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Room for One More? A review of the literature on ‘inappropriate’ admissions to hospital for older people in the English NHS

(This article has been accepted for publication by Health and Social Care in the Community and the link to the published version will be provided.)

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Abstract: This paper reports the findings of a review of the literature on emergency admissions to hospital for older people in the UK, undertaken between May and June 2014 at the Health Services Management Centre, University of Birmingham. This review sought

to explore: the rate of in/appropriate emergency admissions of older people in the UK; the way this is defined in the literature; solutions proposed to reduce the rate of inappropriate admissions; and the methodological issues which particular definitions of 'inappropriateness' raise. The extent to which a patient perspective is included in these definitions of inappropriateness was also noted, given patient involvement is such a key policy priority in other areas of health policy.

Despite long-standing policy debates relatively little research has been published on formal rates of 'inappropriate' emergency hospital admissions for older people in the English NHS in recent years. What has been produced indicates varying rates of in/appropriateness, inconsistent ways of defining appropriateness, and a lack of focus on the possible solutions to address the problem. Significantly, patient perspectives are lacking, and we would suggest that this is a key factor in fully understanding how to prevent avoidable admissions. With an ageing population, significant financial challenges and a potentially fragmented health and social care system, the issue of the appropriateness of emergency admission is a pressing one which requires further research, greater focus on the experiences of older people and their families, and more nuanced contextual and evidence-based responses.

Key words:

- Older people
- Emergency hospital admission
- Prevention
- Health and social care

What is known about this topic?

- Inappropriate emergency admissions to hospital are the subject of significant policy and media debate
- While a range of possible explanations are put forward, many of the accounts appear overly-simplistic and/or under-evidenced
- Given current demographic and financial pressures, the desire to prevent unnecessary emergency admissions will only increase

What this paper adds:

- There is relatively limited research on this topic, and it is difficult to compare results in a meaningful way (due to local contextual and methodological details)
- Different methods of identifying 'inappropriate' admissions each have their limitations, and potential solutions do not appear well thought through
- Research which includes the perspective of patients, families and front-line staff may provide a more nuanced, helpful approach

Every year, the NHS experiences more than 2 million unplanned admissions for people over 65 (accounting for 68 per cent of hospital emergency bed days and the use of more than 51,000 acute beds at any one time) (Imison *et al.*, 2012; Poteliakhoff, 2011). With an ageing

population, a challenging financial context and major structural upheavals throughout the English health service, such pressures show no sign of abating – and the NHS has to find ways of reducing emergency hospital admissions (in situations where care can be provided as effectively elsewhere). However, this is by no means a new issue. For many years, a common concern for policy makers has been that high levels of emergency hospital admissions run the risk of concentrating too many resources in expensive, acute care, leaving insufficient funding to invest in community-based alternatives and in rehabilitation for people recovering from ill health. Under successive governments, this has led to a series of attempts to make more effective use of hospital beds, recognising that these are scarce resources for which demand outstrips supply. Over time, this has included the creation of a national Change Agent Team, the advent of intermediate care, additional funding, the introduction of financial penalties for social care-related delayed hospital discharges, new reablement services and significant emphasis placed on hospital waiting times and prompt hospital discharge (see, for example, Glasby, 2003, 2012). More recently, the emphasis has been on trying to reduce the number of emergency readmissions; the 2012/13 NHS Operating Framework committed to performance-reporting based on emergency admissions for acute conditions that should not usually require hospital admission, stressing potential non-payment for emergency readmissions within 30 days of discharge following an elective admission (Department of Health, 2011). To help develop this policy further, the Department of Health - with the Foundation Trust Network - has jointly sponsored a number of sample audits of emergency readmissions, designed to inform more detailed guidance on the operation of the policy in future. As the Framework states, however:

Emergency readmissions need to continue to reduce as patients receive better planned care and are supported to self-care more effectively. Commissioners need not reimburse hospitals for admissions within 30 days of discharge following an elective admission with locally agreed thresholds for other readmissions. The savings made need to be invested in clinically driven initiatives to support improved outcomes through reablement and post-discharge support (p.17)

Linked to this are policy initiatives such as the marginal tariff for emergency admissions (with savings to be invested in preventative services and care closer to home), the greater integration of acute and community services through 'Transforming Community Services' (Department of Health, 2008), work to improve early identification and support of people with dementia and a series of 'whole systems demonstrator' sites for new approaches to telehealth and telecare (linked to the subsequent '3 million lives' campaign, since superseded by the Technology Enabled Care Services programme – see NHS England, n.d.). More generally, national policy continues to explore scope for community alternatives to hospital via the long-term conditions agenda, the advent of clinical commissioning, the focus on more integrated care, new health, social care and public health outcomes frameworks, and the Quality, Innovation, Productivity and Prevention (QIPP) agenda (see, for example, Department of Health, 2010). The latter includes a national programme on long-term conditions management, with an emphasis on risk stratification, integrated locality teams and case co-ordination, where prevention of unplanned admissions is a key outcome. There is also significant national work underway to better understand and resolve considerable variation in the probability of emergency admission or bed utilisation in over 65s between localities, with a desire to achieve greater efficiency and better outcomes for patients by tackling any unwarranted variation (see Imison *et al.*, 2012 for further discussion).

