

ACUTE GERIATRICS

Safe to send home? Discharge risk assessment in the emergency department

Lauren T SOUTHERLAND,¹ Scott PEARSON,² Carolyn HULLICK ,^{3,4} Christopher R CARPENTER ⁵ and Glenn ARENDTS ⁶

¹Department of Emergency Medicine, The Ohio State University Wexner Medical Center, Columbus, Ohio, USA, ²Department of Emergency Medicine, Christchurch Hospital, Christchurch, New Zealand, ³Faculty of Health, The University of Newcastle, Newcastle, New South Wales, Australia, ⁴Hunter Medical Research Institute, Newcastle, New South Wales, Australia, ⁵Department of Emergency Medicine, Washington University in St. Louis, St. Louis, Missouri, USA, and ⁶School of Medicine, The University of Western Australia, Perth, Western Australia, Australia

‘An 88-year-old man who lives alone attends ED with cough, weakness and dyspnoea, which you diagnose as viral bronchitis. As an avid reader of the Acute Geriatric Series in *Emergency Medicine Australasia*, you identify that he scores 6 on the Clinical Frailty Scale, that is, he is moderately frail (needing help with all outside activities and with keeping house).¹ You recognise that he is at increased risk in the short term if discharged, and wonder if he will be safer if admitted?’

What is safe?

If risk is the probability of suffering harm, safety is reduced exposure to risk. In general, physicians are more risk averse than patients, and equate risk reduction with hospital admission. This is especially powerful for emergency physicians – we transfer risk to inpatient teams by admitting the patient, whereas we accept risk ourselves in discharging. Discharging a patient to outpatient care has risks of inadequate social, medical and physical support at home. This risk is not minimal – inadequate supervision for the cognitively impaired or an unsafe environment can cause falls,

worsening of illness, or death. Almost one-third of older adults will experience an adverse outcome (ED revisit, subsequent hospital admission, admission to a long-term care facility or death) within 3 months of the ED visit.²

However, admission also poses a risk for older patients including deconditioning (loss of muscle mass), loss of independence (functional decline) and the iatrogenic harms of delirium and hospital-acquired infections.^{3–6} These risks are often downplayed or ignored by physicians and are almost entirely unknown to patients.

Central to the theme of ‘what is a safe discharge?’ is shared decision-making, incorporating the risks and benefits of both admission and discharge, valuing not just the medical problems but also other circumstances; patient vulnerability to harm, encompassing an assessment of mobility, function and cognitive status, are weighed against protective factors like home support.

A full evaluation of these issues and discussion with patients and carers is time consuming for the busy ED clinician. The result is that we often do not meaningfully involve the patient in this decision or do not

allow appropriate time to ensure understanding.⁷ In one study of independent older patients without any prior diagnoses of cognitive impairment discharged from the ED, formal testing revealed that 62% had cognitive impairment, with severe impairment in 23%.⁸ Not understanding a patient’s cognitive status and health literacy can result in miscommunication and poor discharge planning.⁹ Presumably it also results in poor admission planning, but this has never been studied.

How can the ED clinician measure risk and present it in interpretable form to patients and carers within the time constraints of the ED? How can we avoid the temptation to admit as the path of least assumed risk? Help can come from a geriatrics-trained staff member or from a multidisciplinary team of nurses, nurse practitioners, pharmacists, dieticians, physiotherapists, occupational therapists, case managers, social workers, and/or geriatricians. The ability of each ED to achieve this multidisciplinary input is dependent on resources, with larger EDs more likely to have support. Even without help, ED clinicians must recognise the critical issues: understanding the patient’s vulnerabilities, protective factors and, most importantly, goals and values before an admission or discharge decision.

There are multiple ways to assess for these critical issues. Some formal tools are listed in Table 1. Although these tools are validated in the ED, this does not mean that ‘high risk patient’ equates with hospital

Correspondence: Associate Professor Glenn Arendts, School of Medicine, The University of Western Australia, 35 Stirling Hwy, Crawley, WA 6009, Australia. Email: glenn.arendts@uwa.edu.au

Lauren T Southerland, MD, Emergency Physician; Scott Pearson, MBChB, Emergency Physician; Carolyn Hullick, BMed, Emergency Physician; Christopher R Carpenter, MD, MSc, Emergency Physician; Glenn Arendts, MBBS, MMed, PhD, Emergency Physician.

