Developing quality indicators for older adults: transfer from the USA to the UK is feasible

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Background: Measurement of the quality of health care is essential for quality improvement, and patients are an underused source of data about quality of care. We describe the adaptation of a set of USA quality indicators for use in patient interview surveys in England, to measure the extent to which older patients receive a broad range of effective healthcare interventions in both primary and secondary care.

Method: One hundred and nineteen quality indicators covering 16 clinical areas, based on a set of indicators for the care of vulnerable elderly patients in the USA, were reviewed by a panel of 10 clinical experts in England. A modified version of the RAND/UCLA appropriateness method was used and panel members were supplied with literature reviews summarising the evidence base for each quality indicator. The indicators were sent for comment before the panel meeting to UK charitable organisations for older people.

Results: The panel rated 102 of the 119 indicators (86%) as valid for use in England; 17 (14%) were rejected as invalid. All 58 indicators about treatment or continuity and follow up were rated as valid compared with just over half (13 of 24) of the indicators about screening.

Conclusions: These 102 indicators are suitable for use in patient interview surveys, including the English Longitudinal Study of Ageing (ELSA). The systematic measurement of quality of care at the population level and identification of gaps in quality is essential for quality improvement. There is potential for transfer of quality indicators between countries, at least for the health care of older people.

Remarkable variations in the care provided by individual physicians are widespread and well documented, and reflect the extent of clinical uncertainty about treatment.1 Researchers at RAND and UCLA developed a method for combining the best available research evidence with expert opinion to assess the appropriateness of treatment.2 3 Modifications of this method have been widely used to develop quality indicators for health care.

Quality indicators have been used to show that effective health care is delivered only about half as often as it could be in the USA,6 7 and as many or perhaps even more opportunities for effective care may be being missed in British general practice.8 9 However, we still know surprisingly little about how many people with common medical conditions in the UK receive effective interventions when needed. An independent review published at the end of 2003 concluded that we do not have enough data to know whether the NHS is getting better or worse, particularly for conditions not covered by national initiatives.6 Better measurement of quality at health system level is essential for quality improvement.

Quality measures can be classified into three types. Structure measures consider factors such as the availability of facilities and staff, process measures consider whether treatment adheres to good practice, and outcome measures consider the resulting changes in health status. There are advantages in using measures of process: (1) processes are a more efficient measure of quality; (2) for most conditions there is insufficient information to adequately adjust outcomes for differences in case mix between providers; and (3) processes of care are amenable to direct action by providers.10 Where the evidence exists, the healthcare processes should be linked to an improved health outcome.

The thoughtful use of the right quality indicators has the potential to improve health outcomes, at least in specific disease areas.11 12 However, concerns about the increased use of quality indicators remain. The desire to quantify may lead to neglect of other areas of health care where quality is particularly difficult to quantify. This is particularly relevant for older people1 who are major recipients of health care, often for several conditions at once,13 delivered across the boundary between primary and secondary care. There have also been problems with the implementation of quality indicators, and in England the Department of Health has been criticised for using indicators that are not based on evidence of effectiveness14 and for using indicators where the NHS lacks capacity to produce valid data.9

The possible neglect of some care may be reduced by more engagement of the public and patients in the implementation of quality indicators. One approach to public involvement is to assess quality through interviews with patients, an underused source of data about healthcare quality which avoids the problems of extracting data from clinical records.13 The risk of excessive focus on a few specific areas may be less if indicators describe a standard which, if not met, would almost certainly identify poor quality care rather than the optimal care described by practice guidelines.

This paper presents an independently developed set of evidence based indicators capable of measuring the quality of health care of older adults at the level of the health system by covering a broad range of conditions simultaneously, across primary and secondary care, and suitable for use in an interview survey of patients. They are intended for use in interview surveys, including the English Longitudinal Study of Ageing (ELSA), a new national cohort study that offers the opportunity to measure quality of care systematically from a population perspective in 2004.15

METHODS
The development of evidence based quality indicators de novo is resource intensive so we adapted a comprehensive set
## Box 1 Examples of quality indicators rated as valid* by expert clinical panel

### Continuity of care
IF a person aged 65 or older is deaf or does not speak English, THEN appropriate assistance for communication should be provided to facilitate communication between the older person and the doctor or nurse, such as hearing aids, an interpreter, or written or translated materials.

### Dementia
IF a person aged 65 or older has mild to moderate Alzheimer’s disease, THEN the treating physician should discuss treatment with a cholinesterase inhibitor with the patient and the primary caregiver (if available).

