# Frailty identification in the Emergency Department – a systematic review focussing on feasibility.

## Metadata

Here we will need to add key words, word count, ‘what this paper adds’ etc depending upon what the journal requires.

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## Key words

* Frailty
* Risk stratification
* Older people
* Urgent care
* Implementation

## Key points

* Risk stratification is a useful first step in identifying a cohort of older people accessing urgent care settings at especial risk of harm
* Several risk stratification tools exist, but little is known about their acceptability in practice (acceptability, completion rates)
* Although most commonly used tools are relatively quick to use (less than 10 minutes), little over 50% of potentially eligible people are screened using existing tools

## Abstract

### Introduction

Risk stratifying older people accessing urgent care is a potentially useful first step to ensuring that the most vulnerable are able to access optimal care from the start of the episode. Whilst there are many risk stratification tools reported in the literature, few have addressed the practical issues of implementation. This review sought evidence about the feasibility of risk stratification for older people with urgent care needs.

### Methods

Medline was searched for papers addressing risk stratification and implementation (feasibility or evaluation or clinician acceptability). Al search stages were conducted by two reviewers, and selected papers were graded for quality using the CASP tool for cohort studies. Data was summarised using descriptive statistics only.

### Results

1872 titles of potential interest were identified, of which 1827 were excluded on title/abstract review, and a further 43 after full-text review, leaving four papers for analysis. These papers described nine tools, which took between one to 10 minutes to complete for most participants. No more than 52% of potentially eligible older people were actually screened using any of the tools. Little detail was reported on the clinical acceptability of the tools tested.

### Discussion

The existing literature indicates that commonly used risk stratification tools are relatively quick to use, but do not cover much more than 50% of the potential population eligible for screening in practice. Additional work is required to appreciate how tools are likely to be used, by whom, and when in order to ensure that they are acceptable to urgent care teams.

## Introduction

Hospitalisation of an older person can be a sentinel event that heralds an intensive period of health and social care service use [1-3]. This is especially the case for ‘older people with frailty’, a distinctive late-life health state in which apparently minor stressor events are associated with adverse health outcomes [4-8]. Depending upon definitions, the setting, and local service configuration, about 5-10% of all Emergency Department (ED) attendees [9] and about 30% of patients in Acute Medical Units are older people with frailty [2, 10]. Older people with frailty represent a relatively small proportion of all those accessing urgent care settings, but an increasing proportion of those at risk of harms and high resource use as they progress from admission onto inpatient care. Focusing on these people is, in essence, an exercise in risk stratification - identifying a cohort at especially high risk of adverse outcomes. This then allows targeted intervention to be applied, and if identification occurs in the first hours or days, such interventions could be initiated at the beginning of the patient journey. Example interventions might include Comprehensive Geriatric Assessment [11-13], which has been shown to be feasible to apply in the Emergency Department [14, 15] and Acute Medical Unit settings [16].

There are limitations to frailty/risk-stratification tools in the urgent care context: although most scales perform better than chance in predicting a range of poor outcomes, none of them performed adequately for individual clinical decision making [17]. Moreover, little attention has been paid to the clinical utility of such tools (ease of use; amount of time required to administer; and the level of training required to be able to complete the assessment) [18]. An instrument can have the best reliability and validity but these benefits will not be realised if the instrument is not used because it is too difficult, takes too long, or can only be used by a few trained people. This is especially relevant in the pressurised, fast-paced urgent care context.

The purpose of this systematic review was to identify evidence on the feasibility of implementing frailty/risk-stratification tools for older people in the Emergency Department.

## Methods

### Eligibility

We searched for papers that assessed the feasibility of identifying frailty or risk-stratifying older people in the acute, urgent or emergency care setting. Studies were included if they included both of the following criteria in the title or abstract:

* assessments undertaken within 48 hours of attendance
* studies assessing a frailty scale, multi-dimensional risk stratification tool, or reflecting multiple domains of comprehensive geriatric assessment (medical, psychological/cognitive, functional, social or environmental aspects)

Studies were retained following full text review if they addressed some or all of the following:

* how long the assessment took to complete
* completion rates of an assessment tool in clinical practice (as opposed to as part of a research study)
* ease of use or acceptability to clinicians was reported

The CASP tools for cohort and qualitative studies were used to assess the risk of bias and grade the papers [19], with only papers scoring at least 50% being retained. Other exclusion criteria included:

* disease or condition specific tools
* pre-hospital assessments, including primary care settings
* assessments involving biochemical investigations or imaging (as these may not be available more generally)
* post-acute care assessments

A limit was set so that only English language studies from 2001 and later were included.

