The US Medicare policy of not reimbursing hospital-acquired conditions: what impact would such a policy have in Victorian hospitals?

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ABSTRACT

Objective: To model the effect of excluding payment for eight hospital-acquired conditions (HACs) on hospital payments in Victoria, Australia.

Design, setting and participants: Retrospective ecological study using the Victorian Admitted Episodes Dataset. The analysis involved all acute inpatient admissions to Victorian public and private hospitals between 1 July 2007 and 30 June 2008.

Interventions: Each admission record includes up to 40 diagnosis and procedure codes from which payments are calculated. The model deleted diagnosis codes for eight HACs from all records, then recalculated payments to estimate the impact of a policy of non-payment for HACs.

Main outcome measure: The effect on hospital payments of excluding diagnosis codes for eight HACs.

Results: 2 047 133 cases with total estimated payments of $4902 million were identified; 994 cases (0.05%) had one or more diagnoses meeting the code definition for a definable HAC, representing total payments of $24.1 million. In-hospital falls and pressure ulcers were the most commonly coded HACs. Applying a model that excluded HAC diagnosis codes changed the diagnosis-related group for 134 cases (13.5%), thereby generating a $448 630 reduction in payments.

Conclusions: Introducing a non-payment for HACs policy similar to that introduced by Medicare in the United States would have little direct financial impact in the Australian context, although additional savings would accrue if HAC rates were reduced. Such a policy could add further incentive to current initiatives aimed at reducing HACs.

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Activity-based inpatient funding systems pay for the amount of treatment provided to patients rather than for the expected outcomes of clinical treatment for a given condition. These systems include payments for preventable complications of care, which funders are increasingly looking to avoid.

The United States Medicare system, which reimburses hospitals for inpatient care using a diagnosis-related group (DRG)-based casemix payment system, has recently ceased paying for eight specific hospital-acquired conditions (HACs) that are considered preventable. The US Centers for Medicare and Medicaid Services (CMS), having identified funding policy as a way to encourage higher quality care and fewer unintended clinical outcomes,[1] implemented a non-payment for HACs policy in 2008.[2] The policy attempts to penalise hospitals for poor-quality care and to encourage them to implement strategies for eliminating avoidable complications. The eight avoidable complications excluded from casemix payments are: foreign object retained after surgery; air embolism; blood incompatibility; pressure ulcer stage III or IV; in-hospital falls and trauma; catheter-associated urinary tract infections; vascular catheter-associated infections; and surgical site infection — mediastinitis after coronary artery bypass graft. (Since the drafting of this article, the CMS have added four HACs to the list: poor glucose control, infection following specific orthopaedic procedures, infection following specific bariatric procedures, and deep vein thrombosis following specific orthopaedic procedures.) The codes that define the HACs take into account International classification of diseases — clinical modification (9th revision) (ICD-9-CM) diagnosis and procedure codes as well as condition-present-on-admission indicators. The policy removes diagnosis codes from the payment calculation process, in the expectation that this will result in a lower payment.

Abbreviations

AR-DRG	Australian refined DRG
CMS	Centers for Medicare and Medicaid Services
DRG	Diagnosis-related group
DRG + CC	DRG involving complications and comorbidities
DRG – CC	DRG without complications and comorbidities
HAC	Hospital-acquired condition
ICD-9-CM	International classification of diseases — clinical modification (9th revision)
ICD-10-AM	International classification of diseases — Australian modification (10th revision)

The HACs policy has attracted much media interest in the US.[3] Although a recent study has shown that this policy will have an impact of as little as 0.001% on US Medicare's $106 billion budget for acute hospital funding,[4] it is of interest because it may be the first instance of a jurisdiction refusing to pay for complications of care.

In the state of Victoria, complications of care are estimated to account for up to 15% of inpatient costs.[5] The landmark "Quality in Australian health care study" found that about half of all complications were considered preventable.[6] DRG-based payments for inpatient care are not tied to the quality of the outcome,[7] and provider-caused complications may actually result in increased payments.

In this study, adapting methods outlined in a previous study carried out in California,[4] we translated the eight HAC diagnosis codes from ICD-9-CM to the International classification of diseases — Australian modification (10th revision) (ICD-10-AM) (5th edition) codes and used acute inpatient admission data from Victorian hospitals to estimate the likely effect the HACs policy would have on hospital payments in Victoria.

