What evidence is there for the identification and management of frail older people in the emergency department? A systematic mapping review

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Scientific summary

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Scientific summary

Background

Emergency departments (EDs) are facing unprecedented levels of demand. There are numerous causes of the increase in demand, including the increase in the proportion of older people in the population of the UK. The population of the UK is ageing and older people represent a particular challenge to the ED, as those older people who are frail or at high risk of negative outcomes will require management that considers their frailty alongside their presenting complaint. How to identify these older people as frail and how to best manage them in the ED is a major challenge for the health service to address. Being able to better identify and manage these patients is likely to have benefits for both individual and health service outcomes. Therefore, it is timely and relevant to undertake a review of the published evidence to examine the interventions that exist to identify frail and high-risk older people when they present at the ED, to see if there are standard ways to identify older people as frail, and also to examine interventions to manage frail older people and the outcomes that they may influence.

Objective

The objective of the review was to answer the following research questions:

- What is the evidence for the range of different approaches to the management (identification and service delivery interventions) of frail older people within the ED?
- Is there any evidence of their potential and actual impact on health service and patient-related outcomes, including impacts on other services used by this population and health and social care costs?

Methods

Protocol development

The review was guided by a protocol developed by the team at the School of Health and Related Research at the University of Sheffield, led by the lead review author. The protocol was shared with our internal team and our clinical experts as well as with the National Institute for Health Research Health Services and Delivery Research (HSDR) team. The final protocol was produced in June 2016 and registered with the international database of prospectively registered systematic reviews (PROSPERO).

Literature search

The search for evidence was conducted in three stages.

Stage 1

An initial search (in May 2016) was undertaken of the database of references retrieved for a previous review undertaken by the research team on emergency and urgent care, which was supplemented by a scoping search of MEDLINE (2005–16).

Stage 2

The second stage of the search (in July 2016) covered a wider range of health and medical databases using an improved version of the MEDLINE scoping search. Databases searched were EMBASE, The Cochrane Library, Web of Science, Cumulative Index to Nursing and Allied Health Literature, Health Management Information Consortium and PROSPERO.

Stage 3

The third stage of the search (in autumn 2016) involved scrutiny of reference lists of included papers and relevant reviews, plus citation searching of studies that included a frail or high-risk population.

Study selection

References identified by the literature search were uploaded into EndNote reference management software (version 8; Clarivate Analytics, Philadelphia, PA, USA) for study selection. Screening of titles/abstracts and full texts against the review inclusion criteria was undertaken by three reviewers (LP, AC and DC). Two reviewers screened 50% of the records each and then, to check the screening consistency of the reviewers, a third reviewer screened approximately 50% of the references from each reviewer and a kappa coefficient was calculated. Uncertainties were discussed until a consensus was reached, with reference to a fourth reviewer (JT) when necessary. Review articles that met the inclusion criteria and background articles were also identified in the screening process.

The review inclusion criteria were:

- population
  - aged ≥ 65 years or described as frail or high-risk older people
- intervention
  - to either identify or manage (or both) frail or high-risk older people in the ED
- outcome
  - patient or health service outcomes as the result of a specific intervention
  - patient opinions and experiences of specific interventions
- setting
  - delivered within the ED or in units embedded in the ED
- study type
  - peer-reviewed evidence, published from 2005 to 2016
  - evidence from qualitative and quantitative studies relating to specific interventions
  - English-language evidence from Organisation for Economic Co-operation and Development countries to ensure comparability.

Study classification

Following the screening process, a list of included studies was drawn up. Full-text papers were obtained for all of the included studies. An examination of titles, abstracts and full texts was undertaken. As this review was a systematic mapping review, it was important to classify the evidence in order to develop a better understanding of the evidence base. It became clear that there was not a clear definition of the population of frail older people, so the review would need to include evidence on a wider population of older people (generally aged > 65 years). In addition, this classification allowed the review team to divide articles into two categories: (1) those looking at the identification of frail older people or older people at high risk and (2) those looking at service delivery interventions to better manage older people and frail older people in the ED.

