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RESEARCH ARTICLE

Using consensus methods to prioritize modifiable risk factors for development of manifestations of frailty in hospitalized older adults

Susanne Coleman[1] | Faye Wray[2,3] | Kristian Hudson[4] | Anne Forster[3,5] | Simon Conroy[6] | Jonathan Tremyl[7] | Susan D. Shenkin[8] | Jane Nixon[9] | Mandy Fader[10] | Victoria A. Goodwin[11] | Danielle Woods[12] | Shelley Crossland[13] | Rachel Holt[14] | Louise Mcgregor[15] | Rebecca Maud[16] | Zoe Wyrko[17] | Sarah E. Lamb[18] | Elizabeth Teale[3,19]

[1]Clinical Trials Research Unit, Leeds Institute of Clinical Trials Research, University of Leeds, Leeds, UK

[2]Academic Unit for Ageing and Stroke Research, Leeds Institute of Health Sciences, University of Leeds, Leeds, UK

[3]Academic Unit for Ageing and Stroke Research, Bradford Institute for Health Research, Bradford Teaching Hospitals NHS Foundation Trust, Bradford, UK

[4]The Improvement Academy, Bradford Institute for Health Research, Bradford, UK

[5]Department of Stroke Rehabilitation, Academic Unit for Ageing and Stroke Research, Leeds Institute of Health Sciences, University of Leeds, Leeds, UK

[6]Central and North West London NHS Foundation Trust, London, UK

[7]Queen Elizabeth Hospital Birmingham, Birmingham, UK

[8]Geriatric Medicine, Usher Institute, University of Edinburgh, Edinburgh, UK

[9]Tissue Viability and Clinical Trials Research, Leeds Institute Health Sciences, Leeds, UK

[10]Department of Continence Technology, University of Southampton, Southampton, UK

[11]Department of Ageing and Rehabilitation, University of Exeter, Exeter, UK

[12]University of Highlands and Islands, Perth, UK

[13]Leicestershire Partnership NHS Trust, Leicester, UK

[14]Mid Yorkshire Hospitals NHS Trust, Wakefield, UK

[15]St Georges University Hospitals NHS Foundation Trust, London, UK

[16]University College London Hospital, London, UK

[17]Riverstone Living, London, UK

[18]Medical School Building (F.02), St Lukes Campus, Exeter, UK

[19]Geriatric Medicine, Academic Unit for Ageing and Stroke Research, Leeds Institute of Health Sciences, University of Leed, Leeds, UK

Correspondence
Susanne Coleman, Clinical Trials Research Unit, Leeds Institute of Clinical Trials Research, University of Leeds, Leeds, UK.
Email: medscole@leeds.ac.uk)

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Abstract

Aim: The aim of the study was to reach consensus on modifiable risk factors for a novel system of care to address Manifestations of Frailty in hospitalized older adults.

Design: Consensus study.

Method: A modified nominal group technique, incorporating expert group face-to-face interaction, review of existing evidence and pre/post-meeting questionnaire completion was undertaken November 2019–February 2020.

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Results: Seventy-one risk factors, within seven risk factor domains (pain, medication, fluid and nutrition intake, mobility, elimination, infection, additional patient factors) were considered. It was agreed that 44 risk factors incorporating patient, organizational and environmental risk factors were modifiable and should be included in a novel system of care.

KEYWORDS
acute care, consensus methods, frailty

1 | INTRODUCTION

In the 1960s, Bernard Isaacs described five key syndromes (Geriatric Giants) that commonly occur during acute illness in frail older people: falls, delirium, incontinence, immobility, loss of function (Isaacs, 1992). These syndromes are now understood to be Manifestations of Frailty (MoF)—a pre-disposition to independence limiting physical and/or cognitive decompensation in the face of an apparently innocuous insult (Clegg et al., 2013).

People over 75 are at high risk of hospital admission; accounting for 22% of hospital admissions despite representing 8% of the population (Dalrymple et al., 2020). Older people in hospital are at particular risk of developing MoF. Some of this is a direct consequence of the physiological stresses of acute illness, but there are many additional, and potentially modifiable (i.e. can be altered or controlled), risk factors introduced during a hospital stay. These MoF are important contributors to excess in-hospital morbidity, adverse events (including hospital-acquired infections, injurious falls and pressure ulcers), excess costs and long-term functional and cognitive outcomes (Andrew et al., 2005; Clegg et al., 2013; Coleman et al., 2013; Dunne et al., 2014; Han et al., 2019; Kenny et al., 2017; Smith et al., 2016; Witlox et al., 2010).

2 | BACKGROUND

In 2017, there were 3.5 million unplanned hospital admissions for people aged over 75 in England accounting for over 40% of hospital bed days (Dalrymple et al., 2020). Unfortunately, many of these people leave hospital less independent than their pre-admission status (Edmans et al., 2013). There are currently many and varied strategies to target the prevention and management of MoF in hospitalized older people. There are, for example, separate National Institute for Health and Care Excellence (NICE) guidance for each of falls, delirium and incontinence (National Institute For Health And Care Excellence, 2010; National Institute For Health And Care Excellence, 2013a; National Institute for Health and Care Excellence, 2013b). NICE guidance advocates risk factor assessment and strategies to modify contributing factors where possible. However, due to the similarity in risk factor profile for the MoF, this may result in duplicated assessments, overlapping care pathways, separate and duplicative national audits and a lack of consistency in approach across different organizations in the NHS. Moreover, the guidance fails to address the complexity of the health systems within which these interventions are applied. The contextual factors associated with caring for patients in an acute hospital environment and preventing additional burden to staff needs to be integrated into intervention development research. There remains an urgent need for a coordinated approach by the multi-disciplinary team to deliver key interventions to target risk factors for the development of the MoF in hospital, in order to maintain and promote independence and self-care in this vulnerable group.

