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# HOSPITAL PAYMENT MECHANISMS: AN OVERVIEW AND OPTIONS FOR CANADA

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HEALTH SYSTEM EFFICIENCY: PAPER 4

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# TABLE OF CONTENTS

KEY MESSAGES .....	2
1 INTRODUCTION .....	3
2 REVIEW OF HOSPITAL FUNDING MECHANISMS .....	3
2.1 Global budgets .....	4
2.2 Activity-based funding .....	4
2.3 Fee-for-service based funding .....	8
2.4 Line-by-line based funding .....	8
3 HOW IS HOSPITAL CARE AFFECTED BY SPENDING LEVERS? .....	9
3.1 Activity-based funding .....	9
3.2 Pay-for-performance .....	10
4 HOW DO HOSPITAL FUNDING POLICIES AFFECT QUALITY, VOLUME AND ACCESS TO CARE? .....	11
4.1 Quality .....	11
4.2 Volume .....	12
4.3 Access .....	12
5 ALIGNING FUNDING POLICIES TO IMPROVE EFFICIENCY, QUALITY AND APPROPRIATENESS .....	13
5.1 Population-based funding models .....	13
5.2 Activity-based funding .....	13
5.3 Combining properties of ABF and global budgets .....	14
5.4 Re-defining DRGs, 'Bundled Episodes' .....	14
5.5 Accountable care organizations .....	15
6 RECOMMENDATIONS FOR HOSPITAL FUNDING POLICIES .....	15
6.1 Use ABF as part of the funding 'toolkit' to increase activity and decrease waiting lists .....	16
6.2 Prepare for change in hospitals .....	16
6.3 Prepare for change in other sectors .....	17
6.4 Adapt CMG+ or create a case mix classification system for ABF .....	17
7 BIBLIOGRAPHY .....	18

## Key messages

- ✦ Canada's publicly funded healthcare system is facing increasing cost control pressures. Hospitals alone represent a substantial burden on provincial health budgets, accounting for 28% of total costs.
- ✦ Presently, in the Canadian system, the primary source of funding for hospitals is through a global budget. Under this model, a fixed (global) amount of funding is distributed to each hospital to pay for all hospital-based services for a fixed period of time (commonly one year). Global budgets:
  - ✦ Are based on historical spending, inflation, negotiations and politics in many provinces, rather than on the type and volume of services provided.
  - ✦ Constrain hospital spending growth and create budgetary predictability; however, its consequences may be decreased services and increases in waiting times.
  - ✦ Do not provide incentives to improve access, quality or efficiency of hospital care.
- ✦ Funding hospitals on the basis of the type and volume of services they provide has become the international norm. Known as activity-based funding (ABF), these systems have been systematically supplementing global budgets in public and private insurance-based health systems around the world. ABF:
  - ✦ Provides powerful financial incentives to stimulate productivity and efficiency: efficient hospitals retain the difference between the payment amount and the hospital's actual cost of production.
  - ✦ Is associated with higher volumes of hospital care, shorter lengths of stay, and yet has not been linked to poorer quality of care.
  - ✦ Is linked to higher overall spending, due to higher volumes of patients being treated, and evidence of lower cost per admission is mixed.
- ✦ Combining properties of ABF and global budgets may optimize the strengths of both global budgets and ABF. Many countries that have ABF to fund their hospital systems utilize a blend of global budgets to control spending, while instituting an ABF mechanism to create incentives for hospitals to provide timely and equitable access, appropriate volume of care, and efficient care.
- ✦ In the Canadian context, recommendations are:
  - ✦ Adopt population-based funding at the regional level to reduce historical funding inequities by recognizing differences in need across populations, regions and over time.
  - ✦ Blend ABF and global budgets to create incentives for hospitals to improve hospital efficiency and access.

## 1 INTRODUCTION

Maintaining high quality, publicly accessible and cost-effective hospital care is one of the most important issues facing Canada's healthcare system. Hospitals account for more than 28% of total healthcare expenditures and, while this share has fallen considerably over the past few decades, hospitals continue to represent the largest single component of healthcare expenditures (approximately \$45 billion).<sup>1</sup> Hospitals provide a mix of services – the largest elements being nursing, diagnostic and therapeutic services.<sup>2, 3</sup> Given the materiality of these expenditures, hospital costs place a substantial burden on provincial budgets.<sup>4</sup>

Meeting public and patient expectations in the hospital sector is increasingly challenging since costs continue to rise faster than inflation.<sup>5</sup> To respond to these challenges, provinces are re-examining the method by which Canadian hospitals are funded. Under the current system, the primary source of revenue for hospitals is a global budget, which provides an annual lump sum transfer to an individual hospital for treatment of its patients based on historical spending. For hospital funders and hospitals alike, global budgets have been criticized for perpetuating inequities between hospitals, lacking transparency and stifling incentives to improve the quality or efficiency of care delivery.

Despite regionalization of care, changes in demographics and adoption of new medical technologies, the methods used to fund hospitals have remained largely unchanged in Canada for several decades. Evidence suggests that there is wide variation among Canadian hospitals in utilization, cost and quality, and external criticisms cite the lack of competitive forces as a possible cause of inefficiencies.<sup>2, 4</sup>

Hospital funders are examining the range of funding policies that might encourage hospital or regional health authority managers to implement changes that could shorten wait times, contain cost growth, maintain or improve quality and safety, provide equity in access and coordinate care across sectors. To inform discussions of policy options, there is a need for objective evidence regarding the impact, both intended and unintended, of possible hospital funding alternatives. Through a review of international experiences with hospital funding, this paper aims to present a synthesis of evidence governing hospital funding. It discusses the relevance of other countries' experiences to Canada's federalist system, and it identifies key issues facing publicly funded hospitals from the funder's perspective and policy options for decision-makers and Canadians.

