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Living well in Communities with Frailty

Evidence for what works

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Improvement Hub

Enabling health and social care improvement

NHS SCOTLAND

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Introduction

Frailty is the manifestation of ageing that is associated with poor outcomes. A person with frailty can experience serious adverse consequences following even a relatively minor illness. Its impact can be very significant in terms of consequent disability or admission to a nursing home. Timely identification of frailty, and targeting with appropriate evidence-based interventions, can help to reduce the likelihood of progression of frailty or poor outcomes and support the long-term management of people's health and wellbeing.

The literature on frailty is vast. This document was written to benefit health and social care commissioning. The specific focus of this document is evidence for interventions in frailty that are community based, focused on the prevention of harms or poor outcomes, and supported by relatively high-level evidence.

An initial search was conducted of systematic reviews grey literature by an information scientist. After discarding duplications and obviously irrelevant results, results were reviewed and interventions grouped thematically amongst the reviewing team. Papers relating to acute frailty interventions (those that take place in hospital) were discarded. Health service researchers reviewed these remaining papers and requested additional searches where necessary.

We created visual abstracts of each evidence summary, with icons to illustrate different concepts and the quality of the evidence base behind them (see visual abstract guide on page 5).

The abstracts include brief descriptions of each intervention and list their key benefits, with links to the evidence that supports those statements. Each intervention is given an evidence quality rating from 1–3. Cost ratings (from 1–3) are based on expert opinion due to the lack of information on costs in the literature. All of the abstracts include links to more detailed evidence summaries for each intervention.

We have included full-text links for all of the citations in the summaries, and for all of the documents in the references.

Visual abstract guide

Intervention

A brief definition of the intervention and a link to a summary of the evidence on the intervention.

Can

This reflects the potential benefits that can be derived from an intervention. Some of these benefits may only relate to a specific condition, such as chronic obstructive pulmonary disease (COPD), or a particular context. For each benefit there is a link to the review that supports this claim so that you can see any possible limitations on the transferability of the evidence.

Evidence quality

This reflects the quality of the studies on this intervention, and not the impact of the intervention (quality rating is from 1–3).

Cost

A rating for the cost of establishing and delivering a particular service (cost rating is from 1–3).

Frailty level

The level of frailty for which an intervention is appropriate. The levels of frailty are fit, mild, moderate and severe.

Further reading

A selection of key reviews and reports on the intervention.

Visual summaries

Exercise interventions and physical activity

Intervention

Includes aerobic, resistance, balance and flexibility training, as well as multi-component exercise regimes and Tai Chi.

Can

- Delay the progression to frailty
- Reduce the rate of falls and risk of falling
- Improve physical function
- Have a positive effect on fitness, activities of daily living and quality of life
- Improve muscle strength

Evidence quality

Cost

£

Frailty level

Fit, mild frailty

Further reading

- Effectiveness of interventions to prevent pre-frailty and frailty progression in older adults: a systematic review
- Effectiveness of exercise interventions on physical function in community-dwelling frail older people: an umbrella review of systematic reviews
- Recognising and managing frailty in primary care
- Exercise Interventions for Preventing Falls Among Older People in Care Facilities: A Meta-Analysis
- Dose-Response Relationships of Resistance Training in Healthy Old Adults: A Systematic Review and Meta-Analysis
- Physical Activity as a Preventative Factor for Frailty: The Health, Aging, and Body Composition Study
- Effective Exercise for the Prevention of Falls: A Systematic Review and Meta-Analysis

Polypharmacy review

Intervention

Polypharmacy is the simultaneous use of multiple medications and commonly defined as the use of five or more drugs. It has also been described as the use of more drugs than clinically indicated, the use of two or more medications to treat a single condition, and the use of two or more drugs of the same therapeutic classification.

Can

- Be used as a prevention and management strategy for frailty
- Reduce the risk of falls and improve medication use (when GPs receive training to improve medication use)

Evidence quality

Cost

£ £

Frailty level

Moderate to severe frailty

Further reading

- The relationship between Frailty and Polypharmacy in older people: a Systematic Review
- Promoting Health and Wellbeing in Later Life: Interventions in Primary Care and Community Settings

Immunisation

Intervention

Immunisation – There are effective vaccines which are recommended for people aged 65+, such as the influenza and pneumococcal vaccinations.

Can

- Reduce hospital admissions and mortality

Evidence quality

Cost

£

Frailty level

Moderate to severe frailty

Further reading

- Vaccination Programmes in Older People - BGS Best Practice Guide
- Effectiveness of Influenza Vaccine in the Community-Dwelling Elderly
- Efficacy and Effectiveness of Influenza Vaccines in Elderly People: A Systematic Review

Primary care interventions

Intervention

Primary care interventions, comprising case-finding (using a tool or otherwise) and subsequent initial assessment using the principles of comprehensive geriatric assessment (CGA), and an associated management plan involving a multidisciplinary team that meets regularly and includes a key contact who acts as a liaison with all health and social care partners.

Can

- Improve outcomes and avoid medical crises
- Reduce nursing home admission
- Reduce hospital admission

Evidence quality

★ ★ ★

Cost

£ £

Frailty level

Moderate to severe frailty

Further reading

- Recognising and managing frailty in primary care
- Fit for Frailty: consensus best practice guidance for the care of older people living in community and outpatient settings
- Promoting Health and Wellbeing in Later Life: Interventions in Primary Care and Community Settings

Community geriatric services

Intervention

Community geriatric services cover the period before a medical crisis, which may or may not result in admission to hospital, and after a medical crisis. They comprise a geriatrician-led multidisciplinary team which liaises with primary care (and potentially other agencies involved in a person's care), and CGA is undertaken and informs a tailored plan of treatment.

Can

- Improve functioning in physically frail older people living in the community (for home- and community-based occupational therapy)
- Reduce frailty through an individualised, person-centred approach which is as participatory as possible

Evidence quality

★ ★ ★

Cost

£ £ £

Frailty level

Moderate, severe

Further reading

- Home- and Community-Based Occupational Therapy Improves Functioning in Frail Older People: A Systematic Review
- Fit for Frailty: consensus best practice guidance for the care of older people living in community and outpatient settings

Addressing lifestyle factors

Intervention

Addressing lifestyle factors, for example physical activity, diet, obesity, smoking, and alcohol consumption.

Can

Provide health benefits and have a protective effect into retirement

Evidence quality

★ ★

Cost

£

Frailty level

Fit and mildly frail

Further reading

- Healthy behaviours yield major benefits in ageing
- Lifestyle, social factors, and survival after age 75: population based study
- Behavioural Risk Factors in Mid-Life Associated with Successful Ageing, Disability, Dementia and Frailty in Later Life: A Rapid Systematic Review

Nutritional interventions

Intervention

Nutritional interventions improve dietary intake, nutrient supplementation, oral vitamin supplementation, and single oral nutrient supplementation.

Can

- Increase physical activity, reduce long-term exhaustion and improve energy intake
- Prevent frailty progression
- Prevent fractures (for vitamin D and calcium supplementation)
- Result in a small but consistent weight gain in older people

Evidence quality

★ ★

Cost

£ £

Frailty level

Mild, moderate frailty

Further reading

- Effectiveness of Interventions to Prevent Pre-frailty and Frailty Progression in Older Adults: A Systematic Review
- Is nutrition important to postpone frailty?
- Vitamin D and vitamin D analogues for preventing fractures in post-menopausal women and older men (Review)
- Protein and energy supplementation in elderly people at risk from malnutrition

Hospital at home

Intervention

Hospital at home provides time-limited care in the patient's home for a condition that otherwise would require admission to hospital, avoiding hospital admission, or enabling early discharge.

