Remunerated patient care services and injections by pharmacists: An international update

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ABSTRACT

Objectives: Recognizing pharmacists' increasing roles as primary care providers, programs offering remuneration for patient care services and the administration of injections by pharmacists continue to be implemented. The objective of this article is to provide an update on remuneration programs available to pharmacists internationally for nondispensing services.

Data sources: Systematic searches for relevant articles published from January 2013 to February 2018 across PubMed (MEDLINE), Embase, International Pharmaceutical Abstracts, Cochrane Library, Econlit, Scopus and Web of Science. Gray literature searches, including targeted searches of websites of payers and pharmacy associations, were also performed.

Study selection: Programs were included if they were newly introduced or had changes to patient eligibility criteria and fees since previously published reviews and if they were established programs offered by third-party payers for activities separate from dispensing.

Data extraction: Descriptive information on each program was extracted, including the program's jurisdiction (country and state, provincial or regional level, as applicable), payer, service description, patient eligibility criteria and fee structure.

Results: Over the 5-year period studied, 95 new programs for noninjection patient care services and 37 programs for pharmacist-administered injections were introduced. Large ranges in fees offered for similar programs were observed across programs, even within the same country or region, at an average of \$US 71 for an initial medication review, \$19 for follow-ups to these reviews, \$18 for prescription adaptations and \$13 for injection administration. Apart from some smoking cessation programs in England, which offered incentive payments for successful quits, all services were remunerated on a fee-for-service basis, often in the form of a flat fee regardless of the time spent providing the service.

Conclusion: Although funding for pharmacists' activities continues to show growth, concerns identified in previous reviews persist, including the great variability in remunerated activities, patient eligibility and fees. These issues may limit opportunities for multijurisdictional program and service outcome evaluation. *Can Pharm J (Ott)* 2019;152:92-108.

As our profession changes from a product focus to a patient care focus and a major role in primary health care, new remuneration models should follow. In 2008, we published a systematic review of remuneration systems for pharmacists' clinical care services.¹ At that time, we

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could identify only 28 examples of remuneration programs. We updated that review in 2014² and reported 60 remuneration programs. In the updated review, we noted that the average fee paid for a medication review was \$CDN 68.76 (\$US 52.59), a follow-up visit was \$CDN 23.37 (\$US 17.85) and a prescription adaptation was \$CDN 15.16 (\$US 11.58). A similar review was also published looking specifically at remuneration offered for the administration of injections by pharmacists.³ Across both of those reports, we noted that there were few programs that measured pharmacists' uptake of these services and impact on patient outcomes. We also identified that this was a very fast-changing area and that, as such, it would be of interest to update the review periodically to capture new and revised program details.

Objective

The purpose of the present report is to provide an update on remuneration programs for pharmacists' clinical care services.

Methods

Consistent with the previous reviews, pharmacists' patient care services were defined as "those that enhanced a patient's medication therapy or overall health and did not include medication preparation or distribution or any tasks that could be delegated to a [pharmacy technician or assistant]."^{1,2} This definition therefore excludes routine medication counselling associated with dispensing, routine clozapine laboratory monitoring without concurrent intervention or care plan development, and provision of self-testing kits without clinical intervention. We also excluded technical tasks, according to the current scope of practice for regulated pharmacy technicians. In Canada, 9 provinces currently recognize pharmacy technicians as regulated health professionals⁴ after the successful completion of Pharmacy Examining Board of Canada examinations and other province-specific requirements.⁵ Because the technician scope of practice includes the ability to "instruct patients about the operation and maintenance of medical devices,"⁶ programs that reimburse pharmacists/pharmacies for medical device training were also excluded from this review.

The administration of drugs or vaccines by injection was defined as the administration of any substance by parenteral route by a

KNOWLEDGE INTO PRACTICE

- A systematic review of remuneration for pharmacists' clinical care services was initially published in 2008, followed by a review of remuneration for the administration of injections in 2013 and an update of the clinical care services review in 2014.
- High variability in fees and patient eligibility criteria were noted across all reviews. It was also noted that this is an area of rapid growth and change, requiring regular review.
- The purpose of this article is to update those reviews according to literature retrieved through February 2018.
- Ninety-five new remunerated programs for pharmacist-performed noninjection clinical care services and 37 new programs for pharmacist-administered injections were identified since the last review.
- Other than smoking cessation services in the United Kingdom, all services were remunerated on a fee-for-service basis.
- Consistent with previous reviews, great variability exists regarding pharmacists' scope of practice, fees offered and patient eligibility criteria for remunerated programs.

pharmacist. This definition excludes the provision of a naloxone kit for patient use, because the pharmacist is paid for dispensing, counselling and education, not administration of the drug.