Data extraction

Single data extraction was undertaken by one of four reviewers (AC, LP, DC and FC) in order to meet the review deadline. A standardised approach was used and a data extraction form was developed for all of the three types of data extraction undertaken. These were:

1. full data extraction for all studies on population groups defined as frail older people or older people at 'high risk' by the study authors
2. brief data extraction for all studies on a population of older people, normally aged > 65 years, without any specific risk criteria
3. brief data extraction for all relevant (systematic or other) reviews that met our inclusion criteria.

All of these data extraction tables were tested and refined by the review team. When it was clear that a conference abstract was related to a study that was published later, these were extracted together in a combined data extraction.

Assessment of the evidence base

As the review was a mapping review, formal quality assessment of individual studies, according to a checklist, was not undertaken. Instead, we carried out a bespoke assessment of the evidence base mapped in our review using three methods:

1. an examination of the research designs used and the strengths and limitations of those designs
2. an examination of the self-reported limitations included in the articles relating to frail or high-risk older people
3. an assessment of the relevance of the evidence to the contemporary UK NHS setting.

Synthesis

Data were extracted and tabulated and summary tables were created. These were used to inform the narrative synthesis. Because of the heterogeneity of study interventions and outcomes, it was not possible to undertake any formal meta-synthesis. Data were synthesised by intervention type – interventions to identify older people at risk of frailty and adverse outcomes and service delivery-type interventions.

Results

The evidence base

- In total, 103 peer-reviewed articles/conference abstracts reporting primary research and 17 systematic reviews were included in the mapping review.
- Ninety data extractions were undertaken on the 103 articles/conference abstracts.
- Fifty-seven studies included a population of older people and 32 included a population that was described as frail and/or at high risk.
- The population of frail older people is not reported consistently in the literature. Some articles/conference abstracts defined their study population as frail or high-risk older people, others used an age criteria threshold (> 65 years, > 75 years, etc.) to define older people and a number defined their population as older/geriatric.
- Fifty-three of the studies were focused on service delivery interventions and 37 on identifying frail or high-risk older people.
- The majority of the 90 studies were undertaken in the USA ($n = 27$), the UK ($n = 14$) and Australia ($n = 10$), with the UK studies appearing to have more of a specific focus on frail or high-risk older people.
- A wide range of study types was reported.

Table a maps the evidence base identified in this review.

TABLE a Overview of the evidence base (by studies)

Population	Frail or high-risk older people ($n = 33$)	
	Older people ($n = 57$)	
Interventions	To identify frail or high-risk older people ($n = 37$)	Diagnostic tools to screen for frailty-related issues ($n = 7$)
		Prognostic tools to measure risk of adverse events in the ED ($n = 5$)
		Diagnostic tools to identify frailty ($n = 7$)
		Prognostic tools to measure risk of adverse events on discharge ($n = 18$)
	To manage frail and older people in the ED ($n = 53$)	Changes to ED staffing ($n = 21$)
		Changes to the physical infrastructure ($n = 11$)
	Other interventions ($n = 3$)	Changes to how care is delivered ($n = 18$)
Outcomes	Patient outcomes	ADL decline; appropriate/correct admission/discharge/referral; appropriate/correct diagnosis; appropriate/correct medication; frailty; long-term care placement; morbidity; mortality; return to home (for how long?); and satisfaction with the ED
	Health service outcomes	Admission to acute care; admissions avoided; attendance or reattendance at the ED; bed occupancy rates; costs/resource utilisation; discharge rates; ED returns/readmissions; ED waiting times; and length of stay

ADL, activities of daily living.

Identification of frail/high-risk older people

Thirty-seven studies (40 publications) dealt with strategies aimed at identifying patients with frailty or distinguishing higher- from lower-risk patients in the ED. The great majority of these studies assessed the diagnostic or prognostic accuracy of tools using a prospective or retrospective cohort design. These are presented in *Table b*. Only one UK study was identified.

Seven studies of diagnostic tools to identify frailty and seven studies of tools to screen for specific frailty-related issues were identified. Overall, the evidence base was limited. None of the tools has been evaluated extensively and differences in terminology make it unclear whether or not different studies are examining the same phenomenon. In addition, individual studies have different methodological features and settings.

