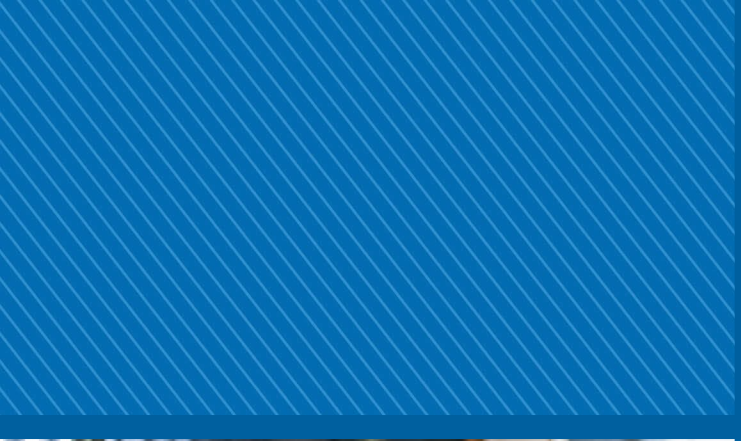
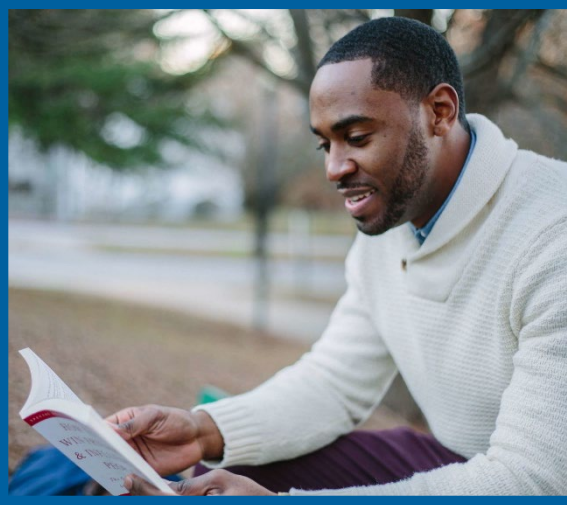




Primary Care Remuneration Models for Substance Use Care: A review of the literature

Prepared for the Canadian Executive Council on Addictions

SRDC SINCE 1991 DEPUIS SRSA

INNOVATION • EXPERIMENTATION • EVALUATION

SRDC Board of Directors

Richard A. Wagner
Partner, Norton Rose Fulbright LLP

Gordon Berlin
Research Professor, Georgetown University and
Past President, MDRC

Erica Di Ruggiero, Ph.D.
Director, Centre for Global Health
Director, Collaborative Specialization in Global Health
Dalla Lana School of Public Health, University of Toronto

Robert Flynn, Ph.D.
Emeritus professor, School of Psychology,
University of Ottawa

Pierre-Gerlier Forest, Ph.D., FCAHS
Director and Palmer Chair
School of Public Policy, University of Calgary

Marie-Lison Fougère
Deputy Minister – Ministry for Seniors and Accessibility
Deputy Minister – Ministry of Francophone Affairs

Renée F. Lyons, Ph.D.
Founding Chair and Scientific Director Emeritus,
Bridgepoint Collaboratory for Research and Innovation,
University of Toronto

James R. Mitchell, Ph.D.
Founding partner, Sussex Circle

Andrew Parkin, Ph.D.
Executive Director of the Environics Institute

Nancy Reynolds
Managing Partner, Sterling Lifestyle Solutions

SRDC President and CEO

David Gyarmati

The Social Research and Demonstration Corporation (SRDC) is a non-profit research organization, created specifically to develop, field test, and rigorously evaluate new programs. SRDC's two-part mission is to help policy-makers and practitioners identify policies and programs that improve the well-being of all Canadians, with a special concern for the effects on the disadvantaged, and to raise the standards of evidence that are used in assessing these policies.

Since its establishment in December 1991, SRDC has conducted over 400 projects and studies for various federal and provincial departments, municipalities, as well as other public and non-profit organizations. SRDC has offices located in Ottawa and Vancouver, and satellite offices in Calgary, Edmonton, Montreal, and Winnipeg.

For information on SRDC publications, contact

Social Research and Demonstration Corporation
55 Murray Street, Suite 400
Ottawa, Ontario K1N 5M3
613-237-4311 | 1-866-896-7732
info@srdc.org | www.srdc.org

Vancouver Office
789 West Pender Street, Suite 440
Vancouver, British Columbia V6C 1H2
604-601-4070

Calgary Contact
343-488-2123

Edmonton Contact
343-488-3462

Montreal Contact
343-488-2124

Winnipeg Contact
343-488-2127

TABLE OF CONTENTS

Executive Summary

What is this report about?

Building on work from a previous study (Childerhose et al., 2019), the Canadian Centre on Substance Use and Addiction (CCSA) and the Canadian Executive Council on Addictions (CECA) have partnered to look more deeply at different available levers and remuneration models to inform recommendations for how to best increase access to and quality of substance use care within primary care settings. The partnership also seeks to identify opportunities for innovation in substance use care within the current health systems landscape in Canada.

As a starting point for this work, SRDC was engaged to conduct a review of the literature on remuneration models for primary care physicians providing care to patients with substance use disorders (SUDs). The aim of the review was to identify remuneration models, mechanisms or processes that could be recommended to improve access to quality substance use care and physician engagement.

What are the main findings?

Results of the literature search revealed a small, emerging evidence base (n = 80 articles total) on the topics of primary substance use care, analogous conditions, and quality of care in general. There was little focus in the literature on physician engagement, and little more on patient perspectives. Most of the literature with regard to primary care for patients with SUDs confirmed the shortcomings of the fee-for-service (FFS) model that were identified in the Childerhose et al. (2019) study, given the complexity of SUDs and the time and coordination required for substance use care. Expanding the search to analogous conditions and chronic disease management in general permitted comparison of different remuneration models and inferences with respect to care quality and access.

While there appears to be consensus that FFS is not aligned with quality primary care for patients with SUDs, there is insufficient evidence for a 'best' primary care remuneration model for either quality care or equitable access. That said, blended payment models appear to be the most promising. In particular:

- Salary + capitation for more collaboration, prevention, and quality of care
- Salary + FFS for better access for high-risk patients

These payment models correspond generally with the recommendation in Childerhose et al. (2019) to introduce base pay with supplemental billing codes to offer physicians predictable revenue – independent of service-based codes – while incentivizing them to provide comprehensive care to patients with SUDs. However, the literature on physician incentives is rife with warnings about unintended consequences, so it is important to proceed with caution, especially since what works for one health condition may not translate to another.

What are the implications?

The literature suggests that the effectiveness of any remuneration model depends on characteristics of the care organization or practice, provider, context, patient population, health condition, and the degree to which quality care is amenable to performance measurement. In particular, it is important to consider the different needs and goals with respect to compensation, access, and quality care that physicians with a dedicated practice in addictions medicine may have, for instance, compared to those in general practice. In other words, remuneration models may need to be nuanced and customized for particular purposes. Another key consideration is how to facilitate more coordination between primary care and the rest of the health care system, especially community and speciality care. Overall, much more research is needed, especially on salary models and patient and provider perspectives.

Introduction

The Canadian Centre on Substance Use and Addiction (CCSA) was created by Parliament to provide national leadership to address substance use in Canada. It provides national guidance to decision makers by harnessing the power of research, curating knowledge, and bringing together diverse perspectives. CCSA provides coordination for the Canadian Executive Council on Addictions (CECA), which has a mandate to form a common national agenda to address the needs of people affected by addiction.

Together, CCSA and CECA are interested in building on findings from an initial qualitative exploratory study, *Family Physician Remuneration for Substance Use Disorders Care* (Childerhose et al., 2019). The purpose of this study was to understand how family physicians working in primary care settings within a fee-for-service (FFS) model use provincial billing codes and incentives to care for patients with substance use disorders (SUDs). Now, CCSA and CECA wish to explore opportunities for innovation in substance use care within the current health systems landscape in Canada, particularly in the context of COVID-19 and the demonstrated potential for rapid health system change. Specifically, they wish to examine the different levers and remuneration models that are available to inform recommendations for how to best increase substance use care access and quality within primary care settings.

Guiding Research Question: ***What types of remuneration and/or incentives are related to physician engagement and high-quality standards of care for substance use care?***

The Social Research and Demonstration Corporation (SRDC) — a non-profit research firm — was engaged to conduct a review of the research literature on remuneration models for primary care physicians providing care to patients with SUDs. The aim of the review was to identify remuneration models, mechanisms, or processes that could be recommended to improve access to, and quality of, substance use care.

This literature review synthesis begins with a description of the issue and the guiding research question, gives an overview of the methods and then moves to findings. Results are provided on the state of the evidence, elements of quality substance use care, challenges with the dominant model, comparison of FFS with other models, and other incentives and factors. The report closes with a discussion of the evidence base, key take-aways, and implications.

Background

Primary care physicians are involved in substance use treatment across a continuum and cycle of care including prevention, treatment, and ongoing/aftercare. Moreover, they operate within multiple systems of care (e.g., with speciality and community care) for people experiencing problematic substance use, and as part of providing quality care, interact and coordinate regularly with these other care settings.

The majority (between 70 to 73 per cent) of clinical payments to primary care physicians in Canada are made through an FFS model, compared to alternative payment models (Canadian Institute for Health Information, 2017). Some of these alternative models include (Rudmik et al., 2014):

- Capitation (payment per patient per time)
- Salary (payment per period of time)
- Pay-for-performance (payment for achieving certain targets)
- Blended models where a combination of different payment systems are in place

Although alternative models represent about one third of payments made in Canada, the vast majority of physicians (88 per cent) receive at least some payment through FFS arrangements (Canadian Institute for Health Information, 2017).

Physician remuneration models are important to consider in terms of effective functioning of the health care system as a whole, since there is strong evidence to show that how physicians are paid has an influence on their activities and behaviour (Gosden et al., 2001). For example, FFS models may increase number of patient visits, while alternative models may lead to higher access to physician services and may encourage physicians to spend more time on patient care outside the office or clinic (Flodgren et al., 2011; Gosden et al., 2001; Sarma, Devlin, Belhadji & Thind, 2010).

Through qualitative interviews with family physicians working in primary care settings, Childerhose et al. (2019) found that while FFS is the current dominant remuneration model, it is not well aligned with substance use care. Based on themes that emerged from these interviews, the authors provided three recommendations:

1. New billing codes and incentives are needed for FFS remuneration, including for chronic disease management, patient intake, assessment and consulting, and ongoing management of patients with SUDs;

2. An alternative remuneration model be considered such as a blended model, which could include base pay with supplemental billing codes (independent of service-based codes), to incentivize the provision of comprehensive care to patients with SUDs;

3. Other improvements to billing practices and care are required, including formal training and supports for billing, funding for allied health professionals, and strengthening community psychosocial services and anti-stigma education for primary care providers.

These recommendations were made to improve the quality and access of treatment that patients with SUDs receive within primary care. However, there is a need to further understand how these and other enhancements could be integrated into the Canadian healthcare landscape, with reference to the Canadian and international research literature in this area.

Methods

In our iterative searches of the research literature, we initially focused on primary care. All searches were limited to articles published in English between 2005 to 2021. For the jurisdictional focus, all Canadian provinces and territories were targeted. Organisation for Economic Co-operation and Development (OCED) countries with federated health systems (e.g., Australia, New Zealand, Netherlands) were also included, as well as US articles when relevant. The databases searched were EconlLit, PsycInfo, MEDLINE Ovid, and Health Systems Evidence; Google Scholar was also used to locate both grey and academic research literature.