To address this, we undertook a programme of work as part of a National Institute for Health Research (NIHR) Project Development Grant, "Older People: a study to investigate maintaining Independence through a novel system of care (OPTIMIZE, RP-DG-0218-10001). The work comprised four distinct phases. In the first phase, frailty risk factors in the in-patient setting were identified through scoping review, qualitative interviews with patients and their carers and focus groups with ward-based hospital staff (Wray et al., 2022) Informed by this work, a theoretical framework for the development of MoF in the hospital setting was created (Figure 1).

The risk factors identified in Phase 1 (Wray et al., 2022), were categorized in to seven patient risk factor domains (pain, medication, fluid/nutrition, mobility, elimination, infection and additional patient factor), 38 associated sub-domains (e.g. balance) and 18 linked care management sub-domains associated with the environment (e.g. beds being set too high), ward culture (e.g. taking away opportunities for patients to be independent) and processes of care (e.g. not having a mobility and functional assessment in a timely manner; Figure 1). In addition, 11 contextual risk factors (e.g. being risk averse may hamper encouraging patients to be independent) were also identified.

The second phase and the focus of this paper reports a consensus study to agree the modifiable risk factors suggested in Phase 1, to be included in the system of care. Later phases will include evidence review to identify care actions that have been evaluated as effective in addressing agreed risk factors and further consensus work to create the system of care.

3 | AIM

To reach consensus on the modifiable risk factors that should be targeted in a novel system of care for the prevention of Manifestations of Frailty in hospitalized older adults.

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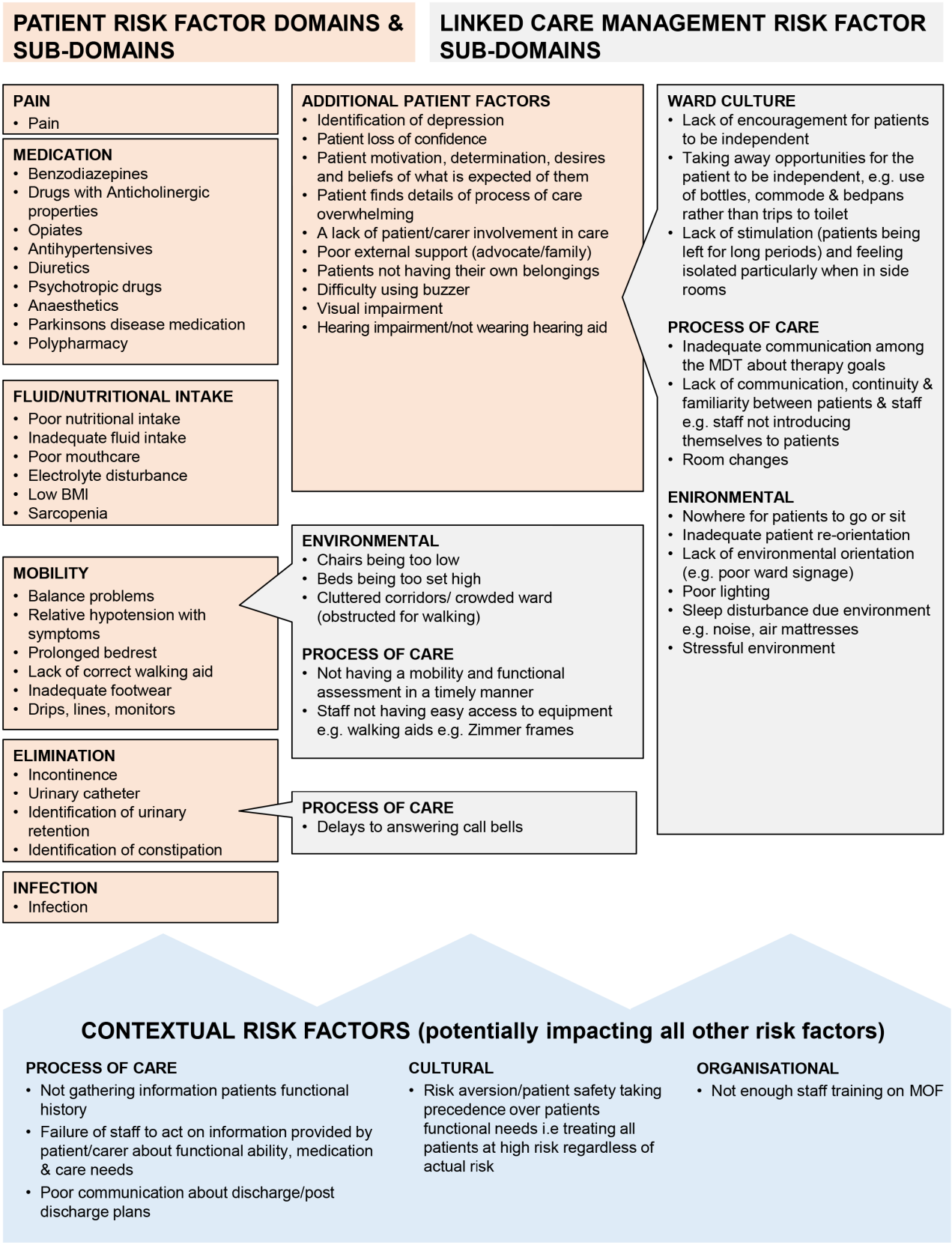

NB: for simplicity the risk factors have been allocated to the predominant risk factor type (i.e. patient risk factors, linked care management risk factors and contextual risk factors) they were considered to belong to, though it is recognised that for some there maybe overlap between these

FIGURE 1 Conceptual framework of risk factors for the development of exacerbation of MoF in the hospital setting. (reference publication).

