Barriers and Facilitators Associated with Antipsychotic Deprescribing for Individuals with Dementia Residing in Long-Term Care as Reported by Physicians: A Mixed Methods Study

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PREFACE

AUTHOR CONTRIBUTIONS

In his role as an MSc candidate and first author on the manuscript, Matteo Peretti (MP) was responsible for the planning, coordination, and execution of this research initiative. In collaboration with thesis supervisor Dr. Machelle Wilchesky, he was responsible for the development of all study materials, data collection, analysis, and interpretation of the results. He was also responsible for dissemination of the research results, as well as the writing of the manuscript and thesis.

Dr. Machelle Wilchesky (MW) served as the principal investigator and thesis supervisor. With training in epidemiology and years of experience as the Director of Research at the Donald Berman Maimonides Centre for Research in Aging, Dr. Wilchesky conceived this project, assisted with its design and development and provided expertise in the substantive area, quantitative methods and analysis, as well as overall supervision for the project.

Dr. Jonathan Salsberg (JS) is a qualitative research expert and served as a co-investigator. Dr. Salsberg assisted with the overall design of the research, particularly with the qualitative design and analysis.

Dr. Mark Karanofsky (MK), an LTC physician, served as a co-investigator and knowledge user (i.e., a member of the study population who is ultimately the target of the research findings). The purpose of a partnership with a knowledge user is to engage in a collaborative research process that ideally results in the co-production of knowledge and the minimization of otherwise unanticipated barriers to knowledge translation.[1] Dr. Karanofsky provided pivotal contributions to the design of the study instruments (survey and interview guide) and the interpretation of the results.

CONFERENCE PRESENTATIONS

Work emanating from this thesis has been presented at a total of 6 scientific meetings to date. Findings from the literature review were presented at the 25th Canadian Academy of Geriatric Psychiatry Annual Scientific Meeting in Quebec City, Quebec (September 30 - October 1, 2016) and the 45th Annual Scientific and Educational Meeting of the Canadian Association on

Gerontology in Montreal, Quebec (October 20-22, 2016). The research protocol was presented at the 44th Annual Meeting of the North American Primary Care Research Group in Colorado Springs, Colorado (November 12-16, 2016). Results from this project were presented at the 3rd Annual Family Medicine Research Division & Graduate Student Society Research Symposium in Montreal, Quebec (May 4, 2017), the 26th Annual Scientific Meeting of the Canadian Academy of Geriatric Psychiatry in Toronto, Ontario (November 5, 2017), and the 45th Annual Meeting of the North American Primary Care Research Group in Montreal, Quebec (November 17-21, 2017).

MANUSCRIPT-BASED THESIS REQUIREMENTS

This thesis is presented in a manuscript-based format and is in accordance with the requirements set forth by Faculty of Graduate and Postdoctoral Studies of McGill University. The structure of the thesis is as follows: an introductory chapter, a literature review to contextualize this project within the most relevant and recent related research, a methods chapter outlining and describing the methodological approach and the specific methods used to answer the research objectives, a manuscript presenting the key study results, an additional results chapter which presents further survey analyses and interview quotes, and finally, two chapters that provide a discussion of the results and concluding remarks on this research, implications, and future directions, respectively.

The following is an excerpt from the Faculty of Graduate and Postdoctoral Studies website (http://mcgill.ca/gps/thesis/thesis-guidelines/preparation):

As an alternative to the traditional thesis format, the thesis research may be presented as a collection of scholarly papers of which the student is the author or co-author; that is, it can include the text of one or more manuscripts, submitted or to be submitted for publication, and/or published articles reformatted according to thesis requirements as described below. Manuscripts for publication are frequently very concise documents. The thesis is expected to be a more detailed, scholarly work than manuscripts for publication in journals, and must conform to general thesis requirements. Note: These papers cannot alone constitute the thesis.

ABSTRACT

Background: Off-label antipsychotic (AP) prescribing for the management of the neuropsychiatric symptoms of dementia in long-term (LTC) care is prevalent despite clinical guidelines and decades of evidence cautioning against this practice.

Objectives: The objectives of this study were: (1) To quantify the degree of difficulty physicians experience when attempting to resist AP initiation requests and taper/withdraw APs for LTC residents (2) To identify and quantify physician barriers and facilitators associated with AP deprescribing for LTC residents with dementia in Canada; and (3) To obtain an in-depth and rich understanding of how these barriers and facilitators unfold in clinical practice.

Methods: A two-phase, explanatory sequential mixed methods design was used. First, a cross-sectional quantitative survey identified potential barriers and facilitators associated with both resisting AP initiation requests and tapering or discontinuing existing AP prescriptions. Multivariable logistic regression models were used to identify survey items associated with the main outcomes. Important barriers and facilitators were then explored in semi-structured interviews with survey respondents. Interview transcripts were coded using thematic analysis.

Results: Multivariable analyses revealed that difficulty resisting AP initiation requests was associated with pressure from nursing staff (RR = 2.35; 95% CI, 1.01 - 5.51), reluctance to question a colleagues' decision to prescribe APs (RR = 2.45; 95% CI, 1.16 - 5.16), lack of access to mental health specialist consultants (RR = 2.51; 95% CI, 1.25 - 5.03), and was more common among physicians who identify as female (RR = 3.67; 95% CI, 1.44 - 9.39). No variables were significantly associated with difficulty deprescribing APs. The thematic analysis highlighted the importance of communicating with families, and how limited LTC resources serve to reinforce the maintenance of AP prescriptions due to concern regarding symptom re-emergence.

Conclusions: Our survey results contribute to the LTC AP deprescribing literature by adding the much-needed physician perspective with regard to specific barriers and facilitators. The follow-up interviews provide a nuanced understanding of complex interplay between physicians and the LTC milieu, and how these forces can both inhibit and assist physicians' deprescribing efforts. Future interventions would benefit from adopting a multifaceted approach that accounts for each facility's context and the perspectives of its various stakeholders.

RESUME

Contexte : La prescription hors indications d'antipsychotiques (AP) pour la prise en charge des symptômes neuropsychiatriques de démence est répandue en soins de longue durée (SLD), malgré l'existence de lignes directrices cliniques et de données probantes recueillies pendant des décennies, qui mettent en garde contre cette pratique.

Objectifs : Cette étude visait à : 1) Cerner et quantifier les obstacles et facteurs facilitants, du point de vue des médecins, associés à la « déprescription » d'AP chez les résidents atteints de démence d'établissements canadiens de SLD; 2) Acquérir une compréhension approfondie et étoffée de la façon dont ces obstacles et facteurs facilitants ont une incidence en pratique clinique.

Méthodes : Nous avons eu recours à un plan séquentiel explicatif à méthodes mixtes en deux phases. D'abord, un sondage quantitatif transversal a permis de cerner les obstacles et facteurs facilitants potentiels associés à la résistance face aux demandes d'instauration d'un traitement par AP et aux demandes de réduction progressive de la dose ou d'arrêt d'un traitement par AP. Des modèles de régression logistique à variables multiples ont été utilisés pour établir les items du sondage qui étaient associés aux issues principales. Les obstacles et facteurs facilitants d'importance ont ensuite été évalués dans le cadre d'interviews semi-dirigées avec les répondants au sondage. Les transcriptions des interviews ont été codées à l'aide d'une analyse thématique.

Résultats : Les analyses de variables multiples ont révélé que la difficulté à résister aux demandes d'instauration d'un traitement par AP était associée à la pression exercée par le personnel infirmier (RR = 2,36; IC à 95 % : 1,01 à 5,51), à la réticence de remettre en question la décision d'un collègue de prescrire des AP (RR : 2,45; IC à 95 % : 1,16 à 5,16) et à l'accès insuffisant à des consultants spécialisés en santé mentale (RR : 2,51; IC à 95 % : 1,25 à 5,03); cette difficulté était plus fréquente chez les médecins de genre féminin (RR : 3,67; IC à 95 % : 1,44 à 9,39). Aucune variable n'était significativement associée à la difficulté de « déprescrire » des AP. L'analyse thématique a souligné qu'il est important de communiquer avec les familles et que les ressources limitées en SLD peuvent renforcer le maintien de la prescription d'AP à cause des inquiétudes concernant la réapparition des symptômes.

Conclusions : Les résultats de notre sondage, qui s'ajoutent à la littérature existante concernant la « déprescription » d'AP en SLD, font valoir le point de vue essentiel des médecins sur les obstacles et facteurs facilitants spécifiques. Les interviews de suivi avec les médecins donnent une compréhension nuancée de l'interaction complexe entre le milieu des SLD, le personnel, les membres de la famille et les personnes atteintes de démence, et des façons dont ces forces peuvent à la fois nuire et aider aux efforts de « déprescription » des médecins. Les interventions à venir gagneraient à adopter une approche multidimensionnelle tenant compte du contexte particulier à chaque établissement et du point de vue des différents intervenants.

ABBREVIATIONS

AP: Antipsychotic

CIHI: Canadian Institute for Health Information

LTCF: Long-term Care Facility

LTC: Long-term Care

NPS: Neuropsychiatric Symptoms

OBRA: Omnibus Budget Reconciliation Act of 1987

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CHAPTER 1: INTRODUCTION

1.1 RATIONALE

Antipsychotic medications (APs) are a class of drugs used to manage psychosis (e.g., delusions, disordered thought, hallucinations, paranoia).[2] APs are indicated for the management of schizophrenia and bipolar disease but are frequently prescribed off-label (i.e., for a reason other than the indication of the medication) for the management of aggression of long-term care (LTC) patients (i.e., LTC residents) with dementia.[3-5] Dementia, an umbrella term for brain disorders that impair memory and other cognitive functions, is highly prevalent among LTC residents, with prevalence estimates ranging from 56% to 69%.[6] Dementia is often accompanied by neuropsychiatric symptoms (NPS, previously referred to as "behavioral and psychological symptoms of dementia"), a constellation of disturbances that includes delusions, hallucinations, agitation/aggression, aberrant motor behavior, depression, anxiety, and apathy.[7] These symptoms present challenges and have a widespread impact due to the associated decrease in quality of life for the affected LTC resident[8], increased caregiver burden[9], and economic costs on healthcare systems.[10] The prevalence rate of NPS among LTC residents with dementia is extremely high, with rates as high as 80% in LTC.[6, 11]

According to Canadian[12] and international guidelines,[13] non-pharmacological strategies are recommended as first-line management for BPSD and pharmacological management (i.e., APs) should only be considered when symptoms do not respond to non-pharmacological strategies and the LTC resident poses a safety risk to themselves or others. Historically, APs have been used excessively and with little oversight in LTC, often in order to render residents more docile and easier to manage.[14] More than an ethical issue, research on AP use among older adults with dementia have found that these drugs are only modestly effective for the management of NPS[7, 15] despite the risks associated with their use in this population (e.g., extrapyramidal symptoms, increased mortality).[7, 16-18] As a result of this evidence, both Health Canada and the U.S. Food and Drug Administration issued warnings in the mid-2000s against the use of APs in older adults with dementia.[19, 20]

According to the Canadian Institute for Health Research (CIHI), recent (2016-2017) estimates of potentially inappropriate (i.e., prescriptions without a diagnosis of psychosis) AP prescribing in LTC ranged from approximately 20% to 38%.[21] That off-label AP prescribing by LTC physicians remains this high despite i) evidence of increased mortality,[17, 18, 22] ii) suboptimal risk-benefit ratios,[7, 23] iii) governmental health agency warnings,[24, 25] and iv) clinical guidelines recommending non-pharmacological strategies as first-line treatment for NPS [12, 26-28] suggests that significant barriers to reducing AP use in this population exist.[29]

Interventions to reduce AP use through non-pharmacological (e.g., music therapy) and deprescribing (i.e., tapering or withdrawing APs) interventions have shown promising results.[30] Inappropriate AP prescribing has continued for decades despite the existence of these interventions. LTC physicians play a central role in the AP prescribing process given that they are responsible for issuing prescriptions. The physician perspective, however, is largely absent from the LTC AP deprescribing literature.[31] The failure to understand and incorporate the experiences of LTC physicians ultimately limits the implementation and effectiveness of AP deprescribing interventions. Given this knowledge gap, analysis of the barriers and facilitators associated with AP deprescribing from the perspective of LTC front-line physicians warrants exploration.[29, 30, 32] Uncovering these understudied factors may illuminate why it is that inappropriate AP prescribing persists in this vulnerable patient population, and may provide direction for the design of more effective AP reduction interventions.

1.2 OBJECTIVES

The overarching objective of this study was to investigate the barriers and facilitators associated with AP deprescribing in Canadian LTC patients with dementia, from the perspective of LTC front-line physicians. This research employed mixed methods, utilizing a two-phase explanatory sequential design.[33] The purpose of this two-phase design is to first generate quantitative data (Phase I), which are then explained through an in-depth qualitative exploration (Phase II). In the first phase of the study, survey data was collected from Canadian LTC physicians to assess whether barriers and facilitators associated generally with appropriate medication prescribing (i.e., with respect to all drugs, classes, and settings) are applicable to the

context of appropriate AP prescribing and deprescribing in this population. The exploratory follow-up, informed by the results of the quantitative phase, sought to provide a richer understanding of how these barriers and facilitators unfold in clinical practice through one-on-one interviews with LTC physicians practicing in Canada.

The specific objectives of this research were to:

(1) Quantify the degree of difficulty physicians experience when attempting to resist AP initiation requests and taper/withdraw APs for LTC residents;

(2) Identify and quantify the barriers and facilitators associated with appropriate AP prescribing and deprescribing for LTC patients with dementia in Canada that physicians face;

(3) Obtain an in-depth and rich understanding of how these barriers and facilitators unfold in clinical practice.

As this was a mixed methods study, it was guided by both a quantitative and a qualitative research question. Phase I of the study attempted to answer to the following quantitative research question: *What are the barriers and facilitators associated with appropriate LTC AP prescribing and deprescribing from the viewpoint of physicians?* Phase II continued this line of inquiry with the following qualitative research question: *How do these barriers and facilitators influence the appropriate prescribing and deprescribing of APs in Canadian LTC for physicians?*

The results of this research aim to contribute to a better understanding of the context of AP prescribing and deprescribing practices in LTC, as well as improved clarity and clinical applicability in clinical guidance for AP prescribing in LTC.

CHAPTER 2: LITERATURE REVIEW

2.1 HEALTH CARE NEEDS OF CANADA'S "OLDEST OLD" POPULATION

Older adults are the fastest growing segment of the population in the world. Global estimates predict that there will be more than two billion people aged 60 years or older by 2050.[34] The most recent Canadian census statistics estimates that the "oldest old" (aged 85+) segment of the population has increased nearly 20% since 2011, representing a growth rate four-times that of the overall Canadian population.[35]

Those aged over 65 consume a greater amount of healthcare resources compared to younger segments of the population. In 2015, older adults accounted for 15% of the Canadian population but consumed roughly 45% of Canadian provincial and territorial budgets.[36] Health spending per person is approximately $6,000 for older adults aged 65 to 69 and spending steadily increases with age, reaching more than $24,000 for those aged 85 and older.[36] This increased need for health services is driven by complex chronic conditions and is not an inevitable result of aging. Older adults aged 85 and older with no chronic diseases use less health services than those aged 65 to 74 with a least three chronic disease; 40% of health care use by seniors is attributed to the 24% of seniors with at least three chronic diseases.[37]

The complex care needs of individuals in the oldest old age group can include: chronic disease (e.g., diabetes), multiple illnesses, medication management/polypharmacy, and reduced functional autonomy (i.e., activities of daily living, which include bathing and eating, and instrumental activities of daily living, which include cooking and managing finances). When complex care needs are coupled with deteriorating functional autonomy and a corresponding loss of independence, placement within a long-term care facility is often required.[38, 39]

The definition of long-term care varies within Canada, as the development of long-term care has been idiosyncratic to each province and territory.[40] Within the context of this research, long-term care is defined as health, social, and personal care for individuals with: (1) complex health needs and moderate to severe functional deficits; or (2) chronic conditions that impact their ability to perform daily activities to the point where they are unable to remain independently at home or in a supportive living environment.[41, 42]

2.2 DEMENTIA AND NPS IN LONG-TERM CARE

Dementia, an umbrella term for neurological disorders that impair memory and other cognitive functions, is one of the primary reasons for institutionalization within an LTCF.[38] Given that dementia is a driver for institutionalization, the prevalence rate of dementia in LTC is unsurprisingly high in Canada (56% - 84%) and throughout the world (12% - 95%).[6] Dementia is extremely burdensome to the patients who suffer from it and to society for a multitude of reasons. Diminished cognitive functioning and loss of autonomy is associated with decreased quality of life and increased burden on family members and/or caregivers. In addition, there are significant healthcare costs associated with dementia that impact healthcare system budgets. In Quebec, 77,000 elderly individuals were institutionalized within an LTCF in 2011, at a cost of $5.9 billion of the $33 billion total spent on health and social services in Quebec.[43, 44] In Canada, it was reported that in 2012 $9.8 billion was spent on long-term care, before accounting for costs for physician services and prescription drugs.[45] Globally, it is estimated that dementia will be a trillion dollar disease in 2018. [10]

NPS are common in patients with dementia in LTC, with prevalence rates as high as 80% in LTC.[6, 11] NPS comprise a wide range of symptoms that include: agitation, aberrant motor behavior, anxiety, elation, irritability, depression, apathy, disinhibition, delusions, hallucinations, and sleep or appetite changes.[46, 47] Depression, apathy, and anxiety are the most commonly occurring symptoms.[48, 49] While aggression is somewhat less common, it is a significant safety concern, as it is prevalent in between 29% - 85% of LTC residents with dementia, and up to 36% of residents without dementia.[50] Among LTC residents with dementia displaying aggression, 50% exhibit physical aggression, 47% express verbal aggression, and 4% display sexual aggression.[51]

Displays of aggression understandably affect LTC staff, as evidenced by an estimate that physical and verbal aggression causes 90% of staff to experience distress, with 20% to 30% reporting severe distress.[52] Acts of resident aggression towards LTC nurses can result in staff experiencing negative feelings, emotional exhaustion, burnout,[53-56] and may even lead to aggression against residents, thus creating a positive feedback loop of violence.[57] The physical and psychological workload of nursing staff in LTC has been shown to increase as a result of

both physical and verbal aggression exhibited by LTC residents.[58] Due to the institutionalized model of long-term care, the LTC environment assembles many residents with dementia and NPS into shared spaces, creating opportunities for conflict between residents that can escalate to resident-to-resident violence.[58, 59] While it is important to recognize the burden of NPS on residents and nursing staff, care should also be taken to resist pathologizing resident behaviors that can be understood as reasonable responses to stress (e.g., unmet needs related to individualistic, social, or organizational contexts).[60, 61]

2.3 NPS MANAGEMENT AND TREATMENT

The first step in the management process for NPS, including aggression and agitation, is a thorough clinical assessment to rule out potential triggers that can be more easily managed non-pharmacologically.[62] For example, agitation or aggression may be the expression of physical health problems (e.g., urinary tract infections, dehydration, pain) or environmental disturbances (e.g., noise levels), especially when considering the communication deficits that accompany dementia.[4, 63, 64] Identification and treatment of underlying causes of these behaviors can result in their elimination without the need for NPS-specific management strategies or therapies.[4, 64-66]

If the recommended general principles of care for patients with dementia are not effective in sufficiently reducing NPS, non-pharmacological management strategies that specifically target specific NPS are recommended.[4, 64, 67] Reviews of non-pharmacological (i.e., behavioral or psycho-social) interventions have shown that NPS management strategies can be effective and have both fewer and less severe adverse effects than pharmacological interventions.[4, 61, 68-71] A recent systematic review of reviews highlighted the wide variety of non-pharmacological interventions to manage NPS that have been studied.[61] This work by Legere and colleagues separated interventions and therapies into three categories: individual therapies, targeted interventions, and organizational interventions. Individual therapies included music therapy, physical activity, massage therapy, light therapy, aromatherapy, and multicomponent interventions incorporating multiple individual therapies. Targeted interventions consisted of interventions aimed at addressing pain, interventions for families and caregivers, and interventions targeting sexual behaviors. The final category, organizational

interventions, included care mapping, functional analysis, dementia advisor services, and dementia case conferencing. The following interventions had the most conclusive evidence to support their use: music therapy, multicomponent interventions, interventions targeting pain, interventions for family and caregivers, and care mapping. Light therapy and aromatherapy were not found to be effective, while the remaining therapies and interventions did not have enough evidence to support their use.

Overall, the scientific literature concerning the non-pharmacological management of NPS has been criticized for small sample sizes, poor design, and substandard reporting.[61, 70] Reviews on this subject have also been subject to criticism[71, 72] for improperly applying criteria designed for pharmacological studies to non-pharmacological studies (e.g., blinded assignment instead of blind assessments and intervention manuals).[68] Although there are some promising non-pharmacological treatments that have been shown to ameliorate NPS symptoms, it remains unclear whether the observed improvements are truly a result of the therapeutic interventions or simply the natural response of an under-stimulated population to increased human interaction (whether direct or indirect), due to the lack of high-quality research in this area.[61, 69]

While non-pharmacological approaches are recommended as first-line therapy for NPS management[64-66], pharmacological approaches are often used: (i) for the management of severe NPS where the resident presents a serious risk of harm to themselves or others; and/or (ii) as an adjuvant to non-pharmacological strategies.[4, 73] A number of drug classes are prescribed for the management of NPS, including: APs, antidepressants, sedative and hypnotic agents, mood stabilizers, anticonvulsants, cholinesterase inhibitors, and melatonin.[73, 74] A recent systematic review of meta-analyses of the effectiveness of drugs for NPS management[73] found that: (i) APs were only modestly effective for the treatment of psychosis, agitation, and aggression (especially when severe) but were also associated with adverse events such as cerebrovascular events and mortality when compared to placebo; (ii) Antidepressants, particularly selective serotonin reuptake inhibitors, can reduce the symptoms of depression and agitation, as well as improve select aspects of sleep quality. In general, antidepressants are well tolerated, with the exception of mood stabilizers, which have little evidence of effectiveness

and are associated with significant adverse effects; (iii) No beneficial effects were observed from the use of anticonvulsants; (iv) Melatonin has been shown to improve sleep parameters, some behavioral symptoms, and is well tolerated; (v) No meta-analyses for the use of benzodiazepines among dementia sufferers were published at the time of the systematic review of meta analyses.

2.4 NPS MANAGEMENT WITH APS

APs are commonly prescribed to manage agitation and aggression in those diagnosed with dementia.[4, 5] APs however, are not approved or indicated for the symptomatic management of aggression and/or psychosis in patients with dementia. The only exception to this guidance pertains to the approved use of short-term use of Risperdal in Canada[75] for aggression and psychotic symptoms in those with severe Alzheimer's disease for whom non-pharmacological approaches are ineffective and a risk of harm to self or others is present.[24, 76, 77] Prescription of AP medications for the management of agitation and aggression in LTC residents with dementia is therefore largely classified as being "off-label" prescribing, a practice defined as "any deviation from the use defined in the approved labeling".[78-80] The ability of physicians to prescribe drugs off-label can be beneficial in scenarios where patients do not respond to approved treatments or when there is promising evidence for a novel drug indication.[81] Physicians must balance these potential advantages with the drawbacks associated with off-label prescribing, such as the absence of safety and efficacy evaluations for the drug's new implementation (e.g., use in an new population) or increased health care costs when more expensive drugs are used in place of indicated therapies that are cheaper.[81] Given that drug manufacturers (especially generic drug manufacturers) may not seek regulatory approval for new indications of an already approved drug due to the time and financial costs associated with this process, physicians may draw on their own individual empirical evidence to guide their off-label prescribing[82, 83] Off-label prescribing is not an inherently negative occurrence but it can be a controversial practice when it is done in the absence of strong evidence, which often occurs.[84-86]

In summary, off-label AP prescribing for displays of agitation and aggression displayed by LTC residents is problematic for several reasons: (1) APs are only modestly effective in

reducing NPS [7, 87, 88] ; (2) the use of APs in this population is associated with severe negative health outcomes, such as increased risk of falls, cerebrovascular events, and mortality[7, 87, 88]; (3) APs are often used as first line-therapy in lieu of non-pharmacological therapies[4, 5], contrary to clinical practice guideline recommendations.[64-66, 89, 90]

2.5 A HISTORICAL REVIEW OF APS: FROM SURGERY TO LONG-TERM CARE

The first AP, chlorpromazine, was released for clinical use in 1952, revolutionizing the treatment landscape for schizophrenia and other serious mental illnesses.[91] Individuals with severe mental illness were principally treated in asylums during the 19th and early 20th century.[92] These institutions came to be widely criticized[93-97] in the 1960s and 1970s by social theorists; the seminal ethnographic research during this period by Erving Goffman in *Asylums* described these facilities as removed, prison-like institutions in which freedoms were restricted, normal social roles were stripped, and mental illness was heavily stigmatized.[92, 96] The advent of APs, in conjunction with community care alternatives and concerns regarding the high costs associated with inpatient mental healthcare, helped spur the deinstitutionalization of individuals with living with mental illness.[92] This shift in the locus of care was later validated by studies demonstrating that deinstitutionalization was associated with improvements in quality of life and an equal or reduced cost of care.[98-100] Though beyond the scope of this review, it is important to note that this paradigm shift has drawn criticism for failing to adequately meet the needs of individuals with severe mental illness.[101-104]

Chlorpromazine was originally developed as an analgesic-potentiating drug for surgery and later tested by Parisian psychiatrists after observing that patients given chlorpromazine experience somnolence and a lack of interest in their surroundings without losing consciousness.[91] Early reports on the effect of chlorpromazine among psychiatric inpatients suggested that the drug was a promising option for reducing agitation and hyperactivity in this patient population.[91] Due to a lack of alternative treatment options, use of these first generation, or "typical", APs persisted despite the emergence of evidence linking typical APs with extrapyramidal symptoms (e.g., tardive dyskinesia, parkinsonism, dystonia); prevalence rates for these adverse events were as high as nearly 40%.[91, 105]

Over time, use of first-generation APs extended to the LTC setting and by 1975, the liberal use of APs as a form of chemical restraint was well documented.[106, 107] AP prescribing in U.S. LTCFs was extremely high, with prevalence rates ranging from 30% to 55% in the 1970s and 1980s.[108-111] During this time period there was a noted lack of research on AP prescribing prevalence rates in Canadian LTCFs.[112] The United States Omnibus Budget Reconciliation Act (OBRA) of 1987 was introduced to improve the quality of care in nursing homes and specifically targeted potentially inappropriate AP prescribing.[113] As a result of OBRA, AP drug use in U.S. LTCFs declined considerably, with some facilities reporting reductions of between 27% and 36% in the late 1980s and early 1990s;[114-116] the average AP prevalence rate for U.S. LTCFs in the mid-1990s was approximately 14%.[117] Canada did not enact analogous regulations, despite evidence of OBRA's success; the AP prescribing rate range in Canada was between 17% and 30% in the early 2000s.[112, 118, 119]

