

Competing demands and opportunities in primary care

Christina Korownyk MD CCFP James McCormack PharmD Michael R. Kolber MD CCFP MSc
Scott Garrison MD CCFP PhD G. Michael Allan MD CCFP

Historically, preventive interventions have yielded dramatic improvements in population health, with substantial benefits in patient-oriented outcomes including death from infectious disease and infant mortality. As medicine evolves, greater numbers of preventive and screening recommendations are encouraged, most often under the auspices of primary care. An aging population, often with multiple comorbidities, has also affected service delivery in primary care, with numerous recommendations for chronic disease management. Increasing time spent in one area must be balanced by a thoughtful review of what might be lost. The concept of competing demands in primary care is not a new one. Almost a quarter of a century ago, authors recognized that competing demands, including acute care, patient requests, chronic illnesses, psychosocial problems, screening, counseling for behavioural change, and administration and management of patient care, presented a substantial barrier to the provision of specific services to patients.¹ In this paper, we estimate the feasibility of implementing current demands in primary care, as well as the relative benefits of these interventions, including screening and preventive health care, chronic disease management, and caring for patients with acute medical conditions.

Primary care and the 36-hour day

The evidence for primary care improving health outcomes on a population basis is clear.² Primary care clinicians provide approximately 68% of all patient care³ and are identified as the best positioned to implement preventive interventions on a population basis.^{4,5} Indeed, some have suggested “the predominance of the biomedical model (which prioritizes disease treatment) hamper[s] the implementation of PP&HP [primary prevention and health promotion]” in primary care.⁶

In 2005, it was estimated that to meet all guideline recommendations, primary care clinicians would require 11 hours per day for chronic disease management⁷ and 7 hours for preventive services.⁸ Since then, guideline recommendations have only increased. From 1984 to 2008,

the number of cardiology guideline recommendations increased by 48%.⁹ Over a similar period, the number of guideline entries on PubMed rose from 73 to 7508.¹⁰ Primary care has been identified in the media and academic research as failing to adequately integrate guidelines and preventive maneuvers into clinical practice,^{11–14} possibly in part because it faces an impossible task.

Primary care interventions

To assess the benefits of competing demands and opportunities in primary care, we postulated that primary care could be divided into 5 main categories for discussion: management of acute symptomatic conditions, management of chronic symptomatic conditions, prevention of cardiovascular disease, cancer screening in average-risk patients, and screening or counseling for health promotion. A representative sample of interventions for each category was selected based on availability of randomized controlled trial data reporting patient-oriented outcomes (with the exception of screening for cervical cancer, which is recommended by national guidelines throughout North America). Using these data, the absolute benefits of the interventions were identified and the numbers needed to treat to benefit 1 individual were calculated. In each case, examples chosen are common conditions seen in primary care or preventive interventions that have been advocated by national guidelines. These estimations are simply to initiate the discussion around how priorities in health care could be balanced.

We calculated the number of encounters with benefit per year based on expected physician panel sizes, patient visits per day, and demographic characteristics of panels. As these numbers are estimates, we calculated values for 2 scenarios to capture a range of possible benefits: conservative and best-case scenarios. To estimate the benefit the average physician would see over their career, we extrapolated these numbers to an assumed 30-year practice lifetime. Full details of the methods used to derive the encounters with benefit per year and benefits in 30 years are provided in **Tables 1** and **2**.^{15–47}

Over a 30-year practice lifetime, treatment of acute conditions will yield a clinical benefit in 5280 to 21 600 patient encounters while treatment of chronic symptomatic conditions will provide a benefit in 4290 to 18 540 patient encounters. At the other end of the spectrum, over a 30-year practice lifetime, primary care prevention

This article has been peer reviewed.

Can Fam Physician 2017;63:664–8

La traduction en français de cet article se trouve à www.cfp.ca dans la table des matières du numéro de septembre 2017 à la page e371.