Search strategy

Literature searches were performed by a research librarian in the following databases: PubMed (MEDLINE), Ovid Embase, Ovid International Pharmaceutical Abstracts, Cochrane Library, Proquest's Econlit, Scopus and Web of Science. The search strategies were derived from the previous reviews and updated to include terms related to specific types of cognitive services offered, including immunization, vaccination, smoking cessation and minor ailments assessment and prescribing. To construct the searches, a combination of medical subject headings and keywords related to payment, remuneration, reimbursement, pharmacy, pharmacists and various clinical services was included. In addition, depending on database functionality, the adjacency operator, truncation and phrase searching were used. All searches were limited to the date range of January 2013 to February 2018 and search results were exported into Refworks citation management software for duplicate removal. Full search strategies are available from the authors on request. To identify additional relevant articles, the bibliographies of included

studies and tables of contents for pharmacy practice journals were reviewed for additional citations.

To complement the searches for published literature, a search for gray literature was conducted. Targeted websites were searched, including the Institute of Health Economics, the Canadian Agency for Drugs and Technologies in Health, Health Action International, the International Society for Pharmacoeconomics and Outcomes Research, the Organisation for Economic Co-operation and Development, the Pharmaceutical Group of the European Union, Proquest's Dissertations and Theses and the World Health Organization. Comprehensive online searches for publicly available information were also performed, beginning with the programs and jurisdictions included in the previous reviews, to specifically look for expansions in programs or changes in patient eligibility criteria or fees offered. Searches of publicly available information from pharmacy associations of all Canadian provinces, US states and other countries with eligible programs mentioned in the previous reviews were performed as well. Associations were contacted individually by e-mail for clarification or additional information as required. Pharmacy provider manuals for state Medicaid programs in the United States were also reviewed for each state. We excluded fees specifically offered to pharmacists through the Vaccines for Children programs across the country. Websites of each of the Local Pharmaceutical Committees of the United Kingdom were also manually searched, because these committees negotiate pharmacy services with local commissioners. The search engine Google was then used to identify any additional programs, incorporating the same search terms as applied to the database searches.

Study selection

Citations were identified that were published from January 2013 to February 2018. Programs were included if they described remuneration programs for pharmacist clinical care services or injection administration in any setting and were not included in the previous review or if they were reported in the previous review but had changes to patient eligibility criteria and/or fees. Remuneration had to be offered through a third-party payer (government, employer or insurance plan), be separate from dispensing

fees and excluded services paid out-of-pocket by patients. Programs were also excluded if they were offered only as part of a funded research study or pilot project or had fewer than 3 participating pharmacies, because we were specifically interested in reporting on ongoing and broadly applicable remuneration programs. Finally, programs where the billing was not done directly through a pharmacist were excluded. This therefore excluded any programs where the pharmacist-performed service is billed for using "incident to" billing, wherein the service is billed under a physician's provider number and the nonphysician provider of the care is considered an employee of the physician who provides this care under physician supervision.⁷

Data extraction

One author screened titles and abstracts for inclusion and performed data extraction. Owing to heterogeneity in this subject area and among different health systems observed from previous reviews, data were reported descriptively.

Results

The database search resulted in 2729 citations, and 218 titles were identified for full-text review (Appendix 1, available online at www.cpjjournal.ca). Of these, 209 were excluded for the following reasons: no report on a remuneration program ($n = 75$), full text could not be retrieved ($n = 51$), report of a program described in a previous review with no changes to patient eligibility or fees ($n = 21$), program offered in fewer than 3 pharmacies ($n = 18$), results reported only in abstract form ($n = 15$), report of a demonstration or pilot program ($n = 13$), report on a program offered only within the context of a research study rather than an ongoing program ($n = 10$) and payment provided in the form of "incident to" billing ($n = 6$). The remaining 9 studies⁸⁻¹⁶ prompted specific gray literature searches on those programs to verify the eligibility of the program for the review and to extract details on patient eligibility and payment offered, if eligible. In total, 178 records from the gray literature were ultimately included in this review in addition to the 9 published studies, for a total of 187 records.

