Rapid Synthesis

Examining the Effects of Value-based Physician Payment Models

10 October 2017

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Rapid Synthesis:
Examining the Effects of Value-based Physician Payment Models
30-day response

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McMaster Health Forum

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Timeline

Rapid syntheses can be requested in a three-, 10-or 30-business-day timeframe. This synthesis was prepared over a 30-business-day timeframe. An overview of what can be provided and what cannot be provided in each of the different timelines is provided on the McMaster Health Forum's Rapid Response program webpage (www.mcmasterforum.org/find-evidence/rapid-response).

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Conflict of interest

The authors declare that they have no professional or commercial interests relevant to the rapid synthesis. The funder played no role in the identification, selection, assessment, synthesis or presentation of the research evidence profiled in the rapid synthesis.

Merit review

The rapid synthesis was reviewed by a small number of policymakers, stakeholders and researchers in order to ensure its scientific rigour and system relevance.

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KEY MESSAGES

Questions

- What value-based physician payment models have been used in primary care and specialty care in two Canadian provinces (Alberta and Ontario) and select comparator countries?
- What are the effects of value-based bundled payment models, and stakeholders' views and experiences with them?

Why the issue is important

- Healthcare provider remuneration mechanisms are one of the key policy levers that decision-makers can harness to influence health-system performance.
- In Canada, physician payments are the second-largest source of public expenditures and account for 21% of health spending in the country.
- Traditional payment mechanisms (e.g., fee-for-service, capitation and fee-for-time/salary) continue to be used within Organisation for Economic Co-operation and Development health systems.
- Although traditional payment mechanisms are frequently used, they do not always align with current health-system priorities or meet the needs of populations.
- Value-based payment models (e.g., payments linked to the quality of care physicians provide) have been proposed as a mechanism to address changing population needs and health-system priorities, but little is known about these types of payment mechanisms, their effects and stakeholders' views and experiences with them.
- In response to this challenge, the rapid synthesis aims to identify what value-based physician payment models have been used in primary care and specialty care in Canada and select comparator countries, what the effects are of value-based bundled payment models, and stakeholders' views and experiences with them.

What we found

- We identified a total of 21 documents including one overview of systematic reviews, 14 systematic reviews and six primary studies on the effects of value-based physician payment models.
- In addition, we undertook a jurisdictional scan of value-based physician payment models in primary care and specialty care in two Canadian provinces (Alberta and Ontario) and select comparator countries (Australia, the Netherlands, New Zealand, Norway, the U.K., and the U.S.).
- To varying degrees, all jurisdictions reviewed employed some form of adaptations to traditional payment models or blended payment models.
- Within the jurisdictional scan, the Centers for Medicare and Medicaid Innovation (U.S.) had the highest number of value-based payment models (testing of 84 new payment and service delivery models).
- Generally, systematic reviews and primary studies focused on the effects of value-based models in terms of costs, utilization, health outcomes, and provider and patient experience.
- Mixed effects were found with regards to bundled payment systems, with one systematic review finding a decrease in utilization of services (between 5% and 15%) and costs of services included in the bundle, while one primary study found they were not associated with changes in 30-day episode payments or 30-day mortality for 28 cardiovascular and nine orthopedic inpatient services.
- One primary study found that bundled models encouraged team-based approaches to care management, but it did not change how physicians delivered face-to-face patient care, and the overall quantity and intensity of physician workload increased due to increased patient volume expectations.
- The majority of the systematic reviews focused on pay-for-performance models within primary care and findings were also mixed.
- Three systematic reviews found positive effects of pay-for-performance models for chronic-disease management, while two systematic reviews found no difference.

QUESTIONS

- What value-based physician payment models have been used in primary care and specialty care in two Canadian provinces (Alberta and Ontario) and select comparator countries?
- What are the effects of value-based bundled payment models, and stakeholders' views and experiences with them?

WHY THE ISSUE IS IMPORTANT

Healthcare provider remuneration mechanisms are one of the key policy levers that decision-makers can harness to influence health-system performance.(1) In Canada, remunerating physicians is the second-largest source of public expenditures accounting for 21% of all health spending in the country.(2) Within the health systems for countries in the Organisation for Economic Co-operation and Development (OECD), many physicians continue to be paid through traditional payment mechanisms, including fee-for-service (i.e., where physicians receive a fixed fee for each healthcare service performed), capitation (i.e., where physicians receive a fixed fee for each patient in the roster) and fee-for-time (i.e., where physicians receive a salary/fixed income on a regular basis).(1; 3-5) In Canada, fee-for-service payments accounted for 72% of total clinical payments in 2015, with the remainder consisting of alternative payment plans (i.e., models other than traditional fee-for-service).(6)

However, these traditional payment mechanisms often have limitations and do not support the achievement of current health-system priorities. Traditional payment mechanisms often produce undesirable outcomes, which are generally described as an over-provision of services (fee-for-service), while capitation encourages an under-provision of services.(4) In addition to being associated with increased physician services, fee-for-service remuneration is also not tied to quality outcomes for the patient, and it can restrict physicians from working in interprofessional teams because physicians must perform the services in order to be able to bill for them.(6) Capitation is similar in that it is also not linked to improving overall quality of care for patients.

Physician payment reforms are a response to changing population needs (e.g., increases in the aging population, prevalence of disability, and those living with multiple chronic conditions) and aligning with broader health-system objectives.(7-9) One main way in which physician payment mechanisms are changing is the addition of value-based components, which provide incentive payments for the quality of care provided.(10) The overarching aims of value-based programs are to support improved care for individuals and population health, while decreasing per capita costs.(10)

Box 1: Background to the rapid synthesis

This rapid synthesis mobilizes both global and local research evidence about a question submitted to the McMaster Health Forum's Rapid Response program. Whenever possible, the rapid synthesis summarizes research evidence drawn from systematic reviews of the research literature and occasionally from single research studies. A systematic review is a summary of studies addressing a clearly formulated question that uses systematic and explicit methods to identify, select and appraise research studies, and to synthesize data from the included studies. The rapid synthesis does not contain recommendations, which would have required the authors to make judgments based on their personal values and preferences.

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This rapid synthesis was prepared over a 30-business-day timeframe and involved four steps:

1) submission of a question from a health system policymaker or stakeholder (in this case, the Ministry of Health of British Columbia);
2) identifying, selecting, appraising and synthesizing relevant research evidence about the question;
3) drafting the rapid synthesis in such a way as to present concisely and in accessible language the research evidence; and
4) finalizing the rapid synthesis based on the input of at least two merit reviewers.

Three broad approaches are being used to reform physician payment mechanisms. The first is through using blended payment models, which are commonly used in primary care and often combine traditional payment methods (e.g., fee-for-service payments with capitation).(5) Within speciality care, blended payments are common in inpatient care, but less widely used for outpatient specialist care, where fee-for-service remains dominant.(5) The second approach is adapting traditional payment models such as adjusted capitation payments in primary care for risk factors (e.g., age, gender and health status) as a way of discouraging under-provision of services.(5) Adjustments to global budgets are the last approach and moves beyond resource-based or historical budgets by adjusting for risk factors (e.g., age, gender) or based on case-mix measure by disease-related groups.(5)

The most recent innovative payment reforms aim to improve care coordination, efficiency, quality, access, and health outcomes. These types of payment models are add-on payments (e.g., pay-for-performance), bundled payments (e.g., for episodes of care or managing chronic conditions) and population-based payments (e.g., groups of healthcare providers receive payments based on the population covered).(5)

While value-based payment models (as described above) have been proposed as a mechanism to address changing population needs and health-system priorities, little is known about the effects of these types of payment approaches. The rapid synthesis seeks to address this by:

1) identifying what value-based physician payment models have been used in primary care and specialty care in two Canadian provinces (Alberta and Ontario) and select comparator countries; and
2) describing the effects of value-based bundled payment models, and stakeholders' views and experiences with them.

Box 2: Identification, selection and synthesis of research evidence

For the first question, we conducted a jurisdictional scan of value-based physician compensation models in Canada by using physician payment data from the Canadian Institute for Health Information's National Physician Database, followed by a grey literature search of provincial/territorial government websites for additional details on physician compensation models. For the select comparator countries, we primarily drew on health systems reviews (Health Systems in Transition) where available, as well as the Organisation for Economic Co-operation and Development's Health Systems Characteristics Survey, and the publication, *Better Ways to Pay for Health Care*. The searches were conducted in July of 2017.

For the second question, we identified research evidence (systematic reviews) on the effects of value-based physician compensation models. In July of 2017 we searched MEDLINE and Health Systems Evidence (www.healthsystemsevidence.org). The MEDLINE search strategy used the following keywords: physician AND bundled payment (limited to the last 10 years). In Health Systems Evidence we applied the following filters: financial arrangements (all but fee-for-service in remunerating providers), providers (physicians) and document type (overviews of systematic reviews, systematic reviews of effects and systematic reviews addressing other questions).