The year 1990 marked the beginning of a new wave of treatment for schizophrenia with the introduction of clozapine, the first "atypical" or "second-generation" AP.[91] After the accumulation of evidence that clozapine was effective for the treatment of both the positive (e.g., hallucinations, agitation, disorganized speech) and negative symptoms (e.g., affective flattening, poverty of thought) of schizophrenia with fewer and less severe extrapyramidal symptoms than first-generation APs, a number of additional second-generation APs were developed in the early and mid-1990s.[91] These atypical APs were quickly preferred over their first-generation counterparts due to the lower risk of tardive dyskinesia, fewer extrapyramidal symptoms, and improved effectiveness in treatment-resistant patients.[2, 120]

The improved tolerability of atypical compared to typical APs contributed to the expansion of AP prescribing for other disorders in which aggression or psychosis is a feature, including post-traumatic stress disorder, bipolar disorder, and dementia with psychosis.[120] An analysis of the overall trend in AP drug use in Ontario, Canada during the 1990s found that atypical AP use comprised 5% of all AP claims by 1995 and 27% by 1998, while the use of typical APs increased by 11% between 1992 and 1995 but then decreased by 7% between 1995 and 1998.[121] By the end of the 1990s, Canadian clinical practice guidelines recommended atypical APs for the management of dementia with psychotic features.[122, 123]

Marketing campaigns from U.S. pharmaceutical companies also contributed to the spread of atypical APs to LTC by promoting their potential as a means of chemical restraint, while intentionally downplaying or outright obfuscating possible risks.[124, 125] Though physicians may legally prescribe a medication off-label in the U.S., the marketing of medications for off-label prescribing is illegal.[126] As a result of whistleblowing, a number of lawsuits against these U.S. pharmaceutical companies for the off-label marketing of APs during the late 1990s and early 2000s were settled in the late 2000s, including: a $515 million settlement from Bristol-Myers Squibb for Abilify, $520 million from AstraZeneca for Seroquel, $301 million from Pfizer for Geodon, and $1.4 billion from Eli Lilly for Zyprexa.[126, 127]

Fueled by an influx of atypical APs, AP prescribing prevalence rates in U.S. LTC climbed once more in the new millennium, reaching rates between approximately 25% to 30%.[78, 113] During the same time period, a Canadian study found that 24% of newly admitted nursing home residents were prescribed an AP despite having no history of AP use, schizophrenia, or major psychoses.[79] The adoption of atypical APs in LTC for the management of NPS and dementia with psychosis soon came to be scrutinized as evidence began to question both the effectiveness and safety of this new generation of APs.[128-130] In clinical trials, significant improvements in aggression were found with Risperidone and Olanzapine and improvements in psychosis for Risperidone treated patients only. Despite modest efficacy, however, the authors warn that the significant increase in adverse events within these trials confirmed that neither Risperidone nor Olanzapine should be used routinely to treat dementia patients with aggression or psychosis “unless there is severe distress or risk of physical harm to those living and working with the patient”. [7]Most concerning, evidence suggested that the use of atypical APs in older adults with dementia was associated with risk of severe side effects such as adverse cerebrovascular events (including stroke), extrapyramidal symptoms, and even mortality.[7, 16-18] In response to this body of evidence, both Health Canada and the U.S. Food and Drug Administration issued warnings in 2005 against the use of atypical APs in older adults with dementia; the FDA extended this warning to typical APs in 2008.[19, 20]

Despite the conclusive body of evidence indicating modest effectiveness, severe side effects, safety warnings from government health agencies, and clinical guidelines cautioning

against the use of APs for the management of NPS, AP use in LTC climbed once more in the U.S., reaching a prevalence rate of nearly 25% by 2011.[131] During this time in Canada, AP prescribing prevalence rates remained high at approximately 34%.[132, 133] This rate is relatively consistent with the global mean prevalence rate of 37.5% for AP use among older adults with dementia in LTC.[133]

AP prescribing rates in LTCFs varies by country and even by geographic regions within countries.[133] The most recently available data (2016 – 2017) among reporting LTCFs from the Canadian Institute of Health Information (CIHI) indicates that the rate of potentially inappropriate AP prescribing in Canada has been steadily decreasing, from approximately 34% in 2011 to roughly 22% in 2017.[134] While this downward trend is encouraging, there is still much room for improvement given that: (i) 22% of LTC residents taking an AP do not have a diagnosis of psychosis according to CIHI; and (ii) AP prescription reviews have been shown to be of poor quality and are conducted infrequently.[135]

2.6 Clinical Guidelines For NPS Management

Clinical guidelines on the management of dementia and NPS were also updated to reflect a more critical approach to APs use in older adults: (i) atypical APs should only be used when non-pharmacological approaches are unsuccessful; (ii) the risks and benefits of APs should be discussed with family members and patients before a course of therapy is initiated; (iii) atypical APs are still preferred over typical APs; (iv) initial AP doses should be low and slowly increased, with tapering occurring as soon as possible.[90]

2.7 Appropriate Prescribing and Deprescribing

The term “appropriate prescribing” has been broadly defined as the use of drugs supported by strong evidence while also discontinuing medications with poor evidence of efficacy and undesirable risk-benefit ratios.[136] In this way, appropriate prescribing can be thought of as the judicious initiation of new medications and the discontinuation of inappropriate medications. Appropriate prescribing is relevant to all populations but is of particular importance for the institutionalized elderly given that most suffer from multi-morbidity, which often results in the use of multiple medications.[137] Though there is no agreed upon definition of polypharmacy, this term refers to the simultaneous use of multiple drugs by

one individual.[138, 139] While the burden of inappropriate polypharmacy in LTC was recognized over 15 years ago, a 2014 report published by CIHI revealed that nearly 61% of LTC seniors used 10 or more different drug classes, a figure more than double the proportion among seniors living in the community (26.1%).[140] Exposure to such a large number of drugs increases the probability of experiencing adverse drug reactions, drug-drug interactions, and drug-disease interactions.[137] Additionally, older adults are at an increased risk of medication related problems as a result of decreased organ efficiency for the elimination of drugs.[141] Prescribing cascades, a term that refers to the prescribing of a new medication to treat an adverse drug reaction associated with another medication, further compounds these risks.[142, 143] As with off-label prescribing and AP prescribing for older adults with dementia, polypharmacy is not inherently inappropriate; the combined use of multiple drugs may be appropriate, especially when considering the high rate of comorbidity in older adults.[139, 144] Appropriate polypharmacy occurs when medications are considered individually and as a component within a network of drugs.[144]

Deprescribing, the process of tapering or discontinuing drugs in situations where potential risks outweigh potential benefits, is therefore embedded within the framework of appropriate prescribing and the "good prescribing continuum" (i.e., drug therapy initiation, titration, medication regimen modification, deprescribing).[145, 146]

2.8 Interventions To Reduce AP Prescribing In Long-Term Care

Interventions to reduce medication use in the elderly by adopting a deprescribing approach have largely shown positive results, resulting in fewer medications being prescribed, fewer adverse effects due to withdrawal, and improved health outcomes.[147-149] APs prescribed to older adults with dementia in LTC can also be deprescribed successfully but the baseline level of agitation or psychosis appears to moderate the level of success.[150]

The first reported intervention to reduce inappropriate AP prescribing in an LTCF occurred in 1987, the same year that OBRA was enacted in the US.[30] Since then, a number of studies conducted globally have been published that have sought to assess the effectiveness of interventions to reduce inappropriate prescribing of APs among LTC residents with dementia. A systematic review conducted in 2014 by Coon and colleagues on interventions in LTC residents

with dementia grouped 23 included studies by intervention type according to the following four categories: (1) educational programs, (2) "in-reach" services (e.g., multidisciplinary teamwork with psychiatric teams or pharmacists and long-term care health professionals), (3) medication reviews, and (4) multicomponent interventions.[30] This study concluded that AP prescription rates were reduced most significantly in "the more robustly designed studies" (12% to 20%) but could not recommend a specific intervention category. Almost all included interventions were delivered directly to physicians, highlighting the importance of LTC physicians in the decision-making process; the central role of physicians in the general deprescribing process has been discussed elsewhere.[151] The authors of this review noted that while interventions were effective in the short term, further qualitative information on the experience of the prescribers involved (i.e., physicians) are needed in order to support sustained intervention effects (i.e., long-term benefits) that account for variations in features such geography, facility, and staff characteristics.[30] Though interventions to reduce inappropriate AP prescribing in LTC have been ongoing for approximately 30 years, APs continue to be overprescribed and it remains unclear as to why this practice continues.

2.9 Driving Forces Behind Antipsychotic Overprescribing

2.9.1 The Anderson Framework

In order to understand what factors drive inappropriate AP prescribing, the barriers and facilitators associated with AP deprescribing must be known. A systematic review and thematic synthesis of prescriber barriers and "enablers" (facilitators) associated with minimizing potentially inappropriate medications in adults was conducted in 2014 by Anderson and colleagues.[32] After conducting a qualitative systematic review, the authors utilized thematic analysis to identify common subthemes and descriptive themes across the 21 included studies; from 42 sub-themes and 12 descriptive themes, four analytical themes were generated:

1) Problem awareness (i.e., the level of prescriber awareness regarding their own prescribing);
2) Inertia (i.e., medication cessation more difficult than renewal or continuation);
3) Self-efficacy (i.e., prescriber confidence in their own ability to address potentially inappropriate medication prescribing; and

4) Feasibility (i.e., external factors that determine the likelihood of change).

While some of the studies included in the review did focus on older adults, only two studies that took place in LTCFs were included, and the inclusion criteria did not limit studies by age group, setting, or drug class. It is therefore difficult to extrapolate the results to the specific context pertaining to AP prescribing in LTC residents with dementia. For example, the authors noted that unique themes had emerged from included studies that took place in LTC and acute care settings, compared to primary care settings (e.g., pressure from nursing staff to continue potentially inappropriate medications was theme unique to LTC).

2.9.2 **Barriers and Facilitators Associated with Antipsychotic Deprescribing**

Some studies have surveyed physicians about NPS management, covering topics such as the barriers associated with the healthcare of individuals with dementia,[152] the perception of the role of physicians in treating resident behavioral problems in LTC,[153] and physicians' self-confidence and beliefs regarding NPS management.[154] These studies, however, fail to capture the specific barriers associated with AP deprescribing in LTC due to their setting [152, 154] and scope.[152-154]

To the author's knowledge, only two studies have included physicians in research on the topic of barriers associated with AP deprescribing in LTC for residents with dementia.[29, 155] Barriers that arose included concerns that deprescribing would negatively affect the quality of life,[29] and a lack of nursing staff and resources.[155] Though these surveys provide insight into the issue of inappropriate AP prescribing in LTC for residents with dementia, the results must be interpreted cautiously. In the study by Azermai and colleagues,[29] the survey-items (i.e., barriers to AP deprescribing) emanated from a single European focus group comprised of a heterogeneous mix of LTC professionals that included physicians and nurses. Given that previous research has shown that nursing staff can influence physician AP prescribing behavior, [11] the inclusion of nurses and physicians within the same focus group may have inhibited physician disclosures of barriers as they pertained to any nursing staff-specific factors. An interesting discrepancy possibly resulting from this issue is the absence of nurse-related barrier items in Azermai et al.'s survey and the prominence of nurses in both barrier and facilitator items that were highly rated in the survey by Cousin and colleagues[155] (i.e., nurses featured in

top barriers to non-pharmacological NPS management as well as top facilitators to AP deprescribing). Additionally, neither of the surveys was conducted in North America.

2.9.3 **Prescriber Rationale**

In order to understand *why* APs are inappropriately prescribed to LTC residents with dementia at such high rates, it is important and necessary to consider the prescriber rationale and clinical context. A 2014 meta-synthesis attempted to understand why potentially inappropriate prescribing (in general) occurs at such high rates among older adults.[23] Drawing from the key concepts that emerged from the seven included studies, the authors of the meta-synthesis concluded that prescribers experience "self-perceived restrictions", which generates a sense of powerlessness to appropriately prescribe for their elderly patients and subsequently leads to their reliance on previous prescribing behavior (i.e., potentially inappropriate prescribing). Though this meta-synthesis was a step in the right direction towards understanding why APs are overprescribed for older adults with dementia in LTC, the studies included were extremely heterogeneous with regard to medication classes (e.g., opioids, insulin) and healthcare setting (e.g., primary care, LTC). Only one study included in the meta-synthesis was related to AP prescribing in LTC and the sample population of this study consisted solely of consultant psychiatrists, rather than the primary care front-line physicians or nurses themselves, who are much more involved in the AP prescribing process for this patient group.

A review of the social cognitive theories used to explain physician prescribing behavior was conducted by the student (MP) in 2016. [156] A systematic review of studies based on social cognitive theories of healthcare professionals' intentions were conducted in 2008 by Godin and colleagues but this review was not limited to physicians. [157] The student (MP) generated an updated inventory of social cognitive theories used describe physicians' clinical decisions by screening Godin and colleagues' review for articles that included physicians and by conducting a scoping review for more recent studies on this topic. A total of 27 articles were included (23 from the systematic review and 4 from the scoping review), yielding 30 social cognitive theories. A wide variety of theories were identified but the most commonly utilized theories was the Theory of Planned Behavior[158] (n=17) and the Theory of Reasoned Action[159] (n=6). Only one included study took place in LTC, suggesting that social cognitive theory research on

physician clinical decisions has neglected this setting. Additionally, significant conceptual overlap existed between theories, making it difficult for researchers to critically choose the most appropriate theory for their own research.

A systematic review and synthesis of qualitative evidence of influences on decision-making regarding AP prescribing in LTC residents with dementia was published in 2017 by Walsh and colleagues.[31] From the 18 included articles, the authors generated 5 key themes: organizational capacity, individual professional capability, communication and collaboration, attitudes, and regulations and guidelines. These key themes were used to develop a novel conceptual model centered on the notion of a dysfunctional negative feedback loop. In this model, challenging behavior (i.e., NPS) leads to the use of AP medication, non-pharmacological management, or both approaches in an effort to suppress the challenging behavior and restore calm. The challenging behavior can sometimes lead to the exclusive use of AP medication as an NPS management strategy, particularly when front-line nursing staff report feeling overwhelmed. The need for intervention is diminished once the challenging behavior is suppressed, but the fear that the behaviors will return and/or confusion surrounding roles and responsibilities contributes to the maintenance of AP prescribing. This systematic review and synthesis of qualitative evidence by Walsh and colleagues provides an excellent base from which to further build in pursuing research that aims to determine why APs are overprescribed to LTC residents with dementia. One the strengths of this review is the wide variety of viewpoints included (family members, nurses, managers, etc.) but it should also be noted that only 7 of the 18 included studies involved physicians, who represented a mere 9% of the total number of unique participants. Additionally, only 1 included study was conducted in Canada. Given that the conclusion by Walsh and colleagues both: (i) highlights a need for the exploration of contextual issues unique to each healthcare system before intervention pilot studies are carried out; and (2) calls for more primary qualitative research on understudied aspects, further research on this subject that includes physicians in Canadian LTCF settings is needed. The call for further qualitative research to better understand inappropriate prescribing is echoed by the authors of a systematic review on interventions to reduce inappropriate prescribing of AP medications in people with dementia in LTC.[30]

2.10 KNOWLEDGE GAP AND RESEARCH NEED

Deprescribing medications, especially for the institutionalized elderly, is a complex process involving many factors. AP prescribing rates for the off-label management of NPS have fluctuated over the years since the introduction of these medications to the LTC setting. Despite poor risk-benefit ratios, safety warnings from government health agencies, clinical practice guidelines cautioning against their use as first-line therapy in elderly patients with dementia, alternative non-pharmacological NPS management strategies, and the existence of relatively effective interventions to reduce AP use, AP prescribing rates for Canadian LTC residents with dementia remains high.

The barriers and facilitators associated with AP deprescribing for older adults with dementia living in LTCFs have not been thoroughly researched, particularly in Canada, and the frontline physician perspective is lacking Uncovering these barriers and facilitators, as reported by physicians working in Canadian LTC, is a necessary first step towards improving LTC AP deprescribing interventions. Furthermore, elucidating these understudied factors is essential to understanding why AP prescribing rates remain so high and will contribute to the development of sustainable AP deprescribing interventions for LTC residents with dementia.[30, 31] Finally, research on this topic may also contribute to the development of clinical practice guidelines that more accurately reflect physicians' experiences.

CHAPTER 3: METHODS

3.1 MIXED METHOD RESEARCH DESIGN OVERVIEW

Mixed methods research is defined as "research in which the investigator collects and analyzes data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or a program of inquiry."[160] This study employed a two-phase explanatory sequential design.[33] This design is especially appropriate when trends and relationships need to be assessed with quantitative data and the researcher is also interested in explaining underlying mechanisms.[33] The goal of Phase I (quantitative) was to determine whether barriers and facilitators associated with physician prescribing that have been previously identified in the literature (i.e., for all medications in any setting) were relevant specifically to the context of AP deprescribing in LTC and, if so, which of these factors were most important. Phase II (qualitative) furthered this line of inquiry by expanding on the Phase I quantitative results in order to explain them in a rich and in-depth manner.

Phase I consisted of a cross-sectional, self-administered mixed-mode (i.e., paper and electronic) survey. The results of this phase were used to identify important barriers and facilitators associated with AP deprescribing, according to Canadian LTC physicians. The second, qualitative phase consisted of semi-structured interviews that utilized an interview guide informed by the results of the initial quantitative phase. This second phase aimed to elaborate on the survey results in order to better understand the clinical landscape of AP prescribing within Canadian LTCFs. Given that there is scant prior research on physician reported barriers and facilitators associated with AP prescribing in this setting, the explanatory sequential design used is well suited to address this knowledge gap. For an overview of the mixed method research design utilized, please refer to Appendix 1.

3.2 STUDY POPULATION

Many actors are involved in the prescribing process for LTC patients with dementia, including: physicians, nurses, administrators, pharmacists, family members, and the residents themselves if they are cognitively able to do so. Physicians play a key role in this process given that it is they who ultimately decide whether or not to issue a prescription. Their perspectives, however, are surprisingly lacking from the AP prescribing and deprescribing literature. With this

in mind and given our research objectives, front-line physicians practicing in LTCFs were selected as the target study population in this investigation.

3.3 INCLUSION CRITERIA

Inclusion criteria for both the quantitative survey and the qualitative interviews were as follows: Participants must have practiced medicine (i.e., provided direct care) within a Canadian LTCF within the past 24 months.

3.4 PHASE I: THE QUANTITATIVE SURVEY

3.4.1 Recruitment

Participant recruitment was carried out using three methods: (i) Through an electronic mailing list (known as a "Listserv" which can be subscribed to via an email address,[161]) for run by the Long Term Care Medical Directors Association of Canada; (ii) Recruitment at scientific conferences that targeted family physicians and/or long-term care clinicians; (iii) Recruitment through the personal contacts and networks of the principal investigator (MW), co-investigator (JS), and physician knowledge user (MK).

3.4.1.1 Long-Term Care Medical Directors Listserv

(I) The LTCMD Listserv membership is comprised of Canadian LTC medical directors located across the country. The purpose of the Listserv is to share information and experiences related to their clinical and administrative LTC work, where many serve as Director of Professional Services. An invitation to participate in the study that included a link to the electronic survey was distributed through the LTCMD Listserv with the help of the Listserv administrator. An email from the Listserv administrator was sent to all Listserv members in order to introduce them to the project and included: (i) a formal letter from the project's principal investigator, Dr. Machelle Wilchesky, inviting the medical directors to participate in the study by recruiting their respective LTCF physicians; and (ii) an additional letter from Dr. Wilchesky that was addressed to the individual LTCF physicians, inviting them to participate in the study by completing the survey (Appendix 2). The medical directors from the listserv were asked to distribute the survey to their respective LTCF physicians by forwarding a second letter of invitation that contained the survey link through their network(s) (Appendix 3).

A modified version of the Dillman Method, an approach that utilizes personalized recruitment materials and scheduled follow-up communication with non-respondents to increase response rates, was used during the recruiting process.[162] Survey recruitment was personalized in the following ways: (i) invoking a sense of community when addressing the Listserv members (i.e., "Dear Fellow LTCMD Listserv Member"); and (ii) including the principal investigator and student co-investigator's name and email address on all communication and surveys. The communication schedule was as follows: (i) an initial email introducing the project to the Listserv administrator and inviting them to collaborate; (ii) an introductory email to individuals serving as the gatekeepers for recruitment (i.e., Directors of Professional Service, Listserv members). A copy of the email that was sent can be found in Appendix 2; (iii) an email to prospective participants (i.e., LTC physicians) with a link to the electronic survey (See Appendix 3). Listserv members were asked to forward the recruitment letter to potentially eligible LTCF physicians and were also invited to complete the survey themselves, if eligible; (iv) a follow-up email sent to the recruitment gatekeepers approximately one month after the initial email to the Listserv. The follow-up email aimed to remind those that had not yet distributed or taken the survey and to thank those who had (See Appendix 4).

3.4.1.2 Scientific Conferences

(II) LTC physicians were recruited in-person at the following three scientific conferences: (i) the Ontario Long-Term Care Clinician Conference (OLTCC) in Toronto, Ontario on October 23rd, 2016; (ii) the North American Primary Care Research Group (NAPCRG) Annual Meeting in Colorado Springs, Colorado from November 12-16, 2016; and (iii) the Family Medicine Forum (FMF) in Vancouver, British Columbia from November 9-12, 2016.

Recruitment at the OLTCC was conducted during two consecutive workshops on AP deprescribing guidelines given by Dr. Lise Bjerre of University of Ottawa. The objectives of the workshop were to outline the spectrum of appropriate and inappropriate AP use, describe a recently developed AP deprescribing guideline,[163, 164] and engage in case discussions with workshop attendees. With the permission of Dr. Bjerre, the workshop facilitator, the student (MP) was allotted time at the end of the workshops to promote the survey and recruit LTC physicians in attendance. Prospective participants were invited to either complete a paper-

version of the survey on-site, or to access the electronic version online at time that was convenient for them. A recruitment postcard that contained the survey URL (abbreviated by a URL shortener) was given to physicians who preferred to complete the survey online at a later time (See Appendix 5).

Recruitment at the NAPCRG annual meeting occurred formally during the student's (MP) poster presentation on the research protocol for the thesis research. A QR code and shortened URL for the electronic survey were added to the poster in order to help recruit prospective participants at the poster session. Recruitment postcards (Appendix 5) and hard copy surveys were available were also available during the poster session and were distributed throughout the span of the conference as part of informal recruitment.

3.4.1.3 Personal Networks

Recruitment through personal networks was jointly conducted by the student (MP), principal investigator (MW), co-investigator (JS), and physician knowledge user (MK). Drawing on professional contacts and networks, this mode of recruitment occurred primarily via email. Prospective participants were put in contact with the student (MP), who offered to answer any additional questions regarding the survey or the overarching project before providing the electronic survey link.

3.4.2 **Survey Development**

The framework proposed by Anderson and colleagues' in their 2014 systematic review and thematic synthesis of prescriber barriers and enablers to minimizing potentially inappropriate medications in adults served as an initial conceptual foundation for the first draft of the survey.[32] Previously published research regarding factors influencing LTC AP prescribing was used to populate the first iteration of the survey.[29, 165, 166] We hypothesized, based on the literature and the expertise of the thesis committee members, that: (i) physicians will perceive nurses' inability (either because of resources or reluctance) to implement non-pharmacological strategies as a barrier to AP deprescribing; and (ii) physicians will perceive potential harm resulting from AP medication discontinuation as a barrier to AP deprescribing.

The study co-investigator and knowledge user (MK), who is also a Quebec LTC physician, assisted in revising the initial iteration of the survey to ensure that the content and language was relevant and appropriate to AP deprescribing in LTC. All co-investigators (MW, JS, MK) were involved in subsequent refinements and iterations. The survey was pilot tested and further refined on a Quebec LTC physician not related to the project before the survey was finalized. The survey was developed in English and professionally translated to French in order to best reach Canada's bilingual population.

3.4.3 **Study Instrument**

The final iteration of the survey also included questions that asked about 14 potential barriers and 6 potential facilitators associated with AP deprescribing in this setting, an open-ended question asking about additional barriers and/or facilitators, participant demographics, and questions to verify that prospective participants met the inclusion criteria.

The response format for the main outcomes, potential barriers (including the two hypothesis variables found in the "Survey Development" section), and potential facilitators was a classic 5-point Likert Scale.[167] Likert scales using the 5-point and 7-point format have greater reliability and validity than those with fewer scale points; those with greater scale points (i.e., 7+) do not improve reliability and validity. Likert scales using the 10-point format produce slightly lower mean scores compared to 5-point and 7-point Likert scales but no difference is observed with regard to variances about the mean, suggesting that all three formats are equally well-suited to data-collection for regression analysis.[168]

The survey began with two questions that served as the main outcomes: (i) "How difficult is it to resist requests to initiate AP medications?" and (ii) "How difficult is it to deprescribe AP medications?" These questions were chosen as the main outcome variables in an attempt to encapsulate both aspects of appropriate prescribing: judicious initiation and tapering/discontinuation, respectively. Survey respondents were asked to answer the main outcome questions using a 5-point Likert scale: a "5" indicated that it is extremely difficult to engage in the deprescribing process, a "4" that it is highly difficult, "3" that it is somewhat difficult, "2" that it is minimally difficulty, and a "1" indicated that it is not difficult to engage in the deprescribing process.

From the survey development process, 14 potential barriers to AP deprescribing were generated. The barriers were grouped into four categories:

1. Time-related factors (time required to investigate if AP medications are indicated or continue to be appropriate for newly admitted residents/patients, time required to actively pursue AP reduction or cessation for current residents/patients);
2. Nurse / care team factors (pressure from front-line staff, insufficient care staff resources to implement non-pharmacological management strategies, care team unaware of risks associated with AP use in LTC patients/residents, care team reluctance to pursue non-pharmacological treatment alternatives);
3. Resident-level factors (concern that behavioral problems will emerge or resume, pressure from family members [either to initiate AP therapy or not to deprescribe]); and
4. Other factors (lack of incentives to reduce APs in symptomatically stable residents, unavailable or poor clinical documentation to justify indication for an AP, reluctance to question a colleagues' previous prescribing decision, irregular medication reconciliation or medication reviews, lack of pharmacological alternatives to APs, lack of access to mental health specialist consultants [e.g., geriatric psychiatrists]).

