

# Screening tools for older people at risk of adverse outcomes

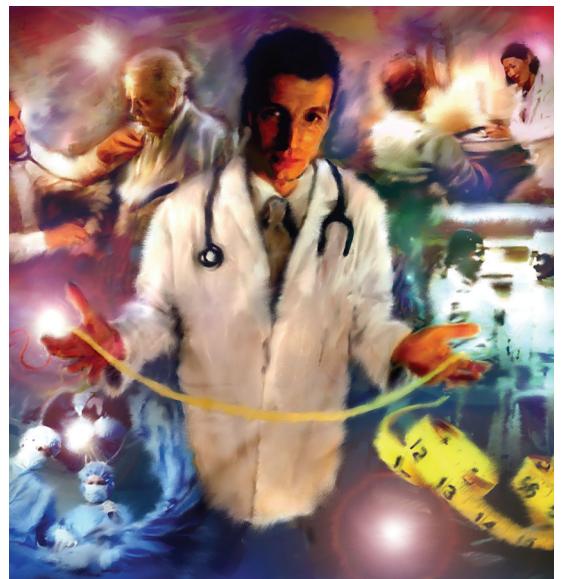
More elderly care physicians are using standardised assessment tools in routine healthcare to generate risk profiles for assessed individuals. These screening tools are able to identify a subgroup of older people at high risk of hospital admission, institutionalisation or death as well as secondary outcomes relating to other aspects of health and well being. **Professor Ian Philp, Emily Hoyle, Emma O'Brien and Chris Parker** review a number of screening instruments that could be incorporated into an assessment by primary healthcare practitioners.

The ageing population in the UK has increased pressure on health services to identify those at risk of adverse outcomes. A key aim is to reduce hospital admissions by targeting preventative services to those at greatest risk. Early intervention can also produce a range of other benefits including: better health, independence and well being of older people and reducing the need for long-term institutionalisation and full time care from family carers.

Particular risk factors for adverse outcomes include: age, living situation, self-rated health, activities of daily living (ADL), health conditions medications and recent hospital use<sup>1-5</sup>. A number of screening tools have been developed for use in community settings to predict risk of adverse outcomes in order to target and support at risk individuals. In this paper, we have attempted to identify and briefly review a number of screening instruments that could be incorporated into an assessment by primary healthcare practitioners.

## Methods

MEDLINE CINAHL and Web Of Science were searched using the terms predict/target/screen/risk/identify/detect AND elder/geriatric/senior/older/aging/ageing. Relevant articles were collected and their reference lists examined for further sources. We restricted our search to



screening tools that were short (10 items or less) as these would have a higher chance of incorporation into routine practice. The primary outcome measures were risk of increased use of hospital institutionalisation and death with secondary outcomes relating to other aspects of health, independence and well being.

For each screener, we calculated the risk of adverse outcomes. We looked at its utility for predicting risk of adverse outcomes based on sensitivity and specificity. The authors were contacted for unpublished data to help with this

**PROFESSOR IAN PHILP** is a Consultant Physician, **EMILY HOYLE** and **EMMA O'BRIEN** are Medical Students and **CHRIS PARKER** is a Research Fellow at the University of Sheffield

**Table 1.** Predictors covered by screeners

| Predictors                         | Community Screeners |    |     |      |         |     |
|------------------------------------|---------------------|----|-----|------|---------|-----|
|                                    | CARS                | EM | FAS | GPSS | PraPlus | SPQ |
| ADL including mobility, continence |                     | x  | x   | x    |         | x   |
| Self-rated health                  |                     | x  | x   | x    | x       |     |
| Number of medications              | x                   |    |     | x    |         | x   |
| Age                                |                     | x  |     |      | x       |     |
| Living situation                   |                     |    |     |      | x       | x   |
| Memory problems                    |                     |    |     | x    |         | x   |
| Recent health service use          | x                   |    |     |      | x       |     |
| Specific diseases                  | x                   |    |     |      | x       |     |
| Depression                         |                     |    |     | x    |         |     |
| Falls/balance                      |                     |    |     | x    |         |     |
| Gender                             |                     |    |     |      | x       |     |
| Number of active medical problems  | x                   |    |     |      |         |     |
| Pain                               |                     |    |     | x    |         |     |
| Sensory deficits                   |                     |    |     |      |         | x   |
| Weight loss                        |                     |    |     | x    |         |     |

where appropriate. We also reviewed the papers to explore the extent of use of the instrument in primary care settings.

## Results

Six short screening tools were identified. Fifteen risk factor items were covered within the six screening tools (*Table 1*). The most common items featured were ADL and self-rated health (in four screeners each) and number of medications (in three screeners).

The number of items covered by the individual screening tools ranged from two to eight. The size of the high risk subgroups varied from seven per cent to 56 per cent and the follow-up period from 12–48 months<sup>6–15</sup>. Response rates for the community screeners ranged from 61 per cent to 100 per cent (*Table 2*). Characteristics of the individual tools are discussed below.

### Community Assessment Risk Screen (CARS)

This is a simple instrument to identify patients aged 65 years and over who are at higher risk for health service use and associated costs<sup>5</sup>. Items included in this method were current diseases, medications and prior hospital use. Results were obtained via telephone interviews, postal questionnaires and health plan records. These identified three predicting characteristics for hospitalisation within the next 12 months:

- Having two or more co-morbidities
- Taking five or more prescription medications
- Having been hospitalised in the last 12 months.