Table 1. Common conditions and preventive interventions across primary care

ACUTE SYMPTOMS	LONG-TERM SYMPTOMATIC CONDITIONS	CVD (PRIMARY PREVENTION)	CANCER SCREENING (CANCER-SPECIFIC MORTALITY)	SOCIAL SCREENING OR HEALTH PROMOTION
Headache ¹⁵ : ASA or sumatriptan, NNT= 5 to 9 to be pain free at 2 hours	Depression ¹⁶ : antidepressants, NNT= 7 to 9 for response in 6 weeks	Statin ¹⁷⁻²⁰ : NNT= 55 to 77 over 5 years (any CVD)	Mammogram ^{21,22} : NNS= 377 to 2000 over 10 years	Alcohol screening ²³ : No evidence of benefit in heaviest drinkers
Knee osteoarthritis ²⁴ : intra-articular steroid, NNT= 3 to 5 for global improvement over 4 weeks	Chronic neuropathic pain ^{25,26} : duloxetine or gabapentin, NNT= 6 to 8 at 3 months for reduction of $\geq 50\%$	Metformin in diabetes ²⁷ : NNT= 29 over 5 years (myocardial infarction)	Fecal immunochemical testing ²⁸ : NNS= 1200 over 10 years (assumed similar to fecal occult blood testing)	Counseling on increased physical activity (single interventions) ²⁹⁻³¹ : insufficient evidence of benefit
Gout ³² : colchicine, NNT= 5 for $\geq 50\%$ symptom free at 24 hours	Headache ^{33,34} : tricyclic antidepressant or β -blocker, NNT= 4 to 8 over 6 months for reduction of 50%	ASA ³⁵ : NNT= 346 to 427 over 5 years (any CVD)	Prostate-specific antigen ³⁶⁻³⁸ : NNS= 441 to 1410 over 10 years	Family violence screening ³⁹ : increased awareness but insufficient evidence for improved outcomes
Benign positional vertigo ⁴⁰ : Epley maneuver, NNT= 3 for symptom resolution	Constipation (chronic) ⁴¹ : polyethylene glycol, NNT= 2 to 3 for resolution over 6 months	Hypertension (≥ 160 mm Hg) ^{42,43} : treated, NNT= about 20 over 5 years (any CVD)	Cervical cancer ^{44,45} : NNS unknown (but 1 in 500 women die of cervical cancer when screened every 3 years compared with 1 in 100*)	Screening for obesity ^{46,47} : no evidence of improved outcomes (about 3 kg of weight loss with behavioural programs at 1 y; no evidence of improved patient outcomes)

ASA—acetylsalicylic acid, CVD—cardiovascular disease, NNS—number needed to screen, NNT—number needed to treat.

*Data are based largely on national cohort and case-control studies that demonstrate a strong association between the introduction of screening and reduced incidence of cervical cancer. One cluster randomized controlled trial from rural India shows a 0.35 relative reduction in mortality with a 1-time screen.

Table 2. Comparison of benefit of interventions across primary care

CATEGORY	ACUTE SYMPTOMS	LONG-TERM SYMPTOMATIC CONDITIONS	CVD (PRIMARY PREVENTION)	CANCER SCREENING (CANCER-SPECIFIC MORTALITY)	SOCIAL SCREENING OR HEALTH PROMOTION
Estimated benefit	NNT= about 5	NNT= about 7	NNT= about 40 over 5 years	NNS= about 1000 over 10 years	NNS= ∞
Encounters with benefit per year	176* to 720 [†]	143 [†] to 617 [§]	3.25 to 12 [¶]	0.13 [#] to 0.36**	0
Encounters with benefit over 30 years	5280 to 21 600	4290 to 18 540	98 to 360	4 to 11	0

CVD—cardiovascular disease, NNS—number needed to screen, NNT—number needed to treat.

*Acute visits—conservative: Visits per year are based on 220 working days. Assuming 20 visits per day with 20% of visits having some acute symptom component, $(220 \times 20) \times 0.2 = 880$. Estimated NNT of 5 means 176 $(880/5)$ encounters with benefit per year.

[†]Acute visits—better case: Visits per year are based on 240 working days. Assuming 30 visits per day with 50% of visits having some acute symptom component, $(240 \times 30) \times 0.5 = 3600$. Estimated NNT of 5 means 720 $(3600/5)$ encounters with benefit per year. Assumptions minimizing benefit include no weekends, holidays, or evenings worked.

[‡]Long-term symptomatic conditions—conservative: Based on a patient panel of 2000, assuming about 50% of patients have 1 continuing problem (note that some patients will have more and some will have none), then $2000 \times 0.50 = 1000$, with an NNT of 7 $(1000/7 = \text{about } 143)$.

[§]Long-term symptomatic conditions—better case: Visits per year are based on 240 working days. Assuming 30 visits per day with 60% of visits having some chronic symptom component, $(240 \times 30) \times 0.6 = 4320$. Estimated NNT of 7 means 617 $(4320/7)$ encounters with benefit per year.

