the high number of DTPs identified per patient (i.e., mean of 5.1) along with the data collected from the stakeholder interviews in which all three stakeholder groups consistently discussed the positive impact that the MAC program had on patient health outcomes.

5.1.3 Insight Into the Independent Consultant Pharmacist Model

Despite the fact that not all of the MAC program objectives were met at the end of the pilot project, the results of this study suggest that the independent consultant pharmacist service delivery model for providing CMM, which was utilized by the MAC program, has potential to be utilized as a new service delivery model (in addition to community pharmacies and primary health care teams) to provide CMM services in the primary health care system (PHCS). This conclusion is made based on the following findings from the study: (1) the MAC service received on-going patient referrals throughout the duration of the pilot (albeit a small number) from multiple different sources, despite a lack of a coordinated and consistent promotional plan; (2) the assessments performed by the MAC pharmacists resulted in a large number of DTPs being identified in patients attending the MAC program; (3) very few patients who were referred to MAC declined the service (5.7%) or did not attend their appointments (9.4%); and, (4) the

consistently positive comments from all stakeholders who experienced the service, including the MAC staff.

5.1.4  MAC Program Strengths

The results of the program evaluation allow for some conclusions to be drawn regarding strengths of the MAC program.  These include: an accessible service location; a strong patient care process; effective communication with physicians; a collaborative approach to patient care; and skilled pharmacists who received a high level of support and mentorship.  These program attributes are discussed in more detail below.

*Location*

An accessible office that is centrally located, provides free and accessible parking, and is easy to get to by car or public transportation was a definite strength of the MAC program.  While location and parking may initially seem to be trivial aspects of a health care service, the location of the MAC program, and the fact that it offered free parking that was very close to the appointment room, were mentioned consistently by all three stakeholder groups, indicating that it is an attribute of a service that stakeholders greatly valued.

*Strong Patient Care Process*

The data from the document review found that the MAC program trained its pharmacists to utilize a structured and consistent approach to their patient care process.  Over the course of the two to three standardized patient encounters, the pharmacists collected a detailed medication history from the patient, in addition to an in-depth discussion regarding the patient's current medical conditions.  After the initial patient appointment(s), the MAC pharmacist often requested additional information from the patient's physician in order to complete his or her assessment.  This was followed by a discussion with the patient related to the pharmacist's recommendations and eventual referral back the physician to implement the recommendations.  The results of the stakeholder interviews suggest that this clearly defined patient care process was a key strength of the MAC program.  The MAC staff also commented on how they valued the fact that the patient care process was standardized and clearly defined for them.  They felt that this standardization ensured that the MAC pharmacists provided a consistent level of service

and ensured that they did not miss gathering any key patient information during the assessments. This likely contributed to physician stakeholders' comments in which they noted that patient assessments were thorough and resulted in practical, solution-focused recommendations.

Overall, it is clear based on the results of this study, that the MAC program's standardized patient care process was a strength of the program.

*Communication with Physicians*

The data from the stakeholder interviews found that communication between the physicians and the MAC pharmacists was both effective and timely. The physicians felt that communications with the MAC staff were effective based largely on how the recommendations were presented to them. The recommendations were described as being well organized and presented in an efficient manner allowing the physicians to easily follow and implement them. The physician stakeholders specifically noted this to be a strength of the program. They also mentioned that contacting the MAC staff when necessary was not a problem.

The MAC staff interviews also revealed some insight into their perspectives related to communicating with physicians. The pharmacists indicated that the written form of communication (i.e., consult letters) allowed for the logical organization of their recommendations. They also reported experiencing a prompt response from physicians when requesting additional patient information (a finding which was confirmed by the document review data).

Consequently, effective communications between the MAC pharmacists and physicians was another strength of the MAC program.

*Collaborative Approach to Patient Care*

The MAC program utilized a collaborative approach in the delivery of CMM services. The collaboration involved the MAC staff, the physician, and the patient in the problem-solving process to help foster support and understanding from all parties involved. The physician interviewees stated that the MAC program supported a collaborative approach to patient care by involving both patients and physicians in shared decision-making related to drug therapy, supporting this conclusion. Both the patient interviewees and MAC staff also commented on the

usefulness of this collaborative approach.  This collaborative approach was an additional strength of the MAC program.

*Skilled Pharmacists who Received a High Level of Support and Mentorship*

The results of the evaluation of the program indicate that the MAC pharmacists were skilled in the delivery of CMM services.  Comments from both patient and physician stakeholder interviews consistently support this fact by highlighting both the strong interpersonal skills, as well as the proficient professional skills of the MAC pharmacists.  The document review revealed that both MAC pharmacists had additional training above and beyond minimum Canadian entry to practice pharmacist credentials (one had completed a hospital pharmacy residency and the other had completed the ADAPT Certificate Program in Patient Care Skills).  This was not a coincidence as the document review also found that the *MAC Policy and Procedure Manual* mandated that staff pharmacists have advanced skills and qualifications including: residency training or ADAPT certification; comprehensive medication management experience; and ideally an advanced degree, such as a Pharm D or MSc, or equivalent clinical practice experience.

In addition to extra training, the MAC staff interviews also revealed that the mentorship and support system utilized by the program was considered important for the pharmacist's performance and was attributed to MAC's success in delivering CMM services.  The program director (who is a nationally recognized as an expert in the area of CMM services in primary care) provided regular support and mentorship to the MAC pharmacists.  In addition, the MAC staff interviews revealed that the entire MAC team met regularly to discuss challenging patient cases and complex clinical dilemmas, integrating a peer support program into the daily activities of the pharmacists.

The results of this study suggest that the individual skills and performance of the pharmacists who provided the CMM service was a strength of the MAC program.

5.1.5  Opportunities for MAC Program Improvement

It is also important, for future MAC program delivery and for others who may want to replicate the program, to identify opportunities for improvement.  Some areas for program improvement that were identified in this study include: the need for administrative support;

securing dedicated office space; obtaining effective documentation tools; a strong program promotion plan; the need for more patient referrals; and the development of an on-going program evaluation process. These opportunities for improvements are discussed in detail below.

*Need for Administrative Support*

The MAC staff indicated that the lack of administrative support made it difficult to book patient appointments, coordinate communications with patients (e.g., to answer patient questions that arose outside of scheduled appointments), and schedule patient follow-up. To overcome this challenge, it was suggested by the interviewees that administrative support be provided to improve these aspects of the program and to help the pharmacists focus on their primary role, patient care.

*Dedicated Office Space*

The MAC staff indicated that a dedicated service delivery location would be ideal. The MAC staff used a shared public space throughout the pilot, which led to various challenges including reserving the space, repeatedly setting up the room with tables and chairs, and an inability to permanently alter the room to make it more comfortable and welcoming to patients. The interviewees suggested that a dedicated office space would overcome all these barriers, as well as eliminate the time the pharmacists spent travelling to and from the service location. Despite not having an "ideal" service delivery space (according to MAC staff), patients did not complain about the physical space in which their appointments were held (other than the fact that more signage was needed to help them find the office) and they reported a high level of overall satisfaction with the program, indicating that the physical and cosmetic appeal of the space was not a major factor for patients, and that location and parking were of highest value.

The lack of dedicated office space also led to some logistical challenges encountered by the MAC staff throughout the pilot. Since two part-time pharmacists delivered services one day per week, the coordination of shared equipment was a challenge (this included exchanging items such as the laptop and BpTRU$^©$ machine). A dedicated office space would eliminate this challenge and equipment would no longer have to be transported to the service location. This would further increase the efficiency of the service.

Consequently, finding and utilizing dedicated office space for the MAC program would improve the job satisfaction and efficiency of the MAC pharmacists, suggesting that it is an opportunity for improving the program.

*Effective Documentation Tools*

The MAC pharmacists commented that it would be valuable to identify a secure patient appointment scheduling system (other than Google Calendar), in addition to a user-friendly electric medical record (to allow the MAC pharmacists to efficiently document during patient encounters). Documentation is vital in any health care service to track patient encounters, eliminate duplication of efforts, and allow HCPs to follow-up with patients appropriately and effectively. Therefore, this is a key opportunity to improve the MAC program.

*Improved Program Promotion*

Physician interviewees specifically mentioned using a promotional brochure to support program promotion. The MAC program did send a brochure to patients upon the booking of their first MAC appointment, but physicians were not made aware of this. Also, physicians were sent a promotional letter explaining the MAC program, but did not specifically mention this during their interviews. This finding supports the need for improved and on-going promotion to multiple stakeholder groups. Physicians also indicated that they simply forgot to refer patients to the program, which also supports the need for on-going promotion of the program. Improving physician-focused promotional activities, and expanding promotional efforts to patients and other HCPs are important areas of opportunity to increase the awareness of the MAC program.

*Increased Referral Rates*

If MAC is to continue beyond a pilot project and be successful, it must address the issue of low patient referral rates. A recommendation provided by physicians to help increase new patient referrals to the program was to have community pharmacists identify patients who may benefit from the MAC program based on pre-defined criteria. Community pharmacists were not a focus of promotional efforts during the MAC program pilot. This group of HCPs would be an ideal target to which to promote the program to help increase awareness and as a result, potentially increase patient referrals.