Our preliminary search strategy used combinations of the following terms:

Domain	Search terms
Locus of care	("primary care" OR "physician" OR "doctor")
Population/Focus	("substance use" OR "substance abuse" OR "alcohol" OR "drugs" OR concurrent disorder") AND ("patient" OR "client", where applicable)
Intervention	("policy" OR "billing" OR "remuneration" OR "fee" OR "payment" OR "incentives" OR "reform")
Outcomes	("engagement" OR "quality" OR "coordinated* OR "integrated" OR "patient centred")

We started by conducting specific searches of Canadian studies on remuneration and substance use care, then moved to international studies on the same specific topic. Analogous health conditions (i.e., diabetes, mental illness) and remuneration were then searched for, and then broader searches were conducted on remuneration and quality care, with a focus on complex chronic conditions.

We also expanded our searches to look at quality of care in relation to other system components in order to consider coordination of substance use care from a systems perspective (see Appendix A for a full overview of the search results). In total, 146 searches were conducted across the databases noted above, using various combinations of search terms.

Findings

State of the literature

Results of the literature search revealed a small evidence base of only eight articles in the specific area of primary care remuneration and substance use care. Based on iterative searching, we discovered an emerging evidence base (n=80 articles total) on the related topics of primary substance use quality care, analogous conditions, quality of care in general, and remuneration. Specifically, 19 articles were found on primary care remuneration and diabetes, chronic pain, or other chronic conditions; 11 articles on primary care remuneration and mental illness; nine articles on coordination of primary substance use care across the health system; 32 articles on physician remuneration and quality of care; and nine quality substance use care standard documents. Forty-nine of the articles were Canadian, and the remainder were from the US or other OECD countries or were multi-jurisdictional reviews. Not all of these articles were cited in the report, which focused on the most up-to-date studies.

The articles also drew on diverse methods: 21 reviews (11 systematic reviews, 10 narrative reviews); four intervention studies (randomized controlled trials, time series, observational studies); 28 analyses of administrative data (retrospective and prospective cohort studies); ten surveys; five qualitative studies; two theoretical/conceptual papers; one policy analysis; and nine grey literature quality standard documents.

In summary, the varying extent, quality, and diversity of the studies means there is no clear-cut consensus on what types of remuneration and/or incentives are related to physician engagement and high quality standards of care for substance use care. However, some themes and patterns did emerge, which are explored further below.

Elements of quality substance use care

In order to get a sense of how Canadian provincial and territorial governments, OECD countries, and United Nations agencies define high quality substance use care, we first conducted searches on this topic in Google and Google Scholar. This led to seven quality standards documents for substance use care in six contexts (i.e., Ontario, Nova Scotia, Australia, USA, Scotland, and British Colombia)[1] as well as two quality standards documents from the World Health Organization and the United Nations Office on Drugs and Crime.[2]

> *"Substance use disorders include dependence syndrome and harmful use of psychoactive substances. A group of conditions related to alcohol or other drug use [opioids, cannabinoids, sedatives or hypnotics, cocaine, other stimulants including caffeine, hallucinogens, tobacco and volatile solvents]" (United Nations Office on Drugs and Crime, 2012, p.58).*

The following are common themes that emerged from the nine quality standards documents, focusing on what principles constitute high quality primary care for people with SUDs. These principles also align with the *Guiding Principles and Elements of Recovery-Oriented Systems of Care*, as outlined by the US Substance Abuse and Mental Health Services Administration (Sheedy & Whitter, 2009). We also mapped these substance use quality care principles onto clinical care guidelines for various substance use treatments (e.g., alcohol and opioids), and they were found to be congruent:

Substance use quality care principle	Description
Collaborative Care Planning	People with SUDs receive a comprehensive assessment and collaboratively work with their health care provider to develop their care plan (services to access and goals of treatment).
Person-Centred Care	People with SUDs receive holistic and integrated care for their physical and mental health, along with their social needs.

1 Addiction Services Nova Scotia, 2013; National Institute on Drug Abuse, 2012; British Columbia Ministry of Health, 2011; Health Quality Ontario, 2018; Health Quality Ontario, 2020; Scottish Government, 2014; Victoria Department of Health, 2013.

2 United Nations Office on Drugs and Crime, 2012; World Health Organization and United Nations Office on Drugs and Crime, 2020.

Concurrent Care for Multiple Diagnoses	Health care providers to people with SUDs have the ability and capacity to respond to treat multiple diagnoses, including concurrent mental health disorder diagnoses.
Care Information and Education	People with SUDs, along with their family members/caregivers, are provided with information, education, and support to enable them to participate in the care process.
Harm Reduction Services	People with SUDs have ready and consistent access to harm reduction services, where applicable.
Continuum of Care	People with SUDs have a continuity of services, including monitoring, support, and follow-up.
Equity in Care	The rights of people with SUDs are protected and upheld throughout their care, including freedom from discrimination, and intersections of identities (race, socio-economic status, gender, sexual orientation, ability) and their impact on the lived experiences of people with SUDs are consistently considered and centred in care.

A multi-jurisdictional, systematic scoping review (Marchand et al., 2019) of 149 articles explored which patient centred care (PCC) principles have been described, defined, and measured among people with substance-related disorders. They key principles of patient-centred substance use care identified were:

- Therapeutic alliance — defined as empathy and non-judgement (identified by 72 per cent of references)
- Shared decision-making — defined as negotiation through activities/strategies between client and provider in treatment planning process (identified by 36 per cent of references)
- Individualized care — defined as individualized assessment and treatment delivery efforts (identified by 30 per cent of references)
- Holistic care — defined as integrated delivery of substance use, health and psychosocial services via comprehensive care settings or coordination (identified by 23 per cent of references).

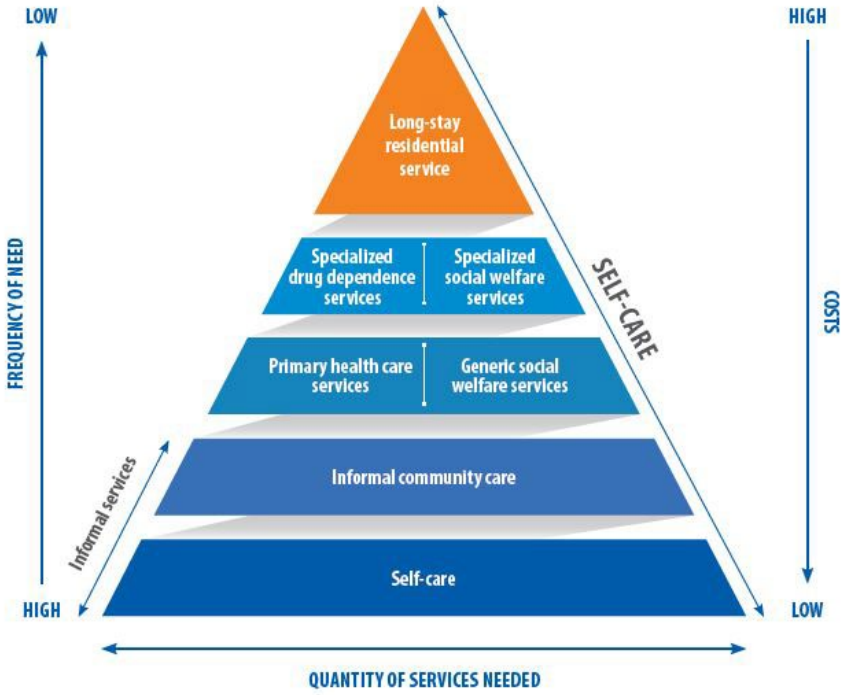
Additionally, the authors suggested that the substance use care literature tends to emphasize outcomes at the expense of quality care, in that "*a continued emphasis on substance use outcomes neglects that the stated goal of PCC is to improve the treatment process*" (Marchand et al., 2019, p. 11).

The literature also recognizes that quality primary care of patients with SUDs requires more time, follow-up, and accounting for relapse. Therefore, caring for patients with SUDs —

particularly those with concurrent disorders (SUD and mental illness) — can be time-consuming (Durbin et al., 2016; Sarma, Devlin & Hogg, 2010).

Primary care is part of the overall system of care for persons with SUDs (Figure 1). While treatment guidelines differ by substance, generally they are shifting from specialty to primary care (British Columbia Centre on Substance Use, 2019), with the caveat that primary care for SUDs care needs to be coordinated with other system components. The literature also suggests that the quality of primary substance use care is enhanced when coordinated with other system components (e.g., community treatment, specialized care, tertiary care). One report developed by experts on a national substance use treatment strategy for Canada proposes a five-tiered systems approach, including primary care (National Treatment Strategy Working Group, 2008).

Figure 1 Substance Use Disorder System of Care Components (World Health Organization and United Nations Office on Drugs and Crime, 2020, p. 17)



Chronic disease care management (CDM) is one model of coordinated care that needs to be further explored in relation to substance use care. Kim et al. (2011) discussed how CDM has shown promise in terms of outcomes for other chronic conditions such as congestive heart failure, chronic pulmonary disease, and depressive disorders. While SUDs are similar to these chronic conditions, they are also more complex due to stigma, complex co-morbidities, trauma,

and the need for linked supports (Kim et al. 2011). Kim et al. (2011) conducted a prospective cohort study involving 282 participants from the US and outlined what CDM looks like for substance dependence care. They found evidence that patients with SUDs engage with this care model: 81 per cent of the cohort met the criteria for linkage with CDM care and 62 per cent met the criteria for continuation of CDM care over the course of the study period.

CDM for SUDs allows for adjustments to treatment intensity and mode based on patients' needs, as well as access to multidisciplinary teams with a variety of addiction-specific skills. CDM includes key quality care processes, and the authors concluded that "even if CDM care per se is not found to be effective, these findings [regarding patient engagement with CDM] are of interest, given the growing interest in transforming a system of time-limited episodic addiction care to one that spans different stages of substance use recovery and even a lifetime" (Kim et al., 2011, p. 85).

Challenges with the dominant model

Fee-for-service

In an FFS remuneration model, the physician bills for each service provided for a patient's treatment, using service-based codes — the unit of payment is the number of services a physician delivers to a patient during a visit (Canadian Medical Association, 2016; Childerhose et al., 2019). In Canada, 70 per cent of primary care physicians are paid by FFS (Canadian Institute for Health Information, 2017), making it the dominant remuneration model in Canada.

FFS models may increase the number of patient visits. In an analysis of Ontario data (n=4,162 patient visits) from the 2004 National Physician Survey (Sarma, Devlin & Hogg, 2010), FFS physicians were found to have more patient visits than physicians working under alternative remuneration models. Therefore, one potential advantage to FFS could be service accessibility; however, others position FFS as a source of systemic inefficiency that may encourage an "over-consumption of care," as more services provided equates to more revenue for physicians under this model (Léger, 2011, p. 2).

In fact, there is evidence that the FFS model does not facilitate high quality care for people with SUDs. Since it compensates on the basis of number of services and not on time spent with patients, the model does not account for the time and complexity of care that is needed by patients with SUDs (Gosden et al. 2001). In Sarma, Devlin and Hogg's (2010) analysis, quality of care was not accounted for, and the authors concluded that any edge FFS physicians had over physicians in alternative remuneration models regarding number of patient visits may be significantly reduced or eliminated once quality of care is taken into consideration (Sarma, Devlin & Hogg, 2010). Drawing on the literature on FFS, we can infer that remuneration models

to support quality substance use care need to account for the longer time required to meet patients' needs. Sarma, Devlin and Hogg (2010) concluded that this may be addressed through group practice models under an FFS remuneration scheme, since such team-based models may balance out the time-consuming nature of practicing addictions medicine.

Canadian and international qualitative studies describe how, from the perspective of physicians, the number and type of consultations reimbursable under FFS are not adequate for quality substance use care, either generally or for specific care such as Opioid Substitution Therapy or Methadone Maintenance Treatment. For instance, in-depth qualitative interviews with 20 primary care physicians in Nova Scotia (Livingston et al., 2018) identified salaried remuneration and working in collaborative teams — as opposed to the FFS model — as practice-related factors that enable primary care physicians to provide Methadone Maintenance Treatment, due to the time-consuming nature of appointments with those in treatment. Similarly, a survey of 596 German physicians (Schulte et al., 2013) — the majority of whom were general practitioners – indicated that the current number of reimbursable consultations and lump sum compensation per patient were not adequate for quality Opioid Substitution Therapy. These physicians identified disproportionate effort (such as time spent) compared to their remuneration as a structural barrier to the provision of Opioid Substitution Therapy.

