

Preventive health risk appraisal for older people and impact on GPs' patient management: a prospective study

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Eichler K, Scrabal C, Steurer J and Mann E. Preventive health risk appraisal for older people and impact on GPs' patient management: a prospective study. *Family Practice* 2007; **24**: 604–609.

Background. Health risk appraisals (HRAs) are recommended for detection of potentially modifiable risk factors for health status decline of older people. Little is known how family physicians manage detected risk factors.

Objective. We evaluated (i) if risk factors in one or more of five predefined domains were detected in a primary care-based HRA and (ii) how often these findings had an impact on the further management of patients.

Methods. We performed a prospective observational study in a rural community in Austria and included persons (age ≥ 70 years) living at home. We applied the standardized assessment for elderly people in primary care (STEP) instrument and evaluated risk factors for status decline assessing five domains (cognitive function, depression, urinary incontinence, hearing impairment and mobility/falls).

Results. Two hundred and sixty-four persons participated and the HRA revealed a wide range of risk factors for health status decline [from 4.5% (12/264) in the depression domain up to 31% (81/264) for mobility/falls and 41% (107/264) in the cognitive domain]. The findings had an impact on the further management in four domains: hearing impairment (100% of findings with impact), mobility/falls (93%), depression (83%) and urinary incontinence (65%). In contrast, abnormal cognitive findings lead to action only in every fifth participant (18%; 19/107).

Conclusion. In contrast to other domains, family physicians are hesitant to act upon abnormal findings of cognitive testing. Additional knowledge is needed to clarify the value of abnormal cognitive findings for management of patients and support of their carers.

Keywords. Aged, dementia, health risk appraisal, preventive health services, primary health care.

Introduction

Little is known how family physicians manage detected health problems of older people living in the community. The primary challenge is not to identify all deficits of older people but to detect risk factors for status decline that have consequences for the management of the patient as they can affect quality of life. Such risk factors comprise functional impairment (e.g. fear of using the bus due to mobility problems) as well as manifest problems (e.g. urinary incontinence).

For detection of risk factors, standardized health risk appraisal (HRA) tools are recommended.^{1–3} A

HRA is defined as a systematic approach to collect information from individuals in order to detect and modify potentially modifiable risk factors for functional status decline.¹ The ultimate goal is to maintain independence and improve quality of life.

For HRA, older people are invited systematically or, because of practical advantages, opportunistic assessments at routine primary care consultations are offered (case-finding approach).⁴ A recent UK study has evaluated different approaches to a multidimensional assessment of older people in primary care to learn about feasibility of such programmes.⁵ A two-stage targeted assessment performed by primary care teams

Received 15 January 2007; Revised 20 August 2007; Accepted 21 September 2007.

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showed similar results to a more universal assessment performed by hospital outpatient geriatric teams.

We evaluated in our study (i) if risk factors in one or more of five clinical domains were detected in a HRA of older people in an Austrian community and (ii) how often these findings had an impact on the further management of GPs.

Methods

Setting and study population

We invited all 13 family doctors of a defined rural region in Austria to offer the structured HRA to older persons living in the community [communities of Bludenz, Bürs, Nüziders, province of Vorarlberg, with 2164 older persons aged ≥ 70 years, 67% female (2001 population census)]. The HRA was offered from February 2005 to December 2005. Potential participants were informed about the HRA by an administrative newsletter that was sent to each household in the defined region. The newsletter described the purpose of the study and the target population. Interested persons contacted their family physician for participation. Due to low recruitment rate, family physicians started in August 2005 to include patients attending their practice if they fulfilled inclusion criteria (opportunistic screening).

We included older persons (age ≥ 70 years) living at home. We excluded persons with permanent nursing home stay and/or substantial morbidities with less than 2 years life expectancy. Participants gave written informed consent and the local ethics committee of Vorarlberg agreed to the study protocol.

Study design

We performed a prospective observational study.