Clinical care services excluding injections

A total of 95 new remunerated programs and services were identified since the last review, with

1 additional program having incomplete information available (Appendix 2, available online).¹⁷⁻¹⁴³ Thirteen programs that were previously reported had changes in patient eligibility criteria and fees offered.

Injection administration

A total of 37 new remunerated programs/services were introduced since the last review and 6 were previously reported but had changes in patient eligibility criteria and fees offered (Table 1).^{20,21,24,25,36,37,40,52,62,66,72,73,77,79,88,93,100,102,105,144-195}

As with the previous reviews, a large degree of variation was noted in types of services offered, patient eligibility criteria and fees offered (Table 2). For example, medication therapy management initial encounters and related medication review services were remunerated at an average of \$US 71.48 (SD \$44.47, range \$35-\$247.11) for an estimated 30-minute interaction (all fees converted to \$US for purposes of comparison, with conversions current as of April 3, 2018). Follow-ups to medication reviews were remunerated at an average of \$19.13 (SD \$7.85, range \$11.72-\$40). Prescription adaptations (changes to dose, dosage form, route, duration) were remunerated at an average of \$18.49 (SD \$10.79, range \$4-\$30), whereas refusal to dispense was remunerated at an average of \$8.75 (SD \$3.78, range \$5.01-\$15.62). Assessment and initiation of therapy for minor ailments was remunerated at an average of \$7.52 (SD \$12.93, range \$2.81-\$21.10) per encounter, whereas assessment and initiation of therapy for other conditions was remunerated at an average of \$19.22 (SD \$5.57, range \$10.56-\$42.23). Fees for the administration of injections averaged \$12.95 (SD \$5.61, range \$3.31-\$23.28).

Almost all services were remunerated on a fee-for-service basis, with only smoking cessation services in the United Kingdom being remunerated based on outcome. In the UK program, pharmacies providing the service were equipped with point-of-care carbon monoxide monitors to verify patients' smoking status. A pharmacy that had a patient with a verified quit at 4, 8 and 12 weeks qualified for an incentive payment ranging from £5 to £200 (\$7.05-\$281.88). Nonverified (patient self-report) quits qualified for incentive payments ranging from £4 to £82 (\$5.64-\$115.57). Some commissioning groups offered additional bonuses based on patient characteristics, including the following:

£5 (\$7.05) per successful quit if the patient was eligible for prescriptions at no charge,¹⁹⁶ £20 to £150 (\$27.56-\$206.72) if pregnant, £10 (\$13.78) if the patient also had severe mental health problems, £100 (\$137.81) if age less than 18 years or a member of a targeted ethnic group and £10 to £20 (\$13.78-\$27.56) if the patient resided in a region with significant deprivation. Other commissioning groups offer incentive payments based on the number of successful quits achieved annually by the pharmacy. For example, one offers £5 (\$7.05) per patient who quits if the pharmacy achieves its target count and an additional £500 (\$689.08) if 40 patients successfully quit; another offers £250 (\$344.54) for 50 to 100 quits, £500 (\$689.08) for 101 to 150 quits and £1000 (\$1378.15) for more than 150 quits in a specified year.

Discussion

Since our last review 5 years ago, we identified 95 new programs that fund noninjection pharmacist clinical services and 37 new programs that fund pharmacist-administered injections. One of the biggest changes has been in the number of programs that support pharmacist care of the patient independently from a physician. In our 2008 review, we noted that "most systems encouraged or required physician involvement at some point in the process."¹ In our previous update, we noted the emergence of remuneration programs for independent pharmacist prescribing, including common ambulatory condition programs in England, Northern Ireland and Saskatchewan.² In the present review, we saw 2 of those 3 common ambulatory programs expand to include several new conditions, and we saw a Canadian province add such a program. Similarly, several jurisdictions now allow pharmacists to renew, adapt or initiate a prescription, and we continue to see new remuneration programs emerging to support these services.