^{||}Long-term CVD prevention—conservative: Using age 45 as the start of screening (knowing that is early) to age 75, that represents 32.5% of the population or 650 patients. Assuming all will be high enough risk to be offered at least 1 therapy, estimated NNT is 40 over 5 years $(650/40 = 16.3$ per 5 years, $16.3/5 = 3.25$ per year).

[¶]Long-term CVD prevention—better case: Using age 45 as the start of screening (knowing that is early) to age 75, assuming this demographic makes up 60% of the patient panel or 1200 patients, and assuming all patients will be high enough risk to be offered at least 1 therapy, with the most effective therapy (hypertension treatment), NNT is estimated to be 20 over 5 years $(1200/20 = 60$ per 5 years, $60/5 = 12$ per year).

[#]Long-term cancer prevention—conservative: Assuming 650 eligible patients (as in CVD) and 2 maneuvers per patient, benefit would be 2 per 1000 over 10 years, or 1 in 500 over 10 years. So, we take $650/500 = 1.3$ encounters with benefit over 10 years. That is 0.13 over 1 year or around 4 over 30 years.

**Long-term cancer prevention—better case: Using age 45 as the start of screening (knowing that is early) to age 75, assuming this demographic makes up 60% of the patient panel or 1200 patients, and assuming the best-case scenario (ie, mammography with NNS= 337 over 10 years), $1200/337 = 3.6$ over 10 years. That is 0.36 over 1 year.

of cardiovascular disease yields benefit in 98 to 360 patient encounters and screening for cancer yields benefit in 4 to 11 encounters. If we compare the conservative estimates from symptomatic presentations ($5280 + 4290 = 9570$) to the best-case estimates for prevention and screening ($360 + 11 = 371$), the gap represents a ratio of benefit of 26:1. Calculating the ratio considering the best case for acute presentations and conservative estimate for screening and prevention gives us a ratio of benefit of 394:1. The best available evidence suggests a number of health promotion maneuvers like alcohol screening and intervention will not yield clinically significant benefits in the average primary care setting.

Important considerations

Estimation of numerical benefit is one piece of the puzzle; however, primary care outcomes are complex and many other factors require discussion.

Opportunity costs. Time spent screening asymptomatic patients for disease creates an opportunity cost whereby patients who are symptomatic with disease might not be seen. Patients often have trouble seeing their physicians in a timely manner. One in 5 patients visits the emergency department in Canada for conditions that could be treated in a primary care setting.⁴⁸ About 50% of the time, difficulties in accessing family physicians was given as a reason for presenting to the emergency department.⁴⁸ IMS Health reported that the second most common reason for patients to visit their family physicians in 2014 was for “health checkups” (10.3 million visits),⁴⁹ which are often booked long in advance and have questionable value.^{50,51} So while family physicians perform (and are incentivized for) periodic health examinations for prevention and screening of asymptomatic patients, their patients with acute medical conditions might be frequenting emergency departments with concerns most suitably cared for by their own physicians.

Harms. Symptomatic patients might be more willing to accept short-term adverse events of treatment to obtain symptomatic improvement. The introduction of harm is less acceptable in an asymptomatic person. In prevention and screening, weighing potential harms and benefits is challenging. For instance, mammograms might reduce breast cancer-specific death in approximately 1 out of 721 women screened every 2 to 3 years over 11 years.⁵² During that period, 204 will have a false-positive result on mammography and 26 will have an unnecessary biopsy.⁵² Follow-up with women who have false-positive findings demonstrates increased levels of distress and anxiety that can persist up to 3 years after being told they are cancer free.⁵³ Similar discussions could be had about a number of other screening interventions, where false-positive

results or premature diagnoses shift a patient’s perception of health from well-being to illness.

Outcomes and quality of life. Relief of an acute attack of gout or headache cannot be compared with a reduction in cancer-specific death. This raises the question: Is the ratio of benefit in favour of treating acute conditions over cancer screening meaningful? The advantages of treating acute conditions are certainly not limited to benign conditions. Sorting out the more sinister headache or dizziness from vertigo can have a profound effect on patients. Early corticosteroid treatment can reduce neurologic impairment for 1 in 10 patients with Bell palsy⁵⁴ and can reduce emergency department visits or hospital admissions for 1 in 10 patients with a chronic obstructive pulmonary disease exacerbation.⁵⁵

What is the current state of primary care?

