

Open Medicine

A peer-reviewed, independent, open-access journal.

Open Medicine, Vol 7, No 4 (2013)

[Home](#) > [Vol 7, No 4 \(2013\)](#) > [Palmer](#)

REVIEW

Prelude to a systematic review of activity-based funding of hospitals: potential effects on cost, quality, access, efficiency, and equity

KAREN S. PALMER, DANIELLE MARTIN, GORDON GUYATT

ABSTRACT

Until recently, hospital funding in Canada has been based predominantly on global budgets, but health care system decision-makers throughout the country are now seriously considering an alternative funding model referred to as activity-based funding (ABF). Under this system, hospital services are classified prospectively into clinically meaningful “bundles” of care that use similar levels of resources. Opinion is divided as to whether ABF would help the Canadian health care system to achieve any of the putative benefits originally achieved by ABF in other countries, or whether the risks would outweigh the benefits. As yet, there has been no systematic review of the evidence. In March 2012 our research team launched a systematic review to inform Canadian policy-makers about how this funding model affects health care systems around the world. Of the more than 16 000 potentially eligible titles and abstracts screened, 261 studies, representing 64 countries (either singly or in aggregate), provide data on at least one of the cost, quality, access, efficiency, and equity outcomes of interest to our research team. We are now in the process of analyzing data from the eligible studies most germane to the Canadian context. This commentary is intended to alert decision-makers to the upcoming release of a series of papers based on our systematic review of ABF, in the hope that our synthesis will soon provide a more robust evidence base to better inform decision-makers.

Karen S. Palmer is an Adjunct Professor in the Faculty of Health Sciences and the Faculty of Science, Simon Fraser University, Burnaby, British Columbia. **Danielle Martin** is Vice-President of Medical Affairs and Health System Solutions at Women’s College Hospital and an Assistant Professor in the Department of Family and Community Medicine and the Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto, Ontario. **Gordon Guyatt** is a Professor in the Department of Clinical Epidemiology & Biostatistics, McMaster University, Hamilton, Ontario.

Competing interests: None declared.

Contributors: Karen Palmer wrote the first draft. Karen Palmer, Danielle Martin, and Gordon Guyatt contributed to the article, revised it critically for important intellectual content, and gave final approval of the version submitted for publication. Karen Palmer and Gordon Guyatt will act as guarantors for the manuscript.

Acknowledgments: We acknowledge the contribution to our research of all other team members: Arnav Agarwal (abstraction), Thomas Agoritsas (screening, abstraction, methodology), Neera Bhatnagar (literature search), Andrew Bresnahan (abstraction), Irfan Dhalla (initial study co-conception and co-design), Stephen Duckett (methodology), Bob Evans (economics), Afeez Hazzan (abstraction), Rebecca Jeffery (abstraction), John Lavis (knowledge transfer and exchange), Arnaud Merglen (abstraction), Ashley Miller (screening, abstraction), Sohail Mulla (screening, abstraction), Ahmed Negm (abstraction), Taryn Scott (research coordination, screening, abstraction), Reed Siemieniuk (abstraction), John You (methodology).

Funding: This project is being funded by a Knowledge Synthesis Grant (priority area: evidence-informed health care renewal) from the Canadian Institutes of Health Research.

Correspondence: kpalmer@sfu.ca

The Canadian approach to funding hospitals may be on the verge of a monumental change. Until recently, hospital funding has been based predominantly on global budgets, but health care system decision-makers throughout the country are now seriously considering—and some are already adopting—an alternative funding model referred to as activity-based funding (ABF).

In contrast with global budgeting, ABF pays hospitals per episode of care for each patient served. In simple terms, the money follows the patient. Under this system, hospital services are classified prospectively into clinically meaningful “bundles” of care that use similar levels of resources. These bundles take into account patient characteristics such as diagnosis and complexity, along with anticipated volume and intensity of care. Different jurisdictions use various terms to describe these bundles of services; for example, they might be called “diagnosis-related groups” in the United States and “health-resource groups” or “case-mix groups” in Canada.¹ Various costing methods are used to set a “price” for the bundle of services provided to each patient during a hospital stay.

The historical roots of ABF lie in the US health care system. In the late 1970s, rising health care costs in the United States coupled with economic stagnation forced policy-makers to investigate financing reforms for Medicare (the publicly funded program for patients aged 65 and older). Starting in 1983, the government implemented a prospective system of hospital payment based on DRGs; rather than simply paying hospitals whatever they charged to treat Medicare patients, the new model paid hospitals a predetermined, set rate based on the patient’s diagnosis.² Since then, other countries have adopted, and adapted, this approach as the basis for all or part of their hospital funding systems.