During the MAC staff interviews, the staff specifically noted the problem of low patient referral rates. The MAC staff desired more referrals and felt that the low numbers of referrals were a result of limited promotion. This correlated with statements made by physicians, who recommended more promotion of the service to increase the awareness of the program. Similar to the physician interviewees, the MAC staff suggested that promotional activities be targeted toward other HCPs beyond physicians, and that the program be promoted directly to patients in an effort to increase the number of patient referrals.

It is beyond the scope of the results of this study to draw definitive conclusions regarding exactly why MAC patient referrals were low or how patient referral rates can be increased; however, increasing the number of patient referrals received by the MAC program is a key issue that must be addressed for future program improvement and sustainability.

*On-going Program Evaluation Process*

The MAC staff felt that the pilot program lacked a formal satisfaction survey or program evaluation process that would facilitate the opportunity to regularly identify program strengths and opportunities for improvement. It was suggested that it would be particularly valuable to obtain regular feedback about the program from key stakeholders such as physicians and patients. Ensuring that there is a process in place to allow for stakeholder feedback related to the program and its services would allow for continual program improvement so that it could better meet the needs of its stakeholders, suggesting that it is an opportunity for improving the program that is worthy of consideration.

## 5.1.6  Relevance and Significance

The evaluation of this independent consultant pharmacist-delivered CMM service provides insight into the feasibility of this additional CMM service delivery model, which has not been previously evaluated anywhere in the world. The results of this evaluation may be used for health service delivery decision-making within primary health systems to expand the availability of pharmacist-delivered CMM services.

## 5.2  Study Limitations
## 5.2.1  Lack of Critical or Negative Viewpoints

The consistent and positive responses about the MAC program that were received from all three stakeholder groups may not have provided a comprehensive understanding of the challenges related to the program and the comprehensive identification of opportunities for improvement. While it is likely gratifying for MAC staff to determine that the program was well-received and valued by its stakeholders, an expanded understanding of the program's potential drawbacks, would be equally useful from a quality improvement perspective.

The stakeholder interviews produced such overall positive feedback, that it raises the possibility that the interview guides (developed by the investigator and her academic supervisor) may have biased responses toward the positive, and that the sampling strategy excluded those who had negative or critical opinions. The lack of critical or negative viewpoints may in part be explained by a combination of the design of the interview guides, as well as the effects of the study's inclusion criteria and/or by volunteer bias.

The investigator and her academic supervisor designed the interview guides since no guide designed to evaluate a consultant pharmacist-delivered CMM service was identified in the literature. The investigator also acted as a MAC pharmacist, and her academic supervisor was the MAC Program Director. Based on the involvement of these two individuals in the delivery of the MAC program, it is possible that their biases toward a desire for a successful program could have entered into the interview guides.

Of the 53 patients referred to the MAC program, 42 were eligible for a stakeholder interview based on the study inclusion criteria, which stated that only patients who had experienced the entire program service and attended all of their appointments were eligible for an interview (consequently 20.8% of patients [11/53] were not eligible for an interview). Considering that eight of the eleven patients who were not eligible were excluded because they either declined participation in the program or did not attend all their appointments, it is possible that some of the patients ineligible for an interview might not have been supportive of the program or had negative initial experiences.

Another consideration is that a small number of Saskatoon physicians referred patients to the MAC program (only 23 of the approximately 250 family physicians working in Saskatoon at the time of the pilot project). As a result of the low number of individual physicians referring to the service, the vast majority of physicians were excluded based on their lack of referrals.

In addition, a relatively small proportion of individuals in each group were ultimately interviewed (five of the 23 referring physicians and nine of the 53 referred patients). This raises the possibility that volunteer bias may also have affected the results. Volunteer bias refers to a specific bias that can occur when the individuals who volunteer to participate in a research project are different in some way from the general population.[69] If this occurs, the researcher has sampled only a subset of the population, and consequently, the data gathered are not representative of all people, merely of those that choose to volunteer.[69] Although both physician and patient interviews in this study were continued until data saturation was observed by multiple researchers, which is a very common approach used in qualitative research, it is possible that the limited number of interviews may have excluded individuals who were negative or unsupportive towards the MAC program.

Future program evaluations should proactively attempt to collect more information about opportunities for improvement. This could be achieved by either specifically asking stakeholders more detailed questions about program inadequacies, or by seeking out the viewpoints of stakeholders more likely to have negative experiences (e.g., patients who did not attend all of their appointments; physicians who referred only one patient or who did not refer at all).

## 5.2.2 Unblinded MAC Staff Interviews

Due to the small number of MAC staff interviews (two pharmacists and the program director), it was not possible to blind or anonymize the data. Consequently, the two pharmacist interviewees were aware that their responses would not be anonymous and that the program director (i.e., their boss) would eventually read the collated themes that emerged from their responses. Consequently, it is possible that some negative comments or experiences may not have been shared during these interviews, especially those regarding the performance of the director.

## 5.2.3 Researcher Bias

Since the investigator of this study was also a MAC pharmacist, there was potential for the personal biases of the researcher to enter into results of the study, as well as the data analysis. Since the program evaluation was intended to examine the activities of the MAC program, and

consequently the role of the investigator in her position as a pharmacist for the MAC program, there was a possibility that the investigator's bias would lead her to seek out findings that resulted in a positive perspective related to the MAC program and the role of the pharmacists within that program. The steps taken to minimize this potential researcher bias were previously described in detail in Section 3.4 entitled *Researcher's Story*.

## 5.2.4  Limitations of Using Drug Therapy Problems (DTPs) as an Endpoint

It is difficult to interpret the meaning of the number and types of DTPs identified by pharmacists during the medication assessments in this study, as well as their significance related to patient health outcomes. It would have been preferable to measure the impact of the program on patient health outcomes using endpoints such as adverse drug reaction rates, emergency department visits, drug related hospitalizations or even indices of chronic disease management control (e.g., blood pressure, cholesterol); however, measuring these outcomes was beyond the scope of this research project. It may have also been helpful to collect data regarding the seriousness or severity of the DTPs that were identified, but a validated scale for defining DTP severity in a primary care setting does not exist. Finally, collecting information regarding whether or not each DTP was ultimately resolved would have also provided additional insight into the impact of the program on patient health outcomes, but the scope of the research project did not allow for an extended data collection period.

## 5.2.5  Generalizability of the Results

The first factor that may limit generalizability of the results of this program evaluation is that the MAC program interacted with patients who may have been more complex than those in the typical Canadian primary care population, based on their advanced age (mean of 71 years), their high number of medications (mean of 13.3 medications per patient), and their number of health conditions or diagnoses at the time of the first appointment (mean of 9.2 per patient). Recent Canadian data indicates that in 2012, seniors (those aged 65 or older) were taking an average of 7.4 medications each.[70] In Saskatchewan, only 17% of seniors were taking ten to 14 medications, and only 5.9% were taking 15 or more medications.[70] Therefore, it appears that MAC patients were taking more medications than the average Canadian senior, thus would have more complex medication regimens, and therefore may not be exactly representative of a

"typical" patient population.  Consequently, it is unclear how the results of this program evaluation might apply to a less complex group of patients.

Another consideration related to the generalizability of the findings is that the MAC staff pharmacists do likely not represent a typical Canadian pharmacist.  The MAC pharmacists both had advanced training (e.g., one pharmacist had an acute care pharmacy residency and the other had completed the ADAPT certificate program in patient care skills) that many pharmacists in the primary care system do not have.  In addition, the MAC pharmacists worked in an environment in which they had regular support and mentorship from an expert in the area (i.e., the program director) and other pharmacist colleagues.  Consequently, it is unclear if the results of this evaluation would be generalizable to pharmacists without additional training and to those practicing in a setting without significant mentorship and support.

5.3 Future Research Opportunities

A few key opportunities for further research were identified that would be worthwhile to pursue.  The first opportunity would be to increase physician-focused promotion and evaluate if these increased efforts resulted in increased physician referrals.  In addition, determining an effective way to remind physicians to refer patients to the service could have a significant impact on the number of referrals the physicians may generate.

Another opportunity for future research is to proactively collect more information about critical viewpoints and opportunities for program improvement through a study re-design.  This could be achieved by either specifically asking stakeholders more detailed questions about program inadequacies, or by seeking out the viewpoints of stakeholders most likely to have negative experiences (e.g., patients who did not attend all of their appointments; physicians who referred only one patient or who did not refer at all).  Surveying non-referring physicians to determine why they have not referred may also be useful research to pursue.  Determining if it is due to the fact that they are unaware of the service, if they do not value the service, or if their patients decline referral when the physician mentions it to them, would provide great insight into increasing referrals in the future.  This will ensure that the overwhelmingly positive and supportive feedback collected during the stakeholder interviews are consistent with a larger sample of physicians and will determine if there are aspects of the program that need to be adjusted to appeal to a larger group of stakeholders.