Accepted 20 January 2019

TABLE 1. Suggestions of tools or screening instruments for use in the ED to evaluate for post-discharge risk factors (this list is not all inclusive)

Assessment	Tools	Interventions
Medication effects ^{10,11}	• AGS Beers Criteria • UpToDate Drug Interactions • AGS app	• Pharmacist consultation • Discussion with primary care physician about de-prescribing
Mobility ¹²	• Timed Up and Go • 4 Stage Balance Test • Sit to Stand Test	• Physiotherapist (PT) evaluation • Home safety assessment, and admission for placement if unable to walk well with assistive devices • Referral for outpatient PT assessment
Activities of daily living ^{13–16}	• Identification of Seniors at Risk • TRST • Older Adult Resources and Services • Functional Status Assessment of Seniors in Emergency Departments	• Address any unmet needs for assistance • Arrange close outpatient follow up by a home health team (nurse, therapist or community paramedic)
Driving safety ¹⁷	• Trail making test • Fitness to drive screen	• Driver safety course • Family discussion • Referral for more resources and assessment
Cognition ^{18–20}	• MMSE • MoCA • Short Blessed Test • Ottawa 3DY	• Referral for full cognitive evaluation • Admission if unable to follow medical instructions at home or lack of assistance at home
Delirium ²¹	• Delirium Triage Screen • bCAM • 4AT	• Medical evaluation for causes of delirium • Appropriate delirium management

Beers Criteria: https://www.sigot.org/allegato_docs/1057_Beers-Criteria.pdf or find this in an easily searchable form on the AGS app. Drug Interactions: https://www.uptodate.com/drug-interactions/?source=responsive_home#di-druglist. Trail making test: <http://elderlydrivingassessments.com/images/individ/adres.pdf> last page in the document. Fitness to drive screening: <http://fitnesstodrive.php.ufl.edu/us/>. AGS, American Geriatrics Society; bCAM, brief Confusion Assessment Method; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment; TRST, Triage Risk Screening Tool.

admission. Some conditions are beyond the scope of restorative care. ED clinicians must understand the limits of current medical therapies in restoring patient-oriented outcomes such as mobility or cognition – separating the concept of improving from that of supporting. Admission of a patient with Parkinson's disease and falls related to her disease process leads to deconditioning, further decline, and increased risks from not being able to administer her medications on her typical schedule. Despite being 'high risk', this patient will benefit more from a referral to an outpatient exercise programme or fall risk clinic for chronic management.²²

Assessment of discharge risk

Screening instruments

The ideal prognostic screening instrument for discharge risk will be well calibrated across a broad range of illness severity, disability, socioeconomic status and health literacy. The instrument will be accurate enough to significantly reduce (negative LR <0.1) or increase (positive LR >10) the probability of adverse outcomes. This ideal tool does not exist. However, there are many different validated prognostic screening instruments that offer some insight into patient risk.^{13,23,24} Constructs of frailty have also been trialled to predict adverse patient outcomes such

as risk of nursing home placement or hospital readmission.^{25,26} Unfortunately, no tool provides the accuracy and simplicity needed in the ED to be a standard solution for all patients and all EDs. The tools have a common characteristic of a high false positive rate (see Carpenter *et al.* for full comparison).²⁷

The advantage of using a formal risk stratification tool is not that it accurately prognosticates, but that it guides ED clinicians to consider the elements of risk involved. For example, the Identification of Seniors at Risk tool asks if the patient needed help at home prior to the ED visit, and also addresses visual and memory impairment.¹⁴ This both reminds

the clinician of the importance of these issues, and also may help in identifying the ED patients who will benefit from alternatives to admission. These include observation for further multidisciplinary geriatric assessment prior to discharge or Hospital at Home programmes.^{14,28–30} Each ED must carefully consider how such an instrument can help their team although acknowledging their limitations. It may be that a tiered response is useful with early screening using one of these tools and then progressing to more complex evaluations, similarly to fall risk evaluations. Although there is no perfect fall risk tool (see the articles on falls and postural hypotension in this series^{31,32}), using a tool can give you and the patient objective evidence of their need for further fall risk evaluation.