METHODS

Data

The Department of Health Ethics Committee approved our use of the 2007–08 Victorian Admitted Episodes Dataset for our study. This dataset includes patient demo-

graphics, up to 40 diagnosis codes (each linked to a condition-present-on-admission flag), and up to 40 procedure codes for every admission for inpatient care. The diagnosis and procedure codes are used to allocate each admission to a DRG. Victoria uses the suite of 667 Australian refined DRGs (AR-DRGs).[8] Each AR-DRG has a Victoria-specific weight reflecting the relative cost of admissions allocated to the AR-DRG. Payments for individual admissions are calculated as the Victoria-specific weight multiplied by a price. Weights are adjusted for "outliers" (unusually long AR-DRG-specific lengths of stay), among other factors.

To estimate the statewide effect of a policy of non-payment for HACs, we included both public and private hospital acute admissions data and used the public hospital funding algorithm to estimate payments for private hospitals. (Payments were calculated at the standard rate of $3279 per WIES [weighted inlier equivalent separation] for all hospitals [ie, excluding price modifications for small, regional or remote hospitals].)

Defining the eight hospital-acquired conditions

The eight HAC diagnosis codes were translated from ICD-9-CM to ICD-10-AM codes using metadata mapping. The accuracy of the eight HAC code definitions was then verified by two health information managers who were specialists in clinical coding.

One of the eight designated HACs, vascular catheter-associated infections, could not be accurately translated into an ICD-10-AM code. The relevant ICD-10-AM code is imprecise, capturing all instances of infection and inflammatory reaction due to cardiac and vascular devices, implants and grafts. An upper limit of the impact of this HAC was all that could be estimated.

Extraction of the codes and reassigning diagnosis-related groups

We simulated the impact of the US Medicare HACs policy by deleting complication codes for the eight HACs from all Victorian acute admission records for the period 1 July 2007 to 30 June 2008. The DRG grouping algorithm was then applied to these records to determine whether the deletion altered the DRG classification. The diagnosis codes were deleted from the payment algorithm with the intent of moving the current admission grouping to a lower-paying DRG — that is, from a DRG involving complications and comorbidities (DRG + CC) to a DRG without complications and comorbidities (DRG – CC). If the DRG changed, we estimated the effect on hospital payments as the difference between the payment under the initial AR-DRG assignment and payment under the reallocated AR-DRG.

RESULTS

There were 2 047 133 acute admissions to Victorian public or private hospitals between 1 July 2007 and 30 June 2008, incurring total estimated payments of $4902 million. There were 14 700 cases (0.72%) in which the length of stay was higher than expected for the specific AR-DRG (high outliers). These cases attracted $253 million (5.17%) in additional payments.

Of the 2 047 133 acute cases, 994 (0.05%) had one or more diagnoses meeting the code definition for one of the seven definable HACs (Box). The total estimated payment for the 994 cases in which an HAC was detected was $24.1 million; 310 of these cases (31.2%) were eligible for outlier payments, which represented 17.3% ($4.2/$24.1 million) of their total payments.

In-hospital falls and trauma, pressure ulcers, catheter-associated urinary tract infections, and foreign objects retained after surgery were the most commonly coded of the seven definable HACs we studied. Removal of diagnosis codes for these seven HACs changed the DRG category in 134 cases (13.5%). There were no cases in which the DRG changed on the basis of excluding codes for air embolism or mediastinitis. We estimate that these 134 cases would account for a $448 630 reduction in total payments, representing only 0.01% of annual estimated payments for all cases ($0.4/$4902 million). Considering only public hospital cases affected by the policy, the proportion of cases would be 0.01% (87/1 301 898), with a financial impact of 0.01% ($302 914/$3117 million) (data not shown).

Incidence and cost of eight hospital-acquired conditions (HACs) in Victorian hospitals (July 2007–June 2008), and effect of excluding payments for these HACs*

	All HACs				HACs with payment change†		
Complication	Cases	Total payments	Outlier cases	Outlier payments	Cases	Total change	Outlier change
Foreign object retained after surgery	84	$787 233	3	$18 491	29	–$103 983	$16 723
Air embolism	3	$64 311	0	$0	0	$0	$0
Blood incompatibility	4	$124 636	1	$21 372	1	–$7 132	$0
Pressure ulcer stage III or IV	235	$11 372 135	97	$3 180 013	26	–$83 787	$84 369
In-hospital falls and trauma‡	489	$7 693 060	147	$0	54	–$161 611	$69 962
Catheter-associated UTI	178	$4 070 585	62	$957 024	24	–$92 117	$69 501
Surgical site infection — mediastinitis after coronary artery bypass graft	1	$27 994	0	$0	0	0	0
Subtotal	*994*	*$24 139 954*	*310*	*$4 176 900*	*134*	*–$448 630*	*$240 555*
Vascular catheter-associated infection§	1 526	$30 677 045	334	$6 468 898	369	–$1 242 094	$570 678
Total	*2 520*	*$54 816 999*	*644*	*$10 645 798*	*503*	*–$1 690 724*	*$811 233*