The Ovid Medline database was searched, using the following terms:

1. Frailty rating scales (exp)

2. Frail elderly or aged (exp)

3. Risk assessment or case finding or geriatric assessment

4. Emergency services or urgent care

5. Feasibility or evaluation or clinician acceptability

6. 2+3

7. 1 or 6

8. 4+7

9. 5+8

The full search strategy can be found in [on-line] appendix 1.

All titles and abstracts were assessed by two reviewers (AE, SC) to determine if a full-text review was required. Agreement between the two reviewers was good (99%, kappa = 0.63), but any disagreements were resolved through discussion.

References of retained papers were cross-checked for additional potential papers for inclusion.

We did not anticipate there being sufficiently homogenous results to allow a meta-analysis, so planned to use descriptive statistics to summarise the findings.

## Results

The initial search on Medline identified 1872 titles and abstracts for title/abstract review, following which 1827 papers were excluded, leaving 45 papers to undergo a full text review; reference searches identified two additional papers. Four of the 47 full text papers reviewed contained some data on feasibility or clinical acceptability (Figure 1).

Figure 1 Study selection process

4 papers included in final review

1827 did not meet inclusion criteria during title/abstract review

* 38 had no specific feasibility information
* 1 was used in intensive care only
* 2 were not multi-dimensional
* 2 involved data collection by research assistants

Two papers identified from reference searching

47 papers for full review

1872 papers identified from initial search

Overall, the literature was sparse on the practical details of implementing or administering the tools in clinical practice. Many studies contained comments on how long an assessment tool took to carry out, or mentioned how easy a tool was to use, but there was no specific data to support these statements. To clarify this, authors were contacted, to ascertain whether they had made any specific measurements on feasibility or clinician acceptability, leading to further exclusions if no specific measurement was undertaken to inform feasibility (total 43). The four retained papers described nine tools being used in emergency departments in three different countries. Three papers included information on how long the tool took to use [20-22] and three included information on completion rates [20, 22, 23]; one paper addressed acceptability [22]. The selected papers were methodologically robust (mean CASP score 76.8%). The findings are summarised in Figure 2; in brief, tools that have been tested took between one and ten minutes to complete for most participants, but none were able to be used in more than 52% of all older people potentially eligible for screening. There was little detailed information about the factors affecting clinician acceptability of the tools.

Figure 2 Characteristics and findings from retained studies.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Author** | **Study type** | **Setting** | **CASP review score (%)** | **Tool assessed** | **Synopsis** | **Feasibility criteria assessed** | **Result** | **Comments** |
| Asomaning & Loftus[23] | Quality improvement study, n=525 | North America, emergency department | 13/22 (59%) – using CASP cohort study tool | ISAR | Repeated PDSA cycles including: group education, one-on-one teaching sessions, tool revisions and data feedback | Completion rate | 52% of ISAR forms completed | No analysis of differences between enrolled and unenrolled participants.  Barriers cited as: fast-paced nature of emergency care, lack of dedicated personnel, lack of visibility of the inpatient interventions provided to ISAR-positive patients. |
| Maxwell et al[20] | Prospective cohort study, n=365 | North America, emergency department of a Level I trauma centre | 19/22 (86%) | Vulnerable Elders Survey (VES-13)  Barthel Index  Life Space Assessment | Measured enrolment rates and completion rates of selected instruments as part of cohort study | Time taken | <5 minutes for each (not actually measured) | No significant differences between enrolled and unenrolled. |
| Completion rate | 48% completed  19% declined enrolment; 6% excluded on clinical judgement; 27% unable to complete tool. |
| Nguyen et al[21] | Feasibility study, n=25 | Australia, emergency department | 19/22 (86%) | Synthesised geriatric assessment, including: MMSE, ISAR, falls risk, ABC-6, GDS 5, Barthel and Lawton ADL scales | Measured time taken to complete overall and individual scales | Time taken | Overall mean time - 20 minutes 40 seconds  MMSE – 4 minutes 52 seconds minutes  ISAR – 1 minute 43 seconds  Falls assessment – 1 minute 1 second  ABC-6 – 1 minute 7 seconds  GDS-5 1 minute 7 seconds  Barthel – 1 minute 27 seconds  Lawton – 1 minute 27 seconds | Small sample (n=25). Interpretation – 20 minutes is 9% of ED waiting standard, therefore feasible. |
| Schoenenberger et al[22] | Historical control cohort study, n=1547; 795 involved in screening process | Switzerland, emergency department | 13/17 (76%) | Emergency Geriatric Screening tool (EGS) – bespoke tool covering cognition, falls, mobility, and activities of daily living | Time was estimated by the completing clinician  Acceptability by survey of emergency clinicians | Time taken | 34% - less than 3 minutes for 114  32% - 3 to 4 minutes  20.% - 4-5 minutes  14% - 5-10 minutes | Timings taken by clinicians’ estimations so are open to error, compared to using a stopwatch.  Less than half completed. |
| Completion rate | 42.5%; non-completion related to: patients’ clinical state (22%) or ‘logistical reasons’ (35%) |
| Clinician acceptability | Domains of tool acceptable to ED clinicians (41/71 (64%) |