Health risk appraisal

We applied the standardized assessment for elderly people in primary care (STEP) instrument.⁶ This tool for HRA allows an assessment of 33 possible health problems and evaluates risk factors for health status decline. Besides the five health problems we investigated in this study, others are related to, for example, lipid metabolism, thyroid dysfunction and osteoporosis. Risk factors comprise functional impairments (e.g. recent decline in mobility) as well as existing problems (e.g. falls or incontinence). STEP has been developed in a cooperation of seven European countries relying on best available evidence for selection of validated assessment instruments and effective interventions.⁶ It has been field tested in community practice settings in Great Britain and Germany.⁷ We slightly adapted the questionnaire to Austrian wording.

The two-stage approach of STEP follows an algorithm with Step 1 (risk factor identification level) and Step 2 (further diagnostic evaluation, if needed).

STEP comprises a self-rating questionnaire for patients and a structured examination along the STEP manual carried out by GPs and practice nurses. In case of a positive diagnostic evaluation (Step 2 positive), the tool provides explicit non-compulsory recommendations for further patient management. For example, the further management for patients with impaired cognitive function included blood tests (blood count, sedimentation rate, thyroid-stimulating hormone [TSH], blood glucose, vitamin B₁₂, folic acid and liver enzymes), referral for magnetic resonance imaging (MRI) scan of the brain and then referral to psychiatrist/neurologist (in Austria psychiatry and neurology is one combined specialty, no single specialties for neurology and psychiatry exist) of patient.

For our analysis, we concentrated on five clinical domains: cognitive function, depression, urinary incontinence, hearing impairment and mobility/falls (for assessment algorithm see Fig. 1). We selected the five domains based on an antecedent Delphi survey among GPs⁸ and according to the relevance of the health problems for older people.⁹

Data collection

We held teaching sessions prior to the study for the 11 participating physicians (four sessions of 2 hours each) and the 11 practice nurses (2 hours) to encourage reliable assessment procedures. We collected all data prospectively using predefined forms.

Step 1: Study participants received the self-rating questionnaire from the practice nurse for completion at home. At a first appointment, they handed over the completed questionnaire. The practice nurse collected additional data (e.g. body weight and blood tests) as described in the STEP manual. At a second appointment (1–2 weeks after the first appointment), the physician checked the results of the self-rating questionnaire and the data collected by the practice nurse. In addition, the physician performed predefined tests in the cognitive and the mobility domain.

Step 2: Participants with positive test results in Step 1 underwent additional predefined examinations at the second appointment to revise or confirm positive findings of Step 1. In case of a positive result in the diagnostic evaluation Step 2, the physician decided together with the patient if and which actions, as recommended by the STEP manual, should be taken. The physician documented performed actions and stated if the identified risk factor was already known before the HRA.

Outcome

For each domain, we calculated the following:

- (i) the number of confirmed risk factors and/or health problems and
- (ii) among those with confirmed risk factors and/or health problems, the number and type of actions taken.