UTI = urinary tract infection. * Data source: Victorian Admitted Episodes Dataset 2007–2008. † Cases in which excluding HAC diagnosis codes would change the diagnosis-related group (DRG), thereby moving the case into a lower-paying DRG category. ‡ Includes two instances of pressure ulcer stage III or IV.
§ This is an upper estimate, as coding may include cardiac and vascular devices. ◆

Upper limit estimate

Vascular catheter-associated infections are defined in ICD-10-AM (5th edition) by an imprecise code. When an estimate of the upper limit of this HAC was included in the estimate of the HACs policy effect, the proportion of cases eligible for the HACs policy was 0.12% (2520/2 047 133), with total payments of $54.8 million. About a quarter of these cases (644/2520) incurred outlier payments, which accounted for 19.4% ($10.6/$54.8 million) of the total payments for these hospitalisations. The HACs policy would have an impact on 0.02% of cases (503/2 047 133), with a financial impact of $1.7/$4902 million (0.03%). Considering only public hospital cases affected by the policy, the proportion of cases would be 0.03% (365/1 301 898), with a financial impact of 0.04% ($1.3/$3117 million) (data not shown).

DISCUSSION

Our analysis shows that the annual number of cases likely to be affected by adopting the CMS policy of non-payment for HACs in Victorian hospitals would be small, and that the revenue implications for hospitals would also be small. Based on 2007–08 hospital admission data, we estimate that the HACs policy would reduce total hospital payments by between $448 630 (0.01%) and $1 690 724 (0.03%). The financial impact for public hospitals would be between $302 914 (0.01%) and $1 329 049 (0.04%).

In our analysis, long length-of-stay (outlier) cases accounted for 0.72% of all cases but constituted 31.2% of cases involving one of the eight HACs. This over-representation may be the result of long lengths of stay induced by these HACs (eg, for mediastinitis after coronary artery bypass graft) or may reflect an increased likelihood of complications (eg, pressure ulcers) for patients with long lengths of stay.

Impact of deleting the eight HAC codes: comparison between California and Victoria. Although small, the potential impact of the HACs policy in Victoria was 10 times the estimated proportion of payments affected by the CMS policy in the Californian population eligible for Medicare payments (0.001%).[4] The small variations in payment can be explained by the robustness of DRG-based payment models. Admissions that group to a DRG + CC often involve not just one, but a suite of complications and co-morbidities, which reduces the likelihood that a single HAC code will make the critical difference in DRG assignment.

In Victoria, 14.2% (108/759) of affected cases regrouped to another DRG after deletion of one or more of the six HAC codes (excluding pressure ulcers). This rate is higher than the 3.1% (26/831) of California Medicare cases that were found to regroup after deletion of the six HAC codes.[4] The difference in proportions between Victoria and California may be due to differences in the DRG grouper used in each jurisdiction (AR-DRGs versus Medicare-severity DRGs [MS-DRGs]). As there are more AR-DRGs than MS-DRGs (667 v 559), the former are more finely granulated. Also, California Medicare beneficiaries are predominantly 65 years or over, in contrast to Victorian beneficiaries, who include all residents of the state. As a result, California Medicare beneficiaries are more likely, on average, to have comorbidities. Hence, admissions involving Medicare beneficiaries in California are less likely to have one of the seven HACs as the critical diagnosis code that, on deletion, would change the case from DRG + CC to DRG – CC.

Study limitations. US hospitals have responded to the introduction of previous DRG-based payment policies with changes to their coding practices.[9] While the simple code deletion strategy, as proposed by CMS, provides limited capacity to "game the system", there may be little incentive for hospitals to include the eight HAC codes if their incidence is reported with no prospect of additional payment.

We based our study on Victorian data because Victoria was the only Australian jurisdiction with both DRG-based funding and a history of collecting a condition-present-on-admission indicator. However, the results of our study would be equally applicable to other states that use a DRG-based inpatient payment system and now collect condition-present-on-admission data.

Potential policy modifications. The HACs policy is predicated on the theory that financial incentives will at least raise the profile of the eight HACs and, at best, encourage systematic measures for minimising the likelihood of complications of care. Although financial incentives should be only one component of any reduction strategy for complications of care, they must be large enough to attract the attention of both clinicians and hospital administrators without jeopardising the immediate financial viability of health services, particularly public services in rural and remote areas that struggle to remain financially viable. (Small, remote hospitals in Victoria often receive block funding rather than casemix-based funding, reflecting the expectation of service provision rather than efficient throughput.)