The development and incorporation of preventive and chronic disease interventions is gaining speed,⁵⁶ often driven by guidelines composed by specialty groups⁵⁷ (at times with high degrees of conflict of interest⁵⁸) with little to no representation from primary care.⁵⁹ The large number of disease-specific guidelines, with at times conflicting recommendations, can confuse patient care.⁶⁰ Not surprisingly, many initiatives are frequently reported as having poor buy-in from primary care providers.⁶¹ To combat this, various tools (like reminders within electronic medical records) have been used in an attempt to improve integration into primary care.⁶² Occasionally, these interventions are also used to create pay-for-performance measures in an attempt to incentivize their adoption.

At least 4 systematic reviews examining the effect of pay for performance on clinical outcomes have been published in the past 6 years.^{63–66} Most studies assessed surrogate clinical outcomes (eg, hemoglobin A_{1c} targets) or uptake rates (eg, mammography rates), while patient-oriented clinical outcomes were rarely assessed.^{63–65} The effect on clinical outcomes was generally inconsistent and minor,^{63–66} with improvement in the short term (about 1 year) and return to baseline shortly after.^{64,66} Included studies were generally of poor quality,^{63–65} and all authors recommend caution before adopting pay-for-performance strategies.^{63–66} Not surprisingly, additional findings included a decrease in performance of nonincentivized maneuvers,^{64,65} a decline in patient-centredness,^{64,67} and a lack of evidence for many measures.⁶⁸ Ironically, financially incentivizing clinicians has not been shown to be cost effective.^{66,69}

The next 25 years

In the context of competing demands and opportunities in primary care, it is essential that we carefully consider and balance priorities—being careful not to minimize


opportunities to treat patients presenting with symptomatic illness. Additional time dedicated to interventions for chronic illnesses, screening, and counseling for behavioural changes should be in order of those with the greatest rewards for our patients.

To prioritize interventions in the context of overall patient health, primary care might need to step back from the prescriptive, target-driven culture that negates diagnostic and clinical expertise and minimizes holistic patient care. One way to do this is to have primary care providers driving the development of guidelines. Currently, family physicians make up about 17% of contributors to primary care guidelines, whereas their specialist colleagues are more than 3 times as likely to contribute.⁵⁹

Guidelines should advocate for integrated patient care with evidence of improved patient-oriented outcomes. There must be a clear understanding of opportunity costs when multiple interventions are recommended with no clear prioritization. National primary care bodies would do well to avoid endorsement of specialty-driven guidelines that are created outside the context of primary care. Avoidance of pay-for-performance programs that do not focus on interventions with clear benefit on patient-oriented outcomes is also essential.

In the context of the patient-centred medical home, there is also room for innovative new ways to provide patient care, with the possibility of redrawing boundaries around what care the physician provides, and what is provided by other members of the team. Family physicians are uniquely skilled in and suited to resolving undifferentiated illness and providing balanced care for complex medical conditions. Health promotion and screening might be provided more consistently and at lower cost by other members of the primary care team. However, 2 issues need consideration. First, without solid evidence of improved patient-oriented outcomes, we should not consider another intervention in primary care. Second, finances are not infinite, so the costs of augmenting primary care must be worth the health and society benefits.

Conclusion

As clinicians struggle with finite time and resources to incorporate the onslaught of “good ideas,” we need to clearly define our priorities. Primary care providers should not abandon the opportunity to care for patients with symptomatic medical concerns, which might mean less time trying to make asymptomatic patients healthier. 

Dr Korownyk is Associate Professor in the Department of Family Medicine at the University of Alberta in Edmonton. **Dr McCormack** is Professor in the Faculty of Pharmaceutical Sciences at the University of British Columbia in Vancouver. **Drs Kolber** and **Garrison** are Associate Professors in the Department of Family Medicine at the University of Alberta. **Dr Allan** is Professor and Director of Evidence-Based Medicine in the Department of Family Medicine at the University of Alberta.

Competing interests
None declared

Correspondence

Dr Christina Korownyk; e-mail cpoag@ualberta.ca

The opinions expressed in commentaries are those of the authors. Publication does not imply endorsement by the College of Family Physicians of Canada.