## 2 REVIEW OF HOSPITAL FUNDING MECHANISMS

In general, hospital funding policy consists of rules or methods that are used to distribute public funds to hospitals to address where, when and what type of care should be provided. The approaches to funding hospitals in Canada include global budgeting, population-based, departmental-based (line-by-line) and case-mix-based methods.<sup>6</sup> In this paper, each of these approaches is described, including exploration of positive and negative aspects in a Canadian context and evaluation from the perspective of a hospital funder. Since hospitals currently fall under the jurisdiction of regional health authorities in most provinces, the hospital funder is the region; however, the hospital funder can also be a province or territory.

## 2.1 Global budgets

The predominant method for funding hospitals in Canada continues to be global budgeting. Funding by global budget means that a fixed (global) amount of funding is distributed to hospitals. In return, the hospital is expected to provide all hospital-based services for a fixed period of time (commonly a year). The amount of the global budget has, historically, been based on a combination of factors, including historical budgets, rates of inflation, capital investment decisions, negotiation and politics. The type or complexity of services provided in the hospital has not generally been a factor taken into account in determining the global budget.

The major advantage of global budgeting for funders is that it provides a straightforward way of creating budgetary predictability, and a simple means of limiting growth in hospital expenditures through the supply side lever of capped budgets.<sup>7</sup> Global budgets have been an effective cost control instrument, although the response of hospitals has been to restrict admissions in order to stay within budget, resulting in lengthening waiting lists.<sup>8</sup> Other disadvantages of global budgets are significant: the opaqueness of the hospital allocation process on the basis of historical funding opens the funder to claims by hospitals of unfairness, rigidity and inequity. These complaints are not entirely unfounded, as hospitals bear the financial risk of changes in volume and case mix (i.e. intensity of patients) without commensurate change in available funds.

Moreover, historically-based global budgets do not incent hospitals to focus on shortening lengths of stays and shifting less acute activity to other, less costly settings such as outpatient or home-based care. The incentive is based on the relationship between patients' per diem costs and lengths of stay. Generally there is a decline in patients' per diem costs with longer lengths of stay (and recovery). Therefore, hospitals that vacate a bed earlier to admit a new patient exchange lower per diem cost patients for higher per diem cost patients.

In addition, global budgets do not incent hospitals to incur higher costs to increase quality, nor to decrease waiting lists. Furthermore, global budgets risk perpetuating historical inequities or inefficiencies,<sup>9</sup> sustaining cultural norms within hospitals regarding spending and hoarding of funds early in the year to ensure sufficient resources later in the year. Few developed countries other than Canada use this method, but those that have, such as Italy, have subsequently adopted activity-based funding.<sup>10</sup>

## 2.2 Activity-based funding

Funding hospitals on the basis of the type and volume of services they provide, as well as patient characteristics, has become a recent international norm.<sup>11, 12, 13</sup> This approach is known as activity-based funding (ABF), or case-based funding. Over the past two decades, ABF has been systematically supplanting cost-based or historically-based global budgets for hospitals in public and private insurance-based health systems around the world.

Relative to historically-based budgets, ABF is more complex. ABF funds hospitals based on the nature and volume of patients treated (hospital throughput). The development of diagnosis-related-groups (DRG) by American researchers solved the longstanding problem of how to classify and then quantify hospital output.<sup>14</sup> Subsequent to this development, the Medicare program in the U.S. initiated payment to hospitals using DRGs in 1983. Each DRG represents a constellation of clinically similar patients whose costs are expected to be similar. Each hospitalization is assigned to a single DRG based on the patient's combination of procedures and diagnoses. For example, a DRG might represent 'Viral Pneumonia'. Subsequently, each DRG is associated with a payment amount, a value representing the expected cost of a patient's hospitalization. Most countries have developed their own DRG-type system, each designed to reflect local

procedure classifications, treatment patterns and costs, and to gain acceptance as the hospital payment method. Examples include HRG (England), AR-DRG (Australia) and Nord-DRG (Nordic countries).<sup>12</sup> In Canada, the Canadian Institute for Health Information (CIHI) maintains an analogous system known as CMG+, which includes resource intensity weights (RIWs) that can be used to determine case-specific payment amounts.

Robert Fetter, the originator of DRGs, intended to stimulate utilization review activities in hospitals, that is, analysis of the use of ‘intermediate products’ of care (days of stay, imaging studies, lab tests, etc.) to better manage their costs and care outcomes.<sup>15</sup> The economic incentives associated with ABF are powerful because efficient hospitals ‘pocket’ the difference between the payment amount and the hospital’s actual cost of production. The most common methods hospitals use to achieve efficiencies include changing their patient mix toward cases with higher ‘margins’, and mix of labour and non-labour inputs. As a result, ABF (relative to global budgets) is strongly linked to shorter lengths of stay and higher numbers of patients treated per bed. The political incentives are equally powerful. With the use of a transparent hospital funding method such as ABF, hospitals’ ability to claim underfunding or unfair treatment relative to peers is minimized, and the method reduces the likelihood of hospitals decreasing services to attain cost savings.<sup>16</sup> The detractors of ABF rightfully cite the lack of incentives for hospitals to coordinate care with post-acute and community providers (though this aspect is already lacking in global budgets) and the trend to over-provide the most profitable services.