Implementing the HACs policy would have a range of intended and unintended consequences. Non-payment for the eight HACs if they arose after admission might encourage careful detection and documentation of potential HACs at admission. The presence of most of the eight HACs can be detected during admission by a basic physical examination (by nursing or medical staff), and most can be prevented by standard nursing care practices (eg, postoperative surgical pack counts; use of pressure ulcer and falls risk assessment tools that prescribe preventive measures; aseptic vascular catheter insertion and routine insertion site care; and care and maintenance of indwelling urinary catheters). Victoria has a range of quality improvement initiatives in place to address some of the eight HACs, with particular emphasis on pressure ulcer and falls prevention.[10,11] Although gains have been made in these areas, attaching a financial incentive might help to further focus attention on the issue and justify investment in prevention.

The CMS policy of not paying for HACs affects only a limited suite of complications of care that are arguably preventable. Another that has been suggested is to delete all codes for conditions arising after admission (irrespective of preventability) and to pay for them at a "complication-averaged rate".[12] This approach would have many advantages over simple output funding, but could be too great a change for hospitals to manage in a single step. Two incremental approaches to strengthening payment policies should be considered: increasing the proportion of payments affected by the policy, or starting with a low-impact policy (such as the HACs policy) and strengthening it over time.

There may be an opportunity to strengthen the policy by formalising existing data collection conventions. Specifically, all diagnosis and procedure codes in routine Victorian hospital data are sequenced chronologically, with some specific standardised exceptions. (This contrasts with the US system, in which only eight secondary diagnoses and five secondary procedure codes are used for MS-DRG assignment and can be resequenced by the hospital to maximise payment.) If these conventions were

adopted as a matter of policy, sequelae of HACs (eg, sepsis following vascular catheter infection) could be identified and potentially used as part of the funding modification.

One of the aims of such a funding policy would be to draw attention to areas in which there is potential for improving patient outcomes. The impact of each policy would be largely dependent on the amount of attention it received, irrespective of the financial impact. While the capacity for the HACs policy to drive reductions in complications would be limited, as in the US, it would seem to be a prudent first step towards outcome funding. If introducing a HACs policy failed to draw adequate attention, jurisdictions could further strengthen the financial impact of the HACs policy in several ways — for example, by: (i) expanding the range of diagnosis codes for deletion per discharge by including codes that are frequent sequelae of the eight HACs; (ii) expanding the discharges affected by the HACs policy to include transfers to acute or subacute facilities; (iii) excluding payments for readmission for any of the eight HACs; and/or (iv) altering the general approach to payment for complications. These options have been discussed elsewhere, albeit in the US context.[4]

Alignment of funding incentives. Introducing any policy of non-payment for HACs is unlikely to result in immediate savings for funders, given the very small potential reduction in payments. Significant savings from reduced payment for the eight HACs, either through reduced length of stay or readmission, are likely to be offset to some extent by investment in prevention activities at the hospital level that will eventually be reflected in subsequent AR-DRG cost weights. Although the HACs payment policy was initially introduced in the US in response to the Deficit Reduction Act,[13] the main benefit of the policy may be from reduced patient morbidity rather than large reductions in costs.

Components of a broader complication prevention program. Financial incentives are one part of a broader complication prevention program in which the dollars at risk need to be large enough to engage hospital administrators so that resources are provided for risk reduction/quality improvement. Feedback to hospitals on rates of HACs may, in and of itself, create an incentive for clinicians and hospitals to address problems, and such feedback could readily be incorporated into other current outcome-monitoring processes.[14-16] Whether these rates should be published is a matter for debate. Some jurisdictions are choosing not to publish comparative outcomes in an effort to reduce gaming around outcome reporting and thus encourage health services to acknowledge and address, rather than deny, the need for risk-reduction strategies.[14] Other jurisdictions are attempting to publicly report the results of remedial actions rather than the initial data.[17] As a minimum, each hospital should receive benchmarked reports of their performance under qualified privilege.

There may also be an opportunity to achieve further HAC reductions by consolidating the data reported back to health services and developing virtual learning communities.

CONCLUSION

The CMS HACs policy has drawn much attention to preventable HACs in the US. Although the financial impact of introducing such a policy in jurisdictions using AR-DRGs might be greater than the impact in the US, the policy would be unlikely to have a major detrimental impact on any single hospital, and might augment other initiatives to reduce complications of care.

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