We also saw an expansion in medication review programs that support pharmacists in following up with patients after an initial review. This is consistent with the findings of a meta-analysis by Kwint et al.¹⁹⁷ that pharmacist recommendations are more likely to be implemented after a medication review if the pharmacist follows up (among several other factors, such as if the pharmacist has clinical experience, if the pharmacist is the patient's regular pharmacist and has access to medical records, if the

TABLE 1 Pharmacist injection administration remuneration programs

New programs introduced since previous reviews			
Region/program	Eligible drugs or vaccines	Administration fee	Patient eligibility or other restrictions
United States (fees in \$US)¹⁴⁴			
Arkansas (AR) ^{145,146}	Influenza, pneumococcal vaccines	\$9.56	AR Medicaid beneficiaries age ≥ 19 y
California (CA) ¹⁴⁷⁻¹⁴⁹	Diphtheria, hepatitis A, hepatitis B, herpes zoster, human papillomavirus, measles, meningococcal, mumps, rabies, rubella, tetanus, varicella	\$4.46	CA Medicaid beneficiaries age ≥ 19 y
Georgia (GA) ¹⁵⁰	Influenza	\$10.00	GA Medicaid beneficiaries age ≥ 19 y, August-February only
Hawaii (HI) ^{151,152}	Diphtheria, hepatitis B, influenza, pneumococcal, rubella, tetanus	\$4.00	HI Medicaid beneficiaries; influenza and pneumococcal for high-risk groups; rubella for women of childbearing age; hepatitis B for high-risk groups
Idaho (ID) ¹⁵³	Diphtheria, hepatitis A, hepatitis B, herpes zoster, human papillomavirus, influenza, measles, meningococcal, mumps, pertussis, pneumococcal, polio, rubella, tetanus, varicella	\$23.28 initial vaccine given in a visit, \$11.94 each additional vaccine	ID Medicaid beneficiaries
Indiana (IN) ¹⁵⁴	Diphtheria, herpes zoster, human papillomavirus, influenza, meningococcal, pertussis, pneumococcal, tetanus	\$17.61	IN Health Coverage Program (Medicaid) beneficiaries age ≥ 19 y
Iowa ¹⁵⁵⁻¹⁵⁷	All vaccines for adults, influenza only for children	\$5.09 for injection, \$12.88 for intranasal administration	Adult Medicaid beneficiaries
Kansas ^{158,159}	All vaccines	\$14.15	Adult Medicaid beneficiaries
Massachusetts (MA) ¹⁶⁰	Influenza	\$19.33	MA Medicaid beneficiaries
Minnesota ^{161,162}	Diphtheria, <i>Haemophilus influenzae</i> type b, hepatitis A, hepatitis B, herpes zoster, human papillomavirus, influenza, measles, meningococcal, mumps, pertussis, rubella, tetanus, varicella	Children: \$21.22 first vaccine, \$10.61 for each subsequent Adults: \$19.82 first vaccine, \$9.49 each subsequent	Influenza vaccine for children ≥ 6 y of age, all other vaccines for those age ≥ 13 y
Missouri (MO) ^{20,21}	Vaccines recommended by ACIP	Children: \$5 per ingredient Adults: \$12.34 first vaccine, \$6.25 each subsequent	MO Medicaid beneficiaries
Montana (MT) ^{163,164}	Vaccines recommended by ACIP	\$21.32 first vaccine, \$12.68 each subsequent	MT Medicaid beneficiaries; influenza for children only if age ≥ 12 y
Nebraska (NE) ^{165,166}	Influenza	\$5.80	NE Medicaid beneficiaries age ≥ 19 y
Nevada (NV) ¹⁶⁹	<i>Haemophilus influenzae</i> type b	\$7.80	NV Medicaid beneficiaries age ≥ 19 y
New Mexico (NM) ¹⁶⁸	Vaccines recommended by ACIP	\$20.80	NM Medicaid beneficiaries
New York (NY) ¹⁶⁹	Herpes zoster, meningococcal	Age 18 y: \$17.85; age ≥ 19 y: \$13.23	Meningococcal for NY Medicaid beneficiaries age ≥ 18 y; zoster restricted to those age ≥ 50 y
North Carolina (NC) ^{170,171}	Diphtheria, hepatitis B, herpes zoster, influenza, meningococcal, pertussis, pneumococcal, tetanus	\$13.30	NC Medicaid beneficiaries age ≥ 19 y
Vermont (VT) ¹⁷²	Influenza	\$20.35	VT Medicaid beneficiaries age ≥ 19 y