References

- Jaén CR, Stange KC, Nutting PA. Competing demands of primary care: a model for the delivery of clinical preventive services. *J Fam Pract* 1994;38(2):166-71.
- Chang CH, Stukel TA, Flood AB, Goodman DC. Primary care physician workforce and Medicare beneficiaries' health outcomes. *JAMA* 2011;305(20):2096-104. Erratum in: *JAMA* 2011;306(2):162.
- Stewart M, Ryan B. Ecology of health care in Canada. *Can Fam Physician* 2015;61:449-53 (Eng), e249-54 (Fr).
- Goodwin N, Dixon A, Poole T, Raleigh V. *Improving the quality of care in general practice*. London, Engl: The King's Fund; 2011.
- Moore G, Showstack J. Primary care medicine in crisis: toward reconstruction and renewal. *Ann Intern Med* 2003;138(3):244-7.
- Rubio-Valera M, Pons-Vigués M, Martínez-Andrés M, Moreno-Peral P, Berenguera A, Fernández A. Barriers and facilitators for the implementation of primary prevention and health promotion activities in primary care: a synthesis through meta-ethnography. *PLoS One* 2014;9(2):e89554.
- Østbye T, Yarnall KS, Krause KM, Pollak KI, Gradison M, Michener JL. Is there time for management of patients with chronic diseases in primary care? *Ann Fam Med* 2005;3(3):209-14.
- Yarnall KS, Pollak KI, Østbye T, Krause KM, Michener JL. Primary care: is there enough time for prevention? *Am J Public Health* 2003;93(4):635-41.
- Tricoci P, Allen JM, Kramer JM, Califf RM, Smith SC Jr. Scientific evidence underlying the ACC/AHA clinical practice guidelines. *JAMA* 2009;301(8):831-41. Erratum in: *JAMA* 2009;301(15):1544.
- Upshur REG. Do clinical guidelines still make sense? No. *Ann Fam Med* 2014;12(3):202-3. Erratum in: *Ann Fam Med* 2014;12(4):301.
- Davey M. Doctors failing to identify and counsel overweight patients, study suggests. *The Guardian* 2015 Apr 13. Available from: www.theguardian.com/society/2015/apr/13/doctors-failing-to-identify-and-counsel-overweight-patients-study-suggests. Accessed 2016 Jun 21.
- Beasley D. Most U.S. doctors fail to discuss alcohol with patients: study. *Reuters* 2014 Jan 7. Available from: www.reuters.com/article/us-usa-health-alcohol-idUSBREA0612320140107. Accessed 2016 Jun 21.
- Ewing GB, Selassie AW, Lopez CH, McCutcheon EP. Self-report of delivery of clinical preventive services by U.S. physicians. Comparing specialty, gender, age, setting of practice, and area of practice. *Am J Prev Med* 1999;17(1):62-72.
- Hutchison B, Woodward CA, Norman GR, Abelson J, Brown JA. Provision of preventive care to unannounced standardized patients. *CMAJ* 1998;158(2):185-93.
- Korownyk C, Ross D. *From headache to happiness: new old options for treating acute migraine*. Edmonton, AB: Tools for Practice, Alberta College of Family Physicians; 2013. Available from: www.acfp.ca/wp-content/uploads/tools-for-practice/1397842343_20130909_085759.pdf. Accessed 2016 Jan 12.
- Arroll B, Elley CR, Fishman T, Goodyear-Smith FA, Kenealy T, Blashki G, et al. Antidepressants versus placebo for depression in primary care. *Cochrane Database Syst Rev* 2009;(3):CD007954.
- Brugts JJ, Yetgin T, Hoeks SE, Gotto AM, Shepherd J, Westendorp RG, et al. The benefits of statins in people without established cardiovascular disease but with cardiovascular risk factors: meta-analysis of randomised controlled trials. *BMJ* 2009;338:b2376.
- Davidson RA, Rosenberg E. Review: statins reduce mortality and cardiovascular events in adults at risk for cardiovascular disease. *Ann Intern Med* 2009;151(8):JC4-14.
- Cheung BM, Lauder IJ, Lau CP, Kumana CR. Meta-analysis of large randomized controlled trials to evaluate the impact of statins on cardiovascular outcomes. *Br J Clin Pharmacol* 2004;57(5):640-51.
- Colhoun HM, Betteridge DJ, Durrington PN, Hitman GA, Neil HA, Livingstone SJ, et al. Primary prevention of cardiovascular disease with atorvastatin in type 2 diabetes in the Collaborative Atorvastatin Diabetes Study (CARDS): multicentre randomised placebo-controlled trial. *Lancet* 2004;364(9435):685-96.
- Nelson HD, Tyne K, Naik A, Bougatsos C, Chan BK, Humphrey L, et al. Screening for breast cancer: an update for the U.S. Preventive Services Task Force. *Ann Intern Med* 2009;151(10):727-37, W237-42.
- Göttsche PC, Jørgensen KJ. Screening for breast cancer with mammography. *Cochrane Database Syst Rev* 2013;(6):CD001877.
- Salvalaggio G, Korownyk C. *Getting patients to drink less—are words mightier than drink?* Edmonton, AB: Tools for Practice, Alberta College of Family Physicians; 2015. Available from: www.acfp.ca/wp-content/uploads/tools-for-practice/1426518561_tfpalcoholscreeningandinterventionsfv2.pdf. Accessed 2016 Jan 12.
- Jamieson J, Allan GM. *Corticosteroid shots and knees: a match made in osteoarthritis heaven?* Edmonton, AB: Tools for Practice, Alberta College of Family Physicians; 2015. Available from: www.acfp.ca/wp-content/uploads/tools-for-practice/1427727062_tfp135steroidsforkneeoa.pdf. Accessed 2016 Jan 12.