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4 | DESIGN

A modified nominal group technique based on the Research and Development/University of California at Los Angeles (RAND/UCLA) Appropriateness Method (Fitch et al., 2001) was undertaken. This consensus approach incorporates consideration of existing evidence via a pre-meeting expert group questionnaire, face-to-face meeting of a multi-speciality expert group; post-expert group questionnaire completion (Byrne et al., 2020; Coleman et al., 2017; Power et al., 2015) and priority setting exercise (also see Figure 2).

In keeping with other consensus methods, we recruited a Programme Management Group (PMG) comprising clinicians, researchers and methodologists (incorporating the following disciplines: Geriatrician, Nurse, Physio, Statistician, Health Economist and Consensus methods expert), who provided study guidance and oversight. They were consulted at key stages of the project including protocol development, identifying the expert panel, data collection (questionnaire review) and reviewing results (Mokkink et al., 2010; Williamson et al., 2017).

4.1 | Sample/participants

We aimed to recruit 12–14 expert group participants comprising clinical and academic leaders identified via their publication record, conference presentations or involvement in professional organizations/societies (Murphy et al., 1998). Participants were purposively sampled to include the perspectives of the acute hospital multidisciplinary team (nurses, geriatricians, occupational therapists, physiotherapists and pharmacists) as multi-specialty groups are favoured in consensus methods to take account of a wide range of opinions (Hutchings & Raine, 2006). Nominations for panel members who met the above criteria were solicited from the PMG to facilitate good representation of relevant multi-disciplinary team members.

4.2 | Data collection

Data collection, incorporating face-to-face interaction of the expert group and pre- and post-questionnaire completion and priority setting exercise was undertaken November 2019–February 2020 (Figure 2, data collection flow-chart).

The questionnaires facilitated consideration of each risk factor captured in the preceding work (Figure 1; Wray et al., 2022). The questionnaire was structured to include the supporting evidence from the Phase 1 work including the scoping review; the patient interviews; and the staff focus groups. This evidence was summarized for consideration by the expert group participants prior to them being asked to rate of their level of support (on a 9-point Likert scale) for each risk factor to be included in the novel system of care. An example of a questionnaire item and structure is detailed in Table 1.

The questionnaires were independently completed by all expert group participants before and after the face-to-face expert group meeting. Analysis of the pre-meeting questionnaire was completed prior to the face-to-face expert group meeting allowing initial levels of support and areas of disagreement and uncertainty to be identified and presented. Completion of the post-meeting questionnaires allowed participants to change their ratings in light of discussions and/or where necessary for questionnaire items to be clarified and amended. The post-meeting questionnaire also identified final levels of support for the inclusion of risk factors.

The expert group face-to-face meeting was led by three experienced facilitators (SC, KH, ET) and was audio-recorded. The pre-meeting collective questionnaire responses were anonymously fed back to the group and provided the focus for group discussions. Expert group participants were also provided with a reminder report of their individual questionnaire responses so they could see how

