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Development of a model to predict demand for rehabilitation from activity in acute care AR-DRGs

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Development of a model to predict demand for rehabilitation from activity in acute care AR-DRGs

Abstract

Admitted rehabilitation activity accounts for an increasing proportion of health care expenditure in Australia. This presentation describes the development of a tool to predict demand for rehabilitation care generated by acute inpatient episodes provided in Australian public sector facilities. Previous work by Dr Lynette Lee identified a set of "rehabilitation-sensitive AR-DRGs", or AR-DRGs from which patients are more likely to require subsequent rehabilitation. In developing the predictive tool, this earlier work was extended, primarily by quantifying the degree of sensitivity and by incorporating the patient's age. The model uses variables, both clinical and demographic, found within routinely collected administrative data sets and could be used in routine service planning. Rehabilitation activity can be predicted as the number of episodes or the expected number of bed days. A strategy for "finding" additional bed days was proposed for situations where the prediction exceeds the current level of activity.

Keywords

model, development, activity, demand, acute, predict, care, ar, drgs, rehabilitation

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Development of a Model to Predict Demand for Rehabilitation from Activity in Acute Care AR-DRGs

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Introduction

Admitted rehabilitation activity accounts for an increasing proportion of health care expenditure in Australia. This presentation describes the development of a tool to predict demand for rehabilitation care generated by acute inpatient episodes provided in Australian public sector facilities. Previous work by Dr Lynette Lee identified a set of "rehabilitation-sensitive AR-DRGs", or AR-DRGs from which patients are more likely to require subsequent rehabilitation. In developing the predictive tool, this earlier work was extended, primarily by quantifying the degree of sensitivity and by incorporating the patient's age. The model uses variables, both clinical and demographic, found within routinely collected administrative data sets and could be used in routine service planning. Rehabilitation activity can be predicted as the number of episodes or the expected number of bed days. A strategy for "finding" additional bed days was proposed for situations where the prediction exceeds the current level of activity.

Methods

The model was developed using complex statistical analyses of national datasets, informed by a panel of expert clinicians. In the national admitted patient dataset (APC) some, but not all, acute episodes which had been followed by rehabilitation within 28 days could be identified. Predictors of the likelihood of subsequent rehabilitation care were identified from this dataset using logistic regression and a preliminary predictive model was developed. Using published national hospital statistics and data from the Australasian Rehabilitation Outcomes Centre (AROC), adjustments were made to the model parameters to account for activity that had not been identifiable in the APC. AROC data were also used to convert the number of episodes predicted by the model to estimated bed days.

Results

The predictive model comprises tables of probabilities that patients will require rehabilitation care after an acute episode with columns defined by age group and rows defined by grouped AR-DRGs. When applied to national data, the model successfully predicted 83% of the rehabilitation activity estimated to have been generated across Australia. When the model was applied to Tasmanian data, the results confirmed independent sources that Tasmania provides substantially less rehabilitation care than expected. The strategy proposed to "find" the additional beds required reduced the shortfall from 114 to 13 beds.

Conclusions

Clinicians and other stakeholders regarded the model favourably and believed that it was an improvement on current methods available. The model prediction of 83% was a good result, remembering that there are additional patients who are admitted directly from home rather than from acute care. Best practice for the delivery of rehabilitation care incorporates a range of modalities, including hospital and community based models. However, the predictive tool estimates the demand for inpatient care only. Local arrangements will determine the most appropriate way to deliver this care.

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