Other studies evaluated tools for their ability to predict the risk of adverse events either in the ED or following discharge (prognostic accuracy). The five studies considering adverse events in the ED all used different tools. These tools assessed the short-term outcomes of older patients attending the ED.

TABLE b Evidence on tools to identify frailty

Type of tool	Publications (*n*)
Diagnostic tools to identify frailty	9
Diagnostic tools to screen for frailty-related issues	7
Prognostic tools to measure risk of adverse events in the ED	5
Prognostic tools to measure risk of adverse events on discharge	19

Eighteen studies (19 publications) evaluated tools to predict the risk of adverse events following discharge, with follow-up periods ranging from 28 days to 12 months. The well-established Identification of Seniors at Risk (ISAR) tool and triage risk screening tool (TRST) were most frequently evaluated, but a number of newer tools were evaluated in single studies. None of these studies was performed in the UK.

Overall, the evidence on tools to support the identification and management of patients with frailty in the ED is extensive but inconclusive. ISAR and TRST are the most extensively evaluated tools but many other tools are available, including non-question-based tests and tools using administrative data. Limitations of the included studies include the small sample sizes, that most were conducted at a single centre and that many were published as conference abstracts with limited details provided. Contradictory results obtained in different prognostic studies using the same tool reflect the fact that outcomes, such as repeat ED visits and hospital admission, will be influenced by the health and care system as well as by patient factors. Hence, the results of studies performed in one country cannot be readily generalised to other countries. The lack of UK studies in this body of evidence limits the relevance of the evidence to UK NHS settings.

Managing (frail) older people in the emergency department

Studies of service delivery interventions were divided into four categories, presented in *Table c*.

The service delivery intervention studies reported a wide variety of (mostly patient-related) outcomes. Determining which interventions were targeted at the frail older people and which were targeted at a general older population was challenging. The evidence shows a general pattern of increased discharge rates, reduced ED admission and reduced length of stay for those admitted when receiving a service delivery intervention.

Review-level evidence

The review-level evidence that we identified confirmed the findings of our review. Interventions and screening tools were heterogeneous and outcomes measured in individual studies were highly variable. Key messages emerging were that some screening tools demonstrated diagnostic validity, that ED utilisation could be reduced by specific interventions and that improving the intensity and consistency of interventions is essential when assessing effectiveness.

Limitations

This review was a mapping review and did not aim to measure the effectiveness of interventions. In addition, formal quality assessment of individual studies was not undertaken; instead, the overall evidence base was assessed using a bespoke method.

TABLE c Service delivery interventions for frail and older people

Category	Details and example	Publications (*n*)
Changes to ED staffing	Adding specific staff to the MDT with responsibility for older patients (e.g. geriatric liaison nurse) or restructuring or developing teams to improve care delivery (e.g. CCT)	26
Changes to the physical infrastructure	Making the ED more 'frail friendly', establishing specific units in the ED for older patients or creating GEDs	12
CGA	Multifaceted screening/assessment and planning of older people's care	22
Individual studies	Not replicated elsewhere	3

CCT, care co-ordination team; CGA, comprehensive geriatric assessment; GED, geriatric emergency department; MDT, multidisciplinary team.

Conclusions

There is an extensive but inconclusive evidence base for tools to identify frail and at-risk older people. These tools have not been tested in the UK and are variable in their outcomes. Service delivery interventions demonstrate a general trend towards reduced admissions, reduced ED reattendance and improved discharge rates. However, the evidence base was mixed in terms of interventions and the outcomes that they measured and assessing which outcomes are important to patients and which are important to the health service.

Future research should attempt to assess the relative effectiveness of interventions as well as their acceptability to patients. It would also be interesting to measure outcomes in the short and medium term, to better understand issues around avoiding admissions. As the population becomes older, it would be of use to compare the acceptability and outcomes of services dedicated to older people with the acceptability and outcomes of tailoring all services to better meet the needs of an ageing and potentially frail population.

Study registration

This study is registered as PROSPERO CRD42016043260.

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