ABF brings a greater degree of uncertainty for the funder and the hospital. Sources of increased uncertainty include:

- ▶ The incentive structure of ABF may increase the volume of the most profitable patients rather than those most in need of care<sup>17</sup>
- ▶ Without strong mechanisms to constrain growth in volume, ABF can transfer liability for changes in patient volume, morbidity and demographics to the funder<sup>18</sup>
- ▶ ABF increases the responsibility of hospital managers from only cost control to cost and revenue management<sup>19</sup>
- ▶ Within ABF, hospitals are at risk for not being adequately compensated for extremely high cost patients, unless stop-loss policies (such as ‘outlier’ payments) are introduced.<sup>20</sup>

Policy-makers in some provinces have decided to pursue ABF for funding hospitals (to this point, only partially). Accordingly, a closer examination of rationales for implementing ABF is warranted. As countries report different reasons for implementing ABF, the most common objectives include:<sup>21, 22</sup>

- ▶ Stimulating productivity and efficiency
- ▶ Reducing hospital waiting lists
- ▶ Increasing competition between hospitals to improve quality
- ▶ Encouraging monitoring and benchmarking
- ▶ Reducing excess capacity, increasing transparency in hospital funding
- ▶ Facilitating patient choice
- ▶ Harmonizing payment mechanisms between public and private provider

Not all of these objectives are equally relevant in Canada. Clearly, reducing waiting lists are forefront in the public’s mind. To a lesser degree, ABF can provide a more precise payment mechanism for reimbursements between regions and provinces and at a minimum, it can be used to estimate global

budgets. In contrast, rationalizing the adoption of ABF to increase competition or differentiate between hospitals on the basis of quality is more difficult in Canada due to large geographic distances between hospitals and the tendency of patients to choose their hospital based on where their physician has admitting privileges. Clearly irrelevant in Canada's system is the need to harmonize public and private hospital payments.

Despite DRG-like methods being widely available in Canada for more than 20 years, application of these tools has been primarily limited to utilization management and benchmarking, unsupported by economic incentives. To date, the rationale for using DRG-like methods has often been premised on increasing use of 'unused surgical capacity' in the hospital system. For example, governments in B.C. and Ontario have purchased increased volumes of procedures from hospitals, outside of global budgets, to reduce waiting lists for certain procedures. This 'incremental funding' has been based on a pre-negotiated price list.

### *2.2.1 Policy and technical challenges: Data and information*

There are two important aspects of hospital data necessary to support any ABF funding for Canadian hospitals. The first is standardization of patient data, and the second is availability of data, on a timely and reliable basis, to those involved in the funding of hospitals. First, all hospitals in Canada employ a common nosology (terminology) for diagnoses and procedures (ICD-10-CA and CCI) and all abstract clinical data from the patient chart according to defined guidelines. Both the definitions and guidelines are maintained by CIHI, although adherence to the guidelines across provinces and territories varies. With respect to data availability, hospitals collect and report clinical, administrative and demographic information for hospitalizations into CIHI's Discharge Abstract Database (DAD). CIHI then uses CMG to construct a fee schedule (Resource Intensity Weights, RIW) from this hospital data, where the payment amount is set at the average cost (RIW). Three provinces (Ontario, Alberta and B.C.) submit data on individual patient costs for the purpose of estimating these relative weights. The timeliness with which these data are available needs to be improved in some regions if this information is to be a reliable basis on which to fund hospitals. However, in general, there appear to be no insurmountable implementation obstacles related to data availability.

### *2.2.2 Defining hospital outputs*

Differentiation between DRGs and their Canadian equivalent, CMGs, are important to consider as the specifics of each case mix system will affect hospital payment and incentives differently.<sup>23, 24</sup> Narrowly defined DRGs (which increase homogeneity of patients within groups) reduce incentives for patient selection bias, but lead to an enormous number of DRGs. The resulting funding system is akin to hospital cost-based reimbursement (whereby the funder provides the hospital the exact amount of actual expenditures).<sup>12, 25</sup> On the other hand, more broadly defined DRGs lessen the clinical usefulness and, lacking the ability to capture clinical complexity, may make it possible for hospitals to select only the patients likely to provide the largest margins (reimbursement rate minus actual cost) within each patient grouping.<sup>26</sup> Examination of DRG systems worldwide reveals that most systems have settled on anywhere from 500 to 1,400 patient complexity groupings.<sup>27, 28</sup> CIHI's 588 CMG+ groups include additional sub-strata for high-cost procedures, return trips to the operating room, age groups plus prevalent comorbidities, leading to thousands of possible combinations and thus approximating a highly complex cost-based reimbursement structure.<sup>29</sup>

### 2.2.3 Setting payment amounts

Setting the payment amount for each DRG has important ramifications for encouraging certain behaviours. An ABF system can be expected to provide incentive to hospitals to increase activity only if the payment amount is higher than the hospital's marginal cost. The marginal cost is the hospital-borne cost of an additional patient. It can differ significantly from the average cost if, for example, overtime pay rates are required to admit and treat an additional patient. In practice, the payment amount for many DRG systems is set to equal the average cost of patients in the DRG. Setting the payment amount at the average cost can be expected to reduce incentives for innovation or to increase volume in those hospitals with a marginal cost higher than the average.

Using the average cost as a payment amount within a DRG seems unlikely to encourage the behavioural responses desired by funders. Only if the region's current volume and mix of hospital services is already seen as appropriate should the payment amount reflect the underlying average cost. However, little information is yet available in Canada regarding hospitals' marginal cost structure relative to average costs, and hospitals may struggle reconciling ABF revenues to costs.<sup>30</sup> Inappropriately setting the payment amounts can cause significant stress on ABF initiatives, such as hospital deficits, reduced hospital volume or perpetuation or exacerbation of funding inequalities.<sup>31</sup>

Discussion of DRG payment amounts should include considerations of the availability of timely, accurate hospital cost data. Evidence has shown that length of stay is not a good proxy for hospital cost.<sup>32</sup> Obtaining precise cost information is a challenge in Canada, whose hospitals, unlike in the U.S., do not record detailed activity logs because they do not create a hospital 'bill' or charge. Without accurate cost data, it is difficult to assign payment amounts to DRGs or develop adjustments for high cost, or new, specialized clinical services.<sup>33</sup> Even for countries funding hospitals with ABF, the number of hospitals precisely costing episodes using activity-based costing is limited<sup>34</sup> and not standardized.<sup>35, 36, 37</sup> Costing systems have limited appeal to hospitals due to the perceived difficulty of implementation and high cost.<sup>38</sup> In the absence of accurate local cost information, hospitals may struggle to respond to the efficiency incentives of ABF, and engage in crude length of stay reduction strategies to reduce costs.