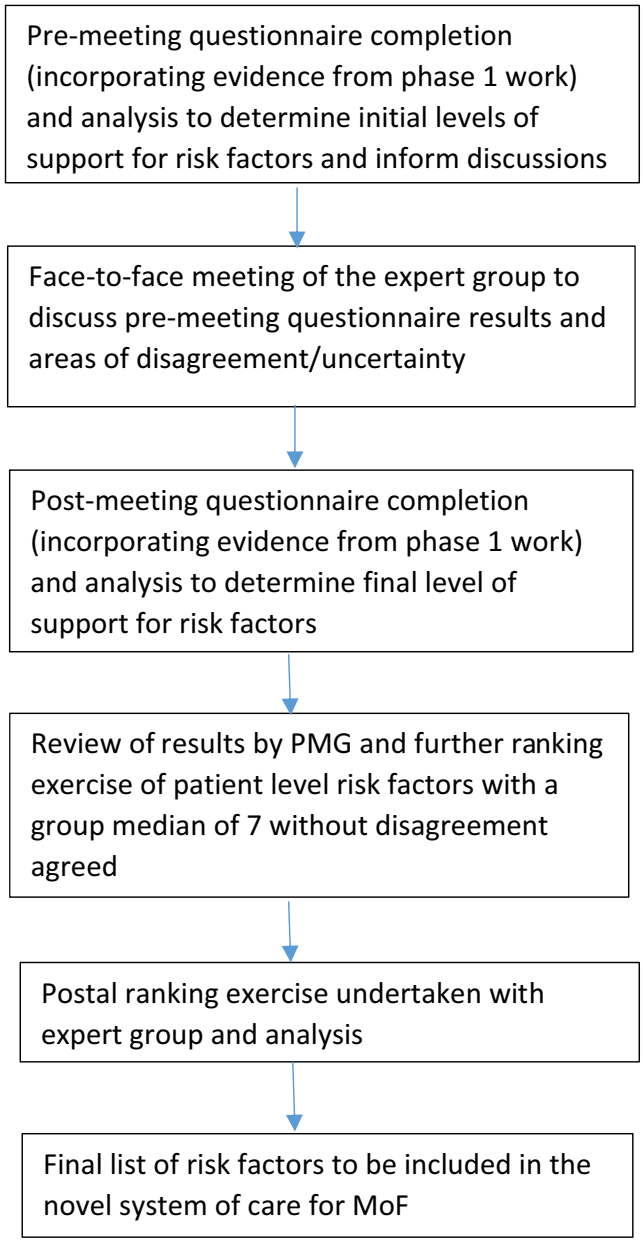

FIGURE 2 Data collection flow-chart

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TABLE 1 Example of questionnaire item and structure

10.5 Sub-domain: Patient loss of confidence

10.5.1 Summary of Staff Focus Group Discussion
Three staff participants talked about how stopping patients from doing things for themselves eventually erodes their confidence.

"Or like even if we're like mobilising patients and we're clinging on to them like that, it does nothing for anyone's confidence, you know, them thinking I need someone to be on my hip the whole time, rather than if you just take a step back and you know".

10.5.2 Summary of the patient interviews
Seven patient participants talked about losing confidence in their ability to do things for themselves. This tended to be around going home. One patient was "terrified" of falling again.

Just before going home another patient reported "I was frightened, I was actually frightened and I've got two grown-up people with me and I'm not normally a frightened person".

Being repeatedly told they couldn't do anything for themselves was felt by some patients as responsible for their lack of confidence: "I think I was brainwashed into believing I couldn't cope".

10.5.3 Risk Factor Statement(s)
Please reflect on the summary information above and your clinical experience/expertise in the field to rate your views regarding your level of support for the following Statement(s):

Patient loss of confidence is a modifiable risk factor for MoF that should be addressed in a novel system of care for hospitalised older people.

Strongly Disagree			**Neutral: Neither agree nor disagree**					**Strongly Agree**
○	○	○	○	○	○	○	○	○
1	2	3	4	5	6	7	8	9

10.5.4 Comment and suggest other proposed modifiable risk factors

their initial views compared with the overall group views. The group also had the opportunity to highlight and discuss additional risk factors they felt were missing from the initial list.

4.3 | Ethical considerations

The study was reviewed and approved by an NHS Research Ethics Committee in June 2019. Informed consent was gained from expert group participants, and they remained free to withdraw from the study without giving reasons.

4.4 | Data analysis

In keeping with other consensus studies and the Rand Appropriateness Method guidance, expert group questionnaire statements were summarized using the median group response and were categorized into tertiles, 1–3 disagree, 4–6 uncertain, 7–9 agree (Coleman et al., 2014, 2017; Fitch et al., 2001; Lechner et al., 2019). Within-group agreement was measured using the RAND disagreement index (Fitch et al., 2001), which considers the dispersion of individual scores and identifies areas of disagreement (where panellists rate at both ends of the Likert Scale).

Using the group median response and the disagreement index for each risk factor statement, the following principles were applied following the post-meeting questionnaire to decide which modifiable risk factors will be targeted for the novel system of care:

1. Group medians of 1–3 without disagreement will be excluded.
2. Group medians of 7–9 without disagreement will be included. However, if the number of patient-level risk factors with a group median of 7 (without disagreement) exceeds what can be reasonably be addressed in a novel system of care, the Programme Management Group will be consulted, and further ranking of these factors will be undertaken with expert group participants.
3. Disagreement index is >1 or median 4–6 will be excluded but are potential areas for further research.

Notes were taken by the co-facilitator (KH) regarding the key points of the discussion and the researcher (SC) listened to the audiotapes in full. The data were coded with categories based on the

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risk factor domains and sub-domain, in keeping with a directed content analysis approach (Hsieh & Shannon, 2005). This illuminates the reasoning behind the decisions made, particularly in relation to uncertain risk factors and where additional questionnaire items were needed or existing ones required clarification.

4.5 | Validity and reliability

It is difficult to determine whether the collective judgements of an expert group are valid (i.e. good judgements) at the time of undertaking a consensus study, and it is therefore important to ensure a rigorous and transparent process is employed throughout. This study applied key principles of good practice (Black et al., 1999; Coleman, 2014; Coleman et al., 2017; Hutchings & Raine, 2006; Raine et al., 2005), including the involvement of a mixed-speciality expert group; consideration of relevant evidence from a scoping review, interviews with patients and their carers and focus groups with ward-based hospital staff; support and oversight of a programme management group; private completion of questionnaires by expert group members; facilitated face-to-face meetings and the inclusion of a measure of dispersion as well as central tendency in the reporting.

5 | RESULTS

The expert group comprised 14 participants with expertise in the frailty field, incorporating senior clinical and/or academic geriatricians, nurses, occupational therapists and physiotherapists, comprising 12 females and two male participants. There was 93% (13 of 14) completion of pre- and post-meeting questionnaires, 100% (13 of 13) completion of the ranking exercise and 93% (13 of 14) attendance at the face-to-face meetings.