Can

- Offer an effective alternative to acute inpatient care for a select group of elderly people and for a select group of presenting with acute exacerbations of COPD
- Reduce the likelihood of living in residential care at six months' follow-up when avoiding acute hospital admission
- Decrease treatment costs compared with admission to acute hospital when excluding caregiver costs
- Increase patient satisfaction
- Reduce readmission rates for a select group of acute exacerbations of COPD
- Reduce length of stay for people who can be safely discharged early from acute hospital

Evidence quality

★ ★ ★

Cost

£ £ £

Frailty level

Moderate, severe frailty

Further reading

- Admission avoidance hospital at home (Review)
- Hospital at home for acute exacerbations of chronic obstructive pulmonary disease
- Early discharge hospital at home

Reablement (including rehabilitation)

Intervention

Reablement (including rehabilitation) is a time-limited, multidisciplinary intervention that aims to support people to regain independence and enable them to resume their daily activities after they return home from an inpatient care setting, or to enable them to remain at home.

Can

- Reduce ongoing care needs
- Improve functional status when compared with usual home care
- Be more effective than conventional homecare

Evidence quality

★ ★

Cost

£ £

Frailty level

Moderate frailty

Further reading

- Time-limited home-care reablement services for maintaining and improving the functional independence of older adults
- National Institute for Health and Care Excellence (NICE) Guideline NG74 Intermediate care including reablement

Bed-based intermediate care

Intervention

Bed-based intermediate care is a time-limited episode of care provided by a dedicated intermediate care service. It can be provided as an alternative to hospital admission as a step-up from home rehabilitation or to provide assessment and rehabilitation following discharge from hospital.

Can

- Improve function
- Increase the number of patients discharged home, rather than to an institution, after three months (although this was not sustained at six months)

Evidence quality

★★

Cost

£££

Frailty level

Severe frailty

Further reading

- Effectiveness of intermediate care in nursing-led inpatient units
- Postacute care for older people in community hospitals: a multicenter randomized, controlled trial
- NHS Benchmarking Network National Audit of Intermediate Care

Anticipatory care planning

Intervention

Anticipatory care planning is a process of shared decision making about future actions in relation to an individual's care, which can also involve families and carers, and is based on a shared understanding of their condition and personal circumstances.

Can

- Increase the likelihood that a person will die in his or her preferred place of death
- Be beneficial in reducing emergency and inpatient admissions
- Increase shared decision making and improve patient and family satisfaction with care
- Reduce rates of hospitalisation and occupied bed days

Evidence quality

★ ★

Cost

£

Frailty level

Moderate to severe

Further reading

- Advance care planning - Emergency and acute medical care in over 16s: service delivery and organisation
- Patient Care Planning Discussions for Patients at the End of Life: An Evidence-Based Analysis
- Anticipatory care planning and integration: a primary care pilot study aimed at reducing unplanned hospitalisation

Exercise interventions and physical activity

Background

There are numerous descriptions in the literature of exercise interventions as a strategy to prevent and treat frailty. Different types of exercise regimes include: aerobic, resistance, balance and flexibility training, as well as multi-components exercise regimes and Tai Chi. The length and intensity of exercise regimes varies, as well as place of delivery (for example class/ groups in a community setting, or in the individual's place of residence).

In addition, some literature describes more broadly the benefits of physical activity to people's health and wellbeing.

Why focus on exercise and physical activity?

Exercise is thought to target some of the symptoms commonly describing frailty: weakness, low physical activity, slow motor performance and poor exercise tolerance. On a molecular level it is thought to reduce frailty by decreasing muscle inflammation and increasing anabolism and muscle protein synthesis, thus impacting positively on muscle mass and strength, which decrease with ageing (1, 2).

As muscle weakness is consistently and strongly associated with the risk of falls (3), exercise could act as a preventative measure by increasing muscle strength and by promoting compensatory mechanisms against falls.

Wider benefits of physical activities are reported in the literature for non-frail adults (not covered in depth by this review). These include social, psychological and disease specific benefits. For example, Svantesson et al (5) in their review of literature concluded that there is positive correlation between physical activity and the reduction of preventable chronic illnesses, lower healthcare costs, improved cognition, improved muscle function, decreased fear of falling, and thereby, inevitably, an increased self-perceived quality of life in non-frail older adults. Exercise interventions also have a beneficial impact on clinical outcomes for particular conditions, such as peripheral vascular disease(6). Finally lack of physical activity and sedentary lifestyle can also increase the risk of frailty (7).

The benefits

Evidence from secondary literature (systematic reviews and meta-analysis), described in the section below, indicates that exercise interventions may **delay the progression of frailty** in older adults (7, 8). There is evidence that exercise interventions, particularly those involving gait, functional training, balance training and strength, **reduce the rate of falls** in people living in care facilities but are more effective when combined with falls interventions (4, 9). Practicing Tai Chi was also shown to **reduce the risk of falling** in frail and at risk adults (15). Multi-components exercise regimes, in particular, were shown to **improve physical function**

in pre-frail and frail adults in the community (2) and to have a **positive effect on fitness, activity of daily living and quality of life** (10). Resistance training was shown to improve muscle strength in older adults (11). There is less conclusive evidence on the effectiveness of exercise interventions on **cognitive functional and social outcomes** in pre-frail elderly people (12, 13). Longer, more frequent multi-components exercise interventions appear to be more effective (2, 14).

Findings from secondary evidence (systematic reviews, meta-analysis, literature reviews)

Emerging evidence from reviews suggests that multicomponent exercise programmes, including strength (or power exercise), balance/gait and endurance components, were more effective than single-component exercise programmes. In addition, it is suggested that frail and pre-frail adults should increase duration and intensity of exercise. Exercise interventions delivered in class with or without home-based practice or delivered with supervision were particularly effective.

Generally, no consistent definition of frailty was used across studies and the severity of frailty was not always reported. In addition, there was no consistent reporting from studies on drop-out and adherence rates with exercise programmes. There was also limited data on adverse effects but those studies that reported on this domain suggested an absence or a small number of adverse events indicating that exercise interventions are generally safe. Limited data on cost saving of exercise interventions was available.

Table 1 outlines key findings and recommendations from secondary evidence.

Table 1: Key findings and recommendations from secondary evidence

Authors	Target group	Interventions	Outcome measures reported	Findings and recommendations
Apóstolo et al (2018) (13) Systematic review	• Older adults • Primary care and institutional care	• Home-based physical exercise programme • Exercise programmes in groups • Exercise programmes in groups and nutrition • Physical exercise in class and home-based practice • Supervised computerised balance training	• Primary outcome: progression of frailty (e.g. improved grip strength, gait, weight gain and activity of daily living)	Physical exercise delivered in class or delivered in class with home-based practice were shown to be effective in preventing the progression of frailty and pre-frailty, at least in some frailty indicators. No effect for computerised balance training. They conclude that based on current evidence physical exercise programmes conducted in class with home-based practice can be provided to prevent the progression of pre-frailty and frailty in community dwelling non-institutionalised older adults.
Jadczak et al (2018) (2) Umbrella review of systematic reviews	• Pre-frail • Frail • Community dwelling	• Multi-component exercise, including resistance, aerobic, balance, flexibility, resistance training	• Physical function, i.e. muscle strength, gait, speed, speed, balance, physical performance	Multi-components exercise interventions, including in particular resistance training, aerobic, balance and flexibility are effective in improving physical function