Similar to the main outcome survey questions, respondents were asked to rate each potential barrier using a 5-point Likert scale, where: a "5" indicated that the item is an extreme barrier to deprescribing, a "4" that it is a strong barrier, "3" that it is somewhat of a barrier, "2" that it is a minimal barrier, and a "1" indicated that it is not a barrier.

A list of potential facilitators to AP deprescribing was also developed, resulting in a total of six potential facilitator items. Facilitators included: mandatory periodic medication reviews and/or medication reconciliation for residents/patients, access to mental health support services, nurses/care team educated on the risks of AP use in LTC residents, nurses trained in non-pharmacological management strategy alternatives, physician education/training regarding the risks associated with AP use by LTC residents, physician education/training regarding non-pharmacological alternatives to AP medication prescribing for resident behaviors. Facilitators were not grouped by category. Similar to questions pertaining to barriers, a 5-point Likert scale was also used for facilitators, where: a "5" indicated that the item is an extreme deprescribing

facilitator, a “4” that it is a strong facilitator, “3” that it is somewhat of a facilitator, “2” that it is a minimal facilitator, and a “1” indicated that it is not a facilitator and does not help the physician engage in the AP deprescribing process.

In addition, six supplemental questions were also developed. The first supplemental question was an open-ended question that allowed for respondents to add a barrier or facilitator not already contained within the survey. If a barrier or facilitator was added, respondents were asked to rank the new item using the same 5-point Likert scale used throughout the survey. The remaining five supplemental questions that were included were as follows: (i) how often do you receive Continuing Medical Education (CME) credits for long-term care relevant topics? (5 multiple choice answer options ranging from “never” to “at least once every month”); (ii) do the barriers and facilitators discussed in this survey vary by units that have specialty care? (yes or no); (iii) do front-line staff (i.e., nurses) at your LTCFs have training in the management of the behavioral and psychological symptoms of dementia? (yes or no); (iv) are AP prescriptions automatically renewed without writing a renewal prescription at your LTCF? (yes or no); (v) in your opinion, if a policy was implemented whereby it was required to manually issue renewal prescriptions, would the rates of AP use fall in your facility? (yes or no).

Finally, nine questions pertaining to respondent demographics were included at the end of the interview guide, five of which related to survey respondent characteristics: (i) gender (female, male, other); (ii) province or territory (open ended); (iii) primary clinical specialty (general practice, family medicine, geriatrics, internal medicine, other [open ended]; (iv) number of years in clinical practice; and (v) number of years practicing medicine in LTC. The remaining four items asked about the characteristics of the LTCF where the survey respondent spends the most time engaged in LTC clinical work. These items included: number of hours per week on call, number of patients under care; number of patients seen each week; and LTCF setting (rural or urban).

3.4.4 **Study Objectives**

The three primary objectives of the study were to:

1. Quantify the difficulty physicians experience when attempting to resist AP initiation requests and taper/withdraw APs for LTC residents;
2. Identify and quantify barriers associated with appropriate AP prescribing and deprescribing for LTC patients with dementia in Canada that physicians face.
3. To identify and quantify the facilitators associated with appropriate AP prescribing and deprescribing for LTC patients with dementia in Canada that physicians face.

Our secondary objective was to obtain an in-depth and rich understanding of how these barriers and facilitators unfold in clinical practice.

3.4.5 **Data Collection**

The paper version of the survey was available at the scientific conferences that served as recruitment sites. The paper survey was adapted to an electronic format using LimeSurvey, a free open source web software survey tool.[169] The electronic survey was accessible by hyperlink and self-administered. Electronic survey invitations were distributed by email in two waves (initial and follow-up) over a two-month-long period, in accordance with the modified version of the Dillman approach that was utilized to enhance response rates. The finalized survey and consent form can be found in Appendix 6.

3.4.6 **Ethics**

Participants who completed the hard-copy survey were required to sign a consent form before beginning the survey. The landing page for the electronic survey served as the consent form; at the bottom of the consent page, potential participants were directed to only click 'next' and proceed with the survey if they were providing their consent to do so. All responses were anonymous. The Institutional Review Board of the McGill University Faculty of Medicine approved this study (Ethics Certificate Number: A09-E60-16B).

3.4.7 **Data Analysis**

Descriptive analyses were performed to generate an initial report of the survey results. Inferential analyses were then conducted to more thoroughly assess the determinants of the main outcomes and hypotheses.

In a first analysis, descriptive statistics were produced in order to evaluate the demographic characteristics of survey respondents and to determine the ranking (mean and standard deviation) of the main outcomes, potential barriers, and potential facilitators.

In the next step, logistic regression models were assessed using the two study outcomes as dependent variables and the set of barriers, facilitators, and demographic survey items as quasi-continuous, independent variables.

The two outcome variables were dichotomized into two response classes based the item score:

1 – 3 (zero to some difficulty resisting initiation requests or deprescribing; or

4 – 5 (high to extreme difficulty resisting initiation requests or deprescribing)

Our two study hypotheses were: (i) Physicians will perceive nurses' inability to implement non-pharmacological strategies as a barrier associated with AP deprescribing; and (ii) Physicians will perceive potential harm resulting from medication discontinuation as a barrier to AP deprescribing. The barriers and facilitators were also dichotomized into the same response classes: 1 – 3 (not a barrier or facilitator to somewhat of a barrier or facilitator) or 4 – 5 (high to extreme barrier or facilitator). Potential confounding between the main outcome and variables pertaining to our hypothesized exposures (i.e. nursing pressure and concern for symptom reemergence) and survey items was also assessed using verification of change in estimates of effect. Variables with an estimate of effect that changed by more than 10% were added to the multivariable model.

Our first set of multivariable analyses used modified Poisson regression modeling to determine the odds of scoring either 4 or 5 (i.e., a moderate to extreme barrier or facilitator) for each of the barriers and facilitators. The Quasilikelihood under the Independence model Criterion (QIC) was used to assess model fit and determine the most parsimonious model.[170] The model was assessed for strong linear dependencies among the explanatory variables (i.e., multicollinearity) using a variance inflation factors.[171]

Logistic regression is suitable for obtaining an adjusted odds ratio that approximates the adjusted relative risk when disease incidence is rare (I.e., <10%), while adjusting for potential

confounders.[172] Given that the proportion of physician respondents who rated having high to extreme difficulty deprescribing exceeded 10%, a modified Poisson regression model was used to obtain adjusted measures of relative risk (RR) with robust standard errors (and corresponding confidence intervals .[173]

Finally, factor analysis was performed in order to identify how the barriers may group together in the clinical setting. All analyses were conducted using SAS (v9.4) and SPSS (v20).

3.4.8 Power Calculation

In order to determine the optimal sample size for our investigation we performed a statistical power analysis using the free software GPower 3.1.[174, 175] Power analysis assumed use of a logistic regression model, given that we had planned to dichotomize our main outcomes pertaining to difficulty resisting AP initiation requests and difficulty deprescribing APs. Independent variables for logistic modeling were the potential barriers and facilitators. The following assumptions were used to calculate the minimum sample size: (i) a statistical power of at least 90%; (ii) an odds-ratio of 2.33 (e.g., corresponding to a 50% of respondents for whom independent variable X is not a barrier to engage in deprescribing versus 75% of respondents for whom the independent variable X is a barrier); and (iii) a p-value of 0.05 for the statistical threshold. Based on these assumptions, the statistical power calculations yielded a minimum sample size of 61 individuals (for a statistical power of 90%) or 78 individuals (for a statistical power of 95%). The power plot for these calculations is presented in Appendix 7.

3.5 PHASE II: QUALITATIVE METHODS

3.5.1 Instrument Development

As per the explanatory sequential design, the Phase II interview guide was developed using the results of the quantitative phase. The guide was structured to include the highest rated (mean) individual barrier from each barrier category: Nurse/Care Team, Resident Level Factors, Time Constraints, and Other Factors. The next section on facilitators asked respondents whether the highest rated (mean) individual facilitator from the survey improved their ability to appropriately prescribe or deprescribe APs, as there were no categories for facilitators. The interview guide began by asking respondents whether a given barrier impedes their ability to

appropriately prescribe or deprescribe APs. Each question contained a follow-up prompt for the interviewer to ask interviewees to explain why they either do or do not experience a given barrier or facilitator as being an impediment or helpful, respectively. This allowed for rich descriptions of clinical contexts where highly rated barriers were problematic but also provided valuable insight into the experience of clinicians who do not perceive these barriers to exert significant influence on their AP (de)prescribing efforts. The question related to the highest-rated facilitator also utilized this follow-up prompt approach. The inclusion criteria-check question and demographic questions from Phase I were placed at the end of the interview guide.

The interview guide was pilot tested with the LTC physician knowledge user (MK) and revised in conjunction with all study co-investigators (MW, JS, MK). As a result of the revisions, two additional questions were added to the interview guide. The first additional question was related to the role of family members as potential barriers to deprescribing. Although the individual barrier related to family members was not the most highly rated in its respective category in the survey, the co-investigators believed that the role of family members was nonetheless important and worthy of adding to the interview guide. The other question that was added asked participants to assist in interpreting an unexpected result from the quantitative survey indicating that reported difficulty in resisting requests to initiate AP medications differed by gender. The interview guide was professionally translated to French.

3.5.2 Ethics

Due to the explanatory sequential design (i.e., the interview guide development was informed by the results of the survey), it was not possible to submit a finalized version of the interview guide during the initial ethics submission. Upon finalization of the interview guide, an ethics amendment was sent to, and approved by, the Institutional Review Board of the McGill Faculty of Medicine.

Before each interview, a consent form was read aloud, and participants were required to provide their verbal consent to participate before continuing with the interview (See Appendix 8). Interviews were confidential and anonymized during transcription. The digital

audio-recordings of the interviews and corresponding notes were password protected. All files were stored within a secure research office.

3.5.3 Recruitment

According to our protocol, we had permission to recruit participants in three ways for Phase II:

(I) Phase I Follow-Up. At the end of the survey, participants were asked if they would be interested in participating in a follow-up interview (i.e., Phase II). Interested participants were asked to provide their email address and province of practice in order to facilitate follow-up and to mitigate geographic clustering in Phase II. A recruitment letter was then sent to all survey respondents who had provided their email address during Phase I from the principal investigator and student (See Appendix 9).

(II) Recruiting Through Personal Networks. Recruitment was jointly conducted by all co-investigators (MW, JS, MK) by drawing on professional contacts and networks, via email. Prospective participants were put in contact with the student (MP) to answer any questions and to finalize interview meeting details.

(III) Snowball Sampling. Snowball sampling, a subset of network sampling, was also used.[176] Participants who were contacted via email as part of the Phase I follow-up mode of recruitment were asked to refer potentially eligible colleagues to the student (MP).

Given the high rate of Phase I participant interest, only the first option for recruitment was pursued.

3.5.4 Data Collection

The qualitative phase of this research collected data using semi-structured, individual interviews conducted via phone. Interviews were audio-recorded with two devices (one primary and one backup) and transcribed with the assistance of NVivo.[177]

The interview guide was structured to inquire about main findings from the survey results. As such, it included questions concerning: (i) the most highly rated barrier item from each barrier category (time constraints, nurse / care ream, resident-level, and other factors); (ii) the specific role of resident family members play in the process; (iii) the survey result that

female physicians experienced more difficulty resisting requests to initiate APs, (iv) an open-ended question allowing the interviewee to discuss any barriers not mentioned, (v) the most highly rated facilitator item, (vi) an open-ended question allowing the interviewee to discuss any facilitators not mentioned, and (vii) the demographic questions used in the Phase I survey. See Appendix 8 for the finalized interview guide.

3.5.5 Data Analysis

Interviews were coded using thematic analysis.[178] The goal of thematic analysis is to "identify, analyze and report patterns (themes) within data".[179] Inductive coding, a form of coding that consists of "detailed readings of raw data to derive concepts, themes, or a model through interpretations made from the raw data", was employed as this allowed for the creation of themes specific to the context of AP prescribing in LTC.[180] Inductive coding borrows the method of *constant comparison* and the concept of *data saturation* from the methodology of grounded theory.[181]

Qualitative data analyses followed Braun & Clarke's six steps for thematic analysis.[179] In order to improve reliability, an independent coder (SB) reviewed and met with the primary coder (MP) to discuss and revise themes after coding every two transcripts. In addition, consultation with the investigator team took place throughout the analysis of data for this phase. A virtual *double coding* is achieved through this consultation process by providing opportunities to discus, adjust, and strengthen codes and themes as an investigator team. For example, when strong agreement on codes and themes is observed, it is considered that multiple coders have come to a consensus; disagreements were resolved by consensus after consulting with the investigator team to discuss codes and themes. Consultations also allowed for "member-checking"[182] with the physician Knowledge User (MK), who has insight matching that of the study participants. NVivo (v11) was used to organize and analyze the Phase II data.[177]

CHAPTER 4: MANUSCRIPT

4.1 PREFACE TO MANUSCRIPT

This section represents a manuscript intended for future publication. The references and table numbers are ordered in accordance with previous thesis sections, given that the manuscript is integrated within the thesis. Greater detail regarding the methods and results can be found in Chapters 3 and 5, respectively.

The manuscript presents the main findings from this mixed method research, which sequentially incorporated quantitative cross-sectional and qualitative descriptive methodologies in order to answer the following research questions:

1) What are the barriers and facilitators associated with antipsychotic deprescribing, from the perspective of physicians working in Canadian LTCFs?
2) How do these barriers and facilitators affect physicians' ability to appropriately prescribe and deprescribe antipsychotics in this setting?

The manuscript should be referenced as follows:

> Peretti, M., Salsberg, S., Karanofsky, M., K., Ballard, S.A., Lungu, O., and Wilchesky, M. Barriers and Facilitators Associated with Antipsychotic Deprescribing for Residents with Dementia in Long-Term Care: A Mixed Methods Study. Unpublished manuscript. Montreal: Department of Family Medicine, McGill University, 2016.

4.2 MANUSCRIPT ABSTRACT

Purpose: Off-label antipsychotic (AP) prescribing for the management of the neuropsychiatric symptoms of dementia in long-term care (LTC) is prevalent despite clinical guidelines and decades of evidence cautioning against this practice. The objectives of this study were to: (1) Quantify the degree of difficulty physicians experience when attempting to resist AP initiation requests and taper/withdraw APs for LTC residents; (2) Identify and quantify physician barriers and facilitators associated with AP deprescribing for LTC residents with dementia in Canada; and (3) Obtain an in-depth and rich understanding of how these barriers and facilitators unfold in clinical practice.

Methods: A two-phase, explanatory sequential mixed methods design was used. First, a cross-sectional quantitative survey identified potential barriers and facilitators associated with both resisting AP initiation requests and tapering or discontinuing existing AP prescriptions. Multivariable logistic regression models were used to identify survey items associated with the main outcomes. Important barriers and facilitators were then explored in semi-structured interviews with survey respondents. Interview transcripts were coded using thematic analysis.

Results: Multivariable analyses revealed that difficulty resisting AP initiation requests was associated with pressure from nursing staff (RR = 2.35; 95% CI, 1.01 - 5.51), reluctance to question a colleagues' decision to prescribe APs (RR = 2.45; 95% CI, 1.16 - 5.16), lack of access to mental health specialist consultants (RR = 2.51; 95% CI, 1.25 - 5.03), and was more common among physicians who identify as female (RR = 3.67; 95% CI, 1.44 - 9.39). No variables were significantly associated with difficulty deprescribing APs. The thematic analysis highlighted the importance of communicating with families, and how limited LTC resources serve to reinforce the maintenance of AP prescriptions due to concern regarding symptom re-emergence.

Conclusions: Our survey results contribute to the LTC AP deprescribing literature by adding the much-needed physician perspective with regard to specific barriers and facilitators. The follow-up interviews provide a nuanced understanding of complex interplay between physicians and the LTC milieu, and how these forces can both inhibit and assist physicians' deprescribing efforts. Future interventions would benefit from adopting a multifaceted approach that accounts for each facility's context and the perspectives of its various stakeholders.

4.3 MANUSCRIPT OR PUBLICATION

Barriers and Facilitators Associated with Antipsychotic Deprescribing for Individuals with Dementia Residing in Long-Term Care as Reported by Physicians: A Mixed Methods Study

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Abbreviations:
AP: Antipsychotic Medication **LTC:** Long-Term Care
LTCF: Long-term Care Facility **NPS:** Neuropsychiatric Symptoms

4.3.1 Introduction

Antipsychotic (AP) medications are commonly prescribed to manage neuropsychiatric symptoms (NPS) in patients diagnosed with dementia.[4, 5] Neuropsychiatric symptoms (NPS), also known as the behavioral and psychological symptoms of dementia, constitute a wide range of symptoms that include: agitation, aberrant motor behavior, anxiety, elation, irritability, depression, apathy, disinhibition, delusions, hallucinations, and sleep or appetite changes. [46, 47] AP medications, however, are not approved or indicated for the symptomatic management of aggression and/or psychosis in patients with dementia (with the exception of short-term use of Risperidone in Canada).[24, 75-77] Off-label AP prescribing for agitation and aggression behaviors in long-term care facility (LTCF) residents with NPS is problematic for several reasons: (i) AP medications are only modestly effective in reducing NPS[7, 87, 88] ; (ii) the use of APs in this population is associated with severe negative health outcomes, such as increased risk of falls, cerebrovascular events, and mortality[7, 87, 88]; and (iii) contrary to clinical practice guideline recommendations,[64-66, 89, 90] AP medications are often used as first line-therapy for NPS management.[4, 5]

Deprescribing is the process of tapering or discontinuing drugs in situations where potential risks outweigh potential benefits. Deprescribing is embedded within the framework of appropriate prescribing and the "good prescribing continuum" (i.e., drug therapy initiation, titration, medication regimen modification, deprescribing).[145, 146] The continued practice of AP prescribing for the management of NPS in LTC residents despite the accumulated body of evidence against this practice is suggestive of barriers to appropriate AP prescribing in clinical practice. Though interventions to reduce inappropriate AP prescribing in LTC have been ongoing for approximately 30 years, APs continue to be overprescribed, for reasons unknown. Canadian guidelines suggest that physicians should consider deprescribing APs once residents have been behaviorally stable for 3 months.[66, 183]

The barriers and facilitators associated with appropriate AP prescribing and deprescribing for older adults with dementia living in LTC have not been thoroughly researched. In the growing but modest literature on this topic, the physician perspective is largely absent. Uncovering these barriers and facilitators, as reported by LTC physicians, is essential to

understanding why AP prescribing rates remain so high. Furthermore, elucidating these understudied factors is a necessary first step towards improving AP prescribing rates in this setting, and can contribute to the development of sustainable deprescribing interventions.[30, 31]

4.3.2 Methods

We conducted a mixed method study that utilized a two-phase explanatory sequential design.[33] The first phase consisted of a cross-sectional, self-administered, mixed-mode survey that was followed by semi-structured interviews. To be included, participants had to be physicians who had practiced medicine (i.e., provided direct care) at a Canadian LTCF within the past 24 months. Ethical approval for this study was obtained by the Institutional Review Board of the McGill University Faculty of Medicine (Certificate Number: A09-E60-16B).

4.3.2.1 Phase I: Quantitative Survey

Recruitment

We recruited participants both at scientific conferences that targeted physicians who were likely to practice in the LTC setting, and through an electronic mailing list (i.e., Listserv)[161] of Canadian LTCF medical directors. The listserv administrator distributed an email to all members to introduce the project, which included a recruitment letter containing the electronic survey link. The group of listserv medical directors was encouraged to forward this letter of invitation to practicing physicians at their respective LTCFs.

Questionnaire Development

The framework proposed in Anderson and colleagues' 2014 systematic review and thematic synthesis of prescriber barriers and enablers to minimizing potentially inappropriate medications in adults served as the conceptual foundation for the survey.[32] Previously published research on the factors influencing LTC AP prescribing was used as the basis of the first iteration of the survey.[29, 165, 166] A LTC physician co-investigator (MK) assisted in pilot testing and survey revisions to ensure that the content and language was relevant and appropriate to the target population. On the basis of this, we generated 14 barriers and 6 facilitators. The survey was developed in English and professionally translated to French given Canada's bilingual population.

Instrument

The survey aimed to obtain information about the two main questions of interest: whether it was difficult to resist AP initiation request, and whether it was difficult to taper or withdraw APs for residents who were currently using them. The final iteration of the survey also included questions that asked about 14 potential barriers and 6 potential facilitators associated with AP deprescribing in this setting, an open-ended question asking about additional barriers and/or facilitators, participant demographics, and questions to verify study inclusion. We asked physicians to rate their difficulty associated with both resisting AP medication initiation requests and deprescribing on a 5-point Likert Scale, where "1" indicated that the barrier (facilitator) did not make it difficult (easier) to deprescribe/resist initiating APs and a "5" indicated that this factor was an extreme barrier (facilitator). All other survey items used this response format, with the exception of the demographic items and the open-ended question which asked participants to share information about any additional barriers and facilitators that they encountered in their clinical practice.

Analysis

Descriptive statistics pertaining to demographic characteristics of survey respondent were calculated, and score rankings for study main outcomes as well as potential barriers and facilitators were analyzed. Modified Poisson regression models[173] were used to identify factors associated with our two main outcomes where outcome variables were dichotomized into two response classes based on whether the item ranking score was 1 – 3 (zero to some difficulty) or 4 – 5 (moderate to extreme difficulty). Barriers and facilitators were similarly dichotomized: a ranking of 1 – 3 (not a barrier/facilitator to somewhat of a barrier/facilitator) or 4 – 5 (moderate to extreme barrier/facilitator). The Quasilikelihood under the Independence model Criterion (QIC) was used to assess model fit and determine the most parsimonious model.[170] Confounding variables were included if the change in estimate of effect was equal to or greater than 10% when examining bivariate associations between survey items and main outcomes. The model was assessed for strong linear dependencies among the explanatory variables (i.e., multicollinearity) using variance inflation factors.[171] Finally, factor analysis was conducted to

identify how the barriers may group together in the clinical setting. All analyses were conducted using SAS (v9.4) and SPSS (v20).

4.3.2.2 Phase II: Qualitative Interviews

Recruitment

Participants were asked to provide their email addresses at the end of the quantitative survey if they were interested in participating in a follow-up interview. A recruitment letter was sent to all respondents who indicated interest.

Instrument

The interview guide was structured to inquire about main findings from the survey results. As such, it included questions concerning: (i) the most highly rated barrier item from each barrier category (time constraints, nurse / care ream, resident-level, and other factors); (ii) the specific role that resident family members play in the AP (de)prescribing process; (iii) the survey result that female physicians experienced more difficulty resisting requests to initiate APs, (iv) an open-ended question allowing the interviewee to discuss any barriers not mentioned, (v) the most highly rated facilitator item, (vi) an open-ended question allowing the interviewee to discuss any facilitators not mentioned, and (vii) the demographic questions used in the Phase I survey. The questions related to gender and the role of family members were added after pilot testing the interview guide with the LTC physician co-investigator (MK). Once finalized, the interview guide was professionally translated into French.

Analysis

We conducted a thematic analysis using qualitative description[184] to analyze the transcripts generated from the audio recordings of the interviews. Inductive coding was used as this allowed for the creation of themes specific to the context of AP prescribing in LTC. In order to improve reliability, an independent coder (SB) reviewed and met with the primary coder (MP) to discuss and revise themes after coding every two transcripts. A coding meeting between all co-authors took place at the end of the coding process to finalize themes.

4.3.3 Results

4.3.3.1 Phase I: Quantitative Survey

A total of 85 individuals participated in the quantitative survey. Of these, 62 respondents (73%) met the inclusion criteria and were retained for analyses (4 physicians had not practiced medicine in the past 24 months and 18 respondents were not practicing physicians, and 1 survey was incomplete). Respondents were largely family physicians (73%) practicing in urban settings (86%), were more often male (56%), and had a number of years of experience both in clinical practice and long-term care (Table 1). Resisting requests to initiate APs and deprescribing APs for patients using these medications was reported as being either very or extremely difficult in 26.2% and 14.7% of respondents, respectively (Table 2). In general, barriers involving the nurse/care team were reported as being the most challenging with respect to physicians' overall AP deprescribing efforts (mean score of 3.5 out of 5 for this category). Of the 14 total individual barriers, "insufficient care staff resources to implement non-pharmacological alternatives to APs" was the highest (Mean = 4.05, SD = 1.09, 95% CI 3.77 - 4.33; Table 3). The highest ranked facilitator was having nurses trained in non-pharmacological management strategy alternatives (Mean = 4.28, SD =1.27, 95% CI 3.95 - 4.60; Table 3).

The multivariable robust Poisson model results for Main Outcome 1 indicate that physicians who experienced difficulty resisting AP initiation requests were more likely to identify as female (RR = 3.67; 95% CI, 1.44 - 9.39), rate pressure from front-line staff (RR = 2.35; 95% CI, 1.01 - 5.51), were more reluctant to question a colleagues' previous prescribing decision (RR = 2.45; 95% CI, 1.16 - 5.16), and lacked access to mental health specialist consultants (RR = 2.51; 95% CI, 1.25 - 5.03). They were also less likely to report having the time required to investigate if AP medications are indicated or continue to be appropriate for newly admitted residents as a barrier (RR = 0.21; 95% CI, 0.07 - 0.61) (Table 4, Model 1). Although adding years of LTC experience to the model did change the female estimate of effect by 9%, neither adding this variable nor total years of overall clinical experience to this model significantly changed this result related to gender (Table 4, Models 2 and 3). In models where difficulty deprescribing was the dependent variable (Main Outcome 2), pressure from family

members was the only variable significant in crude analyses (RR = 4.10; 95% CI, 1.14 - 14.73; not shown) but this effect was no longer significant when any other variables were added.

Exploratory factor analysis yielded five factors that cumulatively explained 71.17% of the total variance, with the first factor (Work Environment) accounting for 31.9%. Based on variable loading, the factors were: “Work Environment” (Factor 1), “Time Constraints” (Factor 2), “Maintaining Status-Quo” (Factor 3), “Physician Perception of LTCF Staff AP Knowledge” (Factor 4) and “Pharmacological Considerations” (Factor 5) (Table 5).