Risk also depends on social and cultural differences. A Turkish study found that living alone increased sevenfold the rate of ED returns at 30 days.³³ However, Lowthian *et al.* in an Australian cohort study found that those who lived alone were not more likely to return to the ED at 30 days.³⁴ Differences between studies can be related to access to care and community resources; in the Australian cohort, 97% had a general practitioner.

What can we do to improve these screening tools?

Future discharge risk assessment tools must consider the heterogeneity of this population, and investigate new conceptualisations of risk and outcome measures.

- *What is an adverse outcome?* The 'adverse outcomes' used to validate these tools (such as ED revisits) may not be the best measure. Patient-oriented outcomes such as functional decline or health-related quality of life may be better.³⁵
- *Can the patient tell us?* Involving the patient in shared decision-making at the time of discharge can help with identifying risk. In an inpatient study, patients who did not feel ready for discharge were 70% more likely to have ED revisits, death, or an unplanned readmission by 30 days.³³ Additionally, the nurse's perception of whether the patient was ready for discharge can be even more predictive than the patient's perception.³⁶ This has not been investigated in the ED but a discussion with the patient about their readiness and comfort with discharge gives the patient the opportunity to bring up some of the issues listed in Table 1 without using formal assessments.
- *Can life space be predictive?* Life space refers to the spatial area (home, bedroom, outside home) that a person moves through in their day and the assistance they require to move through this area.³⁷ It is measured by a simple tool with up to nine yes/no questions starting with 'During the past 3 days, have you been to other rooms of your home besides the room where you sleep?'³⁷ Older adults have a significant reduction in their life space after an index ED visit and rarely recover.³⁸ This measure may encapsulate other markers (such

as frailty and functional status) more accurately than other tools.

What can the ED do?

If you have identified a patient at heightened risk after discharge, what is the next step? Comprehensive Geriatric Assessment (CGA) is a comprehensive and multidisciplinary review of social and health issues including cognitive function in order to develop a coordinated and integrated plan for treatment and long-term follow up. Although generally time consuming, and considered by some an oxymoron for the ED environment, models have been developed for this to occur in the ED itself or in an ED co-located unit, such as an Observation Unit or Frailty Unit.^{29,39,40} Using an Observation Unit provides a setting and time for these assessments to occur without interrupting the flow of medical care in the ED.^{41–43} There is an experience with a co-located Emergency Frailty Unit that facilitates CGA including geriatric assessment and has been shown to reduce ongoing admissions and representations to ED.⁴¹ A similar successful strategy is to include more staff into the ED itself to provide concurrent assessments. Examples of this strategy include Aged Care Services in Emergency Teams nurses, transitional care nurses, and care coordination teams.^{39,44,45}

Other programmes use home assessment teams that will evaluate the patient within 24 h of the ED discharge.⁴⁶ In-person assessments seem to provide better outcomes than phone follow ups, as discharge follow up by telephone has not been

TABLE 2. Questions to consider prior to discharging an older adult from the ED

- Have you accounted for any cognitive deficits or changes in mental status?
- Have you assessed for safe ambulation (if ambulatory)?
- Have you discussed the level of care needed at home and whether carers will be available?
- Do you have any concern for abuse or neglect, even self-neglect?
- Have you double checked any new prescriptions for medication interactions?
- Have you confirmed good understanding of the discharge instructions with the patient and caregiver?
- Does the patient feel comfortable and ready for discharge? Is there anything the patient is worried about?
- Has the plan of care been communicated with the patient's general practitioner?

shown to reduce ED revisits or complications.^{47,48} The most intensive discharge follow up is a hospital at home programme. These programmes require more time in the ED or ED Observation Unit to set up, but may reduce overall health-care costs, functional decline and nursing home use after an ED visit.⁴⁹ Programmes arranging for services in the community rather than admission have shown good outcomes.^{50,51}

Ultimately, the burden is on the ED clinician to ensure a safe transition to home. We recommend going through a structured series of questions to help (Table 2). This structure encourages a detailed and standardised assessment of issues likely to be relevant for older adults.