Mini-Mental State Examination (MMSE), Identification of Seniors At Risk (ISAR), falls risk, Activities Balance Coordination (ABC-6), Geriatric Depression Score (GDS 5)

## Discussion

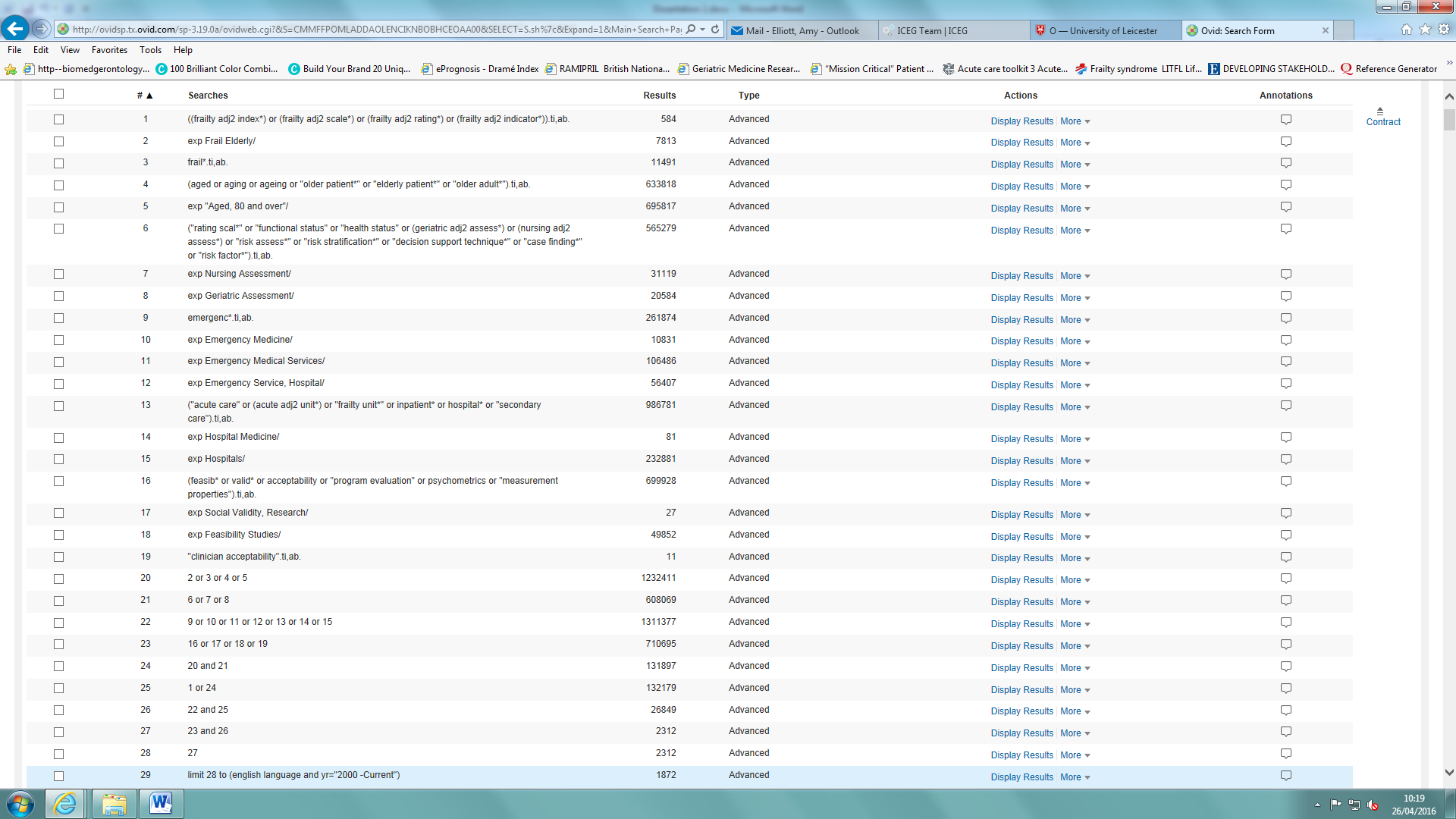
We identified only four studies from the literature that described the practical issues relating to the use of frailty orientated risk stratification tools in urgent care settings. All four studies were methodologically robust (mean CASP score 77%), and assessed nine different tools in urgent care settings (i.e. from attendance in the Emergency Department up to 72 hours). Completion rates were less than 52% for any tool and the time taken to complete individual tools ranged from one minute to ten minutes. Only Schoenenberger et al [22] formally assessed clinician acceptability for the Emergency Geriatric Screening tool, and reported that it was ‘predominantly acceptable’.