In Canada, where reductions in government revenues are spurring a desire to “bend the cost curve” in health care, ministries of health are “focusing more on efficiency, value for money, and accountability”³ while they simultaneously look for ways to increase access to hospital care and maintain quality of care.⁴ ABF has captured the imagination of some policy-makers and advocates as one potential component of hospital reform.

Opinion is divided within the Canadian health care policy community as to whether ABF would help us achieve any of

the putative benefits originally achieved in the United States and in other nations that subsequently adopted variations on the ABF theme, or whether the risks would outweigh the benefits.

What are those alleged benefits? Enthusiasts point to evidence that ABF can reduce costs per episode of care or improve efficiency,^{4,5} reduce length of stay,⁶ and reduce wait times;⁷ they also claim that a culture change, by which patients are seen not as cost centres but as revenue generators,⁴ is needed in Canadian health care. To elaborate, by fostering competition for patients between hospitals, ABF theoretically provides hospitals with financial incentives to increase efficiency. Under ABF, hospitals retain any surplus in funding above their expenditures per case, but must absorb any losses if expenditures exceed reimbursement. The other potential benefits arising from these financial incentives include stimulating productivity⁸ (i.e., increasing patient throughput, leading to improved access and reduced wait times), increasing transparency⁹ and accountability in hospital spending, and moderating cost growth.¹⁰

But what about the potential adverse consequences of introducing ABF? The detractors of this funding method point to evidence that it leads to the rapid discharge of sick patients into community settings that may be unprepared to care for them,¹¹ provides an incentive to “up-code” and thus “game” the system,¹² creates a perverse focus on “profitable” over “unprofitable” patients and procedures, with negative implications for equitable access to care,¹³ and increases overall costs to the health care system^{14,15} in the absence of global caps on spending.⁴

Under ABF, the incentive to spend less, on average, per patient could encourage the premature discharge of sick patients from hospital, which might increase rates of preventable readmissions¹⁶ and of postdischarge mortality. Spending less per patient might also compromise the quality of care patients receive in hospital or lead hospitals to eliminate unprofitable services (such as trauma units^{17,18}) or, conversely, in order to “make a profit,” to unnecessarily admit and potentially overtreat patients who could otherwise be cared for as outpatients.^{4,19} There is also a concern that a “cherry-picking” or “cream-skimming” effect could reduce equitable access to care if hospitals cater preferentially to profitable patients.²⁰ Similarly, since more treatment-intensive case-mix groups warrant a higher reimbursement rate, there is an incentive to selectively code patients as being sicker than they really are.^{21,22} Any efficiencies gained through ABF may be undermined by the increased administrative spending required to cope with coding and monitoring demands, as well as by the transaction costs of implementing ABF. Another worry is that by breaking care into “saleable units”²³ ABF will facilitate the introduction of private, profit-driven delivery of care.

Both ABF enthusiasts and detractors can point to evidence to support their claims, and each line of reasoning follows a logical narrative that can be persuasive to policy-makers. However, in making their case, each group selects the international experiences that are consistent with their narrative, rather than attempting to understand the evidence as a whole.

British Columbia and Ontario are leading the Canadian movement toward ABF as an alternative to, or in combination with, global budgets. Results from a British Columbia study published early in 2013 indicated that one anticipated benefit, increasing patient through-put, had not been achieved: the researchers found “no intervention effect of the ABF reform on the changes in surgical volumes over time in all five health authorities.”²⁴ Such findings raise questions about whether the supposed benefits of ABF play out when this model is implemented in the real world.

The international literature on ABF consists of research studies and non-systematic reviews^{8,9,25,26,27,28} without, so far, a single systematic review. Health care researchers are convinced that “systematic reviews of research evidence constitute a more appropriate source of research evidence for decision-making than the latest or most heavily publicized research study.”²⁹ Policy- and decision-makers should rely on robust evidence to make well-informed decisions about how best to finance and deliver health care. “Evidence-informed” policy-making is characterized by the “systematic and transparent access to, and appraisal of, evidence as an input into the policy-making process.”³⁰

Yet, in the absence of a thorough and systematic approach to understanding the impact of ABF on cost, quality, access, efficiency, and equity across multiple health care systems and at different times, Canadian policy-makers continue to make decisions based upon only selected evidence. The limited reviews available may well reflect biased selections of the available evidence.