The pre-meeting questionnaire incorporated 64 risk factor statements. The results indicated initial support (group median 7–9) for 55 risk factors and uncertainty (group median 4–6) for the remaining nine risk factors (Table 2). During the course of the face-to-face expert group meeting discussion indicated an additional seven risk factors (use of Parkinson's disease medication, poor mouthcare, sarcopenia, identification of constipation, lack of environmental orientation, inadequate patient orientation and delays in initiating treatment) that needed to be considered in this consensus process and minor adjustments to existing risk factor statements (Table 2 – see italics). These changes were incorporated into the post-meeting questionnaire. Discussions relating to risk factor items considered uncertain (group median 4–6) in the pre-meeting questionnaire are detailed in Table 3.

The face-to-face expert group discussions highlighted the need to clarify the scope of the intended new system of care and how this would target risk factors at a patient, ward and/or organizational level. The discussion would also help to elucidate the requirements of the multi-component interventions. It was also acknowledged that patients with cognitive impairment should be flagged as being particularly vulnerable in the novel system of care, as many frailty risk factors are present in this population, for example nutrition and fluid intake, incontinence, difficulty using buzzer.

The post-meeting questionnaire incorporated 71 risk factor statements. The results indicated support (group median 7–9) for 61 risk factors, uncertainty (group median 4–6) for six risk factors and poor support for four risk factors (Table 2). This led to refinement of the theoretical framework to incorporate the 61 agreed risk factors under the existing categories (Figure 3).

5.1 | Categorization of risk factors

The results were reviewed by the Programme Management Group (PMG) and they considered the number of patient risk factors with a median of 7–9 to exceed what could reasonably be addressed in a novel system of care. Therefore, in line with our analysis principles (see data analysis section), it was agreed that a further priority setting of modifiable patient-level risk factors with a median of 7 would be undertaken by the expert group. The risk factors with a group median of 7 were categorized into three groups:

1. Important patient risk factors, but not modifiable within a time-limited hospital-based intervention: four risk factors comprising low BMI, sarcopenia, poor external support advocate/family and poor balance were considered non-modifiable within the confines of a 5–7 days acute hospital admission. We propose that the system of care should aim to ensure that these are identified where present and signpost to community-based services for longer term follow-up. Some steps to prevent exacerbation of these risk factors during the hospital admission have already been prioritized through the consensus process (i.e. promotion of adequate nutrition, early mobilization, provision of walking aids).
2. Non-patient-level risk factors: four risk factors comprising chairs being too low, poor lighting, patient having nowhere to go or sit and lack of environmental orientation, (e.g. ward signage), that might need a different approach (i.e. at an environmental level).
3. More difficult to address risk factors due to circumstances of hospital stay: 12 risk factors comprising patient motivation, patient finding details of process of care overwhelming, patients not having their own belongings, difficulty using buzzer, lack of patient/carer involvement in care, room changes, sleep disturbance, stressful environment, inadequate patient re-orientation, poor mouthcare, staff not having enough training and delays in initiating treatment. These were considered modifiable, but less easy to address when compared to the other risk factors.

The PMG decided that to address the first two groups (non-modifiable within a time-limited hospital-based intervention

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TABLE 2 Progression of risk factor domains and sub-domains through the consensus process

Risk factor & linked care management domains	Risk factors & linked care management sub-domain	Pre-meeting Group median with DI < 1	Post-meeting Group median With DI < 1	Decision Include: ✓ Exclude: X
Pain	1. Pain	8.00	8.00	✓
Medication	2. Use of benzodiazepines	9.00	8.00	✓
	3. Use of *drugs with* anticholinergic *properties*	8.00	8.00	✓
	4. Use of opiates	8.00	8.00	✓
	5. Use of antihypertensives	7.00	8.00	✓
	6. Use of diuretics	7.00	7.50	✓
	7. Use of psychotropic drugs	8.00	8.00	✓
	8. Use of anaesthetics	6.00	8.00	✓
	9. Use of Parkinsons disease medication		8.00	✓
	10. Polypharmacy	8.00	9.00	✓
Fluid/Nutrition	11. Poor nutritional intake	8.00	9.00	✓
	12. Low BMI *(/sarcopenia separated out)*	7.00	7.00	X[a]
	13. Inadequate fluid *(balance changed to) intake*	8.50	9.00	✓
	14. Electrolyte disturbance	7.00	8.00	✓
	15. Use of caffeinated drinks	5.00	3.00	X
	16. Poor Mouthcare		7.00	X PE
Mobility	17. Balance problems	8.00	7.00	X[a]
	18. Sarcopenia		7.00	X[a]
	19. *(Syncope changed to) Relative hypotension with symptoms*	6.00	8.00	✓
	20. Prolonged bedrest	9.00	9.00	✓
	21. Lack of correct walking aid	8.50	9.00	✓
	22. Inadequate footwear	8.50	8.00	✓
	23. Drips, lines and monitors	7.50	8.00	✓
Environmental	24. Chairs being too low	8.00	7.00	X[b]
	25. Beds being set too high	8.00	8.00	✓
	26. Cluttered corridors (obstructed for walking)	8.00	8.00	✓
	27. Poor flooring	6.00	6.00	X
Linked care management: process of care	28. *(Not been seen by a physio changed to) Not having a mobility and functional assessment in a timely manner*	8.50	9.00	✓
	29. Staff not having easy access to equipment (e.g. walking aids e.g. Zimmer frames)	8.50	8.00	✓
Elimination	30. Incontinence	8.00	9.00	✓
	31. Urinary catheter	8.00	8.00	✓
	32. *Identification of* urinary retention	7.00	8.00	✓
	33. Identification of constipation		9.00	✓
Linked care management: process of care	34. Delays in answering call bells	9.00	8.00	✓
Infection	35. Infection	7.50	8.00	✓