The ROC analysis revealed that only “Work Environment” (Factor 1) and “Time Constraints” (Factor 2) had a significant discriminating power for difficulty resisting AP initiation requests and difficulty deprescribing APs in patients currently using them, respectively (area under the curve – AOC = 0.68, asymptotic p-value = 0.03 for Factor 1/Main Outcome 1 and AOC = 0.72, asymptotic p-value = 0.04 for Factor 2/Main Outcome 2).

4.3.3.2 Phase II: Qualitative Interviews

From the 62 survey respondents who met the inclusion criteria, 29 provided email addresses in order to be contacted for the Phase II follow-up interviews. We contacted all 29 prospective participants, resulting in 9 (31%) interviews. The demographic characteristics of the included participants for Phase II can be found in Table 6.

4.3.3.2.1 Barriers

Our analysis of the interviews resulted in the generation of 6 barrier themes, derived from 17 sub-themes (Table 7).

4.3.3.2.1.1 Insufficient Resources

The most prevalent theme, “insufficient resources”, was characterized by physicians citing a lack of resources (e.g., staffing, training, lack of pharmacological alternatives, access to specialists, and funding) as an important barrier to their AP deprescribing efforts. Insufficient staffing levels and training in non-pharmacological NPS management strategies were particularly difficult barriers: “*I think that, to a certain extent, it helps to have more people*

available, but the other [barrier] *is the training component so that they are comfortable working with the behaviors and understanding what the responsive behaviors are*."

4.3.3.2.1.2 Aggressive Behavior

When residents displayed aggression or had a history of violence, physicians experienced more difficulty deprescribing APs. APs were viewed as a last resort for violent behaviors that are unresponsive to other management strategies, particularly when the behavior either puts nurses at risk of harm or the resident at risk of traumatizing events like hospitalizations of the involvement of facility security.

4.3.3.2.1.3 Family Members of LTC Residents

While the majority of family members were not a barrier to deprescribing, physicians reported that those who did oppose deprescribing were a particularly difficult barrier to overcome. Owing to the communication difficulties associated with dementia, family members often play a significant role in the resident's medical care. Family members who resist AP tapering or discontinuation are often fearful that their loved one will be destabilized: "*But there are a lot of* [family members] *who say, 'Mom is stable, she's happy, we're happy, we're not getting phone calls, don't change anything. Don't do anything.'"* Additionally, family members may pressure physicians to prescribe in order to alleviate the resident's behavioral symptoms (e.g., yelling, aggression).

4.3.3.2.1.4 Limited Time of Physicians

Some physicians reported that a shrinking population of LTC physicians has led to increased patient workloads and complex care issue management that is progressively conducted via phone while physicians are on-call. Even when physicians were able to be on-site, they found it difficult to deprescribe or to investigate possible underlying triggers for NPS (e.g., untreated pain) after performing their essential clinical duties. Physicians also reported that time constraints made it difficult for them to discuss AP deprescribing with family members and nurses, both of whom wield significant influence with regard to deprescribing:

"*Currently it's* [time constraints] *terrible. So if a physician is going to be there a half a day a week, looking after 35 patients… that's one every five and a half minutes… tell me what sort of evaluation you can do in five and a half minutes?"*

4.3.3.2.1.5 Institutional Challenges

Physicians reported that the LTC environment itself is often stressful for residents due to harsh lighting, loud settings, and shared spaces, which can lead to or intensify agitation and aggression. As a result, physicians felt that nurses or family members may request AP medication for the resident or may pose greater resistance to their deprescribing attempt(s). Physicians also discussed how the widely used institutional model of care, rather than a patient-centered model, can result in what amounts to essentially supervisory care and may foster a risk-averse attitude in the LTCF that makes it more difficult for physicians to deprescribe. An institutional challenge reported by physicians was the balancing act required to maintain a trusting, respectful dynamic between the physician and their nursing team. This dynamic can become strained when physicians attempt to deprescribe APs without nurse buy-in, given the strong leadership role that nurses often hold in LTCFs.

4.3.3.2.1.6 Lack of Interprofessional Collaboration

An overall lack of interprofessional collaboration, such as communication and meetings with nursing staff and other healthcare professionals, left many physicians feeling like they were operating within professional silos. This disconnect made it difficult to deprescribe APs since nurses and physicians may not share or understand each other's perspective and goals. Sub-par resident medical documentation due to poor information sharing between facilities (e.g., hospital and LTCF) was also common. Poor information sharing between facilities made it more difficult for physicians to make informed decisions regarding AP deprescribing, especially for residents recently admitted to an LTCF.

4.3.3.2.2 Facilitators

Our analysis of the interviews resulted in the generation of 9 facilitator themes, derived from 23 sub-themes (Table 8).

4.3.3.2.2.1 Physician Approach to Prescribing

Physicians recommended many approaches to prescribing and management that has helped them deprescribe APs in their own clinical practice. Overall, physicians who viewed AP prescribing as an iterative process were more likely to deprescribe. Specific approaches that were suggested included: thoroughly investigating NPS triggers (e.g., drug-drug interactions), allowing newly admitted residents to acclimate before altering their medications and gradually tapering symptomatically stable residents: *"The disease* [dementia] *progresses over time. Medication that you needed a year or two ago, you might not need now."*

4.3.3.2.2.2 Staff Trained in Non-Pharmacological NPS Management

All physicians interviewed communicated in some way that having staff trained in non-pharmacological NPS management strategies made it easier for them to deprescribe APs. Training was particularly helpful when easily available and administered to all staff members that interact with residents (nurses, orderlies, and even support staff [e.g., custodial workers]) and easily available, especially for evening and night shift staff, who are often unable to attend training sessions held during the day.

4.3.3.2.2.3 Family Members of LTC Residents

Family members were cited as a potential facilitator by nearly all participants. Physicians believed that whether a family supports AP deprescribing efforts depends on their medication philosophy (e.g., wary of polypharmacy or equation of less medication with poor care), past experiences (e.g., resident behavioral issues), and general knowledge about AP medication risks.

4.3.3.2.2.4 Administrative Support

Many physicians brought up the important role of administrative support in AP deprescribing efforts, from setting institutional priorities, facilitating staff education in dementia and NPS management, to creating dedicated positions to help nurses and physicians deprescribe (e.g., assisting nurses to implement non-pharmacological NPS management

strategies or supporting physicians with regular reviews of residents' AP medications): I guess it has to be in a sense from the top down- the organization of what we do about it: *"I think a big facilitator is having management that has a very keen understanding of appropriate* [AP] *use. Where they're interested in best practices."*

4.3.3.2.2.5 Communication

Maintaining open lines of communication between physicians, nursing staff, and families with regard to a resident's clinical care and modifications to their AP medication regimen was an important facilitator.

4.3.3.2.2.6 Specialized Support Staff

Physicians emphasized the importance of specialized support staff (e.g., geriatric psychiatrists, nurse clinicians) and how this support can augment their deprescribing capabilities. Psychogeriatric support can not only help physicians manage residents exhibiting difficult behavioral issues, it can also provide an opportunity for physicians to learn from specialists and apply this knowledge to their own future clinical work. Psychiatric nurses or nurse clinicians can also act as a facilitator by providing non-pharmacological NPS management strategy recommendations and assistance to front-line nursing staff, which in turn facilitates physicians' AP deprescribing efforts.

4.3.3.2.2.7 Interprofessional Support

Working collaboratively (e.g., holding regular team meetings, building trusting relationship) with other LTC medical professionals, such as health care aides, recreational therapists, and particularly pharmacists, was viewed as integral to successful deprescribing.

4.3.3.2.2.8 Drawing on Other Successful Interventions

Physicians felt that it was important to either adopt or draw on components of existing successful AP deprescribing interventions, rather than working from scratch.

4.3.3.2.2.9 Patient Medical Record Documentation

High quality, easily available patient medical record documentation was mentioned as a facilitator, as this allowed physicians to make informed decisions regarding APs deprescribing (e.g., knowing that a resident had a history of mental illness with psychotic features). Without this information, physicians are more likely to exercise caution by not making any changes to a resident's prescriptions.

4.3.3.2.3 Physician Gender Dynamics

Physicians were surprised at the survey result that female physicians had more difficulty resisting requests to initiate AP medications. Given the sensitive nature of the topic, nearly all physicians were hesitant to even hypothesize why this difference may exist. Eventually, most of the physicians attributed this difference to the observation that the more recent cohorts of physicians graduating from medical school and those who specialize in family medicine and LTC work are more likely to be women. As a result, the physicians interviewed felt that the reason female physicians appeared to have more difficulty resisting AP initiation requests was actually because female physicians tend to have less experience and occupy more junior positions compared to male physicians, who have often been working in the field for decades.

4.3.4 Discussion

This is the first study to explore the barriers and facilitators associated with AP deprescribing from the perspective of physicians in Canadian LTCFs. Taking both the survey and interview results into consideration, we found that physicians believe nursing staff, family members, other physicians' previous AP prescriptions, and their level of access to mental health specialists exert considerable influence on their ability to appropriately prescribe and deprescribe AP medications in LTCFs.

Physicians do not believe that nurses receive sufficient training in non-pharmacological NPS management strategies and that, even when properly trained, they are hampered by time constraints and poor staff-to-resident ratios. Physicians are concerned that nurses will be put at risk of violence if APs are deprescribed given the staffing levels and training levels of nurses. This finding is in line with other studies that have identified LTCF nursing staff members as an

overworked group that lacks sufficient training in NPS management, which may influence the prescribing and deprescribing of APs in LTC.[31] Previous research, however, has shown that increasing staffing levels and training for LTCF staff is not necessarily associated with an increase in quality of care,[185, 186] suggesting that optimization of non-pharmacological NPS management in LTCFs may need to modify current approaches to training and care delivery.[187]

With regard to family members, physicians often do not have the time to properly communicate the rationale for deprescribing or the risks associated with AP use, which can lead to strong opposition to deprescribing from family members. Poor communication with family members has been identified as a barrier to AP deprescribing by other LTC stakeholders [31] but the results of the qualitative research suggest that it is one of the more important barriers for physicians. As such, family members of LTC residents may warrant additional research when studying AP prescribing in LTC and/or greater consideration when designing deprescribing interventions. Although pressure from family members did emerge as significant in the bivariate analyses and the thematic analysis, the significance of this barrier was not sustained in multivariable models.

Finally, physicians felt isolated in their clinical work, and this makes it difficult to work collaboratively towards deprescribing with other LTC medical professionals or learn from specialists (e.g., geriatric psychiatrists). This isolation, combined with time constraints and poor medical record documentation across the healthcare system, makes it difficult for physicians to challenge a colleagues' professional opinion by tapering or withdrawing a newly admitted resident's AP prescription. Previous research has found that interprofessional collaboration and access to specialists, like psychiatrists and geriatricians, is viewed by physicians as a facilitator associated with appropriate prescribing in primary care and elderly acute care[32, 188-193], as well as appropriate AP prescribing in LTC settings.[31]

With regard to the discrepancy between male and female physicians' reported difficulty resisting requests to initiate APs from the survey results, no statistically significant relationship was found between, gender, years of LTC or overall clinical experience, and difficulty resisting AP initiation requests. The lack of an association despite the clinical intuition of interviewed physicians may suggest that this analysis was underpowered. A possible explanation for the lack

of an association despite the clinical intuition of interviewed physicians is that the physicians interviewed (the majority of whom were males), have never witnessed their female colleagues interact with nursing staff and are unable to give informed conclusions for the observed effect. Given that LTC physicians reported that they work in professional silos with little collaboration between other professionals, including other physicians, it is possible that male physicians have never witnessed the gendered dynamics that occur during interactions between nurses and female physicians. There is little research on the topic of physician-nurse gender dynamics in LTC, but there is some evidence to suggest that the female dominated nursing profession may be more critical of female physicians due to expectations of camaraderie despite the hierarchical nature of the relationship between nurses and physicians. [194] Further research on the potential effect of physician gender on AP deprescribing is needed. Given that no Francophone physicians agreed to participate.in the Phase II interviews despite the use of French language recruitment materials, the experiences of Canada's Francophone physicians also warrant additional research.

4.3.5 Conclusion

APs have been inappropriately prescribed for the management of NPS in LTC residents for decades despite evidence and guidelines cautioning against this practice. Decisions regarding AP prescribing in LTC are the result of many actors (physicians, family members, nurses), often with varying interests, operating within institutional settings with differing philosophies and resource levels. AP deprescribing interventions need to adopt a multifaceted approach that accounts for each LTCF's unique context and the perspectives of its various stakeholders.[30] This research addresses a gap in the literature by identifying and exploring the barriers and facilitators associated with AP deprescribing, as experienced by Canadian LTC physicians. In addition to providing direction for AP deprescribing interventions, this research also provides insight into why AP overprescribing in LTC continues and addresses the call for prescribers' experience in order to support sustained intervention effects.[30]

4.3.6 Tables and Appendix

Table 1 - Survey Participant Characteristics (n=62)

Male (%)	55.7
Years of Experience in LTC	
Mean (SD)	17.3 (16.5)
Years of Experience in Clinical Practice	
Mean (SD)	26.3 (30.5)
Primary Clinical Specialty (%)	
General Practice	21.0
Family Medicine	72.6
Geriatrics	3.2
Other	3.2
Patient Caseload	
Mean (SD)	108.5 (61.5)
Patients Seen Each Week	
Mean (SD)	41.1 (30.0)
Hours on Call at LTC at LTC per Week	
Mean (SD)	52.8 (40.0)
Urban (%)	85.5
Province (%)	
Alberta	12.9
British Columbia	11.3
Manitoba	8.1
New Brunswick	1.6
Northwest Territories	1.6
Nova Scotia	1.6
Ontario	25.8
Quebec	35.5
Saskatchewan	1.6
Survey Language (%)	
English	82.3
French	17.7
LTC CME Attendance (%)	
Once a month	10
Three to Four Times per Year	45
Once per Year	31
Every Two to Five Years	6
Never	8

Table 2 – Survey Main Outcomes: Difficulty Resisting Initiation Requests and Difficulty Deprescribing

	Frequency N=62	Percent	Mean	SD
How difficult is it to resist AP initiation requests?			2.90	0.90
1 - Not Difficult	3	4.9		
2 - Slightly Difficult	16	26.2		
3 - Somewhat Difficult	26	42.6		
4 - Very Difficult	15	24.6		
5 - Extremely Difficult	1	1.6		
Missing	1			
How difficult is it to deprescribe AP medications?			2.50	0.80
1 - Not Difficult	5	8.2		
2 - Slightly Difficult	28	45.9		
3 - Somewhat Difficult	19	31.2		
4 - Very Difficult	8	13.1		
5 - Extremely Difficult	1	1.6		
Missing	1			

SD = standard deviation.

Table 3 - Relative Ranking of Barrier Categories, Individual Barriers, and Facilitators

	Mean Score*	SD
Barriers		
Nurse / Care Team Barriers	3.5	0.9
Insufficient care staff resources to implement non-pharmacological management strategies	4.0	1.1
Pressure from front-line staff	3.4	1.1
Care team unaware of risks associated with AP use in long-term care residents / patients	3.2	1.2
Care team reluctance to pursue non-pharmacological treatment alternatives	3.1	1.2
Resident Level Barriers	3.0	0.8
Concern that behavioral problems will emerge or resume	3.5	1.1
Pressure from family members (either to initiate AP therapy or not to deprescribe)	2.8	1.1
Lack of incentive to reduce APs in symptomatically stable residents	2.7	1.3
Time Related Barriers	2.8	1.0
Time required to investigate if AP medications are indicated or continue to be appropriate for newly admitted residents/patients	2.9	1.1
Time required to actively pursue AP reduction or cessation for current residents/patients	2.7	1.2
Other Barriers	2.7	0.7
Lack of pharmacological alternatives to APs	3.6	1.1
Unavailable or poor clinical documentation to justify indication for an AP	2.9	1.3
Lack of access to mental health specialist consultants	2.9	1.4
Reluctance to question a colleagues' previous prescribing decision	2.4	1.2
Irregular medication reconciliation or medication reviews (formal/informal)	1.7	1.1
Facilitators (by rank order)		
Nurses trained in non-pharmacological management strategy alternatives	4.3	1.3
Nurses / care team educated on the risks of AP use in LTCF residents	3.8	1.3
Physician education/training regarding non-pharmacological alternatives to AP medication prescribing for resident behaviors	3.6	1.3
Access to mental health consultants	3.5	1.4
Medication reviews and/or medication reconciliation for residents/patients	3.4	1.6
Physician education / training regarding the risks associated with AP use by LTCF residents	3.3	1.3

Refers to the average score for each item, derived from calculating the mean of individual scores in the survey population. Ratings can range from 1 to 5. A “1” indicates that the barrier does not make it difficult to engage in the deprescribing process. A “5” indicates that the barrier makes it extremely difficult to engage in the deprescribing process. SD = standard deviation.

Table 4 – Multivariable Association Using Robust Poisson Regression
Main Outcome 1: Difficulty Resisting Antipsychotic Initiation Requests N=62

	Model 1		Model 2		Model 3	
	Risk Ratio	95% CI	Risk Ratio	95% CI	Risk Ratio	95% CI
Female	3.67	1.44, 9.39	4.12	1.56, 10.87	3.72	1.46, 9.46
Reluctance to question colleagues' previous AP	2.45	1.16, 5.16	2.94	1.36, 6.35	2.44	1.15, 5.16
Pressure from front-line staff	2.35	1.01, 5.51	2.56	1.03, 6.40	2.38	1.03, 5.47
Lack of access to mental health specialist consults	2.51	1.25, 5.03	2.40	1.22, 4.70	2.56	1.21, 5.42
Time to investigate AP indication/appropriateness	0.21	0.07, 0.61	0.19	0.06, 0.64	0.20	0.07, 0.61
Years of Experience in LTC	-	-	1.02	0.98, 1.06	-	-
Years of Overall Clinical Experience	-	-	-	-	1.00	0.97, 1.04

Table 5 – Exploratory Factor Analysis: Rotated Component Matrix

Variables	Factors				
	1	**2**	**3**	**4**	**5**
Time required to investigate if Aps are indicated or continue to be appropriate for newly admitted residents	0.17	**0.79***	0.15	0.09	0.03
Time required to actively pursue AP reduction or cessation for current residents/patients	0.23	**0.81***	0.10	0.00	-0.15
Pressure from front-line staff	**0.73***	0.21	0.22	0.06	0.06
Insufficient care staff resources to implement non-pharmacological management strategies	**0.72***	0.34	0.14	0.03	0.19
Care team unaware of risks associated with AP use in long-term care residents / patients	0.60	-0.02	-0.01	**0.64***	-0.10
Care team reluctance to pursue non-pharmacological treatment alternatives	0.46	0.07	-0.04	0.58	0.38
Lack of incentive to reduce Aps in symptomatically stable residents	0.15	-0.07	**0.86***	0.13	0.24
Concern that behavioral problems will emerge or resume	0.32	0.27	**0.78***	-0.02	-0.07
Pressure from family members (either to initiate AP therapy or not to deprescribe)	0.13	0.59	-0.21	0.40	0.25
Unavailable or poor clinical documentation to justify indication for an AP	**0.62***	0.14	0.24	0.18	-0.12
Reluctance to question a colleagues' previous prescribing decision	-0.06	0.24	0.27	**0.74***	0.03
Irregular medication reconciliation or medication reviews (formal/informal)	-0.10	-0.01	0.21	0.15	**0.88***
Lack of pharmacological alternatives to Aps	0.56	0.00	-0.08	-0.12	**0.65***
Lack of access to mental health specialist consultants	0.07	0.49	0.47	0.29	0.02

Note: Factor 1: "Work Environment", Factor 2: "Time Constraints", Factor 3: "Maintaining Status-Quo", Factor 4: "Physician Perception of LTCF Staff AP Education", Factor 5: "Pharmacological Considerations".
***** indicates significant items within a factor.

Table 6 – Characteristics of Included Interview Phase II Participants (N=9)

Male n (%)	6 (67)
English Speaker n (%)	9 (100)
Province n (%)	
Alberta	2 (22)
Manitoba	2 (22)
Ontario	2 (22)
Quebec	2 (22)
British Columbia	1 (11)
Years in LTC clinical practice Mean (SD)	18 (10)
Overall Years of Clinical Practice Mean (SD)	36 (6)
Primary Clinical Specialty n (%)	
Family Medicine	6 (67)
General Practice	1 (11)
Geriatrics	1 (11)
Other	1 (11)
LTC Resident Caseload Mean (SD)	48 (34)
Residents Seen Each Week Mean (SD)	28 (13)
Nurses Covering Patients During Day Shift Mean (SD)	6 (4)

Table 7 – Thematic Analysis: Barrier Themes, Sub-themes, Sources, and References

Barrier Themes	Sources	References
1. Insufficient Resources	**9**	**64**
Insufficient Staffing Levels	7	25
Insufficient Training	7	19
Lack of Pharmacological Alternatives	6	9
Insufficient Access to Specialists	2	6
Insufficient Funding	2	2
2. Aggressive Behavior	**8**	**27**
Aps Last Resort for Violent Behavior	5	11
Physician Concern for Others' Safety	3	4
Agitation and Aggression Inhibit Care	2	3
Safety Concerns from Nurses	2	3
3. Family Members of LTC Residents	**7**	**18**
Fear	7	16
4. Limited Time of Physician	**5**	**21**
Time Required to Investigate Underlying Reasons for NPS	2	5
Limited Time to Speak with Families	2	3
Limited Time to Speak with Nurses	2	3
5. Institutional Challenges	**4**	**30**
Lack of Patient Centered Care	2	22
Respecting Nurse Opinion	2	3
6. Lack of Interprofessional Collaboration	**4**	**10**
Professional Silos	2	6
Poor Information Sharing Between Facilities and Professionals	2	2

Note: Total of 9 interviews. "Sources" indicates the number of interviews that discussed the respective theme or sub-theme. "References" indicates the number of individual codes in a given theme or sub-theme.

Table 8 – Thematic Analysis: Facilitator Themes, Sub-themes, Sources, and References

Facilitator Themes	Sources	References
1. Physician Approach to Prescribing	**9**	**56**
Slow Tapering of Aps	4	9
Physician Knowledge of Aps	4	7
Perspective of Prescribing as Iterative	4	4
Investigating Underlying Issues Before Resorting to Aps	3	6
Physician Skill	2	13
No Medication Changes for New Residents	2	9
Deprescribing Attitude	2	2
2. Staff Trained in Nonpharmacological NPS Management	**9**	**27**
Training All LTCF Institutional Support Staff	6	12
Staff Willing to Implement Nonpharmacological Strategies	6	8
Training Eases Physicians' Deprescribing Efforts	2	2
3. Family Members of LTC Residents	**8**	**21**
Medication Philosophy of Family	6	7
Knowledge of AP Side Effects	5	7
4. Administration Support	**7**	**40**
Top-Down Prioritizing	4	7
Routine AP Appropriateness Reviews	3	12
Holistic Approach to Dementia Care	3	8
AP Education	2	2
5. Communication	**7**	**20**
Communication with Families	6	8
Communication with Nurses	3	8
6. Specialized Support Staff	**6**	**34**
Psychogeriatric Support	5	19
Nursing Support	3	14
7. Interprofessional Support	**6**	**12**
Pharmacy Support	5	6
8. Draw on Other Successful Interventions	**4**	**29**
Appropriate Use of AP Project	2	19
9. Patient Documentation	**3**	**7**
Monitoring Resident Changes During Deprescribing	2	4

Note: Total of 9 interviews. "Sources" indicates the number of interviews that discussed the respective theme or sub-theme. "References" indicates the number of individual codes in a given theme or sub-theme.

Manuscript Appendix – Additional Qualitative Interview Quotations

Barriers

Aggressive Behavior

"If I was to taper and could somebody get hurt, especially if there is a history of previous injury either to another resident, staff member, or visitor. The resident on resident harm…It's definitely a factor when it comes to prescribing and it's kind of a part of the whole, right?"

Institutional Challenges

"Because there's more vocalizations, might be more screaming, or just agitation and this has an influence on the surrounding residents. So the physical facility has to be designed for calming effect."

"The nurse is there all the time. I'm only there for a few hours a week. So the nurses have the best appreciation, so I have to trust their judgement. Otherwise- I'm not sure how we would work otherwise… What is the message if they suggest something and I resisted?"

"*I think it would be good for it to be much more patient centered…I think on the whole it tends to be driven from a risk point of view. In other words, the team and the site is a little bit panicked about what this person* [resident] *could do and the harm they could cause."*

Lack of Interprofessional Communication

"It's never like, 'In the next six months, or year we're focusing on these issues. This is how we can improve, this is how we're all working together.' We don't meet together to improve quality. Like it seems you know, I work with my physician colleagues. The nurses work with nursing colleagues. But it's like we're not really working together."

"*The sharing of information is really poor. Between institutions and between professionals. So people frequently arrive with limited history, medical history, into my care. That happens all the time. Sometimes to an appalling degree. So that can be a very big impediment to – for all sorts of things, but certainly to successful deprescribing for one."*

Facilitators

Communication

"And so that's probably my top strategy and kind of, you know, get the communication with staff and family and that kind of thing…and encouraging staff as well as – as best they can to use other strategies and so on."

Interprofessional Support

"*These decisions when it comes to the actual prescribing piece, it's a trifecta of the physician, nursing, and pharmacy. But in terms of a person that you've described, to me, the smartest person to do that, to initiate that, would be clinical pharmacy"*

Drawing on Other Successful Interventions

"*Look at the environments of institutions both nationally and internationally that have dealt with this in perhaps a different manner to see how we can maybe modify what we're doing in a cost-effective way so that the investments don't have to be – we don't have to recreate the wheel."*

Patient Medical Record Documentation

"*We now have a good provincial* [electronic documentation system] *so that we could get a good history…So we have all of the pharmaceutical prescriptions on this system and we can access them throughout the province. We can also access discharge summaries from hospitals, investigations, DI, that sort of thing…So we have that data available to us much more easily now."*

CHAPTER 5: ADDITIONAL RESULTS

5.1 PHASE I: QUANTITATIVE SURVEY

5.1.1 Logistic Regression

Despite having a dichotomized outcome variable, the logistic model appeared to not fit the data well. After verifying that there was no multicollinearity between variables in our model (Appendix 10), we ultimately re-ran our analyses using the robust Poisson model. In the interest of transparency, we present the full results emanating from the logistic models in Appendices 12-17).