Whilst all of the reviewed tools have reasonable predictive properties, none are perfect; moreover, with completion rates in the region of 50%, none of these tools are likely to fulfil their primary role of risk stratification of older people in urgent care settings. Time to complete the tools appears to be an important determinant of acceptability – for example, a survey of 192 clinicians (mainly geriatricians) at a 2015 international frailty symposium found that 78% opted for less than five minutes, the remaining 22% chose longer than five minutes.

Our search was comprehensive, identifying a large number of potentially relevant papers, but some studies may have been missed as only one database was searched and the grey literature was omitted. It was not always possible to precisely ascertain the source of some authors’ feasibility and timing data; some of the evidence on timings appears to have been estimated by the developers.

If a key first step to improving outcomes for frail older people in urgent care settings is risk stratification to identify the population of interest [24], then additional work is required to appreciate how tools are likely to be used, by whom, and when in order to ensure that they are acceptable to urgent care teams. If these key aspects of implementation are not addressed, the there is a high risk that any tool, no matter how sensitive or specific, will not achieve its intended purpose. Given the paucity of data on the implementation of risk stratification tools in urgent care settings, further studies are required.

## Appendix 1



## References

1. Krumholz HM. Post-Hospital Syndrome — An Acquired, Transient Condition of Generalized Risk. New England Journal of Medicine. 2013;368(2):100-2.

2. Wou F, Gladman JR, Bradshaw L, Franklin M, Edmans J, Conroy SP. The predictive properties of frailty-rating scales in the acute medical unit. Age Ageing. 2013 Nov;42(6):776-81.

3. Edmans J, Bradshaw L, Gladman JRF, Franklin M, Berdunov V, Elliott R, et al. The Identification of Seniors at Risk (ISAR) score to predict clinical outcomes and health service costs in older people discharged from UK acute medical units. AGE AND AGEING. 2013 November 1, 2013;42(6):747-53.

4. Rockwood K, Mitnitski A. Frailty in relation to the accumulation of deficits. Journals of Gerontology Series A-Biological Sciences & Medical Sciences. 2007 Jul;62(7):722-7.

5. Clegg A, Young J, Iliffe S, Rikkert M, Rockwood K. Frailty in elderly people. The Lancet. 2013;381:752-62.

6. Fried L, Tangen C, Walston J, Newman A, Hirsch C, Gottdiener J, et al. Frailty in Older Adults: Evidence for a Phenotype. Journal of Gerontology: Medical Sciences. 2001;56A(3):M146-56.