(Continues)

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TABLE 2 (Continued)

Risk factor & linked care management domains	Risk factors & linked care management sub-domain	Pre-meeting Group median with DI < 1	Post-meeting Group median With DI < 1	Decision Include: ✓ Exclude: X
Additional patient factors	36. *Identification of* Depression	7.00	8.00	✓
	37. Visual impairment	7.50	8.00	✓
	38. Hearing impairment/not wearing a hearing aid	8.00	8.00	✓
	39. Patient loss of confidence	8.00	8.00	✓
	40. Patient motivation, determination, desires and beliefs of what is expected of them	8.00	7.00	X PE
	41. Patient finds details of process of care overwhelming	8.00	7.00	X PE
	42. Patient not having their own belongings	8.00	7.00	X PE
	43. Patient loss of routine	7.00	5.00	X
	44. Patient difficulty using buzzer	7.50	7.00	✓ PE
	45. A lack of *(patient awareness about MOF changed to) patient/carer involvement in care*	7.00	7.00	✓ PE
	46. Poor external support (advocate/ family)	7.00	7.00	X[a]
	47. Patient adherence to planned care	6.00	4.00	X
Linked care management: ward culture	48. Lack of encouragement for patients to be independent	8.50	9.00	✓
	49. Taking away opportunities for patients to be independent	9.00	9.00	✓
	50. Lack of patient stimulation/isolation	8.00	9.00	✓
Linked care management: process of care	51. Inadequate communication among the MDT about therapy goals	8.00	9.00	✓
	52. Lack of communication, continuity & familiarity between patients & staff	8.00	9.00	✓
	53. Room changes	7.00	7.00	X PE
	54. Lack of environmental orientation (e.g. poor ward signage)		7.00	X[b]
	55. Inadequate patient re-orienatation		7.00	X PE
Linked care management: environmental	56. Poor lighting	8.00	7.00	X[b]
	57. Patients having nowhere to go or sit	7.00	7.00	X[b]
	58. Patients having no phone signal & no alternative phone to use	7.00	2.00	X
	59. Sleep disturbance due environment e.g. noise, air mattresses	7.00	7.00	X PE
	60. Stressful environment	8.00	7.00	X PE
Contextual (potentially impacting all other risk factors): *Process of care*	61. Not gathering information about the patients functional history	9.00	9.00	✓
	62. Failure of staff to act on information provided by patient/carer about functional ability, medication & care needs	9.00	9.00	✓
	63. Delays in patient discharge	7.00	6.00	X
	64. Poor communication about discharge/post discharge plans	8.50	8.00	✓

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TABLE 2 (Continued)

Risk factor & linked care management domains	Risk factors & linked care management sub-domain	Pre-meeting Group median with DI < 1	Post-meeting Group median With DI < 1	Decision Include: ✓ Exclude: X
Ward Culture	65. Risk aversion/patient safety taking precedence over patients' functional needs	8.00	8.00	✓
Organizational	66. Time consuming paperwork	5.00	5.00	X
	67. Difficulty locating patient notes	5.00	3.00	X
	68. High staff turnover	5.00	3.00	X
	69. Inadequate staffing levels	6.50	5.00	X
	70. Staff not having enough training	8.00	7.00	✓ PE
	71. Delays in initiating treatment		7.00	X PE

Note: Italics indicates amendments to wording or additional risk factors following the expert group meeting (i.e. between the pre and post meeting questionnaire).

Grey box indicates not considered in pre-meeting questionnaire.

PE: considered as part of Priority Exercise.

[a]Considered non-modifiable within a 5–7 days hospital admission by PMG.

[b]Considered non-patient-level risk factor by PMG.

TABLE 3 Summary of face-to-face meeting discussion regarding uncertain risk factors

Uncertain risk factors (pre-meeting group median 4–6)	Summary of face-to-face meeting discussion
Use of anaesthetics	The group recognized the importance of different protocols for anaesthetics and suggested that where appropriate regional rather than general anaesthetics are preferred
Caffeinated drinks	The group acknowledged only limited evidence to support the impact of caffeine on disruption to sleep and suggested this would vary from person to person. There was also a need to ensure patients personal preferences were taken into account. The need to have a good range of none caffeinated drinks available particularly before bed was acknowledged
Syncope	This was considered a risk factor for falls and acknowledged as being complex in the frail population. A more appropriate item was proposed, "relative hypotension with symptoms"
Poor flooring	While important and modifiable, particularly if a trip hazard, poor flooring was considered to be more of an organizational risk factor. The need to ensure adhere to safety regulations and to be involved in the design processes for future changes was highlighted
Patient adherence to planned care	This item was viewed quite negatively by the group as it was associated with non-compliance rather than working in partnership with patients and carers to facilitate an agreed approach to care management
Time consuming paperwork	While it was recognized that there was a need to streamline documentation generally, it was not considered to be a specific risk factor specific for frailty
Difficulty locating patient notes	This was acknowledged as being important in facilitating history taking (and covered in Table 2, item 60) but not considered a specific risk factor for frailty
High staff turnover inadequate staffing levels	These were important for managing care generally but considered to be difficult to modify. They were not considered specific risk factors for frailty

and non-patient-level risk factors) would require signposting for longer-term action or organizational change. For the third group, the PMG recommended further prioritization was needed to facilitate the development of a feasible novel system of care to address patient-level risk factors that could be implemented in practice.