What also emerged from the literature was some evidence of unmet needs among patients with SUDs in provinces where FFS is the predominant remuneration model. In an analysis of survey data from the 2012 Canadian Community Health Survey on Mental Health, people living with SUDs were found to have unmet needs in comparison to people with mental health conditions or concurrent disorders (i.e., both mental health and substance use disorders), independent of having accessed health care services (Urbanoski et al., 2017). Similarly, a longitudinal survey of 1,153 homeless and vulnerably house adults in ON and BC found increased use of acute care in conjunction with primary care, which the authors posited may be due to the inability of primary care to manage mental health and SUDs for this population (Zhang et al., 2018). In other words, while FFS may promote service accessibility in general, it may not be as accessible for people with substance use disorders or others facing disadvantage.

Comparison with other models

Childerhose et al. (2019, p. 7), and the Canadian Medical Association (2016) provide an overview of alternative remuneration models, as follows:

Model	Definition	Unit of Payment
Capitation	Physicians are guaranteed a fixed payment amount for delivering annual care to rostered patients	Number of patients under a physician's care
Blended capitation	Physicians receive a guaranteed annual base payment for the number of patients enrolled in their care, as well as FFS payments for treating patients not enrolled in their care	Number of patients under a physician's care + number of services a physician delivers to a patient during a visit
Salaried	Physicians are paid regularly based on an employment contract	Physician's time (attributed to a specific time period) as a fixed financial amount

Capitation-based models

In the capitation model, physicians receive a fixed payment depending on the number of patients enrolled in their practice. Those patients are "rostered" in that they are registered as being under the physician's care. The number of patients in the roster represents the physician's unit of payment (Childerhose et al., 2019, p. 7), and other variables — called "modifiers" — are taken into account to calculate the base rate payment (College of Family Physicians of Canada, 2016, p. 5). For example, a patient's age and sex changes the amount received by the physician for that patient. The rationale behind this calculation is that certain demographic characteristics (e.g., older patients) are associated with more care and that physicians should be compensated accordingly.

Capitation models usually offer some additional FFS payments, in which case, they become a blended FFS capitation model. Under this form of the model, physicians receive additional payments for the treatment of non-enrolled patients, as well as for certain services to enrolled patients. In Ontario, capitation-based practices that offer blended capitation payments include Family Health Networks, Family Health Teams, and Family Health Organizations (Hutchison & Glazier, 2013). Similarly, medical homes, which were introduced in Ontario in 2002, "*involve a blend of fee-for-service and capitation payments, formal patient enrolment, and incentives to provide chronic disease prevention and monitoring*" (Spithoff et al., 2019, p. 345).

There is no strong evidence on the effects of capitation on quality of care for patients with SUDs specifically. However, evidence from analogous diseases suggests capitation-based practices generally offer a better quality of care than FFS. For patients with mental illness in Ontario, switching from blended FFS to blended capitation appears to have had positive outcomes;

administrative data showed the switch was linked to a four per cent decrease in emergency department visits for health reasons (Vu et al., 2021a) and a 6.2 per cent decrease in the number of psychiatric hospitalizations (Vu et al., 2021b).

According to other studies of administrative data in Ontario, patients with diabetes also received some benefits from capitation-based practices compared to those seeing an FFS physician. Specifically, those who saw a physician in a blended capitation model were more likely to receive recommended diabetes testing than those in an FFS model (Kiran et al., 2014). Moreover, patients of physicians receiving blended capitation payments were nine percentage points more likely to receive optimal monitoring (34 compared to 25 per cent) than patients attached to a comprehensive FFS physician (Kiran et al., 2016). The effect was larger in team-based capitation medical homes, specifically compared to enhanced FFS (10.6 per cent more likely to receive optimal monitoring), but also compared with non-team-based capitation (6.4 per cent more likely; Kiran et al., 2015). However, another study that analyzed administrative data suggested the blended capitation model might not have a positive effect on all aspects of monitoring. When it comes to eye examinations — part of recommended monitoring for diabetes — there was no effect compared to FFS (Bamimore et al., 2021).

Two systematic reviews of Canadian and international literature on physician remuneration and quality of care in general indicated that blending capitation and FFS payments should encourage preventive care and collaboration while solving the accessibility issues raised by the capitation model (Souri, 2020; Wranik & Durier-Copp, 2011). However, these reviews did not account for the possible lack of accessibility. As with FFS, there may be a trade-off to blended capitation when it comes to quality of care and accessibility.

For instance, a retrospective cohort study in Ontario that linked administrative data sets (n=20,406) found that medical home models — which blend FFS and capitation payments, formal patient enrolment, and incentives — may facilitate primary care screening among Opioid Agonist Treatment (OAT)[3] patients (Spithoff et al., 2019). The analysis found that OAT patients who were enrolled in a medical home (team-based family medical homes and non-team-based medical homes) were more likely to receive cervical cancer screening and colorectal cancer screening than those not enrolled.

However, OAT patients were also found to have lower enrolment in medical homes than matched controls. Patients receiving OAT were also more likely to live in urban areas and in socio-economically disadvantaged neighbourhoods, and less likely to be formally enrolled in any health care model. Therefore, they were less likely to reap the benefits of patient rostering, such as increased continuity of care (Spithoff et al., 2019, p. 350). The authors suggested this may be

[3] Opioid Agonist Treatment is an Opioid Substitution Treatment.

due to the fact that the capitation model does not reimburse physicians for patient complexity (Spithoff et al., 2019).

Similarly, an Ontario survey analysis found socio-economically disadvantaged patients had fewer visits per year in capitation models (six to seven) than in FFS (11 visits) for comparable 15-minute appointments. The salaried model also offered more appointments than capitation (11 to 14 visits), but for longer visits (24 minutes; Dahrouge, 2011, p. 83). This finding could signal that capitation is not able to meet the needs of patients with SUDs.

The evidence is similar regarding mental illness. An analysis of Ontario administrative data shows patients with mental illness are under-represented in the roster of capitation-based practices. Compared with enhanced FFS practices, capitation-based practices are less likely to roster patients with psychosis or bipolar disorders (a rate ratio of 0.92) and patients with other mental illnesses (a rate ratio of 0.94 for blended capitation and 0.93 for team-based blended capitation; Steele et al., 2013).

While capitation models provide a base payment per patient and modifiers are included to enable physicians to be paid more for patients who require more care, the current modifiers in Canada do not reflect the realities of providing care to patients with SUDs. Drawing on a survey of family physicians and a review of randomly selected patient charts, one study pointed out how the "*lack of meaningful financial incentive for visits under the capitation structure might compromise access to needed visits*" (Dahrouge, 2011, p. 106). The author advised adjusting the capitation amount so that providers "*are paid more for complex patients that take more time per visit and need to be seen more often*" (Dahrouge, 2011, p. 107).

Steele et al. (2013) noted that some variables crucial to the level of care required for patients with higher needs are not taken into account by capitation calculations. As a result, the capitation model may encourage physicians to roster low-needs patients rather than members of high-needs populations such as patients with mental illness or SUDs (Dahrouge et al., 2013). Multiple Canadian and US literature reviews and environmental scans found that even if the capitation model is meant to give the time and means to physicians to care for patients with complex illnesses, in practice "cream-skimming" occurs — that is, patients with mental illnesses or SUDs are excluded because they have greater needs and represent a higher financial risk for physicians (Dahrouge, 2011; Durbin et al., 2016; Steele et al., 2013). Overall, the capitation model does not adequately reimburse physicians for the complexity of patients with SUDs, which may lead to the exclusion of these patients from their care (Spithoff et al., 2019).

Supplemental financial incentives

In Canada and elsewhere, health system reforms have introduced supplemental financial incentives in an attempt to encourage certain behaviors among physicians, such as offering

designated services more often, providing care to specific populations, or providing care in accordance with recommended guidelines.

The evidence regarding the effect of such pay-for-performance incentives specifically on substance use care is small and based primarily on studies that also look at mental illness. In British Columbia, where physicians are mainly paid by FFS, an incentive for treating patients with mental illness was introduced in 2007-2008. An analysis of the province's administrative data found the incentive did not result in an increase of visit frequency for patients with comorbid mental illness and Alcohol Attributed Disease (AAD). In fact, *"[w]hile the number of persons seeking care for an AAD increased from 2001 to 2011, the frequency of visits to a GP dropped from 3.9 visits in 2001 to 2.7 in 2011*" (Slaunwhite & Macdonald, 2016, p. 362). The study notes it is not clear why the frequency of visits dropped, but suggests it could be due in some cases to "*more GP referrals to specialists or community-based treatment programs"* (2016, p. 362).

Steele et al. (2013) also expressed doubts about the impact of financial incentives on the inclusion of patients with mental illness in the capitation system in Ontario. Even if there are incentives to provide mental health care and premiums for primary health care for patients with serious mental illness, they suggested that "*it may still be financially advantageous for Ontario physicians to selectively roster healthier patients*" (Steele et al., 2013, p. e15).

The literature suggests that remuneration models or incentives may not be the only factors explaining the under-representation of patients with mental illness (Steele et al., 2013) or SUDs (Spithoff et al., 2019) in Ontario medical homes, in that there may also be discrimination taking place. Steele et al. (2013) state that even though physicians are not supposed to discriminate against patients according to the College of Physicians and Surgeons of Ontario and the Ontario Ministry of Health and Long-Term Care, there may still be workarounds. For instance, "*a physician could provide services to all patients while rostering only his or her healthy patients and still be in compliance with the College policy*" (Steele et al., 2013, p. e17). The authors recommended the implementation of a "*surveillance mechanism*" to protect patients with higher needs.

Even if patients with SUDs and mental illness are not discriminated against, it is not clear whether pay-for-performance incentives would have any effect on the quality of care they receive. Studies on another analogous condition, diabetes, are more abundant and more robust. But these findings are also conflicting.

Some studies found incentives had little or no effect. A study analysing administrative data in Ontario found there was an increase in patients receiving optimal monitoring over time after the introduction of the Diabetes Management Incentives in 2002 (DMI): from 16 per cent in 2000 to 27 per cent in 2008. However, the study notes that these changes were already happening

beforehand. According to the authors, "[*f*]*ollowing the same patients over time, improvement in recommended testing was no greater after billing of the first incentive code than before*" (Kiran et al., 2012, p. 1038), indicating that the incentive did not have a significant effect.

In British Columbia, an interrupted time series analysis using administrative data found that no statistically significant changes regarding the quality of care for patients with diabetes could be linked to the introduction of a pay-for-performance incentive, which rewarded physicians from $75 to $125 for following the recommended guidelines (Lavergne et al., 2018). A study in New Brunswick using administrative data showed the introduction of a pay-for-performance program had a positive impact on A1C testing for patients with diabetes. However, it also highlighted that no difference was found in glycemic control for those patients. In other words, there was more testing, but not necessarily better outcomes (LeBlanc et al., 2017).

These findings do not necessarily mean incentives have no impact on the care of patients with diabetes. There is strong evidence in Canada and internationally that incentives can have a positive effect on the quality of care of those patients. For instance, a study using administrative data from Ontario found patients with a blended capitation physician were eight per cent more likely to receive the services related to the $60 per patient Diabetes Management Incentive (DMI) introduced in 2002 than those enrolled in the enhanced FFS model. Since participation of physicians in the blended capitation model is voluntary, there could be concerns about selection bias, but this was addressed in the study through a difference-in-difference matching strategy. The results indicated physicians in the blended capitation system might be more responsive to financial incentives (Kantarevic & Kralj, 2013).