The results from the searches were assessed by one reviewer for inclusion. A document was included if it fit within the scope of the questions posed for the rapid synthesis.

For each review we included in the synthesis, we documented the focus of the review, key findings, last year the literature was searched (as an indicator of how recently it was conducted), methodological quality using the AMSTAR quality appraisal tool (see the Appendix for more detail), and the proportion of the included studies that were conducted in Canada. For primary research (if included), we documented the focus of the study, methods used, a description of the sample, the jurisdiction(s) studied, key features of the intervention, and key findings. We then used this extracted information to develop a synthesis of the key findings from the included reviews and primary studies.

WHAT WE FOUND

We identified a total of 21 relevant documents by searching two databases (Health Systems Evidence and MEDLINE), with the search strategy for these databases detailed in Box 2. We identified one overview of systematic reviews, 14 systematic literature reviews and six primary studies on the effects of value-based physician payment models. In addition, we undertook a jurisdictional scan of value-based physician payment models in primary care and specialty care in two Canadian provinces (Alberta and Ontario) and select comparator countries (Australia, the Netherlands, New Zealand, Norway, the U.K., and Medicaid and Medicare in the U.S.). For these jurisdictions we identified (where possible) the types of value-based physician payment models and features of the models for both

primary and specialty care. To conduct the scan, we purposefully sampled governmental websites from each of the jurisdictions, as well as key organizations (e.g., OECD and Health Systems in Transitions) involved in providing health-systems information on physician payment mechanisms.

For the purpose of this rapid synthesis, we have applied a broad lens to identifying value-based payment models and include those that depart from traditional models by either combining (e.g., blended models) or adapting them (e.g., adjusted capitation), or adopting new approaches (e.g., pay-for-performance and bundled). In order to be included in the jurisdictional scan the payment model had to include a value-based component, which we have conceptualized as incentivizing physicians for the quality of care they provide.(10) We take a similarly broad approach to the second question (the effects of value-based bundled payment models, and stakeholders' views and experiences with them) as we only identified one systematic review and five primary studies that directly examined the effects of bundled payment models. As such, we include reviews that more broadly examine the effects of value-based models (e.g., blended models and pay-for-performance) and provide details about each of the overview of systematic reviews, systematic literature reviews and primary studies in Appendices 1 to 3, respectively.

What value-based physician payment models have been used in primary care and specialty care in two Canadian provinces (Alberta and Ontario) and select comparator countries?

We provide an overview of alternative physician payment methods in Canada in Tables 1 and 2, and the results of our summary of the select comparator countries in Table 3.

Canada

All provinces and territories in Canada use at least two types of alternative physician payment methods. Table 1 presents data from the Canadian Institute for Health Information's National Physician Database and provides a breakdown of the range of alternative physician payment methods by province/territory.(11) Table 2 uses data from the same series to show the percentage distribution of alternative physician payments by specialty. Ontario has the highest percentage (55%) of alternative physician payments in family medicine, and the Yukon has the highest for medical specialists (80%) and surgical specialists (43%).

In Alberta (the first of the two provinces for which we conducted an in-depth scan), the Alternative Relationship Plans have been created to remunerate physicians working in models other than traditional fee-for-service.(12) All types of physician specialities are eligible to work in the plan, with the purpose of enhancing care across the following five dimensions:

- recruitment and retention;
- team-based approaches;
- access;
- patient satisfaction; and
- value for money.(12)

As of 2016, 2,308 of the 9,024 (26%) physicians in Alberta were practising either part-time or full-time under the Alternative Relationship Plan.(12; 13) Within the plan, Clinical Alternative Relationship Plans remunerate physicians for providing a set of clinical services at specific facilities and for target populations.(14) There are three compensation models within the Clinical Alternative Relationship Plans, which include the:

- annualized model, where remuneration is based on the number of physician full-time equivalents needed to deliver clinical services;
- sessional model, where remuneration is based on the hourly rate for the delivery of clinical services; and
- blended capitation model, where remuneration is based on an annual amount per registered patient in combination with a fee-for-service component.(14)

In addition, the Academic Alternative Relationship Plan remunerates physicians who are in teaching, research or administrative roles. The aim of the plan is encourage physicians to provide clinical, education, research and leadership services.(15) It is anticipated that master agreements for the plans will be in place sometime in 2017 and these will help physicians move away from fee-for-service and into alternative payment models.(15)

Within primary care in Ontario (the second of the two provinces for which we conducted an in-depth scan), physicians are increasingly paid through blended mechanisms, with the specific approach used depending on the model in which a physician practises.(3; 4; 16) Some primary-care models in Ontario use blended capitation payments (e.g., Family Health Networks and Family Health Organizations), and Family Health Groups use enhanced fee-for-service (e.g., incentives for chronic-disease management) as well as small monthly comprehensive-care capitation payments for enrolled patients.(3; 17)

Physicians working in a Family Health Team (i.e., interprofessional primary-care teams) are paid through one of the following mechanisms:

- blended capitation, which provides a fixed payment per patient, adjusted for age and sex for a predetermined set of primary-care services, with fee-for-service payments given for other services that fall outside of the capitation model;
- blended salary, which provides a base salary determined by the number of enrolled patients (e.g., a roster of fewer than 1,300 patients is considered part-time), as well as incentives, premiums and special payments for the provision of specific primary healthcare services; and
- blended complement-based, which provides a base payment determined by the number of physicians in the group, as well as incentives, premiums and special payments for the provision of specific primary healthcare services (this model is available for those providing primary healthcare and emergency services in communities with an underserviced designation).(3; 17)

Within speciality care, there are blended models (Alternative Funding Arrangements or Alternative Payment Arrangements) that consist of contracts between groups of specialist physicians and the Ministry of Health and Long-Term Care, and sometimes other organizations such as hospitals and universities.(18) These funding arrangements are blended to combine a base rate with fee-for-service or shadow billings (an approach that generates a premium that represents a percentage of the full value of a fee-for-service claim), with possible incentives/premium payments.(18)

Select comparator countries

Australia

Within primary care, the Practice Incentives Program focuses on improving access and quality of care. The pay-for-performance model consists of 11 individual incentives for physicians:

1) supporting care for individuals with moderate to severe asthma;
2) after-hours care for family practices;
3) cervical screening for under-served women (i.e., women aged 20 to 69 who have not had a cervical smear in the last four years);
4) early diagnosis and management of diabetes;
5) eHealth to encourage practices to adopt digital health technology;
6) increased and continuing services for government-funded residential aged care facilities;
7) Indigenous health services for Aboriginal and Torres Strait Islander patients, including chronic-disease management;
8) Procedural General Practitioner payment to maintain local access to surgical, anesthetic and obstetric services in rural and remote areas;
9) effective and quality prescribing;
10) rural loading for practices in rural and remote communities; and
11) teaching sessions for medical undergraduate and graduate students.(1; 19)

Within specialty care, pay-for-performance is used in acute-care settings.(1) However, we were unable to identify details on the program from publicly available sources.

New Zealand

We found limited information available on physician payment models in primary care in New Zealand, and no information on value-based physician payment models within specialty care. Within primary care, some physicians are remunerated through an adjusted capitation fee for each registered patient, which is based on age and deprivation status.(20; 21)

Netherlands

In 2015 a new payment system for primary-care physicians was introduced in the Netherlands. The system consists of three segments. In the first segment the primary-care physician acts as gatekeeper to speciality care and there are three payment types within this segment:

1) a capitation fee for each patient registered in the practice, which is based on age (under or over 65) and deprivation status (established through patients' postal codes);
2) fees for each consultation and home visit; and
3) fees for practice nurses that provide mental health care (but the physician needs a contract in order to receive this payment).(22)

The second segment consists of a bundled payment system for integrated care, which focuses on care for specific chronic conditions (Type 2 diabetes, chronic obstructive pulmonary disease (COPD), asthma and those at a high risk for cardiovascular diseases).(22) Care standards have been developed for each of the conditions and the care group manages the necessary care for these conditions. The care groups are owned by physicians, which serve a certain geographic area with the group sizes ranging from four to 150 physicians.(22) The third segment consists of pay-for-performance with payments linked to specific areas of performance (e.g., accessibility of practice, efficiency in prescribing and efficiency in referrals to specialty care).(22)

Within specialty care, physician remuneration is not value-based as specialty physicians are paid through the DBC system (English translation is diagnosis treatment combination) and medical specialist companies negotiate payments with hospitals.(22)

A bundled payment system also exists for those with Parkinson's disease (ParkinsonNet) and is available across the Netherlands. The program consists of 19 different types of healthcare providers (e.g., geriatricians, neurologists and occupational therapists) working in primary and specialty care.(1) The program uses bundled payments, specifically population-based budgets that are calculated by the care required by a region's population.(23) The provider payments are based on health outcomes, which are independently measured by validated outcome indicators.(23)

Norway

Within primary care in Norway, capitation accounts for 30% of physicians' income and fee-for-service accounts for the rest,(24) but we were unable to identify any details about whether any payments are linked to values-based outcomes.