(continued)

TABLE 1 (continued)

New programs introduced since previous reviews			
Region/program	Eligible drugs or vaccines	Administration fee	Patient eligibility or other restrictions
Virginia (VA) ¹⁷³	Vaccines recommended by ACIP	Varies	Routine vaccinations limited to VA Medicaid beneficiaries age 19-20 y; only influenza and pneumococcal vaccines and those needed for the direct treatment of an injury are covered for those age >20 y
West Virginia (WV) ^{174,175}	Diphtheria, hepatitis A, hepatitis B, herpes zoster influenza, pertussis, pneumococcal, tetanus	\$16.71 first vaccine, \$8.62 each subsequent	WV Medicaid beneficiaries age ≥19 y; herpes zoster limited to those age ≥60 y
Wisconsin ^{176,177}	Influenza	\$3.31	Influenza vaccine only for Badgercare and Medicaid beneficiaries age ≥6 y and Forwardcare beneficiaries age ≥19 y
Wyoming ¹⁷⁸	Not specified	\$21.72	Not specified
Canada (fees in \$CDN)			
British Columbia (BC) ^{37,179}	Diphtheria, <i>Haemophilus influenza</i> type B, hepatitis A, hepatitis B, human papillomavirus, measles, meningococcal, mumps, pertussis, polio, rubella, tetanus, varicella	\$10.00	BC resident ≥5 y of age who meets criteria for each agent under the publicly funded immunization program
Manitoba (MB) ¹⁸⁰	Human papillomavirus, influenza, tetanus/diphtheria/pertussis, pneumococcal	\$7.00	MB resident ≥7 y of age
Newfoundland and Labrador (NL) ⁴⁰	Influenza	\$13.00	NL Prescription Drug Program beneficiaries ≥5 y of age
Nova Scotia (NS) ¹⁸¹	Influenza	\$12.00	NS resident ≥5 y of age
Prince Edward Island (PEI) ¹⁸²	Influenza	\$12.36 ^a	PEI resident ≥5 y of age
Saskatchewan (SK) ¹⁸³	Influenza	\$13.00	SK resident ≥9 y of age
United Kingdom			
England ¹⁸⁴ (nationwide)	Influenza	£7.64	High risk (age ≥65 y, pregnant women, chronic conditions as defined by NHS England)
England ^{52,66,73,77,79,88,93,100,102,105} (varies by commissioner)	Influenza, for local health authority employees	Varies by commissioner: £10-£15	Local health authority employees and contractors who work directly with people in clinical risk groups
England—City and Hackney LPC ¹⁰²	Influenza	£8.30	Home-bound residents on referral, special schools staff, caregivers for individual dependent on their help
England—City and Hackney LPC ¹⁰²	Pneumococcal	£8.30	Individuals age ≥65 y or age 2-64 y who are considered at high risk
England—Birmingham LPC ⁶²	Hepatitis B	£10	Residents of Birmingham LPC age ≥16 y who have received ≥1 dose at a sexual health clinic
England—Birmingham LPC ⁶²	Injectable contraceptive	£10	Not specified

(continued)

TABLE 1 (continued)