Authors	Target group	Interventions	Outcome measures reported	Findings and recommendations
		• Also each of the above alone • Exercise and nutrition (protein supplements or fruit and dairy products)		(i.e. muscle strength, gait, speed, speed, balance, physical performance). Resistance training alone is beneficial for improving muscular strength, gait speed and physical performance. Other types of exercise, on their own, were not sufficiently studied. Only personalised exercise seemed to increase mobility consistently. Mixed results for studies that combined exercise and nutritional interventions. It is suggested that timing might be important but this has not been sufficiently investigated. Older people should gradually increase exercise frequency to three times a week and also increase duration and intensity. Agrees with published literature that suggests up to 60 min per session, mix regime (20 min resistance, 10 min aerobic, 20 min balance, 10 min flexibility) for

Authors	Target group	Interventions	Outcome measures reported	Findings and recommendations
				pre-frail and 45 min for frail (0 min resistance, 20 min aerobic, 8 min balance, 7 min flexibility)
Lee and Kim (2017) (4) Meta-analysis	• Older people aged over 65 living in care facilities (nursing home or assisted living)	• Exercise interventions, and exercise interventions in combination with falls prevention initiatives	• Rate of falls (falls per person years- total length of time falls were monitored • Number of recurrent falls	Exercise interventions involving gait, balance and functional training with mechanical devices and balance and strength exercises reduced rate of falls and recurrence of falls. Balance and functioning training on one leg and Tai Chi did not differ and tended to reduce rate of falls. Balance, strength and walking, and goal setting activities increase the rate of falls. Effect of exercise interventions for rate of falls and number of fallers was stronger when combined with other falls prevention interventions (medication review, environmental modification, staff education). Balance training was shown to be effective only if combined with other type of

Authors	Target group	Interventions	Outcome measures reported	Findings and recommendations
				exercises such as gait and strength training. When it combines with walking, in this group of patients, it can increase rate of falls. Exercise interventions have a role in reducing falls in people living in care facilities but are more effective when combined with two or more falls interventions (medication review, environmental modification, staff education). Older people who have fallen or are of high risk of falling should receive individual intervention for prevention of falls.
Del-Pino et al (2017) (15) Systematic review and meta-analysis	• Frail and at risk adults	• Tai Chi trials	• Falls prevention	Practice of Tai Chi significantly reduced the risk of falling.
Chase et al (2017) (16)	• Community dwelling older adults (not	• Supervised resistance and/or aerobic training	• Performance-based measures of physical functioning	Supervised resistance and/or aerobic physical activity interventions significantly improved performance-based, composite

Authors	Target group	Interventions	Outcome measures reported	Findings and recommendations
Systematic review and meta-analysis	necessarily frail)	physical activity interventions		physical function outcomes among community-dwelling older adults. Larger intervention effects were associated with: • longer, more frequent interventions • maintaining consist intensity rather than progressive increase. • upper extremity resistance exercises • more repetition (rather than number of sets per se). Supervised resistance and/or aerobic physical activity interventions significantly improve physical function outcomes. Supervised physical activity interventions conducted among frail older adults were especially effective in improving physical function.
Gine-Garriga et al (2014) (17) Systematic review and Meta-analysis	• Community dwelling frail older people	• Efficacy of exercise-based interventions	• Physical function • Markers of physical frailty	Exercise was shown to improve normal gait speed, fast gait speed and the Short Physical Performance Battery.

Authors	Target group	Interventions	Outcome measures reported	Findings and recommendations
				Inconclusive results in relation to endurance, balance and activities of daily living. Exercise has some benefits in frail older people, although uncertainty still exists with regard to which exercise characteristics (type, frequency, intensity, duration, setting, combinations) are most effective.
Cadore et al (2013) (18) Literature search	• Physically frail older adults or people aged above 70 presenting with decline in physical function	• Supervised exercise programmes	• Muscle strength • Gait • Balance • Falls	Greater gains in strength have been achieved when resistance training was used in exercise. Exercise programmes (including resistance training) have also enhanced functional parameters, such as gait and balance, and reduced the risk of falls.
Theou et al (2011) (14) Systematic review	• Frail people (community and care facilities)	• Exercise interventions	• Physical and functional outcomes	Exercise interventions were more beneficial for people in long-term care, compared with community and those who were between 80-90 years old.

Authors	Target group	Interventions	Outcome measures reported	Findings and recommendations
				Longer and more frequent interventions were more beneficial (more than three times a week for at least 30-45 minutes). Multi-component training was more effective in improving functional ability. Resistance training alone had the most positive effect on physical and psychological determinants and muscle function outcomes (e.g. strength). There is good evidence that exercise improves cardiorespiratory function, muscle function, flexibility, physical activity participation, and functional ability of frail older adults. There is moderate evidence that exercise has a positive impact on psychosocial state, biochemical status, and adverse health consequences. Finally, there is little evidence to suggest that exercise positively influences body composition and nutritional status in frail people.

Authors	Target group	Interventions	Outcome measures reported	Findings and recommendations
				Evidence is not as strong for improving activities of daily living and disability. Neurological and cognitive function and utilisation of resources was not included as an outcome in a sufficient number of studies to make recommendations.

Polypharmacy review

Background

Polypharmacy is the simultaneous use of multiple medications and commonly defined as the use of five or more drugs. It has also been described as the use of more drugs than clinically indicated, the use of two or more medications to treat a single condition, and the use of two or more drugs of the same therapeutic classification (1).

Polypharmacy is highest amongst patients aged 75–84, with more than half of this group prescribed five to nine drugs to take each day (2).

Why focus on polypharmacy review?

The Scottish Government and NHSScotland (2015) polypharmacy guidance states that since condition-specific guidelines are unlikely to account for whether a person also has frailty, a focus on the medications prescribed within this group is required.

As a group, **people with frailty are at risk of 'adverse drug reactions, drug to drug interactions, or rapid deterioration if necessary medication is not optimised',** since people with frailty 'lack reserve to deal with adverse events' and even minor physical and mental stresses can have a major impact on health (1).

The benefits

The anticipated health economic impacts are a **reduction in the cost** (and waste) of medicines prescribed, an **increase in healthcare capacity** (as patients are more stable and require less contact with health professionals), and **fewer unscheduled hospital admissions** related to adverse drug reactions.

Projected health economic impacts of polypharmacy reviews in the wider older population, including those in care homes, reported in 2015 **estimated overall savings in the range of £3.7m and £10m**. The upper estimate includes medication change, switching to more effective drugs and cost avoidance measures. Implementation cost was calculated at approximately £4.7m to £7.4m, not including travel (1).

Key components

The Scottish Government and NHSScotland suggest adults in care homes age 50+ and adults age 75+ on $\geq$ 10 medicines (where 1 is a high risk medication) and with a SPARRA score of 40% to 60% should be prioritised for medication review. Where this leads to large numbers of patients, frailty is recommended as one of four further prioritisation criteria for consideration.

The Scottish Government and NHSScotland jointly produced the '7-steps' approach to medication review. Briefly, this involves

1. identifying the aims and objectives of drug therapy
2. identifying essential drug therapy
3. identifying unnecessary drug therapy
4. checking if objectives of drug therapy are achieved
5. identifying if the patient is at risk of (or suffers) adverse drug reactions
6. identifying if the drug therapy is cost-effective, and
7. checking if the patient is willing and able to take the drug therapy as intended (1).