Within specialty care, pay-for-performance is used in hospitals as part of a broader reform to support systematic quality improvement.(1) The scheme consists of three indicators: outcome, process and patient satisfaction.(25) Payment methods use a mix of absolute measures (e.g., proportion of hypertensive patients) to set a minimum standard and relative rankings, along with patient experience as an outcome indicator.

Negative penalties are also used, where pay-for-performance is capped, covering a small portion of the annual block grant each region receives.(1)

Sweden

In Sweden, county councils are responsible for healthcare provider payment mechanisms, and there is a great deal of variability in the payment models throughout the country.(26) In primary care, there is a mix of: 1) bundled payments focusing on specific episodes of care (e.g., hip replacement, spine surgery) and chronic conditions (e.g., diabetes); 2) pay-for-performance, which is linked to targets (e.g., accessibility, prevention, patient satisfaction, and compliance); and 3) variable payment, which is based on visits by registered and non-registered patients.(26)

In specialty care, a mix of three payment mechanisms are used:

- prospective per-case payments, which are based on disease-related groups and have price or volume ceilings and quality components;
- pay-for-performance with targets consisting of general indicators such as wait times, preventive care and patient safety; and
- penalties where payments are withheld if targets are not met.(26)

In Sweden there have been a small number of bundled-payment initiatives, which are used for specific episodes of care (e.g., hip replacement and spine surgery) and chronic conditions (e.g., diabetes). The first pilot was implemented in 2009 for a hip and knee surgery bundle called OrthoChoice.(1) The bundle included a pre-operative visit, surgery, inpatient care, all physician fees, additional costs (e.g., personnel costs, drugs and diagnostics), and a two-year follow-up visit.(1) The orthopedic surgeons were held financially liable for complications related to the surgery (e.g., infection, revision or surgery up to five years after initial surgery). Following the hip and knee surgery pilot, a new pilot launched in 2014 in the area of spine surgery, and the program is scheduled for completion in 2017. This bundled payment includes the surgery itself, costs associated with pre- and post-operative visits, rehabilitation, and a warranty payment for complications.(1) In addition, 10% of the payment is related to a patient's post-surgical functionality.(1)

United Kingdom

In 2009 the Commissioning for Quality and Innovation payment framework was introduced and makes physician income conditional upon reaching goals related to quality and innovation.(27) The program covers 2.5% of all provider income, with at least 0.5% conditional upon goals set at the national level, and the remainder conditional upon goals set at the local level.(27) The most recent indicators (2017-2019) focus on improving clinical quality and transformational indicators (comprised of 13 indicators), and supporting local areas (e.g., sustainability and transformation plans, and local financial sustainability).(28)

General practitioners work under the General Medical Services Contract, which is negotiated between the British Medical Association and National Health Service (NHS) Employers.(27) Practices hold the contract, (not individual general practitioners) and a fixed national global sum funds essential services.(27) The Carr-Hill formula is used to calculate the global sum, which consists of a refined weighted capitation rubric that incorporates sex, age, number of new patients, population morbidity profile, rural, and market forces.(27) Practices can receive supplementary payments by providing enhanced services that are designed to meet needs of the local population and support patient choice.(27)

The Quality and Outcomes Framework is used across the U.K. as an additional voluntary payment structure that links physician payments to quality of care, with variation in the choice of indicators.(27) The main focus of the framework is to improve chronic-disease management and to reduce avoidable hospital admissions.(27) The framework is comprised of four main components: 1) clinical standards; 2) organizational standards; 3) experience of patients; and 4) additional services.(27)

Best-practice tariffs were implemented in 2010 and are bundled payments that focus on following clinical guidelines and encourage the use of evidence-based medicine.(1) Originally, best-practice tariffs focused on four clinical areas in hip fractures and stroke, and have now expanded to cover 50 procedures.(1) Maternity care is the most recent bundled payment and is based on the total reported costs for the three components of maternity care (antenatal, labour and delivery, and postnatal).(1) Payments are adjusted for medical needs, however the mode of delivery does not influence the payment (i.e., caesarean versus vaginal).(1) Additional payments are also made for specific complications. The pregnant person chooses their lead provider for each of the three components of maternity care, and the Clinical Commissioning Groups purchase the care and pay for each component.(1) If the pregnant person is referred to another provider, the second provider invoices the first provider.(1)

United States

Under the Centers for Medicare and Medicaid Innovation there are 84 new payment and service delivery models listed.(29). Here we describe those from the list that include a value-based component within primary and specialty care.

Within primary care there are three value-based primary care transformation initiatives related to physician payments that have been implemented. The first is Comprehensive Primary Care Plus (CPC+), which is a public-private partnership that aims to strengthen primary care through regional multi-payer payment reform and care delivery transformation, and through improvements in quality, access and efficiency. The program includes the following three payment elements:

1) care management fee, which is a non-visit-based care management fee paid per beneficiary per month (a risk-adjusted amount for each practice's specific population that incorporates the intensity of care-management services, and the Medicare fee-for-service is paid to practices on a quarterly basis);
2) performance-based incentive payment, which is a prospective payment that is retrospectively reconciled based on a performance-based incentive (e.g., how well the practice performs on a range of measures that drive the total cost of care, including patient experience, clinical quality and utilization); and
3) payment under the Medicare physician fee schedule, which has two tracks, where the first continues to bill Medicare under the fee schedule and the second also bills as usual, but the fee-for-service payment is reduced to account for shifting a portion of payments into Comprehensive Primary Care Payments (a quarterly lump-sum payment).(30)

Second, the Independence at Home Demonstration is a home-based primary-care program designed to improve overall quality of care by allowing healthcare providers to spend more time with their patients. Primary-care practices provide care to targeted chronically ill patients over a three-year period, with care experience tracked through quality measures. In addition, incentive payments are given to practices that meet Medicare's minimum savings requirement.(31)

The third value-based payment model in primary care is the Transforming Clinical Practice Initiative, which consists of collaborative peer-based learning networks. The networks are designed to support clinicians in developing quality-improvement strategies, with the aim of supporting large-scale adoption of alternative payment models.(32)

Within specialty care, the Bundled Payments for Care Improvement (BPCI) initiative emerged from the Affordable Care Act with the goal of testing innovative payment and service delivery models in order to reduce spending while improving quality of care.(33) The initiative consists of four broad models of care that link payments for the multiple services beneficiaries receive during an episode of care.

- Model 1 (concluded at the end of 2016) defined an episode of care as the inpatient stay in an acute-care hospital, and Medicare paid the hospital a discounted amount (based on payment rates under the Inpatient Prospective Payment System) and paid physicians separately for their services (under the Medicare Physician Fee Schedule);(34)

- Model 2 is a retrospective bundled payment arrangement that reconciles the actual expenditure with a target price for an acute and post-acute episode of care. Medicare issues fee-for-service payments to providers and suppliers, and the total expenditures for a beneficiary's episode are later reconciled against a target price bundled payment amount set by the Center for Medicare and Medicaid Services (Medicare then makes a payment or recoupment amount, which reflects the aggregate performance compared to the target price);(35)
- Model 3 is also a retrospective bundled payment arrangement that reconciles the actual expenditures with a target price for a post-acute episode of care. Medicare makes fee-for-service payments to providers and suppliers, and the total expenditures for a beneficiary's episode of care are later reconciled against a target bundled payment amount set by the Center for Medicare and Medicaid Services (Medicare then makes a payment or recoupment amount, which reflects the aggregate performance compared to the target price);(36)
- Model 4 is a single, prospective bundled payment to hospitals that accounts for all the hospital, physician, and other healthcare provider services during an episode of care (i.e., the full inpatient stay). Physicians then submit a "no-pay" claim to Medicare and are remunerated through the hospital out of the bundled payment.(33; 37)

In addition, bundled payments (Outpatient Prospective Payment System) are used for outpatient ambulatory care. Medicare assigns bundled payment rates that are based on the median cost of services in the procedure group and geographical variation in wages.(38)

It is important to note that there is significant variation in how state Medicaid agencies remunerate healthcare providers (e.g., Medicaid fees for an office visit can be five times higher in one state than another).(38) In addition, many state reimbursement methods employ a fee schedule that incorporates a relative value (e.g., physician services that require more resources will receive a higher rate).(38)

Table 1. Alternative physician payment methods by province/territory, 2014-2015

Province/territory	Alternative physician payment method							
	Salary	Sessional	Capitation	Block funding	Blended	Northern and under-serviced areas	Emergency and on call	Contracted/ unspecified
British Columbia	x	x	x			x	x	x
Alberta		x	x				x	x
Saskatchewan				x		x	x	x
Manitoba	x							
Ontario	x	x	x		x	x	x	x
Quebec	x	x	x		x	x		x
New Brunswick	x	x						x
Nova Scotia		x		x			x	x
Prince Edward Island	x						x	x
Newfoundland and Labrador	x			x				
Northwest Territories	x	x					x	
Nunavut[1]								
Yukon							x	x

Sources: (3; 39)

Note:
[1] Data not available for Nunavut.