Conclusions

Emergency clinicians must understand the complications and limitations of acute admission for the elderly patient and the risks and difficulties after ED discharge. Although we do not have an ideal risk screening tool, the concepts raised by such instruments encourage a deeper exploration of patient- and community-centred factors to promote a safer transition of care. When possible, there must be consideration of CGA in the ED or an ED Observation Unit, coordination of outpatient resources, or hospital at home programmes.

Competing interests

None declared.

References

- Arendts G, Burkett E, Hullick C, Carpenter CR, Nagaraj G, Visvanathan R. Frailty, thy name is. *Emerg. Med. Australas.* 2017; 29: 712–6.
- Hastings SN, Oddone EZ, Fillenbaum G, Sloane RJ, Schmader KE. Frequency and predictors of adverse health outcomes in older Medicare beneficiaries discharged from the emergency department. *Med. Care* 2008; 46: 771–7.
- Zisberg A, Shadmi E, Gur-Yaish N, Tonkikh O, Sinoff G. Hospital-associated functional decline: the role of hospitalization processes beyond individual risk factors. *J. Am. Geriatr. Soc.* 2015; 63: 55–62.
- Marcantonio ER. Delirium in hospitalized older adults. *N. Engl. J. Med.* 2017; 377: 1456–66.
- Kaye KS, Marchaim D, Chen TY *et al.* Effect of nosocomial bloodstream infections on mortality, length of stay, and hospital costs in older adults. *J. Am. Geriatr. Soc.* 2014; 62: 306–11.
- Calero-Garcia MJ, Ortega AR, Navarro E, Calero MD. Relationship between hospitalization and functional and cognitive impairment in hospitalized older adult patients. *Aging Ment. Health* 2017; 21: 1164–70.
- Dyrstad DN, Laugaland KA, Storm M. An observational study of older patients' participation in hospital admission and discharge – exploring patient and next of kin perspectives. *J. Clin. Nurs.* 2015; 24: 1693–706.
- Ouellet MC, Sirois MJ, Beaulieu-Bonneau S *et al.* Correlates of cognitive functioning in independent elderly patients discharged home from the emergency department after a minor injury. *Int. Psychogeriatr.* 2016; 28: 1313–22.
- Hastings SN, Barrett A, Weinberger M *et al.* Older patients' understanding of emergency department discharge information and its relationship with adverse outcomes. *J. Patient Saf.* 2011; 7: 19–25.
- Counsell SR. 2015 updated AGS beers criteria offer guide for safer medication use among older adults. *J. Gerontol. Nurs.* 2015; 41: 60–1.
- Briggs S, Pearce R, Dilworth S, Higgins I, Hullick C, Attia J. Clinical pharmacist review: a randomised controlled trial. *Emerg. Med. Australas.* 2015; 27: 419–26.
- Stevens JA. The STEADI tool kit: a fall prevention resource for health care providers. *IHS Prim. Care Provid.* 2013; 39: 162–6.
- Braes T, Moons P, Lipkens P *et al.* Screening for risk of unplanned readmission in older patients admitted to hospital: predictive accuracy of three instruments. *Aging Clin. Exp. Res.* 2010; 22: 345–51.
- McCusker J, Verdon J, Tousignant P, de Courval LP, Dendukuri N, Belzile E. Rapid emergency department intervention for older people reduces risk of functional decline: results of a multicenter randomized trial. *J. Am. Geriatr. Soc.* 2001; 49: 1272–81.
- Thiem U, Heppner HJ, Singler K. Instruments to identify elderly patients in the emergency department in need of geriatric care. *Z. Gerontol. Geriatr.* 2015; 48: 4–9.
- Bissett M, Cusick A, Lannin NA. Functional assessments utilised in emergency departments: a systematic review. *Age Ageing* 2013; 42: 163–72.
- Betz ME, Haukoos JS, Schwartz R *et al.* Prospective validation of a screening tool to identify older adults in need of a driving evaluation. *J. Am. Geriatr. Soc.* 2018; 66: 357–63.
- Carpenter CR, Bassett ER, Fischer GM, Shirshekan J, Galvin JE, Morris JC. Four sensitive screening tools to detect cognitive dysfunction in geriatric emergency department patients: brief Alzheimer's screen, short blessed test, Ottawa 3DY, and the caregiver-completed AD8. *Acad. Emerg. Med.* 2011; 18: 374–84.
- Carpenter CR, DesPain B, Keeling TN, Shah M, Rothenberger M. The six-item screener and AD8 for the detection of cognitive impairment in geriatric emergency department patients. *Ann. Emerg. Med.* 2011; 57: 653–61.
- Barbic D, Kim B, Salehmohamed Q, Kemplin K, Carpenter CR, Barbic SP. Diagnostic accuracy of the Ottawa 3DY and short blessed test to detect cognitive dysfunction in geriatric patients presenting to the emergency department. *BMJ Open* 2018; 8: e019652.
- Han JH, Suyama J. Delirium and dementia. *Clin. Geriatr. Med.* 2018; 34: 327–54.
- Fasano A, Canning CG, Hausdorff JM, Lord S, Rochester L. Falls in Parkinson's disease: a complex and evolving picture. *Mov. Disord.* 2017; 32: 1524–36.