New programs introduced since previous reviews			
Region/program	Eligible drugs or vaccines	Administration fee	Patient eligibility or other restrictions
Wales ^{185,186}	Influenza	£9.46	High-risk individuals as defined by NHS Wales annually
France			
New Aquitaine and Auvergne-Rhône-Alpes regions ¹⁸⁷	Influenza	€4.50 per patient with prescription, €6.30 per eligible person with a National Insurance voucher. €100 flat fee per pharmacist who has performed ≥5 injections in a given pharmacy.	Patients age ≥65 y or with selected chronic health conditions that place them at high risk; patients receive a voucher that can be taken to a pharmacy to receive the vaccination if they have received the vaccine before; first-time recipients must visit a physician
New Zealand			
All regions ^{188,189}	Influenza	Varies (agreement between pharmacy and District Health Board)	Age ≥65 y, pregnant women
Programs included in the previous review with patient eligibility or fee changes (changes set in italics)			
Region/program	Eligible drugs or vaccines	Administration fee	Patient eligibility or other restrictions
United States (fees in \$US) ⁷²			
Michigan (MI) ¹⁹⁰	Vaccines recommended by ACIP (<i>previous review listed only influenza</i>)	\$7.00	MI Medicaid beneficiaries
North Dakota (ND) ¹⁹¹	Hepatitis B, influenza	\$15.49	ND Medicaid beneficiaries
Oregon (OR) ^{192,193}	Vaccines recommended by ACIP	\$17.92 first vaccine, \$8.98 for each subsequent	OR Medicaid beneficiaries age ≥19 y
South Carolina (SC) ^{194,195}	Hepatitis B, influenza, pneumococcal vaccines (<i>hepatitis added</i>)	\$3.72	SC Medicaid beneficiaries age ≥19 y
Washington (WA) ^{24,25}	Herpes zoster, influenza, pneumococcal vaccines	\$15.56	WA Medicaid beneficiaries age ≥19 y
Canada (fees in \$CDN)			
Alberta (AB) ³⁶	Influenza vaccine	\$13.00	AB resident ≥5 y of age. <i>Previous limit of 1 fee per day was increased to 2 per day in 2014. This limit does not apply to publicly funded vaccines.</i>

ACIP, Advisory Committee on Immunization Practices; LPC, Local Pharmaceutical Committee; NHS, National Health Service.

^aPersonal communication, PEI Pharmacists Association.

physician referred the patient for review, if the pharmacist and physician hold a case conference and if there is an action plan). However, evaluation of the diabetes-focused MedsCheck program in Ontario, Canada, showed that although one-half of all patients with diabetes in the province had received a medication review from a pharmacist, only 3% had received a follow-up, despite a funding mechanism in place.¹⁹⁸ This is

a useful reminder that remuneration is not the only barrier to comprehensive pharmacy care and that other issues, such as time constraints, organizational workflow and a culture/workplace setting that supports taking responsibility for patient care, need to be addressed to ensure that programs can be implemented as designed.

Another important point to consider is that although medication reviews consistently

TABLE 2 Summary of remuneration for pharmacist clinical services (in \$US)

Service type	Service description	Average fee (\$D)	Range	Comments
Medication reviews				
Initial medication review	Pharmacist reviews medications with the patient to create a list, which may include identifying drug therapy problems	\$71.48 (\$44.47)	\$35-\$247.11	\$247.11 fee max from Denmark, where reviews are remunerated at 500-1500 Danish Krone
Follow-up medication review		\$19.13 (\$7.85)	\$11.72-\$40	
Adaptations, renewals and refusal to dispense				
Prescription adaptations	Changes to dose, dosage form, route, duration	\$18.49 (\$10.79)	\$4-\$30	
Medication renewals	Renewing a chronic medication or providing an emergency supply	\$15.40 (\$4.38)	\$9.74-\$27.57	
Refusal to dispense	Sending a notification to the prescriber that the medication cannot be dispensed as written	\$8.75 (\$3.78)	\$5.01-\$15.62	
Prescribing				
Prescribing: minor ailments	Assessing a patient for a common ambulatory ailment, which may include initiating treatment	\$7.52 (\$12.93)	\$2.81-\$21.10	Examples include acne, atopic dermatitis and skin and soft tissue infections
Prescribing: general	Assessing a patient for a previously diagnosed condition and initiating treatment	\$19.22 (\$5.57)	\$10.56-\$42.23	Examples include prescribing for hypertension or diabetes
Prescribing: smoking cessation	Assessing a patient for smoking cessation, which may include initiating nicotine replacement therapy, bupropion or varenicline	\$21.03 (\$11.18)	\$6.89-\$41.36	
Administration of injections				
Injections	Administration of a drug or vaccine by the parenteral route	\$12.95 (\$5.61)	\$3.31-\$23.28	

improve outcomes related to conditions such as hypertension, diabetes and cholesterol in the research setting,¹⁹⁹ they tend to be less effective in the real world. For example, an evaluation of the British Columbia pharmacist medication review services found that uptake by pharmacists was very low, one-half of reviews were not policy concordant, prescription drug use did not change and the reviews were associated with an overall increase in physician visits.^{200,201} An evaluation of the Ontario MedsCheck program found that people who took more medications were less likely to be offered a medication review.²⁰² Similarly, a review of research on the Australia Home Medicines Review and Clinical Medicines Review programs noted that awareness and service delivery is low for more vulnerable populations, including those who are indigenous or who are culturally and linguistically diverse.²⁰³ It is notable that these studies

have all contributed to changes in those medication review programs, suggesting that regular evaluation is a key component of an effective medication review program. These experiences also highlight some of the planning considerations for new medication review programs, including clear patient eligibility criteria, expectations that pharmacists will provide follow-up, the inclusion of billing codes that facilitate large-scale evaluation and, importantly, an *a priori* plan for evaluation of the program.