Table 2 provides the results of the post-meeting prioritizing exercise, with patient difficulty using buzzer, lack of patient/carer involvement in care and staff not having enough training being prioritized. This led to the agreement of 44 modifiable risk factors to be included in a novel system of care to address MoF in hospitalized patients (Table 4).

6 | DISCUSSION

We used structured consensus methods (modified nominal group process) to agree the risk factors that should be targeted in a novel system of care for prevention of MoF in hospitalized older adults. Our previous Phase 1 work, incorporating a scoping review, patient

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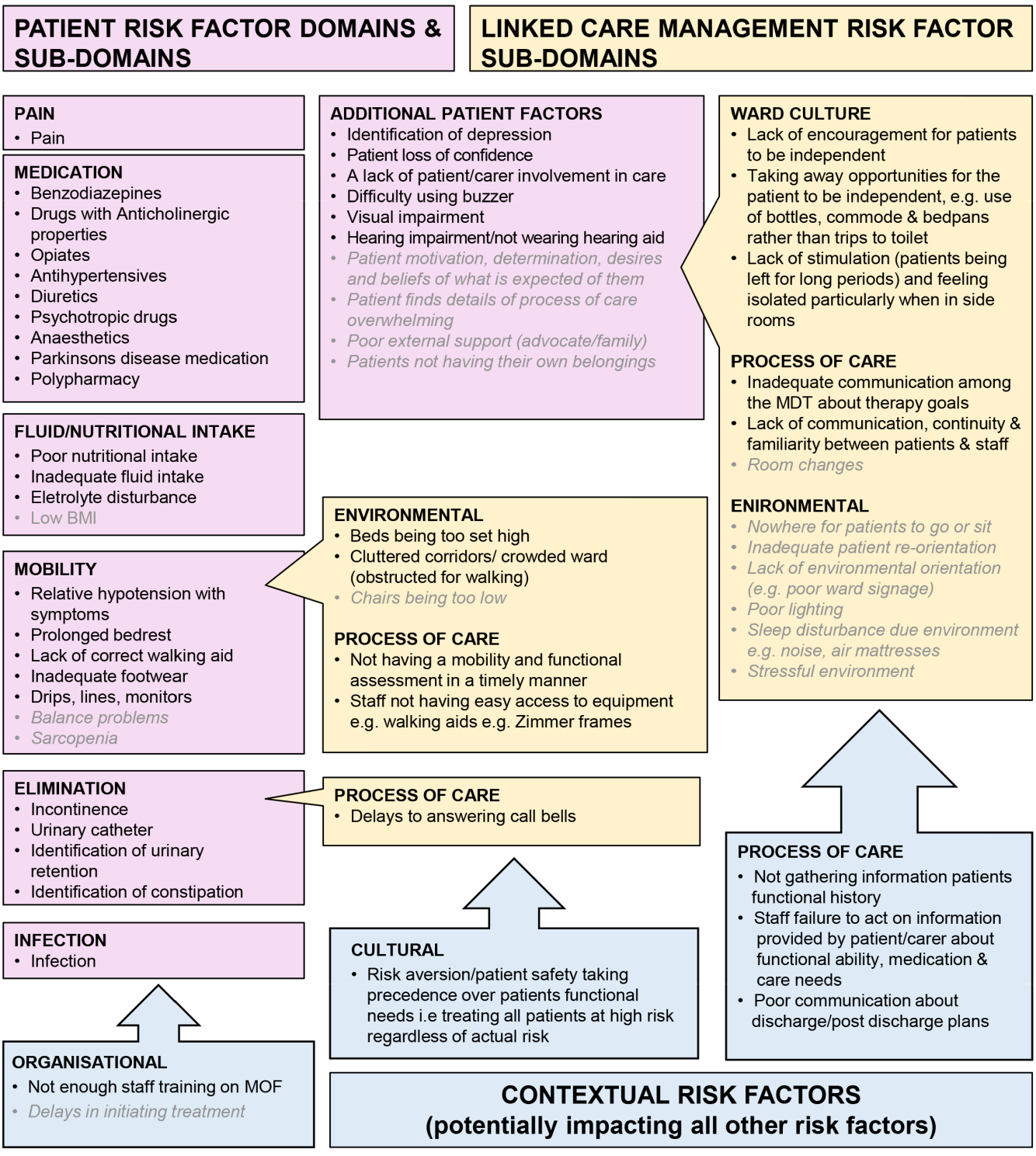

FIGURE 3 Revised conceptual framework of risk factors for the development of exacerbation of MoF in the hospital setting following consensus study.

interviews and staff focus groups (Wray et al., 2022) were integrated into the consensus process and facilitated the development of a long-list of 71 modifiable risk factors (Table 2) for consideration by a multi-disciplinary expert group, based on their clinical relevance and modifiability in an acute admission. Of the 71 modifiable risk factors, 61 were agreed to be important throughout the consensus process. Further prioritization led to the agreement of 44 risk factors (across seven domains: pain, medication, fluid/nutrition, mobility, elimination, infection and additional patient factor) to be included in a novel system of care to address MoF in hospitalized older adults (Table 4).