A 2017 PrescQIPP1 bulletin (3) recommended that medication reviews should be undertaken more regularly for patients with frailty using an evidence-based medication review tool such as PrescQIPP IMPACT tool, STOPP/START, Beers, or the NO TEARS tool, and that a single clinician or clinical team should take responsibility for the medicines for an individual patient. In 2014, best practice guidelines from the British Geriatrics Society also recommended medication review using an evidence-based medication review checklist (4) such as STOPP/START, as part of CGA. Other factors to consider in a medical review include considering dosages as the metabolism changes with age, and whether there is a lower overall benefit of continuing treatments that aim to offer prognostic benefit (5).

Findings from secondary evidence

A 2018 systematic review (6), which investigated the relationship between frailty and polypharmacy in older adults, found that there was an association but that the direction of the relationship was unclear and it was difficult to draw conclusions to inform clinical practice based on the studies found. However, the authors suggested that polypharmacy can be recognised as 'a major contributor' to frailty development and that polypharmacy should receive particular attention in this group of patients, as **medication reduction may represent a prevention and management strategy for frailty**.

A 2013 systematic review (7) aimed to identify intervention studies that reduced the use of unnecessary medications in frail older adults or adults approaching the end of life. They found that processes for identifying medications for reduction (with pharmacists being central to most of the interventions) used various medication identification criteria and included pharmacist drug reviews, educational interventions for physicians and nursing home staff and systematic medication reviews by physicians. Overall, they concluded that there was a lack of robust research which had been carried out in this area.

In 2010, the Chief Scientist Office and the Scottish Collaboration for Public Health Research and Policy produced a review of interventions in primary care and community settings (8) and

[1] An NHS-funded not-for-profit organisation that supports quality, optimised prescribing for patients (in NHS England)

found that medication review by a pharmacist or other health professional did not reduce hospital admission or mortality in older people. There was no evidence that medication review by a pharmacist had an impact on quality of life. There was limited evidence that educational programmes for GPs, including medication review, may reduce the risk of falls and improve medication use in this group (8).

Immunisation

Background

There are effective vaccines which are recommended for people aged 65+, such as vaccinations for influenza and pneumococcal, which make an important contribution to health and longevity, particularly to those in earlier old age. However the immunological response in older age is diminished compared to younger adults: seroconversion after vaccination follows in 70–90% of young subjects, compared to 30% in those aged 70+, and 12% in those aged 80+ (9).

Why focus on immunisation?

Optimisation of immunisation is important because a significant proportion of hospital admissions and deaths in the elderly can be accounted for by infectious diseases, particularly influenza and pneumonia (9). The council of the European Union has recommended that action is taken to increase influenza vaccination in older people (10), and approximately 70% of Herpes Zoster (shingles) cases occur in people aged 70+ (9). In the UK, the annual influenza campaign is considered highly successful, with 78% uptake in those aged 70+ (9).

The benefits

The current best practice guidelines from the British Geriatrics Society (2011) state there is no reliable way of improving responsiveness to vaccines, but higher vaccine doses and improving nutrition may be of benefit. The guidelines cite findings of a 2005 systematic review in which influenza immunisation was shown to reduce the incidence of bronchopneumonia, with a 27% reduction in hospital admissions and 47% reduction in overall mortality, although there was no effect in mortality from respiratory disease, which the authors suggested was confusing and put the mechanism of effect into question.

In pneumococcal vaccination, efficacy varied from 70–80% in adults aged 65–74+ to 0–22% in adults aged 85+, although the authors highlighted a 2010 randomised controlled trial from Japan, which demonstrated a significant reduction in pneumonia (2.8% vs. 7.3% over 2 years) and pneumonia mortality rate (20.6% vs. 25%) in nursing home residents.

In a 2005 US multi-centre trial, the use of Herpes Zoster vaccine in adults aged over 60 reduced the incidence by 51% and the incidence of post-herpetic neuralgia by 66% (9).

Guidance

In 2011, the British Geriatrics Society stated that whilst vaccination is recommended, there are limitations to the value of immunisation in older people with frailty, and resources should be targeted at other approaches such as developing more effective vaccines, better forms of

delivery (for example adjuvants and intradermal injections) and vaccinating health and social care workers who work with vulnerable elderly people to increase herd immunity (9).

Findings from secondary evidence

A 2017 systematic review (10) of economic evaluations of seasonal influenza vaccination for the elderly population in the European Union found that **most studies suggest vaccination is cost-effective**, but the results are not certain due to methodological limitations, and controlled prospective clinical and economic evaluations and surveillance data are needed to strengthen the evidence base.

A 2014 systematic review (11) of interventions to increase influenza vaccination rates of those aged 60+ in the community concluded that there were a number of interventions which were effective in increasing community demand for vaccination (letter plus leaflet/postcard; nurses/pharmacists educating and vaccinating patients; phone call from a volunteer peer; telephone invitation versus clinic drop in), enhancing access (home visits compared to clinic vaccination), and improving provider/system response (reminding physicians about all their patients, chart review/feedback, educational outreach).

A 2014 review (12) of factors affecting the uptake of vaccination by older people in Western society concluded that the key factors were a person's attitudes and beliefs towards vaccination (particularly negative attitudes), their perceived susceptibility, the side effects and effectiveness of the vaccine, and healthcare workers' recommendations.

A 2014 review (13) of interventions to reduce hospital admissions from care homes reported that **the evidence for the effect of vaccinating health personnel was unclear and of low quality and for nursing home residents showed a positive effect but was very low quality.**

Primary care interventions

Background

For the purposes of this paper, primary care interventions relating to frailty were understood as comprising case-finding (using a tool or otherwise) and subsequent initial assessment using the principles of CGA and an associated management plan involving a multidisciplinary team which meets regularly and includes a key contact who acts as a liaison with all health and social care partners.

Case-finding refers to identifying individuals who are already affected by a condition (current state: prevalent cases) (8). Case management is a community-based, anticipatory care approach which includes case-finding, assessment, care planning and care co-ordination (14).

Why focus on primary care interventions?

Active management of frailty through prevention, recognition and management can support people to avoid medical crises (5).

Guidance

The British Geriatrics Society concluded in 2014 consensus best practice guidance (15) that the best way to manage frailty once recognised is through CGA, comprising medical review and specialist referral with holistic care and support planning. Each person should have an individual care and support plan, which should be shared with any other health and care professionals involved.

Key actions for the recognition and management of frailty in primary care have been identified as:

- assess older people for frailty during all healthcare contacts using a recommended frailty tool
- record frailty, and severity, using Read Codes
- conduct a comprehensive geriatric assessment for people with moderate or severe frailty
- refer to a specialist as appropriate regarding uncertain or complex cases
- share the support plan with the person with frailty
- with permission, share the support plan with other relevant people, and
- offer advance care planning for people with very severe frailty (5).

Findings from secondary evidence

A 2008 meta-analysis (23) of a diverse range of multidisciplinary interventions to tackle frailty in community-based older people examined data from 89 randomised controlled trials. It

found that **multidisciplinary interventions in the community that combine aspects of case finding, assessment and care management could reduce nursing home admission, hospital admissions and falls with improved physical function.** Identification of patients at risk and appropriate management seem to be key. Trials addressing patients of all risk categories saw **benefits in a reduction in nursing home admissions with improved physical functioning**. Those that tackled more high-risk patients identified as frail saw a reduction in hospital admissions.