To identify those high-risk individuals, a scoring system of 0–9 was used. A score of four or more indicated high risk.

### Empirical methods (EM)

Members of a US health plan aged 65 and over completed a questionnaire covering age<sup>6,7</sup>, how their health interfered with daily activities and whether assistance was required for daily tasks. This was used to predict elderly members at risk of frailty in the subsequent year. A statistical model then calculated the probability of an adverse outcome, with 0.5 or greater indicating high risk. This screening tool correctly classified 90.9 per cent of the population.

### Functional Assessment Screen Index (FAS)

Four items covering general health and ADL<sup>8</sup> were investigated in this screener. Two or more positive items indicated high risk. Data on adverse outcomes over 18 months were collected from medical records and telephone interviews with participants.

### Geriatric Postal Screening Survey (GPSS)

Ten items were identified in this survey<sup>9</sup> covering

**Table 2.** Response rate to community screeners

| Screeners | Response rate (%) |
|-----------|-------------------|
| CARS      | 90                |
| EM        | 92                |
| FAS       | 100               |
| GPSS      | 90                |
| PraPlus   | 61                |
| SPQ       | 87                |

self-perceived health, weight loss, medications, falls, ADL, pain, memory loss and depression. Any individual with four or more positive items was considered to be at high risk. It was validated on a sample of US veterans (97 per cent male) aged 65 or over.

Data on adverse outcomes within 12 months were collected from healthcare use databases and by telephone interview. This survey identified a subgroup of older outpatients with multiple geriatric syndromes who were at increased risk for hospital use and nursing home admission and who could potentially benefit from geriatric intervention.

### PraPlus

This screening instrument<sup>10-13</sup> is used to identify members of older populations who are at high risk of using healthcare services in the future. It consisted of a six item questionnaire covering self-rated health, prior hospital or clinic use, current disease, age, gender and presence of an informal caregiver. A probability of repeated hospital admission was calculated with 0.5 or over indicating high risk. Data on healthcare use and death within the follow-up period were collected from health plan and health department records.

### Sherbrooke Postal Questionnaire (SPQ)

This questionnaire comprised of five items<sup>14,15</sup> including living situation, medications, mobility, sensory deficits and memory problems. Risk was indicated by a positive answer to two or more items or no response. Data on outcomes over 12 months were collected from registers and by home interviews with participants or relatives.

## Discussion

In this paper, we have identified six screening tools for potential use in primary care settings, that were able to identify a subgroup of older people at high risk of hospital admission, institutionalisation or death.

The screeners studied were mainly North American, but we were able to identify use outside America in published papers for the following:

- The Sherbrooke Postal Questionnaire has been used in the UK in studies undertaken in 2005 and 2006<sup>15,16</sup>
- CARS was used in Japan to compare the assessment of community-dwelling elderly in Asia with those in Japan<sup>17</sup>.

When choosing which particular screener to use, one should take into account the desired size of the high risk subgroup and the relative importance placed on sensitivity and specificity. There is no point in selecting more than half the population as high risk unless an appropriate detailed assessment and/or intervention can be provided for such large numbers. However, a screening programme that identifies only a small minority of the high risk individuals would be of limited value.

There is variation between screeners in their length and complexity of scoring. The shortest screener may seem a good choice for convenience, but can be inappropriate for health professionals due to its lack of domain coverage. Certain screeners are scored by computer, but this doesn't necessarily mean greater accuracy. There is also the potential bias with inter-rater scoring systems.

Practitioners and managers can use our findings to identify the most appropriate screener for their needs according to the intended setting of use, practicality, outcomes to be predicted and the balance required between sensitivity and specificity. The Sherbrooke Postal Questionnaire had a high response rate when used in the UK, and was perceived by both patients and practitioners as easy and straight forward to use<sup>15,16</sup>. Due to this, and its balance of sensitivity and specificity, we think that SPQ could be considered a good choice.

Now that more people are using standardised assessment tools in routine healthcare, it should be

## Key points

- Some older people are at high risk of adverse outcomes (hospitalisation, institutionalisation, death).
- We have reviewed the properties of six short instruments for use as screeners in primary care. All have potential.
- The Sherbrooke Postal Questionnaire has the best documented use in the UK.
- In the future, risk assessment could be integrated within standardised assessment systems in primary care.
- Practitioners and managers can use our findings to identify the most appropriate screener for their needs according to the intended setting of use, practicality, outcomes to be predicted and the balance required between sensitivity and specificity.

possible to incorporate risk factor items within these tools to generate risk profiles for assessed individuals. By following up individuals who have been assessed using these tools, we would be able to evaluate how well the different risk factors were at predicting adverse outcomes and producing a more powerful standardised scoring system for generating an individual risk profile.

## Conclusion

This study has highlighted the use of short screening tools for primary care assessment of older people at high risk of hospitalisation, institutionalisation or death. By identifying and reviewing the utility and features of six short tools, we have provided an overview of some of the options available for use in primary care and the relative advantages and disadvantages of each.

In future, standardised assessment systems in primary care could generate individual risk profiles, by inclusion of some of the risk factor items from the short screening instruments.

**Conflict of interest: Professor Ian Philp is National Director for Older People. The views expressed here are his own and that of the research team and do not necessarily represent the views of the Department of Health.**

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