NIHR133884: Reducing unplanned hospital admissions from care homes: an extended and enhanced systematic review (protocol)

ADMINISTRATIVE INFORMATION

Reducing unplanned hospital admissions from care homes: an extended and enhanced systematic review (Review Protocol)

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Contributions
Duncan Chambers: Principal investigator and lead author; Anna Cantrell: Information specialist, reviewer and PPI lead; Louise Preston: Reviewer; Carl Marincowitz: Topic expert and additional reviewer; Cynthia Atkin: Patient/public representative; Simon Conroy: Topic expert; Adam Gordon: Topic expert. Duncan Chambers is the guarantor for the data.

Amendments

Version	Date	Comments
Original (first) version	28/10/2021	Draft for funder approval
Approved final version	26/11/2021	PROSPERO registration added

INTRODUCTION

Rationale
Care home residents include a high proportion of people with complex health and care needs, including frailty and dementia[1]. Consequently, they are at high risk of experiencing unplanned hospital admissions through the urgent and emergency care (UEC) system. While they are sometimes appropriate, such admissions can be distressing for the residents, their families and friends, and care home staff, and costly. A report by the Health Foundation concluded that around 40% of unplanned admissions from care homes may be avoidable (conditions potentially manageable outside hospital or possibly caused by poor care or neglect)[2]. In-hospital mortality following unplanned admission is high (up to 34% in a 2014 systematic review) despite specialist emergency care[3].

Interventions to reduce unplanned admissions from care homes or the community can potentially be implemented at various points in the health and social care system[4]. The University of York Centre for Reviews and Dissemination (CRD) conducted an evidence review on the topic for Northumberland Clinical Commissioning Group (CCG) in 2014[5]. This review focused on evidence related to community geriatrician services, case management, discharge planning, integrated working between primary care and care homes, medicines management, the prevention of delirium and end-of-life care. A systematic review of interventions to reduce admissions from care homes was published by Graverholt et al. around the same time as the CRD report[6]. The review included four systematic reviews and five primary studies, covering 11 different interventions. Interventions were categorised as interventions to structure or standardise clinical practice; geriatric specialist services; and influenza vaccination. We are not aware of any subsequent broad reviews of this topic.

The need for an update is justified by the publication of a substantial volume of new research since 2014. An initial scoping search of Medline, the Cochrane Library and CINAHL

(January 2014 to January 2021) identified 647 unique references. Additional references were identified by members of the review team.

Action to reduce unnecessary and/or unhelpful/potentially harmful unplanned admissions is an important priority for the NHS. This review is also timely in the light of the recent UK Government White Paper Integration and Innovation, which aims to promote greater co-operation between health and social care[7]. The current COVID-19 pandemic further demonstrates the need for health and social care systems to work together.

Relevant interventions may be delivered in care homes, NHS settings or a mixture of the two and may involve many different health and social care professionals. This means that the research evidence identified and synthesised in this review is of key importance in enabling further development of integrated working between health and social care as the White Paper is implemented.

Objectives
This project entails a systematic review and synthesis of recent research on interventions to reduce unplanned hospital admissions of care home residents. The overall research questions are:

- What interventions are used in the UK health and social care system to minimise unplanned hospital admissions of care home residents (including, and extending beyond, the interventions covered in the CRD briefing)?
- What candidate interventions, used in other applicable settings, could potentially be used in the UK?
- What can we learn from research studies and 'real-world' evaluations about the effects of such interventions on admissions?
- What is known about the feasibility of implementing such interventions in routine practice and their acceptability to care home residents, their families and staff?
- What is known about the costs and value for money associated with these interventions?

Specific objectives are:
- To perform a robust and systematic search for published evidence and UK grey literature
- To select evidence for inclusion based on pre-specified criteria

- To evaluate the methodological quality and risk of bias of included studies
- To develop a narrative synthesis of the evidence around the pre-defined research questions, including an assessment of the overall strength of the evidence base, implications for service provision and evidence gaps/research priorities
- To perform meta-analysis for any outcomes for which sufficient data are available
- To publish a peer-reviewed report of the findings and develop other outputs to communicate the findings to target audiences including health and social care decision-makers, practitioners and the public (including care home residents and their families)
- To involve members of the public and care home staff throughout the project.