Table 2. Alternative physician payments to physicians - percentage distribution of total clinical payments, by specialty and province/territory, 2014-2015

Specialty	Percentage clinical												
	BC	AB	SK*	MB	ON	QC	NB	NS	PEI	NFLD	NWT	NT	YK*
Family medicine	**17%**	—	**39%**	**35%**	**55%**	**32%**	**42%**	**45%**	**35%**	**23%**	—	—	**35%**
Medical specialties	**24%**	—	**38%**	**27%**	**17%**	**18%**	**45%**	**68%**	**54%**	**54%**	—	—	**80%**
Anesthesia	19%	—	33%	17%	17%	24%	35%	73%	60%	63%	—	—	10%
Dermatology	4%	—	0%	1%	4%	10%	2%	38%	47%	0%	—	—	0%
Internal medicine	22%	—	23%	28%	16%	11%	35%	53%	0%	40%	—	—	80%
Cardiology	4%	—	11%	20%	9%	5%	*11%*	56%	n/a	0%	—	—	0%
Gastroenterology	5%	—	0%	8%	10%	7%	*3%*	56%	n/a	0%	—	—	0%
Neurology	19%	—	16%	21%	14%	15%	44%	54%	70%	58%	—	—	0%
Pediatrics	38%	—	73%	37%	38%	23%	63%	82%	80%	75%	—	—	99%
Physical medicine	20%	—	71%	10%	13%	24%	63%	79%	100%	98%	—	—	0%
Psychiatry	26%	—	56%	40%	8%	29%	75%	86%	45%	75%	—	—	89%
Surgical specialties	**16%**	—	**26%**	**17%**	**13%**	**11%**	**21%**	**17%**	**19%**	**29%**	—	—	**43%**
General surgery	15%	—	44%	24%	13%	15%	24%	16%	0%	40%	—	—	10%
Neurosurgery	34%	—	51%	64%	33%	34%	95%	96%	n/a	0%	—	—	n/a
Obstetrics/gynecology	22%	—	33%	14%	12%	10%	34%	24%	54%	51%	—	—	100%
Ophthalmology	3%	—	5%	3%	8%	2%	1%	3%	10%		—	—	0%
Orthopedic surgery	16%	—	17%	8%	13%	21%	5%	20%	0%	28%	—	—	0%
Otolaryngology	10%	—	7%	8%	11%	8%	12%	15%	52%	9%	—	—	0%
Plastic surgery	30%	—	6%	6%	15%	4%	7%	16%	18%	0%	—	—	n/a
Thoracic/cardiovascular surgery	42%	—	26%	27%	21%	15%	48%	18%	n/a	97%	—	—	n/a
Urology	14%	—	20%	16%	12%	5%	8%	4%	0%	0%	—	—	n/a

Adapted from: (40)

Notes:
1. Percentage clinical refers to the percentage that alternative payment programs represent in total physician clinical payments.
2. n/a refers to no physicians for the specialty in the province.

Table 3: Summary of value-based physician payment models in select Canadian provinces and comparator countries

Jurisdiction	Primary care		Specialty care	
	Type of value-based payment model	**Features of the model**	**Type of payment value-based model**	**Features of the model**
Alberta, Canada (12; 14)	• Blended (Alternative Relationship Plans: Clinical Alternative Relationship Plan and Academic Alternative Relationship Plan)	• Three models are used in the Clinical Alternative Relationship Plan o annualized model – remuneration is based on the number of physician full-time equivalents needed to deliver clinical services; o sessional model – remuneration is based on the hourly rate for the delivery of clinical services; and o blended capitation model – remuneration is based on an annual amount per patient in combination with a fee-for-service component • The Academic Alternative Relationship Plan remunerates physicians who are in teaching, research or administrative roles	• Blended (Alternative Relationship Plans: Clinical Alternative Relationship Plan and Academic Alternative Relationship Plan)	• Three models used in the Clinical Alternative Relationship Plan o annualized model – remuneration is based on the number of physician full-time equivalents needed to deliver clinical services; o sessional model – remuneration is based on the hourly rate for the delivery of clinical services; and o blended capitation model – remuneration is based on an annual amount per patient in combination with a fee-for-service component • The Academic Alternative Relationship Plan remunerates physicians who are in teaching, research or administrative roles
Ontario, Canada (3; 4; 16; 18; 41-43)	• Blended (Family Health Team, Family Health Networks and Family Health Organizations) • Programmatic capitation (Family Health Groups)	• Blended capitation - fixed payment per patient, adjusted for age and sex for a predetermined set of primary-care services, while fee-for-service payments are given for other services that fall outside of the capitation model • Blended salary - a base salary determined by the number of enrolled patients, as well as incentives, premiums and special payments for the provision of specific primary healthcare services • Blended complement - a base payment determined by the number of physicians in the group, as well as incentives, premiums and special payments for the provision of specific primary healthcare services • Monthly comprehensive-care capitation payments for patients enrolled in programs (e.g., chronic- disease management programs)	• Blended (Alternative Funding Arrangement and Alternative Payment Arrangements)	• Alternative Funding Arrangement for continuous emergency department coverage: o workload model for larger hospitals (base funding is determined by annual patient volume and acuity); and o 24-hour model for smaller hospitals (tiered base funding determined by annual patient volume) • Alternative Payment Arrangements (e.g., Northern Specialist Physicians) are blended fee-for-service with additional incentives to promote recruitment and retention of specialists in Northern Ontario
Australia (1; 19; 44)	• Pay-for-performance (Practice Incentives Program)	• Pay-for-performance focuses on 11 priority areas: o asthma; o after-hours care; o cervical screening; o diabetes; o eHealth; o government-funded residential aged-care facilities; o Indigenous health; o rural and remote; o quality prescribing;	• Pay-for-performance	• Unable to identify features of the model from publicly available sources

Jurisdiction	Primary care		Specialty care	
	Type of value-based payment model	**Features of the model**	**Type of payment value-based model**	**Features of the model**
		○ rural loading; and ○ teaching (medical students)		
Netherlands (22)	• Adjusted capitation • Bundled (integrated care) • Pay-for-performance	• Adjusted capitation fee for each patient registered in the practice, based on age and deprivation status (calculated using postal code) • Bundled payment for integrated care addressing patients with the following chronic conditions: Type 2 diabetes, COPD, asthma and those at high risk of cardiovascular diseases • Bundled payment for Parkinson's disease • Pay-for-performance focuses on meeting certain criteria (e.g., efficiencies in pharmaceutical prescribing and referring patients to speciality care)	• Bundled	• Bundled payment for Parkinson's disease which spans primary and specialty care, includes 19 different healthcare providers, and a portion of the payment is linked to health outcomes
New Zealand (20; 21; 45)	• Adjusted capitation	• Capitation fee for each registered patient, based on age and deprivation status	• None identified	• None identified
Norway (1; 24)	• Capitation	• None identified	• Pay-for-performance	• Pay-for-performance for quality improvement includes: ○ absolute measures; ○ relative ranking; ○ negative penalties; and ○ patient experience
Sweden (1; 26)	• Bundled • Pay-for-performance • Variable payment	• Bundled payments focusing on specific episodes of care (e.g., hip replacement, spine surgery) and chronic conditions (e.g., diabetes) • Pay-for-performance is typically linked to 20 or fewer targets (e.g., accessibility, prevention and patient satisfaction) • Variable payment is based on visits by registered and non-registered patients	• Bundled • Pay-for-performance • Prospective per-case payments (based on disease-related-groups)	• Bundled payments focusing on specific episodes of care (e.g., hip replacement, spine surgery) and chronic conditions (e.g., diabetes) • Pay-for-performance includes: ○ targets related to general indicators (e.g., wait times, preventive care or patient safety) or clinical indicators in major disease areas; and ○ penalties - withholding payment if certain targets are not met • Prospective per-case payments are based on disease-related groups and incorporate volume ceilings and quality components
U.K. (1; 27; 28)	• Adjusted capitation • Bundled • Pay-for-performance	• Refined weighted capitation rubric that incorporates sex, age, number of new patients, population morbidity profile, rural and market forces • Best-practice tariffs covering 50 areas, most recently maternity care • Commissioning for Quality and Innovation payment framework and Quality and Outcomes Framework	• Bundled	• Best-practice tariffs (e.g., hip fracture and stroke) covering 50 procedures • Maternity care is the most recent bundled payment and are based on the costs for the three components of maternity care: ○ antenatal; ○ labour and delivery; and ○ postnatal