Notwithstanding the implementation and technical challenges that are universal, non-standardization of costing methodologies within Canada impose an additional layer of complexity. Data from Alberta and Ontario have shown that the method for costing hospitalizations can lead to significant differences in estimated cost.<sup>39, 40</sup> While there are areas in Ontario, Alberta and B.C. where patient cost data are routinely collected, standardization and widespread support is only found across Ontario hospitals.<sup>29</sup> Moreover, additional work is required to untangle the costs of salaried physicians, teaching and research activities within the hospital. The lack of a standard costing methodology across systems, regions, and provinces represents a very real challenge to any near-term implementation using locally-derived RIWs.

### 2.2.4 Clinical data audits

DRG-based systems are dependent on accurate and comprehensive data abstraction, or coding, from the patient chart. Evidence shows that as hospitals implement ABF, a natural increase in the coding of comorbidities can be expected as hospitals become more sophisticated at capturing these data.<sup>41</sup> This initial increase is not to be confused with 'upcoding', inappropriately adding marginal or non-existent comorbidities, to change a patient's DRG to one associated with a higher 'price'. The latter type of activity is fraud, and in some countries is subject to harsh penalties. Such practices are well-documented in the U.S. Medicare system,<sup>42, 43, 44</sup> and elsewhere.<sup>45, 46, 47</sup> Analogous Canadian data reveal that Canadian hospital

managers are not immune to the same pressures.<sup>48, 49</sup> Clinical data audits were concurrently implemented with ABF in Australia<sup>50</sup> and are routine in the U.S. Medicare program. Audits, particular methods and sophistication statistics collection are all now used to detect signs of upcoding<sup>51, 52, 53, 54</sup> and are seen as a necessary, if unfortunate, component of any ABF system. At present, no such comprehensive audit/monitoring system has been developed for application with CMG+ in Canada.

### 2.2.5 Costs

There are costs associated with implementing and regulating ABF. In the U.K., the transition from global budgets to ABF incurred costs for monitoring changes in hospital activity, collecting patient-level cost data, surveillance of data quality, and development and management of service contracts for hospitals.<sup>55, 56, 57</sup> The same implementation costs can be expected in Canada. A review of the newly formed B.C. Health Services Purchasing Organization (HSPO) may shed some light on the costs of creating and maintaining an organizational structure: the B.C. HSPO is currently implementing an ABF program to fund day surgeries.<sup>58</sup> Healthcare organizations have been notoriously slow in adopting computerization, so it could be argued that many of these costs for data acquisition would be incurred in any case. But, in addition, a mechanism would have to be established at the regional level to regularly capture and reconcile differences between actual cost and 'price', for each DRG, and activity levels would require careful monitoring to ensure the intended effects of funding policy decisions were realized.

## 2.3 Fee-for-service based funding

Fee-for-service (FFS) describes a process in which hospitals are funded for each (reported) activity. This approach differs from ABF in that ABF uses DRGs to aggregate services for clinically similar patients into a group, while fee-for-service hospital funding 'unbundles' activities within DRGs and funds each separately. The major limitations of fee-for-service are its open-endedness and its tendency to perpetuate inefficient utilization. Fee-for-service indirectly encourages hospitals to provide more services to their patients (yielding additional revenue for the hospital) though not necessarily increasing the volume of patients.

Fee-for-service for hospital funding has not been common over the past 20 years. Moreover, the U.S. experience concludes that funding hospitals on a fee-for-service basis, rather than DRG-defined output, does not provide adequate system level incentives for hospitals.<sup>59</sup> Countries that have abandoned this type of hospital payment mechanism include Portugal, Korea and Taiwan, all of which have moved towards activity-based funding.<sup>13, 60, 61</sup>

## 2.4 Line-by-line based funding

Line-by-line-based methods fund hospitals on the basis of budgets derived on a line-by-line basis (line items are hospital input or activity categories, such as inpatient nursing, diagnostic imaging and therapies). Hospital funding using this approach is based on aggregating the sum of the line items. The limitations of this approach are similar to those outlined for global budgets; an historical basis for deriving departmental costs perpetuates potential inequalities and does not encourage efficient or appropriate resource management. This approach also raises the potential for hospitals to manipulate reported costs, by misallocating overhead costs across departments to maximize revenue. The major

advantage of this approach is the ability to focus funding on priority areas. Although not common, this method has been used in some Canadian provinces.<sup>6</sup> Countries that have transitioned from line-by-line-based funding to ABF include Sweden and Hungary.<sup>13</sup>

### 3 HOW IS HOSPITAL CARE AFFECTED BY SPENDING LEVERS?

Historically, simply changing a method of hospital funding has not been enough to ensure increases in desired volumes, quality or changes in clinical outcomes.<sup>62, 63, 64</sup> However, can the incentive structures inherent in funding models be harnessed to affect what is provided in hospitals? If so, to which patient groups, and with what frequencies? To address this question in more detail, the evidence regarding the relationship between funding levers and hospital behaviours is examined.

#### 3.1 Activity-based funding

There is a well-developed body of empirical evidence illustrating the relationship between funding mechanisms and hospital behaviours, the majority emerging over the past two decades. The earliest evidence regarding ABF came from the U.S., where ABF was implemented in 1983 using DRGs. In a study comparing indicators pre- and post-ABF implementation, shorter lengths of stay<sup>65</sup> and increased use of post-acute care were found under ABF.<sup>66, 67</sup> In a 28-country review, controlling for structural variables and longitudinal changes in hospital funding, Moreno-Serra and Wagstaff confirmed that ABF was associated with shorter lengths of stay, but also found increased total hospital spending.<sup>13</sup> By providing incentives for shorter hospital stays, ABF was associated with increasing technical efficiency. However, decreasing cost per discharge was not associated with aggregate cost savings to the healthcare system due to increasing volumes of patients treated.

