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**title** Is it possible to incorporate quality into hospital pricing systems?

**authors**

**Associate Professor Janet Sansoni**

Australian Health Outcomes Collaboration  
Centre for Health Service Development  
Australian Health Services Research Institute  
Email: [jans@uow.edu.au](mailto:jans@uow.edu.au)

**Professor Kathy Eagar**

Director, Australian Health Services Research Institute  
University of Wollongong  
Email: [keagar@uow.edu.au](mailto:keagar@uow.edu.au)

**Ms Carol Loggie**

National Casemix and Classification Centre  
Australian Health Services Research Institute  
University of Wollongong

**Dr Anne-marie Boxall**

Director, Deeble Institute for Health Policy Research  
Australian Healthcare and Hospitals Association  
Email: [aboxall@ahha.asn.au](mailto:aboxall@ahha.asn.au)

**policy issue**

Australia has recently implemented an activity-based funding system for public hospitals. Policymakers and providers are keen to ensure that the price paid for health care services stimulates improvements in quality and safety, but some remain sceptical that this can be achieved through pricing mechanisms.

There are four main ways of linking quality and safety to hospital pricing in the context of activity based funding:

- Best-practice pricing
  - This involves making evidenced-based decisions on what constitutes 'best-practice' for the treatment of a particular condition, then paying health services a set price when they provide best-practice care.

- Normative pricing
  - This involves using price to influence the delivery of care (for example, providing incentives to deliver more care in the home for certain conditions or to provide day surgery options where appropriate).
- Structural models of pricing quality
  - This involves linking funding to meeting accreditation standards or participating in benchmarking activities or clinical quality registries.
- Payment for Performance (P4P) or quality pricing
  - This involves using financial incentives and/or disincentives to encourage providers to behave in certain ways that will improve quality and safety.

This paper briefly examines the strength of the evidence for each of these pricing models. It considers both peer-reviewed research as well as non peer-reviewed material, such as program evaluations and government reports.

## what does the evidence say?

There is a rich literature arguing that health care pricing models should reward quality and safety. Many of the arguments are inherently appealing. However while strong on argument, overall the literature is weak on evidence.

### *Best-practice pricing*

Very little peer-review research has examined whether best-practice pricing models stimulate improvements in quality and safety, but there are some studies that provide useful information. One study was conducted in Michigan through a Participating Hospitals Agreement with Blue Shield Blue Cross.[1] In this study, researchers examined how closely clinicians adhered to best-practice guidelines for the treatment of acute myocardial infarction and congestive heart failure when guidelines were tied to an incentive tariff. They found that that over a three year period (from 2000 to 2003), the rate of appropriate aspirin use increased by 8 per cent, beta-blockers by 12 per cent and ACE inhibitors by 10 per cent. Overall, the researchers estimated that more than 24,000 patients received better care during this period because of the incentive program.

While the incentive program improved compliance with best-practice guidelines, it came at a cost of more than US\$22 million (including administration costs). Because there was no adequate baseline data prior to implementation, and no control group or data from hospitals that did not participate in the program, it is impossible to tell how effective the incentives really were. Likewise, it is impossible to tell whether the high cost of the program was worthwhile. Some researchers have also criticised the study, suggesting that estimations of the effectiveness of the program were overstated.[2]

Several other small studies on best-practice pricing incentives have also been undertaken: one in the US and one in Taiwan. The US study looked at improvements

## what does the evidence say?

in adherence to best-practice guidelines for coronary artery bypass graft surgery, and the Taiwanese one looked at management of breast cancer patients.[3,4] Both studies reported that best-practice pricing led to modest improvements in the quality of care provided. However both of the studies also had serious methodological flaws (for example, no control group or poor descriptions of the program), which means the evidence is suggestive rather than conclusive.

Because there is little peer-reviewed research evidence in this field, the next best alternative source of evidence comes from evaluating best-practice pricing initiatives operating in the field. Currently, the English Best Practice Price Tariffs (BPPT) scheme is the largest best-practice pricing initiative in operation.[5] The program applies to the treatment of a range of conditions, including cholecystectomy (gall bladder removal), the management of fragility hip fractures, cataract surgery and stroke management. A formal evaluation of the scheme itself has not yet been published, although a review of the related Payments by Results (or pay for performance) program is available.[6] Initial findings suggest that this program has led to substantial improvements in some (but not all) quality indicators for some conditions (hip fractures, for example).[7]

### *Normative pricing*

Just as with best-practice pricing models, there has been very little peer-review research done on normative pricing schemes and their impact on quality and safety. Under these schemes, incentives are provided to encourage certain desired outcomes, for example more day surgery, reduced readmissions, shorter patient processing times or more home based care.

Some research on the impact of normative pricing has been done in the radiology field. It shows substantial improvements in radiology reporting times following the introduction of normative pricing.[8,9] Due to weaknesses in the research design – for example, there was no concurrent control group – it is impossible to draw strong conclusions from these studies.

Normative pricing schemes have been, or are currently being, introduced in a number of countries (e.g. UK, USA, Australia, Canada), but evaluation data for the major initiatives are not yet available. Once evaluations are complete they are likely to generate valuable evidence on the effectiveness of normative pricing models.

### *Structural models of pricing quality*

The main structural approaches to improving quality of care are to link funding to participation in accreditation programs or benchmarking activities. Without strong evidence available, the most promising approach appears to be to provide funding to help clinical services participate in clinical quality registries, and to undertake clinical benchmarking (or casemix adjusted) comparisons with other similar services. The evidence on clinical benchmarking is strong in terms of achieving improvements in quality and safety.[10-12] However, as yet there is no research that examines the impact of clinical benchmarking in combination with incentive or structural funding.