More recently, a national Better Care Fund (see Better Care Fund, 2014) has sought to promote more integrated health and social care to reduce non-elective hospital activity, and commissioners across the English NHS have been under significant policy pressure to reduce urgent hospital activity and hit challenging access targets. A greater focus is also being placed on the role of GPs in coordinating care for older people with complex needs as a way of averting a crisis in their care and an unplanned hospital admission. While all these approaches have sought to reduce potentially avoidable admissions, pressures on acute care remain intense and the received wisdom is that admissions continue to be influenced in

part by the help-seeking behaviour of patients, of their carers, and sometimes of paid care workers in the community (with patients and professionals alike still 'defaulting' to hospital in a crisis). Against this background, experts have questioned the extent to which current policy is based on evidence of what is actually possible, or whether it is overly aspirational and unrealistic in terms of what can be achieved (see, for example, Oliver, 2014).

Moving from national policy to public perceptions, negative headlines continue to appear in the national press around the pressures facing acute hospitals (Boseley, 2012; Prynne, 2014) and perceived shortcomings in community services which are seen as contributing to excessive and unnecessary emergency admissions (particularly of frail older people) (Campbell, 2012). In different accounts, the culprits range from the growing pressures of an ageing population (Donnelly, 2014) to too many reductions in the overall bed base (McArdle, 2013), and from difficulties accessing GP services (especially out of hours) (BBC, 2013) to delays in adult social care (Triggle, 2012a). These reports suggest a growing crisis and a lack of quality care for older people across a range of health and social care services (see Box 1 for examples).

However, behind many of the headlines is an assumption that potentially large numbers of people (often older people) are attending and being admitted to hospital as emergency patients when there is scope to care for them more appropriately in alternative settings. For example, Triggle (2012b) reports that 2.3 million overnight stays could be prevented were there better organisation of urgent care, with GPs and other health care providers working together to prevent patients getting to the stage of crisis requiring hospital. Wright (2013) reports that half a million older patients could avoid hospital if they were cared for appropriately by community services. A recent study by Cowling *et al* (2014) found just over 26 per cent of people attend the emergency department because they could not access a GP appointment. Underpinning both policy and media accounts, therefore, is an assumption that scarce resources could be being used more effectively if the number of inappropriate

admissions to hospital could be reduced, thereby freeing up existing hospital beds for those people who genuinely need them.

Despite common policy and media perceptions of a 'problem' of significant inappropriate emergency hospital admissions, these accounts mask a number of underlying questions:

- What is the rate of 'inappropriate' admission for older people?
- How is this defined and who decides?
- What causes such a situation?
- What solutions might help to make more appropriate use of current resources?

In response to these questions, the current paper reviews the literature on the appropriateness of emergency admissions, taking special account of the extent to which the literature includes a patient perspective. Though the four questions above are set-out as overall review questions, this paper offers more focus on the *methodological* insights gained from doing this review, having had limited success in answering these four questions due to the complex and fragmented nature of the evidence, as will become apparent below.

In our opinion, drawing on the lived experience of people using services is crucial to understanding the context within which the older person is using health and social services and to developing an appropriate response – particularly at a time when government is emphasising their commitment to the concept of 'nothing about me without me.' As we have argued elsewhere (Glasby and Littlechild, 2000):

[Previous approaches to researching this topic] need to be accompanied by research methodologies which include and empower the individuals involved. Patients admitted to hospital are often... the best qualified people to talk about their own conditions, the circumstances of their admissions and possible alternatives to hospital... A patient perspective can also provide a more holistic, long-term view of the factors that contribute to hospital admissions, helping to build a picture of how best to respond to the needs of people starting to experience ill-health.

As we argue below, this patient perspective closes the gap on a patient's journey from healthy to admission to hospital: they can provide the detail and insight which may help to identify moments at which preventative measures could have been taken. We therefore wanted to see the extent to which the current literature reflected this stance and whether patient input is generally valued in studies on inappropriate emergency admissions.

Box 1 Media coverage of emergency admissions and the pressures facing acute care

'NHS services outside of hospitals are struggling to cope with growing demand brought on by the ageing population, hospital bed shortages and staff cutbacks' (Campbell, 2012).

'Sir Bruce [Keogh – NHS Medical Director] believes a system-wide transformation is needed to cope with the "intense, growing and unsustainable" pressures on urgent and emergency care services. ... Every year millions of patients seek emergency help in hospital when they could have been cared for much closer to home' (Prynne, 2014).

'Elderly care is being jeopardised by the increasing numbers of older people being moved to non-specialist wards to clear beds for new patients' (McArdle, 2013).

'Nearly two-thirds of the patients now being admitted to hospital are over the age of 65 and many are much older. Their needs are increasing – they are frail and many have dementia. Many arrive in hospital because of a sudden crisis in their health: over the last 10 years, there has been a 37% increase in emergency hospital admissions' (Boseley, 2012).