Specific to CMM service delivery, it would be valuable to explore if patient assessments need to performed in-person in order to be effective and successful. It would be useful to determine if patient assessments can be offered remotely (e.g., by telephone or video conference), and produce the same levels of quality and stakeholder satisfaction. If it is found that CMM services which are offered remotely are just as successful as those offered face-to-face, this would significantly increase access to CMM services for individuals not living within proximity of a CMM program.

This study did not evaluate the cost effectiveness of this consultant model of delivering CMM in the PHCS, particularly in comparison with other models of delivering CMM (e.g., community pharmacies, PHCTs). Therefore, a detailed economic evaluation would be useful for future research projects.

Finally, future research could focus on measuring the impact of the program on patient health outcomes such as ADR rates, emergency department visits or drug related hospitalizations.

# Chapter 6
## Conclusion

The results of this study suggest the independent consultant pharmacist model for the provision of CMM services has potential to be utilized as a new service delivery model (in addition to community pharmacies and primary health care teams) to provide CMM services in the primary health care system (PHCS).  The study findings have identified several strengths and opportunities for improvement, which may be useful for future attempts at implementing the CMM service model.

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**APPENDICES**

## MAC Patients Interview Guide

**Expected duration of interview: 10 to 15 minutes**

**<u>Interview Questions for MAC Patients:</u>**

Thinking about your experience with MAC…..

How did you find out about the service?

- Were you referred by your physician? Hear about it from a friend?

If your physician referred you, did he/she explain the service to you?

- If not, would it have helped to know more about the service prior to your first appointment?

What do you think worked well or not well in terms of:

a. How appointments were booked?
   i. Did you receive an informational pamphlet about the service in the mail prior to your appointment? What did you think about this pamphlet?

b. Where the service was delivered?
   i. Did you find the location convenient? Easy to find? Parking? Accessibility?

c. The number of appointments you had to attend?

d. The length of the appointment?
   i. Too long? Too short?

e. The times of the appointment(s)?
   i. Did you meet with the pharmacist in the day or evening? Did this work for you?
   ii. How long was it from the time you had initial contact/referral to your first appointment? If delayed, what was the reason? You couldn't make it work with your schedule? Or no appointments were available?

f. The accessibility of the MAC team?
   i. Did you try to contact the MAC pharmacists outside of appointments? Was this easy?

g. Did you find the service valuable?
    i. Do you think this service resulted in an improvement in your medications?
    ii. Do you think this service resulted in an improvement of an understanding of your medications?

h. How were you treated?
    i. Did you find the whole process overwhelming?  Do you feel you were involved in the decision-making?


Are there any other areas that you thought worked well or not well?


Would you recommend this service to others? Why or why not?


Did you speak to your doctor about your appointment afterwards?


How likely would you be to continue to see a MAC pharmacist on an as-needed basis?


Do you have any other comments about the service you received?

**Appendix B**

**Physicians Interview Guide**

**Expected duration of interview: 5 to 10 minutes**

**Interview Questions for physicians who have referred to MAC:**

Thinking about your experience with MAC…..

How did you find out about the service?

- From a colleague?  At a continuing education event?  An in-office presentation?

When you referred your patient(s) to the service, did you explain to them what they might expect?

- What could MAC provide you with that would help explain the service to your patients?

What do you think worked well or not well in terms of:

a. The recommendations that you received from the MAC pharmacist?
    ii. Were they received in a reasonable timeframe?
    iii. Did you find the recommendations to be useful and practical?
        - Were you able to implement the recommendations?

b. How the service affected your patient's medications?

c. How the service affected your patients understanding of his/her medications?

d. Accessibility of the MAC pharmacists
    i. Did you try to contact the MAC pharmacists, and if so, did you encounter any difficulties?
    ii. Did you receive a timely response?

e. Are there any other areas that you thought worked well or not well?

What discussions, if any, occurred between you and your patient about the MAC appointment? In general, what was discussed?

Are you aware of any follow-up that your patient received from the MAC pharmacists?  If so, what was your reaction to this follow-up?


What is the likelihood of you continuing to refer patients to this service?


In your view, should this service be continued, discontinued or revised?


Do you have any other comments about the service?

**Appendix C**

**MAC Staff Interview Guide**

**Interview Questions:**

**1. Physician Communication**

In answering the questions below, think about the various aspects of pharmacist-to-physician communication that occurred through the delivery of the MAC services. For example, communicating your recommendations to the physician; getting the necessary information from physicians (either from the referral or on request) - did physicians send enough information with the initial referral form, or did you often have to request further information? Did you ever request information and not receive it?

**Tell me about your experience communicating with physicians, whether it was via fax or phone.**

**What about your experience communicating with physicians do you think worked well?**

**What were some of the challenges you encountered in communicating with physicians?**

**What would you do to improve pharmacist-to-physician communication?**

**2. MAC Pharmacist Team Communication**

In answering the questions below, think about the various aspects of MAC pharmacist-to-MAC pharmacist communication within the MAC team that occurred through the delivery of the MAC services. For example, communication regarding whether an appointment had been booked; discussing difficult patient cases, etc.

**Tell me about your experience communicating with other MAC pharmacists.**

**What about your experience communicating with other pharmacists within the MAC team do you think worked well?**

**What were some of the challenges you encountered in communicating with your team?**

**What would you do to improve MAC pharmacist-to-MAC pharmacist communication?**

### 3. Patient Communication

In answering the questions below, think about the various aspects of MAC pharmacist-to-patient communication that occurred through the delivery of the MAC services. For example, booking appointments; follow-up phone calls; in-person appointments; the cancellation of an appointment; discussing your recommendations; gathering necessary patient information from the patient; etc.

**Tell me about your experience communicating with patients.**

**What about your experience communicating with patients do you think worked well?**

**What were some of the challenges you encountered in communicating with your patients?**

**What would you do to improve MAC pharmacist-to-patient communication?**

### 4. Patient Referrals & Drug Therapy Problems

**In terms of the patients who were referred to MAC (either by physicians, other HCPs, or self-referrals), do you think that the right patients were being referred to the service (i.e. did these patients require a medication assessment)?**

**Do you think that patients who were referred to MAC benefited form the service?**

**Was there any particular type of drug therapy problem that you noticed occurred most frequently? Was there any particular drug therapy problem that you think had the greatest impact on patients when it was corrected?**

**Do you feel that you were able to adequately address patient drug therapy problems?**

**5. Communication with Other Healthcare Providers (HCPs)**

In answering the questions below, think about the various aspects of MAC pharmacist-to-other HCP communication that occurred through the delivery of the MAC services. For example, communicating with home care – did you receive enough information from their referral? Communicating with community pharmacists - did they provide you with any further insight or information related to the patient who was referred to MAC?

**Tell me about your experience communicating with other healthcare providers (e.g. community pharmacists, home care staff).**

**What about your experience communicating with other HCPs do you think worked well?**

**What were some of the challenges you encountered in communicating with other HCPs?**

**What would you do to improve communication with other HCPs?**

**6. The Resources Used/Required to Deliver MAC Services**

In answering the questions below, think about the various resources used to deliver MAC services. For example:

- o The MAC referral form used by physicians - did it provide the information required? Would you add or delete anything?
- o The patient brochure – did you find it valuable?
- o The use of Google calendar to coordinate appointments with both patient and pharmacist availability.
- o The space in which the service was delivered (i.e. the Co-op Community Room) - was it comfortable? Accessible? Private? Was it an appropriate space for service delivery?
- o Other resources available to you to deliver MAC services (e.g. EMR, laptop, cellphone, internet stick, printer, BPTru, extension cord, electronic resources, fax machine, shredder)

**Tell me about your experience with MAC resources (e.g. the referral form, the patient brochure, Google calendar, the Co-op Community Room, the EMR, the laptop, the cellphone, the internet stick, the printer, the BPTru machine, the extension cord, any electronic resources, fax machine, shredder, etc.).**

**In your experience with the above resources what do you think worked well or was integral in service delivery?**

**What were some of the challenges you encountered with the above resources? Would you say that any particular resource that you had access to was not required or necessary?**

**What resources would you add to MAC services to improve the service?**

**7. MAC Service Delivery – The Process of Providing a Medication Assessment Service**

In answering the questions below, think about the process used to deliver MAC services. For example:

- o Contacting patients for their initial appointments – were patients easy to contact or get a hold of? Were they expecting a call? Did you have to explain the service?
- o The appointment format - do you agree with the "defined MAC appointment format"? Were you able to follow it? How would you change it? Was follow-up easy or difficult?
- o Documentation – what is the best way to document (e.g. Assurance, your own forms, on paper)? Was it difficult to document during the encounter/follow-up phone calls?
- o Drug therapy problems – identifying problems, finding solutions, and prioritizing problems – was it easy or difficult? How did you prioritize?
- o Consult notes to the physician – did you use the SOAP format?

