

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

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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 ≥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 ≥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 × 20) × 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 × 30) × 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 × 0.50 = 1000, with an NNT of 7 (1000/7 = 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 × 30) × 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

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