A 2017 summary of research evidence compiled by the Centre for Research Dissemination in collaboration with the Yorkshire and Humber Academic Health Science Network and Connected Yorkshire reported that in the context of recognising and managing frailty in primary care, **supported self-management can improve outcomes, but the value of case management is uncertain and it is not clear how case management should be targeted.**

In 2010, the Chief Scientist Office and the Scottish Collaboration for Public Health Research and Policy produced a review of interventions in primary care and community settings (8) and found that, for frail people, because of the lack of consensus on the classification of frailty, the tools for screening, case finding and associated outcome measures, **drawing conclusions from research across different interventions and populations is challenging**. They suggested that standardisation of outcomes relating to disability and hospital admissions is needed.

A key finding was that the evidence for health promotion and case management was mixed but **a targeted approach to identification of frail older people at lower risk and including CGA with long-term follow-up visits was most likely to be successful**. The authors cited a trial which suggested that CGA might be best implemented in general practice, if GPs received training and the associated paperwork was minimised. The authors also emphasised that **improvement in functional outcome is not always linked to a reduction in hospital and institutional admissions**.

Community geriatric services

Background

Community geriatric services have been described as '…covering the period before a medical crisis which may or may not result in admission to hospital, and after a medical crisis...' (16).

Community geriatric services appear to be variable in nature in Scotland and the UK, and no universal definition was identified. For the purposes of this paper, a community geriatric service is understood as comprising a geriatrician-led multidisciplinary team which liaises with primary care (and potentially other agencies involved in a person's care), and where Comprehensive geriatric assessment (CGA) is undertaken and informs a tailored plan of treatment.

CGA has been defined as a holistic personal management plan which includes person-centred interventions from a wide multidisciplinary team such as specialist nurses, allied health professionals and social work professionals (17).

Why focus on community geriatric services?

The primary focus of Community Geriatrics '…is reducing admissions to hospital and as far as possible…preventing re-admissions by ensuring that the older patient receives adequate and appropriate care within the community, whether at home or in residential care (16)'.

In 2015, the British Geriatrics Society stated that outreach models with community geriatricians provide a powerful mechanism for supporting GPs in the management of individual cases, and that the model is especially effective when deployed in contexts where there are multidisciplinary team meetings providing a forum for team discussion and peer learning. Frailty can be improved through an individualised, person-centred approach which is as participatory as possible with the person with frailty and their family/carers (18).

Key components

According to the British Geriatrics Society (18) there are six essential characteristics of a good community service for frailty:

- effective recognition, diagnosis and referral for frailty
- person-centred ethos and practice
- integration of care in multiple settings
- expertise of staff
- practice underpinned by CGA and care planning, and
- use of tools to assist case finding.

Once a person has frailty, they are 'likely to benefit from a service model based around ongoing proactive person-centred, coordinated care via care and support planning'. **It is suggested that recurrent 'planning cycles' which inform care are put in place**, for example, questionnaire administration, blood tests and checks, medical (and medication) review and a care planning discussion with the person with frailty and their families/carers as appropriate. This process is estimated to take approximately 30–60 minutes (18).

It is also suggested that **service design must include assessment and management of frailty alongside assessment of dementia and cognitive impairment** and joint working and closer working between services in the community is especially important for those with frailty and dementia, due to evidence of common risk factors. Services should be designed so that closer working or integration is supported, for example in older people's mental health teams and care of the elderly services. This support needs to be sustained over a long period of time and needs to be ongoing throughout any deteriorations (18).

Findings from secondary evidence

In a 2017 Cochrane systematic review protocol (17) of comprehensive geriatric assessment (CGA) for high-risk frail people living in the community it was noted that there is some evidence to date, but no comprehensive review of CGA in this setting. The forthcoming review will investigate whether for older people at risk of functional decline, CGA in the community would have a positive impact on healthcare utilisation, nursing home admission and mortality.

A 2017 systematic review (19) of home- and community-based occupational therapy found that there was **strong evidence that occupational therapy improves functioning in physically frail older people living in the community**.

A 2014 systematic review (20) of the effectiveness of preventative home visits for adults aged 65+ without dementia did not identify reliable effects of home visits overall and were unable to draw firm conclusions due to limitations of the available evidence.

A 2014 systematic review (13) on the effects of interventions to reduce hospital admissions from nursing homes stated there was little evidence available and that which existed was low quality. The authors concluded that **low quality evidence showed advance care planning, palliative care, care pathways and geriatric specialist services could have an effect, and should be evaluated further**.

A 2014 systematic review (21) of models evaluating the effectiveness of integrated and co-ordinated care networks for the older population found five key models from the USA and Canada: The Integrated Care System for Older Adults (SIPA); the Program of All-Inclusive Care for the Elderly (PACE); The Program of Research to Integrate Services for the Maintenance of Autonomy (PRISMA); the Guided Care Program; and The Geriatric Resources for Assessment and Care of Elders (GRACE). The authors concluded that patient care which is managed from entry into the system until end of life and integrated at all levels has been shown to be

optimal for patients and their families. Some of the models aimed to improve the process of referral and transfer between services, while others were more multi-dimensional and developed a responsible organisation to deliver all services to a particular cohort of people. They found that spending on community services was expected to increase as a result, in order to target savings in hospital and nursing home use in the longer term.

A 2013 systematic review (22) to evaluate the impact of interventions designed to reduce hospital bed use by older people found that **an integrated approach facilitated by local agencies working together across hospital and community settings was required**.

The 2010 Chief Scientist Office and the Scottish Collaboration for Public Health Research and Policy review of interventions in primary care and community settings for older people (8) reported that there was significant overlap between interventions, especially where these were preventative home visits and might include comprehensive geriatric assessment (CGA). Home visit factors which were reported to be associated with favourable outcomes for frail people were the experience of the care provider, easy access to provision of follow-up services, and length of follow-up. The authors suggested that there were 'promising' potential changes at a system level, including integrated service delivery, which could reduce institutionalisation and healthcare cost and improve functional decline in frail older people. They cautioned this would require local and regional co-ordination of care between health and social services combined with long-term follow-up and evaluation.

The 2008 meta-analysis (23) of multidisciplinary interventions to tackle frailty in community-based older people also examined trials where community services were sometimes supplemented by geriatricians in just under 50% of studies. Those studies that focused on adults with frailty found that **multidisciplinary interventions in the community saw a reduction in hospital admissions.**

Lifestyle factors: physical activity diet, obesity, smoking alcohol and their relation to frailty

Why focus on lifestyle factors?

There is increasing evidence that adopting healthy lifestyles in old age can yield health benefits (1). Maintaining behaviours, such as regular exercise, not smoking, reducing alcohol consumption, healthy eating, and preventing obesity in mid–life, was shown to have a protective effect well into retirement (2).

Findings from secondary evidence

Physical activity

Frost et al (3), in their report on the promotion of health and wellbeing in later life, suggested that there is high strength evidence indicating an association between low frequency of social contact and physical activity and functional decline in later life. Similarly, in a more recent review informing the development of UK national public health guidance, Lafortune et al (4) concluded that physical activity in mid-life is related to more positive outcomes in terms of disability in later life.

Diet

Lafortune et al (4), in a recent systematic review informing the development of UK national public health guidance on midlife approaches to prevent dementia, disability and frailty in later life, suggested that, overall, **there is limited evidence that healthy dietary patterns in mid-life are related to better function later on**. Nevertheless, in a more recent systematic and meta-analysis, Kojma et al (5) suggested that **greater adherence to a Mediterranean diet** (high intake of fruits, vegetables, legumes, nuts, cereals, fish, and olive oil, low intake of saturated fats; low intake of meat and dairy products; and regular but moderate intake of alcohol, mostly wine) **was associated with significantly lower incident frailty risk** compared to poorer adherence in community dwelling adults. They suggested that the Mediterranean diet may decrease the risk of frailty by counteracting oxidative status and by reducing inflammatory markers. There is also some suggestion from a prospective cohort study that higher protein composition in diet is associated with lower risk of incidence frailty in older women (6).