METHODS

Eligibility criteria

Population/participants

The population of interest is residents in care homes for older people. Studies in which the main participants belong to other groups (for example, families and social networks of residents; care home staff; other health and social care professionals providing services for care home residents; and health and social care policy makers/service commissioners) will be included if they meet the other criteria with a focus on reducing residents' unplanned hospital admissions. We will also include residents in assisted living or extra-care housing (with a wide range of services available on-site).

Given their different circumstances and care needs, we propose to exclude studies involving residential care for children/young people and vulnerable working age adults (e.g. people with learning disabilities). Studies of older adults living in the community, including sheltered housing and those receiving care at home, will also be excluded.

Interventions

We will include interventions that map to the taxonomy below (Table 1) and meet the other criteria. This taxonomy (based on the CRD report and other relevant literature) is provisional

and will be finalised in the early stages of the project following initial scoping and consultation with stakeholders.

Table 1: Taxonomy of relevant interventions

Event/process	Setting	Example interventions	Comments
Regular assessment	Care home	Community geriatrician services Case management	CM initiated in hospital or community
Primary care response	Care home	Integrated working	
Training and workforce development	Care home	Training courses; vocational/educational qualifications	
Dealing with specific problems	Care home	Prevention of delirium Medicines management Hydration and nutrition	
Transport to ED	Pre-hospital	Non-conveyance/specialist paramedic assessment	
Admission	ED	Specialist geriatric in-reach/discharge service	
Discharge	Hospital	Discharge planning Case management	To prevent readmission
End of life care	Care home	Advance care planning	

Comparator/Control

Optimally, included studies will compare an intervention with an alternative (such as continuing current practice) using an experimental (e.g. a cluster randomised trial comparing two groups of care homes)[8] or quasi-experimental (e.g. interrupted time series) design. We will also include before/after studies with a control setting and non-comparative qualitative or mixed-methods studies.

Outcomes

The primary outcomes are measures of impact on unplanned admissions among care home residents (for example, absolute numbers or statistical effect measures from comparative studies); perceived feasibility of implementing the intervention in UK settings

(barriers/facilitators); and acceptability to care home residents, their families and staff involved in delivering the intervention. Secondary outcomes include costs/resource use and any measure of 'cost-effectiveness' (value for money). Patient-reported outcome measures (PROMs, i.e. those reported directly by the patient or carer without interpretation by clinicians or others) will also be included where available.

Study types

We will include studies of any design providing data on the outcomes of interest. This includes:

- quantitative research studies of any design
- qualitative research involving interviews, focus groups etc.
- mixed-methods studies
- service evaluations from the UK only
- UK-relevant guidelines, policy documents and grey literature.

We will also include systematic and narrative literature reviews where relevant and if there is limited duplication from the included primary research.

Settings

The setting of interest is the UK social care and health system. Studies from other high-income countries (as defined by the World Bank) will be included but the evidence will be synthesised separately and assessed for relevance to the UK context. We will pilot the use of the FITAR (Framework for Intervention Transferability Applicability Reporting) tool[9] for this purpose.

Additional exclusion criteria

Editorials, commentaries, opinion surveys, news and discussion articles, books, book chapters, theses and conference abstracts will be excluded, as will articles in languages other than English.

Review strategy

Study selection, data extraction and quality assessment will be carried out in two stages. The first phase will characterise the evidence base and identify gaps/areas for additional focused searching if required.

Information sources

A broad search to identify published and peer reviewed literature on interventions to reduce unplanned admissions from care homes in the United Kingdom and other high income countries will be conducted, including a search for relevant grey literature..

The search strategy will include thesaurus and free-text terms and relevant synonyms for the population (residents in care homes for older people) and intervention (interventions to reduce unplanned admissions and named interventions) and will use proximity operators where appropriate. Search terms will then be combined using Boolean operators appropriately. Outcome terms will not be included in the search as outcomes information is not always included in title or abstracts meaning that including these could mean that relevant studies would potentially not be retrieved.