A review of four countries' experiences with ABF found that, in Denmark, volume and hospital spending increased, but it is unclear whether these changes are attributable to ABF.<sup>60</sup> The results for Sweden were mixed. Early work found that ABF-funded hospitals were more efficient than those using global budgets<sup>68</sup> due to increased volume and decreased cost. This result was attributed to a shift toward post-acute care.<sup>69</sup> In contrast, later work in Sweden found that, relative to non-ABF-funded hospitals, productivity fell, hospital spending rose and upcoding appeared.<sup>70, 22</sup> In Norway, a natural experiment revealed increases in volume<sup>71, 72</sup>, cost<sup>73</sup> and decreased cost efficiency.<sup>72</sup> Victoria (Australia) was an early adopter of ABF. There, ABF is associated with shorter lengths of stay, though the result is confounded by increased total spending to stimulate clinical activity to improve access to care.<sup>60, 20</sup> More recent work is showing mixed efficiency effects.<sup>22</sup>

A comparison of hospital statistics from 30 OECD countries found that countries that have adopted ABF shifted inpatient care to outpatient care more rapidly than those that did not.<sup>74, 22</sup> Other findings are mixed – a study evaluating hospital efficiency in 729 hospitals in Norway, Sweden, Finland and Denmark reported that improvements in hospital efficiency cannot be attributed to ABF.<sup>75</sup> A separate analysis of 184 hospitals from the same four countries finds significant disparities in efficiency,<sup>76</sup> though none are attributed to ABF.

England is using a system known as Payment by Results (PbR), whose objective is to provide economic incentives to reward improvements in hospital efficiency and quality. Yet, early emphasis has been on seeking hospital efficiencies through implementation of ABF.<sup>77</sup> A comparison of those trusts that implemented ABF to those that did not found that the volume of patients increased in the ABF trusts.<sup>78</sup>

A separate analysis of English hospitals found more activity and shorter lengths of stay in hospitals funded with ABF.<sup>33</sup> To complement these findings, recent implementation of ABF in Germany is associated with shortened lengths of stay, consistent with reports from Italy and Hungary.<sup>22, 10, 79</sup>

A few common themes emerge from the review of studies examining ABF implementation: lengths of stay tend to decrease, volume of hospitalizations tends to increase and total hospital costs increase. At the same time, the evidence regarding technical efficiency (cost per admission) is mixed. However, many of the studies reviewed are affected by confounded effects, such as physician payment reform, which threaten the strength of the associations drawn between ABF and volume or cost. Consequently, it is difficult to draw unequivocal conclusions about links between ABF and hospital performance.

## 3.2 Pay-for-performance

Pay for performance (P4P) is not the same as ABF. P4P incentives are focused on the quality of care delivered and often include standards or benchmarks for quality (ABF, FFS and line-by-line funding methods are focused on how to provide incentives for 'desirable' volume and case mix). P4P can supplement any of these hospital funding methods and establishes a formal link between health-care providers (hospitals or clinicians) and quality. In the context of hospital care, P4P is a framework to provide incentives to hospitals to exhibit behaviours to achieve certain outcomes or results that are considered desirable by those designing the funding mechanism.

P4P generally takes the form of supplemental remuneration to hospitals for achieving specified thresholds or improvements on quality metrics. Hospital measures of technical quality generally fall into one of two categories – process or outcome measures – but, can also include measures of patient experience and appropriateness of care. Process indicators of high technical quality might include rates at which patients receive beta blockers for acute myocardial infarction (AMI) or timing of preoperative antibiotics for surgical patients. On the other hand, outcome indicators of technical quality include rates of readmission or surgical site infections. While Petersen's synthesis of the literature on P4P in 2005<sup>80</sup> found very few examples of hospital-based P4P programs, key recommendations for successful P4P programs include strong political and management support, leaving room for innovation and a strong health information system.

Hospital funders in some jurisdictions are now integrating components of P4P into ABF. The most prominent example of these recent initiatives is the U.S. Medicare program defining the presence of hospital-acquired conditions (HAC) as a quality indicator. In this scenario, hospitals do not receive higher DRG payment amounts when patients are diagnosed with HAC, despite the facts that patients with HAC will often be assigned to more complex case mix groups, and their treatments will be more expensive for the hospital. While affecting reporting requirements with a new 'present on admission' variable, this payment change is expected to only affect 0.2% of Medicare's hospital expenditures.<sup>81</sup> Medicare is also evaluating options for reducing payments to hospitals based on unplanned readmission rates.<sup>82</sup>

A hospital P4P program supplementing global budgets is currently operating in B.C. In this P4P program, an Emergency Department Decongestion P4P pilot program is reported to have decreased emergency room wait times.<sup>83</sup> This program has subsequently been expanded to additional B.C. hospitals and the funding pool has been increased.<sup>84</sup>

The downsides of P4P programs are the increased demands on hospital information systems and the labour costs of collecting and reporting quality information. For example, many process indicators, such as beta blockers prescribed at discharge for AMI patients, are difficult to monitor in Canadian hospitals with current standardized datasets. However, expansion of electronic medical records that capture this information as a standard of care may facilitate increased use of quality of care indicators for P4P.

## 4 HOW DO HOSPITAL FUNDING POLICIES AFFECT QUALITY, VOLUME AND ACCESS TO CARE?

To borrow from the Institute of Medicine, funding policies should provide incentives for care that is safe, effective, patient-centred, timely, efficient and equitable.<sup>85</sup> The ability to achieve these six aims will be influenced by a hospital's quality, volume of services and access. Accordingly, the evidence regarding the relationships between hospital funding policies and these three factors is reviewed. Although all funding policies were included in the review, the majority of findings link ABF to hospitals' quality, volume of services and access.