## what does the evidence say?

### *Pay for performance models*

In Pay for Performance (P4P), or what are sometimes called ‘quality pricing models’, financial incentives are paid to providers who achieve a high level of performance on specified indicators. For example in the US, if hospitals performed in the top 10 per cent for a certain clinical measure, a bonus payment equivalent to 2 per cent of annual diagnosis-related group payment was paid.

There has been considerable research done on the effectiveness of pay-for-performance schemes in improving quality and safety, much of it coming from the US.[13,14] Numerous research studies have examined the Premier Hospital Quality Incentive Demonstration (PHQID), one of the first and leading initiatives in the US. Overall, there is no convincing evidence that improvements in outcomes can be attributed to P4P programs.[13,14] Findings from many of the studies are limited because of issues with generalisation; participation in the P4P scheme was voluntary, for example, which means the hospitals participating in the program may not be representative of hospitals more generally. Findings are also limited because the incentives often applied to the treatment of only a few conditions. It is also difficult to demonstrate that the scheme was effective because the Centre for Medicare and Medicaid Services implemented a public reporting program at the same time, making it difficult to isolate the individual effect of the P4P incentives.

The most definitive evidence on the effectiveness of the PHQID P4P scheme in the US comes from a recent study published in the *New England Journal of Medicine*. [13] It found that there was no difference in patient outcomes when hospitals in the Premier pay-for-performance program were compared with non-Premier hospitals. Importantly, no difference was found in outcomes even for conditions where incentives were explicitly provided to reduce mortality rates.

In England, the Advancing Quality (AQ) initiative implemented in 2008 was modelled on the PHQID program, but the price incentives were considerably larger, and applied to the top 25 per cent (versus the top 10 per cent) of hospitals. In the AQ program, participation was mandatory for all hospitals in the North-West England region, and efforts were made to ensure incentive payments were received by the actual clinical areas involved in the program.

Study results show that the introduction of the AQ initiative in 132 hospitals had an impact on short-term in-hospital mortality rates. It led to a 1.3 per cent drop in the overall 30 day in-hospital mortality rate for the three conditions examined (pneumonia, heart failure, acute myocardial infarction), although only the reduction in mortality rate for pneumonia (1.8 per cent) was significant.[15,16] Despite these positive findings, researchers found that these observed improvements did not lead to improvements in the composite quality scores for participating hospitals, and this raises some doubts about the interpretation of results.

The use of financial disincentives or penalties to drive quality improvement appears to be gaining momentum both domestically and internationally. In these models, it is common to withhold payment for ‘never events’ or when patients end up with hospital acquired infections.[5,17] Because these models are only relatively new,

there is currently no evidence demonstrating how effective they are in improving quality and safety.

*What works best?*

When taken as a whole, the evidence provides some guidance on the factors that are likely to make a pricing model effective. They are:

- Incentives need to be substantial if the model is to have any effect [13]
- Incentives need to be delivered to the level of the clinical department to have any effect [13-16,18,19]
- The impact of any proposed model needs to be modelled and carefully evaluated both prior to implementation and at regular intervals afterwards
- Any analysis of the impact of a new pricing model should consider the possibility that regional disparities will arise; there is some evidence that some pay for performance models have disadvantaged rural hospitals [19]
- Incentive structures need to focus on engendering improvement across all hospitals rather than just rewarding hospitals or services that are already performing well [14,20-23]
- Potential perverse incentives need to be carefully considered, and [18,24]
- Methodologies for risk adjustment need to be developed and incorporated.[10,14,22,24]

## what is the quality of the evidence available?

In this field, much of the current research suffers from a variety of methodological flaws, making the evidence base relatively weak. Many studies, for example, do not have adequate control groups, making it difficult to make strong claims about the impact of pricing models. For some initiatives, the only evidence available comes from program evaluations published in government reports or grey literature, and this evidence also suffers from similar methodological weaknesses.[2,25]

Evaluations of pricing initiatives to improve quality need to be carefully designed with appropriate controls and baseline data. They need to commence at the start of any field trial rather than at some period after initial implementation. When post hoc analyses or evaluations are done, often the relevant data has not been gathered, making it impossible to measure the impact of the scheme.

A number of key evaluation reports for some of the British Schemes (AQ, BPPT, and the Commissioning for Quality and Innovation Payment Framework) are unavailable as yet, making it impossible to critically evaluate the effectiveness of these schemes.

## what does this mean for policymakers?

Overall, there is insufficient international evidence at present to support the adoption of any 'off the shelf' pricing model designed to improve the quality and safety of health care.

Some models show promise and these could be trialled in the Australian context. However it is vital that rigorous evaluations are designed and implemented as the program is rolled out.

The existing evidence, while limited, does have some implications for the new hospital pricing system currently being implemented in Australia. Under the new pricing model, the Independent Hospital Pricing Authority (IHPA) determines the price that the Australian Government pays as its contribution to public hospital funding. The Australian Government contribution is approximately 40 per cent of public hospital funding and any incentive that the IHPA might build into the model would impact only on the Commonwealth contribution. Further, the Australian Government funding is not directed to specific hospitals or to clinical departments within hospitals. Based on the evidence in the international literature, it is unlikely that incentives built into the model at this level would work unless there was agreement that these incentives would flow down to the level of the clinical department.

## key readings

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## contact

Dr Anne-marie Boxall  
Director  
Deeble Institute  
Australian Healthcare and Hospitals Association  
E: [aboxall@ahha.asn.au](mailto:aboxall@ahha.asn.au)