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TABLE 4 Final agreed patient-level risk factors for inclusion in a novel system of care to address MoF

Risk factor & linked care management domains	Risk factors & linked care management sub-domains
Pain	1. Pain
Medication	2. Benzodiazepines 3. Drugs with Anticholinergic properties 4. Opiates 5. Antihypertensives 6. Diuretics 7. Psychotropic drugs 8. Anaesthetics 9. Parkinsons disease medication. 10. Polypharmacy
Fluid/Nutrition	11. Poor nutritional intake 12. Inadequate fluid intake 13. Electrolyte disturbance
Mobility	14. Relative hypotension with symptoms 15. Prolonged bedrest 16. Lack of correct walking aid 17. Inadequate footwear 18. Drips, lines and monitors
Linked Care Management: Environmental	19. Beds being set too high 20. Cluttered corridors (obstructed for walking)
Process of Care	21. Not having a mobility and functional assessment in a timely manner 22. Staff not having easy access to equipment (e.g. walking aids e.g. Zimmer frames)
Elimination	23. Incontinence 24. Urinary catheter. 25. Identification of urinary retention 26. Identification of constipation
Linked Care Management: Process of Care	27. Delays in answering call bells
Infection	28. Infection
Additional Patient Factors	29. Identification of Depression 30. Visual impairment 31. Hearing impairment/not wearing a hearing aid 32. Loss of confidence 33. Difficulty using buzzer 34. A lack of patient/carer involvement in care
Linked Care Management: Ward Culture	35. Lack of encouragement for patients to be independent36. Taking away opportunities for patients to be independent37. Lack of patient stimulation/isolation
Linked Care Management: Process of Care	38. Inadequate communication among the MDT about therapy goals 39. Lack of communication, continuity & familiarity between patients & staff
Contextual (potentially impacting allother risk factors): Process of Care	40. Not gathering information about the patients functional history 41. Failure of staff to act on information provided by patient/carer about functional ability, medication & care needs 42. Poor communication about discharge/post discharge plans
Cultural	43. Risk aversion/patient safety taking precedence over patients' functional needs
Organizational	44. Staff not having enough training about MOF

These comprised 39 patient level and linked care management risk factors and 5 contextual risk factors. The number of risk factors considered to be important, highlights the complexity of identifying and managing MoF and the need to follow a robust methodological approach in developing intervention content, appropriate and feasible mechanisms of delivery and contextual evaluation (Skivington et al., 2021).

A strength of this study lies in the detailed evidence synthesis undertaken to identify risk factors which were further informed by input from patients, health professionals and our multi-disciplinary consensus group and PMG. Similar approaches have been used previously for the development risk assessment instruments (Coleman et al., 2014), wound assessment data sets (Coleman et al., 2017) and core outcome sets (Lechner et al., 2019). The advantage of such an approach is that it combines up to date evidence with the collective wisdom of a multi-disciplinary expert group who have clinical and academic experience to facilitate informed and transparent decision-making (Fitch et al., 2001).

Primarily, further work is needed to identify whether particular combinations or clusters of risk factors increase the risk of MoF and how these might be affected by patient characteristics. This could be facilitated by the increasing routine use of electronic patient records where relevant information can be extracted and modelled more easily compared with prospective paper-based data collection. Typical care bundles have three to five components with larger care bundles being more difficult to implement (Horner & Bellamy, 2012). Adoption of even simple tools (for example the FRAILSAFE checklist aimed to improve quality and safety of acute hospital care for frail older people) may be limited if the diversity of individuals is not considered within the context of complex healthcare systems (Papoutsi et al., 2018). Identifying the key risk factors for individuals would enable development of a more customized,

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person-centred intervention optimized for an individual's specific characteristics. Furthermore, there is a need to understand intervention delivery and the conditions needed to realize mechanisms of change within an organization (Skivington et al., 2021). These considerations may help to target better key intervention components, resulting in a simple, practical and implementable system of care to attenuate the manifestations of frailty in hospitalized older people.

6.1 | Limitations

While the study followed principles of good practice, a limitation of the methodology relates to difficulty in facilitating and assessing validity and reliability. To counter this we facilitated a robust consensus process that integrated existing evidence (from the preceding scoping review), the views of ward-based hospital staff (via the preceding staff focus groups work) and patients/carers (via the preceding interview work) allowing this evidence to be carefully considered by the expert group when making their judgements. In addition, though the study involved a carefully sampled multi-disciplinary expert group with considerable clinical experience, the small numbers involved raise questions about the reliability of the results and whether they are representative of the views of other clinicians in the field. It is important to note that the consensus study is only one step in the development of a novel system of care for the prevention of MoF, with further work planned to develop and assess the validity, reliability and usability of the intervention.

7 | CONCLUSION

Using a modified nominal group technique based on the RAND/UCLA appropriateness method, incorporating an expert group, review of the evidence from a literature review, patient interviews and staff focus groups we have agreed important risk factors to be incorporated into a novel system of care to address the MoF in an acute hospital environment. These incorporated 44 risk factors across seven domains (pain, medication, fluid/nutrition, mobility, elimination, infection and additional patient factor) incorporating patient, organizational and environmental risk factors. Development of the novel system of care will form the basis of future research to determine optimal personalized content, delivery mechanisms and contextual evaluations to reduce these manifestations of frailty and maintain and promote independence and self-care for these patients both in the in-patient setting and post-discharge.

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CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

DATA AVAILABILITY STATEMENT

Data available on request from the authors

ORCID

Susanne Coleman https://orcid.org/0000-0002-1437-421X
Faye Wray https://orcid.org/0000-0001-9351-5019

TWITTER

Susanne Coleman @drsusannec

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