23. Meldon SW, Mion LC, Palmer RM *et al.* A brief risk-stratification tool to predict repeat emergency department visits and hospitalizations in older patients discharged from the emergency department. *Acad. Emerg. Med.* 2003; 10: 224–32.
24. Arendts G, Etherton-Beer C, Jones R *et al.* Use of a risk nomogram to predict emergency department reattendance in older people after discharge: a validation study. *Intern. Emerg. Med.* 2015; 10: 481–7.
25. Apostolo J, Cooke R, Bobrowicz-Campos E *et al.* Predicting risk and outcomes for frail older adults: an umbrella review of frailty screening tools. *JBIG Database System Rev. Implement. Rep.* 2017; 15: 1154–208.
26. Rockwood K, Song X, MacKnight C *et al.* A global clinical measure of fitness and frailty in elderly people. *CMAJ* 2005; 173: 489–95.
27. Carpenter CR, Shelton E, Fowler S *et al.* Risk factors and screening instruments to predict adverse outcomes for undifferentiated older emergency department patients: a systematic review and meta-analysis. *Acad. Emerg. Med.* 2015; 22: 1–21.
28. Salvi F, Morichi V, Grilli A *et al.* Screening for frailty in elderly emergency department patients by using the Identification of Seniors At Risk (ISAR). *J. Nutr. Health Aging* 2012; 16: 313–8.
29. Aldeen AZ, Courtney DM, Lindquist LA, Dresden SM, Gravenor SJ. Geriatric emergency department innovations: preliminary data for the geriatric nurse liaison model. *J. Am. Geriatr. Soc.* 2014; 62: 1781–5.
30. Galvin R, Gillett Y, Wallace E *et al.* Adverse outcomes in older adults attending emergency departments: a systematic review and meta-analysis of the Identification of Seniors At Risk (ISAR) screening tool. *Age Ageing* 2017; 46: 179–86.
31. Nagaraj G, Hullick C, Arendts G, Burkett E, Hill KD, Carpenter CR. Avoiding anchoring bias by moving beyond ‘mechanical falls’ in geriatric emergency medicine. *Emerg. Med. Australas.* 2018; 30: 843–50.
32. Kennedy M, Davenport KT, Liu SW, Arendts G. Reconsidering orthostatic vital signs in older emergency department patients. *Emerg. Med. Australas.* 2018; 30: 705–8.
33. Kaya S, Sain Guven G, Aydan S *et al.* Patients’ readiness for discharge: predictors and effects on unplanned readmissions, emergency department visits and death. *J. Nurs. Manag.* 2018; 26: 707–16.
34. Lowthian J, Straney LD, Brand CA *et al.* Unplanned early return to the emergency department by older patients: the Safe Elderly Emergency Department Discharge (SEED) project. *Age Ageing* 2016; 45: 255–61.
35. Lo AX, Biese K, Carpenter CR. Defining quality and outcome in geriatric emergency care. *Ann. Emerg. Med.* 2017; 70: 107–9.
36. Weiss ME, Costa LL, Yakusheva O, Bobay KL. Validation of patient and nurse short forms of the Readiness for Hospital Discharge Scale and their relationship to return to the hospital. *Health Serv. Res.* 2014; 49: 304–17.
37. Baker PS, Bodner EV, Allman RM. Measuring life-space mobility in community-dwelling older adults. *J. Am. Geriatr. Soc.* 2003; 51: 1610–4.