### 4.1 Quality

As described earlier, the incentives under ABF are for hospitals to decrease lengths of stay, increase volume and reduce cost. While cost cutting can lead to improved efficiencies, inappropriate 'stinting' on care must be protected against to ensure that efficiency gains are not achieved at the expense of the quality of care. Analyses of the U.S. Medicare hospital data have detected no change in mortality attributable to ABF.<sup>86, 87, 66</sup> Early work found no observable change in quality indicators for six common chronic diseases in U.S. hospital data. (65) Later work found processes of care improved and in-hospital mortality was unchanged, but patients were less stable after discharge.<sup>64</sup>

In England, quality indicators did not suggest declines in hospital care quality associated with ABF.<sup>33</sup> In a recent study of ABF, cost and quality, Forgiione et al.<sup>74</sup> reported no association between countries adopting ABF and mortality, while mortality and readmission rates remained unchanged with the adoption of ABF in Italy.<sup>10</sup> In a separate 28-country study of ABF, funding hospitals with ABF has been weakly associated with lower mortality.<sup>13</sup> Although hospitals lack incentives to address avoidable re-hospitalizations under ABF since admissions generate new payments, evidence in the U.S. points to re-hospitalizations being unprofitable for most hospitals.<sup>88</sup> Recent empirical work suggests ABF may encourage hospitals to provide higher quality care to reduce costly complications or readmissions.<sup>89</sup>

Implementation of ABF has also been correlated with increased efforts to monitor hospital quality. ABF in Victoria (Australia) was introduced at the same time as a comprehensive program to monitor and evaluate hospital quality,<sup>20</sup> aspects of which included quality assurance plans, readmission indicators and patient satisfaction surveys. In Germany, a national hospital quality monitoring system was implemented in conjunction with ABF.<sup>22</sup> In France, there are plans to monitor hospital acquired infections, transfusion accidents and serious events reporting as ABF is being implemented.<sup>22</sup> Furthermore, clinical data and administrative data used to support ABF initiatives are now being used for hospital-based quality improvement efforts.<sup>90, 91, 92</sup>

A single recent reference to evaluating patient satisfaction with hospital care relative to the implementation of ABF was found in Norway, where surveys revealed patients experienced increased satisfaction with hospital care due to reductions in waiting times. These wait time reductions were attributed to ABF.<sup>93</sup>

## 4.2 Volume

Since ABF is explicitly designed to incent volume/activity increases, it would be a surprise to find evidence suggesting otherwise. Among countries that have implemented ABF for hospital funding, there are consistent findings linking ABF to increased volume of hospital care, such as those reported in Victoria (Australia), Norway, Italy, Sweden and elsewhere.<sup>60, 20, 22, 13</sup>

While increases in volume are expected across the board, there is a body of literature from the U.S. linking significant increases in volume to the highest margin activities. This has been observed in cardiac, orthopedic and surgical hospitals,<sup>94, 95, 17, 96, 97</sup> and evidence is now beginning to emerge in other countries, with hospitals focusing on areas of care wherein they believe they have a competitive advantage.<sup>98, 22</sup> Moreover, the U.S. experience, in particular, highlights the effects of conflicts between physicians' ownership interests, payment amounts and utilization rates.<sup>99, 100, 101</sup>

In Canada, there have been targeted ABF initiatives to increase volume of particular procedures or services as a way of increasing access to procedures with long waits. Described as 'incremental funding' and based on volume and price, these initiatives have focused on hip and knee replacement, select cardiac procedures, cataract surgery (B.C., Ontario) and selected imaging procedures (Ontario). Reports by the Institute for Clinical Evaluative Sciences (ICES) and CIHI have found no substitution by hospitals of prioritized surgical procedures for non-priority surgeries,<sup>102, 103</sup> suggesting that hospitals probably had excess capacity under their global budgets.

While the intent of this review is to focus on hospitals, it is important to note the critical role that physicians play in affecting hospital volume. There is a direct relationship between hospital volume and payment for physicians. Financial incentives to shorten lengths of stay and increase the number (and acuity) of patients may affect the behaviour of hospital's salaried physicians differently than fee-for-service remunerated physicians. From this perspective, hospital funding should not be considered independently from the structure used to remunerate healthcare providers (such as physicians).

ABF systems that rely on simple measures of volume increases are problematic, as 'nominal' increases can be created by manipulating the episode of care definition (e.g. creating separate acute and rehabilitation episodes), or admitting patients for services previously offered on an outpatient basis (e.g. colonoscopy). This type of activity is known as 'unbundling'. Creation of spurious episodes can be combated with well-defined business rules to regulate inappropriate unbundling.

## 4.3 Access

Access to hospital services continues to be the topic of considerable criticism of the Canadian hospital sector.<sup>9</sup> Here, the evidence regarding the association between method of hospital funding and access is reviewed from the perspective of timeliness (waiting times), geographic access and equity of access. The preponderance of evidence is based on hospitals funded with ABF.

ABF is credited with reducing waiting times by increasing volume in many countries.<sup>104, 105, 22, 20</sup> However, in light of the evidence of the relationship between volume and the most profitable activities, we may expect wait times to decrease unevenly across activities commensurate with profitability.

Geographic access to hospital services is closely monitored in many countries implementing ABF. The quest for achieving economies of scale may induce concentration (centralization) of some hospital-based services in urban centres. Concentration may be desirable when it leads to improved clinical outcomes, such as in cases of highly technical, specialized care, but it may also reduce hospital capacity in certain

clinical areas if allowed to evolve in an unplanned way. Declines in geographic access are also directly linked to equity of access, as socio-economic status has been inversely correlated to the distance travelled to receive care – poorer patients make fewer longer journeys and have a higher incidence of chronic disease prevalence.<sup>106</sup>

Risk selection – the process of restricting access to hospital care for unprofitable patients (groups of patients where costs are high relative to payments) or a preference to treat groups of patients where costs are low relative to payments – is a possible threat to equitable access associated with ABF. There is some U.S.-based evidence that hospital managers engage in behaviours designed to reduce access for the least profitable (revenue minus expected cost) patients,<sup>7</sup> with findings of risk selection now appearing in other countries.<sup>107</sup> Accordingly, setting payment amounts is complex and politically sensitive.<sup>108</sup> The process, if it is working, would be expected to induce changes in efficiency rather than inducing higher cost hospitals to restrict access to less-profitable activity.<sup>109, 110, 22</sup> Setting the payment amount is crucial to ensuring access for services whose hospitalization costs are notoriously difficult to predict, such as mental health and pediatrics. Targeted grants for activities not included in the payment amount, such as teaching or research, can reduce the likelihood of risk selection behaviours and are funded separately in most countries.<sup>111, 7, 28</sup>