Obesity, smoking, alcohol

Although involuntary weight loss is a phenotypic marker of frailty, weight gain as well as loss were reported to be associated with functional decline in the literature.

Frost et al (3) suggested that **there is high strength evidence indicating an association between functional decline and decrease or increase in body mass index**. The British

Geriatrics Society (7) in their consensus best practice guidance for the care of older people living in the community and outpatient setting suggested that there is **emerging evidence of the association between frailty and obesity** particularly in the context of other unhealthy behaviours such as sedentary lifestyle, poor diet and smoking.

Smoking was also reported to be **associated with functional decline** (3). It may play a role in frailty pathogenesis, increasing inflammation which in turn causes muscle wasting (8). Kojima G, Iliffe S, Walters (9) reported in their systematic review that there were a limited number of studies investigating the association between smoking and frailty but that **emerging evidence suggests that smoking is significantly associated with development of frailty or worsening of frailty**. Nevertheless, Lafortune et al (4) concluded that there is **limited evidence on the association between smoking and low impact fractures**.

The evidence in relation to **the association between alcohol consumption and frailty is inconclusive** (4, 10). A number of studies are reporting contradicting findings. Kojma et al (5) in their systematic review suggested that moderate consumption of alcohol mostly wine as part of a Mediterranean diet was associated with significant lower incident frailty risk. Similarly, in another systematic review (10), they concluded that moderate alcohol consumption was associated with a lower risk of frailty, but a high consumption of alcohol increased the risk. In a more recent published meta-analysis, Kojma et al (11) demonstrated an association between heavier alcohol consumption and a lower risk of frailty. They concluded that findings should be interpreted with caution due to methodological issues and possible confounding factors.

Nutritional interventions for the prevention and treatment of frailty

Background

Dietary interventions reported in the literature vary and include interventions to improve dietary intake, nutrient supplementation (for example oral protein, amino acids and energy supplements), oral vitamin supplementation (for example vitamin B or antioxidant supplements) and single oral nutrient supplementation (for example vitamin D and calcium).

Why focus on nutrition?

Malnutrition can cause weight loss, one of the phenotypic markers of frailty (1), which in turn can lead to weakness, exhaustion and low level of physical activity. Ageing is associated with deterioration in taste, smell and dental health, all of which can impact on nutritional status (2). Malnutrition increases with ageing and is associated with poor dietary intake and a sedentary lifestyle, factors which contribute to a decline in muscle mass and physical function (3). **A causal link between malnutrition and frailty has not been established, but there is strong association between poor nutritional state and the onset of frailty from population studies** (3). In hospitalised or institutionalised older people, malnutrition has also been shown to affect recovery, for example delay in wound healing and increased complications (4).

The benefits

Nutritional interventions are used to treat and delay the progression of frailty.

Energy supplementation is used to treat fatigue and exhaustion, a symptom of frailty. Protein supplementation is also a dietary intervention considered in the treatment of frailty in order to improve muscle mass, bone health and the immune system. **As frailty is considered to exacerbate the effects of age on protein metabolism (3), the supply of protein is important for maintaining good muscle mass** (5). High protein intake is also important for the maintenance of good bone structure and immune competence (5). Similarly amino-acid supplementation has been suggested to improve the synthesis of muscle proteins (3).

Dairy intake and vitamin D are important for maintaining bone health (6). Frailty is considered to contribute to the development of low levels of vitamin D due to an increase in sedentary lifestyle, reduction in outdoor activities and consequent reduced exposure to the sun (6, 3). **Low levels of vitamin D are associated with frailty (7) and with the increase in bone turnover, which increases the risk of falls** (3).

The evidence in relation to the use of nutritional interventions is largely clinical. **There is limited evidence on whether nutritional interventions impact on the use of health and social care services, for example hospital admission** (2).

Findings from secondary evidence

The evidence on the effect of nutritional interventions on frail older people is inconclusive.

Generally, recommendations from consensus statements and professional guidance recommend the optimisation of protein and calorie intake for the treatment of frailty. For example, the British Geriatrics Society (2014) consensus best practice guidelines (8) recommend the optimisation of protein intake and the correction of vitamin D insufficiency.

Apostolo et al (1), in a recent large systematic review on effective interventions for the prevention of frailty, concluded that nutritional supplementation (protein, protein-calorie and micronutrient intake) provided to pre-frail and frail older adults from the community was an effective intervention for increasing physical activity, reducing long-term exhaustion and for improving energy intake but had no impact on body weight. **They concluded that nutritional interventions were favourable for the prevention of frailty progression.** However, it was suggested that protein supplementation (dairy derivables) can increase body weight if taken for longer duration by less nourished and more physically fit participants (6). **Nevertheless, a systematic review by Kelaiditi et al (11) concluded that there is no sufficient published evidence to suggest that nutritional interventions can delay the onset of frailty.** Similarly, a meta-analysis by Zhe-rong et al (15) concluded that amino acid/protein supplements did not increase lean body mass gain and muscle strength significantly more than placebo in a diverse elderly population. This is in contrast to Bauer and Diekmann (5) who suggested in their review that protein supplementation had a positive effect on muscle mass, muscle strength and functionality of older people living in the community. Frost et al (2), in their review on frailty interventions in primary care and community settings, concluded that there is limited evidence that dietary advice, combined with supplementation, improves dietary intake and weight gain in undernourished older people, and no evidence that it affects mortality or hospital admission.

A Cochrane review of supplementation (oral protein and energy) (4) concluded that **supplementation can result in a small but consistent weight gain in older people but there was no evidence that it improved function or reduced hospital length of stay for older people.** Nevertheless, the review concluded that supplementation may reduce mortality and complications in undernourished older people.

A number of reviews examined oral nutritional supplementation in combination with exercise interventions on frailty indicators. **Combining exercise intervention with nutritional intervention appears to be more effective than nutritional interventions alone.** However, it is not clear whether nutritional supplementation augments the effect of exercise on muscle (12, 13).

Finally, Dewansingh et al (6), in a systematic review and meta-analysis, concluded that **vitamin D supplementation showed a small significant effect on physical performance (timed up and go tests) in older adults**. Avenell, Mak and O'Connell (14) in a Cochrane

systematic review concluded that vitamin D supplementation on its own is unlikely to prevent fracture in older people in community nursing homes or hospital settings, but that the **supplementation of vitamin D and calcium may prevent fractures.** They highlighted some of the risks associated with this type of supplementation, mainly an increase in gastrointestinal symptoms and renal disease.

In conclusion, the literature agrees that it is beneficial to optimise protein and calorie intake in the treatment of frailty, but that those with kidney disease should be cautioned regarding high intake of protein beyond the recommended 0.8 g per kg of weight (5). There are inconsistent findings in relation to the benefit of protein/amino acid supplementation. In malnourished older people, there is evidence that supplementation may increase weight gain and reduce mortality but it was also shown to increase weight gain in more fit and less malnourished older people. The effect of protein supplementation on muscle mass and function is less clear indicating that there may be some benefits to muscle strength and physical function.