Methods

The literature review we conducted was a narrative analytical review, summarising and interpreting the data presented in the reviewed studies to compare and contrast them in their original form (Mays *et al.*, 2001). The review was undertaken between May and June 2014. This review sought to explore: the rate of in/appropriate emergency admissions of older people in the UK; the way this is defined in the literature; solutions proposed to reduce the rate of inappropriate admissions; and the methodological issues raised by particular definitions of 'inappropriateness'. Importantly for our present study, the extent to which patient perspectives are included in these definitions of inappropriateness was also noted.

The literature search was undertaken by the Health Services Management Centre, University of Birmingham specialist library and documents identified via the following databases: the Health Management Information Consortium database, Medline, the Social Science Citation Index, the Applied Social Sciences Index and Abstracts, AGEINFO, CareData Abstracts, and Social Care Online; the list of search terms used can be viewed in Appendix A. These databases were selected as the most significant to health and social care, and we include a short description of each below:

- The Health Management Information Consortium (HMIC) database is made up of the King's Fund Library & Information Services database, the Department of Health Library, and the Nuffield Institute for Health's HELMIS database and includes bibliographic references frequently with abstracts of journal articles, monographs, reports, government documents and grey literature which focus on health policy and management related research and information.
- Medline is the online version of the printed *Index Medicus*, *Index to Dental Literature*, *International Nursing Index* and other health-related indexes. It gathers together scholarly articles on medicine, nursing, dentistry, and allied health from 1966 onwards. Created and administered by the U.S. National Library of Medicine, it is updated on a monthly basis.
- The Social Science Citation Index is a general social science database which includes some health scholarship. It is accessed via the "Web of Science" database and allows for cited reference searches.
- ASSIA (Applied Social Sciences Index and Abstracts) is a general social science database incorporating 650 applied social science journals.
- AGEINFO is an information service run by the Library and Information Service of the Centre for Policy on Ageing. It provides access to several databases: a bibliographic database of over 40,000 books, articles and reports; details of over 4,000 organisations; and a calendar of courses, conferences, meetings, training sessions and future events world-wide, all related to age and ageing.
- Social Care Online is produced by the Social Care Institute for Excellence and is the UK's largest database of research and information on social care and social work, including legislation, government documents, practice and guidance, systematic reviews, research briefings, UK grey literature, books, text books and journal articles. There are around 150, 000 records recording data from the 1980s to the present day, with the database updated on a daily basis. It now incorporates CareData Abstracts, a UK-based

social care database which dates back to 1989. This database alone contains a list of over 50,000 journal articles, research reports, and central and local government publications.

The reference lists of articles included in this study were also searched. Each title and abstract was reviewed independently by two members of the research team and selected for relevance to the overall aims and objectives of the study. The inclusion and exclusion criteria are set out below.

Inclusion and Exclusion Criteria

Studies were included if they set out a formal rate (percentage or frequency) of people aged 65 and over, inappropriately admitted to a UK hospital(s) on an emergency basis.

Specifically excluded were:

- Material published and/or based on data collected prior to 1993 (the date of the implementation of the NHS and Community Care Act 1990 – a key piece of legislation significantly affecting the provision of older people's services).
- Local inspections where findings have been summarised in a national report.
- Articles reporting findings from studies already included in the review.
- Admission to non-acute care
- The admission of people aged under 65 (unless a significant proportion of the sample are older people).

Studies were categorised using the criteria of the *National Service Framework for Older People* (Department of Health, 2001; see Appendix C) and data were extracted using the proforma in Appendix B. This included:

- the rate of inappropriate emergency admissions of older people identified by the study
- the way ‘inappropriateness’ is defined
- solutions proposed to reduce the rate of inappropriate admissions
- the extent to which patient perspectives are included in these studies – as we discuss below, we feel this is a key gap in the literature and one where future research is needed

The quality of individual studies was not appraised as part of our inclusion criteria (all studies that met the criteria above were included), albeit that potential limitations in the methods adopted were noted (see below for further discussion).

In conducting this review, we recognise that the terminology used by different commentators and stakeholders is contested. We prefer terms such as ‘avoidable’ or ‘preventable’ admissions (which recognise that some admissions might not have taken place if alternative services existed locally or if a different course of action had been taken at an earlier stage). However, there is a key strand of literature – very much reflected in policy and media debates – which categorises admissions as ‘appropriate’ or ‘inappropriate’, and this is the focus of our current review.

Findings

Overview of the literature

Despite significant media and policy debate, the review identified only ten studies that met our criteria. These are summarised in Tables 1 to 3 below, with a subsequent discussion of the relative absence of patient perspectives and the implications of these findings for future

research, policy and practice. As can be seen, all of the studies bar one were from England (Beringer and Flangan's (1999) study was based in Northern Ireland). Rates of inappropriateness varied widely (see Table 1 and see below for further discussion), while the methods used to define appropriateness were primarily based around clinical judgement or the use of structured 'clinical review instruments' (structured lists of reasons why patients might appropriately be admitted to hospital - see Table 2). Though patient perspectives were included in two studies, one of these studies was written by two of the current authors, while the other did not go on to use this qualitative data in a meaningful way. Finally, the solutions proposed by different authors were diverse and often based on the opinion of individual researchers rather than on formal evaluation of genuine alternatives to hospital admission (see Table 3).