One international systematic review found "*significant improvement mostly on process clinical outcomes*" in 26 studies on the effect of diabetes management incentives (Lin et al., 2016, p. 10). Other international reviews of literature reached similar conclusions. Across chronic care, diabetes would be "*the condition with the highest rates of quality improvement*" due to pay-for-performance (Herck et al., 2010, p. 4). For their part, Latham and Marshall (2015) assessed the evidence in countries with healthcare systems similar to Canada's — UK, Australia and Taiwan. They concluded supplemental financial incentives may have a positive effect, but "[*m*]*ore evidence is required to understand whether these improvements are sustained and translate into better long-term outcomes such as reduced hospitalizations for diabetes-related complications*" (Latham & Marshall, 2015, p. 86).

Evidence from the literature on chronic conditions in general is similarly mixed. A systematic review of international literature on the effects of pay-for-performance on the care of patients with chronic conditions found improvements in quality of care in half (three out of six) of the studies reviewed (Souri, 2020). However, even when there are improvements, those are not in every aspect of care. For instance, an interrupted time series using administrative data in British Columbia found a statistically significant change in prescribing for patients with hypertension

after the introduction of an incentive, but no changes in continuity of care. While there was a decrease in primary care visits, it was considered not clinically significant (Lavergne et al., 2018).

Souri (2020) emphasized that when there are improvements, those "*may be short-lived and may have negative effects on non-incentivized services*" (p. 30). For instance, an interrupted time-series analysis in the UK showed a negative effect on the aspects of care that were not incentivized. For asthma and heart disease, the financial incentives were associated with a 4.1 to 4.3 per cent *lower* score than expected for continuity of care in 2005 and 2007, "*whereas mean scores for aspects of care that were linked to incentives continued to increase*" (Campbell et al., 2009, p. 375).

Evidence from qualitative studies provides similarly mixed results. A Canadian study using semi-structured interviews with physicians addressed the inclusion of patients with common mental illnesses such as anxiety and depression in Toronto's Family Health Teams (Ashcroft & Mckenzie, 2016). Physicians said the use of a flow sheet linked to financial incentive encouraged them to care for patients with diabetes or congestive heart failure. Yet, the absence of such a process for mental illness was detrimental for patients with those health conditions. One of the physicians interviewed stated, "*what I'm incented to do in my practice by the government is to… look after really well my diabetics and my congestive heart failure patients using the flow sheet because I'm getting paid way more to look after those patients than anyone else. So, mental health does fall behind*" (Ashcroft & Mckenzie, 2016, p. 92).

While Latham and Marshall warned that policy makers in Canada "*should proceed with caution*" when advocating for implementation of pay-for-performance incentives (2015, p. 86), other authors suggested some conditions under which incentives may be beneficial. Gupta and Ayles (2019) stated pay-for-performance measures are optimal when linked to clear performance metrics, while for their part, Lin et al. (2016) argued incentives might have more impact on primary care practices that offer lower quality of care at baseline.

Salaried model

In the salaried model, physicians are paid regularly based on an employment contract. The unit of payment is the physician's time: a fixed financial amount is attributed to a specific time period (Canadian Medical Association, 2016; Childerhose et al., 2019).

A systematic review found that FFS physicians increased the quantity and type of medical services in response to incentives, while salaried physicians maintained their patterns of care for patients with more severe conditions and reduced highly elective services across care for a variety of conditions (Chaix-Couturier, 2000, cited in Mossialos et al., 2005).

In studies of physician perspectives, physicians often supported models with a salary component (and collaborative care), compared to FFS. In the study of Nova Scotia primary care physicians (Livingston et al., 2018), the salaried model was identified as a way to incentivize quality substance use care, in that it specifically enabled primary care physicians to provide Methadone Maintenance Treatment, a recommended harm reduction approach. The model was also perceived by physicians as creating the conditions for them to spend adequate time with patients, along with helping them to begin to address patients' mental health issues. The findings stemming from the survey of German physicians (Schulte et al., 2013) also highlighted the importance of a remuneration model that enables physicians to spend adequate time with substance use care patients.

Theoretical/conceptual frameworks and policy analyses in the literature looking at primary health care across conditions discussed how the salaried model is ineffective for achieving high quality care, in that it may discourage physicians from accepting high-risk patients (Wranik & Durier-Copp, 2011), and does not provide incentives for the provision of quality care (Léger, 2011; Wranik & Durier-Copp, 2011). The salaried model's main benefit was seen as encouraging care in low-density or remote areas, where capitation and FFS are not financially optimal, in that there is a low volume of patients (Rudmik et al., 2014; Souri, 2020; Wranik & Durier-Copp, 2011).

However, Community Health Centres (CHCs), which are typified by salaried physicians, appear to consistently provide high quality care, as found by one literature review (Yalnizyan & Macdonald, 2005). Other studies, including administrative data analysis (Glazier et al., 2012) and surveys of practice characteristics in Ontario combined with administrative data analysis (McColl et al., 2010), showed that CHCs provided high quality care to diverse client groups across a variety of conditions, including patients with disabilities and those who are economically disadvantaged.

Moreover, quality of care appeared to be higher within salaried models than in other models. CHCs were found to offer better quality of diabetic care than blended capitation and FFS in a secondary analysis of medical chart audits from a randomized control trial (n=4,808) in Ontario (Liddy et al., 2011). A study using a cross-sectional survey and qualitative case studies in Ontario also concluded that chronic disease management in general was better in CHCs than in FFS, capitation and blended payment by 10 to 15 per cent (Russell et al., 2009). Another Canadian study that used administrative data analyzed which model was the most efficient and found that CHCs ranked poorly because of their high cost, but the authors highlighted that they nevertheless scored high in terms of quality of care, measured in terms of prevention, health promotion, and chronic disease management (Milliken et al., 2011). We found only one Canadian study (a cross-sectional chart abstraction study) that found an exception to high quality of care within CHCs, in that the model might be associated with a lower hypertension treatment rate (Tu et al., 2009).

The high quality of care reported in CHCs could be due to a variety of factors. A review of literature highlighted the quality of care in CHCs for chronic disease specifically, and stated, "*this high quality was a result of longer consultation with patients, collaboration with nurse practitioners, and an organizational readiness for changes aimed at improving diabetic care, specifically in using diabetic education and care teams*" (Souri, 2020, p. 56). In the salary-based model (as in capitation model), the provider "*is not penalized for additional time spent on those with greater needs*" (Dahrouge et al., 2010, p. 9) — an advantage compared to FFS.

But most studies did not see salary as a prevalent factor for CHCs' high quality of care. They pointed out other factors, such as CHCs providing a broad range of services and activities that other types of practices may outsource, including group activities, outreach community services, counselling, and education (Milliken et al., 2011). According to Milliken et al. (2011), even if CHCs are not seen as the most *efficient* because of their high cost per patient, "*it may very well be the case that this higher-cost approach is, in fact, the more desirable way to provide primary care. Clearly, if a broader spectrum of services is provided by a CHC, visits to health-care practitioners outside of the practice are reduced*" (p. 102). Another study drew on semi-structured interviews with CHC staff (n=10) in Ontario and identified that CHCs are able to take action on upstream determinants of health (Collins et al., 2014).

Other factors

The CHC literature points out that remuneration is only part of the story, and there are other factors at play that have a role in determining quality primary care for patients with SUDs. Context is undoubtedly important, especially with regard to patient choice. In Canada, the shortage of physicians in many areas means patients seldom have a choice of practitioner or program (Barham & Milliken, 2015). Geographic differences between providers could therefore strongly influence the demographics of their patient base as well as the level of care to which different patient sub-groups have access.

Geographic location as a quality SUD care factor is also compounded by socio-economic status. Socio-economically disadvantaged patients are more likely to develop behavioral health problems such as substance abuse (Dahrouge, 2011). Ontario administrative data analyzed by Glazier et al. (2012, 2015) showed patients from higher income neighborhoods are more likely to be rostered in the blended capitation models, while patients from lower income neighborhoods are more likely to go to a CHC.

Other studies also pointed to the tendency of FFS clinics to be geographically located in more urban areas (Glazier et al., 2012, 2015; Kiran et al., 2016). Because of the concerns raised in the literature on the quality of care in this remuneration model, it is possible patients with SUDs in urban areas could be disadvantaged if their closest clinic operates under an FFS model. Although

one systematic review of international literature found no clear impact of reimbursement system on socioeconomic inequity, the authors stated that it is a complicated issue, and more research is needed to grasp the ramifications of this problem (Tao et al., 2016).

Other important factors to take into account when considering quality SUD care include organizational characteristics of the physician's practice. A cross-sectional study that used surveys and reviewed randomly selected patient charts suggested preventive care is not linked to physician remuneration schemes as much as to organizational characteristics, such as low patient/physician ratio, presence of a female physician, and use of technology (i.e., electronic reminder systems; Dahrouge et al., 2012). A different study drawing on surveys based on the Primary Care Assessment Tool suggested high quality care is due to the presence of a nurse-practitioner, a low patient/family physician ratio, and practices with four or fewer full-time-equivalent family physicians (Russell et al., 2009).

For patients with SUDs specifically, one policy analysis suggested the presence of non-physician professionals is crucial (Durbin et al., 2016). This analysis pointed out that in Ontario, capitation-based practices are often limited in the type of non-physician professionals they can hire because of funding criteria. Because of this, they cannot presently hire peer workers, who are considered by many — including the US Substance Abuse and Mental Health Services Administration — to be particularly important for patient recovery (Durbin et al., 2016).

It should also be noted that physicians can face non-financial barriers when caring for patients with SUDs. A qualitative study in Saskatchewan (Lang et al., 2013) identified continuing education as a potential non-financial incentive that could improve the quality of care for patients with SUDs. Researchers conducted focus groups of substance use care service providers in Saskatoon to understand their point of view on the care of patients with SUDs. From their perspective, patients with SUDs were identified as a complex population in part because of behaviors associated with addiction (e.g., mental illness and erratic behaviour). Interviewees expressed that continuing education for health care providers on addictions and coping skills for working with complex populations could constitute an incentive (Lang et al., 2013).

Another qualitative study in the US suggested "*the lack of knowledge on evidence-based substance use treatments […] and lack of training on how to assess, monitor, and/or treat substance use [limits] providers' ability to address substance use among clients with [first-episode psychosis]"* (Oluwoye & Fraser, 2021, p. 8). A different US review of evidence and a US qualitative study had similar conclusions regarding patients with mental illness (Bucci et al., 2016; Trainor & Leavey, 2017).

Furthermore, it is important to consider a variety of perspectives on quality care, including metrics such as patient and provider satisfaction. As part of a mixed methods evaluation of integrated programs in Ontario, Tarasoff et al. (2018) found pregnant and parenting women

with problematic substance use in integrated treatment programs with access to primary care had more positive perceptions of their care than those in standard treatment programs. According to these authors, integrated programs seek to "*overcome the traditional fragmentation of services across sectors [by addressing] physical and mental health and socio-economic well-being concurrently with substance use treatment, ideally at a single access point*" (Tarasoff et al., 2018, p. 10).

With regard to physician satisfaction, an Ontario study using a survey, administrative and income data found family physicians working in FFS models were less satisfied with their work than those in other models and that there were financial advantages for physicians to switch to non-FFS models (Green et al., 2009). In other words, the remuneration model may play a role in provider satisfaction.

However, a survey of physicians in the Seattle metropolitan area showed that, when it comes to patients with chronic pain or depression, physician satisfaction with their work is linked in part to measures of quality of care (Grembowski et al., 2005). Another study found that remuneration is not the only factor affecting a physician's behaviour and noted differences among physicians in terms of motivation. Barham and Milliken (2015) distinguished between altruistic physicians, who are more concerned about their patients' health, and nonaltruistic physicians, who are more influenced by financial rewards. Barham and Milliken theorized that altruistic physicians are "*better off treating additional patients [...] rather than providing better care to their existing patients*" (2015, p. 904), since it is presumed they already provide quality care.

Physicians can also be influenced by reputational incentives. According to a theoretical model proposed by Hamblin, physician behaviour is determined by a set of incentives (2007, p. 184)., some of which are reputational, in that they rely on the desire of the providers to attain good standing. Reputational incentives can be effective because of the sense of competition and the willingness of providers to gain respect from other players in the health system. Physicians may wish to attain local or national recognition but may also simply fear having their reputation tarnished (Hamblin, 2007, p. 184).