25. Allan GM, Basset KL. *Gabapentin and chronic pain: missing evidence and real effect?* Edmonton, AB: Tools for Practice, Alberta College of Family Physicians; 2013. Available from: www.acfp.ca/wp-content/uploads/tools-for-practice/1397763768_20131212_022112.pdf. Accessed 2016 Jan 12.
26. Turgeon RD, Allan GM. *Duloxetine (Cymbalta®): jack of all trades, master of none?* Edmonton, AB: Tools for Practice, Alberta College of Family Physicians; 2013. Available from: www.acfp.ca/wp-content/uploads/tools-for-practice/1397843170_20131216_091008.pdf. Accessed 2016 Jan 12.
27. UK Prospective Diabetes Study (UKPDS) Group. Effect of intensive blood-glucose control with metformin on complications in overweight patients with type 2 diabetes (UKPDS 34). *Lancet* 1998;352(9131):854-65. Erratum in: *Lancet* 1998;352(9139):1558.
28. Hewitson P, Glasziou P, Irwig L, Towler B, Watson E. Screening for colorectal cancer using the faecal occult blood test, Hemoccult. *Cochrane Database Syst Rev* 2007;(1):CD001216.
29. Hudon C, Fortin M, Soubhi H. Single risk factor interventions to promote physical activity among patients with chronic diseases. Systematic review. *Can Fam Physician* 2008;54:1130-7.
30. Boysen G, Krarup LH, Zeng X, Oskedra A, Körv J, Andersen G, et al. ExStroke Pilot Trial of the effect of repeated instructions to improve physical activity after ischaemic stroke: a multinational randomised controlled clinical trial. *BMJ* 2009;339:b2810.
31. Pavay TG, Anokye N, Taylor AH, Trueman P, Moxham T, Fox KR, et al. The clinical effectiveness and cost-effectiveness of exercise referral schemes: a systematic review and economic evaluation. *Health Technol Assess* 2011;15(44):i-xii, 1-254.
32. Kolber MR, Korownyk C. *Is colchicine an effective alternative to NSAIDs for the treatment of acute gout?* Edmonton, AB: Tools for Practice, Alberta College of Family Physicians; 2014. Available from: www.acfp.ca/wp-content/uploads/tools-for-practice/1427230627_57updated-colchicinetfp.pdf. Accessed 2016 Jan 12.
33. Allan GM, Levy M. *Antidepressants for preventing headaches: which work and how well?* Edmonton, AB: Tools for Practice, Alberta College of Family Physicians; 2015. Available from: www.acfp.ca/wp-content/uploads/tools-for-practice/1433184684_updatedfp51antidepressantshadaches.pdf. Accessed 2016 Jan 12.
34. Kapusta MJ, Allan GM. *Are antihypertensive medications effective for migraine prophylaxis?* Edmonton, AB: Tools for Practice, Alberta College of Family Physicians; 2015. Available from: www.acfp.ca/wp-content/uploads/tools-for-practice/1433184708_updatedfp52antihypertensivemigraine prophylaxis.pdf. Accessed 2016 Jan 12.
35. Berger JS, Roncaglioni MC, Avanzini F, Pangrazzi I, Tognoni G, Brown DL. Aspirin for the primary prevention of cardiovascular events in women and men: a sex-specific meta-analysis of randomized controlled trials. *JAMA* 2006;295(3):306-13. Erratum in: *JAMA* 2006;295(17):2002.
36. Schröder FH, Hugosson J, Roobol MJ, Tammela TL, Ciatto S, Nelen V, et al. Screening and prostate-cancer mortality in a randomized European study. *N Engl J Med* 2009;360(13):1320-8. Epub 2009 Mar 18.
37. Roobol MJ, Kranse R, Bangma CH, van Leenders AG, Blijenberg BG, van Schaik RH, et al. Screening for prostate cancer: results of the Rotterdam section of the European Randomized Study of Screening for Prostate Cancer. *Eur Urol* 2013;64(4):530-9. Epub 2013 May 25.