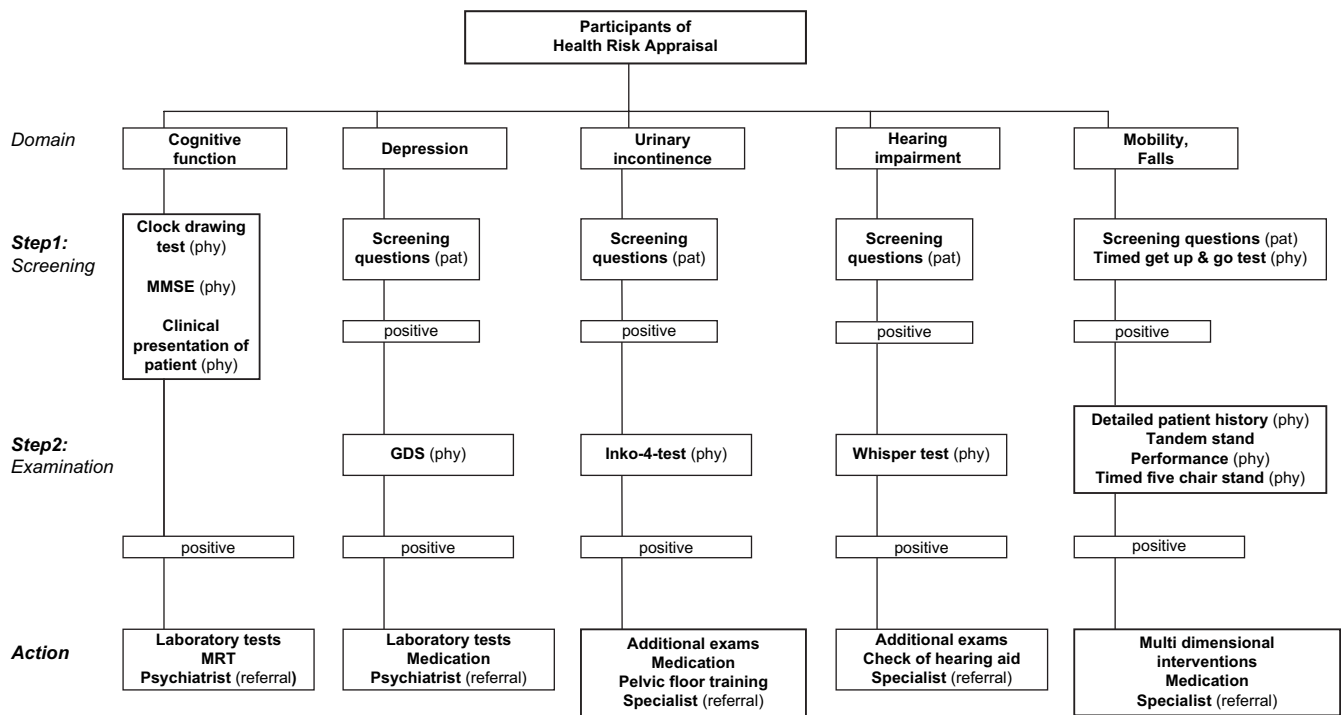


FIGURE 1 Decision flow of HRA in five clinical domains with predefined tests in Step 1 and Step 2. *phy*, information generated by physician; *pat*, information generated from patient questionnaire; MMSE, Mini-Mental State Exam; GDS, Geriatric Depression Scale; Inko-4-test, incontinence screening test (comprising four questions) and MRT: magnetic resonance tomography

Analysis

We computed medians and interquartile ranges (IQR: 25% and 75% percentiles) for continuous data and proportions for categorical data. Data analysis was performed with SPSS for Windows, version 12.0.1 (SPSS Inc., Chicago, IL). In an exploratory analysis, we investigated whether GPs differed in respect to actions they took on the assessments.

Results

Participating physicians and study population

Eleven of 13 invited doctors participated (participation rate 84.6%). Ten of them had followed a seminar in geriatric medicine as part of their continuous medical education prior to our study. The median number of included patients per physician was 18 (IQR 14–30).

Two hundred and sixty-four persons participated in the study. Demographical and clinical characteristics are given in Table 1. Median age of participants was 76 years (IQR 73–81 years) and median age of census population 78 years (IQR 74–83 years). Gender distribution was identical in groups, 33.5% males in the census population and 33.3% males in the study population, respectively. One-third of participants had been admitted to hospital during the last 12 months and 7% (19/264) had been admitted more than once. Ninety per cent of participants reported about a person available for support in case of emergency.

Detected risk factors

In general, completeness of information to calculate the outcome variables was high (completeness of data: median 97.3%; IQR 92.8–98.7). The HRA revealed a wide range of risk factors for status decline (Table 2). This was most often the case in the cognitive domain (41%; 107/264) and for mobility/falls (31%; 81/264). Five per cent (13/264) of the older persons mentioned more than one fall during the last 12 months. Findings of urinary incontinence, hearing impairment and depression were less frequent. Physicians reported that they were not aware of 17% (2/12; depression domain) to 49% (40/81; mobility/falls domain) of the detected problems prior to the HRA.