Jurisdiction	Primary care		Specialty care	
	Type of value-based payment model	**Features of the model**	**Type of payment value-based model**	**Features of the model**
		(chronic-disease management)		
U.S. (Medicare and Medicaid) (1; 10; 29-38; 46)	Medicare • Blended (Value Modifier Program) • Pay-for-performance (Comprehensive Primary Care Plus (CPC+) • Population-based payment (Independence at Home Demonstration) • Alternative payment models (Transforming Clinical Practice Initiative) Medicaid • None identified	Medicare • Measures the quality and cost of care provided against the Medicare Physician Fee Schedule, the program is an adjustment made on a per claim basis to Medicare payments for items and services under the fee schedule • CPC+ has three payment elements: 1) care management fee is a non-visit-based care management fee paid per beneficiary per month; 2) performance-based incentive payment is a prospective payment that is retrospectively reconciled based on a performance-based incentive; and 3) payment under the Medicare physician fee schedule has two tracks where the first continues to bill Medicare under the fee schedule, and the second track bills as usual, but the fee-for-service payment is reduced to account for shifting a portion of payments into Comprehensive Primary Care Payments • Independence at Home Demonstration program provides incentive payments to primary-care practices providing care to targeted chronically ill patients • Transforming Clinical Practice Initiative, collaborative peer-based learning networks that support clinicians in developing quality-improvement strategies, with the aim of supporting large-scale adoption of alternative payment models Medicaid • None identified	Medicare • Bundled (Outpatient Prospective Payment System and Bundled Payments for Care Improvement) Medicaid • None identified	Medicare • Bundled payments for outpatient ambulatory care based on median cost of services in the procedure group and geographical variation in wages • Bundled Payments for Care Improvement consists of four broad models of care that link payments for the multiple services beneficiaries receive during an episode of care o Model 1, an episode of care is the inpatient stay in an acute-care hospital, and Medicare pays the hospital a discounted amount and pays physicians separately for their services; o Model 2, a retrospective bundled payment that reconciles the actual expenditure with a target price for an acute and post-acute episode of care (Medicare makes fee-for-service payments to providers and suppliers, and the total expenditures for a beneficiary's episode are later reconciled against a target price bundled payment amount set by Center for Medicare and Medicaid Services); o Model 3, a retrospective bundled payment arrangement that reconciles the actual expenditures with a target price for a post-acute episode of care (Medicare makes fee-for-service payments to providers and suppliers and the total expenditures for a beneficiary's episode are later reconciled against a target price bundled payment amount set by the Center for Medicare and Medicaid Services); and o Model 4, a single prospective bundled payment to the hospital that accounts for all the hospital, physician and other healthcare-provider services during the episode of care (i.e., the full inpatient stay) - physicians then submit "no-pay" claim to Medicare and are remunerated through the hospital out of the bundled payment Medicaid • None identified

What are the effects of value-based bundled payment models, and stakeholders' views and experiences with them?

We found a total of 21 documents including one overview of systematic reviews, 14 systematic literature reviews and six primary studies on the effects of value-based physician payment models. Only one of the systematic reviews directly examined the effects of value-based bundled payment models, which is most likely a reflection of the recency of these types of payment initiatives. The other reviews examined the effects of other types of value-based models (e.g., pay-for-performance). Given the limited number of highly relevant systematic reviews, we searched for primary studies that examined the effects of bundled payments. There were 55 results that matched the search criteria in MEDLINE, of which six were selected based on their relevance to the research question (the remainder of the articles were commentaries or theoretical articles on the impact of the Affordable Care Act (U.S.) and payment reform, or focused on bundled payments for a small program for a specific type of surgical intervention). We provide details about the overview of systematic reviews and the systematic reviews in Appendix 1 and about the primary studies in Appendix 2.

We summarize the findings on the effects of value-based models and stakeholders' views and experiences with them below, according to bundled payments, pay-for-performance and other models (e.g., blended payment models).

Bundled payments

We identified one recent high-quality systematic review and five primary studies that found mixed evidence for bundled payment models, however none were based on Canadian data.(47-52) The systematic review found that bundled payments may create financial incentives for providers to decrease the number and cost of services included in the bundle, and that the transition from a cost-based or fee-for-service reimbursement to a bundled payment was generally associated with a decline in spending of 10% or less.(49) Bundled payments were also associated with a decrease in utilization of services (between 5% and 15%) and costs of services included in the bundle.(49) One primary study evaluated the effect of bundled payments on process measures and found that adherence to 40 clinical process measures increased from 59% to 100%, but the authors noted a lack of generalizability of the study findings.(50)

One primary study tested the impact of bundled payments for 28 cardiovascular and nine orthopedic inpatient services in the U.S. and found that the program was not associated with changes in 30-day episode payments (the amount Medicare spends from admission up until 30 days after discharge) or 30-day mortality (quality outcomes focus on mortality within 30 days of the surgery and include serious complications and readmissions).(47) Another primary study examined bundled payments for surgical colectomy among Medicare enrollees, and found inconclusive results when comparing fee-for-service to bundled payment models on hospital profitability.(51) The results suggest that risk-adjustment models need to account for individual patient characteristics and use of services within the bundled payment.(51) Lack of accounting for these factors may disincentivize the provision of care for high-risk patients within bundled payment models.(51)

Two primary studies examined the impacts on other outcomes of bundled payments. One primary study found that bundled payments encouraged team-based approaches to care management.(48) At the individual physician level, financial incentives applied to physician practices were not immediately passed on to the physicians, and overall the alternative payment models had minimal effects on individual physician income.(48) The model also did not change how physicians delivered face-to-face patient care, but the overall quantity and intensity of physician workload increased due to increased patient volume expectations, which may contribute to burnout.(48) Another primary study on care group experiences regarding patient involvement in decision-making for a Type 2 diabetes bundled payments program found that patient involvement was primarily limited to information provision and consultation, but rarely involved an equal partnership or having a final vote in formal decision-making in the care group.(52)

We did not identify any studies documenting stakeholders' views and experiences with bundled payment models.

Pay-for-performance

We found one overview of systematic reviews and 10 systematic reviews, with the overall findings suggesting that there is uncertainty regarding the effects of pay-for-performance models.(53; 56-65) An important gap in the literature to note is that we did not find evidence on the cost of pay-for-performance models as it relates to the efficiency.

Within primary care, we found the following mixed evidence:

- one older overview of systematic reviews found that within chronic disease, pay-for-performance had a small impact on the quality of care for diabetes and asthma, but not heart disease;(56)
- one recent high-quality systematic review found that pay-for-performance incentives in Ontario increased the rates of testing for blood glucose levels, retinopathy and cholesterol;(53)
- two high-quality systematic reviews (studies were primarily in the U.S. and U.K.) found that pay-for-performance improved immunization rates by primary-care physicians, with one of the reviews finding little evidence that it improved other outcomes (e.g., referrals and smoking cessation), and the other finding no differences in quality of care between intervention groups for chronic conditions (e.g., diabetes and asthma);(58; 66)
- one older medium-quality review found limited evidence of the effects of pay-for-performance on vaccination rates compared to fee-for-service;(63)
- one recent medium-quality review found strong evidence that pay-for-performance initially improved health outcomes (e.g., blood pressure and cholesterol levels) for a limited number of conditions, but that long-term outcomes regressed back to the initial trend;(59)
- one recent low-quality systematic review in the U.K. found that pay-for-performance mechanisms: 1) improved care (e.g., increasing the use of computers, decision supports, clinician prompts, patient reminders and recalls); 2) enhanced processes and improved intermediate outcomes for most conditions (most notably for diabetes); and 3) modestly reduced population mortality (a modeled 11 lives per 100,000 people in the first year, with no further gains in the second year);(57)
- one recent low-quality systematic review on chronic-disease management found that pay-for-performance resulted in improved quality of care in diabetes management, better clinical management, improved screening of clinical parameters and outcome indicators, and improved delivery of clinical process of care;(60)
- one recent medium-quality review found overall positive effects of pay-for-performance on disease management (measuring blood pressure in patients with hypertension, coronary heart disease, diabetes, COPD, asthma and stroke) and prevention (immunizations and screening); and (62)
- one older medium-quality review found little evidence supporting the effectiveness of pay-for-performance in improving patient care.(61)

In addition, one older medium-quality review on the effects of pay-for-performance programs (U.S.) that explicitly tied financial incentives to the provision of quality of care found that there was the potential for adverse selection (providers avoiding patients that are sicker).(64) The review also found that the size of the financial incentive may be a factor, and that bonuses of at least 5% of a capitation income may influence physician behaviour.(64)

In terms of the effects of pay-for-performance models on patient experience, the findings suggest that it does not improve patient experience. One recent low-quality systematic review in the U.K. found there were no significant changes in quality of care reported by patients for communication, nursing care, coordination or overall satisfaction.(57) For patients with chronic disease, continuity of care worsened, with reports of fewer physician visitations and lower satisfaction ratings for continuity of care.(57) In addition, one recent

medium-quality review on the effects of pay-for-performance models on equity of healthcare (gender, age, socio-economic status, ethnicity, duration of illness, severity or mobility of disease, and size of practice) found no significant improvements.(62) The review also found no significant improvements on patient satisfaction within the pay-for-performance models.(62)