**Tell me about your experience with the MAC service delivery process (e.g. contacting patients, the appointment format, documenting, identifying and addressing drug therapy problems, writing consult notes to physicians, etc.).**

**What about your experience delivering MAC services do you think worked well or were integral in service delivery?**

**What were some of the challenges you encountered with the above process? Would you say that any particular process or step in service delivery was not required or necessary?**

**What other processes would you add to MAC services to improve the service?**

**8. Perceived Service Value**

**How do you think the MAC service most affected patients?  What about physicians?**

**If given the opportunity to offer this service full-time, would you?  Did you enjoy the job?  Why or why not?  What was the best part?  What was the most difficult part?**

**9. Service Promotion**

In answering the questions below, think about the various aspects of how MAC services were promoted to key stakeholders.  For example:

- o Conference booths – were they worthwhile (in terms of your time, the cost, the ability to discuss the service with others)?  Do you feel it generated interest and/or referrals?
- o Mail outs – do you think they were worthwhile (in terms to the cost and time required to prepare a mail out)?  Do you feel it generated interest and/or referrals?
- o Physician meetings – were they worthwhile to attend?  Do you feel it generated interest and/or referrals?
- o In-office physician detail sessions – were they worthwhile?  Do you feel it generated interest and/or referrals?

**Tell me about your experience promoting MAC services (e.g. conference booths, mail outs, attending physician meetings, in-office detail sessions, etc.).**

**What about your experience promoting MAC services do you think worked well or were integral to increasing awareness of the service and possibly result in increased referrals?**

**What were some of the challenges you encountered with service promotion?  Would you say that any particular "promotional tool" that was not useful or worth repeating?**

**What would you recommend that MAC should do to promote the service that wasn't done?**

**Appendix D**

**Patient Invitation to Participate Script**

Hello – May I speak with Mrs./Miss. [last name].

This is [interviewer name] calling from the University of Saskatchewan, College of Pharmacy and Nutrition. I am calling regarding your recent experiences with a program within our College called Medication Assessment Consultants or MAC. I am working with a research team whose purpose is to evaluate the MAC service. I am calling to see if you would be willing to participate in a 10 to 15 minute phone interview about the service.

If you agree to participate, you will be compensated with a $20 gift card for the Co-op.

You should be aware that there are no known or anticipated risks to you by participating in this research, and the possible benefits of the study, while not guaranteed, include contributing to the state of knowledge of such pharmacist-delivered services as MAC.

Would you be interested in participating? If now is not a good time for you, we can arrange a time and date that is convenient for you.

*If the answer is "No." Thank them for their time.*

*If the answer is "Yes, but now is not a good time," arrange for an agreed upon time and date to call back.*

*If the answer is "Yes and now is a good time," continue on with the script.*

The purpose of this interview is to collect feedback and gain a patient-perspective on the Medication Assessment Consultants (or MAC) service. The questions are designed to help identify areas of the service that work well and should remain the same, as well as to identify areas that could be improved or changed. You will be asked to answer several short questions. Your responses will be recorded and transcribed.

All identifiers will be removed from the transcribed interviews. Your physician and MAC pharmacist will only receive de-identified information. This means they will not be able to connect or identify your responses with your identity.

Please know that you may stop the interview at any time should you not wish to continue. You may refuse to answer any question in whole or in part.

If at any point you would like some clarification, please ask.

Do you have any questions or concerns before I begin?

Before I start with the questions, I would like to confirm your mailing address so that I may mail you more detailed information about the study along with the contact information for the researchers in the event you may have any questions in the future, or wish to withdraw from the study.  I will also use this address to send you the gift card as compensation for your participation.

Mailing Address:

_____

_____

_____

_____

ORAL CONSENT

*Note to interviewer:*

*Please date and sign below indicating that you have read and explained this information to the participant before receiving the participant's consent, and the participant had knowledge of its contents and appeared to understand it.*

*Please record the consent along with the interview.*

_____     _____     _____
*Name of Participant*                         *Researcher's Signature*                    *Date*

# Appendix E

## Physician Invitation to Participate Script

Hello, this is [interviewer name] calling from the University of Saskatchewan, College of Pharmacy and Nutrition. I am calling to speak with Dr. [last name]. Dr [last name] has referred patients to our service, and I would like to speak to him/her about those referrals. Could you please have him/her return my call at his/her earliest convenience. I had sent a fax to the Dr about this earlier today/yesterday/this week (*will have to confirm when fax is sent*).

*May have to improvise here to get the receptionists to put your through to the physicians*

*Then when you get to speak with the Dr.:*

Hi Dr. [last name], I am calling regarding your recent experiences with a program within our College called Medication Assessment Consultants or MAC. I am working with a research team whose purpose is to evaluate the MAC service. I am calling to see if you would be willing to participate in a 5 to 10 minute phone interview about the service.

If you agree to participate, you will be compensated with a $20 gift card for the Co-op.

You should be aware that there are no known or anticipated risks to you by participating in this research, and the possible benefits of the study, while not guaranteed, include contributing to the state of knowledge of such pharmacist-delivered services as MAC.

Would you be interested in participating? If now is not a good time for you, we can arrange a time and date that is convenient for you.

*If the answer is "No." Thank them for their time.*

*If the answer is "Yes, but now is not a good time," arrange for an agreed upon time and date to call back.*

*If the answer is "Yes and now is a good time," continue on with the script.*

The purpose of this interview is to collect feedback and gain a physician-perspective on the Medication Assessment Consultants (or MAC) service. The questions are designed to help identify areas of the service that work well and should remain the same, as well as to identify areas that could be improved or changed. You will be asked to answer several short questions. Your responses will be recorded and transcribed.

All identifiers will be removed from the transcribed interviews. Your patients and MAC pharmacist will only receive de-identified information. This means they will not be able to connect or identify your responses with your identity.

Please know that you may stop the interview at any time should you not wish to continue. You may refuse to answer any question in whole or in part.

If at any point you would like some clarification, please ask.

Do you have any questions or concerns before I begin?

Before I start with the questions, I would like to confirm your mailing address so that I may mail you more detailed information about the study along with the contact information for the researchers in the event you may have any questions in the future, or wish to withdraw from the study. I will also use this address to send you the gift card as compensation for your participation.


Mailing Address:

_____

_____

_____

_____


ORAL CONSENT

*Note to interviewer:*

*Please date and sign below indicating that you have read and explained this information to the participant before receiving the participant's consent, and the participant had knowledge of its contents and appeared to understand it.*


*Please record the consent along with the interview.*


| _____ | _____ | _____ |
| *Name of Participant* | *Researcher's Signature* | *Date* |

**Patient Participant Information**

**Project Title:**

Evaluation of a consultant pharmacist delivered comprehensive medication management service

**Researcher:**

Julia Bareham, BSc, BSP, MSc Candidate

Graduate Student

College of Pharmacy and Nutrition, University of Saskatchewan

Phone #: 270-0815

E-mail: julia.bareham@usask.ca

**Supervisor:**

Dr. Derek Jorgenson, BSP, PharmD

College of Pharmacy and Nutrition, University of Saskatchewan

Phone #: 966-2009

E-mail: derek.jorgenson@usask.ca

**Purpose(s) and Objective(s) of the Research:**

The purpose of this study is to evaluate a model for delivering medication reviews by pharmacists as a community-based health service. This model involves a consultant pharmacist (a pharmacist that does not work for a drug store or a hospital, but rather is an independent pharmacist) within a community pharmacy to provide medication reviews to patients. The researchers hope to identify areas of the service that work well, as well as those that could be improved or changed.

Your involvement in the study will contribute to answering the research question: What are the experiences of key program stakeholders (e.g. patients and doctors)?

## Procedures:

Participation in this study involves a one-on-one phone interview. It is expected that the interviews will not last more than 15 minutes. You will be asked to answer several open-ended questions. All interviews will be recorded and later transcribed.

It is anticipated that 10-15 participants will be included in the interview process.

Please feel free to ask any questions regarding the procedures and goals of the study or your role.

## Funded by:

The investigators have received a grant to conduct this study from the Drug Plan and Extended Benefits Branch of Saskatchewan Health. The investigators do not perceive any conflict of interest on their part or that of the grant providers.

## Potential Risks:

There are no known or anticipated risks to you by participating in this research.

## Potential Benefits:

The possible benefits of the study, while not guaranteed, include contributing to the state of knowledge of such pharmacist-delivered services as MAC. Information gathered from this research project may help inform the development of future similar services as well as contribute to the improvement of the MAC service should it continue to be funded.

## Compensation:

In order to compensate you for the cost of your inconvenience and time, you will receive an honorarium in the amount of $20.

- A $20 gift card for the Co-op will be sent directly to you via the mail.

## Confidentiality:

To safeguard the confidentiality and anonymity of your responses, your interview will be transcribed by a transcriber not otherwise involved with this research project. Your transcribed responses will not include your name or any other identifiable facts that you may reveal throughout your interview. It should also be noted that the interviewer is not involved with the delivery of MAC services. Both the interviewer and transcriber have signed confidentiality agreements.

All interview recordings and transcriptions will be kept by the researcher's academic supervisor in a locked university office, further secured within a locked filling cabinet. Any electronic files will be kept on a password-protected computer within the same office. Once five years has passed, all materials will be permanently destroyed/deleted. Data collected from the interviews will be presented in aggregate form and will not be individually identified in any reports, presentations, articles or any other form.

### **Right to Withdraw:**

Your participation is voluntary and you can answer only those questions that you are comfortable with answering. You may withdraw from the research project for any reason, at any time without explanation or penalty of any sort.