Consequences of findings for clinical management

The findings of the HRA had a major impact on the further management in four domains: hearing impairment (100%; 39/39), mobility/falls (93%; 75/81), depression (83%; 10/12) and urinary incontinence (65%; 42/65). In contrast, abnormal findings in the cognitive domain lead to action only for every fifth participant (18%; 19/107).

We found high concordance in taking action between physicians in respect to hearing impairment, mobility/falls and depression, whereas in respect to urinary incontinence (median 83.3%; IQR 59.5–100) and particularly dementia (median 16.7%; IQR 2.9–26.1%), substantial variation between physicians can be demonstrated.

Types of action taken

For the domain mobility/falls, the kind of action depended on the underlying clinical problem. Most often stated underlying conditions were orthopaedic problems (45/81), balance problems (33/81) and muscle strength deficiency (23/81), while neurological or cardiologic problems were mentioned less frequently (14 and 7 times, respectively). Physicians most often gave recommendations concerning home safety or behaviour to reduce risk of falls (e.g. adjustment of bathroom equipment) followed by vitamin-D medication

TABLE 1 *Characteristics of 264 participants of the HRA^a*

Age	Median (IQR)	76 (73–81) years
Sex	Female	176 (66.7%)
Hospital admission ^b	Outpatient care	74 (28.0%)
	Inpatient care	85 (32.2%)
Current medication	For cardiac diseases	94 (35.6%)
	For arterial hypertension	132 (50.0%)
	For diabetes mellitus	25 (9.5%)
Patient history	Myocardial infarction	28 (10.6%)
	Cerebrovascular insult	24 (9.1%)
	Bone fracture (after age of 65)	71 (26.9%)
State of residence	Flat of their own	240 (90.9%)
	Living at their children's accommodation	13 (4.9%)
	Other	5 (1.9%)
Social background	Living alone	111 (42.0%)
	Living with partner	137 (51.9%)
	Living with support of community health services	6 (2.3%)
Social support	Person available for support in case of emergency	236 (89.4%)
Education	College/graduate degree/university	26 (9.9%)

^aData are presented as numbers (percentage) unless otherwise indicated. Some totals may not be 100% due to missing data.

^bHospital admission: during the last 12 months.

(for further details see Table 3). Most often taken action for urinary incontinence was referral to specialists in urology or gynaecology or onset of medication, for hearing impairment physical inspection of external auditory canal and for depression findings onset of antidepressant medication.

In the cognitive domain, action was taken for 18% (19/107) of patients with abnormal findings. Sixteen times laboratory tests were performed, 11 patients were referred to a psychiatrist and four were referred to MRI. Most often stated reasons why no action was taken despite abnormal cognitive tests were 'further action denied by patient' (25%; 20/81) and 'dementia excluded at prior examination' (6%; 5/81). For 59% (48/81) of patients with no action despite abnormal findings in the cognitive domain, physicians gave no information why they did not act.

Discussion

The standardized HRA revealed a wide range of risk factors for health status decline in elderly people. Findings in the domains of depression, urinary incontinence, hearing impairment and mobility/falls often had an impact on the management of these people, but family physicians were hesitant to act on abnormal findings in the cognitive domain. Only in every fifth patient with impaired cognitive function, further tests were ordered to assess the severity and to identify potential causes of cognitive dysfunction.

Strengths and the limitations of this study

In this study, we covered a well-defined geographical region and the participation rate among family physicians of this area was high. We used a standardized approach relying on an established HRA instrument. As the selected domains had an emphasis on existing problems rather than functional impairment, our

TABLE 2 *HRA findings in five domains and impact of retrieved risk factors on patient management^a*