It is suggested that the effect of protein supplementation on muscle mass and muscle strength may be mediated by the ability to digest protein and dependent on the nutritional and physical function of the older person. This, as well as the difference between study designs, type of supplementation used and diversity of elderly population in studies may explain the inconsistency in findings (15). Vitamin D, in combination with calcium, may also prevent fractures in older people in institutionalised settings.

There is little in the literature to support blanket nutritional support. However, screening for under-nutrition and appropriate referral to dietetic support may facilitate appropriate treatment regimes.

Hospital at home: admission prevention and early discharge

Background

Hospital at home provides time-limited care in the patient's home as an alternative to acute inpatient care, with the aim of avoiding hospital admission (1), or enabling early discharge (8). Hospital at home services usually target clinically stable older people in relation to a specific condition such as COPD or stroke, or for multiple conditions (5). Services can be community-based or provided as hospital outreach.

Why focus on hospital at home?

The rationale for hospital at home services is that they offer a safe alternative to acute hospital care for older and frail people that reduces hospital bed use, while improving patient outcomes and avoiding adverse clinical effects. The expected cost benefits relate to **the potential for avoiding hospital admission altogether by providing acute care at home, or by reducing the length of hospital stay and risk of readmission by enabling recovery and rehabilitation at home**. Anticipated benefits in relation to reducing the adverse effects associated with hospital stays for older and frail patients include:

- reducing the risk of functional decline from mobility being limited during hospital stays (particularly for people with frailty), and
- increasing the likelihood of individuals being able to recover and maintain their independence to live at home for longer.

Service delivery

The way in which hospital at home is delivered varies, but is usually provided by a team of healthcare professionals in the home, along with telephone support, as an alternative to acute hospital admission, or to facilitate earlier discharge. Admission avoidance hospital at home services are described as being delivered by either a hospital outreach team, a mix of outreach and community staff or by a GP and community nursing staff (5). Physiotherapy and occupational therapy is also described as being provided. Admission avoidance for acute exacerbations of COPD is usually delivered by specialist respiratory nurses (6). Referral to hospital at home requires assessment of a patient's suitability by a primary care physician or at an admissions unit or emergency department. Suitable patients are clinically stable and not requiring specialist diagnostic investigation or emergency interventions (5). For acute exacerbations of COPD, only a select group of individuals (average 27%) presenting to hospital would be expected to be safely admitted to hospital at home services in accordance with

respiratory guidelines (6). When patients deteriorate in the care of hospital at home, then admission to hospital may be necessary.

Early discharge hospital at home in the UK is described as being usually nursing-led as part of hospital outreach, or based in the community. It is described as excluding other forms of post-discharge care, including services provided in outpatient settings and self-care or self-administration of treatment such as intravenous infusion (8).

Evidence from secondary literature

Admission avoidance

A 2016 Cochrane systematic review (5) assessed the clinical and cost effectiveness of admission prevention hospital at home compared with acute inpatient care. The review included 16 randomised controlled trials from Australia, Italy, New Zealand, Romania, Spain, the UK and the US. The majority included participants who were elderly (average age ranged from 70 to over 80 years) and experiencing a medical event requiring hospital admission. Three studies included participants with COPD, two with participants recovering from stroke and six with participants with a sudden medical condition who were mainly elderly. The review states that **admission avoidance hospital at home may offer an effective alternative to inpatient care for a select group of elderly people, although the evidence is limited to small trials.** It is noted that patients receiving hospital at home care may still require access to hospital services. Furthermore, some of the trials included in the review required a caregiver to be living with or close by to the patient. There are difficulties in determining the type of patients who are most likely to benefit.

The review concludes that moderate-certainty evidence indicates that **there is little or no difference to risk of death at 6 months**. **Little or no difference on the likelihood of being admitted (or readmitted) to hospital** (moderate certainty evidence) was also reported but there may be a **reduction in the likelihood of living in residential care at 6 months' follow-up**. Furthermore, hospital at home was suggested to **cost slightly less, but that this is uncertain and may be offset when the costs of informal care are included** (low-certainty evidence). **Increased patient satisfaction** was also reported (low-certainty evidence), but there is a lack of evidence in relation to the impact on caregivers. Increased satisfaction may also be explained by the fact that participants had a preference for treatment at home, which is why they opted to participate in the trial. It was also noted that admission avoidance hospital at home does not totally substitute hospital care, in that admission to hospital may become necessary at some point for patients receiving care at home. In one trial for participants recovering from stroke, 33% of patients allocated to hospital at home went on to receive inpatient care within 2 weeks.

A 2012 Cochrane systematic review (6) assessed the clinical and cost-effectiveness of hospital at home compared to inpatient care in acute exacerbations of COPD. The review included eight trials from Australia, Denmark, Italy, Spain and the UK. Only a select group of patients presenting at hospital with acute exacerbations of COPD were assessed as being appropriate

for being admitted to hospital at home, which varied between 11% and 39%. Evidence was identified of moderate quality to suggest a **reduction in readmission rates compared with usual hospital inpatient care.** There was a non-significant trend towards a reduction in mortality. The evidence relating to health-related quality of life, lung function and direct costs was of low or very low quality, and results were not determined for these outcomes.

A review of the evidence conducted by the Nuffield Trust in relation to shifting the balance of care concludes that although hospital at home provides a safe alternative to acute hospital care, there is limited and mixed evidence to support a reduction of hospital activity (7). **Cost estimates were reported to vary due to the differences in scope of hospital at home interventions, but greater cost benefits may be associated with certain conditions, and where the cost of hospital care is particularly high.**

In summary, the evidence reviewed suggests that, compared with usual acute hospital care, admission prevention hospital at home **may offer an effective alternative to acute inpatient care for a select group of elderly people, reducing treatment costs slightly and the risk of living in residential care, and improving patient satisfaction, although the evidence is of low certainty (5). Admission prevention hospital at home may also be an effective alternative for a select group of people presenting with acute exacerbations of COPD, reducing readmission rates, but the effect on health service costs is very uncertain (6)**.

Early discharge

A 2017 Cochrane systematic review (8) assessed the effectiveness of hospital at home early discharge compared with in-hospital care. The review included 32 trials that assessed the effects of hospital at home services in relation to hospital outreach and community-based services on patients with different types of conditions, including stroke, older patients with different conditions and those who had had surgery. The review identifies **insufficient evidence of economic benefit or improved health outcomes as a result of early discharge hospital at home, although it may reduce length of stay and reduce the risk of living in residential care**. For older patients with a mix of conditions there is moderate-certainty evidence of a reduction in hospital length of stay, and there was slight improvement in patient satisfaction and the risk of living in an institutional setting (low-certainty evidence). It is uncertain whether there is an effect on costs (very low-certainty evidence).

In summary, the evidence reviewed suggests that early discharge hospital at home compared with in-hospital care may reduce length of stay and improve patient satisfaction but makes little or no difference in relation to reducing readmission. There is also insufficient evidence of the effect on health service costs.

Reablement (including rehabilitation)

Background

Reablement is a time-limited intervention that aims to support people to regain independence and enable them to resume their daily activities after they return home from an inpatient care setting, or to enable them to remain at home (3).

Why focus on reablement?

Reablement differs from ongoing care and support, which has a focus on doing things for older people, rather than supporting them to regain the ability to do things for themselves. **Reablement focuses on achieving goals through active participation of older people to maximise independence.** The aim is to reduce the need for home care in the future, which has shown to increase dependency and loss of function (9). Therefore, **reablement services are anticipated to be able to reduce the costs of ongoing care and decrease demand for these longer-term services by preventing loss of independence and function for the elderly** (9). Furthermore, improved functioning and independence may also **help to reduce emergency hospital admission or postpone the need for admission to residential care**. A reduction in the care hours is often used as a measure of effectiveness. However, older people with high dependency may still need ongoing care (10). Therefore, it is expected that reablement may not be as beneficial for people with a high level of need such as those with complex, intractable conditions.