Rates of in/appropriate admission

The literature does not provide a simple answer to the rate of in/appropriate admissions to hospital (see Table 1): rates of 'inappropriate' admissions vary widely depending on what tools are used to judge the admission or whether this is based solely on the decisions of health professionals (see below for further discussion). Rates also depend on geography, with differences between rural and urban hospitals (Coast *et al.*, 1996); time of year – winter seeing an increase in the overall admission rate and increasing the likelihood of inappropriate admissions (Beringer and Flanagan, 1999); which services are available in a particular area and whether they can be accessed as true alternatives to hospital; and who saw the patient in terms of what knowledge and experience they had in caring for older people (Leah and Adams, 2010).

These findings reflect the difficulties facing acute care in terms of staffing and resource availability, as well as differences occurring due to environment and how these can all impact on the appropriateness of emergency admissions. These varying rates make

comparisons difficult and suggest a critical need to take local context into account when researching and creating policy around emergency admissions: one blanket response, without appropriate, locally contextualised research evidence, will not necessarily deal with the problem (which manifests itself very differently in different local areas).

Definitions of 'appropriate' and 'inappropriate' admission

The literature shows there is no accepted standard definition of what it means to be an inappropriate admission (see Table 2), with studies tending to adopt one of two approaches. The first is based on professional opinion, with studies defining admissions as appropriate/inappropriate on the basis of the author's opinion or with reference to some sort of expert panel of medical practitioners. This makes it difficult to compare results with findings elsewhere and some studies are unclear as to whether they are measuring the number of people who, in an ideal situation, could be cared for in alternative settings or those inappropriately placed within the context of existing local services. Furthermore, the criteria and process used to judge an admission 'inappropriate' are often unclear, making it difficult for readers to judge and compare results.

The second approach uses clinical review instruments. Initially developed in the US to decide which hospital admissions were appropriate for insurers to fund, these are standardised lists of criteria which might necessitate a hospital admission, usually relating to the severity of a patient's condition and the type and intensity of service provided. The two tools used in our studies are known as the Appropriateness Evaluation Protocol (AEP) and the Intensity-Severity-Discharge Review System with Adult Criteria (ISD-A), and both produce easily quantifiable results and help health professionals to structure their decision-making.

However, there are a number of potential criticisms of these tools in the broader literature, including that the AEP does not take into account the fact that there may be no other option

in the local area for the patient except hospital (Glasby and Littlechild, 2000). It is for this reason that some commentators have referred more to 'avoidable' than to 'inappropriate' admissions (Mytton et al., 2013; see Glasby and Littlechild, 2000 for more on problems with terminology), as well as the fact that the AEP can be used in 'pure' or amended form and that this can make a difference to what is then deemed appropriate or otherwise (Houghton *et al.*, 1996). Appropriateness also depends on *when* the AEP or ISD-A are applied to each patient's case: only when there is more knowledge of the person and what actually went on to happen to them can they be properly judged an inappropriate admission (see Coast *et al.*, 1995; Tsang and Severs, 1995). In other words, these tools are helpful up to a point, but are applied retrospectively and take no account of local circumstances or the availability of alternative services.

All this reveals the complexity which surrounds decisions on who is appropriate to admit to hospital. While some studies draw heavily on professional (often medical) discretion but lack consistency and transparency, others use more structured protocols but lack the insights which local professional judgement can bring to understanding the issues at stake.

Patient Perspectives

As outlined above, one of the key stakeholders in understanding how a patient got from being healthy to being admitted to hospital is arguably the patient themselves. They may have real understanding of how their health changed over time and, significantly for reducing inappropriate admissions, what preventative measures could have been taken to avoid hospital admission. Yet, our search found the inclusion of patient perspectives was rare and that their knowledge and potential contribution is therefore missing from research into inappropriate admissions. Only two of the studies in our review (Houghton *et al.*, 1996; Littlechild and Glasby, 2001) included a patient perspective, one of which was written by two

of the current authors, while the other research team did not go on to write up any of the findings from this qualitative element of their study. In our view, this dramatically undervalues the contribution which patients could make to current debates and represents a key gap in the literature (see below for further discussion).

Box Two: Example of a study which uses a clinical review instrument (ISD-A)

Coast et al., 1996 use the ISD-A to judge the appropriateness or otherwise of the admissions in their study, writing: 'The appropriateness of admission was assessed using explicit standardized criteria in the form of the intensity-severity-discharge review system with adult criteria (ISD-A). Up to 19 explanatory variables were available for the analyses. These variables were modelled for each centre separately, using logistic regression to produce final sets of factors independently related to the appropriateness of admission.'