Domain	Cognitive function	Depression	Urinary incontinence	Hearing impairment	Mobility/falls
Total	100% (<i>n</i> = 264)	100% (<i>n</i> = 264)	100% (<i>n</i> = 264)	100% (<i>n</i> = 264)	100% (<i>n</i> = 264)
Step 1 positive	41% (107/264)	16% (42/264)	32% (84/264)	28% (74/264)	37% (98/264)
Step 2 positive	No Step 2 ^b	4.5% (12/264)	25% (65/264)	15% (39/264)	31% (81/264)
Retrieved risk factors ^c	100% (<i>n</i> = 107)	100% (<i>n</i> = 12)	100% (<i>n</i> = 65)	100% (<i>n</i> = 39)	100% (<i>n</i> = 81)
Known problem	24% (26/107)	83% (10/12)	54% (35/65)	77% (30/39)	33% (27/81)
New problem	25% (27/107)	17% (2/12)	45% (29/65)	23% (9/39)	49% (40/81)
Missing data	51% (54/107)	0% (0/12)	1% (1/65)	0% (0/39)	17% (14/81)
Impact on management (total)	18% (19/107)	83% (10/12)	65% (42/65)	100% (39/39)	93% (75/81)
Impact on management (new problem)	n.a.	100% (2/2)	69% (20/29)	100% (9/9)	n.a.
Impact on management (known problem)	n.a.	80% (8/10)	63% (22/35)	100% (30/30)	n.a.

^aSome totals may not be 100% due to missing data; n.a. = not calculated due to missing data.

^bCognitive assessment comprised one step (including three criteria).

^cRisk factors comprise functional impairment (e.g. fear of using the bus due to mobility problems) as well as manifest problems (e.g. urinary incontinence).

TABLE 3 Management decisions in five domains of the HRA^a

Cognitive function, 100% (n = 19)	Depression, 100% (n = 10)	Urinary incontinence, 100% (n = 42)	Hearing impairment, 100% (n = 39)	Mobility/falls, 100% (n = 75)
84% (16/19) Laboratory tests	50% Onset of antidepressant medication	88% (37/42) Referral to specialist (Urology, Gynaecology, Radiology)	72% (28/39) Physical inspection of external auditory canal	96% (72/75) At least one recommendation concerning home safety or behaviour to prevent falls (e.g. removal of loose carpets or use of save footwear)
58% (11/19) Referral to psychiatrist	40% Laboratory tests	38% (16/42) Onset of medication	46% (18/42) Referral to otorhinolaryngologist	49% (37/75) Onset of medication (e.g. vitamin-D and calcium)
21% (4/19) MRI	40% Referral to psychiatrist	31% (13/42) Laboratory tests		28% (21/75) Referral to specialist (Ophthalmology, Neurology; Internal Medicine; Cardiology)
	10% Withdrawal of medication	21% (9/42) Referral to pelvic floor training		17% (13/75) Withdrawal of medication (e.g. tranquilizer or antidepressant)
				8% (6/75) Assessment of bone mineral density
				7% (5/75) Physiotherapist

^aFigures are given as the number of actions taken in patients with a detected risk factor that had implications for management. Totals are not 100% due to multiple answers.

assessment strategy showed a certain overlap to case-finding visits, which have been discussed as an appropriate approach for this setting.⁴

Roughly, every eighth registered older person in the study region participated. However, referral of participants was a mixture of population screening and opportunistic screening during physician consultations, which is likely to have produced sampling bias. Thus, participants are not representative for the population and we cannot draw conclusions about the true prevalence of risk factors or health problems for older persons in the study region. Transferability of this HRA may be limited as general physicians attended 8 hours of training, which may not be feasible in all settings.

A further limitation may be the fact that the reliability of the information provided in the questionnaire by participants, nurses and physicians was not reappraised.

For the cognitive, domain physicians often did not state the reasons why they did not act despite detected cognitive problems. We can only speculate about the reasons, as we did not perform in-depth interviews. The relative low specificity of our test criteria in the cognitive domain may have contributed to this finding.¹⁰ Finally, we have not evaluated if action performed by family physicians finally resulted in a reduction of health problems or improved quality of life of participants, as our primary interest was on impact of the findings on clinical management in daily routine.