One primary study compared the views of stakeholders (e.g., physicians, policymakers, healthcare executives and researchers) on different payment models.(65) Across the different study scenarios (trial-and-error, standard care, network care, and primary prevention) salary and fee-for-service had the greatest levels of support, with pay-for-performance ranked second and prospective payment systems third.(65) Physicians had strong preferences for fee-for-service, whereas healthcare executives and researchers had high levels of support for quality bonus or adjustment and capitation.(65)

Other models

One recent high-quality systematic review and one older high-quality systematic review found limited effects of blended payment mechanisms.(53; 54) The first review focused on Canadian primary-care reforms and found low-quality evidence that blended capitation models lead to small and sometimes non-significant improvements in process of care.(53) While blended capitation payments in Ontario contributed to decreases in the number of services delivered and patients seen per day, the number of enrolled patients and number of days worked in a year were similar to that of enhanced fee-for-service practices.(53) Similarly, the second systematic review also found limited evidence on the impact of blended models for improving the quality of primary care provided by physicians.(54) The review also found insufficient evidence to support the use of financial incentives to improve the quality of primary care.(54)

In addition, one recent medium-quality systematic review found that the evidence was inconclusive in relation to the use of reimbursement mechanisms (e.g., blended capitation and pay-for-performance) in primary care for addressing socio-economic or racial inequalities in access, utilization and quality.(55)

One old high-quality systematic review assessed the effects of primary-care-based interventions (e.g., fundholding) on referral to specialists in the U.K. and comparator countries (Canada and the U.S.).(67) All of the studies found a decrease in publicly funded referrals from primary care to specialty care.(67)

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APPENDICES

The following tables provide detailed information about the systematic reviews and primary studies identified in the rapid synthesis. The ensuing information was extracted from the following sources:

- systematic reviews - the focus of the review, key findings, last year the literature was searched, and the proportion of studies conducted in Canada; and
- primary studies - the focus of the study, methods used, study sample, jurisdiction studied, key features of the intervention and the study findings (based on the outcomes reported in the study).

For the appendix table providing details about the systematic reviews, the fourth column presents a rating of the overall quality of each review. The quality of each review has been assessed using AMSTAR (A MeaSurement Tool to Assess Reviews), which rates overall quality on a scale of 0 to 11, where 11/11 represents a review of the highest quality. It is important to note that the AMSTAR tool was developed to assess reviews focused on clinical interventions, so not all criteria apply to systematic reviews pertaining to delivery, financial or governance arrangements within health systems. Where the denominator is not 11, an aspect of the tool was considered not relevant by the raters. In comparing ratings, it is therefore important to keep both parts of the score (i.e., the numerator and denominator) in mind. For example, a review that scores 8/8 is generally of comparable quality to a review scoring 11/11; both ratings are considered "high scores." A high score signals that readers of the review can have a high level of confidence in its findings. A low score, on the other hand, does not mean that the review should be discarded, merely that less confidence can be placed in its findings and that the review needs to be examined closely to identify its limitations. (Lewin S, Oxman AD, Lavis JN, Fretheim A. SUPPORT Tools for evidence-informed health Policymaking (STP): 8. Deciding how much confidence to place in a systematic review. *Health Research Policy and Systems* 2009; 7 (Suppl1):S8).

All of the information provided in the appendix tables was taken into account by the authors in describing the findings in the rapid synthesis.

Appendix 1: Summary of findings from systematic reviews about the effects of value-based physician payment models

Type of review	Focus of systematic review	Key findings	Year of last search/ publication date	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada
Overview of reviews	Effect of pay-for-performance in healthcare (56)	The review included 22 studies to determine the effects of pay-for-performance in healthcare. The countries of focus within the studies were predominantly from the U.S. and the U.K. The review found that pay-for-performance can potentially be cost-effective, but the limited evidence is not conclusive. There was also insufficient evidence to support or not support the use of pay-for-performance. It also appears that pay-for-performance has a small positive impact on the quality of care for diabetes and asthma, but not for heart disease.	2011	N/A	0/22
Systematic literature review	Impact of the U.K.'s Quality and Outcomes Framework pay-for-performance scheme on primary-care practices (57)	The review included 94 studies that assessed the impact of a pay-for-performance scheme on primary-care practices in the U.K. The scheme assessed is the U.K. Quality and Outcomes Framework, which is comprised of numerous elements, including financial incentives and information technology (computerized prompts and decision support). This scheme was designed to promote structured and team-based care with the aim of achieving evidence-based quality targets. The review found that the framework helped improve care by increasing the use of computers, decision support, clinician prompts, patient reminders and recalls. It also resulted in better recorded care, enhanced processes, and improved intermediate outcomes for most conditions, notably diabetes. In addition, there was an estimated modest population mortality reduction. In terms of patient experiences, the findings remain uncertain. There were no significant changes in quality of care reported by patients between 2003 and 2007 for communication, nursing care, coordination or overall satisfaction. For patients with chronic disease, continuity of care worsened, with reports of fewer physician visitations and lower satisfaction ratings for continuity of care.	2011	3/9 (AMSTAR rating from McMaster Health Forum)	0/94
Systematic literature review	Financial incentives for improved performance on measures of healthcare quality (64)	The review included 17 studies in order to assess the effects of explicit financial incentives for improved performance on healthcare quality measures in the U.S. These financial incentive programs include improving access to healthcare for nursing home patients with debilitating and acute chronic conditions by providing incentives to admit severely dependent patients, for the attainment of health status goals and for discharging clinically appropriate patients. Five of the six studies of physician-level financial incentives and seven of the nine studies of provider-group-level financial incentives found partial or positive effects on measures of quality. This included improvements in access to healthcare for nursing home patients with debilitating acute and chronic conditions, and small improvements in cervical cancer screening.	2005	6/11 (AMSTAR rating from McMaster Health Forum)	0/17

Type of review	Focus of systematic review	Key findings	Year of last search/ publication date	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada
		One of the two studies of incentives at the payment-system level found a positive effect on access to care, and one showed evidence of a negative effect on access to care for the sickest patients.			
Systematic literature review	Effect of reimbursement systems on equity in access and quality in primary care (55)	The review included 27 articles to assess the impact of reimbursement systems (e.g., fee-for-service, capitation, blended capitation, and pay-for-performance) on socio-economic and racial inequalities in access, utilization and quality of primary care. The studies were mostly from the U.S. and the U.K., and there was one from Canada. In terms of patient satisfaction, minority groups (black, Hispanic, Native American/Asian/Pacific Islander) reported lower satisfaction than whites in a capitated insurance plan than a non-capitated insurance plan, but the difference was only significant for a physician's ability to listen and explain to English-speaking Hispanics. Overall, the review was inconclusive regarding which reimbursement system was better with respect to impact on socio-economic or racial inequalities in access, utilization and quality of primary care. In addition, pay-for-performance had minimal or no impact on socio-economic and racial inequity in the management of chronic diseases.	2015	6/9 (AMSTAR rating from McMaster Health Forum)	1/27
Systematic literature review	Effect of primary care-based service innovations on quality and patterns of referral to specialist secondary care (67)	The review included 44 studies to assess the effects of primary-care-based interventions on referral to specialists in the U.K. The review focused mainly on studies from the U.K., but included studies from comparator countries (Canada, U.S.). The interventions included were set in the general practice system, which influenced referral rates to secondary care. Three studies examined the impact of fundholding (U.K.), one study examined changes in remuneration to primary-care physicians in Denmark and England, and one study examined subsidized referral to specialists (Finland). All of the studies found a decrease in publicly funded referrals from primary care to specialty care.	2002	8/11 (AMSTAR rating from www.rxforchange.ca)	1/44
Systematic literature review	Impact of primary-care reform on health-system performance in Canada (53)	The review included 14 studies in order to determine whether Canadian primary-care reforms improved health-system performance based on measures of health-system utilization, processes of care and physician productivity. The review found low-quality evidence that blended capitation models and pay-for-performance incentives led to small and sometimes non-significant improvements in process of care. For practices eligible for pay-for-performance incentives in Ontario, there were higher rates of testing for blood glucose levels, retinopathy and cholesterol. Furthermore, although blended capitation payment in Ontario contributed to decreases in the number of services delivered and patients seen per day, the number of enrolled patients and number of days worked in a year were similar to that of enhanced fee-for-service practices.	2015	8/10 (AMSTAR rating from McMaster Health Forum)	14/14
Systematic literature	Effect of financial incentives on the quality of healthcare provided by	The review included seven studies in order to examine the effect of changes in the method and level of payment on the quality of care provided by primary-care physicians in the U.K. The	2009	10/10 (AMSTAR	0/7