Service delivery

Reablement, including rehabilitation, is usually provided by a team of health and social care professionals and care workers who work with an older person to help them regain their independence and ability to complete everyday tasks. The service is time-limited (usually 6–12 weeks) and involves multiple visits to a person's home.

Evidence from secondary literature

A 2016 Cochrane review (10), assessing the effects of receiving a time-limited (up to 12 weeks) reablement care package for maintaining and improving functional dependence of older adults (>65) compared with usual care, identified two very low quality studies, one from Australia and one from Norway. The review concluded that **reablement may help some older adults to improve their functional status (engaging in everyday activities) to a small degree but makes little or no different in relation to being admitted to hospital or mortality.** However, there is evidence of **a small decrease in the number of people needing higher levels of personal care and in care costs**. Neither study reported satisfaction in relation to using reablement.

A review of the evidence by National Institute for Clinical Care and Excellence (NICE) (3) identified moderate quality evidence that **reablement is more effective when compared with conventional home care**. The review included an evaluation of reablement in Scotland and two trials, finding fewer or no ongoing care needs compared with usual care at follow-up.

In summary, **low to moderate quality evidence is reported to suggest reablement can reduce ongoing care needs and improve functional status when compared with usual home care** but there is insufficient evidence of a difference in relation to hospital admission and health service costs.

Bed-based intermediate care

Background

Bed-based intermediate care is a time-limited episode of care provided by a dedicated intermediate care service (2). It can be provided as an alternative to hospital admission as a 'step-up' from home rehabilitation or to provide assessment and rehabilitation following discharge from hospital.

Why focus on bed-based intermediate care?

Bed-based intermediate care has a focus on providing assessment and rehabilitation for people who are ready to leave the acute hospital but not yet ready to return to their home (2, 11). **It forms a key part of strategy for reducing delayed discharge from hospital and the need for cost-intensive care, and improving patient outcomes**. However, the ability to implement intermediate bed-based care is dependent on the scope of local arrangements which vary between health and social care partnership areas (2).

Service delivery

Bed-based intermediate care is provided as a dedicated service within community hospitals, care homes, standalone intermediate care facilities or housing with care. People can be referred to bed-based intermediate care as an alternative to hospital admission or as a 'step-down' from hospital for assessment and/or rehabilitation before returning home. The majority of intermediate care services are described as providing the latter (7).

Evidence from secondary literature

A 2007 Cochrane systematic review (11) of 10 studies, examining nursing-led inpatient units as an alternative to usual care, identified a number of benefits. Of the included studies, eight were conducted in the UK; patients included those with a wide range of medical or surgical conditions and with a mean age of 70 years and over. The service interventions were described as nurse-managed and non-specialist rehabilitation. **Patients were found to function better and more patients were discharged home and not to an institution after 3 months but this was not sustained after 6 months.** There is uncertainty about the cost effectiveness, with studies in the UK finding them to be more expensive than usual care units.

A review by Nuffield Trust states that, overall, the evidence suggests that bed-based intermediate care **does not reduce admissions or readmissions** (7). The report also notes a near-significant increase in inpatient stay for nurse-led units compared with usual care.

In summary, **low to moderate quality evidence is reported to suggest that the effectiveness of intermediate bed-based care in relation to reducing hospital bed use is uncertain**.

Evidence from UK studies suggests that intermediate bed-based care may increase costs compared with usual care.

Anticipatory care planning

Background

Anticipatory care planning (ACP) can be defined in a number of ways but generally relates to a process of shared decision making about future actions in relation to an individual's care, which can also involve families and carers and is based on a shared understanding of their condition and personal circumstances (12, 13). It can also be referred to as advanced care planning. It is a voluntary process that produces a formal record of an individual's goals, preferred actions and interventions in relation to their care.

Why focus on anticipatory care planning?

The present focus of ACP in Scotland is to enable people with more complex needs to receive co-ordinated care that is suitable for their needs and based on shared decision making. ACP is mainly considered as being appropriate when an individual's needs become more complex, although it can be started at any stage. An estimated 5–6% of the population have the complexity of need where they could potentially benefit from ACP (12). ACP has several expected benefits, including **reducing unscheduled hospital admissions, improving quality of care at the end of life and allowing more people to die in their preferred place of death, resulting in a reduction of acute hospital utilisation.** At the same time there are a number of challenges to achieving the expected benefits of ACP that include time constraints on health and care professionals, people feeling uncomfortable talking about end of life issues or assuming that ACP is only about end of life care, and a lack of awareness about ACP and advance care directives (12).

Components

The components of ACP interventions and how they are implemented vary. Guidance in Scotland for health and care professionals states that ACP involves identifying individuals who would benefit in a timely way to enable them to make an informed choice about care options and ensure optimal outcomes (12). In this guidance, ACP is described as being prompted by a range of triggers determined for an individual's circumstances and condition such as the presence of frailty, frequent unscheduled contacts or deterioration in a long-term condition. Once developed, an anticipatory care plan can be incorporated into an individual's GP record via the electronic Key Information Summary (KIS).

Evidence from secondary literature

In the secondary literature, a recent systematic review of randomised controlled trials (RCT) of the impact of ACP on outcomes in older adults (>65 years) found evidence of **increased documentation of end of life care preferences and use of advance care directives, and improved patient and family outcomes such as increased knowledge of ACP, understanding**

of end of life preferences and concordance with end of life wishes (14). The trials included in the review were conducted in community settings, including nursing homes, and there was considerable variation in the types of ACP interventions and who implemented them. The review found **evidence from two trials of increased patient and family satisfaction, with care and evidence from one trial that ACP decreased hospitalisation from nursing homes and health care services utilisation**. None of the trials measured the effects of ACP on patient outcomes such as symptom management and the quality of end of life care or the death and dying experience (14). An earlier systematic review of controlled studies that focused on people with cognitive impairment or dementia found **limited evidence of variable quality for the potential of ACP to reduce inappropriate hospital admissions** (15).

A systematic review of the impact of care planning discussions on outcomes for people at the end of life identified **evidence of an increased concordance between patient and family wishes and improved patient and family satisfaction with end of life care**. Insufficient evidence was identified in relation to the benefit to patient quality of life. One RCT reported **fewer episodes of hospital care and reduced length of hospital stay**. Observational studies included suggest an association between earlier discussions with a reduction in hospital use (16).

A systematic review conducted as part of NICE guidelines identified evidence from three RCTs (moderate to very low quality) in relation to the impact of ACP on outcomes for adults and young people at risk of acute medical emergency compared with usual care (17). The results from these suggest that **ACP may be beneficial in reducing emergency and inpatient admissions.** There was no difference identified to patient quality of life and patient and/or carer satisfaction.

A pilot study undertaken in one general practice in NHS Highland in 2010 showed a **statistically significant reduction in rates of hospitalisation and occupied bed days following the introduction of ACP for people with frailty considered to be at high risk of hospital admission** (18).

In summary, recent studies suggest that individuals with an anticipatory care plan are **more likely to die in their preferred place of death.** Several studies show evidence for the benefits of ACP in terms of **increasing shared decision making and improving patient and family satisfaction with care**. The **evidence is limited associating ACP with a reduction in emergency hospital admission and in improving patients' quality of end of life care**.

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