Comparison with existing literature

The frequency of detected risk factors in the domains' depression, urinary incontinence, hearing and mobility/falls in our sample is similar to reported HRA findings in Germany, Switzerland and the UK for

community-dwelling older persons.⁷⁻⁹ The frequency of abnormal cognitive tests in our study (41%) is higher compared to those samples. Based on the results of the Mini-Mental Status Examination (MMSE) (≤ 26 points) alone, 19% showed a positive test result, which is comparable to findings in community-dwelling older people of similar age groups.¹¹ Therefore, the most probable reason for the high prevalence rate in our study is the sensitive measurement instrument and not a selection effect.

Beside the MMSE, we applied the clock-drawing test to further enhance sensitivity. In addition, we defined the evaluation as positive if the physician suspected an abnormal cognitive function based on the clinical presentation of the patient, irrespective of test findings.¹⁰ We choose this approach to identify persons with cognitive impairment at an early stage, which may have implications for therapy and psychosocial interventions.¹² The disadvantage of such a sensitive approach is the high number of positive results. A further test should be included as a second step in the HAR to identify patients with 'cognitive impairment not dementia', a condition somewhere between normal aging and dementia.¹³

The most striking result of our study is the reluctance of family physicians taking further action for cognitive problems. Early diagnosis of dementia is meaningful as it allows patients and their relatives to plan for their futures.¹⁴ Reluctance to early diagnosis seems to be a general problem and has been observed in earlier studies.^{7,11,15-17} In the literature, we have identified at least three reasons that could explain this behaviour. First, a considerable number of family doctors doubt whether early diagnosis and disclosure to the patients is meaningful.^{14,18} A recent systematic review showed both, negative and positive

consequences, of diagnostic disclosure for patients and their carers.¹⁹ Second, although therapeutic advances have been achieved, the efficacy of recommended therapeutic options is limited.¹² A third reason is that GP's feel inadequately trained to respond to the needs of patients with cognitive impairment or potential dementia/dementia and that the diagnosis is difficult to accept for physicians as well as patients and their families or shame of patients/carers to deal with a possible diagnosis of dementia.^{18,20–22}

Implications for clinical practice and future research

If a multidimensional HRA for older people is applied in practice, the findings have diverse impacts on clinical management of family doctors. A HRA in the domains' depression, urinary incontinence, hearing impairment and mobility/falls seems to provide useful information to family physicians. The gathered information had implications for patient management not only for newly discovered problems but also for already treated or known but yet untreated problems.

For the cognitive, domain implications are yet unclear, as information gathered may often not have management consequences. Additional scientific knowledge is needed to clarify the value of abnormal cognitive testing for management of patients and support of their carers.^{17,18}

Acknowledgements

We thank the GPs, their practice teams and the participating older people of Bludenz, Bürs and Nüziders for their willingness to join the study.

Declaration

Funding: Helmut Horten Foundation (<http://www.helmut-horten-stiftung.org>); Novartis International AG. The funding sources had no influence on study design; in the collection, analysis and interpretation of the data; in the writing of the manuscript and in the decision to submit the manuscript for publication.

Ethical approval: The local ethics committee has approved the study protocol (Ethikkommission des Landes Vorarlberg, c/o Geschäftsstelle, Rathausstrasse 15, A-6900 Bregenz, Austria; Email: ethikkomm.vlbg@bregenznet.at)

Conflict of interest: None.

References

¹ Shekelle P. *Evidence Report and Evidence Based Recommendations: Health Risk Appraisals and Medicare*. Baltimore, MD: US Department of Health and Human Services, 2003.