In the UK, the Quality and Outcomes Framework financially rewards physicians based on different quality indicators, and a quality score is published online, creating a reputational incentive for practices to increase quality of care (Allen et al., 2018). An observational study in the UK suggests that, over the long term, the reputational aspect of this framework might have more effect than the financial reward to physicians (Allen et al., 2018). The study found the effect of financial incentives decreased from 0.797 percentage points to 0.138 percentage point per £100 between 2004 and 2013, while the effect of the reputational incentives increased during the same period, from -0.121 to 0.209 percentage points per quality point.

Nevertheless, Hamblin warned reputational incentives "*are not a panacea, and they risk encouraging unintended consequences that lead to only the impression, rather than reality, of improvement*" (2007, p. 185). A more extensive review on the effect of reputational incentives is needed, since a systematic review showed their effect could differ depending on the remuneration system in which they are implemented (Roland & Dudley, 2015). Overall, the impact of reputational incentives on the care of socio-economically disadvantaged patients should be assessed before reaching a conclusion about their potential effects on the care of patients with SUDs, particularly in the Canadian context.

Discussion

Summary of the evidence base

The remit of this review was to summarize the research literature on primary care physician remuneration to determine which models optimize physician engagement, access, and quality of substance use care. We found that the literature on this specific topic is quite small — it appears to be a nascent area of study. The literature that does exist draws on various methods and methodological approaches. While it is possible research exists in other databases that were not included in our searches, a systematic review of international interventions designed to improve care for patients with mental health and SUDs also concluded, "*the body of research in this area is surprisingly small, given the morbidity, mortality and barriers to care faced by this population*" (Druss & von Esenwein, 2006, p. 150). Other studies discuss how substance use care literature places emphasis on SUD treatment outcomes (i.e., less substance use) at the expense of considering or focusing on substance use quality of care (Kim et al., 2011; Marchand et al., 2019). A similar concern is the importance of defining quality of care broadly, including process-of-care and structural elements (McGinty & Daumit, 2020).

There is also little focus in the literature on physician engagement or satisfaction, and little more on patient perspectives. Most of the literature regarding primary care for patients with SUDs confirmed the shortcomings with respect to FFS which Childerhose et al. (2019) outlined and made suggestions towards addressing, given the complexity of SUDs and the time and coordination required for the care of these patients. Expanding the search to analogous conditions and chronic disease management in general allowed us to compare remuneration models and make inferences with respect to quality and access of care. Overall, there was slightly more literature for analogous conditions — particularly diabetes — and more literature looking at blended capitation, compared to the other models.

Key take-aways

Overall, results from this review helped articulate nuances of the problem, rather than point towards a particular solution. While there appears to be a consensus that FFS is not aligned with quality primary care for patients with SUDs, there is insufficient evidence for a 'best' primary care remuneration model (Jeffries et al., 2013) for either quality care or equitable access. While the blended capitation model is sometimes viewed as optimal (Souri, 2020; Wranik & Durier-Copp, 2011), there could still be issues with this model when it comes to accessibility for patients with a high level of complex needs and social or economic disadvantage. That said, a blended payment model appears to be the most promising. Mixed forms of payments are generally

considered preferable to models relying only on salary, capitation, or FFS (Léger, 2011; Souri, 2020; Wranik & Durier-Copp, 2011).

These options correspond generally with the recommendation from Childerhose et al. (2019) to introduce base pay with supplemental billing codes in order to offer physicians predictable revenue — independent of service-based codes —— while incentivizing provision of comprehensive care to patients with SUDs. However, the literature on physician incentives is rife with warnings about the unintended consequences of incentives, given contextual factors as well as patient population. What works for one condition may not translate to another, due to the specificities at work within complex conditions, populations, and contexts.

Implications

In fact, the effectiveness of any model depends on characteristics of the organization/practice, provider, context, patient population, health condition, and the degree to which quality care is amenable to performance measurement (Beaulieu et al., 2013). For example, those who have access to primary care physicians working within models that enable them to take the necessary time to provide quality substance use care, are generally not disadvantaged people with multiple needs (Spithoff et al., 2019; Zhang et al., 2018).

In particular, it is important to consider the different needs and goals with respect to compensation, access, and quality care for physicians with a dedicated practice in addictions medicine (i.e., more than 15 per cent of patients with SUDs) compared to those in a general primary care practice. In addition, remuneration models may need to be nuanced or customized for different purposes. The evidence seems to suggest that (a) salary and capitation together are best suited for more collaboration, prevention, and quality of care, and (b) salary and FFS combined may result in enhanced access to primary care for high-risk patients (Wranik & Durier-Copp, 2011).

In addition, different approaches may need to be considered for different physician groups or practice settings. The solution of how to incentivize primary care physicians to not exclude persons with SUDs from their care (i.e., address barriers to access) is likely to be different from ways to incentivize these same physicians to provide high quality SUD care to their pre-existing patients. It is also important to consider how to facilitate more alignment and coordination between primary care and other components of the health care system, especially with regard to community and specialty care, since coordination of care is central to quality care and accessibility.

In summary, much more research is needed, especially on salary models and on patient and provider perspectives, which are currently lacking in the literature. What is evident is that remuneration is only part of the primary quality care story for patients with SUDs.

References

Addiction Services Nova Scotia. (2013). *System level standards for community-based addiction services*. Government of Nova Scotia.

Ashcroft, R., Silveira, J., & Mckenzie, K. (2016). A qualitative study on incentives and disincentives for care of common mental disorders in Ontario Family Health Teams. *Healthcare Policy*, *12*(1), 84–96.

Bamimore, M. A., Devlin, R. A., Zaric, G. S., Garg, A. X., & Sarma, S. (2021). Quality of diabetes care in blended fee-for-service and blended capitation payment systems. *Canadian Journal of Diabetes*. *45*(3), 261–268.e11.

Barham, V., & Milliken, O. (2015). Payment mechanisms and the composition of physician practices: Balancing cost-containment, access, and quality of care. *Health Economics*, *24*(7), 895–906.

Beaulieu, M.-D., Haggerty, J., Tousignant, P., Barnsley, J., Hogg, W., Geneau, R., … & Dragieva, N. (2013). Characteristics of primary care practices associated with high quality of care. *Canadian Medical Association Journal*, *185*(12), E590–E596.

British Columbia Centre on Substance Use. (2019). *Provincial guideline for the clinical management of high-risk drinking and alcohol use disorder*. Vancouver, B.C.: Author.

British Columbia Ministry of Health. (2011). *Service model and provincial standards for adult residential substance use services*. Vancouver, B.C.: Author.

Bucci, S., Berry, K., Barrowclough, C., & Haddock, G. (2016). Family interventions in psychosis: A review of the evidence and barriers to implementation. *Australian Psychologist*, *51*(1), 62–68.

Campbell, S. M., Reeves, D., Kontopantelis, E., Sibbald, B., & Roland, M. (2009). Effects of pay for performance on the quality of primary care in England. *New England Journal of Medicine*, *361*(4), 368–378.

Canadian Institute for Health Information. (2017). *Physicians in Canada, 2016: summary report*. Ottawa, Ont.: Author.

Canadian Medical Association. (2016). *Joule Module 8: Physician Remuneration Options*.

Childerhose, J., Atif, S., & Fairbank, J. (2019). *Family physician remuneration for substance use disorders care*. Ottawa, Ont.: Canadian Centre on Substance Use and Addiction.

College of Family Physicians of Canada. (2016). *Best advice: physician remuneration in a patient's medical home*. Retrieved from https://patientsmedicalhome.ca/files/uploads/BAG_Rem_ENG_WEB_rev.pdf.

Collins, P. A., Resendes, S. J., & Dunn, J. R. (2014). The untold story: Examining Ontario's Community Health Centres' initiatives to address upstream determinants of health. *Healthcare Policy*, *10*(1), 14–29.

Dahrouge, S. (2011). *Evaluation of the equity of primary care service delivery models in Ontario* (Unpublished doctoral dissertation). University of Ottawa, Ottawa, Ont.

Dahrouge, S., Hogg, W. E., Russell, G., Tuna, M., Geneau, R., Muldoon, L. K., Kristjansson, E., & Fletcher, J. (2012). Impact of remuneration and organizational factors on completing preventive manoeuvres in primary care practices. *CMAJ*, *184*(2), E135–E143.

Dahrouge, S., Hogg, W., Tuna, M., Russell, G., Devlin, R. A., Tugwell, P., & Kristjansson, E. (2010). An evaluation of gender equity in different models of primary care practices in Ontario. *BMC Public Health*, *10*, 151.

Dahrouge, S., Hogg, W., Ward, N., Tuna, M., Devlin, R. A., Kristjansson, E., Tugwell, P., & Pottie, K. (2013). Delivery of primary health care to persons who are socio-economically disadvantaged: Does the organizational delivery model matter? *BMC Health Services Research*, *13*, 517.

Druss, B. G., & von Esenwein, S. A. (2006). Improving general medical care for persons with mental and addictive disorders: Systematic review. *General Hospital Psychiatry*, *28*(2), 145–153.

Durbin, A., Durbin, J., Hensel, J. M., & Deber, R. (2016). Barriers and enablers to integrating mental health into primary care: A policy analysis. *Journal of Behavioral Health Services & Research*, *43*(1), 127–139.

Flodgren, G., Eccles, M. P., Shepperd, S., Scott, A., Parmelli, E., & Beyer, F. R. (2011). An overview of reviews evaluating the effectiveness of financial incentives in changing healthcare professional behaviours and patient outcomes. *Cochrane Database of Systematic Reviews*, *7*, CD009255.

Glazier, R., Hutchison, B., & Kopp, A. (2015). *Comparison of primary care models in Ontario by demographics, case mix and emergency department use, 2004/05 to 2011/12: ICES Investigative Report*. Toronto, Ont.: Institute for Clinical Evaluative Sciences.

Glazier, R., Zagorski, B., & Rayner, J. (2012). *Comparison of primary care models in Ontario by demographics, case mix and emergency department use, 2008/09 to 2009/10: ICES Investigative Report*. Toronto, Ont.: Institute for Clinical Evaluative Sciences.

Gosden, T., Forland, F., Kristiansen, I. S., Sutton, M., Leese, B., Giuffrida, A., Sergison, M., & Pedersen, L. (2001). Impact of payment method on behaviour of primary care physicians: A systematic review. *Journal of Health Services Research & Policy*, *6*(1), 44–55.

Green, M. E., Hogg, W., Gray, D., Manuel, D., Koller, M., Maaten, S., Zhang, Y., & Shortt, S. E. (2009). Financial and work satisfaction: Impacts of participation in primary care reform on physicians in Ontario. *Healthcare Policy*, *5*(2), e161–e176.

Grembowski, D., Paschane, D., Diehr, P., Katon, W., Martin, D., & Patrick, D. L. (2005). Managed care, physician job satisfaction, and the quality of primary care. *Journal of General Internal Medicine*, *20*(3), 271–277.

Gupta, N., & Ayles, H. M. (2019). Effects of pay-for-performance for primary care physicians on diabetes outcomes in single-payer health systems: A systematic review. *The European Journal of Health Economics: HEPAC: Health Economics in Prevention and Care*, *20*(9), 1303–1315.

Hamblin, R. (2007). Publishing "quality" measures: How it works and when it does not? *International Journal for Quality in Health Care*, *19*(4), 183–186.

Health Quality Ontario. (2018). *Opioid use disorder: Care for people 16 years of age and older* [Quality standards]. Toronto, Ont.: Government of Ontario.

Health Quality Ontario. (2020). *Problematic alcohol use and alcohol use disorder: Care for people 15 years of age and older* [Quality standards]. Toronto, Ont.: Government of Ontario.

Hutchison, B., & Glazier, R. (2013). Ontario's primary care reforms have transformed the local care landscape, but a plan is needed for ongoing improvement. *Health Affairs*, *32*(4), 695–703.