## **5 ALIGNING FUNDING POLICIES TO IMPROVE EFFICIENCY, QUALITY AND APPROPRIATENESS**

### **5.1 Population-based funding models**

Geographically-based variations in the volume and cost of hospital care in the U.S. are well documented and remain largely unexplained by differences in age, disease burden and socio-economic factors.<sup>112, 113, 114, 63</sup> These variations reflect over- or under-reliance on hospital care and are observed through a wide range of supply- and preference-sensitive care delivered in hospitals.<sup>115</sup> In response to differences in hospital cost and utilization observed in Canada, population-based allocations to adjust for population need are being explored in several provinces as a basis for regional funding.<sup>4</sup> Population-based models draw on existing physician, hospital and post-acute care data plus resident demographics to project a region's population expenditures over a fixed period of time.

DRG payment for hospitals is, in many respects, complementary to population-based funding methods. In the first step of using a population-based model, health sector funds are allocated to regions based on the needs of the residents<sup>116, 111</sup> and reflect legitimate differences in input costs. In a second step, based on their population allocations, regions provide payments to hospitals for actual activity – typically using a DRG-based method. Examples of this design exist in Australia and Norway,<sup>18</sup> although, as pointed out by Palmer<sup>117</sup>, there are challenges in reconciling the competing objectives of equity and efficiency with the two methods.

### **5.2 Activity-based funding**

Some countries, including the Medicare program in the U.S., opt to use ABF to fund 100% of hospital activity. More recent examples of this movement include England, France and Germany. Due to the expected disruptive effects, a transition period during which blended funding sources are harnessed is applied to facilitate the implementation of ABF in these countries. The transition period was announced to be six years in England, five years in Germany, while in France it was four years (though later

lengthened). During the transition in these countries, the maximum amount of decrease in hospital funding was ‘capped’; in England, the limit was 2% of hospital funding, 3% in Germany, and there was no limit in France.<sup>28</sup>

U.S. Medicare has also incorporated explicit adjusters to hospital DRG payment amounts to reflect different input price differences or regional population characteristics. Specifically, there are adjustments to the payment amount for regional wage rates, teaching/research costs, and ‘disproportionate share’ of uninsured patients.<sup>118</sup> A similar strategy has been adopted in Australia, albeit in a simpler form, providing adjustments to payment amounts for rural and isolated hospitals.<sup>20</sup>

### 5.3 Combining properties of ABF and global budgets

There is strong evidence showing that, due to growth in volume, ABF is linked to increased total hospital expenditures. In contrast, global budgets effectively constrain cost growth, but lead to rationing of hospital services. Some countries have drawn on the strengths and tried to circumvent the weaknesses of both methods by implementing ‘blends’ of ABF and global budgets. Examples include Victoria (Australia), Denmark, Sweden, Norway and Italy. The proportion of hospital funding covered by ABF varies. While there is notional support for covering hospitals’ fixed costs with global budgets (and variable costs through ABF), the proportion of hospital funding covered by ABF is often subject to policy considerations and negotiations between funder and hospitals. In Victoria (Australia), the share of hospital funding based on ABF is 60%. In Norway it is 40%, while the proportion varies between 39% and 52% by county in Denmark<sup>28</sup> with similar variations in Sweden (up to 70% in Stockholm).<sup>22</sup>

One of the earliest examples of a ‘blended’ hospital funding approach was in Victoria (Australia). To address the policy objectives of reducing waiting lists and constraining cost growth, an innovative two-part funding model was applied.<sup>20</sup> In the first element, DRG payment amounts were split into fixed and variable components and set at a benchmark efficiency level (not the average cost), with simple adjustments for rural and isolated hospitals. The second element consisted of a ‘throughput’ funding pool to encourage increased volume, similar to Canada’s existing incremental funding programs, but much larger at 7% of hospital costs.<sup>20, 50</sup> A similar approach was applied in other Australian states, but other states ‘discounted’ DRG payment amounts if volume targets were not attained.<sup>50</sup>

### 5.4 Re-defining DRGs, ‘Bundled Episodes’

There is also considerable potential to create new episode of care classifications that ‘bundle’ pre-admission, inpatient and post-acute care components into a single payment amount, including physician payment.<sup>119, 120, 121</sup> Breaking down the funding silos rewards coordination and collaboration of care by making facilities and clinicians jointly accountable for the volume and total cost of an episode of care.<sup>59, 100</sup> In addition, it removes the risk of cost shifting between sectors<sup>122</sup> and potentially improves quality measurement.<sup>121, 123</sup> Bundling across sectors holds considerable appeal in Canada, where the same funder is responsible for cost and quality across the continuum of care. In general, the use of more expansive definitions of care episodes has been found to lead to wider variability in patient treatment and difficulty in setting fair payment rates. The biggest impediment to garnering support for reallocating resources between sectors is modifying physicians’ relationships with hospitals and having physicians bear some portion of financial risk for the cost<sup>124</sup> while ensuring continued or improved quality and access to care. In Canada, significant work is needed to link and value hospital episodes, physician claims and post-acute care. Nonetheless, this avenue has strong potential for future application to fund care episodes involving at least some hospitalization.

## 5.5 Accountable care organizations

Accountable care organizations (ACOs) are newly proposed entities intended to reform provider payment and healthcare delivery systems in the U.S.<sup>125, 126, 127</sup> ACOs are affiliations of providers voluntarily accepting accountability for total per capita costs and quality metrics. The objective of ACOs is to align payment incentives with the responsibility for delivering cost-effective high quality care across the continuum of care. While formal evaluation of ACOs is premature, they are receiving considerable attention.<sup>128</sup> ACO-like models may be relevant in Canada in the future, when funding models of care cross multiple sectors, including physician payment, pharmaceutical use and post-acute care.