Whether you choose to participate or not will have no effect on the future care you may receive from MAC or your family doctor.

Should you wish to withdraw during the interview, you can simply tell the interviewer and the interview will immediately stop. All recording will also be immediately and permanently deleted. Should you wish to withdraw after the interview is complete, and before the data is analyzed, you will need to contact the primary researcher to inform her of your decision. Her contact information is included below this paragraph. If you withdraw after completing the interview, your interview recording will be permanently deleted and any transcripts will be permanently deleted and/or shredded.

> Primary Researcher:
>
> Julia Bareham, BSc, BSP, MSc Candidate
>
> College of Pharmacy and Nutrition, University of Saskatchewan
>
> Phone #: 270-0815
>
> E-mail: julia.bareham@usask.ca

Your right to withdraw data from the study will apply until the data has been analyzed. After this has been completed, it is possible that some form of research dissemination will have already occurred and it may not be possible to withdraw your data.

**Follow up:**

To obtain a summary of the results from the study, please contact Derek Jorgenson.

Dr. Derek Jorgenson, BSP, PharmD

College of Pharmacy and Nutrition, University of Saskatchewan

Phone #: 966-2009

E-mail: derek.jorgenson@usask.ca

**Questions or Concerns:**

If you have any questions or concerns, please contact the researcher, Julia Bareham, using the information listed directly below.

Primary Researcher:

Julia Bareham, BSc, BSP, MSc Candidate

College of Pharmacy and Nutrition, University of Saskatchewan

Phone #: 270-0815

E-mail: julia.bareham@usask.ca

This project was reviewed by the U of S Behavioural Research Ethics Board and received an exemption in November 2012. Any questions regarding your rights as a participant may be addressed to the Research Ethics Office toll free at 1-888-966-2975 or ethics.office@usask.ca.

**Physician Participant Information**

**Project Title:**

Evaluation of a consultant pharmacist delivered comprehensive medication management service

**Researcher:**

Julia Bareham, BSc, BSP, MSc Candidate

Graduate Student

College of Pharmacy and Nutrition, University of Saskatchewan

Phone #: 270-0815

E-mail: julia.bareham@usask.ca

**Supervisor:**

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Your involvement in the study will contribute to answering the research question: What are the experiences of key program stakeholders (e.g. patients and physicians)?

### Procedures:

Participation in this study involves a one-on-one phone interview. It is expected that the interviews will not last more than 10 minutes. You will be asked to answer several open-ended questions. All interviews will be recorded and later transcribed.

It is anticipated that 10-15 participants will be included in the interview process.

Please feel free to ask any questions regarding the procedures and goals of the study or your role.

### Funded by:

The investigators have received a grant to conduct this study from the Drug Plan and Extended Benefits Branch of Saskatchewan Health. The investigators do not perceive any conflict of interest on their part or that of the grant providers.

### Potential Risks:

There are no known or anticipated risks to you by participating in this research.

### Potential Benefits:

The possible benefits of the study, while not guaranteed, include contributing to the state of knowledge of such pharmacist-delivered services as MAC. Information gathered from this research project may help inform the development of future similar services as well as contribute to the improvement of the MAC service should it continue to be funded.

### Compensation:

In order to compensate you for the cost of your inconvenience and time, you will receive an honorarium in the amount of $20.

- A $20 gift card for the Co-op will be sent directly to you via the mail.

### Confidentiality:

To safeguard the confidentiality and anonymity of your responses, your interview will be transcribed by a transcriber not otherwise involved with this research project. Your transcribed responses will not include your name or any other identifiable facts that you may reveal throughout your interview. It should also be noted that the interviewer is not involved with the delivery of MAC services. Both the interviewer and transcriber have signed confidentiality agreements.

All interview recordings and transcriptions will be kept by the researcher's academic supervisor in a locked university office, further secured within a locked filling cabinet. Any electronic files will be kept on a password-protected computer within the same office. Once five years has passed, all materials will be permanently destroyed/deleted. Data collected from the interviews will be presented in aggregate form and will not be individually identified in any reports, presentations, articles or any other form.

**<u>Right to Withdraw:</u>**

Your participation is voluntary and you can answer only those questions that you are comfortable with answering. You may withdraw from the research project for any reason, at any time without explanation or penalty of any sort.

Whether you choose to participate or not will have no effect on the future services you may receive from MAC. Your patients will not be informed of your participation in the study, nor will they be informed if you decline participation.

Should you wish to withdraw during the interview, you can simply tell the interviewer and the interview will immediately stop. All recording will also be immediately and permanently deleted. Should you wish to withdraw after the interview is complete, and before the data is analyzed, you will need to contact the primary researcher to inform her of your decision. Her contact information is included below this paragraph. If you withdraw after completing the interview, your interview recording will be permanently deleted and any transcripts will be permanently deleted and/or shredded.

> Primary Researcher:
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> College of Pharmacy and Nutrition, University of Saskatchewan
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> Phone #: 270-0815
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**Follow up:**

To obtain a summary of the results from the study, please contact Derek Jorgenson.

Dr. Derek Jorgenson, BSP, PharmD

College of Pharmacy and Nutrition, University of Saskatchewan

Phone #: 966-2009

E-mail: derek.jorgenson@usask.ca

**Questions or Concerns:**

If you have any questions or concerns, please contact the researcher, Julia Bareham, using the information listed directly below.

Primary Researcher:

Julia Bareham, BSc, BSP, MSc Candidate

College of Pharmacy and Nutrition, University of Saskatchewan

Phone #: 270-0815

E-mail: julia.bareham@usask.ca

This project was reviewed by the U of S Behavioural Research Ethics Board and received an exemption in November 2012.  Any questions regarding your rights as a participant may be addressed to the Research Ethics Office toll free at 1-888-966-2975 or ethics.office@usask.ca.

## MAC Staff Participant Information

**Project Title:**

Evaluation of a consultant pharmacist delivered comprehensive medication management service

**Researcher:**

Julia Bareham, BSc, BSP, MSc Candidate

Graduate Student

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**Purpose(s) and Objective(s) of the Research:**

The purpose of this study is to evaluate a model for delivering medication reviews by pharmacists as a community-based health service. This model involves a consultant pharmacist (a pharmacist that does not work for a drug store or a hospital, but rather is an independent pharmacist) within a community pharmacy to provide medication reviews to patients. The researchers hope to identify areas of the service that work well, as well as those that could be improved or changed.

Your involvement in the study will contribute to answering the research question: What are the experiences of key program stakeholders (e.g. patients, physicians and pharmacists)?

## Procedures:

Participation in this study involves a one-on-one in-person interview. It is expected that the interviews will not last more than 60 minutes. You will be asked to answer several open-ended questions. All interviews will be recorded and later transcribed.

It is anticipated that 3 participants will be included in the interview process.

Please feel free to ask any questions regarding the procedures and goals of the study or your role.

## Funded by:

The investigators have received a grant to conduct this study from the Drug Plan and Extended Benefits Branch of Saskatchewan Health. The investigators do not perceive any conflict of interest on their part or that of the grant providers.

## Potential Risks:

There are no known or anticipated risks to you by participating in this research.

## Potential Benefits:

The possible benefits of the study, while not guaranteed, include contributing to the state of knowledge of such pharmacist-delivered services as MAC. Information gathered from this research project may help inform the development of future similar services as well as contribute to the improvement of the MAC service should it continue to be funded.

## Confidentiality:

All interview recordings and transcriptions will be kept by the researcher's academic supervisor in a locked university office, further secured within a locked filling cabinet. Any electronic files will be kept on a password-protected computer within the same office. Once five years has passed, all materials will be permanently destroyed/deleted. Data collected from the interviews will be presented in aggregate form and will not be individually identified in any reports, presentations, articles or any other form.

## Right to Withdraw:

Your participation is voluntary and you can answer only those questions that you are comfortable with answering. You may withdraw from the research project for any reason, at any time without explanation or penalty of any sort.

Whether you choose to participate or not will have no effect on future employment opportunities you may have with MAC.

Should you wish to withdraw during the interview, you can simply tell the interviewer and the interview will immediately stop. All recording will also be immediately and permanently deleted. Should you wish to withdraw after the interview is complete, and before the data is analyzed, you will need to contact the primary researcher to inform her of your decision. Her contact information is included below this paragraph. If you withdraw after completing the interview, your interview recording will be permanently deleted and any transcripts will be permanently deleted and/or shredded.

Primary Researcher:

Julia Bareham, BSc, BSP, MSc Candidate

College of Pharmacy and Nutrition, University of Saskatchewan

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        Primary Researcher:

        Julia Bareham, BSc, BSP, MSc Candidate

        College of Pharmacy and Nutrition, University of Saskatchewan

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**Instructions for Interview Transcript Analysers**

**Project Background & Instructions for Interview Transcript Analyzers**

Overview of the research project

Purpose: to perform a program evaluation to evaluate a consultant-pharmacist model for delivering comprehensive medication management (CMM) in the primary healthcare system.