Jeffries, V., Slaunwhite, A., Wallace, N., Menear, M., Ardnt, J., Dotchin, J., GermAnn, K., & Sapergia, S. (2013). *Collaborative care for mental health and substance use issues in primary health care: Overview of reviews and narrative summaries*. Ottawa, Ont.: Mental Health Commission of Canada.

Kantarevic, J., & Kralj, B. (2013). Link between pay for performance incentives and physician payment mechanisms: Evidence from the diabetes management incentive in Ontario. *Health Economics*, *22*(12), 1417–1439.

Kim, T. W., Saitz, R., Cheng, D. M., Winter, M. R., Witas, J., & Samet, J. H. (2011). Initiation and engagement in chronic disease management care for substance dependence. *Drug and Alcohol Dependence*, *115*(1–2), 80–86.

Kiran, T., Kopp, A., & Glazier, R. H. (2016). Those left behind from voluntary medical home reforms in Ontario, Canada. *Annals of Family Medicine*, *14*(6), 517–525.

Kiran, T., Kopp, A., Moineddin, R., & Glazier, R. H. (2015). Longitudinal evaluation of physician payment reform and team-based care for chronic disease management and prevention. *Canadian Medical Association Journal*, *187*(17), E494–E502.

Kiran, T., Victor, J. C., Kopp, A., Shah, B. R., & Glazier, R. H. (2012). The relationship between financial incentives and quality of diabetes care in Ontario, Canada. *Diabetes Care*, *35*(5), 1038–1046.

Kiran, T., Victor, J. C., Kopp, A., Shah, B. R., & Glazier, R. H. (2014). The relationship between primary care models and processes of diabetes care in Ontario. *Canadian Journal of Diabetes*, *38*(3), 172–178.

Lang, K., Neil, J., Wright, J., Dell, C. A., Berenbaum, S., & El-Aneed, A. (2013). Qualitative investigation of barriers to accessing care by people who inject drugs in Saskatoon, Canada: Perspectives of service providers. *Substance Abuse Treatment, Prevention, and Policy*, *8,* 35.

Latham, L. P., & Marshall, E. G. (2015). Performance-based financial incentives for diabetes care: An effective strategy? *Canadian Journal of Diabetes*, *39*(1), 83–87.

Lavergne, M. R., Law, M. R., Peterson, S., Garrison, S., Hurley, J., Cheng, L., & McGrail, K. (2018). Effect of incentive payments on chronic disease management and health services use in British Columbia, Canada: Interrupted time series analysis. *Health Policy*, *122*(2), 157–164.

LeBlanc, E., Bélanger, M., Thibault, V., Babin, L., Greene, B., Halpine, S., & Mancuso, M. (2017). Influence of a pay-for-performance program on glycemic control in patients living with diabetes by family physicians in a Canadian province. *Canadian Journal of Diabetes*, *41*(2), 190–196.

Léger, P. T. (2011). *Physician payment mechanisms: an overview of policy options for Canada.* (CHSRF Series on Cost Drivers and Health System Efficiency: Paper 3). Ottawa, Ont.: Canadian Health Services Research Foundation.

Liddy, C., Singh, J., Hogg, W., Dahrouge, S., & Taljaard, M. (2011). Comparison of primary care models in the prevention of cardiovascular disease — A cross sectional study. *BMC Family Practice*, *12,* 114.

Lin, Y., Yin, S., Huang, J., & Du, L. (2016). Impact of pay for performance on behavior of primary care physicians and patient outcomes. *Journal of Evidence-Based Medicine*, *9*(1), 8–23.

Livingston, J. D., Adams, E., Jordan, M., MacMillan, Z., & Hering, R. (2018). Primary care physicians' views about prescribing methadone to treat opioid use disorder. *Substance Use & Misuse*, *53*(2), 344–353.

Marchand, K., Beaumont, S., Westfall, J., MacDonald, S., Harrison, S., Marsh, D. C., Schechter, M. T., & Oviedo-Joekes, E. (2019). Conceptualizing patient-centered care for substance use disorder treatment: Findings from a systematic scoping review. *Substance Abuse Treatment, Prevention, and Policy*, *14*(1), 37.

McColl, M. A. H., Shortt, S., Hunter, D., Dorland, J., Godwin, M., Rosser, W., & Shaw, R. (2010). Access and quality of primary care for people with disabilities: a comparison of practice factors. *Journal of Disability Policy Studies*, *21*(3), 131–140.

McGinty, E. E., & Daumit, G. L. (2020). Integrating mental health and addiction treatment into general medical care: The role of policy. *Psychiatric Services*, *71*(11), 1163–1169.

Milliken, O., Devlin, R. A., Barham, V., Hogg, W., Dahrouge, S., & Russell, G. (2011). Comparative efficiency assessment of primary care service delivery models using data envelopment analysis. *Canadian Public Policy*, *37*(1), 85–109.

Mossialos, E., Walley, T., & Rudisill, C. (2005). Provider incentives and prescribing behavior in Europe. *Expert Review of Pharmacoeconomics & Outcomes Research*, *5*(1), 81–93.

National Institute on Drug Abuse. (2012). *Principles of drug addiction treatment: A research-based guide* (3rd ed.). Retrieved from https://www.drugabuse.gov/download/675/principles-drug-addiction-treatment-research-based-guide-third-edition.pdf.

National Treatment Strategy Working Group. (2008). *A systems approach to substance use in Canada: Recommendations for a national treatment strategy*. Ottawa, Ont.: Canadian Centre on Substance Abuse.

Oluwoye, O., & Fraser, E. (2021). Barriers and facilitators that influence providers' ability to educate, monitor, and treat substance use in first-episode psychosis programs using the theoretical domains framework. *Qualitative Health Research*. 31(6), 1144–1154.

Roland, M., & Dudley, R.A. (2015). How financial and reputational incentives can be used to improve medical care. *Health Services Research*, *50*(Suppl 2), 2090-2116.

Rudmik, L., Wranik, D., & Rudisill-Michaelsen, C. (2014). Physician payment methods: A focus on quality and cost control. *Journal of Otolaryngology – Head and Neck Surgery*, *43*(1), 34.

Russell, G. M., Dahrouge, S., Hogg, W., Geneau, R., Muldoon, L., & Tuna, M. (2009). Managing chronic disease in Ontario primary care: The impact of organizational factors. *Annals of Family Medicine*, *7*(4), 309–318.

Sarma, S., Devlin, R. A., Belhadji, B., & Thind, A. (2010). Does the way physicians are paid influence the way they practice? The case of Canadian family physicians' work activity. *Health Policy*, *98*(2–3), 203–217.

Sarma, S., Devlin, R. A., & Hogg, W. (2010). Physician's production of primary care in Ontario, Canada. *Health Economics*, *19*(1), 14–30.

Schulte, B., Schmidt, C. S., Kuhnigk, O., Schäfer, I., Fischer, B., Wedemeyer, H., & Reimer, J. (2013). Structural barriers in the context of opiate substitution treatment in Germany — a survey among physicians in primary care. *Substance Abuse Treatment, Prevention, and Policy*, *8,* 26.

Scottish Government. (2014). *The quality principles: Standard expectations of care and support in drug and alcohol services*. Edinburgh: Author.

Sheedy, C. K., & Whitter, M. (2009). *Guiding principles and elements of recovery-oriented systems of care: What do we know from the research?* Rockville, MD: Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services.

Slaunwhite, A. K., & Macdonald, S. (2016). Regional variations in general practitioner visits for alcohol-attributed diseases in British Columbia, Canada. *International Journal of Mental Health and Addiction*, *14*(6), 952–968.

Souri, S. (2020). *A comparison between alternative primary care physician payment models: A systematic review and policy analysis* (Unpublished master's thesis). University of Calgary, Calgary, Alta.

Spithoff, S., Kiran, T., Khuu, W., Kahan, M., Guan, Q., Tadrous, M., Leece, P., Martins, D., & Gomes, T. (2019). Quality of primary care among individuals receiving treatment for opioid use disorder. *Canadian Family Physician*, *65*(5), 343–351.

Steele, L. S., Durbin, A., Sibley, L. M., & Glazier, R. (2013). Inclusion of persons with mental illness in patient-centred medical homes: Cross-sectional findings from Ontario, Canada. *Open Medicine*, *7*(1), e9–e20.

Tao, W., Agerholm, J., & Burström, B. (2016). The impact of reimbursement systems on equity in access and quality of primary care: a systematic literature review. *BMC Health Services Research*, *16*(1), 152.

Tarasoff, L. A., Milligan, K., Le, T. L., Usher, A. M., & Urbanoski, K. (2018). Integrated treatment programs for pregnant and parenting women with problematic substance use: Service descriptions and client perceptions of care. *Journal of Substance Abuse Treatment*, *90*, 9–18.

Trainor, K., & Leavey, G. (2017). Barriers and facilitators to smoking cessation among people with severe mental illness: A critical appraisal of qualitative studies. *Nicotine & Tobacco Research*, *19*(1), 14–23.

Tu, K., Cauch-Dudek, K., & Chen, Z. (2009). Comparison of primary care physician payment models in the management of hypertension. *Canadian Family Physician*, *55*(7), 719–727.

United Nations Office on Drugs and Crime. (2012). *TREATNET quality standards for drug dependence treatment and care services*. New York: United Nations.

Urbanoski, K., Inglis, D., & Veldhuizen, S. (2017). Service use and unmet needs for substance use and mental disorders in Canada. *Canadian Journal of Psychiatry*, *62*(8), 551–559.

Van Herck, P, De Smedt, D., Annemans, L., Remmen, R., Rosenthal, M. B., & Sermeus, W. (2010). Systematic review: Effects, design choices, and context of pay-for-performance in health care. *BMC Health Services Research*, *10,* 247.

Victoria Department of Health. (2013). *Victorian strategic directions for co-occurring mental health and substance use conditions*. Melbourne, Australia: State Government Victoria.

Vu, T., Anderson, K. K., Somé, N. H., Thind, A., & Sarma, S. (2021). Mental health services provision in primary care and emergency department settings: Analysis of blended fee-for-service and blended capitation models in Ontario, Canada. *Administration and Policy in Mental Health and Mental Health Services Research, 48*(4), 654–667.

Vu, T., Anderson, K. K., Devlin, R. A., Somé, N. H., & Sarma, S. (2021). Physician remuneration schemes, psychiatric hospitalizations and follow-up care: Evidence from blended fee-for-service and capitation models. *Social Science & Medicine, 268*, 113465.

World Health Organization & United Nations Office on Drugs and Crime. (2020). *International standards for the treatment of drug use disorders: Revised edition incorporating results of field-testing*. Geneva: Author.

Wranik, D., & Durier-Copp, M. (2011). Framework for the design of physician remuneration methods in primary health care. *Social Work in Public Health*, *26*(3), 231–259.

Yalnizyan, A., & Macdonald, D. (2005). *CHC cost effectiveness. a review of the literature*. Toronto, Ont.: Association of Ontario Health Centres.

Zhang, L., Norena, M., Gadermann, A., Hubley, A., Russell, L., Aubry, T., ... & Palepu, A. (2018). Concurrent disorders and health care utilization among homeless and vulnerably housed persons in Canada. *Journal of Dual Diagnosis*, *14*(1), 21–31.