- ² Department of Health. *National Service Framework for Older People*. London: Department of Health, NHS UK, 2001.
- ³ Sandholzer H, Hellenbrand W, Renteln-Kruse W, Van Weel C, Walker P. [STEP—standardized assessment of elderly people in primary care]. *Dtsch Med Wochenschr* 2004; **129**: (suppl 4): S183–S226.
- ⁴ Williams EI. Evolving methods for comprehensive assessment by general practitioners: the UK experience. In Rubenstein LZ (ed.). *Geriatric Assessment Technology: The State of the Art*, New York: Springer Publishing Company, 1995: 255–264.
- ⁵ Fletcher AE, Price GM, Ng ES *et al*. Population-based multidimensional assessment of older people in UK general practice: a cluster-randomised factorial trial. *Lancet* 2004; **364**: 1667–1677.
- ⁶ Junius U, Fischer G. [Geriatric assessment in family practice—results of concerted action by 7 European countries]. *Z Gerontol Geriatr* 2002; **35** (3): 210–223.
- ⁷ Junius U, Schmidt C, Fischer G, Breull A, Langner D. [The European geriatric assessment in general practice: results of the German feasibility and acceptability study]. *Z Allg Med* 2003; **79**: 620–623.
- ⁸ Eichler K, Steurer J. [Preventive assessment for older persons]. *Arzt im Ländle (Mitt Ärztekammer Vorarlberg)* 2003; **8**: 16–17.
- ⁹ Stuck AE, Elkuch P, Dapp U, Anders J, Iliffe S, Swift CG. Feasibility and yield of a self-administered questionnaire for health risk appraisal in older people in three European countries. *Age Ageing* 2002; **31**: 463–467.
- ¹⁰ De Lepeleire J, Heyrman J, Baro F, Buntinx F. A combination of tests for the diagnosis of dementia had a significant diagnostic value. *J Clin Epidemiol* 2005; **58**: 217–225.
- ¹¹ Sandholzer H, Breull A, Fischer GC. [Early diagnosis and early treatment of cognitive disorders: a study of geriatric screening of an unselected patient population in general practice]. *Z Gerontol Geriatr* 1999; **32** (3): 172–178.
- ¹² Boustani M, Peterson B, Hanson L, Harris R, Lohr KN. Screening for dementia in primary care: a summary of the evidence for the U.S. Preventive Services Task Force. *Ann Intern Med* 2003; **138**: 927–937.
- ¹³ Graham JE, Rockwood K, Beattie BL *et al*. Prevalence and severity of cognitive impairment with and without dementia in an elderly population. *Lancet* 1997; **349**: 1793–1796.
- ¹⁴ Turner S, Iliffe S, Downs M *et al*. General practitioners' knowledge, confidence and attitudes in the diagnosis and management of dementia. *Age Ageing* 2004; **33**: 461–467.
- ¹⁵ Iliffe S, Mitchley S, Gould M, Haines A. Evaluation of the use of brief screening instruments for dementia, depression and problem drinking among elderly people in general practice. *Br J Gen Pract* 1994; **44**: 503–507.
- ¹⁶ Vernooij-Dassen MJ, Moniz-Cook ED, Woods RT *et al*. Factors affecting timely recognition and diagnosis of dementia across Europe: from awareness to stigma. *Int J Geriatr Psychiatry* 2005; **20**: 377–386.
- ¹⁷ Carpenter B, Dave J. Disclosing a dementia diagnosis: a review of opinion and practice, and a proposed research agenda. *Gerontologist* 2004; **44** (2): 149–158.
- ¹⁸ Iliffe S, Manthorpe J, Eden A. Sooner or later? Issues in the early diagnosis of dementia in general practice: a qualitative study. *Fam Pract* 2003; **20**: 376–381.
- ¹⁹ Bamford C, Lamont S, Eccles M, Robinson L, May C, Bond J. Disclosing a diagnosis of dementia: a systematic review. *Int J Geriatr Psychiatry* 2004; **19** (2): 151–169.
- ²⁰ Kawas CH. Early Alzheimer's disease. *N Engl J Med* 2003; **349**: 1056–1063.
- ²¹ Downs M, Cook I, Rae C, Collins KE. Caring for patients with dementia: the GP perspective. *Aging Ment Health* 2000; **4**: 301–304.
- ²² Audit Commission. *Forget Me Not*. London: The Audit Commission, 2000.