RESEARCH ROUNDup

Keep up to date with new Australian primary health care research

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Avoiding hospitalisation: effective primary care interventions

Ambulatory care sensitive conditions (ACSCs) "represent a range of conditions for which hospitalisation should be able to be avoided because the disease or condition has been prevented from occurring, or because individuals have had access to timely and effective primary care".[1] This *RESEARCH ROUNDup* investigates the factors that may predict avoidable hospital admissions. It also provides an overview of interventions that may be effective in reducing avoidable hospitalisations, and follows from a previous issue that examined the scope of ACSCs in Australia, and their reliability as a measure of primary health care (PHC) performance.[2] *RESEARCH ROUNDup* is an abbreviated review of major citation databases and freely available literature and includes recent relevant Australian research where available.

Avoidable hospitalisation predictors

A growing and ageing population, and an increase in chronic diseases, particularly diabetes, are some of the factors that have led to increasing pressure on Australian hospitals.[3] An Australian systematic review published in 2008 examined "the factors related to avoidable admissions in chronic disease" that could be utilised in a predictor matrix.[4] From 82 reviewed publications, 31 determinants were identified and were grouped into three categories; those relating to the individual, the environment, and the health service system. The review authors concluded that no single factor could be attributed to avoidable hospitalisation and that the interaction between predictors was complex. Those most likely to experience avoidable hospitalisation were summarised as "people (especially those >65 years of age) who are mentally vulnerable, from ethnic backgrounds, who have higher levels of disease severity and/or more co-morbid conditions, with overt symptoms such as breathing obstruction".[4]

Interventions to reduce avoidable hospitalisations

In 2009, a comprehensive review of 'strategies and initiatives' to reduce avoidable hospitalisation was undertaken by Melbourne's *Clinical Epidemiology & Health Services Evaluation Unit*.[5,6] Diseases avoidable through immunisation, and a number of acute and chronic conditions are customarily considered amenable to effective primary care interventions.[1,7] Of note in this report, is the inclusion of "interventions in primary care aimed at reducing ADE [adverse drug events] and related hospital admissions".[5] The review defined an adverse event as "injury or harm resulting from medical management rather than the medical condition itself" and noted that related studies tended to focus upon medication errors.[5] The *SIGN 50*[8] protocol was used to rate the quality of each study. The evidence base was determined using the NHMRC pilot program 2005-06 format for intervention studies. Using this format, evidence is scaled from strong (several high quality systematic reviews (SR) of randomised controlled trials (RCTs)), scaling down to 'good', 'some' and finally 'weak' (low quality SRs or RCTs, or moderate to low quality comparative studies).

The two RCTs used to evaluate the success of vaccination related interventions on ACSC hospitalisation rates were of moderate quality, but there was no good evidence to suggest that mail reminders or telephone advice impacted upon avoidable hospitalisations. When evaluating the effectiveness of interventions to reduce avoidable hospitalisations for chronic conditions, review authors examined the uptake of the six components of chronic care (*Chronic Care Model (CCM)*) as advocated by Wagner and colleagues:[9] self management support, delivery system design, decision support, clinical information systems, health care organisation and community resources. Of the many studies identified, few used hospitalisation rates as an outcome measure. However, there was good evidence that the management of chronic obstructive pulmonary disease (COPD) using CCM components can reduce avoidable hospitalisations and ED visits, and, that support for COPD and asthma self management can reduce avoidable hospitalisation rates. High level evidence supporting the effectiveness of interventions to reduce avoidable hospitalisation rates for acute ACSCs was limited. Good quality evidence obtained from two SRs with meta-analyses was available for the evaluation of interventions to prevent adverse drug events, but neither found the interventions they investigated (community based, pharmacist-led interventions (including medication reviews), and primary care physician education programs) to be effective.

A New Zealand systematic review (2008)[10] examined programs aiming to reduce admissions for nine ACSC conditions (asthma, cellulitis, ear nose throat conditions, gastroenteritis, epilepsy, pneumonia, diabetes mellitus,

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Type of Intervention	Effective	Ineffective
1 Comprehensive, multidisciplinary, **team-based medical care** programs – patient education/ participation in discharge planning, follow-up.	Programs combining all these components were likely to be beneficial.	Not very effective when more than one ACSC present, or for diabetes.
2 **Education** (individual, internet, self-management, or healthy schoolchildren).	For combinations of ACSCs, educational interventions undertaken with comprehensive disease management programs were better than education alone.	Not effective for diabetes.
3 **Telehealth** (eg. phone, internet, telemonitoring, telecounselling).	In general, patient and health care provider interactions via computer based programs were effective. Improved access to high quality medical care for patients living in remote areas.	Telehealth was ineffective for asthma and diabetes.
4 **System level** interventions – e.g. policy changes, structures and programs, physician education.	System or institution level changes, including discharge planning, were effective for many ACSCs. Disease-specific observation units were effective for angina, ischaemic heart disease.	System or institution level changes, including discharge planning, were ineffective for diabetes.
5 **Specialist clinics** – physician or nurse practitioner led outpatient or private clinics.	Limited evidence for effectiveness of specialist clinics, although appear beneficial if part of comprehensive care programs.	

Table: Interventions and their effectiveness. Compiled from Basu & Brinson (2008).[10]

angina and chronic heart failure) plus 'all' ACSCs (combination of more than one condition). COPD was not included. Almost one quarter of reviewed publications were systematic reviews/meta-analyses. The methodological quality of reviewed studies was evaluated using NHMRC checklists. Results, reported in relation to five intervention themes, are summarised in the Table. Diabetes appeared to be resistant to many interventions aiming to reduce ACSC hospital admissions. The study concluded that "in general, programs that increase access to care for all sections of a population or particular subgroups are associated with reductions in ambulatory care sensitive hospitalisations". Importantly, the authors cautioned that as "different disease conditions have different sensitivities to interventions in general and specific types of interventions in particular … specific disease management processes should be tailored to specific patient populations".

> Programs that increase access to care for all sections of a population or particular subgroups are associated with reductions in ambulatory care sensitive hospitalisations.

Conclusions

Many factors relating to the individual, environment, or the health service system, operating either in isolation or combination, may lead to avoidable hospital admissions. The quality of studies that aimed to evaluate the effectiveness of primary health care interventions in reducing ACSC related hospital admissions was variable. Elements of the *Chronic Care Model* were effective in addressing some chronic disease avoidable hospital admissions. Evidence supporting the effectiveness of interventions to reduce avoidable hospitalisation rates for acute ACSCs was limited. None of the interventions reviewed were found to be effective for reducing adverse drug event related hospital admissions. Diabetes appeared to be resistant to many hospital avoidance interventions. Reducing avoidable hospitalisations may be best achieved by identifying the needs of communities and establishing appropriate local health services.

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