The tool was applied during and after the first 24 hours of admission, using hospital notes and patient records, with the patient's health status available in only one of the two study sites. The ISD-A uses both a generic set of criteria for all patients and then more specific questions related to certain conditions or hospital units. The researchers did not meet with the patients themselves, but relied on these assessment criteria and the intensity of the service they are receiving.

Logistical regression was carried out on the variables which arose from the application of these criteria. Inappropriateness was judged on the criteria and the intensity of service the patient was receiving within a 24 hour time-period.

Though this provides a clear route by which to judge an admission as in/appropriate, it leaves the patient themselves out of the discussion, focusing instead on clinical notes and statistical regression models. The inappropriateness of the admission is judged without recognition of the situation the patient may have been in prior to admission; in one case study site this included not taking the person's health status prior to admission into account. The authors are well aware of the potential limitations of their method, including that the tool has only been noted as 'fair to moderate' in validity, but feel its strengths lie in the consistent application of an objective tool.

Possible solutions

As Table 3 suggests, different authors suggest a very broad range of potential solutions (or developments that might help reduce the scale of the problem). While some studies focus

on particular alternative service models (Leah and Adams, 2010; Mayo and Allen, 2010), these authors were a part of the organisations setting up and evaluating such services – and more independent verification may be needed to develop a more robust evidence base. However, many of the rest of the recommendations have more of a ‘scattergun’ feel and are certainly a lot less focused or definitive. Indeed, the impression in the majority of the literature is of authors who have identified a problem and are then speculating on potential ways forward – rather than a series of studies which are able to point unambiguously to specific solutions. There is, however, general agreement that high quality decision-making is needed when deciding whether to admit an older patient to hospital care or not and that health care professionals in different parts of the system should be supported and trained to be able to do this more effectively than at present. These findings, though complex, have important implications for health research, policy, and practice which we will now go on to examine.

Implications of this Review

From this review of the literature it is clear that inappropriate emergency hospital admissions are highly complicated and, potentially, not currently very well understood. Given this is such a high profile policy and media issue, it is particularly surprising that there are so few UK studies setting out a formal rate of inappropriate admissions, and there is a an urgent need for more research.

Our review also suggests that different studies use different approaches to defining the rate of inappropriate admissions, finding different levels of inappropriateness in different local contexts. This is a highly important point: if the tools and methods used to categorise an emergency admission then define ‘inappropriateness’ differently this will feed through into how many inappropriate admissions are understood to exist and the following analysis and

understanding of the situation within those specific hospitals and beyond. If our ability to even understand an admission as inappropriate is limited, then our ability to respond positively to the issues at stake is significantly curtailed. At present, some studies include a key role for the clinical judgement of local professionals (but often provide little detail on how decisions are made) while others use more structured tools (but pay insufficient attention to clinical expertise and the context of local services). Without much greater attention to the strengths and limitations of each approach, current debates are likely to be over-simplistic and limited in terms of their effectiveness. To be successful, future policy must surely pay much greater attention to the importance of local context, and this review suggests that there is unlikely to be a 'one size fits all' solution to an issue this complex. Many of the 'solutions' currently put forward also appear to lack rigour, based more on the informal assumptions of individual authors than on a detailed analysis of the pros and cons of alternative service models.

Above all, older people seem to be rarely involved in research into inappropriate admissions, and this seems a major gap. If policy and practice is to better understand how best to reduce the number of potentially inappropriate or avoidable admissions, it is difficult to imagine a way forward which does not involve some degree of engagement with older people themselves. Researchers, clinical experts and structured tools might all have a role to play in exploring the nature and scale of the issues at stake – but it is our contention that research, policy and practice must also engage directly with older people if local services are to stand a chance of understanding how people come to be admitted as emergencies, what alternatives might have been appropriate, and what might work better in the future. Overall, therefore, this review concludes that more research is needed to contribute additional evidence to highly topical policy and media debates, that local context is crucial in understanding the issues at stake, and that future research must engage meaningfully with the lived experience of people using services. The current research team is involved in a wider study which seeks to fill precisely this gap (Glasby et al., forthcoming) – but until these

limitations in the existing evidence are overcome, the search for potential solutions is likely to prove elusive.

Conclusion

This survey of the relevant literature has shown that emergency admissions are a complex topic, for which there are few, if any, straight-forward answers. Varying rates of inappropriateness across contexts allow for few comparisons, but instead highlight the critical need to take context into account when researching emergency admissions and suggesting possible practice and policy solutions. These varying rates in part rest upon the initial definition of in/appropriateness given in the literature, which is defined in two ways: using expert clinical perspectives or by using more structured clinical review instruments. Neither approach is perfect: the former rests on potentially opaque decision-making processes, inevitably subjective and partial, while the latter approach, though guided by more objective criteria, is arguably overly-simplistic, enjoys the benefit of hindsight and ignores the realities of what resources/alternatives were actually available to local practitioners. Future research needs to take these methodological concerns into account. Furthermore, this review has identified a crucial gap in the literature: patient perspectives are rarely included in research on inappropriate emergency admissions. This means a key perspective on why the patient ended up in the crisis situation of emergency admission is missing and the story of that admission is incomplete. Including the lived experience of patients may bring a better understanding of emergency admissions for older people, and whether and how more preventative measures can be put in place to avoid unnecessary admissions in future.