5.1.1.1 Main Outcome 1: Difficulty Resisting Antipsychotic Initiation Requests

Bivariate logistic regression analysis revealed that survey respondents had a greater odds of reporting difficulty resisting AP initiation requests if they perceived nurses' reluctance to implement non-pharmacological management strategies as a barrier (OR = 3.85; 95% CI, 1.13 - 13.08) or identified as female (OR = 5.50; 95% CI, 1.50 - 20.21) (Appendix 11).

The analysis of potential confounders revealed that nurses' reluctance to implement non-pharmacological management strategies was no longer significantly associated with difficulty resisting AP initiation requests when adjusted for gender (female) (OR = 2.70; 95% CI, 0.73 - 9.94) or front-line staff training in non-pharmacological NPS management strategies (OR = 2.86; 95% CI, 0.79 - 10.29) (See Appendix 12). No other variables significantly changed the odds ratio of this barrier.

5.1.1.2 Main Outcome 2: Difficulty Deprescribing Antipsychotics

Bivariate logistic regression analysis also revealed that survey had a greater odds of reporting difficulty deprescribing APs if they rated as barriers: concern that behavioral problems will emerge or resume (OR = 9.33; 95% CI, 1.09 - 80.05), pressure from front line staff (OR = 9.33; 95% CI, 1.09 – 80.05), or pressure from family members (OR = 5.43; 95% CI, 1.19 - 24.70) (Appendix 13).

The analysis of potential confounders revealed that pressure from front-line staff was no longer associated significantly with Main Outcome 2 when adjusted for province (OR =

12.43; 95% CI, 1.30 – 118.36) (See Appendix 14). No other variables significantly changed the odds ratio for these barriers (See Appendix 15 and 16).

5.1.2 Robust Poisson Regression

In bivariate analysis, robust Poisson regression revealed that survey respondents were more likely to report difficulty resisting AP initiation requests (Main Outcome 1) if they also rated care team reluctance towards non-pharmacological strategies as being a barrier to deprescribing (RR = 2.69; 95% CI, 1.06 – 6.79) or identified as female (RR = 3.60; 95% CI, 1.29 – 10.01). See manuscript Table 4 for an overview of the multivariable robust Poisson regression model for Main Outcome 1. Survey respondents were also more likely to report difficulty deprescribing APs (Main Outcome 2) if they also rated pressure from family members to initiate or to not reduce APs as being a barrier to deprescribing (RR = 4.10; 95% CI, 1.14 – 14.73). No variables were significant in the multivariable robust Poisson regression models for Main Outcome 2.

5.2 PHASE II: QUALITATIVE RESULTS

5.2.1 Barrier Sub-Themes

5.2.1.1 Insufficient Resources

5.2.1.1.1 Sub-Theme 1: Insufficient Staffing Levels

Many physicians reported that insufficient staffing levels are a barrier to AP deprescribing: "*But certainly you know, actual shortage in terms of number of people and number of hours is, is really a big one* [barrier]." These insufficient staffing levels result in less time for nurses to dedicate to care for the residents, which makes it more difficult to properly assess a resident and explore avenues for non-pharmacological intervention in lieu of resorting to APs: "*…If you have too many patients, you're not going to have adequate amount of time to understand the particular needs of the patient or the particular problem of the patient. So it's just work allocation. That is not determined by the nurses, it's determined by the resources.*" According to physicians, lack of time due to insufficient staffing levels is also associated with resident violence: "*When nurses don't have time, when they – or aides, you have to get through a certain number of showers, teeth cleaning and hair brushing and things and dressing and feeding in a shift, then they have to start to rush people, have to do things with residents when*

they are not ready to do, and so it makes- it invites aggressive or violent responses sometimes to that push that the nurses need to give the patient."

Consistently working in an understaffed environment creates a feedback loop that can lead nurses to experience burnout, decreased job motivation, and ultimately fosters high turnover. Overworked nurses who are also demotivated are more likely to pose a barrier to AP deprescribing: "*Well certainly chronic understaffing, it takes some motivation away…chronic understaffing is, you know, a frustrating environment to work in. Especially as the environment becomes more difficult. So that's certainly one of them* [barriers]." High nurse turnover stemming from chronic understaffing prevents the establishment of meaningful professional relationships between nurses, doctors, and residents' family members, which ultimately inhibits AP deprescribing: "*I went there* [LTCF] *today and from like the most wonderful place to the worst place in the world and it's strictly because of a system problem of the nurses not being consistent. So that's a huge barrier. If you have a high turnover of nurses, that's a huge barrier. You want consistency because then the power of attorney* [family member] *knows the nurse and trusts her* [the nurse]*. So that's huge for - and takes the load off me.*

5.2.1.1.2 Sub-Theme 2: Insufficient Training

Almost all the physicians interviewed cited insufficient training in NPS management as a barrier to AP deprescribing: "*I think that to a certain extent, it helps to have more people available, but the other is the training component so that they are comfortable working with the behaviors and understanding what the responsive behaviors are*." Even when NPS management training is available, physicians pointed out gaps in knowledge translation, particularly for night shift staff: "*…what I notice is that it's really hard to set up education that will cover the whole spectrum of staff, so they all try to get folks in programs that overlap the two shifts for example, days and evenings. And then nights if people only work nights, we rarely get that sort of educational piece…I know they try, but it's really hard…"*

In addition to insufficient NPS training, physicians mentioned that nursing staff are often unaware of the risks associated with AP use in LTC due to a lack education on the subject: "*Research based evidence to teach the staff that these problems often go away, and that there*

are problems with sedating in the long term. Then it becomes education of all the staff, then that would make it easier so I think the lack of in-service education together is a problem."

5.2.1.1.3 Sub-Theme 3: Lack of Pharmacological Alternatives

Physicians also frequently spoke about how a lack of pharmacological alternatives was a barrier to AP deprescribing: "*I mean, sort of none of these drugs are great, for the elderly. So you're kind of all - you're kind of between a rock and a hard place if you're trying to find a drug that doesn't have a million side effects for an elderly person."* The risks of AP prescribing were acknowledged but given that other drugs used to manage NPS are perceived to be less effective, physicians continue to prescribe APs: "*Well yeah because there's nothing else that really works, I mean there's various ones that we try but they don't really work. So, antipsychotics kill you which is which is why we're trying to get rid of them but at least they do something*." Even when APs are chosen to manage severe NPS, finding the right combination of drug and dosage can be difficult, highlighting the clinical complexity physicians face when trying to manage agitation and aggressive in residents with NPS: "*The harder one actually, to be honest, when it comes to deprescribing - the harder one is to try and sort out when someone is on an AP and they are still having significant behaviors - to stop them. Or, do stop it and not try another one? Should you try another one or not? You know, I mean, there are different ones that we use, you know, Olanzapine, Risperdal, Seroquel…Haldol. You know, there's four or five that we routinely use. So you try one, things don't seem to be settling, what should you do? Should you go up on the dose or you want a higher dose? Which increases sedation and side-effects. Switch to another one? I mean, that's actually a harder thing to sort out than deprescribing if you ask me.*" One physician felt that they were more likely to prescribe APs compared to other drugs because these alternatives lack sufficient dosage form options to allow for easy titration: "*Well, we do have a couple of alternatives. Is there a product that's easy to titrate? I don't think so. I think it's hard to get a product that you take orally, that you can titrate easily. You know, sometimes I don't want 6.25mg. I want eight, or I want nine. But I don't have a choice in the preparation I have. So to have preparations that can be titrated more easily in the future would help. So I think that we are limited by the dosage forms available.*"

5.2.1.1.4 Sub-Theme 4: Insufficient Access to Specialists

Some physicians felt that insufficient access to psychiatrists or geriatric psychiatrists, either via phone or on-site, made it more difficult to manage NPS and hampered their ability to deprescribe APs. "*Well because there aren't very many* [geriatric psychiatrists]*, so they provide the service for quite a number of facilities and they might only visit once a month or they're just - you know they may do an intensive first assessment, but then not tend to see the right follow-up. Having said that, if were really concerned or having difficulty with behaviors they will spend a little bit more time setting up some parameters for the staff to use but then they tend to step away - because of their resources as well*."

5.2.1.1.5 Sub-Theme 5: Insufficient Funding

The final sub-theme for the barrier category "insufficient resources" was "insufficient funding". Physicians felt that one of the reasons why LTCFs lack the resources (staffing levels, individualized care, etc.) needed to deprescribe APs is a result of underfunding: *"But that* [additional resources] *would be revolutionary in Canada where we've been, where we've actually enjoyed a cheap system for too long."*

5.2.1.2 Aggressive Behavior

5.2.1.2.1 Sub-Theme 1: APs Last Resort for Violent Behavior

The most commonly reported sub-theme from the aggressive behavior theme was that physicians struggle to manage residents' violent behavior without resorting to AP medication: "*We try everything to handle it and sometimes you have to just use an antipsychotic because they are hurting other people or hurting themselves. We hate using it. It's kind of like we have a gun to our head.*" Another physician saw AP medication for the management of aggression as a necessary evil to avoid traumatizing events like hospitalizations or the involvement of facility security: "*In reality…if I'm looking at starting somebody* [on an AP]*, if I've ruled out a delirium and the behavior is just really difficult to manage, then I would do that to begin with, acutely, and then look at what the best direction is going to be once you have that under control. Because what we're really trying to do is prevent transfer to the hospital for behaviors that are difficult to control.*"

5.2.1.2.2 Sub-Theme 2: Physician Concern for Others' Safety

Physicians expressed hesitation towards deprescribing APs when they were concerned that deprescribing would lead to the emergence or resumption of behavioral problems that may place nursing staff at risk of violence: "*Well it's* [concern] *not necessarily to me personally because I haven't been personally assaulted, but I do think about setting up staff or family to be at risk for having aggressive behavior towards them*." These concerns about deprescribing APs also extend to potentially putting the residents themselves at risk for resident on resident aggression or violence: "*If I was to taper and could somebody get hurt, especially if there is a history of previous injury either to another resident, staff member, or visitor. The resident on resident harm, that would be, I think it'd be more physical but we tend to play down the verbal. We probably should pay attention to that as well. It's definitely a factor when it comes to prescribing and it's kind of a part of the whole, right?"*

5.2.1.2.3 Sub-Theme 3: Agitation and Aggression Inhibit Care

Some physicians pointed out that agitation and aggression inhibits the quality of care given to residents due to the increased time required by nurses to perform care tasks when residents are agitated or aggressive. As a result, nurses may pressure physicians for APs to facilitate care tasks and ease their workload: "*Well, so the residents- our patients need daily care, and if they tend to get agitated it takes many, many times longer for the staff to provide the care. And so I'm under great pressure to give medication during periods of the day where the person tends to be more agitated. So it's mostly daily care; like washing. And I understand it because otherwise the persons would not be washed. Or they would be washed very superficially given the time available. So the staff wants to do a good job, and the only way to do it is to have the person not agitated… So they'll get better care. Because if you can't reach all the little bits of the body, then what happens? Then they remain dirty. Right? More prone to infection. It can shorten their life, and decrease their comfort.*"

5.2.1.2.4 Sub-Theme 4: Safety Concerns from Nurses

Physicians also cited pressure from nurses, stemming from safety concerns, to prescribe APs or keep residents on APs in order to manage aggressive residents as a barrier to deprescribing: "*I mean it's a generalized fear that their behavior will recur* [if APs are

deprescribed]. *Like it's not so much mine. It's the nursing staff's fear. And then my interaction with the nursing staff. They are the ones who get punched* [by aggressive residents].”

5.2.1.3 Family Members of LTC Residents

5.2.1.3.1 Sub-Theme: Fear

A large proportion of physicians believed that the resistance to AP deprescribing exhibited by family members is the product of a fear to destabilize the resident: “*So, I can give you an example of someone who came in who was on a fair dose of Risperidone but was very sleepy during the day so the family were very, very insistent that we couldn't decrease the dose because he had been so difficult before... it really reflects their experience with the angst that somebody has or the agitation and how they have to personally deal with it.*” Family members are wary of deprescribing as they believe this may destabilize their loved one and decrease their quality of life: “*But there is a lot of kids* [family members] *who say, ‘Mom is stable, she's happy, we're happy, we're not getting phone calls, don't change anything. Don't do anything.’”*

Family members may serve as a barrier to AP deprescribing due to a number of other reasons, including: Fear of eviction from the LTCF due to the residents’ disruptive behavior: “*… the husband is very concerned his wife will be forced to leave the facility that she's currently in because she's too disruptive… So he's putting quite a bit of pressure on me and the psychiatrist to, to even sedate her to the point where she sleeps most of the day, in order to not have her behaviors be a problem.*”; Fear of violence against their loved one by other residents: “*I've had people literally screaming at the top of their lungs, fifteen hours a day and I know medications aren't great for vocalizing. And you have to do something because people* [other residents] *are walking up to them and smacking them and pushing them and doing stuff to them. And the family is just distraught because they don't want - well, nobody wants their mother being assaulted because she's yelling all the time.”;* Even fear of judgement from others if their loved one’s behavior is perceived as inappropriate: “*I've actually had people be concerned about, you know, the judgement of others if their family members behaviors is inappropriate, right? What will other people think?”*

5.2.1.4 Limited Time of Physicians

5.2.1.4.1 Sub-Theme 1: Time Required to Investigate Underlying Reasons for NPS

The time required to investigate possible underlying triggers for NPS, rather than simply attributing behavioral issues to NPS, was cited as a barrier to AP deprescribing given that LTC physicians need to see a large amount of patients in the limited amount of time that they are on-site at their LTCFs: "*Taking the time to do a rectal exam, check the bladder, you know all that kind of stuff. Check lab work, see if there's some underlying cause for this behavior problem. That's time consuming…* [but] *it's up to us* [physicians] *to find some other explanation other than just the ordinary BPSD* [NPS] *developing.*"

5.2.1.4.2 Sub-Theme 2: Limited Time to Speak with Families

Given the influential role of family members in the AP deprescribing process, physicians found the limited time available to speak with families regarding deprescribing a barrier: "*Yes, the other time constraints are that it's important to talk to families …both kinds of families*, *you know the families who hate to see their family member on medication just to kind of put them on a chemical straight jacket, they've seen lots of publicity in the press about how bad APs are. And then there are the people who can't stand seeing their relative yelling and screaming and hitting or wondering, or have a mannerism like banging a table or something, and they want that stopped."*

5.2.1.4.3 Sub-Theme 3: Limited Time to Speak with Nurses

The limited time available to physicians for discussions with nursing staff regarding NPS management and AP deprescribing was brought up as a barrier: "*Yes, the other time constraints are that it's important to talk to… nurses. You know the nurses are stretched and feeling badly about how difficult it is to work with somebody, and so spending time to talk to them about the limits of the drugs and what are the alternatives and so on."*

5.2.1.5 Structural Challenges

5.2.1.5.1 Sub-Theme 1: Lack of Patient Centered Care

Some physicians felt that the institutional model of providing long-term care that is widely used can act as a barrier to AP deprescribing. An institutional approach to care, rather than a patient centered approach, can result in an LTCF that is less willing to tolerate risk and

therefore less amenable to deprescribing APs: "*I'd have to say, it's, I believe, a little bit disappointing, the quality of that one-on-one care. I mean, there's a custodial element… I think it would be good for it to be much more patient centered…I think on the whole it tends to be driven from a risk point of view. In other words, the team and the site is a little bit panicked about what this person* [resident] *could do and the harm they could cause."*

The lack of patient centered care results in an approach to care that is antithetical to providing non-pharmacological NPS management: "*Attempt*[s] *to standardize everything. In other words the nursing acts and the tasks that are provided to the nurse means that they have to spend more time on doing what is being required of them as far as the individual care, it's not logistical care, and less time on the interpersonal or the emotional support that's required for many patients."*

5.2.1.5.2 Sub-Theme 2: Maintaining Professional Relationships with Nurses

Physicians felt that it was important to maintain a trusting, professional dynamic between themselves and their nursing team, a dynamic that can become strained when physicians attempt to deprescribe APs without buy-in from nurses. LTCFs are nurse-led environments and physicians need to work collaboratively with nurses in order to more successfully deprescribe APs and also to ensure the more long-term professional relationship between themselves and the nursing team is properly maintained. "*The nurse is there all the time. I'm only there for a few hours a week. So the nurses have the best appreciation, so I have to trust their judgement. Otherwise- I'm not sure how we would work otherwise… Like who am I to say 'Oh, no, they're not agitated.' or 'Put up with it.' What is the message if I would - If they suggest something and I resisted? Then I'm saying 'No. Your assessment is wrong.' Or to put up with it. Like 'Deal with it.' You know just 'Tough luck.'*

5.2.1.6 Lack of Interprofessional Collaboration

5.2.1.6.1 Sub-Theme 1: Professional Silos

Physicians expressed discontent that nursing staff and physicians seemed to operate independently and suggested that this disconnect made it difficult to deprescribe APs since nurses and physicians may not share or understand each other's perspective and goals: "*Well, it has to be together. Right? Like the nurses have their saying. We have our saying. But it's never*

like "In the next six months, or year we're focusing on these issues. This is how we can improve, this is how we're all working together." Like we don't meet together to improve quality. Like it seems you know, I work with my physician colleagues. The nurses work with nursing colleagues. But it's like we're not really working together."

5.2.1.6.2 Sub-Theme 2: Poor Information Sharing Between Facilities &Professionals

Poor information sharing between facilities makes it more difficult for physicians to make informed decisions regarding AP deprescribing, especially for residents recently admitted to an LTCF with a prescription for an AP: "*The sharing of information is really poor. Between institutions and between professionals. So people frequently arrive with limited history, medical history, into my care. That happens all the time. Sometimes to an appalling degree [laughs]. Yeah, it's just shocking. So that is - that can be a very big impediment to - for all sorts of things, but certainly to successful deprescribing for one."*

5.2.2 Facilitator Sub-Themes

5.2.2.1 Physician Approach to Prescribing

5.2.2.1.1 Sub-Theme 1: Slow Tapering of Antipsychotics

Physicians who reported low concern about a resident becoming more aggressive following AP deprescribing attributed their confidence in the deprescribing process to their gradual AP tapering approach: "*So if you go very slowly, you know, you don't just cut them off cold turkey. It's like getting off narcotics. You go very slowly and you do it every two days and then every three days and then every four days and watch for them escalating* [behaviors]*."* Adding to this approach, ensuring residents were symptomatically stable before engaging in the deprescribing process helped ease the burden on staff and facilitated buy-in from the residents' family: "*So, once we had him there we were in a stable situation with staff who were comfortable, then we could start tapering the dose and then it was great. Then she* [family member] *was much more accepting that he* [resident] *didn't return to the previous behaviors. So, I think that would be an example of one way that that worked well."*

During the tapering process, it is important to communicate with the nursing team to make sure they felt supported during the deprescribing process. Without adequate communication and support during this process, the professional relationship between the

physician and the nursing team may be diminished. This diminished trust in the relationship negatively affects the current deprescribing attempt and may also makes nurses less responsive to future deprescribing attempts: "…*you had to be careful when you were tapering that you made sure the team understood what you were doing and that they - it wasn't a question of just waltzing into a unit and sort of stopping everyone's antipsychotics and then going away for two weeks holiday and all hell breaks loose. That's harmful or potentially harmful but probably the greatest harm doing it that way is you actually reduce your confidence of the team. They see that - it kind of becomes a binary thing that if we stop antipsychotics it's going to be mayhem."*

5.2.2.1.2 Sub-Theme 2: Physician Knowledge of Antipsychotics

Physicians who were knowledgeable about APs felt more confident in their decision and ability to deprescribe APs: "*Well part of the problem is that so many physicians get their information, in particular their pharmaceutical information from pharmaceutical industry, either directly or indirectly. And so most physicians don't know the literature that suggests that antipsychotics don't work*."

Knowing that APs are often prescribed to manage behaviors that stem from underlying medical issues (i.e., not NPS) allows some physicians to more appropriately address residents' medical needs without resorting to APs: "*…a lot of these people are in pain and they are misbehaving because they are in pain and they can't tell you…They don't need antipsychotics because it was actually pain driving it. And we just sort of use Tylenol without any indication…So that's been a real good thing to get them off antipsychotics - is treating underlying pain that is not obviously there."*

A facilitator associated with AP deprescribing is not being afraid of behavioral problems emerging or resuming after deprescribing APs. Sporadic behavioral problems, while burdensome, are not sufficient cause for continuous management with APs and can be dealt with if they reemerge after deprescribing APs: "*I know that it* [behavioral problems] *will happen some of the time but that's not the end of the world.*"

5.2.2.1.3 Sub-Theme 3: Perspective of Prescribing as Iterative

Another reason why some physicians felt more comfortable with deprescribing APs mediations was because of their perspective of AP medication prescribing as an iterative process: "*And then I'm just telling my nurses that um, you know, if they get aggressive again, we can always restart the medication. Well it happens in maybe a third or quarter of them, but the other one's will be on a lower dose or off.*"

A number of physicians felt that consideration of dementia's disease progression mitigated concerns that behavioral problems will emerge or resume while deprescribing APs: "*Well, my thought process is that, the disease progresses over time. Medication that you needed a year or two ago, you might not need now. So, I suspect some folks don't think of that? Or buy into that?*"

5.2.2.1.4 Sub-theme 4: Investigating Underlying Issues before Resorting to Antipsychotics

APs are often used as first-line therapy for managing agitation and aggression in LTC. Rather than resorting to APs at the first sign of behavioral issues, physicians suggested more thoroughly investigating possible underlying issues that may be triggering the behavioral issues. As a result of dementia-related communication difficulties, however, residents are often unable to clearly convey their needs. Some physicians felt that agitation and aggression is often a means for residents to communicate untreated pain and other unmet needs, rather than displays of NPS. By attempting to manage pain or other possible unmet needs (e.g., depression), physicians are sometimes able to avoid resorting to the use of AP medications to manage agitation or aggression: "*There's kind of a step-wise process you do* [for pain-management]. *So, with dementia it's the same thing. You see someone who has behavior issues in dementia. First thing you do is you think they have pain, so you start them on Tylenol and you might start them on - if they have agitation, you'll start them on an SSRI, an antidepressant. You give it a month to see how it works. If things aren't working well, you add a narcotic…The thing about all of them is that they are changing neurotransmitter levels, not on the pain side but on the psychotropic medication side. You're waiting for neurotransmitters levels to change so that takes four to six weeks before you see your effect.*"

Assessing and modifying environmental triggers that may be the source of behavioral issues was also suggested as a means to facilitate AP deprescribing: "*Look at environment and see if there is anything - and consulting with staff - is there anything that - if they have a roommate that is screaming all the time, well that's not going to help them. Rather than medicate the patient maybe it'd be better to change the rooms or look at the other patient see what problems they have."*

Given the prevalence of polypharmacy among the elderly, behavioral issues may actually be a result of drug-drug interactions. Reviewing a resident's medication list and deprescribing other medications may reduce behavioral issues and possibly eliminate the need for AP medications: "*The other thing that one has to look at is the overall medication list because some of the medications can contribute to their status of the agitation for example. Because you have a lot of stuff with the anticholinergics and some of the blood pressure medication or the SSRIs that can be contributing to a change in their cognitive and behavioral aspects.*"

5.2.2.1.5 Sub-theme 5: Physician Skill

The pharmacological skill of physicians was mentioned as a facilitator associated with AP deprescribing. With sufficient skill, the physician is more easily able to manage NPS without the use of APs: "*If there are other options available, and assuming the non-pharmacological approach has been tried and is not proving to be beneficial, then you go back and you either adjust your medication back up or modify or combine it. That's where the skill of the prescribing physician plays a role.*"

In addition to pharmacological skills, time management skills were also highlighted as an important facilitator. By working at their LTCFs in shorter, more frequent sessions rather than longer sessions once a week, physicians may be able to better manage their workload and improve their communication with other stakeholders (e.g., family, nurses). This in turn allows the physician to have more time available to get information about a residents' clinical situation and engage with the care team about deprescribing APs: "*…A lot of these doctors in nursing homes go once a week and then they're totally destroyed, you know, they have so much on their plate...I go in three times a week and I'm in and out really fast...Because I'm staying ahead…I*

find I have lots of time to talk to the families, talk to the patients, talk to the nurse or the pharmacist, just by being a good time manager…They're trying to jam it in…I always teach in my time management that this should be part of your schedule.