Appendix A: Search results

#	Database	Search terms	Field codes	Other search specifications	Results
1.	EconLit (Boolean/Phrase Search mode)	"physician remuneration" AND "substance use care"	TX All Text	Northern America	0
2.	EconLit	"physician remuneration" AND "substance use care"	None specified	Northern America	0
3.	EconLit	"physician remuneration" AND "substance use care" AND Canada	None specified	Northern America	0
4.	EconLit	physician remuneration and substance use care	None	Canada (Geographic Descriptor)	8 (SmartText Searching)
5.	EconLit	physician remuneration and substance use care	TX All Text	Canada (Geographic Descriptor)	0
6.	EconLit	"physician remuneration" AND "substance use care"	TX All Text	Canada (Geographic Descriptor)	0
7.	EconLit	remuneration and substance use care	None specified	Canada (Geographic Descriptor)	0
8.	EconLit	remuneration AND "substance use care"	None specified	Canada (Geographic Descriptor)	0
9.	EconLit	physician AND remuneration AND "substance use"	None specified	Canada (Geographic Descriptor)	0
10.	EconLit	physician AND remuneration AND substance	None specified	None	0
11.	EconLit	physician AND pay AND "substance use treatment"	None specified	None	0
12.	EconLit	physician AND pay AND "substance use care"	None specified	None	0
13.	EconLit	"primary care" AND remuneration AND "substance use"	None specified	Canada (Geographic Descriptor)	0
14.	EconLit	"primary care" AND remuneration AND "substance use"	None specified	None	0

#	Database	Search terms	Field codes	Other search specifications	Results
15.	EconLit	"primary care remuneration" AND "substance use care"	None specified	None	0
16.	EconLit	"substance use" AND "physician pay" AND "primary care"	None specified	None	0
17.	EconLit	substance use care and physician remuneration	None specified	Canada (Geographic Descriptor)	14 (SmartText Searching)
18.	EconLit	substance use care and physician remuneration	None specified	Northern America	33
19.	EconLit	doctor AND alcohol OR drugs AND billing AND "patient centred care"	None specified	Canada (Geographic Descriptor)	0
20.	EconLit	doctor AND remuneration AND addict* AND "quality care"	None specified	Canada (Geographic Descriptor)	0
21.	EconLit	primary care AND remuneration AND addict*	None specified	Canada (Geographic Descriptor)	0
22.	EconLit	"primary care" AND remuneration AND addictions	None specified	Canada (Geographic Descriptor)	0
23.	EconLit	"primary care" OR physician OR doctor AND "substance use" OR "substance abuse" OR alcohol or drugs OR "concurrent disorder" AND patient OR client AND policy OR billing OR remuneration OR fee OR payment OR incentives OR reform AND engagement OR quality OR coordinated OR integrated OR "patient centred"	None specified	Canada (Geographic Descriptor)	1
24.	EconLit	"primary care" OR physician OR doctor AND "substance use" OR "substance abuse" OR alcohol or drugs OR "concurrent disorder" AND policy OR billing OR remuneration OR fee OR payment OR incentives OR reform AND engagement OR quality OR coordinated OR integrated or "patient centred"	None specified	Canada (Geographic Descriptor)	0

#	Database	Search terms	Field codes	Other search specifications	Results
25.	EconLit	physician AND "substance use" AND fee OR payment AND engagement OR quality OR coordinated OR integrated OR patient centred	None specified	Canada (Geographic Descriptor)	0
26.	EconLit	remuneration AND substance use AND patient centred care	None specified	Canada (Geographic Descriptor)	0
27.	EconLit	primary care OR physician OR doctor AND substance use OR substance abuse OR alcohol OR drugs OR concurrent disorder AND policy OR billing OR remuneration OR fee OR payment OR incentives OR reform AND engagement OR quality OR coordinated OR integrated OR patient centred	Abstract	Northern America; Europe; Oceania; Academic Journals	8
28.	EconLit	primary care OR physician OR doctor AND "substance use" OR "substance abuse" OR alcohol or drugs OR "concurrent disorder" AND policy OR billing OR remuneration OR fee OR payment OR incentives OR reform AND engagement OR quality OR coordinated OR integrated OR "patient centred"	Abstract	Northern America; Europe; Oceania; Academic Journals	15
29.	EconLit	primary care OR physician OR doctor AND substance use OR substance abuse OR alcohol OR drugs OR concurrent disorder AND policy OR billing OR remuneration OR fee OR payment OR incentives OR reform AND engagement OR quality OR coordinated OR integrated OR patient centred	None	Northern America; Europe; Oceania; Academic Journals	22
30.	EconLit	"primary care" OR physician OR doctor AND "substance use" OR "substance abuse" OR alcohol or drugs OR "concurrent disorder" AND policy OR billing OR remuneration OR fee OR payment OR incentives OR reform AND engagement OR quality OR coordinated OR integrated OR "patient centred"	None	Northern America; Europe; Oceania; Academic Journals	20
31.	EconLit	(“community treatment” OR “tertiary care” OR “specialized care” OR coordination OR linkage OR reform) AND (“substance use”)	None	None	5

#	Database	Search terms	Field codes	Other search specifications	Results
32.	EconLit	(“community treatment” OR “tertiary care” OR “specialized care” OR coordination OR linkage OR reform) AND (“substance misuse” OR “substance dependence” OR “substance use” OR “behavioral health”)	None	None	16
33.	EconLit	(reimbursement OR remuneration OR pay OR incentive) AND (“addictions medicine” OR opioids OR alcohol OR “substance use” OR “substance dependence” OR “substance disorder” OR substance)	None	Northern America; Europe; Oceania; Academic Journals	68
34.	EconLit	(access OR inclusion OR exclusion) AND (“physician engagement” OR “general practitioner” OR physician) AND (substance OR drug OR alcohol)	None	Northern America; Europe; Oceania; Academic Journals	11
35.	PsycInfo (ProQuest)	substance use OR substance abuse OR alcohol OR drugs OR concurrent disorder	Anywhere	Location: Exact("Canada")	1
36.	PsycInfo (ProQuest)	substance use care and physician remuneration	Anywhere except full text	Location: Exact("Canada")	""
37.	PsycInfo (ProQuest)	"substance use care" AND "physician remuneration"	Anywhere except full text	Location: Exact("Canada")	0
38.	PsycInfo (ProQuest)	primary care AND remuneration AND addiction	Anywhere except full text	Location: Exact("Canada")	0
39.	PsycInfo (ProQuest)	substance use care AND physician remuneration	Anywhere	None	3
40.	PsycInfo (ProQuest)	substance use care and physician remuneration	Anywhere	None	3
41.	PsycInfo (ProQuest)	substance use care AND physician remuneration AND primary care	Anywhere	None	3
42.	PsycInfo (ProQuest)	substance use care AND primary care AND remuneration	Anywhere	None	3
43.	PsycInfo (ProQuest)	substance use care and physician remuneration	Anywhere except full text	None	3

#	Database	Search terms	Field codes	Other search specifications	Results
44.	PsycInfo (ProQuest)	substance use care AND primary care AND remuneration	Anywhere	None	3
45.	PsycInfo (ProQuest)	substance use treatment AND physician pay	Anywhere	None	3
46.	PsycInfo (ProQuest)	"substance use care" and "physician remuneration"	Anywhere	None	0
47.	PsycInfo (ProQuest)	"substance use care" AND "physician remuneration" AND "primary care"	Anywhere	None	0
48.	PsycInfo (ProQuest)	"substance use care" AND "primary care" AND remuneration	Anywhere	None	0
49.	PsycInfo (ProQuest)	"substance use care" AND "physician remuneration"	Anywhere except full text	None	0
50.	PsycInfo (ProQuest)	"substance use care" AND "primary care" AND remuneration	Anywhere	None	0
51.	PsycInfo (ProQuest)	"substance use treatment" AND "physician pay"	Anywhere	None	0
52.	PsycInfo (ProQuest)	“primary care” or “physician” or “doctor” AND “substance use” or “substance abuse” or “alcohol” or “drug” or "concurrent disorder" AND “policy” or “billing” or “remuneration” or “fee” or “payment” or “incentives” or “reform” AND “engagement” or “quality” or “coordinated" or “integrated” or “patient centred”	Anywhere except full text	Location: Exact("Canada")	21
53.	PsycInfo (ProQuest)	(“primary care” or “physician” or “doctor”) AND (“substance use” or “substance abuse” or “alcohol” or “drug” or "concurrent disorder") AND (“policy” or “billing” or “remuneration” or “fee” or “payment” or “incentives” or “reform”) AND (“engagement” or “quality” or “coordinated" or “integrated” or “patient centred”)	Anywhere except full text	Location: Exact("Canada")	22

#	Database	Search terms	Field codes	Other search specifications	Results
54.	PsycInfo (ProQuest)	“primary care” or “physician” or “doctor” AND “substance use” or “substance abuse” or “alcohol” or “drug” or "concurrent disorder" AND “policy” or “billing” or “remuneration” or “fee” or “payment” or “incentives” or “reform” AND “engagement” or “quality” or “coordinated" or “integrated” or “patient centred”	Anywhere	Location: Exact("Canada")	20
55.	PsycInfo (ProQuest)	(“primary care” or “physician” or “doctor”) AND (“substance use” or “substance abuse” or “alcohol” or “drug” or "concurrent disorder") AND (“policy” or “billing” or “remuneration” or “fee” or “payment” or “incentives” or “reform”) AND (“engagement” or “quality” or “coordinated" or “integrated” or “patient centred”)	Anywhere	Location: Exact("Canada")	20
56.	PsycInfo (ProQuest)	physician AND billing AND addiction*	Anywhere except full text	Location: Exact("Canada")	12
57.	PsycInfo (ProQuest)	(“community treatment” OR “tertiary care” OR “specialized care” OR coordination OR linkage OR reform) AND (“substance use”)	Anywhere except full text	Location: Exact ("Canada")	51
58.	PsycInfo (ProQuest)	(“community treatment” OR “tertiary care” OR “specialized care” OR coordination OR linkage OR reform) AND (“substance misuse” OR “substance dependence” OR “substance use” OR “behavioral health”)	Anywhere except full text	Location: Exact ("Canada")	64
59.	PsycInfo (ProQuest)	(reimbursement OR remuneration OR pay OR incentive) AND (“addictions medicine” OR opioids OR alcohol OR “substance use” OR “substance dependence” OR “substance disorder” OR substance)	Anywhere except full text	Location: Exact ("Canada")	66
60.	PsycInfo (ProQuest)	(access OR inclusion OR exclusion) AND (“physician engagement” OR “general practitioner” OR physician) AND (substance OR drug OR alcohol)	Anywhere except full text	Location: Exact ("Canada")	115

#	Database	Search terms	Field codes	Other search specifications	Results
61.	MEDLINE Ovid	Subject Terms Search: Reimbursement Mechanisms (explode) AND Substance-Related Disorders (explode) AND Canada (explode) AND Quality of Health Care (explode) OR Delivery of Health Care (explode)	None	None	1
62.	MEDLINE Ovid	"substance use" AND (remuneration OR fee OR billing OR payment OR incentive)	None	Canada	9
63.	MEDLINE Ovid	(“community treatment” OR “tertiary care” OR “specialized care” OR coordination OR linkage OR reform) AND (“substance use”)	None	Canada	2
64.	MEDLINE Ovid	(reimbursement OR remuneration OR pay OR incentive) AND (“addictions medicine” OR opioids OR alcohol OR “substance use” OR “substance dependence” OR “substance disorder” OR substance)	None	Canada	34
65.	MEDLINE Ovid	(access OR inclusion OR exclusion) AND (“physician engagement” OR “general practitioner” OR physician) AND (substance OR drug OR alcohol)	None	Canada	116
66.	Health Systems Evidence	physician remuneration AND substance use AND primary care	None	Canada	0
67.	Health Systems Evidence	remuneration AND substance use AND primary care	None	Canada	0
68.	Health Systems Evidence	substance use AND primary care	None	Canada; Financial arrangements, Remunerating providers	0
69.	Health Systems Evidence	None specified (topics only)	None	Canada; Financial arrangements, Remunerating providers; Other, Mental health and addictions	0