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Table 1: Rates of in/appropriateness in different localities

Author/Date	Location	Sample	Rate of In/Appropriateness
Beringer and Flanagan (1999)	Northern Ireland	1300 acute medical beds surveyed to identify patients from nursing homes admitted on one day in June 1996 and another single day in January 1997. 84 patients over the age of 65 from nursing homes admitted in June and 125 in January. Only asked in January if admission could have been avoided	9.6% of studied admissions deemed unnecessary (12/125 people)
Coast <i>et al</i> (1995, 1996)	South-west England	Two hospitals: 700 individuals in each. Centre 1: 64% were aged over 65 and of this group 41% were aged over 75. Centre 2: 58% aged over 65 and of this 33% aged over 75	In both centres, 20% of admissions were defined as inappropriate using a clinical review instrument (see below for further discussion). GP panel (1995 study): 9.8% - 15% (after looking at the 'inappropriate' cases themselves).
Houghton <i>et al</i> (1996)	Homerton Hospital, East London	572 admissions reviewed for their appropriateness (77% were aged 55 or over)	31% of admissions inappropriate
Leah and Adams (2010)	Broomfield Hospital, Chelmsford in Essex	666 patients seen between June and September 2009. They ranged in age from 60 – 103, but the majority were over 80	27% of the admissions could have been prevented by sending to a specialist geriatric team like the one discussed in this study
Littlechild and Glasby (2001)	South Birmingham	52 participants who responded to participation letter (self-selecting). These 52 people accounted for 63 emergency admissions during the period	All admissions deemed appropriate – but may still have been scope for longer-term preventative work

Mayo and Allen (2010)	Five primary care trusts in London	1814 patients seen between October 2009 and March 2010 (63% of sample aged 80 or over)	Overall, only 6% of patients needed immediate referral to the ED
McDonagh <i>et al</i> (2000)	Systematic review (UK and international)	Articles found through a literature search in English using MEDLINE, Health Star, HMIC, and the Cochrane Library CD-ROM for the years 1988 – 1998. The bibliographies of included studies were also searched. Studies had to assess use of acute hospital beds to be included.	20% of admissions deemed inappropriate in studies specifically relating to older people (for the population overall, the range was between <1 and 30%)
Menon <i>et al</i> (2000)	Royal Berkshire and Battle Hospitals, in Reading	A random sample of 261 of the 447 patients over 80 admitted as general surgical emergencies was studied (median age 84)	9% of admissions to the surgical ward (24 patients) were deemed inappropriate
Mytton <i>et al</i> (2012)	Royal Berkshire hospital, Reading	January – February 2011. 131 admissions reviewed (median age 84)	20.6% - 32.0% of admissions were avoidable, depending on who was making/which tool was being used to make the decision
Tsang and Severs (1995)	Queen Alexandra Hospital, Portsmouth	146 admissions analysed in May 1993 (age range 67 – 100, with 79% over 75 and 34% over 85)	According to consultants: 13% of admissions inappropriate According to the AEP: 11% of admissions inappropriate

Table 2: Defining inappropriateness

Author/Date	Method of Defining In/Appropriateness
Beringer and Flanagan (1999)	Opinion of a local assessing doctor.
Coast <i>et al</i> (1995, 1996)	Intensity-Severity-Discharge Review System with Adult Criteria (ISD-A). In the 1995 paper, GPs then commented on those cases perceived to be inappropriate according to the ISD-A
Houghton <i>et al</i> (1996)	Appropriateness Evaluation Protocol (AEP)
Leah and Adams (2010)	The opinion of the Assessment Team for Older People
Littlechild and Glasby (2001)	Older people commented as to whether their admission was the result of their medical condition, social and living conditions, formal, or informal support. The opinions of GPs and social workers also sought
Mayo and Allen (2010)	Opinion of the Rapid Response Team
McDonagh <i>et al</i> (2000)	N/A: systematic review of the methods used to define appropriateness, including the IDS-A and the AEP
Menon <i>et al</i> (2000)	The researchers themselves, who judged in their professional capacity as surgeons
Mytton <i>et al</i> (2012)	Opinions of two consultant geriatricians and one GP
Tsang and Severs (1995)	AEP and also the opinion of one of six participating consultants

Table 3: Proposed solutions to inappropriate admissions

Author/Date	Proposed Solutions to Inappropriate Admissions
Beringer and Flanagan (1999)	More support for GPs in providing appropriate medical care for older people; enhanced investment in community services; and reinvestment in acute hospital care for older people
Coast <i>et al</i> (1995, 1996)	More funding for alternatives to hospital (for example, GP beds and urgent outpatient assessment)
Houghton <i>et al</i> (1996)	Better liaison between health and social services and more timely provision of community care services; more non-acute bed provision (or an acceptance that acute beds are actually a mixture of acute and non-acute).
Leah and Adams (2010)	Further evaluation of teams like the Assessment Team for Older People described and further investment in their creation in hospitals around the country
Littlechild and Glasby (2001)	Broad range of potential solutions, including: more preventative work with older people to prevent falls, improve the detection of