5.2.2.1.6 Sub-theme 6: No Medication Changes for New residents

Despite the notoriously poor documentation that accompanies newly admitted LTC residents, some physicians don't feel that the time required to investigate if AP medications are indicated or continue to be appropriate is a barrier to deprescribing. During this adjustment period, these physicians allow residents to acclimate to their new environment and try to connect with the residents' family member(s) in order to better understand the resident's medical history. This also allows the physician to build a trusting rapport with family members and can facilitate AP deprescribing once the resident has settled into their new environment: "*And I would leave it* [existing AP prescription] *a month or two for us to get used to the situation. I think that there's an issue of trust if there's family involved. Like they're in a new place, and suddenly everything gets changed. I would like some time to get to know the situation; get to know the family. Give it a couple of weeks and then a good time to do it would be at the time of the initial meeting with the family on admission to look at the medication, to ask the history, and then to suggest some changes."*

5.2.2.1.7 Sub-theme 7: Deprescribing attitude

Another aspect of physicians' approach to prescribing that facilitates AP deprescribing is their motivation and attitude towards deprescribing. Physicians with a favorable attitude towards deprescribing APs and other medications are naturally more inclined to attempt deprescribing while physicians who are more hesitant about deprescribing may be more influenced by potential barriers: "*… I think it may be overall attitude toward deprescribing. If I think there's at all a chance that deprescribing might work out, I just go ahead and deprescribe [laughs]. I just go ahead and give it a try…So some would be maybe more tentative about deprescribing and then maybe barriers seem larger to them?"*

5.2.2.2 Staff Trained in Non-Pharmacological NPS Management

5.2.2.2.1 Sub-Theme 1: Training all LTCF Institutional Support staff

One physician spoke to the importance of training all front-line staff in NPS management strategies, including health care aides and housekeeping staff, as they are frequently in close proximity to residents: "*Yeah, we train them all and we train the PSWs* [personal support workers]*. In fact, and the janitors. All the staff. Like, everyone is trained...because they* [janitors] *spend more time with the patients than anybody."*

Making NPS training sessions frequent was found to be helpful for refreshing nurses' NPS knowledge. Recording these training sessions and posting them online was especially helpful for evening and night shift nurse, who are often not able to attend these training sessions as they are held during the day: "*They have training every month. They'll have an hour where people can come - and they will actually film it and people on shift work can watch it online."*

5.2.2.2.2 Sub-theme 2: Staff Willing to Implement Non-Pharmacological Management Strategies

Once LTCF staff receive training, it is also important for them to actually implement the NPS management strategies learned. Physicians felt that having nurses who were willing to implement non-pharmacological NPS management strategies was a facilitator associated with their AP deprescribing efforts. Physicians noted that they felt nursing staff with higher levels of experience were more likely to feel capable of managing difficult behaviors like agitation and implement NPS management strategies, compared to less experienced nurses: …*as you have nursing staff who have more experience, then they're going to be more comfortable with the deprescribing."*

5.2.2.2.3 Sub-Theme 3: Training Eases Physicians' Deprescribing Efforts

Nurses who have received NPS training ease physicians deprescribing efforts because it eliminates the need for physicians to discuss the importance of attempting non-pharmacological NPS management before using APs: "*Yes* [training is a big facilitator]*. Because it moves you along that arc of decision making. You're not having to explain first principles to the team, you're already much further along, you're much closer to your goals, I guess*." Even if

non-pharmacological management strategies are not able to eliminate the need for APs, they may be able to reduce the dose of APs prescribed or allow the use of alternative pharmacological options: "*Because if you know they've tried it* [non-pharmacological management strategies] *or they know that - let's say you do that and there's a decrease in the level of tension by 25%, that can have an influence on exactly how much you're going to deprescribe or what quantity or even shift treatments to a less powerful medication. So the more enhanced training skills that they staff have, utilizing non-pharmacological approach, the easier it is.*"

5.2.2.3 Family Members of LTC Residents

5.2.2.3.1 Sub-Theme 1: Medication Philosophy

The medication philosophy of family members can be a facilitator associated with AP deprescribing. For example, families who are wary of polypharmacy more readily support AP deprescribing: *"…a lot of the people* [families] *just have the general view that if you can do without a medication that's better than taking one. Which is obviously the geriatrics mindset*." Families who are opposed to the practice of chemical sedation are also more likely to support AP deprescribing: "*You know the families who hate to see their family member on medication just to kind of put them on a chemical straight jacket.*"

5.2.2.3.2 Sub-Theme 2: Knowledge of Antipsychotic Side Effects

Families who are in favor of deprescribing APs appear to be more informed about the risks associated with the use of AP medications for managing NPS in LTC: "*I think they're better educated, for one thing. There seems to be and understanding that these are powerful drugs that are being used on frail, older people. So it definitely seems that there's been some public education that's been underway for a while.*"

5.2.2.4 Administrative Support

5.2.2.4.1 Sub-Theme 1: Top-Down Prioritizing

A number of physicians believed it was helpful to have the LTCF administration adopt a pro-AP deprescribing position for the facility in order to create a shared framework from which to operate: "*It's leadership. You need to have somebody who takes the initiative, in charge and*

doing it, then things get done. If you don't and you leave things to sort of float along, then it floats along. Programs, structure."

5.2.2.4.2 Sub-Theme 2: Routine Antipsychotic Appropriateness Reviews

A facilitator that multiple physicians mentioned was having routine AP appropriateness review meetings with other LTC professionals. Many physicians felt that time constraints was a barrier to reviewing AP medication prescriptions for residents but physicians who did not feel this way cited routine AP reviews as a facilitator. Having dedicated time and additional assistance to review these medications and potentially deprescribe lessens the workload of physicians who are otherwise trying to deprescribe in isolation: "*So let's call it the "Quality Assurance Manager". One of her jobs is to identify folks who are on antipsychotics and can we get them off. So let's say, once a year or every six months but I think it's - let's say once a year. I get a list of all my patients on antipsychotics and all my patients on benzodiazepines. And we sit down and I tell you, it takes me 20 minutes…it's not like every two weeks you're looking at all your patients to try and figure out which ones you're going to stop antipsychotics on."*

5.2.2.4.3 Sub-Theme 3: Holistic Approach to Dementia Care

Multiple physicians said that administrative support for more holistic approaches to dementia care, such as smaller communities of care and more individualized care, aided their AP deprescribing efforts: For example, a substantial facilitator mentioned by one physician was having their LTCF administration fund the implementation of a non-pharmacological program for dementia and supporting the staff through the shift towards a more personalized and less institutional approach to care:*"… having management support the staff, that's really what I'm getting at. I attribute the success of getting her* [resident] *off the APs and managing, it was mostly managing her behaviors. I put that down to the support that we got from management throughout that. They are powerful when it comes to - they're very influential and they really do set the tone."*

5.2.2.4.4 Sub-Theme 4: Antipsychotic Education

Physicians felt that administrative support in the form of ensuring the front-line nursing staff is provided sufficient education regarding dementia and NPS was a facilitator: "[The]

administration at the nursing home I've been thinking of has certainly been on board also and involved in making sure the staff is getting education and so on."

Administrative support was also important for the education of physicians on AP deprescribing. Though there has been increased awareness generally, it is important to reinforce and update physicians' knowledge on this issue, and is especially important to educate less experienced physicians who may not have been exposed to the issue of inappropriate AP prescribing in LTCFs: *"Oh the other part of it is physician education…We've come a long, long way and we understand that's* [chemical sedation with APs] *not appropriate, so I think the education and additional information, and development, that's happened, has also made a big difference… it's a really strong push and it's supported systemically, so I think that's also helping."*

5.2.2.5 Communication

5.2.2.5.1 Sub-Theme 1: Communication with Families

Communicating with families, from both an educational and shared decision-making perspective, aided physicians' AP deprescribing efforts: *"…Over time, as you start to communicate more, that they* [family members] *understand side effects and risks more, then it becomes easier."*

5.2.2.5.2 Sub-Theme 2: Communication with Nurses

Strong communication between physicians and nurses can act as a facilitator for AP deprescribing, especially when physicians make an effort to encourage staff to utilize non-pharmacological management strategies: *"And so that's probably my top strategy and kind of, you know, get the communication with staff and family and that kind of thing…and encouraging staff as well as - as best they can to use other strategies and so on.*"

5.2.2.6 Specialized Support Staff

5.2.2.6.1 Sub-Theme 1: Psychogeriatric Support

Physicians emphasized how important geriatric psychiatrists were to their AP deprescribing capabilities, whether because of their assistance via consultations for residents with severe behavioral issues or more general case management meetings. Not only does the

psychogeriatric support help physicians with residents exhibiting difficult behavioral issues, it also provides an opportunity for physicians to learn from these specialists and apply this knowledge to their own clinical work in the future: "*So, getting psychogeriatric folks to come and see your really difficult patients and you kind of learn from them… So experience, consults, direct experience, talking with psychogeriatric people. Having somebody - you know what, here's something to put in, having a direct contact with easily, easily available contact with a psycho-geriatrician."*

5.2.1.6.3 Sub-Theme 2: Nursing Support

Physicians mentioned how specialized nursing support, such as a psychiatric nurse or nurse clinician, can act as an AP deprescribing facilitator by providing non-pharmacological NPS management strategy recommendations and assistance to front-line nursing staff: *"This is a thing in Ontario where they have a nurse where all she does or he does is go and deal with people who have behavioral problems. So it's really good, they have extra training and they're paid extra and they really go on and focus on the non-pharmacological way to deescalate the patients. So that's really been tremendous."*

5.2.2.7 Interprofessional Support

5.2.2.7.1 Sub-Theme: Pharmacy Support

Pharmacists were seen as a natural ally when deprescribing or trying to foster an LTCF environment that values and pursues AP deprescribing. One physician expressed appreciation for pharmacists who are proactive and persistent in their AP deprescribing efforts: "*I mean yeah, these decisions when it comes to the actual prescribing piece, it's a trifecta of the physician, nursing, and pharmacy. But in terms of a person that you've described, to me, the smartest person to do that, to initiate that, would be clinical pharmacy…I think we've been successful in the other sites* [LTCFs] *because the pharmacy has been a little more tenacious when it comes to having those discussions with physicians. I think it's a good idea. Because I mean, like any institutional practice, you're going to get lulled into a sameness.*

5.2.2.8 Drawing on Other Successful Interventions

5.2.2.8.1 Sub-Theme: Appropriate Use of Antipsychotics Project

Two physicians felt that the Appropriate Use of Antipsychotic (AUA) project was extremely helpful and facilitated their AP deprescribing efforts: *"Well it's been a focus over the last couple of years to really work at deprescribing and looking at reasons for using them, how best to manage responsive behaviors and it's now part of the whole picture of long term care. It's a quality indicator, it's a philosophical change throughout the whole province, with a lot of educational support, management support, clinical support, in order to try to change that. So we really have been successful, obviously some places better than others, in reducing antipsychotic use."*

5.2.3 Physician Gender Effects

Three participants felt that female physicians were more sympathetic towards nursing staff, compared to male physicians. This sympathetic attitude was thought to influence female physicians, making them more likely to acquiesce to AP initiation requests stemming from nursing staff:

[Male]: *"Difficulty saying no* [to requests for APs from nursing staff] *in the sense that they really want to help…and it's one of the things in our arsenal of medication, in our list of medication, that we can use to make a big difference."*

[Female]: "*As a woman, I would probably say, I would hate to think that's the case but I think that I probably understand or appreciate the vulnerability that the staff feel and if I know the staff well and I'm working with them, that also would make a difference with whether I would start something or not."*

One physician felt that nurses had less respect for, or confidence in, female physicians' professional opinion:

[Male]: "*I think sometimes female physicians get more flak from female nurses than male doctors seem to. Some kind of gender something… If I'm going to decrease an antipsychotic and the nurse says, "Well will they just start punching me again?" And I'll say "Well, yeah. That might happen." But often it doesn't, And- and you know, if I explain myself*

and be supportive then they'll listen to me. But sometimes maybe they would be less likely to listen to the- a female physician, or want the female physician to be their friend or some- I don't know what it is but. It seems as though there is some gender difference."

One of the few female participants in Phase II was surprised to hear about this gender difference but offered a potential explanation centered on the concept of trust between the physician and the nursing team:

[Female]: *"All I can say for myself if the request comes from nursing staff then I almost always go along with it. It's interesting that it would be gender related. But I feel that I need to work along with the staff, and I need to trust their judgement."*

Many of the participants speculated that the observed gender difference may have more to do with experience than gender, given that they believe the majority of current medical school graduates are female:

[Male] "*I'm just guessing - I hate to be politically incorrect but it would be interesting to see their age, you know, if they are younger female physicians. As you get older, it is easier to get people to accept what you tell them and they look at you as the old doctor."*

One physician expanded on the experience line of argument by suggesting younger physicians, who are now increasingly female, have fewer opportunities for mentorship in general and this translates to more difficulty deprescribing APs:

[Male]: "*They* [female physicians] *tend to be younger, so with less experience in this clinic. And one of the things that disappeared, because they're not there very much, is the mentoring factor…We've lost that ability to mentor younger doctors in that setting, so that's going to lead to increased insecurity and reluctance to change."*

Another physician suggested that younger doctors (i.e., the majority of female physicians) may be more collaborative in their approach to medicine, and this approach may make them more receptive to the opinions and pressures of nursing staff:

[Male]: "*I think that my younger colleagues are more collaborative…and they're more likely to seek out the opinion of others, whereas I think the older male physicians would have*

tended to be much more autocratic in their approach and some of that was built around the fee schedule.

Finally, some participants cited gender stereotypes, revolving around the idea that women are more agreeable or conflict averse than men and are more natural caregivers:

[Male]: *"No, I think they're treated differently. I've seen it. I've worked with a lot of female physicians - actually, females are better time managers because - especially if they have kids because they're used to multi-tasking...women are more caring in gen*[eral] - *and these are…broad brush* [strokes] *but the public thinks of them as more caring... which makes it easier to be a good time manager because I can go in and go out and not have people sit and tell me all their problems for an hour which slows you down.*

CHAPTER 6: DISCUSSION

Integrating quantitative and qualitative data can improve the quality and value of mixed methods research.[195] At the level of interpretation and reporting, integration can occur through narrative, data transformation, and joint displays.[160] The contiguous approach to integration through narrative, in which the quantitative and qualitative findings are presented in different sections of a single report, was chosen.[195] The coherence of the quantitative and qualitative results, or "fit", can be classified in three ways: confirmation, expansion, or discordance.[195]

Overall, the fit of the quantitative and qualitative results in this study can be classified as expansion. Expansion occurs when the two data types address differing aspects of a phenomenon or when each data type describes complementary facets of the phenomenon being studied.[195] The quantitative data identified the most important barriers and facilitators, while the qualitative results expanded and elaborated on the perspectives of physician's concerning these factors. Discordance did occur with regard to physician gender effects, leading to the use of reconciliation in order to account for this divergence between the quantitative and qualitative results.[196]

6.1 SUMMARY OF RESULTS

6.1.1 Quantitative Results

Overall, survey respondents reported their difficulty deprescribing AP medications in LTCFs between "slightly" and "somewhat", with a higher difficulty rating given to resisting requests to initiate APs compared to deprescribing existing prescriptions. The highest rated barrier category pertained to nursing and care team related items, the most highly rated individual barrier was "insufficient care staff resources to implement non-pharmacological management strategies". The most highly rated facilitator was having a nursing team trained in non-pharmacological management strategies.

Physicians who reported more difficulty resisting AP initiation requests were significantly more likely to identify as female and to rate pressure from front-line staff,

reluctance to question a colleagues' previous prescribing decision, and lack of access to mental health specialists as barriers associated with AP deprescribing.

Physicians who reported more difficulty tapering or withdrawing APs were more likely to rate pressure from family members to initiate or to not reduce APs as a barrier when conducting the bivariate analyses using robust Poisson regression but these associations were no longer significant in multivariable models.

6.1.2 Qualitative Results

The qualitative interviews explored a number of barriers associated with AP deprescribing that physicians face. Physicians felt that many LTCFs are underfunded and understaffed. They perceived front-line nursing staff members as having high workloads and little training in NPS management, especially non-pharmacological strategies. Even with training, both nurses and physicians don't appear to have the time to implement these techniques. APs are used to manage difficult behavior, particularly aggression, but tapering or discontinuing them is difficult for physicians due fear from nurses and families that these behaviors will return. Physicians felt isolated in their clinical work and this makes it difficult to work collaboratively towards deprescribing with other LTC medical professionals and families or learn from specialists (e.g., geriatric psychiatrists).

A number of facilitator themes were generated. The physician's approach to prescribing, such as slowly tapering APs or perceiving AP prescribing in LTC as an iterative process, was the most discussed facilitator. Having LTCF staff trained in non-pharmacological NPS management was also a widely discussed facilitator, as physicians felt this training made nurse more willing to implement non-pharmacological strategies. Having a nursing staff well trained in NPS management also eased physicians' deprescribing efforts because training reduced the need for physicians to educate their staff on NPS management strategies or the risks associated with AP use in older adults with dementia. Just as families can often act as a serious impediment to deprescribing, they can also serve as an important ally for physicians seeking to deprescribe APs. Family members were more willing to support deprescribing when well-educated on the topic AP medication use in LTC and their medication philosophy was in alignment with deprescribing (e.g., reducing polypharmacy or opposing chemical sedation). Communication

between physicians, nurses, and families was viewed as a facilitator because it allowed for all three groups to share clinical care goals and concerns, which then made it easier to deprescribe as all involved are working from a position of mutual understanding. Specialized support staff, such as geriatric psychiatry consultations or expert nurse clinicians, was viewed as an effective facilitator when physicians had experience accessing these resources. Working with geriatric psychiatrists provided immediate benefit to residents with behavioral issues through the use of tools like behavior mapping and allowed physicians to learn how to better manage aggressive residents. On-site nurse clinicians who are trained in managing NPS and work exclusively with residents displaying severe NPS were seen as an invaluable addition to an LTCF's nursing staff. Interprofessional support, particularly regular medication review meetings that heavily involve pharmacists, helped physicians overcome time constraints, improve collaboration, and provided an impetus to review existing APs prescriptions and overcome prescribing inertia. Physicians felt that drawing on existing successful AP deprescribing interventions was easier than attempting to deprescribe as an individual actor. Whether adopting an existing program across an entire LTCF (e.g., Appropriate Use of Antipsychotic Project) or adapting program components to an LTCF's existing framework, physicians perceived value in using evidence-based AP deprescribing interventions. Finally, access to high quality records was deemed essential when trying to understand the history and reasoning for a newly admitted patient with a prescription for APs. Possessing this information helps physicians overcome hesitations to change to a residents' medication regimen, especially while a newly admitted resident is adjusting to their new environment.

6.2 RESULTS IN CONTEXT

6.2.1 Quantitative Results

The finding that the nursing staff related items were the most highly rated barriers by Canadian LTC physicians is in line with other studies that have identified nursing staff as an overworked group [166, 197-200] that lacks sufficient training in NPS management,[166, 197-209] that may influence AP prescribing and deprescribing in LTC.[31]

With the exception of gender, pressure from nurses to prescribe APs,[166, 199, 201, 207, 210] reluctance to question a colleagues' previous prescribing decision,[199, 202, 209] and lack of access

to mental health specialists[166, 203, 206, 208] have been found to influence decision-making with regards to AP prescribing in LTC.[31] We were unable to identify previous studies reporting an association between physician gender and difficulty resisting AP initiation requests. Paradoxically, physicians who experienced more difficulty resisting AP initiation requests were less likely to report that time is too limited to investigate whether AP medications are indicated or continue to be appropriate for newly admitted resident. One possible explanation is that when physicians are pressured to prescribe APs, they may not feel empowered to deprescribe, which could then render time constraints as irrelevant. It is important to note, however, that this association, while significant, was much weaker than the other variables in the model.

6.2.2 Qualitative Results

Many of the barrier themes that have been identified in our study have also been reported in studies in which participants were primarily LTC nurses (and not physicians):[31] Insufficient resources (e.g., limited time);[166, 197-209] aggressive behavior from residents;[166, 198, 200, 201, 205, 211] lack of interprofessional collaboration;[197-199, 202, 206-212] and structural challenges (e.g., prescribing culture, maintaining an effective professional relationship with nurses who often pressure physicians to prescribe or resist deprescribing).[166, 197-202, 204-206, 209, 210, 212] Family members have been reported in previous research as being both a barrier and a facilitator associated with AP deprescribing,[198, 201, 208-211] but based on interview results, it was abundantly clear that if opposed, families can serve as a one of the most important barriers to deprescribing for physicians. This suggests that family members may be an underappreciated component of the AP deprescribing paradigm.

Some of the facilitators that emerged were naturally analogous counterparts to the barriers: having staff trained in non-pharmacological NPS management, supportive family members, communication, specialized support staff, and interprofessional support. Other facilitator themes not mirrored in the barrier themes included: the physician approach to prescribing, administrative support, good patient medical record documentation, and drawing on other successful interventions. While drawing on successful AP deprescribing interventions may be an obvious facilitator to researchers, and administrative support has been previously discussed as a facilitator, [197-200, 202, 204, 205, 207-209, 211, 213] good patient medical record

documentation and the physician approach to prescribing have not been thoroughly explored in the literature. Previous research suggests that skill level of nurses and healthcare assistants can be a barrier[166, 197-208, 211-213] but the impact of a physician's clinical skill and their approach to AP prescribing is relatively absent in the literature. Given that many barriers and facilitators were related to factors that are beyond an individual physician's control (e.g., insufficient NPS training for nurses, administrative support) it is encouraging that physicians still felt that factors under their control (i.e., approach to prescribing, clinical skill) could aid their deprescribing efforts.

6.2.3 Integration of Quantitative and Qualitative Results

Taken together, the survey and interview results suggest that physicians believe nursing staff and family members have a large influence, both positive and negative, on their ability to appropriately prescribe and deprescribe Aps in LTC. More specifically, physicians do not feel that nursing staff have sufficient training in non-pharmacological NPS management strategies or even the resources necessary (e.g., time, sufficient staffing) to implement these strategies if properly trained. Given that previous research has shown that increasing staffing levels and training for LTC staff is not necessarily associated with a corresponding increase in quality of care,[185, 186] optimization of non-pharmacological NPS management in LTC will probably need to involve more than simply increasing staffing levels or training availability.[187] Physicians reported experiencing frequent and intense pressure from nurses to prescribe APs in order to manage difficult resident behavior, particularly aggression. This pressure from nurses appears to stem from a reliance on APs as a method of compensating for rampant understaffing, inadequate training in NPS management, and fear of resident violence. Physicians must strike a delicate balance between providing optimal care for residents while also mitigating nurses' (and other residents') exposure to violence due to resident aggression and acknowledging the shortcomings of the LTC clinical environment.

The male and female physicians interviewed were surprised that female physicians reported more difficulty resisting requests to initiation AP medications in the survey. While all were hesitant to suggest a reason for this result, physicians interviewed generally hypothesized that this might be because females are increasingly graduating medical school and working in

family medicine and in LTC. As a result, they expected that female physicians reporting more difficulty resisting AP initiation requests might actually have less clinical experience and less seniority, compared to their male physician counterparts, who have dominated the physician workforce in the past. Years of overall clinical experience and years of experience in LTC specifically, were analyzed to assess if experience was indeed a confounding variable, as suspected by the interviewed physicians. The gender effect, however, was unchanged when either experience variable was added to the model, and no statistically significant relationship between years of experience and difficulty resisting AP initiation requests was observed. The lack of an association despite the clinician intuition of both the male and female physicians interviewed may suggest that this analysis was underpowered. Another possible explanation is that the physicians interviewed, the majority of whom were men, have never witnessed the unique gender dynamics that occur between female physicians and nursing staff. Given that LTC physicians reported that they work in professional silos with little collaboration between other professionals, including other physicians, it is possible that these physician gender effects do, in fact, occur. There is some research to suggest that a physician gender effects have been observed in other contexts, but research on this topic is largely limited to the physician-patient dyad in primary care settings. A meta-analytic review of physician gender effects in medical communication with patients in primary care found that female physicians utilize more active partnership behaviors, positive talk, psychosocial counseling and questioning, and emotionally focused talk.[214] It is possible that these gender effects may also translate to LTC physician-nurse relationships, which may have increased influence in this setting due to both the frail nature of dementia patients who often have communication difficulties and the limited time LTC physicians spend on-site. The observed physician gender effects in the physician-patient dyad may foster higher levels of care satisfaction in primary care settings but it may also inhibit female LTC physicians' ability to deprescribe APs. Previous research suggests that nurses (the majority of whom are female) are more critical of female physicians due to expectations of camaraderie in spite of the professional power imbalance between the two groups.[194]

Pressure from nursing staff, may be further compounded when physicians do not have adequate access to mental health specialist consultations (e.g., geriatric psychiatrist) to help

support their deprescribing efforts. Time constraints for both nurses and physicians, combined with a lack of intraprofessional collaboration and support, work together to maintain the status quo of AP prescribing in LTCFs, thus inhibiting AP deprescribing. This interplay is related to the concept of prescribing inertia, which has been described as a barrier to appropriate AP prescribing in LTC and for other drugs and clinical settings.[31, 32] The tenuous dynamic between physicians and nurses may then be additionally complicated by family members (who are often mandated to carry out decisions regarding direct care of the resident) communicate a preference for their loved one being more docile in an effort to improve their own quality of life. As such, greater communication with, and consideration of, family members may be required when planning future AP deprescribing interventions.

Though there were a number of barriers and facilitators associated with AP deprescribing, the most enumerated facilitator was related to the physician's approach to prescribing. This suggests that while many factors influence a physician's ability to deprescribe, an individual physician may still be able to effect change in this regard within the complex LTC environment.

6.3 STUDY STRENGTHS AND LIMITATIONS

This research adds to the limited body of literature that seeks to better understand AP deprescribing in LTC and is also inclusive of physicians' experience. To our knowledge, it is the first Canadian study on this topic to incorporate the perspective of the prescribing physicians. It is also one of the few studies to quantify the relative impact of barriers and facilitators on physicians' ability to deprescribe APs in the LTC setting. The influence of physician gender effects between female LTC physicians and nurses, and the impact of this effect on AP deprescribing, is a potentially novel finding that necessitates additional research.

Though the survey was sent to a large electronic listserv and a modified approach to the Dillman method was used during recruitment, the response rate was not sufficient to allow for meaningful comparisons by geographic location. Future research that is able to capture a larger sample may be able to add an additional layer of analysis by incorporating LTCF location. Despite being sent French-language recruitment materials, no Francophone physicians agreed to participate in the Phase II interviews. In order to more accurately assess and explore the

perspective of Canadian LTC physicians, additional research on this topic must make an effort to reach this population.

CHAPTER 7: CONCLUSION

Off-label AP prescribing for the management of the NPS in LTC is prevalent despite clinical guidelines and decades of research cautioning against this practice. This discrepancy may be the result of incongruity between clinical guidelines and the realities of clinical practice and suggests that there are unidentified barriers associated with deprescribing APs in LTC. Given that little research on this topic has been conducted with LTC physicians, this mixed methods study aimed to identify, quantify, and explore the barriers and facilitators associated with AP deprescribing, from the perspective of the prescribing physicians themselves. In order to accomplish this, survey data was collected from physicians in order to determine the most important barriers and facilitators; follow-up interviews were then conducted to further explore the results of the survey and to better understand physicians' rationale for prescribing or deprescribing APs in LTC.

Physicians who reported more difficulty resisting AP initiation requests were more likely to identify as female, and rate pressure from front-line staff, reluctance to question colleagues' previous AP prescribing decision, and lack of access to mental health specialists as barriers to AP deprescribing. In light of the considerable influence that nurses have regarding AP prescribing, it may be easy to cast LTC nurses in a harsh light. When examining the results in context, however, it is clear that this would be overly reductive. Physicians acknowledge that LTC nurses are insufficiently trained in the management of NPS and work in an environment that is underfunded, understaffed, and prone to put them at risk of violence. Given this reality, physicians in our sample (particularly female physicians) were sympathetic to the demands faced by front-line LTC nursing staff. Physicians are indeed aware of the risks associated with AP use in LTC residents with dementia. Their reality, however, is that they are faced with little choice but to manage patients with a treatment that is "less than ideal" in terms of benefit-risk ratios, in order to address distressing and sometimes dangerous behavioral symptoms. Once these medications have been initiated, physicians often experience considerable difficulty deprescribing them. Finally, when encountering resistance by nurses and families to tapering

or withdrawing APs, they may yield and continue these prescriptions, as front-line physicians in this setting may view this as being one of the few ways in which they, as an individual, can support their nursing staff.