Type of review	Focus of systematic review	Key findings	Year of last search/ publication date	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada
review	primary-care physicians (54)	studies used a variety of payment mechanisms, including single-threshold target payments, a fixed fee-per-patient achieving an outcome, payments based on the relative ranking of medical group performance (tournament-based pay) and moving from a blended payments scheme to salaried payment. Despite the popularity of these schemes, there is currently little rigorous evidence of their success in improving the quality of primary care, or of whether such an approach is cost-effective relative to other ways to improve the quality of care. There is also insufficient evidence to support the use of financial incentives to improve the quality of primary care.		rating from McMaster Health Forum)	
Systematic literature review	Assess pay-for-performance remuneration to improve patient care for individual healthcare practitioners (58)	The review included 30 studies to determine the effect of pay-for-performance remuneration for individual healthcare practitioners on patient care outcomes (e.g., preventive care or screening rates, and chronic conditions). The studies were predominantly from the U.S. and U.K., with only one from Canada and one from Germany. The authors concluded that pay-for-performance modestly improved preventive activities, such as immunization rates, but there was little evidence that it improved other outcomes such as referrals and smoking cessation. There were also no significant differences in quality of care between intervention groups for chronic conditions such as diabetes and asthma.	2012	9/10 (AMSTAR rating from McMaster Health Forum)	1/30
Systematic literature review	Effect of targeted payments on the behaviour of primary-care physicians (66)	The review included two studies to determine the effects of targeted payments on the behaviour of primary-care physicians in the U.S. and the U.K. The study pool was limited to two studies, with the findings reporting that target payments resulted in an increase in immunizations by primary-care physicians. However, due to the limited evidence, it is unclear whether target payments were effective in improving quality of care.	1997	10/11 (AMSTAR rating from McMaster Health Forum)	0/2
Systematic literature review	Impact of different reimbursement schemes on primary-care physician behaviour (63)	The review included six studies to determine the impact of payment methods (fee-for-service, capitation, salary, mixed remuneration systems and target payments) on primary-care physician behaviours. The countries of focus within the studies were Canada, the U.S., the U.K., and Denmark. When comparing capitation with fee-for-service, there was very low-quality evidence that showed fee-for-service may increase the number of consultations in primary-care settings. For mixed capitation instead, there were no significant differences in patient admission rates or days in hospital compared to fee-for-service. When comparing salary with fee-for-service, there is some evidence that physicians tend to carry out more consultations with fee-for-service than salaries. For target payments, there is limited evidence of the effects on vaccination rates compared to fee-for-service.	1997	7/11 (AMSTAR rating from McMaster Health Forum)	2/10

Type of review	Focus of systematic review	Key findings	Year of last search/ publication date	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada
Systematic literature review	Assess pay-for-performance schemes on improving health outcomes (59)	The review included 11 studies to examine the evidence on the efficacy of pay-for-performance schemes for improving health outcomes in the U.K. The review found strong evidence that a quality and outcomes framework (i.e., incentivizing practices to achieve higher standards of care) through a pay-for-performance scheme initially improved health outcomes (e.g., blood pressure, cholesterol levels) for a limited number of conditions, but subsequently fell back into the pre-existing trend.	2012	6/10 (AMSTAR rating from McMaster Health Forum)	0/11
Systematic literature review	Effect of pay-for-performance on chronic-disease management (60)	The review included eight studies to provide insights on the effects of pay-for-performance schemes on healthcare quality and costs. The countries of focus in the studies were the U.S., Germany and Australia. The review identified eight pay-for-performance schemes, with most financial incentives being rewards, selective and granted on the basis of absolute performance. Five studies evaluated the effects on healthcare quality, finding mostly positive effects. These include positive effects on quality of care in diabetes management, better clinical management, improved screening of clinical parameters and outcome indicators, and improved delivery of clinical process of care.	2010	2/9 (AMSTAR rating from McMaster Health Forum)	0/8
Systematic literature review	Impact of pay-for-performance on primary-care physician behaviour and patient outcomes (62)	The review included 44 studies to determine the impact of pay-for-performance on the behaviour of primary care physicians and patient outcomes. The included studies were primarily conducted in the U.K. and the U.S. The review found an overall positive effect of pay-for-performance on the management of disease, which varied depending on the baseline medical quality and the practice size. The majority of studies reported positive results in vaccine injection or screening of diseases, improvements in the management of blood pressure in patients with hypertension, and improvements in the management of both coronary heart disease and diabetes. Positive effects on primary healthcare were also seen in the few studies that investigated chronic obstructive pulmonary disease, asthma and stroke. Some studies raised concerns regarding the implementation of pay-for-performance on the equity of healthcare. Results on unfairness were reported about genders, ages, socio-economic status, ethnicity, duration of illness, severity or mobility of disease, and size of practice. There were mixed findings on the impact of pay-for-performance on patient satisfaction. Additionally, studies that investigated healthcare costs found that pay-for-performance may increase medical costs.	2013	6/10 (AMSTAR rating from McMaster Health Forum)	0/45
Systematic literature review	Assess pay-for-performance on quality improvement in healthcare (61)	The review included seven studies to determine the effects of paying for quality in healthcare. All studies were conducted in the U.S. The review found little or no evidence supporting the effectiveness of pay-for-performance. One study found that providing financial incentives to physicians for each flu immunization	2003	5/10 (AMSTAR rating from McMaster Health	0/6

Type of review	Focus of systematic review	Key findings	Year of last search/ publication date	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada
		resulted in improved immunization rates. However, these findings should be interpreted with caution since those in the intervention group were more likely to be involved in previous efforts to increase influenza immunization rates. Additionally, two studies found that providing financial incentives to physicians may improve documentation of patients' smoking status and advice to quit smoking. However, one of these studies lacked a control group, and the impact of quality bonus cannot be disentangled from the impact of the performance feedback that medical groups received at the same time. The remaining studies did not find pay-for-performance effective in improving care.		Forum)	
Systematic literature review	Effect of bundled payment on healthcare spending and quality (49)	The review included 58 studies that examined 20 different bundled-payment interventions. Bundled payment was defined as a method in which payments to healthcare providers are based on the predetermined expected costs of a grouping of related healthcare services. Bundled-payment interventions may aggregate costs over time within a single provider, aggregate costs across providers, and/or involve warranties where costs of complications are rolled into a single payment. Bundled payments may create financial incentive for providers to decrease the number and cost of services included in the bundle. The review found that the transition from a cost-based or fee-for-service reimbursement to bundled payment was generally associated with a decline in spending of 10% or less. Additionally, bundled payment was associated with a decrease in utilization of services included in the bundle, demonstrated through reductions in length of stay or use of specific services. Most of these reductions were between 5% and 15%. There were inconsistent and mixed findings on the effect of bundle payment on quality measures. Only a few studies included analyses of differential effects by key contextual factors. There was low-quality evidence that for-profit providers generally experienced larger declines in utilization under bundled payment than their non-profit counterparts. Additionally, providers with greater financial pressure had greater reductions in utilization. None of the studies included analyses of differential effects by key design factors.	2011	10/11 (AMSTAR rating from McMaster Health Forum)	2/58

Appendix 2: Summary of findings from primary studies about the effects of value-based bundled payment models

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
Evaluating expenditures and quality outcomes of Medicare's Acute Care Episode (ACE) Demonstration Program (47)	*Publication date:* 2017 *Jurisdiction:* U.S. *Methods:* Difference-in-differences analyses	Participants (*n*= 5,017) who underwent cardiac or orthopedic surgical procedures included in the ACE Demonstration (e.g., cardiac bypass, cardiac valve surgery, hip or knee replacement or revision)	The ACE Demonstration Program was a Centers for Medicare & Medicaid Services' three-year initiative on bundled payments.	The aim of the ACE Demonstration Program initiative was to test the impact of bundled payments for 28 cardiovascular and nine orthopedic inpatient services. A difference-in-differences approach was used to assess the impact of the program on Medicare expenditures and clinical outcomes for cardiac and orthopedic surgery, by comparing changes in episode payments and clinical outcomes from before to after enrolment, compared with control hospitals. Data from the 2001-2012 MedPAR (Medicare Analysis Provider and Review) and Master Beneficiary Summary files were used to identify clinical cohorts, patient risk factors, and calculate study outcomes. The American Hospital Association Annual Survey was used to identify hospital characteristics. The program was not associated with reductions in total 30-day episode payments, hospital payments, or physician payments during the index hospitalization for cardiac or orthopedic surgery. The program was also not associated with consistent improvements in clinical outcomes. The program was associated with reductions in the total 30-day post-acute care payments.
Effects of healthcare payment models on physician practice (48)	*Publication date:* 2015 *Jurisdiction:* U.S. *Methods:* Qualitative multiple-case studies	The cases consisted of 34 physician practices within six geographically defined healthcare markets	Multiple-case studies were used to understand the effects of alternative physician payment models (e.g., the mix of competitors, health plans, and payment programs)	Findings related to the effects of alternative payment models at the organizational level found that practice stability, which includes overall financial impact, ranged from neutral to positive. Findings related to changes in practice operations found that alternative payment models encouraged team-based approaches to care management (e.g., team-based approaches that include allied health professionals). Within primary-care practice, physicians and practice leaders described how virtual global capitation (e.g., medical home programs and shared savings models) allowed them to fund care-manager positions, which were filled by allied health professionals. Findings related to the effects of alternative payment models at the individual physician level indicate that financial incentives applied to physician practices were not immediately passed on to the physicians. Overall, alternative payment models had minimal effects on the aggregate income of individual physicians. The models also did not change how physicians delivered face-to-face patient care. However, the overall quantity and intensity of physician workload increased due to increased patient volume expectations, which may contribute to burnout. While physicians recognized that documentation improved patient care, increases in these types of nonclinical work (e.g., documentation requirements) decreased