7. Boyd C, Xue Q, Simpson C, Guranlnik J, Fried L. Frailty, hospitalization, and progression of disability in a cohort of disabled older women. The American Journal of Medicine. 2005;118(11):1225-31.

8. Bradshaw LE, Goldberg SE, Lewis SA, Whittamore K, Gladman JRF, Jones RG, et al. Six-month outcomes following an emergency hospital admission for older adults with co-morbid mental health problems indicate complexity of care needs. Age and Ageing. 2013 June 25, 2013.

9. Ferguson C, Woodard J, Banerjee J, Conroy S. Operationalising frailty definitions in the emergency department - a mapping exercise. Age Ageing. 2010;39(S1):i7.

10. Soong J, Poots A, Scott S, Donald K, Woodcock T, Lovett D, et al. Quantifying the prevalence of frailty in English hospitals. BMJ Open. 2015 October 1, 2015;5(10).

11. Beswick AD, Rees K, Dieppe P, Ayis S, Gooberman-Hill R, Horwood J, et al. Complex interventions to improve physical function and maintain independent living in elderly people: a systematic review and meta-analysis.[see comment]. Lancet. 2008 Mar 1;371(9614):725-35.

12. Ellis G, Whitehead M, O'Neill D, Robinson D, Langhorne P. Comprehensive geriatric assessment for older adults admitted to hospital. . Cochrane Library [serial on the Internet]. 2011.

13. Ellis G, Whitehead MA, Robinson D, O’Neill D, Langhorne P. Comprehensive geriatric assessment for older adults admitted to hospital: meta-analysis of randomised controlled trials. BMJ. 2011 2011-10-27 00:00:00;343.

14. Conroy SP, Ansari K, Williams M, Laithwaite E, Teasdale B, Dawson J, et al. A controlled evaluation of comprehensive geriatric assessment in the emergency department: the ‘Emergency Frailty Unit’. AGE AND AGEING. 2014 January 1, 2014;43(1):109-14.

15. Wright PN, Tan G, Iliffe S, Lee D. The impact of a new emergency admission avoidance system for older people on length of stay and same-day discharges. Age Ageing. 2014 Jan;43(1):116-21.

16. Silvester KM, Mohammed MA, Harriman P, Girolami A, Downes TW. Timely care for frail older people referred to hospital improves efficiency and reduces mortality without the need for extra resources. Age and Ageing. 2014 July 1, 2014;43(4):472-7.

17. Conroy S, Dowsing T. The ability of frailty to predict outcomes in older people attending an acute medical unit. Acute Med. 2013;12(2):74-6.

18. Smart A. A multi-dimensional model of clinical utility. Int J Qual Health Care. 2006 2006-10-01 00:00:00;18(5):377-82.

19. CASP UK. CASP Checklists. 2013 [cited 2016 21 May]; Available from: <http://www.casp-uk.net/#!casp-tools-checklists/c18f8>.

20. Maxwell CA, Mion LC, Mukherjee K, Dietrich MS, Minnick A, May A, et al. Feasibility of screening for preinjury frailty in hospitalized injured older adults. J Trauma Acute Care Surg. 2015 Apr;78(4):844-51.

21. Nguyen A, Straney L, Cameron P, Lowthian J. Synthesised geriatric assessment in the Emergency Department setting: is it NEAT? Aust Health Rev. 2014 Sep;38(4):370-6.

22. Schoenenberger AW, Bieri C, Ozguler O, Moser A, Haberkern M, Zimmermann H, et al. A novel multidimensional geriatric screening tool in the ED: evaluation of feasibility and clinical relevance. Am J Emerg Med. 2014 Jun;32(6):623-8.

23. Asomaning N, Loftus C. Identification of seniors at risk (ISAR) screening tool in the emergency department: implementation using the plan-do-study-act model and validation results. J Emerg Nurs. 2014 Jul;40(4):357-64 e1.

24. Conroy SP, Turpin S. New horizons: urgent care for older people with frailty. Age and Ageing. 2016 August 1, 2016.