Overall, the results of this study demonstrates that many of the barriers and facilitators identified by international research with nurses, other nursing home staff, family members, and pharmacists are shared by LTC physicians in Canada. [31] The finding that gender was significantly associated with difficulty resisting AP initiation requests is a novel finding that requires further research. Additionally, while the role of family members has been noted as being both a barrier and a facilitator to AP deprescribing, our qualitative study results suggest that family influence may be a factor that is underestimated due to the lack of research that incorporates physicians' perspectives.

The survey results add to this literature by quantifying the degree to which these barriers and facilitators impact physicians' AP prescribing decisions for LTC residents with dementia. In doing so, we have highlighted the most promising factors that could be incorporated in future AP deprescribing interventions. The qualitative interviews built on the survey results and provided a more nuanced understanding of physicians' AP prescribing and deprescribing rationale, and highlighted the complexity associated with practicing medicine in the LTC environment. The integration of the quantitative and qualitative results can be used to address the knowledge gap concerning physicians' experience with deprescribing AP in LTC and can help support the development of multidimensional AP deprescribing interventions that are able to sustain long-term intervention effects. [30]

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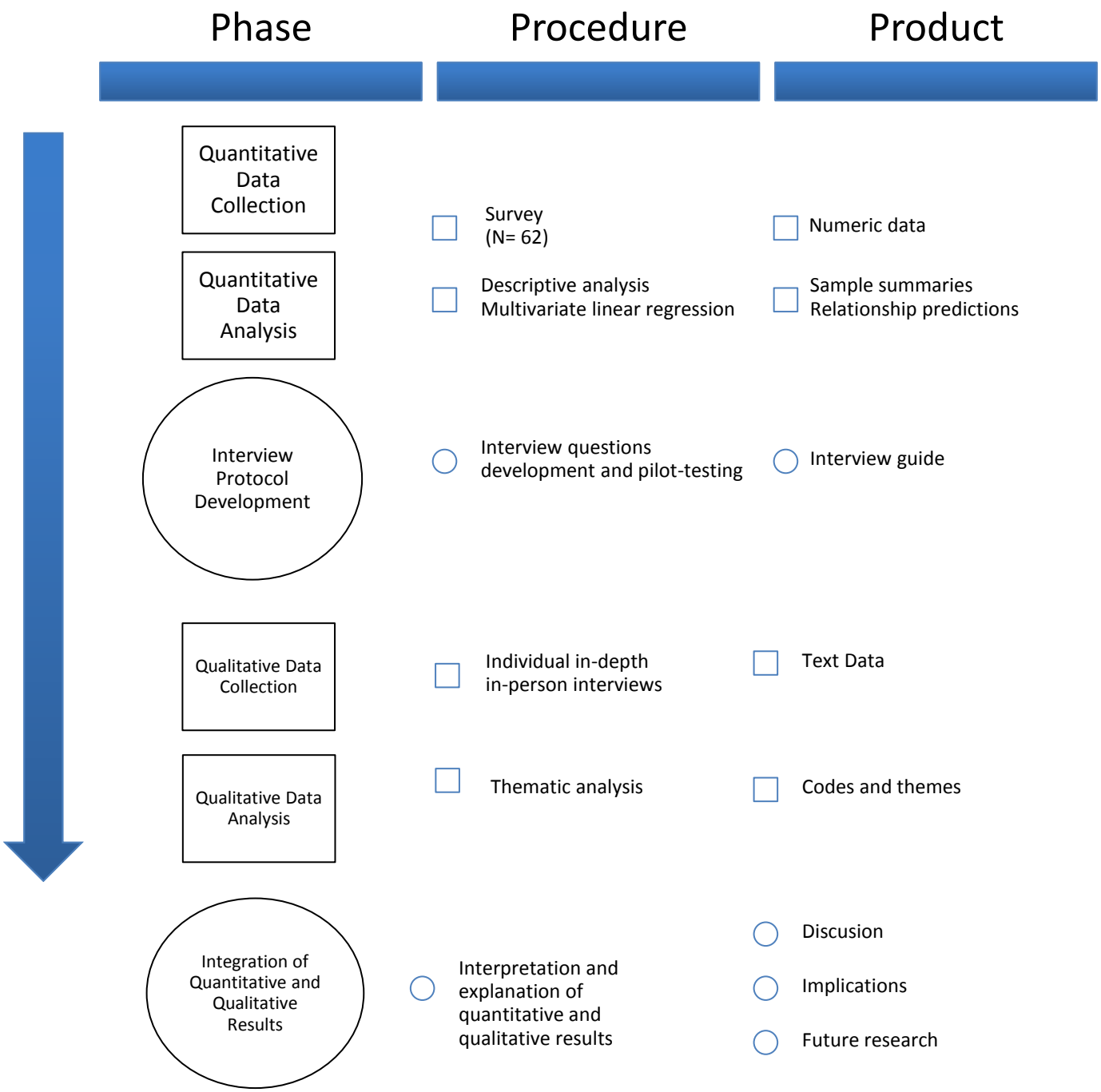
APPENDICES

APPENDIX 1: MIXED METHOD DESIGN OVERVIEW



APPENDIX 2: LTCMD LISTERV MEMBER RECRUITMENT LETTER

McGill | Department of Family Medicine | Département de médecine de famille
5858 Côte-des-Neiges
3rd Floor, Suite 300
Montreal, Quebec H3S 1Z1
Tel: (514) 398-7375
Fax: (514) 398-4202
www.mcgill.ca/familymed/

Dear Fellow LTCMD Listserv Member,

We are currently conducting a study investigating the barriers and facilitators associated with antipsychotic deprescribing in long-term care facilities (LTCFs). While physicians play a key role in the antipsychotic deprescribing process, there is an information gap pertaining to their clinical perspectives on this topic.

As a prescribing physician within a long-term care facility, we are asking for your assistance in the recruitment of physician participants for our study.

The survey results will provide important information, such that it will produce a novel list of weighted barriers and facilitators to deprescribing and appropriate initiation of antipsychotic medications in LTCFs by and for Canadian physicians. Elucidating these understudied factors will add to the scientific literature and provide direction for interventions to reduce inappropriate antipsychotic prescribing among LTCF residents. For this reason, we are asking for your help in forwarding the attached letter of invitation to the practicing physicians in your LTCF network. If you yourself provide direct medical care to residents in your LTCF, we request that you also consider our invitation to participate.

Please note: We ask that you simply forward the invitation letter, and not directly communicate with the physician(s) in an effort to reduce any undue influence or impression of coercion on behalf of invitation recipients.

If you have any questions about this study, please do not hesitate to contact either myself or Mr. Matteo Peretti, (study co-investigator):

matteo.peretti@mail.mcgill.ca

(514)-483-2121 extension 2235

Thank you in advance for your consideration.

Sincerely,

Machelle Wilchesky, PhD
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APPENDIX 3: PHYSICIAN RECRUITMENT LETTER

McGill | Department of Family Medicine | Département de médecine de famille
5858 Côte-des-Neiges
3rd Floor, Suite 300
Montreal, Quebec H3S 1Z1
Tel: (514) 398-7375
Fax: (514) 398-4202
www.mcgill.ca/familymed/

Dear Long-Term Care Physician:

We are currently conducting a study investigating the barriers and facilitators associated with antipsychotic deprescribing in long-term care facilities (LTCFs). While physicians play a key role in the antipsychotic deprescribing process, there is an information gap pertaining to their clinical perspectives on this topic.

WE NEED YOU! As a practicing (or recently practicing) physician working in a long-term care facility, you possess valuable insight on this issue. We would therefore like to invite you to participate in a brief survey. Survey results will provide important information, allowing for the creation of a novel list of weighted barriers and facilitators associated with appropriate initiation and deprescribing of antipsychotic medications in LTCFs, by and for Canadian physicians. Elucidating these understudied factors will add to the scientific literature and provide direction for interventions to reduce inappropriate antipsychotic use by LTCF residents.

The survey should take approximately 5 – 10 minutes to complete.

Your responses will be anonymous and confidential. There are no opportunities for your participation to be verified by the individual who sent you this invitation. You will not suffer any direct or indirect consequences for refusing to participate.

To participate in the online survey, please go to:

http://mcgillphysiciansurvey.limequery.com/883999

NOTE: If you are unable to click on the link directly, please type the entire link into the Address or Location field at the top of your Web browser, and press the ENTER key on your keyboard to access the survey Web site. If you experience any technical difficulties with the Internet survey and need assistance, you may email study co-investigator at matteo.peretti@mail.mcgill.ca

If you would have any questions about this study, please contact Mr. Matteo Peretti by email (matteo.peretti@mail.mcgill.ca) or phone (514-483-2121 x2235). You may also contact me, the principal investigator, directly by email: machelle.wilchesky@mcgill.ca

Thanking you in advance,

Machelle Wilchesky, PhD
Assistant Professor, Department of Family Medicine and
Division of Geriatric Medicine, McGill University
email: Machelle.Wilchesky@mcgill.ca
https://www.mcgill.ca/familymed/machelle-wilchesky

Director of Research,
Donald Berman Maimonides
Geriatric Centre
5795, Avenue Caldwell, Montreal (Quebec) H4W 1W3
office: 514-483-2121 x2346

Scientist,
Centre for Clinical Epidemiology Lady Davis Institute for Medical Research - Jewish General Hospital

APPENDIX 4: FOLLOW-UP EMAIL

McGill | Department of Family Medicine | Département de médecine de famille
5858 Côte-des-Neiges
3rd Floor, Suite 300
Montreal, Quebec H3S 1Z1
Tel: (514) 398-7375
Fax: (514) 398-4202
www.mcgill.ca/familymed/

Dear Long-Term Care Physician:

We recently contacted you to request your participation in a study of the barriers and facilitators associated with antipsychotic deprescribing in long-term care.

If you have already completed the survey, thank you!

We appreciate the time you took to share your viewpoint and expertise. It is only through the involvement of committed clinicians in collaborations such as these that we can move towards a greater understanding of the physician perspective on antipsychotic medication prescribing in long-term care. Your input is crucial to this research.

If you have not yet completed the electronic survey, there is still time to respond!

The survey should take approximately 5 – 10 minutes to complete.

Take a break, complete the survey, and let us know what you think about antipsychotic medication prescribing in long-term care.

Your responses will be anonymous and confidential. There are no opportunities for your participation to be verified by the individual who sent you this invitation. You will not suffer any direct or indirect consequences for refusing to participate.

To participate in the online survey, please go to:

http://mcgillphysiciansurvey.limequery.com/883999

NOTE: If you are unable to click on the link directly, please type the entire link into the Address or Location field at the top of your Web browser, and press the ENTER key on your keyboard to access the survey Web site. If you experience any technical difficulties with the Internet survey

and need assistance, you may email the study co-investigator at matteo.peretti@mail.mcgill.ca

If you have any questions about this study, please contact Mr. Matteo Peretti by email (matteo.peretti@mail.mcgill.ca) or phone (514-483-2121 x2235). You may also contact me, the principal investigator, directly by email: machelle.wilchesky@mcgill.ca

Thanking you in advance,

Machelle Wilchesky, PhD
Assistant Professor, Department of Family Medicine and
Division of Geriatric Medicine, McGill University
email: Machelle.Wilchesky@mcgill.ca
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Scientist,
Centre for Clinical Epidemiology Lady Davis Institute for Medical Research - Jewish General Hospital

APPENDIX 5: SURVEY RECRUITMENT POSTCARD

APPENDIX 6: PHASE I CONSENT FORM AND SURVEY QUESTION EXAMPLES

INFORMED CONSENT FORM

PREAMBLE

You are being contacted because of your clinical expertise as a physician working in long-term care. We are inviting you to participate in the first phase of a research project that will survey long-term care physicians across Canada.

THE PURPOSE OF THIS STUDY

The medication prescribing process for institutionalized adults with dementia is a very complex process. Deprescribing, or the process of tapering or discontinuing drugs, is an important concept when working with this population. Antipsychotics are frequently prescribed off-label in long-term care (i.e., for reasons or conditions other than what has been officially approved). In order to design better antipsychotic reduction interventions, the factors involved in this process require greater understanding. **The purpose of this study is to better understand the barriers and facilitators to antipsychotic deprescribing for long-term care residents, from the perspective of physicians.**

YOUR PARTICIPATION IN THIS STUDY

You are being asked to participate in a ten to fifteen minute online survey with other long-term care facility physicians. In this survey, you will be asked to consider a list of barriers and facilitators that may be relevant to your prescribing practices, and to rate them based on their importance in your own personal clinical experience. Your responses will be anonymous and confidential.

FORESEEABLE RISK/INCONVENIENCE AS A RESULT OF YOUR PARTICIPATION

We do not foresee any risks resulting from your participation

POTENTIAL BENEFITS TO YOUR PARTICIPATION IN THIS STUDY

You will not benefit personally from taking part in this study. Your feedback, insight, and opinions may contribute to the development of antipsychotic deprescribing interventions.

COMPENSATION

No monetary remuneration will be provided to you for taking part in this study.

PRIVACY PROTECTION AND CONFIDENTIALITY

All of the information gathered in the survey will be collected anonymously. Survey responses will be password protected and stored on a secure sever. Only the research team will have access to the data, and data will only be used for research purposes in order to meet the scientific objectives of the study as described in this consent form. In addition, the McGill University Institutional Review Board may access the study data to oversee and ensure the ethical conduct of this study.

PUBLICATION OF THE RESULTS

The findings of this study, including data, may be published in peer-reviewed journals, presented at scientific / academic / policy meetings, or shared with persons engaged in this research. At no time will any personal information be disclosed that would allow you to be identified in any publication or scientific communication without your explicit consent.

NO WAIVER OF RIGHTS

By taking part in this project, you do not give up any of your legal rights, nor do you free the researchers or the establishment of any civil and professional liability.

THE RIGHT TO REFUSE TO PARTICIPATE OR TO WITHDRAW YOUR PARTICIPATION

Your participation in this research project is voluntary. You are free to withdraw from the project at any time, without any negative consequence. You may choose not to complete the survey. Your relationship with the researchers of the project, or with your own professional networks, will not be affected.

TERMINATION OF THE PROJECT BY THE RESEARCHERS

The research project may be interrupted or terminated by the researchers due to unforeseen circumstances or for scientific reasons. You will be informed about this situation if it occurs after you have signed the present consent form.

ACCESS TO THE RESEARCHERS

If you have any questions concerning this research project, or if you feel that a specific problem would prohibit your participation in the research project, please feel free to communicate with Mr. Matteo Peretti or Dr. Machelle Wilchesky, as they are the researchers responsible for this study. They can be reached by phone at 514-483-2121 x2335, or by email to matteo.peretti@mail.mcgill.ca OR machelle.wilchesky@mcgill.ca

IN CASE OF A COMPLAINT

If you have any problems related to the conditions of the research project that you are participating in, you are invited to discuss your concern(s) with Mr. Matteo Peretti or Dr. Wilchesky, the persons responsible for the project as listed above. For any questions regarding your rights as a research participant, please feel free to contact Ms. Ilde Lepore, Research Ethics Officer at the Institutional Review Board, Faculty of Medicine, McGill University at 514-398-8302.

ETHICS COMMITTEE INFORMATION

The Institutional Review Board, Faculty of Medicine, McGill University has approved this research project and ensures the rules of ethics will be respected during the entire research project. For more information, you may contact the Ethics Review Administrator at 514-398-2334.

PARTICIPANT'S INFORMED CONSENT

The above named project has been explained to me in detail, including the risks and benefits of participating. By ticking the box below, I am not waiving my legal rights or releasing the investigator(s) or involved institution(s) from their legal and professional responsibilities.

- I am aware that, for protection of confidentiality of all participants, all records will be stored in a locked facility, together with all other documentation that is collected for the purposes of this study, at the Department of Research at Donald Berman Maimonides Geriatric Centre.
- I am aware that only the research staff will have access to the information collected for research purposes and that, following project completion, all data will be stored for a period of 7 years, after which it will be destroyed. I am aware that all the information will be kept confidential and that I will not be able to be identified in any publication or presentation of the results. I am aware that the responses that I indicate on the survey may be included in publications reporting the results, with the understanding that any quotations used will be anonymous.
- I am also aware that I am free to withdraw from the study at any time.

☐ **I, freely and voluntarily, consent to participate in this project. The study has been explained to me and my questions have been answered to my satisfaction. By checking this box, I indicate my willingness to take part in the study according to the conditions set forth above.**

Thank you for taking the time to participate in this research study.
The survey will take approximately 10-minutes to complete.

To begin, please answer the following two questions about your personal experience(s) when attempting to discontinue or taper antipsychotic medications (i.e., deprescribe) for Long-term Care Facility (LTCF) patients / residents.

Please rate the following two questions on a scale from 1 to 5 where:

"1" indicates that it is not difficult to engage in the deprescribing process
"5" indicates that it is extremely difficult to engage in the deprescribing process

1. **How difficult is it to resist requests to initiate antipsychotic medications?** (e.g., from nurses, residents/patients, families, administrators)

1	2	3	4	5
Not difficult				Extremely difficult

2. **How difficult is it to deprescribe antipsychotic medications? (i.e., discontinue or taper)**

1	2	3	4	5
Not difficult				Extremely difficult

We are now going to ask you to rate some potential barriers associated with deprescribing antipsychotic medications in the LTCF setting by category.

Please rate the following <u>barriers</u> on a scale from 1 to 5 where:
"1" indicates that it is not difficult to engage in the deprescribing process
"5" indicates that it is extremely difficult to engage in the deprescribing process

<u>Time Constraints:</u>

3. **Time required to investigate if antipsychotic medications are indicated or continue to be appropriate for newly admitted residents/patients**

1	2	3	4	5
Not difficult				Extremely difficult

*(**Help:** Investigating why a new resident/patient is currently using antipsychotics takes time. Is the time required to investigate the prescribing rationale or indication a barrier to deprescribing?)*

4. **Time required to actively pursue antipsychotic reduction or cessation for current residents/patients**

1	2	3	4	5
Not difficult				Extremely difficult

*(**Help:** Engaging in deprescribing may involve activities including contacting resident family members, consulting nurses and care team members, conducting informal medication reviews, etc. Is the time required to actively pursue antipsychotic medication reductions for LTCF residents a barrier to deprescribing these medications?)*

Demographics

29. Gender

☐ Female
☐ Male
☐ Other

30. Province or Territory: _____

31. Primary Clinical Specialty

☐ General Practice
☐ Family Medicine
☐ Geriatrics
☐ Internal Medicine
☐ Other *(please indicate*) _____

32. How many years have you been in clinical practice?

_____ years

33. Have you practiced medicine in a long-term care facility (LTCF) within the last 24 months?

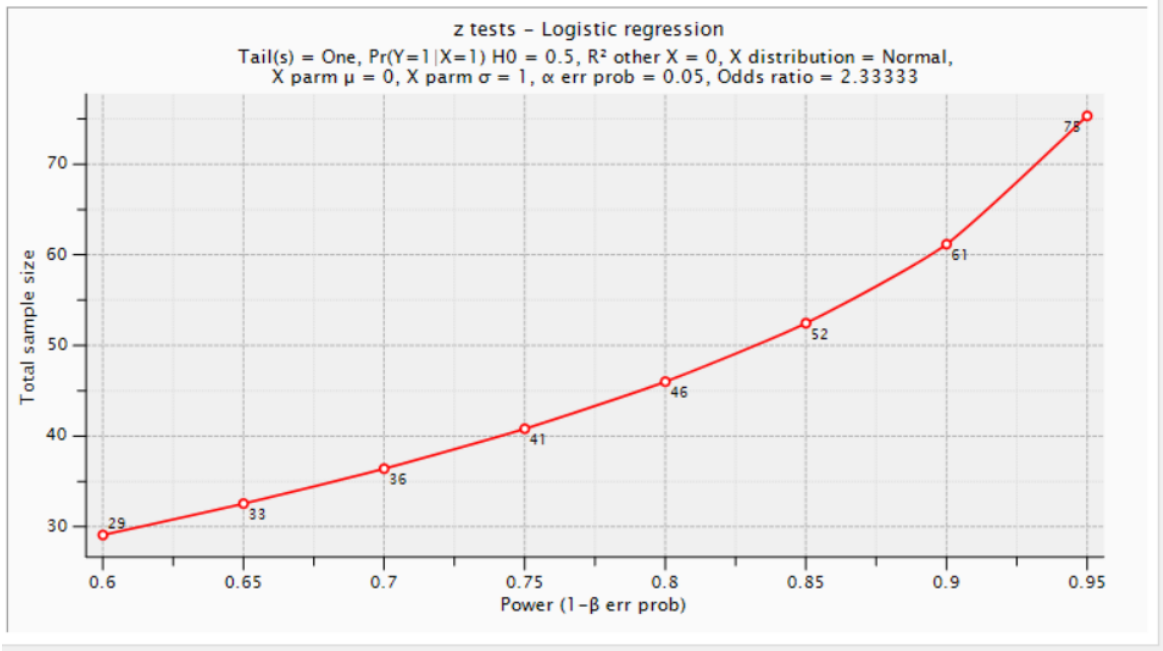
☐ No → Skip to next page
☐ Yes ↓

If you answered "Yes" to the previous question:

34. How many years have you been practicing medicine in LTCF settings?

_____ years

APPENDIX 7: POWER CALCULATION FOR SURVEY SAMPLE SIZE



APPENDIX 8: PHASE II CONSENT FORM AND INTERVIEW GUIDE

Informed Consent: Phase II Interview

Barriers and Facilitators Associated with Antipsychotic Deprescribing: A Mixed Methods Study

Principal Investigator: Dr. Machelle Wilchesky
Student Co-Investigator: Matteo Peretti

THE PURPOSE OF THIS STUDY

The medication prescribing process for institutionalized adults with dementia is a very complex process. Deprescribing, or the process of tapering or discontinuing drugs, is an important concept when working with this population. Antipsychotics are frequently prescribed off-label in long-term care (i.e., for reasons or conditions other than what has been officially approved). In order to design better antipsychotic reduction interventions, the factors involved in this process require greater understanding. **The primary objective of this study is to better understand the barriers and facilitators associated with antipsychotic deprescribing for long-term care residents, from the perspective of physicians.**

YOUR PARTICIPATION IN THIS STUDY

You are being asked to participate in a 20-30 minute interview. During this interview, you will be asked to consider barriers and facilitators that may be relevant to your prescribing practices. The aim of these interviews is to better understand how the significant barriers and facilitators associated with antipsychotic deprescribing, identified in an earlier phase of this research, unfold in the reality of clinical practice. The interviews will be audio-recorded and the researcher conducting the interview will be taking notes during the interview. This interview will be confidential; any identifying information will not be retained in the transcript.

FORESEEABLE RISK/INCONVENIENCE AS A RESULT OF YOUR PARTICIPATION

We do not foresee any risks resulting from your participation.

POTENTIAL BENEFITS TO YOUR PARTICIPATION IN THIS STUDY

You will not benefit personally from taking part in this study. Your feedback, insight, and opinions may contribute to the development of antipsychotic deprescribing interventions.

COMPENSATION

No monetary remuneration will be provided to you for taking part in this study.

PRIVACY PROTECTION AND CONFIDENTIALITY

All of the information gathered in the interview will be treated as confidential. Interview responses and all corresponding material (e.g., audio-recording, notes) will be kept in a locked location by the research team, who will use the data for research purposes only in order to meet the scientific objectives of the study as described in this consent form. In addition, the McGill University Institutional Review Board may access the study data to oversee and ensure the ethical conduct of this study.

PUBLICATION OF THE RESULTS

The findings of this study, including data, may be published in peer-reviewed journals, presented at scientific / academic / policy meetings, or shared with persons engaged in this research. At no time will any personal information be disclosed that would allow you to be identified in any publication or scientific communication without your explicit consent.

NO WAIVER OF RIGHTS

By taking part in this project, you do not give up any of your legal rights, nor do you free the researchers or the establishment of any civil and professional liability.

THE RIGHT TO REFUSE TO PARTICIPATE OR TO WITHDRAW YOUR PARTICIPATION

Your participation in this research project is voluntary. You are free to withdraw from the project at any time, without any negative consequence. You may choose not to complete the interview. Your relationship with the researchers of the project, or with your own professional networks, will not be affected.

TERMINATION OF THE PROJECT BY THE RESEARCHERS

The research project may be interrupted or terminated by the researchers due to unforeseen circumstances or for scientific reasons. You will be informed about this situation if it occurs after you have signed the present consent form.

ACCESS TO THE RESEARCHERS

If you have any questions concerning this research project, or if you feel that a specific problem would prohibit your participation in the research project, please feel free to communicate with Mr. Matteo Peretti or Dr. Machelle Wilchesky, as they are the researchers responsible for this study. They can be reached by phone at 514-483-2121 x2335, or by email to matteo.peretti@mail.mcgill.ca OR machelle.wilchesky@mcgill.ca.

IN CASE OF A COMPLAINT

If you have any problems related to the conditions of the research project in which you are participating, you are invited to discuss your concern(s) with Mr. Matteo Peretti or Dr. Machelle Wilchesky, the persons responsible for the project as listed above. For any questions regarding your rights as a research participant, please feel free to contact Ms. Ilde Lepore, Research Ethics Officer at the Institutional Review Board, Faculty of Medicine, McGill University at 514-398-8302.

ETHICS COMMITTEE INFORMATION

The Institutional Review Board, Faculty of Medicine, McGill University has approved this research project and ensures the rules of ethics will be respected during the entire research project. For more information, you may contact the Ethics Review Administrator at 514-398-2334.

Please retain this document for your records.

If you are interested in participating, Mr. Matteo Peretti will obtain your verbal consent via telephone or video-chat.

Introduction

[Turn on audio-recorder]

Interviewer: Hello, my name is Matteo Peretti. I'm a Master's student in the Department of Family Medicine at McGill University. You recently participated in a survey on antipsychotic medications, which is part of our thesis research that aims to better understand the antipsychotic prescribing practices of long-term care physicians in Canada. You should have received a copy of this study's consent form, which outlines the purpose of this research, your potential role in this study, and your rights as a research participant.

[Allow response]

At the end of the survey in which you took part, you indicated that you were interested in participating in a follow-up interview. These interviews are part of the second phase of our research, which seeks to build on the results of that survey by delving deeper into the barriers and facilitators associated with antipsychotic deprescribing efforts that were identified as important by Canadian long-term care physicians like you.