The CMM service was entitled MAC (Medication Assessment Consultants). MAC positioned a consultant pharmacist within the Co-op grocery store on 8th street (in the Learning Centre room) to provide CMM services. Patients were most frequently referred to the service by their physician, but home care or CPAS also referred patients they identified as being a high risk for falls due to medications. Patients were also able to self-refer to the service. It is important to note that the consultant pharmacist was not an employee of Co-op, but was simply using the space provided by the company (at no charge).

The program evaluation of MAC aims to answer the following questions:

- What worked well with MAC?
- What didn't work well with MAC? What were some of the barriers or challenges encountered?
- What were the experiences of the key MAC stakeholders (i.e. patients, physicians & MAC staff)?
    - o Describe the patient experiences with MAC
    - o Describe the physician experiences with MAC
    - o Describe the MAC staff &/or admin experiences with MAC
- Who utilized MAC?
- Did MAC accomplish what it intended to accomplish?

The interview transcripts that you will be analyzing will help answer the first three questions only.

The MAC clinic was in operation from September 2011 to February 2013, and while referrals are still accepted today, the location and service provider has changed. Also, the evaluation is not examining referrals after the date of February 2013.

Each of the 3 stakeholder groups was interviewed using a different set of questions/interview guide (physician and patient questions were very similar however). All three interview guides have been provided to you.

The following individuals will be analyzing the following transcripts:

| Patients (9 interviews) | Physicians (5 interviews) | MAC Staff/Admin (3 interviews) |
|---|---|---|
| Jason | Jason | Jason |
| Derek | Derek | Rob |
| Julia | Julia | Julia |

As you read through the transcripts, you will be asked to identify themes that fall into 1 of 5 categories:

1. What worked well
2. What could be improved?  What challenges were identified?
3. Any suggestions for improvements.
4. Any other topics/themes that you feel are relevant, but not captured by the above 3 themes.
5. Identify any quotes that you feel capture a theme or relevant topic in a noteworthy way.  (If you think to yourself, "wow, that person said that very well", please capture/highlight that quote.)

To help you organize the transcripts into the above 5 categories, you will have 2 tools to assist you.  The first tool is a simple document that contains the category as its title (so there will be 5 documents).  As you read through the transcripts, if you identify a statement that fits into the category, you can note it within that document.  We will discuss this during our orientation in greater detail.  Your second tool will be colour coding.  As you read through the transcripts, each of the 5 categories is assigned a colour (see below) that you can use to highlight the text to make referring back to the transcripts easier when we review our findings.  You can do this the old fashion way with a highlighter and paper, or do so electronically – whichever you prefer is fine with me.  You may also jot down notes in the margins or use the 'insert comment' function to add in your thoughts or comments.

| Category | Colour |
|---|---|
| #1 – Worked well | Blue |
| #2 – Needs improvement/Challenge | Orange |
| #3 – Suggestions for improvement | Pink |
| #4 – Other relevant themes | Purple |
| #5 - Quotes | Yellow |

Where to start?

I suggest you start by simply reading through the transcripts without attempting to identify themes to ensure you have a better idea of the content of the interviews and what the responses might look like.  Once you have looked through all the transcripts for the first time, now go back and start to see if you can identify any themes within the 5 main categories.  You can take an interviewee's statement (might be several sentences) and assign it a theme within a category.  For example, if a physician said: "I really liked the referral process because I found it to be quick and easy to do", you could identify this theme as 'convenient, easy referral process' and place it under the category #1 – what worked well.

Once all three analyzers have finished analyzing a stakeholder group of transcripts, we will meet again to ensure our identified themes align/match up.  This is where highlighting the transcripts might come in handy, in case you need to refer back to an individual transcript to justify your findings.  You might also find it useful to note the source of your identified theme using both the transcript identifier and page number.  The transcript identifier is on the top left of every page, and the page number is on the bottom right.  When you note it next to your identified theme, it will look like: PT – DERE087, p.3

Jason and Derek, I request that you start with the physician transcripts since they are the shortest.

Once all three stakeholder group transcripts have been analyzed, there will be a between group comparison (versus the previous within group comparison) to see if there is any overlap between the 3 groups.

## Appendix J

## Comprehensive List of All the Documents Identified and Analysed for the Document Review

| MAC Document | Purpose of Document | Type of Information Contained in the Document |
|---|---|---|
| **MAC Promotional Materials** | | |
| MAC Patient Brochure | Mailed out to patients after their initial appointment has been booked to ensure they know when the appointment is, what to bring and what to expect. | • Appointment information (date, time, location, name of pharmacist with whom the patient will meet)<br>• MAC contact information (i.e. phone number) in the event the patient needs to cancel or change his/her appointment<br>• An explanation of what the patient should bring to the appointment<br>• An explanation of why the patient has been referred to the pharmacist |
| MAC Promotional Poster | Mailed out to family physicians in Saskatoon to inform them of the service as well as inform them that they could now refer patients to MAC. | • An explanation of the service<br>• A description of how the MAC service can benefit a physician's practice<br>• MAC contact information (phone and e-mail address) |

| MAC Document | Purpose of Document | Type of Information Contained in the Document |
| --- | --- | --- |
| **MAC Policy and Procedure Manual** | | |
| MAC Policy and Procedure Manual | An internal document designed to describe the service model in detail to MAC pharmacists. The manual allows for a consistent delivery of service. | • A description of the MAC service (what is comprehensive medication management, what are the MAC service objectives, overview of how the service is delivered, reporting structure)<br>• MAC pharmacist job description, responsibilities and qualifications<br>• Patient recruitment strategy and how the service is promoted to various stakeholder groups<br>• A detailed description of the referral process<br>• A detailed description of the patient appointment format (includes assessment, documentation, communication and follow-up)<br>• A list of resources required to deliver the service<br>• Copies of the various documents used to deliver the service<br>• Appendices contained the following sections:<br>    Referral Form<br>    MAC Patient Brochure<br>    Consent Form<br>    Medication Review Form<br>    Care Plan Form<br>    Head-to-toe Assessment Form<br>    Useful Resources |

| MAC Document | Purpose of Document | Type of Information Contained in the Document |
|---|---|---|
| **MAC Policy and Procedure Manual** | | |
| Referral Form and MAC FAQs (both documents were contained in one double-sided document) | Used both as a promotional tool and referral tool. This document was the MAC service's referral form used to refer patients to the service. It also contained frequently asked questions about the service allowing for the service to be both explained and promoted. | Referral Form<br>• MAC contact information (phone and fax number)<br>• Date of referral<br>• Physician information (name, clinic address, phone number and fax number)<br>• Patient information (name, date of birth, phone number, health card number,)<br>• Reason for referral (comprehensive medication assessment or other reason(s))<br>• Urgency of request<br>• Explanation of whether or not the patient was currently experiencing a problem with their medications<br>• Request to the physician to fax relevant investigations along with the referral (e.g. complete list of diagnoses/problems, lab values/results, etc)<br><br>FAQ<br>• Who to refer<br>• An explanation of what happens during an assessment<br>• Description of the benefit of the service (to both physicians and patients)<br>• Description of how the assessment findings will be communicated<br>• An explanation that no medication changes will occur without physician consultation<br>• Statement that there is no charge to the patient for the service |

| MAC Document | Purpose of Document | Type of Information Contained in the Document |
|---|---|---|
| **MAC Policy and Procedure Manual** | | |
| MAC Cover Letter | First sheet that accompanied all physician faxes to help physicians identify the source of the communication. | • Large MAC logo<br>• Contact information (phone and fax number)<br>• Physician information (name and fax number)<br>• Comments section<br>• Space to indicate the total number of pages included in the document |
| MAC Letterhead | To be used for all external communications so that the individual who received the letter knew that it had come from a MAC pharmacist. | • Blank letter with both the MAC logo and name "Medication Assessment Consultants" printed at the top |
| Letter to Physician Requesting Patient Information Following a CPAS Referral | When CPAS identified a patient to be at risk of a fall due to medications and referred the patient to MAC, this letter was used to inform the physician of the referral as well as request relevant patient information. | • The date the letter was sent to the physician<br>• Physician information (name, clinic address, phone number and fax number)<br>• Patient information (name, date of birth, health care number)<br>• Subject line stating "Identification of Fall Risk by CPAS/Home Care"<br>• An explanation of why the patient was referred to MAC by CPAS<br>• A brief explanation of the MAC service<br>• A request for relevant information pertaining to the patient and his/her medications (e.g. complete list of diagnoses/problems, lab values/results, etc) |
| Patient Release of Medical Information Form | | |

| MAC Document | Purpose of Document | Type of Information Contained in the Document |
|---|---|---|
| **MAC Policy and Procedure Manual** | | |
| Medication Review Form | Tool used to collect patient information during the assessment. It also served as part of the patient record. | • Reason for the appointment<br>• Patient demographics<br>• Allergies and past adverse reactions<br>• Medication experience (e.g. patient's attitude toward taking medications, what does the patient expect from his/her drug therapy, etc)<br>• Social drug use (e.g. smoking, caffeine, alcohol, etc)<br>• Past medical history<br>• Medications taken in the past<br>• Current medications<br>• Review of systems<br>• Important lab values |
| **Patient Medical Records** | | |
| EMR & Shared drive | Secure location to store patient information | • Patient demographic and health information |
| **Pharmacist Scheduling Tool (Google Calendar)** | | |
| Shared pharmacist calendar | To coordinate and record patient appointments, pharmacist availability and service room availability | • Date of scheduled appointments |

# Appendix K

# MAC Referral Form

**M⊕C**

**Medication Assessment Consultants**

Phone: 251-1587
Fax: 966-6656

## COMPREHENSIVE MEDICATION ASSESSMENT REFERRAL FORM

Date: _____

**1. Physician Information**

Name: _____

Clinic Address: _____

Phone: _____    Fax: _____

**2. Patient Information**

Name: _____    DOB: _____

Phone: _____    PHN: _____

Reason for referral:    ☐ Comprehensive Medication Assessment*

                                    ☐ Other: _____

Urgent request:    ☐ Yes    ☐ No

Is this patient currently experiencing a problem with their medications?