	<p>established illnesses and to help people manage and treat identified illnesses more effectively; health and social care services need to work more closely together; preventative social work strategies for those needing only small amounts of support at an earlier stage than they might have been referred; more integrated service delivery to users; and more communication and information about where people can go for help.</p>
Mayo and Allen (2010)	<p>More investment in such Rapid Response teams as the one described</p>
McDonagh <i>et al</i> (2000)	<p>Suggests greater methodological clarity and transparency when studies are written up so that results can be better compared and understood; also suggests not using subjective opinion to judge appropriateness of admission and length of stay. For older people specifically, more intense outpatient services or sub-acute beds could be provided. Continued research is needed to produce definitive conclusions.</p>
Menon <i>et al</i> (2000)	<p>No detail given on how to reduce inappropriate admissions</p>
Mytton <i>et al</i> (2012)	<p>High quality, integrated decision-making at admission and across health and social care services; changing the view that hospital is the default care setting; investing in community services to provide viable alternatives; and further education for patients who have long-term illnesses so they can better manage their condition</p>
Tsang and Severs (1995)	<p>Patients being offered outpatient or domiciliary visit assessment; better placing of patients within the hospital; more patient education around understanding and accessing what services are available to them; and continued monitoring of rates of in/appropriate admission locally and nationally. If an admission is quickly judged inappropriate there should be swift action to discharge the patient with a suitable care package</p>

Appendix A: Literature Review Search Terms

Term 1 – Emergency admissions

Keywords:

- Emergency admissions*
- Admission*
- Patient admission*

Descriptors:

- Patient emergency admission
- Admission rates
- Patient admission
- Emergencies?
- Hospitalization

Term 2 - Elderly

Keywords:

- Elderly*
- Geriatric*
- Old*

Descriptors:

- Aged
- Aged 80 and over
- Frail elderly
- Frail elderly people
- Elderly people with disabilities
- Elderly people with handicaps
- Elderly people with hearing impairments
- Elderly people with mental disorders
- Elderly people with physical disabilities
- Elderly people with visual impairments
- Elder
- Elderly
- Elderly-
- Elderly-men
- Elderly-patients
- Elderly-people
- Elderly-persons
- Elderly-women
- Geriatric
- Geriatric-patients
- Geriatrics
- Geriatrics-
- Old
- Old-age
- Older
- Older-people

- Older-women
- Elderly disabled people (de)
- Elderly-mental-infirm-people (de)
- Elderly-mentally-ill-patients (de)
- Dementia

Term 3 - Appropriateness

Keywords:

- Appropriate*
- Inappropriate*
- Prevent*
- Unnecessary

Descriptors:

- Appropriateness of care
- Preventative measures
- Unnecessary procedures

Appendix B: Pro Forma

Assessing the Quality of Research – Pro Forma

Article number:

NSF Type:

Authors and Year	
Brief summary	
Location and sample	
Main findings (rate of appropriate/inappropriate emergency admissions)	
Definition of appropriate/inappropriate	
Solutions proposed	
Inclusion of practitioner views?	
Inclusion of the views of older people or their families?	

Appendix C: National Service Framework for Older People

A1 Systematic reviews which include at least one Randomised Control Trial (RCT) (eg Systematic Reviews from Cochrane or Centre for Reviews and Dissemination)

A2 Other systematic and high quality reviews which synthesise references

B1 Individual RCTs

B2 Individual non-randomised, experimental/intervention studies

B3 Individual well-designed non-experimental studies, controlled statistically if appropriate; included studies using case control, longitudinal, cohort, matched pairs, or cross-sectional random sample methodologies, and well-designed qualitative studies; well-designed analytical studies including secondary analysis

C1 Descriptive and other research or evaluation not in B (eg convenience samples)

C2 Case studies and other examples of good practice

D Summary review articles and discussions of relevant literature and conference proceedings not otherwise classified