#	Database	Search terms	Field codes	Other search specifications	Results
70.	Health Systems Evidence	"substance" AND (“remuneration” OR “fee” OR “payment” OR “incentives” OR "billing")	None	Canada	0
71.	Health Systems Evidence	"substance" AND (“remuneration” OR “fee” OR “payment” OR “incentives” OR "billing")	None	None	16
72.	Health Systems Evidence	"substance use" AND (“remuneration” OR “fee” OR “payment” OR “incentives” OR "billing")	None	Canada	0
73.	Health Systems Evidence	"substance use" AND (“remuneration” OR “fee” OR “payment” OR “incentives” OR "billing")	None	None	8
74.	Health Systems Evidence	(“community treatment” OR “tertiary care” OR “specialized care” OR coordination OR linkage OR reform) AND (“substance misuse” OR “substance dependence” OR “substance use” OR “behavioral health”)	None	Canada	4
75.	Health Systems Evidence	(reimbursement OR remuneration OR pay OR incentive) AND (“addictions medicine” OR opioids OR alcohol OR “substance use” OR “substance dependence” OR “substance disorder” OR substance)	None	Canada	10
76.	Health Systems Evidence	(access OR inclusion OR exclusion) AND (“physician engagement” OR “general practitioner” OR physician) AND (substance OR drug OR alcohol)	None	Canada	40
77.	Google	(“community treatment” OR “tertiary care” OR “specialized care” OR coordination OR linkage OR reform) AND (“substance misuse” OR “substance dependence” OR “substance use” OR “behavioral health”)	None	None	*
78.	Google	(“community treatment” OR “tertiary care” OR “specialized care” OR coordination OR linkage OR reform) AND (“substance misuse” OR “substance dependence” OR “substance use” OR “behavioral health”) AND (Canada)	None	None	*

#	Database	Search terms	Field codes	Other search specifications	Results
79.	Google	(reimbursement OR remuneration OR pay OR incentive) AND (“addictions medicine”) OR opioids OR alcohol OR “substance use” OR “substance dependence” OR “substance disorder” OR substance)	None	None	*
80.	Google	(access OR inclusion OR exclusion) AND (“physician engagement” OR “general practitioner” OR physician) AND (substance)	None	None	*
81.	Google	(access OR inclusion OR exclusion) AND (“physician engagement” OR “general practitioner” OR physician) AND (substance OR drug OR alcohol)	None	None	*
82.	Google Scholar	(“community treatment” OR “tertiary care” OR “specialized care” OR coordination OR linkage OR reform) AND (“substance misuse” OR “substance dependence” OR “substance use” OR “behavioral health”)	None	None	*
83.	Google Scholar	(“community treatment” OR “tertiary care” OR “specialized care” OR coordination OR linkage OR reform) AND (“substance misuse” OR “substance dependence” OR “substance use” OR “behavioral health”) AND (Canada)	None	None	*
84.	Google Scholar	(reimbursement OR remuneration OR pay OR incentive) AND (“addictions medicine”) OR opioids OR alcohol OR “substance use” OR “substance dependence” OR “substance disorder” OR substance)	None	None	*
85.	Google Scholar	(access OR inclusion OR exclusion) AND (“physician engagement” OR “general practitioner” OR physician) AND substance	None	None	*
86.	Google Scholar	(access OR inclusion OR exclusion) AND (“physician engagement” OR “general practitioner” OR physician) AND (substance OR drug OR alcohol)	None	None	*

#	Database	Search terms	Field codes	Other search specifications	Results
87.	Google Scholar	remuneration and substance and "primary care"	None	None	*
88.	Google Scholar	(remuneration or incentive) and (substance or alcohol or drug) and "primary care"	None	None	*
89.	MEDLINE Ovid	(schizophrenia) + ("primary care" OR "physician" OR "doctor")+(“policy” OR “billing” OR “remuneration” OR “fee” OR “payment” OR “incentives” OR “reform”)	None	None	0
90.	MEDLINE Ovid	(schizophrenia) + remuneration	None	None	5
91.	MEDLINE Ovid	(schizophrenia) + physician + health economics	None	None	6
92.	MEDLINE Ovid	(schizophrenia) + general practitioners + (“policy” OR “billing” OR “remuneration” OR “fee” OR “payment” OR “incentives” OR “reform”)	None	None	6
93.	MEDLINE Ovid	(schizophrenia) + physician + billing	None	None	3
94.	MEDLINE Ovid	(schizophrenia) + physician + incentives	None	None	3
95.	MEDLINE Ovid	(schizophrenia) + reimbursement, incentive	None	None	7
96.	MEDLINE Ovid	(schizophrenia) + (“policy” OR “billing” OR “remuneration” OR “fee” OR “payment” OR “incentives” OR “reform”)	None	None	1
97.	MEDLINE Ovid	(schizophrenia) + physician remuneration	None	None	0
98.	MEDLINE Ovid	Schizophrenia + ("primary care" OR "physician" OR "doctor") ("remuneration" OR "fee" or "billing" or "payment")	None	None	11
99.	MEDLINE Ovid	diabetes + ("primary care" OR "physician" OR "doctor") ("remuneration" OR "fee" or "billing" or "payment")	None	None	336
100.	APA PsycInfo	(schizophrenia) + (“physician remuneration”)	None	None	36

#	Database	Search terms	Field codes	Other search specifications	Results
101.	APA PsycInfo	(schizophrenia) AND (Primary care OR physician OR Doctor) AND ("billing" OR "remuneration" OR "fee" OR "payment" OR "incentives") AND ("engagement" OR "quality" OR "coordinated" OR "integrated" OR "patient centred")	None	None	34
102.	APA PsycInfo	(diabetes) AND (Primary care OR physician OR Doctor) + ("billing" OR "remuneration" OR "fee" OR "payment" OR "incentives") AND("engagement" OR "quality" OR "coordinated" OR "integrated" OR "patient centred")	None	None	59
103.	EconLit	(diabetes) + (Primary care OR physician OR Doctor) + ("policy" OR "billing" OR "remuneration" OR "fee" OR "payment" OR "incentives" OR "reform")	None	None	33
104.	EconLit	diabetes) + (Primary care OR physician OR Doctor) + ("engagement" OR "quality" OR "coordinated" OR "integrated" OR "patient centred")	None	None	17
105.	EconLit	(diabetes) + ("policy" OR "billing" OR "remuneration" OR "fee" OR "payment" OR "incentives" OR "reform")	None	None	136
106.	EconLit	(schizophrenia) + (Primary care OR physician OR Doctor) + ("engagement" OR "quality" OR "coordinated* OR "integrated" OR "patient centred")	None	None	0
107.	EconLit	(schizophrenia) + (remuneration)	None	None	0
108.	EconLit	(schizophrenia) + ("policy" OR "billing" OR "remuneration" OR "fee" OR "payment" OR "incentives" OR "reform")	None	None	16

#	Database	Search terms	Field codes	Other search specifications	Results
109.	Google Scholar	schizophrenia + “physician remuneration”	None	None	188
110.	Health System Evidence	(schizophrenia) + ("physician remuneration”)	None	None	0
111.	Health System Evidence	(diabetes)+("physician remuneration”)	None	None	0
112.	Health System Evidence	(schizophrenia) + (“policy” OR “billing” OR “remuneration” OR “fee” OR “payment” OR “incentives” OR “reform”)	None	None	0
113.	Health System Evidence	(schizophrenia) AND (“remuneration” OR “fee” OR “payment” OR “incentives”)	None	None	6
114.	Health System Evidence	(diabetes) AND (“remuneration” OR “fee” OR “payment” OR “incentives”)	None	None	117
115.	Health System Evidence	(diabetes) AND (“remuneration” OR “fee” OR “payment” OR “incentives”)	None	Canada, U.K., France, Italy, Australia	21
116.	Health System Evidence	(schizophrenia) AND ("physician remuneration”)	None	None	0
117.	Health System Evidence	(diabetes) AND ("physician remuneration”)	None	None	64
118.	Health System Evidence	(diabetes) AND ("physician remuneration”)	None	Canada, U.K., France, Italy, Australia, Netherlands, Germany	18
119.	Health System Evidence	"pain" AND (“remuneration” OR “fee” OR “payment” OR “incentives” OR "billing")	None	None	7
120.	Health System Evidence	"mental illness" AND (“remuneration” OR “fee” OR “payment” OR “incentives” OR "billing")	None	None	8
121.	Health System Evidence	"mental disorders" AND (“remuneration” OR “fee” OR “payment” OR “incentives” OR "billing")	None	None	6

#	Database	Search terms	Field codes	Other search specifications	Results
122.	MEDLINE Ovid	"chronic pain" AND ("remuneration" OR "fee" or "billing" or "payment" or "incentives")	None	None	109
123.	MEDLINE Ovid	"chronic pain" AND (Primary care OR physician OR Doctor) AND (engagement OR quality OR coordinated OR integrated OR patient centred) AND (remuneration OR fee or billing or payment or incentives)	None	None	59
124.	MEDLINE Ovid	"mental illness" AND (Primary care OR physician OR Doctor) AND (engagement OR quality OR coordinated OR integrated OR patient centred) AND (remuneration OR fee or billing or payment or incentives)	None	None	8
125.	EconLit	"mental illness" AND (Primary care OR physician OR Doctor) AND (engagement OR quality OR coordinated OR integrated OR patient centred) AND (remuneration OR fee or billing or payment or incentives)	None	None	2
126.	EconLit	"mental illness" AND (remuneration OR fee or billing or payment or incentives)	None	None	13
127.	EconLit	"mental disorder" AND (Primary care OR physician OR Doctor) AND (engagement OR quality OR coordinated OR integrated OR patient centred) AND (remuneration OR fee or billing or payment or incentives)	None	None	1
128.	APA PsycInfo	"mental illness" AND (Primary care OR physician OR Doctor) AND (engagement OR quality OR coordinated OR integrated OR patient centred) AND (remuneration OR fee or billing or payment or incentives)	None	None	31
129.	APA PsycInfo	"physician remuneration" AND "quality of care"	None	None	2
130.	APA PsycInfo	"remuneration model" AND "quality of care"	None	None	1
131.	APA PsycInfo	"incentives" AND "quality of care" AND "fee-for-service"	None	None	20

#	Database	Search terms	Field codes	Other search specifications	Results
132.	MEDLINE Ovid	physician remuneration AND "quality of care"	None	None	6
133.	MEDLINE Ovid	"remuneration model" AND "quality of care"	None	None	2
134.	MEDLINE Ovid	"incentives" AND "quality of care" AND "fee-for-service"	None	None	62
135.	Health System Evidence	"physician remuneration" AND "quality of care"	None	None	1
136.	Health System Evidence	"remuneration model" AND "quality of care"	None	None	1
137.	Health System Evidence	incentives AND "quality of care" AND "fee-for-service"	None	None	14
138.	Health System Evidence	"pain" AND (“remuneration” OR “fee” OR “payment” OR “incentives” OR "billing")	None	None	14
139.	MEDLINE	“pain” AND ("remuneration" OR "fee" or "billing" or "payment" or "incentives")	None	None	7
140.	MEDLINE	"pain" AND (Primary care OR physician OR Doctor) AND (engagement OR quality OR coordinated OR integrated OR patient centred) AND (remuneration OR fee or billing or payment or incentives)	None	None	129
141.	EconLit	"pain" AND (“remuneration” OR “fee” OR “payment” OR “incentives” OR "billing")	None	None	59
142.	EconLit	"pain" AND (Primary care OR physician OR Doctor) AND (engagement OR quality OR coordinated OR integrated OR patient centred) AND (remuneration OR fee or billing or payment or incentives)	None	None	39
143.	APA PsycInfo	"pain" AND (Primary care OR physician OR Doctor) AND (engagement OR quality OR coordinated OR integrated OR patient centred) AND (remuneration OR fee or billing or payment or incentives)	None	None	1
144.	APA PsycInfo	"chronic pain" AND "physician remuneration"	None	None	29

#	Database	Search terms	Field codes	Other search specifications	Results
145.	APA PsycInfo	"chronic pain" AND "remuneration model"	None	None	0
146.	APA PsycInfo	"chronic pain" AND "financial incentive"	None	None	0

OTTAWA • VANCOUVER • CALGARY • EDMONTON • MONTREAL • WINNIPEG

SRDC SRSA
SINCE 1991 DEPUIS
INNOVATION • EXPERIMENTATION • EVALUATION

www.srdc.org • 1 866 896 7732 • info@srdc.org