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
				physician satisfaction. Physicians described three general operational problems related to new payment programs that limited their effectiveness and provider satisfaction: 1) errors in data integrity and timeliness, performance measure specification, and patient attribution; 2) concerns regarding the implementation of performance and risk-adjustment measures, shared savings, and capitation programs; and 3) events within shared savings and capitation programs that were beyond physicians' control (e.g., introduction of costly specialty drugs).
Compare the views of physicians, policymakers, healthcare executives, and researchers from western countries on different care payment systems (65)	*Publication date:* 2013 *Jurisdictions:* Canada, Europe, Oceania, U.S. *Methods:* Cross-sectional analysis of stakeholder survey data	The sample included 942 physicians, policymakers, and healthcare executives who worked in healthcare in Canada, Europe, Oceana, or the U.S.	Cross-sectional analysis of stakeholder survey data rating the supportiveness of care payment systems in fulfilling patients' needs, linked to four types of care scenarios: 1) primary prevention (e.g., patient care focuses on wellness examinations and disease prevention); 2) trial-and-error care (e.g., patients that present with signs and symptoms in a less structured way); 3) standard care (e.g., patients presenting with disorders that can be diagnosed and treated using a series of proven clinical practices); and 4) network care (e.g., preventing further deterioration and chronic-disease management, which involves networking with patients, family, and other healthcare providers).	The respondents completed a questionnaire that presented four care typology scenarios: trial-and-error, standard care, network care, and primary prevention. For each of the scenarios, respondents provided a preference rating on a five-point scale to state their preference for seven different payment systems (fee-for-service, capitation, salary, episode-based payment, quality of care bonus or adjustment, warrant/never event non-reimbursement, evidence-informed case rates). For trial-and-error care, there was a greater preference for traditional payment systems, such as fee-for-service and salary, compared with prospective and performance-related systems. For the standard care scenario, respondents shifted their preference to performance-related payment (quality-of-care bonus or adjustment, evidence-informed case rates) and prospective payment (episode-based payments). This was not the case for warranty use (79.3% against) and capitation (76.0% against). Additionally, respondents showed a greater preference for fee-for-service in the standard care scenario compared to the trial-and-error scenario. For the network scenario, salary received the highest support. Performance-related payment systems gained support, except warranty, and fee-for-service lost support but still remained at a majority level of support. For the primary prevention scenario, the respondents preferred salary and evidence-informed case rates at the standard care level, and other payment systems at or beyond the network care level of support. Quality-of-care bonus or adjustment had the highest level of support. Overall, across scenarios, traditional payment systems such as salary and fee-for-service had the greatest levels of support. Performance-related payment systems were ranked second and prospective payment systems third. Physicians had strong preferences for fee-for-service, whereas

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
				healthcare executives and researchers had high levels of support for quality bonus or adjustment and capitation.
Patient involvement in diabetes care: experiences in nine diabetes care groups (52)	*Publication date:* 2015 *Jurisdictions:* Netherlands *Methods:* Qualitative analysis of semi-structured interviews	The sample consisted of 10 representatives of nine care groups and 11 representatives of patient advocacy groups who were part of the evaluation study for the Type 2 diabetes bundled payment program before implementation in 2010.	Cross-sectional analysis of interviews regarding the experiences and preferences of care group and patient representatives regarding patient involvement in decision-making: 1) current situation (the extent to which patients are currently informed about or involved in decision-making regarding the planning and delivery of the care program or purchasing process, and the nature of current interactions between patient representatives and care groups; 2) facilitators and barriers (the types of perceived facilitators and barriers regarding current patient involvement); and 3) future preferences (preferences regarding patient involvement in future care groups).	Patient participation in decision-making was determined on a five-step scale: 1) being informed by the care group about decisions being made; 2) being consulted about the decision-making process; 3) being asked for advice by the care group regarding decision-making processes; 4) working in equal partnership with the care group in decision-making (also termed co-creation); and 5) having a final vote in formal decision-making in the care group. Patient involvement in the nine sampled care groups was mostly concerned with informing patients (step one) and consulting patients (step two), and rarely involved higher levels (steps four and five). There was variation in the levels of patient involvement, which was partly affected by the length of time that the diabetes care program was being offered (groups with longer care periods showed a higher level of patient involvement than groups with shorter care periods). Some care groups only informed their patients and claimed that they should not burden patients with decision-making, whereas other groups thought they should involve patients as much as possible; these groups showed more active levels of patient involvement and were more likely to have patients on the board of trustees. The facilitators and barriers for patient involvement largely corresponded between representatives of both patients and care groups. The overlap in themes of motivation, competencies, resource management and characteristics of the patient involvement method align with those in existing literature, suggesting that the limitations for patient involvement are not localized to integrated care groups. For future preferences, it was found that both groups of stakeholders assumed that patient involvement was important in improving care. Recommendations included having care groups prioritize patient involvement through the allocation of discretionary bundled payment funds.
Bundled payments for surgical colectomy among Medicare enrollees; potential savings versus the need for further reform (51)	*Publication date:* 2016 *Jurisdictions:* U.S. *Methods:* Cross-sectional retrospective analysis	The sample consisted of Medicare enrollees who underwent elective colectomy at a large tertiary care hospital between January 1, 2009, and December 31, 2013 (n=821).	Cross-sectional retrospective analysis of patients was conducted to calculate the diagnosis-related hospital costs and payments for each patient undergoing colectomy. Net margins were calculated as the difference between	Median total hospital costs were found to be $24,951, with costs being higher among patients who developed post-operative complications than those who did not, as well as among those undergoing "major" bowel procedures compared to those undergoing "other" bowel procedures. Under the fee-for-service payment model, the net margin was $3,177, with 33.7% of patients contributing to an overall negative margin. The overall net margin increased (leading to greater profitability) with increasing length of stay and with an increasing number of post-operative complications.

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
			total hospital costs and total payments received.	Under the bundled payment model, the procedure-specific payments were $30,150 for the "major" bowel procedures and $13,966 for the "other" bowel procedures, resulting in a medial net margin of $3,442. There was a higher percentage of patients who contributed to an overall negative margin under the bundled model than in the fee-for-service model (41.7% versus 33.7%). Overall, the effect of fee-for-service compared to bundled payment models on hospital profitability and the implications on improving surgical care delivery were inconclusive in this investigation. The results indicate a mismatch in financial incentives, quality of surgical care and willingness for hospitals to take high-risk patients in the bundled payment model. It is unclear as to whether value-based payment models can be effectively implemented to increase the quality of surgical care.
Measuring success in healthcare value-based purchasing programs (50)	*Publication date:* 2014 *Jurisdictions:* U.S. *Methods:* Environmental scan of existing programs, literature review, expert panel discussions	N/A	N/A	Value-based purchasing (VBP) was defined through pay-for-performance programs, accountable care organizations (ACO) and bundled payments programs. Goals focused on coordinated care and patient experiences were more prevalent in ACO and bundled payment programs than in pay-for-performance programs. In all VBPs, sponsors were found to be more inclined to have high-level goals focused on improving clinical quality; however, they often lacked specific performance goals (especially when sponsored by private-sector payers). The absence of concrete goals makes it difficult to determine whether VBPs have been successful in meeting predetermined quality-improvement objectives. According to expert panel discussion, creating incentives to drive patients toward higher performing providers may strengthen the impetus for providers to improve, and might be more effective in improving performance compared to current pay-for-performance incentives. "Relative incentive" structures that promote a "race to the top" can create incentives for providers who may not yield the best clinical benefits. Patient preferences for treatments and other individual circumstances mean that it is unlikely for any process to be applicable to every patient in a population. Absolute attainment thresholds were found to be preferred by providers, but were found to be viewed more critically by payers, suggesting that absolute benchmarks create budget challenges; a potential solution to this problem may be the establishment of multiple absolute targets along a continuum to stimulate improvement at all levels of performance. Studies with strong methodological designs were less likely to identify

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
				significant improvements in clinical quality associated with pay-for-performance programs than those with weak methodological designs. Pay-for-performance programs were also not found to have any significant effect on hospital costs, revenues, margins or Medicare payments. Within the literature reviewed, five studies showed that ACO showed greater improvements than controls on some but not all clinical quality measures. Furthermore, there was insufficient evidence to conclude the impact of ACO payment structures on costs to patients or providers. Only one study in the literature review examined the effect of bundled payments on process measures. However, the observed increase in adherence to 40 clinical process measures from 59% to 100% lacks generalizability. A systematic review on bundled payment measures showed inconsistent effects on quality measures. Both studies investigating the impact of bundled payments identified reductions in costs, and a systematic review showed declines of 10% or less in spending and utilization.

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