Having established the pressing need to review all the evidence available about ABF, in March 2012 our research team launched a systematic review to inform Canadian policy-makers about how this funding model affects health care systems around the world. Our systematic search of Canadian and international evidence has demonstrated that there is no shortage of published literature addressing ABF. Of the more than 16 000 potentially eligible titles and abstracts we have screened, 261 studies, representing 64 countries (either singly or in aggregate), provide data on at least one of the cost, quality, access, efficiency, and equity outcomes of interest to our research team. We are now in the process of analyzing data from the eligible studies most germane to the Canadian context.

This commentary is intended to alert decision-makers to the upcoming release of a series of papers based on our systematic review of ABF, in the hope that there will be an appetite for this knowledge at a time when they are being asked to make decisions in its absence.

It would be a shame if Canadian governments moved to ABF only to find later that, for instance, they obtain none of the putative benefits but instead observe premature hospital discharges to an unprepared post-hospital care system and subsequent adverse health consequences to patients. It will be particularly regrettable if, armed with a systematic review of the evidence, they could have foreseen such an unfortunate outcome of their policy experiment. It would be similarly unfortunate for governments to abandon ABF only to learn that the benefits do in fact outweigh the harms. We simply don't know yet which way the evidence will lean.

Our systematic review will soon provide a more robust evidence base to better inform decision-makers. Until then, it would be imprudent to rush to judgment about the effects ABF may, or may not, have on Canada's health care system. We look forward to releasing our results in the near future and encourage governments to consider the implications of our review in their decisions about hospital funding reforms.

References

1. Canadian Doctors for Medicare. *Activity-based funding in Canadian hospitals and other surgical facilities*. Toronto: Canadian Doctors for Medicare; 2008. Available from: <http://www.canadiandoctorsformedicare.ca/Issues/abf-bulletins.html> (accessed 2012 Jul 11).
2. Mayes R. The origins, development, and passage of Medicare's revolutionary prospective payment system. *J Hist Med Allied Sci* 2007;62(1):21–55.
3. Canadian Institute for Health Information. *Health care in Canada 2009: a decade in review*. Ottawa (ON): The Institute; 2009. Available from: https://secure.cihi.ca/free_products/HCIC_2009_Web_e.pdf (accessed 2013 Jul 11).
4. Canadian Institute for Health Information, Activity-Based Funding Unit. *A primer on activity-based funding*. Ottawa (ON): The Institute; 2010. Available from: http://www.cihi.ca/CIHI-ext-portal/pdf/internet/primer_activity_based_fund_en (accessed 2013 Jul 11).
5. Biørn E, Hagen T, Iversen T, Magnussen J. How different are hospitals' responses to a financial reform? The impact on efficiency of activity-based financing. *Health Care Manag Sci* 2010;13(1):1–16.
6. Yin J, Lurås H, Hagen TP, Dahl FA. The effect of activity-based financing on hospital length of stay for elderly patients suffering from heart diseases in Norway. *BMC Health Serv Res* 2013;13:172.
7. Labrie Y. *Activity-based hospital funding: we've waited long enough*. Montreal (QC): Montreal Economic Institute; 2012. Available from: http://www.iedm.org/files/note0612_en.pdf (accessed 2013 Sep 16).
8. Street A, Vitikainen K, Bjorvatn A, Hvenegaard A. *Introducing activity-based financing: a review of experience*