The expansion in programs offering remuneration for pharmacist-administered injections reflects recent expansions of pharmacist scope of practice to include injection administration across a number of Canadian provinces (Manitoba, Newfoundland and Labrador, Nova Scotia, Prince Edward Island, Saskatchewan), France and New Zealand since the previous review. Interestingly, each of these new regions

currently limits remunerated vaccine administration to the influenza vaccine only. Among jurisdictions that offered some remuneration for pharmacist-administered vaccines in the previous review, adoption was noted across a number of state Medicaid programs in the United States, with trends across many programs toward expanding the range of vaccines eligible for remuneration to include a number of those that are part of national or regional routine immunization schedules. These findings are consistent with an analysis of pharmacist vaccination laws in the United States from 1971 to 2016, which noted overall expansion in legislation related to pharmacist-administered vaccines, with lessening restrictions related to patient age and physician oversight.²⁰⁴ Because a number of vaccines require only single doses, annual doses (e.g., influenza) or booster doses at multiple-year intervals, concerns noted with insufficient follow-up after an initial intervention with services such as medication reviews are less prevalent for vaccinations. However, as the scope of eligible vaccines that pharmacists can administer expands to include travel vaccinations or vaccinations for children, pharmacists will need to adopt processes, such as reminder systems, to ensure the completion of multiple-dose series.²⁰⁵

One of the main concerns with remuneration programs for pharmacy services is value for money. A cost-utility analysis in Spain suggested that a medication review with follow-up is cost-effective²⁰⁶ and that for every €1 spent on the service, €3.3 to €6.2 is saved.²⁰⁷ Similarly, a recent cost-effectiveness analysis of pharmacist hypertension services in Canada estimated that pharmacist involvement in hypertension management could save more than \$CDN 6000 over a patient's lifetime and \$CDN 15.7 billion over a time horizon of 30 years if rolled out population-wide.²⁰⁸ Economic evaluations continue to emerge and will be key to establishing sustainable programs in the long term.

It should be noted that our review is not exhaustive. One of the main limitations of the review is that we had to rely on publicly available information. This may have excluded programs offered solely between private payers and pharmacies as part of a proprietary program. We also attempted to obtain information on commissioned services offered by each of the approximately 80 Local Pharmaceutical Committees in the United Kingdom. However, many did not make their fee data publicly available. In particular, we were unable to verify or obtain information on many of the services referenced in a database of locally commissioned services that is maintained by the Pharmaceutical Services Negotiating Committee. Finally, we also excluded vaccine programs for children, because most programs outside of the United States do not allow pharmacists to vaccinate young children.

Conclusion

Opportunities for pharmacists to receive publicly funded remuneration for nondispensing patient care services continue to expand. However, high levels of variation (even within the same geographic region) related to scope of practice recognized by different payers, patient eligibility for services and fees offered make direct comparisons among programs difficult. Large ranges in fees offered for similar services suggest that some programs may generate revenue whereas others may be insufficient to offset the costs of offering the service. Payers and pharmacists are encouraged to investigate the time and other resources required to offer a service of high quality to ensure that these programs can be offered to the patients who would most benefit from them within the business model of community pharmacy practice. Ongoing evaluation of all remuneration programs for pharmacists' services is also strongly encouraged to assess uptake and outcomes. ■

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Acknowledgments: *The authors acknowledge Trish Chatterley for her support of the literature search development based on the search used in the previous reviews and Cassandra Sum for her assistance with the gray literature search.*

Disclosure: *The authors declare no relevant conflicts of interest or financial relationships.*

Author Contributions: *S. K. D. Houle, R. T. Tsuyuki, and K. A. Grindrod conceived of the project. S. K. D. Houle performed data collection. C. A. Carter developed and executed the search strategy. All authors wrote and revised the paper.*

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