P Professional opinion based on clinical evidence, or reports of committees

U User opinion

C Carer Opinion

Appendix D: Synthesis Table

All the data gathered on each study

Author/Date	Location	Sample	Method of Defining In/Appropriateness	Rate of Inappropriate Admission	Proposed Solutions to Inappropriate Admissions
Beringer, T.R.O. and Flanagan, P. 1999	Northern Ireland	1300 acute medical beds surveyed to identify patients from nursing homes admitted on one day in June 1996 and another single day in January 1997. 84 patients over the age of 65 from nursing homes admitted in June and 125 in January. Only asked in January if admission could have been avoided	Opinion of a local assessing doctor	9.6% of studied admissions deemed unnecessary (12/125 people)	More support for GPs in providing appropriate medical care for older people; enhanced investment in community services; and reinvestment in acute hospital care for older people
Coast et al (1995, 1996)	South-west England	Two hospitals: 700 individuals in each. Centre 1: 64% were aged over 65 and of this group 41% were aged over 75. Centre 2: 58% aged over 65 and of this 33% aged over 75	Intensity-Severity-Discharge Review System with Adult Criteria (ISD-A). In the 1995 paper, GPs then commented on those cases perceived to be inappropriate according to the ISD-A	In both centres, 20% of admissions were defined as inappropriate using a clinical review instrument (see below for further discussion) GP panel (1995 study): 9.8% - 15% (after looking at the 'inappropriate' cases themselves)	More funding for alternatives to hospital (for example, GP beds and urgent outpatient assessment)
Houghton et al (1996)	Homerton Hospital, East London	572 admissions reviewed for their	Appropriateness Evaluation Protocol (AEP)	31% of admissions inappropriate	Better liaison between health and social

		appropriateness (77% were aged 55 or over)			services and more timely provision of community care services; more non-acute bed provision (or an acceptance that acute beds are actually a mixture of acute and non-acute).
Leah and Adams (2010)	Broomfield Hospital, Chelmsford in Essex	666 patients seen between June and September 2009. They ranged in age from 60 – 103, but the majority were over 80	The opinion of the Assessment Team for Older People	27% of the admissions could have been prevented by sending to a specialist geriatric team like the one discussed in this study	Further evaluation of teams like the Assessment Team for Older People described and further investment in their creation in hospitals around the country
Littlechild and Glasby (2001)	South Birmingham	All patients aged 65 or over registered to one of the GP Commissioning Project practices who were admitted to the University Hospital Trust in an emergency between December 1997 – March 1998 eligible: 52 responded to participation letter (self-selecting). 29 women; 23 men. 20 people 65 – 74; 25 people 75 – 84; 7 people 85 or over. Everyone white European and a native English speaker. These 52 people accounted for 63 emergency admissions during the	Older people commented as to whether their admission was the result of their medical condition, social and living conditions, formal, or informal support. The opinions of GPs and social workers also sought	26 admissions deemed avoidable (41%).	Broad range of potential solutions, including: more preventative work with older people to prevent falls, improve the detection of established illnesses and to help people manage and treat identified illnesses more effectively; health and social care services need to work more closely together; preventative social work strategies for those needing only small amounts of support at an earlier stage than they might have been referred; more integrated

		period.			service delivery to users; and more communication and information about where people can go for help.
Mayo and Allen (2010)	Five primary care trusts in London	1814 patients seen between October 2009 and March 2010 (63% of sample aged 80 or over)	Opinion of the Rapid Response Team	Overall, only 6% of patients needed immediate referral to the ED	More investment in such Rapid Response teams as the one described
McDonagh et al (2000)	Systematic review (UK and international)	Articles found through a literature search in English using MEDLINE, Health Star, HMIC, and the Cochrane Library CD-ROM for the years 1988 – 1998. The bibliographies of included studies were also searched. Studies had to assess use of acute hospital beds to be included.	N/A: systematic review of the methods used to define appropriateness, including the IDS-A and the AEP	20% of admissions deemed inappropriate in studies specifically relating to older people (for the population overall, the range was between <1 and 30%)	Suggests greater methodological clarity and transparency when studies are written up so that results can be better compared and understood; also suggests not using subjective opinion to judge appropriateness of admission and length of stay. For older people specifically, more intense outpatient services or sub-acute beds could be provided. Continued research is needed to produce definitive conclusions.
Menon et al (2000)	Royal Berkshire and Battle Hospitals, in Reading	A random sample of 261 of the 447 patients over 80 admitted as general surgical emergencies was studied (median age 84)	The researchers themselves, who judged in their professional capacity as surgeons	9% of admissions to the surgical ward (24 patients) were deemed inappropriate	No detail given on how to reduce inappropriate admissions
Mytton et al (2012)	Royal Berkshire hospital, Reading	January – February 2011. 131 admissions reviewed	Opinions of two consultant geriatricians and one GP	20.6% - 32.0% of admissions were avoidable,	High quality, integrated decision-making at admission and

		(median age 84)		depending on who was making/which tool was being used to make the decision	across health and social care services; changing the view that hospital is the default care setting; investing in community services to provide viable alternatives; and further education for patients who have long-term illnesses so they can better manage their condition
Tsang and Severs (1995)	Queen Alexandra Hospital, Portsmouth	146 admissions analysed in May 1993 (age range 67 – 100, with 79% over 75 and 34% over 85)	AEP and also the opinion of one of six participating consultants	According to consultants: 13% of admissions inappropriate According to the AEP: 11% of admissions inappropriate	Patients being offered outpatient or domiciliary visit assessment; better placing of patients within the hospital; more patient education around understanding and accessing what services are available to them; and continued monitoring of rates of in/appropriate admission locally and nationally. If an admission is quickly judged inappropriate there should be swift action to discharge the patient with a suitable care package