Predicting speed at traffic lights—the problem with static assessments of frailty

For some time, considerable research has focused on developing screening tools effective in identifying frail elderly patients at risk of adverse outcomes. The comprehensive geriatric assessment (CGA) remains the gold standard for identifying modifiable risk factors within this group. However, resources are stretched. A good CGA takes time and can involve several members of the multidisciplinary team. An instrument that can effectively guide implementation of the CGA in a discriminatory way is therefore much sought after. ISAR [1], Barthel [2], Katz [3], SHARE [4] to name but a few have been adopted for this purpose.

This profusion of studies unfortunately only re-enforces the lack of consensus on an instrument that satisfactorily fulfils this role. In order for this screening tool to transcend from an academic exercise into real world practice, it must fulfil certain characteristics. Perhaps most importantly, it should be quick and easy to administer; ideally utilising data that are readily available to clinicians. The sensitivity should be high enough to make the exercise worthwhile while retaining the specificity to prevent indiscriminate use of resources.

The paper by Heim et al. [5] in the present edition of the Journal demonstrates how a combination of screening tools can be used to identify a population at risk of functional decline, high healthcare demand or death. The authors used the dichotomised result of assessment tools in the domains of activities of daily living, falls, malnutrition and delirium to generate a score with values from 0 to 4. Collection of all data items is already mandated by the Dutch government via the Dutch Safety Management Programme (VMS). By combining this score with age and using Classification And Regression Trees (CART) analysis, the authors identify two high-risk groups: those under the age of 80 with a score of 3 or more and those 80 years or over with a score of 1 or more.

The obvious advantage of this approach is its simplicity. In the Dutch healthcare system, it requires no additional data gathering and the algorithm would be easy to automate.

However how much does this help clinicians? Identifying that an individual over 80 is at risk as they had suffered a recent fall or are undernourished may not be discriminatory enough to persuade the clinician that they would benefit from more extensive assessment. Additionally, the current algorithm still classifies too many patients with clinical end points as low risk.

How can the algorithm be refined? Combining additional instruments does not necessarily improve the discriminatory power of the screening tool and any benefits gained may be at the expense of utility: an unwieldy and long-winded screening instrument is doomed to failure at the coalface, particularly when the result of a positive outcome is less tangible than when screening for a specific condition such as a cancer [6].

Perhaps the future lies in a longitudinal rather than lateral expansion of the screening process. One of the problems of a static, one-off assessment is the lack of trajectory. One would struggle to predict the future traveling speed of a car at a red light based only on the characteristics of the car and the driver while ignoring the rest of the traffic. Similarly, it is challenging to predict risk of frail patients without data on the speed and steepness of their decline over time. Although prone to subjectivity and variable recall, interviewing patients and their carers may help ascertain the change in frailty over a number of time points in the period prior to admission. The more data points that are available, the more reliable the prediction of future decline is likely to be [7].

The reasons for this are complex. One of the reasons is likely to be that patients’ personal preferences [8] and their social network [9, 10] are a stronger predictor of higher healthcare demand than their quantifiable risk factors. Unfortunately, the present paper does not differentiate the predictive power of the tools for the three adverse events death, functional decline and high healthcare demand. This all would suggest that the simple mechanistic tools to predict dependency are not yet ready for prime time.

Again the answer probably lies in the addition of the human element: if the assessment on admission suggests an existing increased risk, then an interview with patient and family can define the significance of this decline in a ‘what matters conversation’. This is also likely to be helpful for clinicians: ultimately, the objective of the screening process has to be to find patients with predictable and preventable decline and within this group to identify those patients who need and desire an intervention because of their preferences and make-up of their social network.

Is there a perfect screening tool to identify frail elderly at risk? The heterogeneity of healthcare systems [11, 12] in terms of staff, resources and patient populations, may well mean that a ‘one size fits all’ instrument is not feasible. What is clear, however, is that the patients under our care are becoming older and frailer and the need to find a systematic way to identify those who would benefit most from targeted interventions may prove irresistible.

Computerised algorithms using data from multi-dimensional assessments are likely to identify groups at greatest risk of decline. It requires personal negotiation between patients,
their carers and clinicians to determine how this risk can be usefully translated into prevention of adverse outcomes.

**Key points**

- Routinely collected safety data can be used to describe frailty in a hospital population.
- Trends in frailty over time are possibly more powerful.
- Patients’ preferences are likely to dominate any prognostic model.

**Conflicts of interest**

None declared.

C. P. SUBBE1,2, S. JONES3

1Department of Acute Medicine, Ysbyty Gwynedd, Penrhosgarnedd, Bangor LL57 2PW, UK
2School of Medical Sciences, Bangor University, Bangor, UK
3Department of Geriatric Medicine, Ysbyty Gwynedd, Bangor LL57 2PW, UK

Address correspondence to: C. P. Subbe. Tel: (+44) 07771 922890.
Email: csubbe@hotmail.com

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