☐ No, Patient only requires a comprehensive medication assessment

☐ Yes, (please explain) _____

Please document any specific patient medication concerns (optional):

_____
_____
_____
_____

**3. Fax the Following Information with Referral Form** (Required for a thorough medication assessment)

☑ Complete list of diagnoses/problems    ☑ AST    ☑ INR    ☑ ECHO
☑ CBC                    ☑ urea    ☑ ALT    ☑ A₁C    ☑ BP history
☑ Electrolytes                ☑ SCr    ☑ Lipids    ☑ Urine ACR    ☑ Drug levels

* See reverse of form for more information on what comprehensive medication management is, who can benefit, & other reasons to refer patients to MAC.

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Outside Pages of Brochure

## What should I take to my appointment?

When you meet with the pharmacist, take along:

**Rx**

1. **All of your medications.** This includes all prescription and non-prescription drugs, vitamins, herbs and homeopathic medicines.

2. **A list of questions** that you have for the pharmacist.

3. **A list of your allergies.**

This service is offered in conjunction with:

UNIVERSITY OF SASKATCHEWAN

**MaC**
**Medication Assessment Consultants**

# Pharmacist Services

| Your Appointment with MaC is: | | |
|---|---|---|
| Date: | | |
| Time: | | |
| Location: | | |
| Name of Pharmacist: | | |

Inside Pages of Brochure

## Why am I seeing a pharmacist?

- Your doctor has referred you to the M⊕C pharmacist.

- This does not necessarily mean there is a problem with your medications.

- The pharmacist will meet with you to make sure that you are receiving the best medications, and to ensure you understand the benefits and risks of your medications.

- You can request an appointment for any time that is convenient for you.

## What will the pharmacist do?

The pharmacist will meet with you to:

- ask you questions about your medications

- read through your relevant medical history as provided by the referring physician

- explain why you are taking each of your medications, and which side effects you need to watch for

- answer any questions you may have about your medications

- make suggestions to your doctor, when appropriate, to ensure you are on the best medications

This pharmacist does not fill prescriptions.

All information you give to the pharmacist is confidential.

**Medication Review Form**

# Medication Review Form

Date: _____

Location: _____

| Reason for appt | **What is the reason for the referral / encounter today?** |
|---|---|
| | **What does the pt hope to achieve with this consultation?** |

| Demographics | **Wt** | **Ht** | **Age** |
|---|---|---|---|
| | **Occupation** | | **Living arrangement** |
| | **Health insurance (coverage issues and affordability of meds)** | | |

| Allergies and Alerts | **Medication allergies** *(describe reaction and when experienced)* |
|---|---|
| | **Past adverse reactions** *(describe reaction and when experienced)* |

| Medication Experience | **What is pts' general attitude towards taking medication?** | **Needs attention in care plan?** |
|---|---|---|
| | **What does the pt want / expect from their drug therapy?** | **Needs attention in care plan?** |
| | **What is the pts' primary concern about their medications?** | **Needs attention in care plan?** |
| | **To what extent does the pt understand their medications?** | **Needs attention in care plan?** |

| | |
|---|---|
| **Social drugs** | **Smoking / tobacco?** |
| | **Caffeine?** |
| | **Alcohol / Recreational drug use?** |

| | |
|---|---|
| **PMH** | **Relevant past medical history** |

| |
|---|
| **Meds Taken in past** (include why and when stopped) |
| |

| Current Medications (including OTC and herbals) | Diagnoses / problems (describe history of the problem and its management, response to therapy, description of symptoms and disease control) |
|---|---|
|  |  |

| | |
|---|---|
| **Review of Systems** | **EENT** (vision, hearing, or nasal problems; coughing) |
| | **Cardio** (chest pain, heart problems, HTN, lipids) |
| | **Pulmonary** (breathing problems) |
| | **GI** (stomach problems or pain, nausea, constipation, trouble swallowing) |
| | **Skin** (any skin troubles) |
| | **Endocrine** (diabetes, thyroid history) |
| | **Hepatic** (any history of liver problems) |
| | **Diet** (general diet, weight changes) |
| | **Reproductive** (incontinence, impotence, hot flashes) |
| | **Renal / urinary** (urinary frequency, renal dysfunction) |
| | **Hematology** (bruising, bleeding) |
| | **MSK** (pain) |
| | **Neuro** (numbness, tingling, balance or falls, memory) |
| | **Psych** (mood problems) |
| | **ID** (any infectious diseases like HIV, Hep C, TB, etc) |
| | **Immunizations**<br><br>☐ Influenza ☐ Pneumovax<br>☐ Other_____ |
| | **Any additional diagnoses not discussed?** |

| Parameter** | Dates | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| **Scr** | | | | | | |
| **Est. CrCl** (140-age)(wt)1.23/SCr x 0.85 female | | | | | | |
| **Urea** (3.7 – 7.0) | | | | | | |
| **K⁺** (3.5 – 5.1) | | | | | | |
| **Na⁺** ( --- ) | | | | | | |
| **Cl⁻** ( --- ) | | | | | | |
| **ALT** ( --- ) | | | | | | |
| **AST** ( --- ) | | | | | | |
| **Albumin** ( --- ) | | | | | | |
| **GGT** ( --- ) | | | | | | |
| **RBC** ( --- ) | | | | | | |
| **Hgb** ( --- ) | | | | | | |
| **BP** | | | | | | |
| **HR** | | | | | | |
| **LDL** | | | | | | |
| **TC / HDL** | | | | | | |
| **HDL** | | | | | | |
| **Triglycerides** | | | | | | |
| **$A_1C$** | | | | | | |
| **FBG** | | | | | | |
| **ACR** (<2.0 men, <2.8 women) | | | | | | |
| **Microalbumin** (<20) | | | | | | |
| **INR** | | | | | | |
| **CK** (30 - 200) | | | | | | |
| **TSH** (0.3 – 5.5) | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

*Important labs / measurements\**

\* Normal range in brackets may vary with each lab     \*\*Common parameters listed – may need to include other pt specific parameters

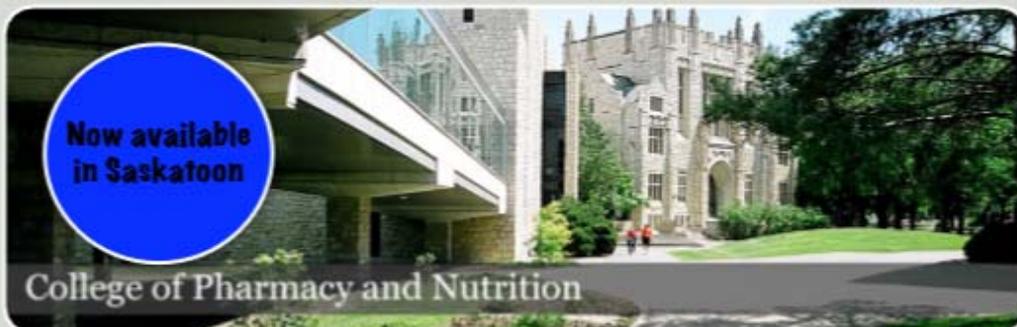D. Jorgenson, PharmD, 2011  Adapted from Pharmaceutical Care Practice 2nd Ed. Cipolle, Strand, Morley

# Appendix O

## MAC Frequently Asked Questions (FAQs)

**MAC**

**Medication Assessment Consultants**

## Frequently Asked Questions

**Who needs a comprehensive medication assessment?**

Patients who have:
- ≥ 3 chronic medications
- A new diagnosis of a chronic disease
- Recently started warfarin treatment
- Side-effects from their medications
- A need for education related to medications
- A problem with adherence

**What happens during an assessment and what will the pharmacist do?**

1. Patient is called to book an appointment
2. Patient meets with the clinical pharmacist in an office-setting
3. Pharmacist performs a comprehensive medication history with the patient
4. Pharmacist provides education to the patient
5. Pharmacist assesses patient's medications for opportunities to improve the patient's medication management
6. A letter containing the findings is sent to the referring physician
7. Pharmacist follows up with the patient as needed

**\*\*WE DO NOT DISPENSE MEDICATIONS & WILL NOT REPLACE THE PATIENT'S REGULAR COMMUNITY PHARMACY\*\***

**What is the benefit?**
- Saves physician time by assisting with complex drug regimens and patient use of natural health products and over-the-counter medications
- Results in improved patient care. 94% of patients referred to a similar service had at least 1 drug-therapy problem identified with an average of 4.4 drug-therapy problems per patient.[1]

**How will the findings of the consultation be communicated to me?**
A written report will be faxed to the physician. If an urgent issue is identified, the physician will be contacted by phone.