- in Australia, Denmark, Norway and Sweden*. Research Paper 30. York (UK): Centre for Health Economics; 2007. Available from: http://www.york.ac.uk/media/che/documents/papers/researchpapers/rp30_introducing_activity-based_financing.pdf (accessed 2013 Sep 15).
9. Busse R, Geissler A, Quentin W, Wiley M, editors. *Diagnosis-related groups in Europe: moving towards transparency, efficiency and quality in hospitals*. Berkshire (UK): World Health Organization on behalf of European Observatory on Health Systems and Policies, Open University Press, McGraw-Hill; 2011.
 10. Canadian Institute for Health Information. Overview of activity-based funding. Ottawa (ON): The Institute. Available from: <http://www.cihi.ca/CIHI-ext-portal/internet/EN/tabbedcontent/health+system+performance/health+fundingactivity+based+funding/cihi008054> (accessed 2013 Jul 11).
 11. Busato A, von Below G. The implementation of DRG-based hospital reimbursement in Switzerland: a population-based perspective. *Health Res Policy Syst* 2010;8:31.
 12. Ross J. *Canadians should beware of Americans bearing "activity-based funding."* Toronto (ON): Canadian Healthcare Network; 2013. Available from: <http://www.canadianhealthcarenetwork.ca/healthcaremanagers/discussions/opinion/beware-of-americans-bearing-activity-based-funding-19897> (accessed 2013 Sep 15).
 13. Newhouse J. Do unprofitable patients face access problems? *Health Care Financ Rev* 1989;11(2):33–42.
 14. Sutherland JM, Repin N, Crump TR. *Reviewing the potential roles of financial incentives for funding healthcare in Canada*. Ottawa (ON): Canadian Foundation for Healthcare Improvement; 2012. Available from: <http://www.cfhi-fcass.ca/publicationsandresources/researchreports/ArticleView/12-12-21/bec64e56-ce47-43c9-b05c-98186051731d.aspx> (accessed 2013 Sep 16).
 15. Moreno-Serra R, Wagstaff A. *System-wide impacts of hospital payment reforms: evidence from Central and Eastern Europe and Central Asia*. Policy Research Working Paper 4987. Washington (DC): The World Bank; 2009.
 16. Cutler DM. The incidence of adverse medical outcomes under prospective payment. *Econometrica* 1995;63(1):29–50.
 17. Schwab CW, Young G, Civil I, Ross SE, Talucci R, Rosenberg L, et al. DRG reimbursement for trauma: the demise of the trauma center (the use of ISS grouping as an early predictor of total hospital cost). *J Trauma* 1988;28(7):939–946.
 18. Curtis K, Mitchell R, Dickson C, Black D, Lam M. Do AR-DRGs adequately describe the trauma patient episode in New South Wales, Australia? *HIM J* 2011;40(1):7–13.
 19. Aaron HJ. Prospective payment: The next big policy disappointment? *Health Aff* 1984;3(3):102–107.
 20. Berta P, Callea G, Martini G, Vittadini G. The effects of upcoding, cream skimming and readmissions on the Italian hospitals efficiency: A population-based investigation. *Econ Model* 2010;27(4): 812–821.
 21. Ablor S, Verde P, Stannigel H, Mayatepek E, Hoehn T. Effect of the introduction of diagnosis related group systems on the distribution of admission weights in very low birthweight infants. *Arch Dis Child Fetal Neonatal Ed* 2011;96(3):F186–F189.
 22. Dafny LS. *How do hospitals respond to price changes?* NBER Working Paper Series no. 9972. Cambridge (MA): National Bureau of Economic Research; 2003. Available from: http://www.nber.org/papers/w9972.pdf?new_window=1 (accessed 2013 Sep 16).
 23. Woolhandler S, Himmelstein DU. Competition in a publicly funded healthcare system. *BMJ* 2007;335(7630):1126–1129.
 24. Sutherland J, Guiping L, Repin N, Crump T. Activity based funding in British Columbia: Changes in activity? [Abstract G3.4] Canadian Association for Health Services and Policy Research Conference, 2013 May 28–30. Available from: http://www.cahspr.ca/web/uploads/conference/2013-05-28_Book_of_Abstracts_2013.pdf (accessed 2013 Jul 2).
 25. Cohen M, McGregor M, Ivanova I, Kinkaid C. *Beyond the hospital walls: Activity-based funding versus integrated health care reform*. Vancouver (BC): Canadian Centre for Policy Alternatives; 2012. Available from:

http://www.policyalternatives.ca/sites/default/files/uploads/publications/BC%20Office/2012/01/CCPA-BC_ABF_2012.pdf (accessed 2013 Jul 2).

26. Canadian Institute for Health Information. *Evaluating the impact of activity-based funding on health system performance*. Ottawa (ON): The Institute; 2013. Available from: http://www.cihi.ca/CIHI-external/pdf/internet/EVALUATING_IMPACT_ABF_EN (accessed 2013 Jul 11).
27. Sutherland JM. *Hospital payment mechanisms: An overview and options for Canada*. Series on Cost Drivers and Health System Efficiency: Paper 4. Ottawa (ON): Canadian Health Services Research Foundation; 2011.
28. O'Reilly J, Busse R, Häkkinen U, Or Z, Street A, Wiley M. Paying for hospital care: The experience with implementing activity-based funding in European countries. *Health Econ Policy Law* 2012;7(1):73–101.
29. Lavis J, Davies H, Oxman A, Denis JL, Golden-Biddle K, Ferlie E. Towards systematic reviews that inform healthcare management and policy-making. *J Health Serv Res Policy* 2005;Suppl 1:35–48.
30. Oxman AD, Lavis JN, Lewin S, Fretheim A. Support tools for evidence-informed health policymaking (STP) I: What is evidence-informed policymaking? *Health Res Policy Syst* 2009;Suppl 1:S1. Available from: <http://www.health-policy-systems.com/content/pdf/1478-4505-7-S1-s1.pdf> (accessed 2013 Jul 2).



This work is licensed under a [Creative Commons Attribution Share-alike 2.5 License](https://creativecommons.org/licenses/by-sa/2.5/).

ISSN 1911-2092