38. Hugosson J, Carlsson S, Aus G, Bergdahl S, Khatami A, Lodding P, et al. Mortality results from the Göteborg randomised population-based prostate-cancer screening trial. *Lancet Oncol* 2010;11(8):725-32. Epub 2010 Jul 2.
39. O'Doherty LJ, Taft A, Hegarty K, Ramsay J, Davidson LL, Feder G. Screening women for intimate partner violence in healthcare settings: abridged Cochrane systematic review and meta-analysis. *BMJ* 2014;348:g2913. Epub 2014 May 12.
40. Braschi E, Ross D, Korownyk C. Evaluating the Epley maneuver. *Can Fam Physician* 2015;61:878.
41. Allan GM, Levy M, Kolber MR. *Polyethylene glycol (PEG) for paediatric and adult chronic constipation.* Edmonton, AB: Tools for Practice, Alberta College of Family Physicians; 2015. Available from: www.acfp.ca/wp-content/uploads/tools-for-practice/1429563797_updatedfp45pegandchronicconstipationfp.pdf. Accessed 2016 Jan 12.
42. SHEP Cooperative Research Group. Prevention of stroke by antihypertensive drug treatment in older patients with isolated systolic hypertension. Final results of the Systolic Hypertension in the Elderly Program (SHEP). *JAMA* 1991;265(24):3255-64.
43. Staessen JA, Thijs L, Fagard R, O'Brien EG, Clement D, de Leeuw PW, et al. Predicting cardiovascular risk using conventional vs ambulatory blood pressure in older patients with systolic hypertension. *JAMA* 1999;282(6):539-46.
44. Canadian Task Force on Preventive Health Care; Dickinson J, Tsakonas E, Conner Gorber S, Lewin G, Shaw E, et al. Recommendations on screening for cervical cancer. *CMAJ* 2013;185(1):35-45. Epub 2013 Jan 7.
45. Peirson L, Fitzpatrick-Lewis D, Ciliska D, Warren R. Screening for cervical cancer: a systematic review and meta-analysis. *Syst Rev* 2013;2:35.
46. Leblanc ES, O'Connor E, Whitlock EP, Patnode CD, Kapka T. Effectiveness of primary care-relevant treatments for obesity in adults: a systematic evidence review for the U.S. Preventive Services Task Force. *Ann Intern Med* 2011;155(7):434-47.
47. Wadden TA, Butryn ML, Hong PS, Tsai AG. Behavioral treatment of obesity in patients encountered in primary care settings: a systematic review. *JAMA* 2014;312(17):1779-91.
48. Canadian Institute for Health Information. *Sources of potentially avoidable emergency department visits.* Ottawa, ON: Canadian Institute for Health Information; 2014. Available from: https://secure.cihi.ca/free_products/ED_Report_ForWeb_EN_Final.pdf. Accessed 2016 Jan 25.
49. IMS Brogan. *Top 10 reasons for physician visits in Canada, 2014.* IMS Brogan; 2015. Available from: www.imshealth.com/files/imshealth/Global/North%20America/Canada/Home%20Page%20Content/Pharma%20Trends/Top10Reasons_EN_14.pdf. Accessed 2016 Jan 25.
50. Si S, Moss JR, Sullivan TR, Newton SS, Stocks NP. Effectiveness of general practice-based health checks: a systematic review and meta-analysis. *Br J Gen Pract* 2014;64(618):e47-53.
51. Kroghsbøll LT, Jørgensen KJ, Grønhoj Larsen C, Gøtzsche PC. General health checks in adults for reducing morbidity and mortality from disease. *Cochrane Database Syst Rev* 2012;(10):CD009009.
52. Canadian Task Force on Preventive Health Care. Recommendations on screening for breast cancer in average-risk women aged 40-74 years. *CMAJ* 2011;183(17):1991-2001. Erratum in: *CMAJ* 2011;183(18):2147.
53. Brodersen J, Siersma VD. Long-term psychosocial consequences of false-positive screening mammography. *Ann Fam Med* 2013;11(2):106-15.