**Will the pharmacist make changes to the medications without first consulting the physicians?**
No changes to prescription medications will be made without consultation with the patient's primary physician.

**Is there a charge to the patient?**
No. This service is provided to patients at no charge to them thanks to a grant made possible by the Saskatchewan Ministry of Health.

[1]Dolovich L, et al. Integrating family medicine and pharmacy to advance primary care therapeutics. Clin Pharmacol Ther. 2008 Jun;83(6).

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**Appendix P**

**Client/Patient Access Services (CPAS) Referral Form**

FAX TO 966-6656

**MaC**

**Medication Assessment Consultants**

Phone: 230-4340   Fax: 966-6656

## COMPREHENSIVE MEDICATION ASSESSMENT REFERRAL FORM

Date: _____

**1. Physician Information**

Name: _____

Clinic Address: _____

Phone: _____          Fax: _____

**2. CPAS Contact Information** *(required if MAC pharmacist needs to contact CPAS re: the referral)*

Name: _____

Phone: _____          Fax: _____

**3. Patient Information**

Name: _____          DOB: _____

Phone: _____          PHN: _____

Primary contact person _____          Phone: _____
*If contacting patient directly is not desirable/useful*

Reason for referral:     ☑   Medication Assessment triggered by CPAS falls risk screening

Please document any specific patient medication concerns (optional):

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

**What is this service?**
MAC is a non-profit service run by College of Pharmacy & Nutrition. Funded by a research grant from Sask. Drug Plan (no charge to pts). Pts are seen by a clinical pharmacist in a convenient off-campus location who will provide comprehensive pt education and an assessment of the pts' medication regimen. Referring physician receives a consult letter summarizing recommendations (changes made only at physician's discretion).

# Appendix Q

## Comprehensive Overview of Patient Data

| MAC Patient Number | Sex | Year Of Birth | Referral Type | Physician Name | Number of Drugs Patient Was Taking at Time of First Appointment | Number of Conditions the Patient Had at Time of First Appointment | Number of Recommendations Sent to the Physician |
|---|---|---|---|---|---|---|---|
| 1 | Male | 1936 | Physician | 22 | 12 | 2 | 0* |
| 2 | Female | 1924 | Physician | 22 | 15 | 16 | 7 |
| 3 | Female | 1930 | Physician | 1 | 23 | 12 | 3 |
| 4 | Female | 1938 | Physician | 1 | 31 | 13 | 9 |
| 5 | Female | 1931 | Physician | 22 | 19 | 10 | 3 |
| 6 | Female | 1964 | Physician | 2 | 16 | 10 | 3 |
| 7 | Male | 1958 | Physician | 3 | 19 | 13 | 3 |
| 9 | Male | 1944 | Physician | 22 | 15 | 18 | 9 |
| 10 | Male | 1924 | Physician | 4 | 21 | 21 | 13 |
| 11 | Female | 1937 | Physician | 5 | 24 | 12 | 4 |
| 12 | Female | 1921 | Physician | 6 | 22 | 15 | 6 |
| 13 | Male | 1948 | Self | Not MD referred | 7 | 4 | 3 |
| 14 | Female | 1939 | Physician | 7 | 23 | 9 | 9 |
| 15 | Male | 1933 | Physician | 8 | 12 | 6 | 2 |
| 16 | Female | 1946 | Physician | 4 | 26 | 10 | 6 |

*For MAC Patient 1, no recommendations were made because the patient was referred to the service for information about which prophylactic antibiotic would be best for a minor surgery. Before the MAC pharmacist could complete the assessment, the patient was called in form surgery.

| MAC Patient Number | Sex | Year Of Birth | Referral Type | Physician Name | Number of Drugs Patient Was Taking at Time of First Appointment | Number of Conditions the Patient Had at Time of First Appointment | Number of Recommendations Sent to the Physician |
|---|---|---|---|---|---|---|---|
| 17 | Female | 1939 | Physician | 4 | 14 | 6 | 0 |
| 18 | Female | 1961 | Physician | 9 | 19 | 11 | 11 |
| 19 | Female | 1953 | Physician | 4 | 16 | 18 | 5 |
| 20 | Female | 1961 | Physician | 10 | 10 | 2 | 1** |
| 21 | Male | 1952 | Physician | 10 | 6 | 4 | 5 |
| 22 | Female | 1970 | Physician | 10 | 14 | 6 | 5 |
| 23 | Female | 1946 | Physician | 11 | 8 | 12 | 8 |
| 24 | Male | 1930 | Physician | 11 | 10 | 4 | N/A |
| 25 | Female | 1956 | Physician | 2 | N/A | N/A | N/A |
| 26 | Female | 1923 | Home Care | Not MD referred | 6 | 10 | N/A |
| 27 | Male | 1919 | Home Care | Not MD referred | 13 | 13 | 6 |
| 28 | Female | 1917 | Home Care | Not MD referred | 13 | 12 | N/A |
| 29 | Male | 1937 | Home Care | Not MD referred | 6 | 17 | N/A |
| 30 | Female | 1923 | Physician | 12 | N/A | N/A | N/A |
| 31 | Female | 1931 | Physician | 10 | 5 | 9 | N/A |
| 32 | Female | 1935 | Physician | 13 | 10 | 8 | 6 |
| 33 | Female | 1925 | Home Care | Not MD referred | 16 | 17 | 5 |
| 34 | Female | 1940 | Home Care | Not MD referred | 2 | 7 | 4 |

**For MAC Patient 20, there was only one drug recommendation made to the physician because the nature of the referral was a drug-information question related to natural products causing liver toxicity.

| MAC Patient Number | Sex | Year Of Birth | Referral Type | Physician Name | Number of Drugs Patient Was Taking at Time of First Appointment | Number of Conditions the Patient Had at Time of First Appointment | Number of Recommendations Sent to the Physician |
|---|---|---|---|---|---|---|---|
| 35 | Male | 1933 | Home Care | Not MD referred | N/A | N/A | N/A |
| 36 | Female | 1960 | Physician | 15 | 6 | 3 | N/A |
| 37 | Female | 1929 | Physician | 15 | 6 | 11 | 3 |
| 38 | Female | 1965 | Physician | 15 | 2 | 5 | 4 |
| 39 | Female | 1961 | Physician | 14 | 16 | 5 | 4 |
| 40 | Female | 1927 | Physician | 14 | 6 | 7 | 8 |
| 41 | Female | 1960 | Physician | 5 | 5 | 5 | 9 |
| 42 | Female | 1948 | Physician | 5 | 21 | 11 | 6 |
| 43 | Female | 1942 | Physician | 16 | 5 | 6 | 1 |
| 44 | Female | 1943 | Physician | 17 | 9 | 9 | 5 |
| 45 | Female | 1948 | Physician | 18 | 17 | 5 | 4 |
| 46 | Female | 1927 | Physician | 19 | 6 | 5 | N/A |
| 47 | Male | 1944 | Physician | 20 | 6 | 3 | 2 |
| 48 | Male | 1926 | Self | Not MD referred | 7 | 5 | 4 |
| 49 | Female | 1940 | Physician | 21 | 20 | 9 | 8 |
| 50 | Male | 1942 | Self | Not MD referred | 13 | 12 | 6 |
| 51 | Male | 1936 | Physician | 10 | 12 | 10 | 7 |
| 52 | Male | 1952 | Physician | 23 | 18 | 8 | 1 |
| 53 | Female | 1949 | Self | Not MD referred | 25 | 5 | 7 |
| 54 | Male | 1961 | Physician | 20 | N/A | N/A | N/A |

*Explanation for Missing Data*

**MAC Patient 8** – This file was created, but no actual patient ever was assigned this number.

**MAC Patient 24** – Patient was unable to attend the clinic.

**MAC Patient 25** – Patient was not interested in the service (patient declined participation).

**MAC Patient 26** – Patient was referred to MAC through home care. The patient's physician was contacted to request relevant health information, but the physician never replied.

**MAC Patient 28** – Patient was seen form initial appointment, but was unable to attend future appointments.

**MAC Patient 29** – Patient was referred to MAC through home care. The patient's physician was contacted to request relevant health information, but the physician never replied.

**MAC Patient 30** – Patient declined participation because she was recently assessed at the Geriatric Assessment Unit (GAU). Her medications were assessed during her time with GAU.

**MAC Patient 31** – Patient was unable to attend the clinic.

**MAC Patient 35** – Patient was new to the referring physician. Physician was unable to access required medical information from previous physician.

**MAC Patient 36** – Patient was unable to attend the clinic (lives two hours outside of Saskatoon).

**MAC Patient 46** – The patient's physician was contacted to request relevant health information, but the physician never replied.

**MAC Patient 54** – Patient was not interested in the service (patient declined participation).