With your consent, I will be taking notes and audio-recording this interview for later analysis. The Institutional Review Board at the McGill University Faculty of Medicine has approved this research project. This interview is confidential; no identifying information will be retained in the transcripts. Your responses will be kept in a locked office, accessible only by the project's research team and the McGill University Institutional Review Board. There are no foreseeable risks as a result of your participation. You will not benefit personally from taking part in this study and no monetary remuneration will be provided if you participate. Your participation is voluntary and you are free to withdraw at any time. The interview will take approximately 20 - 30 minutes. If you agree to continue with the interview, you are providing verbal consent for your willingness to take part in the study.

Do you have any questions for me before we begin the interview?

[Answer any questions]

Would you like to continue with the interview?

*[If **yes**, record verbal consent (study ID, date, time)]*
*[If **no**, thank them for their time, end interview, and turn off recorder]*

We will now begin the interview. As we go through the questions about barriers, I'd like you to answer while keeping in mind the long-term care facility in which you have the most difficulty deprescribing antipsychotics.

Alright, the survey in which you took part asked about sixteen barriers and six facilitators associated with deprescribing antipsychotic medications in long-term care. It is important to make sure everyone who is completing this interview understands the concept of deprescribing in the same way. To ensure this, I will remind you that deprescribing is the process of tapering or discontinuing drugs.

We will start the interview by talking about the top four barriers to antipsychotic deprescribing, as identified by the survey results.

Barriers

When answering the following questions, please keep in mind that a "barrier" is a factor that would make it more difficult to deprescribe antipsychotics.

1. The category pertaining to Nursing Care Team factors was identified as being the commonly reported. In particular, "**insufficient care staff resources to implement non- pharmacological management strategies**" came up most often. An example of this is having a shortage of nursing staff available to manage difficult resident behaviors.

   Do care staff resources impede your ability to deprescribe antipsychotics?

   a) *If respondent answers yes:* Please explain why
   b) *If respondent answers no*: Please explain why not

Facilitators

8. By far, the most commonly reported facilitator was having **nursing staff trained in non-pharmacological management strategy alternatives.**

   Does this make it easier to deprescribe antipsychotics?

   a) *If respondent answers yes:* Please explain why
   b) *If respondent answers no*: Please explain why not

9. Before we finish this interview with some demographic questions, **do you have any other comments concerning the facilitators associated with antipsychotic deprescribing in long-term care?**

Demographics

Interviewer: Thank you so much for providing your time and expertise for this research. Before we finish this interview, I am going to ask you for some demographic information about yourself.

10. Have you practiced medicine in a long-term care facility (LTCF) **within the last 24 months**?

11. Would you characterize the long-term care settings in which you work as **"Rural" or "Urban**?

12. Would you describe your **gender as "Male", "Female", or "Other"**?

13. In what **province or territory** are your long-term care facilities located?

14. Is your primary clinical specialty **"General Practice", "Family Medicine", "Geriatrics", "Internal Medicine", or something else?**

[If respondent answers "something else", ask to specify]

15. How many **years** have you been practicing medicine **in long-term care settings**?

16. How many **years** have you been **in clinical practice?**

Interviewer: Great, thank you. The last few questions I have pertain to the long-term care facility where you work. Please answer for both the facility in which you have the most difficulty deprescribing antipsychotics and the least difficulty deprescribing antipsychotics.

17. How many patients are admitted **under your care?**

18. How many patients do you **see each week?**

19. On average, **how often are you on call?**

20. When you are on call, **how long are you on call?**

21. How many patients do you **cover when on call?**

22. **How many nurses take care of your residents during the day shift** (not including management)?

Interviewer:

That concludes our interview. Thank you again for your time.

If you wish, we can follow up with you by email with a link to our study results once our manuscript has been accepted for publication, so that you can have an early look at how our (phone) meeting today made an impact.

If you would like to discuss any questions concerning this research project with Machelle Wilchesky, the principal investigator, her email address was provided to you on the consent form that was sent to you on [DATE]. She would be more than happy to hear from you about any aspect of this study, so please do not hesitate to contact her.

Do you have any questions or comments for me before we finish?

[Answer any questions]

Interviewer: Thank you once again for your time and interest in this topic.

APPENDIX 9: PHASE II RECRUITMENT LETTER

McGill | Department of Family Medicine | Département de médecine de famille
5858 Côte-des-Neiges
3rd Floor, Suite 300
Montreal, Quebec H3S 1Z1
Tel: (514) 398-7375
Fax: (514) 398-4202
www.mcgill.ca/familymed/

Dear Dr. _____, July 21, 2017

You recently participated in a survey on antipsychotic medications, which is part of my Master's student Matteo Peretti's thesis research that aims to better understand antipsychotic prescribing practices in Canadian long-term care facilities.

I would like to first thank you for taking the time to participate in this research. Given that existing literature on this topic has failed to take the physician perspective into account, your input on this issue is invaluable.

At the end of the survey in which you took part, you indicated that you were interested in participating in a follow-up interview that comprises the second qualitative phase of this research. The purpose of these interviews is to build upon the quantitative survey results and delve deeper into the barriers and facilitators associated with antipsychotic deprescribing efforts that were identified by Canadian long-term care physicians such as you.

Phase II interviews will be conducted via phone and will take approximately 20 - 30 minutes. Please email Matteo Peretti at matteo.peretti@mail.mcgill.ca to set up a date and time for the interview that is convenient for you. We will send you a copy of the study's consent form, which will explain the nature of the study and your participation in more depth. If you have any questions at this time or after reading the consent form, please do not hesitate to contact either Matteo or me at machelle.wilchesky@mcgill.ca.

Thank you again for your help with this research.

Sincerely,

Machelle Wilchesky, PhD
Assistant Professor, Department of Family Medicine and
Division of Geriatric Medicine, McGill University
email: Machelle.Wilchesky@mcgill.ca
https://www.mcgill.ca/familymed/machelle-wilchesky

Director of Research,
Donald Berman Maimonides
Geriatric Centre
5795, Avenue Caldwell, Montreal (Quebec) H4W 1W3
office: 514-483-2121 x2346

Scientist,
Centre for Clinical Epidemiology Lady Davis Institute for Medical Research - Jewish General Hospital

APPENDIX 10: MULTIVARIABLE MODEL ASSESSMENT OF COLLINEARITY

Parameter Estimates							
Variable	**DF**	**Parameter Estimate** $(\widehat{\boldsymbol{\beta}})$	**Standard Error**	**t Value**	**Pr > |t|**	**Tolerance**	**Variance Inflation**
Intercept	1	-0.14	0.17	-0.82	0.42	.	0.00
Female	1	0.40	0.14	2.95	0.00	0.76	1.31
Time to investigate AP indication/appropriateness	1	-0.68	0.18	-3.72	0.00	0.50	1.99
Pressure from front-line staff	1	0.38	0.15	2.57	0.01	0.68	1.48
Reluctance to question colleagues' previous AP	1	0.41	0.16	2.55	0.01	0.69	1.44
Irregular medication reconciliation or medication reviews	1	-0.39	0.25	-1.58	0.12	0.69	1.46
Lack of access to mental health specialist consults	1	0.27	0.14	1.95	0.06	0.72	1.38

APPENDIX 11: LOGISTIC REGRESSION MODEL BIVARIATE ASSOCIATION FOR SURVEY ITEMS & MAIN OUTCOME 1: DIFFICULTY RESISTING ANTIPSYCHOTIC INITIATION REQUESTS

Survey Item	N (%)	OR	95% CI
Barriers			
Time to investigate AP indication/appropriateness	20 (33%)	0.60	(0.18 - 2.19)
Time to reduce/cease APs	18 (28%)	0.46	(0.11 - 1.87)
Pressure from front-line staff	32 (52%)	2.51	(0.75 - 8.42)
Insufficient care staff resources for non-pharm strategies	47 (75%)	2.84	(0.57 - 14.31)
Care team unaware of AP risks	26 (42%)	1.50	(0.48 - 4.72)
Care team reluctance towards non-pharm strategies	27 (44%)	**3.85***	(1.13 - 13.08)
Lack of incentive to reduce APs for stable residents	15 (24%)	1.17	(0.31 - 4.42)
Concern that behavioral problems will emerge/resume	33 (53%)	1.23	(0.39 - 3.88)
Pressure from family members (to initiate or to not reduce)	20 (32%)	2.75	(0.84 - 8.97)
Unavailable/poor clinical documentation for AP indication	22 (35%)	1.72	(0.53 - 5.56)
Reluctance to question colleagues' previous AP prescribing decision	11 (18%)	2.96	(0.76 - 11.54)
Irregular medication reconciliation or medication reviews	7 (11%)	0.53	(0.06 - 4.95)
Lack of pharmacological alternatives to APs	38 (61%)	2.40	(0.67 - 8.59)
Lack of access to mental health specialist consults	23 (37%)	2.85	(0.88 - 9.19)
Facilitators			
Medication reviews / medication reconciliation for residents	36 (59%)	2.74	(0.76 - 9.82)
Access to mental health consultants	35 (56%)	3.14	(0.88 - 11.21)
Nurse/care team educated on risks of AP use in LTCF residents	43 (69%)	4.25	(0.86 - 21.03)
Nurses trained in non-pharm management strategies	51 (84%)	3.86	(0.45 - 33.17)
Physician education/training regarding risks associated with AP use in LTCF residents	32 (52%)	2.51	(0.75 - 8.42)
Physician education/training re: non-pharm alternatives to APs	43 (69%)	2.17	(0.53 - 8.79)
Demographic Items	**N (%)**	**OR**	**95% CI**
Gender: Female	27 (44%)	**5.50***	(1.50 - 20.21)
Years of LTC Experience (1 - 10)	22 (35%)	3.73	(0.67 - 20.89)
Years of LTC Experience (11 - 24)	21 (34%)	4.00	(0.71 - 22.5)
Years of LTC Experience (25+)	19 (31%)	ref	ref
Years of Clinical Experience (1 - 24)	21 (34%)	1.40	(0.36 - 5.49)
Years of Clinical Experience (25 - 34)	21 (34%)	0.66	(0.15 - 2.93)

Years of Clinical Experience (35+)	20 (32%)	ref	ref
Primary Clinical Specialty: Family Medicine	45 (73%)	1.22	(0.33 - 4.48)
Patient Caseload (1 - 45)	19 (31%)	1.31	(0.31 - 5.49)
Patient Caseload (46 - 90)	21 (34%)	1.36	(0.34 - 5.38)
Patient Caseload (91+)	22 (35%)	ref	ref
Patients Seen Each Week (1 - 18)	20 (32%)	1.25	(0.28 - 5.58)
Patients Seen Each Week (19 - 40)	23 (37%)	1.75	(0.42 - 7.25)
Patients Seen Each Week (41+)	19 (31%)	ref	ref
Hours on Call at LTC at LTC per Week (0 - 10)	19 (31%)	0.96	(0.24 - 3.90
Hours on Call at LTC per Week (11 - 50)	22 (35%)	0.74	(0.19 - 2.91)
Hours on Call at LTC per Week (51+)	21 (34%)	ref	ref
Rural	9 (15%)	0.31	(0.04 - 2.68)
French	11 (18%)	1.07	(0.25 - 4.64)
Province: Alberta	8 (13%)	1.88	(0.37 - 9.40)
Province: Ontario	16 (26%)	0.92	(0.24 - 3.34)
Province: Other	16 (26%)	0.32	(0.06 - 1.58)
Province: Quebec	22 (35%)	ref	ref
LTC CME Credits (At least 1x month, 3 - 4x per year)	34 (55%)	1.07	(0.26 - 4.45)
LTC CME Credits (Once per year or less)	28 (45%)	ref	ref
Barriers and facilitators vary by units that have specialty care	37 (70%)	1.15	(0.30 - 4.43)
Staff have non-pharmacological NPS management training	53 (90%)	0.30	(0.05 - 1.68)
AP prescriptions are automatically renewed	29 (48%)	2.19	(0.68 - 7.10)
Would manual prescriptions help deprescribing efforts?	17 (61%)	0.50	(0.10 - 2.43)

Note: * indicates significance. Barrier and facilitator items were dichotomized into two classes based on Likert scores: 1 - 3 (not a barrier/facilitator) and 4 - 5 (barrier/facilitator)

APPENDIX 12: ASSESSING POTENTIAL CONFOUNDING† BETWEEN NURSES' RELUCTANCE TO IMPLEMENT NON-PHARMACOLOGICAL MANAGEMENT STRATEGIES, AND DEMOGRAPHIC CHARACTERISTICS FOR MAIN OUTCOME 1 (DIFFICULTY RESISTING ANTIPSYCHOTIC INITIATION REQUESTS)

Adjustment Variable	OR	New CI L	New CI U	$\widehat{\beta}$	% $\Delta\widehat{\beta}$
Female	2.70	0.73	9.94	0.99	**-26.3%***
LTC Experience continuous	3.67	1.03	13.05	1.30	-3.5%
LTC Experience (0 - 10, 11 - 25) [Ref = 26+]	3.43	0.95	12.42	1.23	-8.6%
Clinical Experience (continuous)	3.70	1.05	12.99	1.31	-3.0%
Clinical Experience (0 - 24, 25 - 34) [Ref = 35+]	3.61	0.99	13.23	1.28	-4.8%
Primary Clinical Specialty: Family Medicine	4.02	1.17	13.86	1.39	3.3%
Patient Caseload (continuous)	3.98	1.16	13.68	1.38	2.5%
Patient Caseload (0 - 45, 46 - 90) [Ref= 91+]	3.78	1.10	12.95	1.33	-1.4%
Patients Seen Each Week (continuous)	3.83	1.12	13.18	1.34	-0.3%
Patients Seen Each Week (0 - 18, 19 - 40) [Ref = 41+]	4.03	1.15	14.07	1.39	3.3%
Hours on Call at LTC per Week (continuous)	3.85	1.13	13.09	1.35	0.0%
Hours on Call at LTC per Week (0 - 10, 11 - 50) [Ref = 51+]	3.33	1.17	13.91	1.39	3.1%
Rural	3.80	1.11	13.00	1.33	-1.0%
French	3.91	1.14	13.37	1.36	1.1%
Province (Alberta, Ontario, Other) [ref = Quebec]	3.76	1.09	12.96	1.32	-1.9%
LTC CME Credits (at least 1x month, 3-4x per year) [ref=once per year or less]	3.83	1.12	13.06	1.34	-0.4%
Barriers and facilitators vary by units that have specialty care [ref = No]	3.43	0.93	12.62	1.23	-8.5%
Staff have non-pharmacological NPS management training [ref = No]	2.86	0.79	10.29	1.05	**-22.1%***
AP prescriptions are automatically renewed [ref = No]	3.44	1.00	11.90	1.24	-8.4%

† Using Logistic Regression

* indicates significance

APPENDIX 13: LOGISTIC MODEL BIVARIATE ASSOCIATION FOR SURVEY ITEMS & MAIN OUTCOME 2: DIFFICULTY DEPRESCRIBING ANTIPSYCHOTICS

Survey Item	N (%)	OR	95% CI
Barrier (Rating)			
Time to investigate AP indication/appropriateness	20 (33%)	3.08	(0.73 - 13.08)
Time to reduce/cease APs	18 (30%)	2.17	(0.51 - 9.26)
Pressure from front-line staff	32 (52%)	**9.33***	(1.09 - 80.05)
Insufficient care staff resources for non-pharm strategies	47 (76%)	2.95	(0.34 - 25.73)
Care team unaware of AP risks	26 (42%)	1.09	(0.26 - 4.54)
Care team reluctance towards non-pharm strategies	27 (44%)	1.65	(0.40 - 6.86)
Lack of incentive to reduce APs for stable residents	15 (24%)	0.95	(0.17 - 5.21)
Concern that behavioral problems will emerge/resume	33 (53%)	**9.33***	(1.09 - 80.05)
Pressure from family members (to initiate or to not reduce)	20 (32%)	**5.43***	(1.19 - 24.70)
Unavailable/poor clinical documentation for AP indication	22 (35%)	2.81	(0.67 - 11.88)
Reluctance to question colleagues' previous AP prescribing decision	11 (18%)	2.75	(0.57 - 13.32)
Irregular medication reconciliation or medication reviews	7 (11%)	<0.001	<0.00, >999.99
Lack of pharmacological alternatives to APs	38 (61%)	2.57	(0.49 - 13.57)
Lack of access to mental health specialist consults	23 (37%)	4.12	(0.92 - 18.49)
Facilitators			
Medication reviews / medication reconciliation for residents	36 (59%)	2.38	(0.44 - 12.91)
Access to mental health consultants	35 (56%)	8.00	(0.93 - 68.59)
Nurse/care team educated on risks of AP use in LTCF residents	43 (69%)	1.70	(0.32 - 9.08)
Nurses trained in non-pharm management strategies	51 (84%)	1.71	(0.19 - 15.47)
Physician education/training regarding risks associated with AP use in LTCF residents	32 (52%)	0.69	(0.17 - 2.85)
Physician education/training re: non-pharm alternatives to APs	43 (69%)	1.56	(0.29 - 8.33)
Do front-line staff have training in non-pharm BPSD management: Yes	53 (90%)	0.91	(0.09 - 8.85)
Are AP prescriptions automatically renewed: Yes	29 (48%)	0.83	(0.20 - 3.46)
Demographic Items			
Gender: Female	27 (44%)	1.79	(0.43 - 7.45)
Years of LTC Experience (1 - 10)	22 (35%)	3.78	(0.38 - 37.28)
Years of LTC Experience (11 - 24)	21 (34%)	4.00	(0.40 - 39.58)
Years of LTC Experience (25+)	19 (31%)	ref	ref
Years of Clinical Experience (1 - 24)	21 (34%)	0.88	(0.19 - 4.16)
Years of Clinical Experience (25 - 34)	21 (34%)	0.19	(0.02 - 1.85)
Years of Clinical Experience (35+)	20 (32%)	ref	ref
Primary Clinical Specialty: Family Medicine	45 (73%)	1.42	(0.26 - 7.63)

LTC CME Credits (4 or more times per year)	34 (55%)	0.80	(0.26 - 2.51)
Patient Caseload (1 - 45)	19 (31%)	1.81	(0.35 - 9.41)
Patient Caseload (46 - 90)	21 (34%)	0.67	(0.10 - 4.45)
Patient Caseload (91+)	22 (35%)	ref	ref
Patient Seen Each Week (1 - 18)	20 (32%)	0.94	(0.17 - 5.36)
Patient Seen Each Week (19 - 40)	23 (37%)	0.84	(0.15 - 4.76)
Patient Seen Each Week (41+)	19 (31%)	ref	ref
Hours on Call at LTC per Week (0 - 10)	19 (31%)	0.85	(0.16 - 4.43)
Hours on Call at LTC per Week (11 - 50)	22 (35%)	0.43	(0.07 - 2.61)
Hours on Call at LTC per Week (51+)	21 (34%)	ref	ref
Rural	9 (15%)	3.83	(0.75 - 19.49)
French	11 (18%)	0.53	(0.06 - 4.69)
Province: Alberta	8 (13%)	2.75	(0.41 - 18.52)
Province: Ontario	16 (26%)	1.50	(0.33 - 6.87)
Province: Other	16 (26%)	0.31	(0.04 - 2.68)
Province: Quebec	22 (35%)	ref	ref

* indicates significance. Barrier and facilitator items were dichotomized into two classes based on Likert scores: 1 - 3 (not a barrier/facilitator) and 4 - 5 (barrier/facilitator)

APPENDIX 14: ASSESSING POTENTIAL CONFOUNDING† BETWEEN PRESSURE FROM FRONT-LINE STAFF, AND DEMOGRAPHIC CHARACTERISTICS FOR MAIN OUTCOME 2 (DIFFICULTY DEPRESCRIBING ANTIPSYCHOTICS)

Adjustment Variable	New OR	New CI L	New CI U	$\widehat{\beta}$	% $\Delta\widehat{\beta}$
Female	9.34	1.06	82.43	2.23	0.0%
LTC Experience continuous	9.12	1.06	78.78	2.21	-1.0%
LTC Experience (0 - 10, 11 - 25) [Ref = 26+]	8.08	0.92	71.04	2.09	-6.4%
Clinical Experience (continuous)	9.15	1.06	78.98	2.21	-0.9%
Clinical Experience (0 - 24, 25 - 34) [Ref = 35+]	7.93	0.91	69.44	2.07	-7.3%
Primary Clinical Specialty: Family Medicine	9.77	1.13	84.54	2.28	2.0%
Patient Caseload (continuous)	9.49	1.09	82.28	2.25	0.7%
Patient Caseload (0 - 45, 46 - 90) [Re f= 91+]	8.87	1.03	76.68	2.18	-2.3%
Patients Seen Each Week (continuous)	8.99	1.04	77.50	2.20	-1.7%
Patients Seen Each Week (0 - 18, 19 - 40) [Ref = 41+]	10.63	1.17	96.29	2.36	5.8%
Hours on Call at LTC (continuous)	8.83	1.02	76.78	2.18	-2.5%
Hours on Call at LTC (0 - 10, 11 - 50) [Ref = 51+]	11.02	1.22	99.37	2.40	7.4%
Rural	10.02	1.12	89.98	2.30	3.2%
French	9.05	1.05	78.35	2.20	-1.4%
Province (Alberta, Ontario, Other) [ref = Quebec]	12.43	1.30	118.36	2.52	**12.8%***
LTC CME Credits (at least 1x month, 3-4x per year) [ref=once per year or less]	9.93	1.14	86.83	2.30	2.8%
Barriers and facilitators vary by units that have specialty care [ref = No]	9.09	1.03	80.55	2.21	-1.2%
Staff have non-pharmacological NPS management training [ref = No]	9.50	1.09	83.08	2.25	0.8%
AP prescriptions are automatically renewed [ref = No]	12.25	1.34	112.28	2.19	-1.8%

† Using Logistic Regression

* indicates significance

APPENDIX 15: ASSESSING POTENTIAL CONFOUNDING† BETWEEN NURSES' RELUCTANCE TO IMPLEMENT NON-PHARMACOLOGICAL MANAGEMENT STRATEGIES, AND OTHER DEMOGRAPHIC CHARACTERISTICS FOR MAIN OUTCOME 2 (DIFFICULTY DEPRESCRIBING ANTIPSYCHOTICS)

Adjustment Variable	OR	New CI L	New CI U	$\widehat{\beta}$	% $\Delta\widehat{\beta}$
Female	9.70	1.12	83.79	2.27	1.7%
LTC Experience continuous	9.35	1.06	82.67	2.24	0.1%
LTC Experience (0 - 10, 11 - 25) [Ref = 26+]	8.08	0.92	71.04	2.09	-6.4%
Clinical Experience (continuous)	8.77	1.01	75.88	2.17	-2.8%
Clinical Experience (0 - 24, 25 - 34) [Ref = 35+]	11.47	1.24	106.15	2.44	9.2%
Primary Clinical Specialty: Family Medicine	9.25	1.07	80.10	2.22	-0.4%
Patient Caseload (continuous)	9.72	1.11	85.36	2.27	1.8%
Patient Caseload (0 - 45, 46 - 90) [Ref= 91+]	10.10	1.15	88.93	2.31	3.5%
Patients Seen Each Week (continuous)	9.10	1.05	78.56	2.21	-1.1%
Patients Seen Each Week (0 - 18, 19 - 40) [Ref = 41+]	9.74	1.12	84.66	2.28	1.9%
Hours on Call at LTC (continuous)	8.48	0.98	73.81	2.14	-4.3%
Hours on Call at LTC (0 - 10, 11 - 50) [Ref = 51+]	10.61	1.20	93.43	2.36	5.7%
Rural	10.02	1.12	89.98	2.30	3.2%
French	9.54	1.11	82.19	2.26	1.0%
Province (Alberta, Ontario, Other) [ref = Quebec]	9.42	1.06	83.74	2.24	0.4%
LTC CME Credits (at least 1x month, 3-4x per year) [ref=once per year or less]	9.36	1.09	80.35	2.24	2.8%
Barriers and facilitators vary by units that have specialty care [ref = No]	8.46	0.93	76.62	2.14	-4.4%
Staff have non-pharmacological NPS management training [ref = No]	9.94	1.15	86.06	2.30	2.8%
AP prescriptions are automatically renewed [ref = No]	8.97	1.04	77.05	2.19	-1.8%

† Using Logistic Regression

APPENDIX 16: ASSESSING POTENTIAL CONFOUNDING† BETWEEN PRESSURE FROM FAMILY MEMBERS, AND DEMOGRAPHIC CHARACTERISTICS FOR MAIN OUTCOME 2 (DIFFICULTY DEPRESCRIBING ANTIPSYCHOTICS)

Adjustment Variable	New OR	New CI L	New CI U	$\widehat{\beta}$	% $\Delta\widehat{\beta}$
Female	5.65	1.16	27.52	1.73	2.4%
LTC Experience continuous	5.30	1.16	24.29	1.67	-1.4%
LTC Experience (0 - 10, 11 - 25) [Ref = 26+]	6.02	1.20	30.08	1.79	6.1%
Clinical Experience (continuous)	5.15	1.12	23.65	1.64	-3.2%
Clinical Experience (0 - 24, 25 - 34) [Ref = 35+]	4.61	0.98	21.72	1.53	-9.7%
Primary Clinical Specialty: Family Medicine	6.32	1.32	30.28	1.84	9.0%
Patient Caseload (continuous)	5.26	1.12	24.65	1.66	-1.8%
Patient Caseload (0 - 45, 46 - 90) [Re f= 91+]	5.79	1.21	27.67	1.76	3.8%
Patients Seen Each Week (continuous)	5.20	1.14	23.80	1.65	-2.5%
Patients Seen Each Week (0 - 18, 19 - 40) [Ref = 41+]	5.44	1.19	24.91	1.69	0.1%
Hours on Call at LTC (continuous)	4.76	1.02	22.36	1.56	-7.7%
Hours on Call at LTC (0 - 10, 11 - 50) [Ref = 51+]	5.31	1.14	24.79	1.67	-1.4%
Rural	6.04	1.23	29.59	1.80	6.3%
French	5.35	1.17	24.43	1.68	-0.9%
Province (Alberta, Ontario, Other) [ref = Quebec]	4.94	1.03	23.63	1.60	-5.6%
LTC CME Credits (at least 1x month, 3-4x per year) [ref=once per year or less]	5.70	1.22	26.56	1.74	2.9%
Barriers and facilitators vary by units that have specialty care [ref = No]	4.96	0.98	25.07	1.60	-5.3%
Staff have non-pharmacological NPS management training [ref = No]	5.65	1.22	26.30	1.73	2.4%
AP prescriptions are automatically renewed [ref = No]	5.53	1.19	25.67	1.71	1.1%

† Using Logistic Regression