## 6 RECOMMENDATIONS FOR HOSPITAL FUNDING POLICIES

The current policy appetite for hospital payment reform in Canada provides an opportunity to apply objective evidence from other countries' healthcare system reforms to inform these discussions. There are significant limitations to global budgets, and while there may be potential for addressing geographical inequities through further refinements to population-based funding allocation methods, this potential is unlikely to address issues related to how best to fund individual hospitals. Fortunately, there is a rich body of literature describing the policy, technical and practical effects of alternative approaches to hospital funding. The limitation of existing evidence is that published findings are unavoidably embedded within particular policy contexts and healthcare systems, and the strength of the evidence is not uniform across countries. For example, there is a great deal of experience with the U.S. DRG-based system. However, other countries, whose policy and system details are more similar to what we find in Canada today, provide less evidence that would directly address the questions at hand, making it more difficult to draw inferences regarding effects in Canada.

Though not addressed in this paper, discussions regarding hospital funding inevitably turn to whether private hospitals or clinics can provide the same service at a lower price, or to whether potential patients should be able to pay privately to avoid waiting lists. It is important to note that debates around private providers are completely separable from the question of how hospitals should receive their funding. In this review, it is assumed that all hospital care in Canada continues to be publicly provided and funded.

The strength of DRG-like systems is its ability to define hospital 'products' – and to focus clinicians' and managers' attention on the 'production' process. Results surrounding ABF implementations internationally have been mixed, including reduced wait times and increased hospital spending. Bearing the limits of other countries' experiences in mind, several provinces are proceeding with activity-based funding policies to partially fund hospitals. In Canada, support for ABF-like funding policies is not universal. ABF has been endorsed by a number of stakeholders, including the Canadian Medical Association,<sup>129</sup> the British Columbia Medical Association,<sup>130</sup> the Ontario Hospital Association<sup>131</sup> and the Ontario Medical Association.<sup>29</sup> It was also recommended by the Kirby Commission as a means to achieve efficiencies.<sup>132</sup> However, the Canadian Healthcare Association<sup>133</sup> and the Canadian Doctors for Medicare<sup>134</sup> are anxious about the unintended consequences of ABF on the healthcare system, such as the emphasis on volume without commensurate indicators of quality.

The clear indication is that some provinces have decided that the risks of hospital funding reform using ABF are less than maintaining the status quo. Given these policy directions, there are options for making use of the best evidence to decrease wait times and obtain high-quality care. Moreover, given that AFB has been positioned as a complement to other hospital funding programs, Canada has time to attend to important considerations such as developing data systems, monitoring data integrity, improving the

availability of key information and expanding education offerings. From the perspective of current implementation of ABF in Canada, the following recommendations are intended to provide policy-makers with key information regarding funding levers and hospital behaviours.

## **6.1 Use ABF as part of the funding 'toolkit' to increase activity and decrease waiting lists**

*Use ABF to provide incentives for increased volume of activity.* Hospital payment amounts should be set to encourage efficient production of desirable activity levels based on population need. Many countries have been experimentally funding hospitals by 'blending' ABF with global budgets, where the rate of ABF funding is set as the proportion of variable cost to total cost, or approximately 40% of total current hospital funding levels.

*To constrain growth of hospital spending commensurate with increasing activity, hospital spending should be 'capped.'* Additional volumes under ABF should be remunerated at a marginal cost or linked to achieving policy priorities.

*Payment amounts should be based on best practices, not average cost.* Payment amounts could vary by province. Payment amounts should be regularly reviewed to reflect changes in desired activity and new technologies. Additional work is needed to help hospitals untangle the costs of teaching and research from patient care activities.

*A long term commitment to ABF is required.* Hospitals need to be confident that changing their behaviors and capacity is going to be maintained through ABF's incentive structure over time. Hospitals perception of soft budgets and bail-outs discourages managers from implementing measures to improve cost efficiency and should be avoided.

*Phased implementation is needed.* While aggressive implementation is needed to induce behaviour change in hospital managers, the proportion of hospital funding attributable to ABF should be phased in over several years. Modelling to forecast the effects of funding formula alternatives on hospitals should be encouraged to reduce any unintended consequences for hospitals or patients.

The major risks of the policies include: understanding the critical success factors for implementation; inaccurately setting the payment amounts or other formula components, which would incent undesirable hospital behaviours; existing natural geographic patterns have created natural monopolies that are resistant to payment amounts; and the politics of changing capacity. Since ABF tends to be implemented in densely populated countries, it is unclear to what extent ABF is appropriate for less-populated provinces. Threats to hospital quality and access (timeliness, geography and equity) must be vigilantly monitored.

## **6.2 Prepare for change in hospitals**

*High-cost hospitals will experience pressures to change practices quickly.* This means that high-cost hospitals may change their service mix or adjust capacity. Limit decreases in hospital funding through 'caps'. Many hospitals will lack precision regarding patient's costs. Patient-level costing within hospitals should be encouraged and provincial standards should be developed, implemented and monitored.

*Monitor key aspects of hospitals.* This includes changes in activity, financial performance and appropriateness of care.

### **6.3 Prepare for change in other sectors**

*Pressures to shorten hospitalizations and increasing reliance on outpatient services will affect the acuity of patients discharged from hospitals. As the acuity and volume of patients using post-acute services will increase, the capacity of post-acute care may have to adjust accordingly. Outpatient services are expected to increase.*

### **6.4 Adapt CMG+ or create a case mix classification system for ABF**

*ABF requires a DRG-like classification system that is transparent, simple and garners clinical support. A critical component of ABF is the DRG-like classification system. CMG+'s complexity is opaque to hospital managers and clinicians and its many adjustments for intervention events, flagged interventions, out-of-hospital events and comorbidity levels too closely mirror the disincentives of cost-based reimbursement. While CMG+ should not be used for hospital payment, CIHI should be encouraged to play a significant role in coordinating the development of a single national classification system which defines hospital outputs for payment purposes.*

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