Once agreed among the research team, the search strategy on MEDLINE will be translated for use in the other major medical and health-related bibliographic databases. The search is limited to research published in English from 2014-Current to reflect developments since the previous review. Methodological search filters will not be utilised to keep searching broad and ensure all relevant study types were retrieved.

For the review, the following electronic databases will be searched: Cumulative Index to Nursing and Allied Health Literature (CINAHL) (EBSCO), MEDLINE (OvidSP), EMBASE (Ovid), PsycInfo (Ovid), Cochrane Central Register of Controlled Trials and Cochrane Database of Systematic Reviews and Science and Social Sciences Citation Indexes (Web of Science), Health Management Information Consortium (HMIC), Social Care Online (Social Care Institute for Excellence), and Social Service Abstracts (ProQuest).

Targeted 'grey' literature searches will be carried out to identify reports, guidelines and policy advisory produced by The Health Foundation, Nuffield Trust, Department of Health

and Social Care Guidelines and other relevant UK-based organisations. Relevant databases such as OpenGrey will also be searched and stakeholders will be asked to identify additional relevant sources. Reference and citation searching of included studies and relevant existing reviews will also be completed.

Search strategy

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations and Daily <1946 to October 26, 2021>
Search Strategy:
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1   residential facilities/ or homes for the aged/ or nursing homes/ (47574)
2   "residential care".ab,ti. (3722)
3   "care home*".ab,ti. (4656)
4   "nursing home*".ab,ti. (32311)
5   1 or 2 or 3 or 4 (63398)
6   exp *aged/ or exp *geriatrics/ or exp *geriatric nursing/ or (centarian* or centenarian* or elder* or eldest or frail* or geriatri* or nonagenarian* or octagenarian* or octogenarian* or old age* or older adult* or older age* or older female* or older male* or older man or older men or older patient* or older people or older person* or older population or older subject* or older woman or older women or oldest old* or senior* or senium or septuagenarian* or supercentenarian* or very old*).ti,kf. (304032)
7   5 or 6 (350931)
8   Patient Admission/ (25698)
9   (unplanned adj3 (admission* or hospital*)).ab,ti. (2615)
10   (avoidable adj3 (admission* or hospital*)).ab,ti. (936)
11   "community geriatric* service*".ab,ti. (8)
12   Case Management/ (10360)
13   "case management".ab,ti. (11373)
14   (discharg* adj3 plan*).ab,ti. (5334)
15   "Delivery of Health Care, Integrated"/ (13673)
16   (integrated adj3 (working or care)).ab,ti. (11966)
17   Delirium/pc [Prevention & Control] (1222)
18   (prevent* adj3 deliri*).ab,ti. (1156)
19   ((medicine* or medication*) adj3 (manag* or monitor*)).ab,ti. (15616)
20   Terminal Care/ (30073)
21   "terminal care".ab,ti. (1547)
22   "end of life care*".ab,ti. (10821)
23   care, end of life.ab,ti. (125)
24   eol.ab,ti. (2181)
25   Advance Care Planning/ (3525)
26   "advance care planning".ab,ti. (3506)
27   Fluid Therapy/ (21104)
28   (hydration adj3 nutrition).ab,ti. (1146)

29	"non convey*".ab,ti. (41)
30	"specialist paramedic*".ab,ti. (7)
31	(paramedic* adj3 assess*).ab,ti. (191)
32	"training course* ".ab,ti. (5511)
33	((vocational or educational) adj qualification*).ab,ti. (790)
34	"hydration and nutrition".ab,ti. (230)
35	"geriatric* specialist".ab,ti. (40)
36	((influenza* or flu*) adj3 vaccin*).ab,ti. (26322)
37	or/8-36 (181239)
38	7 and 37 (13641)
39	exp animals/ (24733328)
40	humans/ (19828449)
41	39 not (39 and 40) (4904879)
42	38 not 41 (13635)
43	(comment or editorial or letter).pt. (2006981)
44	42 not 43 (13054)
45	limit 44 to english language (11847)
46	limit 45 to yr="2014 -Current" (5605)
47	Vaccination/ (89653)
48	covid-19 vaccines/ or influenza vaccines/ (30537)
49	((covid* or corona* or "SARS CoV 2") adj3 vaccin*).ab,ti. (9999)
50	47 or 48 or 49 (115618)
51	37 or 50 (277240)
52	7 and 51 (14570)
53	52 not 41 (14559)
54	53 not 43 (13880)
55	limit 54 to english language (12572)
56	limit 55 to yr="2014 -Current" (5958)
57	56 not 46 (353)