54. Allan GM, Kolber M. *Bell's palsy: what to do and what not to do?* Edmonton, AB: Tools for Practice, Alberta College of Family Physicians; 2016. Available from: www.acfp.ca/wp-content/uploads/tools-for-practice/1478717038_2016updatedfp4treatmentofbells palsy.pdf. Accessed 2017 Jul 18.
55. Walters JA, Tan DJ, White CJ, Gibson PG, Wood-Baker R, Walters EH. Systemic corticosteroids for acute exacerbations of chronic obstructive pulmonary disease. *Cochrane Database Syst Rev* 2014;(9):CD001288.
56. Randell E, Pickles T, Simpson SA, Spanou C, McCambridge J, Hood K, et al. Eligibility for interventions, co-occurrence and risk factors for unhealthy behaviours in patients consulting for routine primary care: results from the Pre-Empt study. *BMC Fam Pract* 2015;16:133.
57. Norris SL, Burda BU, Holmer HK, Ogden LA, Fu R, Bero L, et al. Author's specialty and conflicts of interest contribute to conflicting guidelines for screening mammography. *J Clin Epidemiol* 2012;65(7):725-33. Epub 2012 Apr 11.
58. Wang AT, McCoy CP, Murad MH, Montori VM. Association between industry affiliation and position on cardiovascular risk with rosiglitazone: cross sectional systematic review. *BMJ* 2010;340:c1344.
59. Allan GM, Kraut R, Crawshaw A, Korownyk C, Vandermeer B, Kolber MR. Contributors to primary care guidelines. What are their professions and how many of them have conflicts of interest? *Can Fam Physician* 2015;61:52-8 (Eng), e50-7 (Fr).
60. Mavriplis C, Thériault G. The periodic health examination. A comparison of United States and Canadian recommendations [article in French]. *Can Fam Physician* 2006;52:58-63. Erratum in: *Can Fam Physician* 2006;52:304.
61. Thomas K, Krevers B, Bendtsen P. Long-term impact of a real-world coordinated lifestyle promotion initiative in primary care: a quasi-experimental cross-sectional study. *BMC Fam Pract* 2014;15:201.
62. Greiver M, Barnsley J, Glazier RH, Moineddin R, Harvey BJ. Implementation of electronic medical records. Effect on the provision of preventive services in a pay-for-performance environment. *Can Fam Physician* 2011;57:e381-9. Available from: www.cfp.ca/content/cfp/57/10/e381.full.pdf. Accessed 2017 Jul 21.
63. Scott A, Sivey P, Ait Ouakrim D, Willenberg L, Naccarella L, Furler J, et al. The effect of financial incentives on the quality of health care provided by primary care physicians. *Cochrane Database Syst Rev* 2011;(9):CD008451.
64. Gillam SJ, Sriwardena AN, Steel N. Pay-for-performance in the United Kingdom: impact of the quality and outcomes framework: a systematic review. *Ann Fam Med* 2012;10(5):461-8.
65. Houle SK, McAlister FA, Jackevicius CA, Chuck AW, Tsuyuki RT. Does performance-based remuneration for individual health care practitioners affect patient care?: a systematic review. *Ann Intern Med* 2012;157(12):889-99.
66. Langdown C, Peckham S. The use of financial incentives to help improve health outcomes: is the quality and outcomes framework fit for purpose? A systematic review. *J Public Health (Oxf)* 2014;36(2):251-8. Epub 2013 Aug 8.
67. McDonald R, Roland M. Pay for performance in primary care in England and California: comparison of unintended consequences. *Ann Fam Med* 2009;7(2):121-7.
68. Esposito ML, Selker HP, Salem DN. Quantity over quality: how the rise in quality measures is not producing quality results. *J Gen Intern Med* 2015;30(8):1204-7. Epub 2015 Mar 24.
69. De Bruin SR, Baan CA, Struijs JN. Pay-for-performance in disease management: a systematic review of the literature. *BMC Health Serv Res* 2011;11:272.