38. Brown CJ, Kennedy RE, Lo AX, Williams CP, Sawyer P. Impact of emergency department visits and hospitalization on mobility among community-dwelling older adults. *Am. J. Med.* 2016; 129: 1124.e9–e15.
39. Hwang U, Dresden SM, Rosenberg MS *et al.* Geriatric emergency department innovations: transitional care nurses and hospital use. *J. Am. Geriatr. Soc.* 2018; 66: 459–66.
40. Arendts G. How comprehensive is comprehensive enough? Emergency department assessment of older people. *Age Ageing* 2017; 46: 340–1.
41. Taylor JK, Gaillemain OS, Pearl AJ, Murphy S, Fox J. Embedding comprehensive geriatric assessment in the emergency assessment unit: the impact of the COPE zone. *Clin. Med. (Lond.)* 2016; 16: 19–24.
42. Southerland LT, Vargas AJ, Nagaraj L, Gure TR, Caterino JM. An emergency department observation unit is a feasible setting for multidisciplinary geriatric assessments in compliance with the geriatric emergency department guidelines. *Acad. Emerg. Med.* 2018; 25: 76–82.
43. Foo CL, Siu VW, Tan TL, Ding YY, Seow E. Geriatric assessment and intervention in an emergency department observation unit reduced re-attendance and hospitalisation rates. *Australas. J. Ageing* 2012; 31: 40–6.
44. Shanley C, Sutherland S, Tumeth R, Stott K, Whitmore E. Caring for the older person in the emergency department: the ASET program and the role of the ASET clinical nurse consultant in South Western Sydney, Australia. *J. Emerg. Nurs.* 2009; 35: 129–33.
45. Arendts G, Fitzhardinge S, Pronk K, Donaldson M, Hutton M, Nagree Y. The impact of early emergency department allied health intervention on admission rates in older people: a non-randomized clinical study. *BMC Geriatr.* 2012; 12: 8.
46. Caplan GA, Williams AJ, Daly B, Abraham K. A randomized, controlled trial of comprehensive geriatric assessment and multidisciplinary intervention after discharge of elderly from the emergency department – the DEED II study. *J. Am. Geriatr. Soc.* 2004; 52: 1417–23.
47. Biese K, Lamantia M, Shofer F *et al.* A randomized trial exploring the effect of a telephone call follow-up on care plan compliance among older adults discharged home from the emergency department. *Acad. Emerg. Med.* 2014; 21: 188–95.
48. Biese KJ, Busby-Whitehead J, Cai J *et al.* Telephone follow-up for older adults discharged to home from the emergency department: a pragmatic randomized controlled trial. *J. Am. Geriatr. Soc.* 2018; 66: 452–8.
49. Cai S, Grubbs A, Makineni R, Kinoshian B, Phibbs CS, Intrator O. Evaluation of the Cincinnati Veterans Affairs Medical Center Hospital-in-Home Program. *J. Am. Geriatr. Soc.* 2018; 66: 1392–8.
50. Huntley AL, Chalder M, Shaw ARG *et al.* A systematic review to identify and assess the effectiveness of alternatives for people over the age of 65 who are at risk of potentially avoidable hospital admission. *BMJ Open* 2017; 7: e016236.
51. Caplan GA, Sulaiman NS, Mangin DA, Aimonino Ricauda N, Wilson AD, Barclay L. A meta-analysis of “hospital in the home”. *Med. J. Aust.* 2012; 197: 512–9.