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Data management / data selection

Search results will be downloaded to a bibliographic management database (EndNote X9).
Records will be exported to EPPI-Reviewer systematic review software for coding and
analysis.

Selection process

Selection of studies for the review will be carried out in three stages. Records that are
obviously not relevant based on their title will be excluded by a single reviewer. Titles and
abstracts of remaining records will be screened by two reviewers independently using the
inclusion criteria above. Discrepancies will be resolved by discussion and, if necessary, by

reference to a third reviewer. Full-text items that appear potentially to meet the inclusion criteria will be obtained and evaluated by two reviewers independently, with disagreements resolved as above. Records of the process will be maintained in EPPI-Reviewer.

Data collection process
We will use EPPI-Reviewer for data extraction (coding). Data extractions will be checked for accuracy by a second reviewer and further informal checking will take place during the analysis and report writing process.

Data items
Data will be extracted from included studies using a customised set of codes covering the study characteristics, key findings/conclusions and strengths/limitations. Where applicable, data extraction will include a component analysis of the interventions implemented in included studies. We plan to use the TIDiER or TIDiER-Lite checklist for this purpose. We plan to use a suitable theoretical framework such as PARIHS (Promoting Action on Research Implementation in Health Services) to support extraction of relevant data from included implementation studies.

Quality Assessment
We will assess risk of bias for studies using recognised research designs with appropriate tools such as those developed by the Joanna Briggs Institute (JBI: https://jbi.global/critical-appraisal-tools). Although the JBI offers checklists for diverse study designs, we will use other checklists (e.g. the Cochrane risk of bias tool for randomised trials) if appropriate based on the characteristics of the included studies as advised by the review team. Assessments will be performed by two reviewers independently, with discrepancies resolved by consensus or referral to a third reviewer.

Data synthesis
Given the nature of the review question and the diverse interventions potentially included, we anticipate performing a mixed-method narrative synthesis. However, we will use meta-analysis to synthesise evidence where multiple controlled studies report effects of similar interventions on unplanned hospital admissions. We will classify interventions using a taxonomy based on that reported in Table 1 above modified to include any additional interventions identified by the literature search.

Studies dealing with implementation of interventions will be grouped separately. We anticipate that these will be mainly qualitative in design. The PARIHS framework conceptualises implementation as a function of evidence, context and facilitation, and we will prioritise these factors in synthesising the implementation evidence.

Meta-bias(es)
In view of the nature of the review question and the studies likely to be included, we do not expect to undertake quantitative assessments of publication bias.

Confidence in cumulative evidence
For each type of intervention included in the synthesis, we will assess the collective strength of evidence for its effectiveness in reducing unplanned admissions using a method based on that used by team members in previous projects[10]. This involves classifying evidence as 'stronger', 'weaker', 'very limited' or 'inconsistent', based on the number and design of relevant studies:

- 'stronger evidence' represents generally consistent findings in multiple studies with a comparator group design,
- 'weaker evidence' represents generally consistent findings in one study with a comparator group design and several non-comparator studies or multiple non-comparator studies,
- 'very limited evidence' represents an outcome reported by a single study and, finally,
- 'inconsistent evidence' represents an outcome for which < 75% of the studies agree on the direction of effect.

Evidence on effectiveness will be considered alongside that on feasibility, acceptability and 'cost-effectiveness' to assist decision-makers in forming an overall assessment of the value of the intervention. All studies included in the review will be included in the analysis of the overall strength of evidence, with no exclusions based on study design or risk of bias.

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