### Depression
IF a person aged 65 or older is diagnosed with clinical depression, THEN antidepressant treatment, talking treatment, or electroconvulsive therapy should be offered within 2 weeks after diagnosis unless within that period the patient has improved, or unless the patient has substance abuse or dependence, in which case treatment may wait until 8 weeks after the patient is in a drug- or alcohol-free state.

### Diabetes mellitus
IF a person aged 65 or older has diabetes, THEN his or her glycosylated haemoglobin or fructosamine level should be measured at least annually.

IF a diabetic person aged 65 or older has one additional cardiac risk factor (i.e. smoker, hypertension, hypercholesterolemia, or renal insufficiency/microalbuminuria), THEN he/she should be offered an angiotensin converting enzyme inhibitor or receptor blocker.

### Falls and mobility disorders
IF a person aged 65 or older reported two or more falls in the past year or a single fall with injury requiring treatment, THEN the patient should be offered a multidisciplinary falls assessment.

### Hearing
IF a person aged 65 or older has a problem with hearing, THEN he or she should be offered a formal audiological evaluation within 3 months.

### Hypertension
IF a person aged 65 or older remains hypertensive after non-pharmacological intervention, THEN pharmacological antihypertensive treatment should be initiated.

### Ischaemic heart disease
IF a person aged 65 or older has had a myocardial infarction, THEN he or she should be offered a β-blocker.

### Medication use
IF a person aged 65 or older is prescribed a new drug, THEN the patient (or, if the patient is incapable, a caregiver) should receive education about the purpose of the drug, how to take it, and expected side effects or important adverse reactions.

### Osteoarthritis
IF a person aged 65 or older with severe symptomatic osteoarthritis of the knee or hip has failed to respond to non-pharmacological and pharmacological therapy, THEN the patient should be offered referral to an orthopaedic surgeon to be evaluated for total joint replacement within 6 months unless surgery is contraindicated.

### Osteoporosis
ALL women aged 65 or older should be offered advice at least once regarding intake of dietary calcium and vitamin D and weight bearing exercises.

### Pain management
IF a person aged 65 or older is treated for a chronic painful condition, THEN he or she should be assessed for a response within 6 weeks.

### Screening and prevention
IF a person aged 65 or older has no history of anaphylactic hypersensitivity to eggs or to other components of the influenza vaccine, THEN the patient should be offered an annual influenza vaccination.

### Stroke and atrial fibrillation
IF a person aged 65 or older is admitted to the hospital with a diagnosis of acute ischaemic or haemorrhagic stroke, THEN he or she should be admitted to a specialised acute or combined acute and rehabilitative stroke unit, or transferred to a specialised stroke unit if such a unit is available in the hospital.

### Urinary incontinence
IF a person aged 65 or older has new urinary incontinence that persists for over 1 month or urinary incontinence at the time of a new evaluation, THEN a dipstick urinalysis and/or mid-stream urine sample should be obtained.

### Vision
IF a person aged 65 or older is diagnosed with a cataract that limits the patient’s ability to carry out needed or desired activities, THEN cataract extraction should be offered.

*Valid = median of >6 on a scale of 1–9 with no disagreement (disagreement defined as 3 or more ratings in the 1–3 region, together with 3 or more ratings in the 7–9 region).
Table 1 Proposed and accepted quality indicators according to clinical area

<table>
<thead>
<tr>
<th>Clinical area</th>
<th>Accepted/proposed indicators (n/n)</th>
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<tbody>
<tr>
<td>Continuity of care</td>
<td>3/3</td>
</tr>
<tr>
<td>Dementia</td>
<td>4/4</td>
</tr>
<tr>
<td>Depression</td>
<td>4/4</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>11/11</td>
</tr>
<tr>
<td>Falls and mobility disorders</td>
<td>6/8</td>
</tr>
<tr>
<td>Hearing loss</td>
<td>4/5</td>
</tr>
<tr>
<td>Hypertension</td>
<td>4/4</td>
</tr>
<tr>
<td>Ischaemic heart disease</td>
<td>5/6</td>
</tr>
<tr>
<td>Medication use</td>
<td>12/14</td>
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<tr>
<td>Osteoarthritis</td>
<td>6/6</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>7/10</td>
</tr>
<tr>
<td>Pain management</td>
<td>7/8</td>
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<tr>
<td>Screening and prevention</td>
<td>11/15</td>
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<tr>
<td>Stroke and atrial fibrillation</td>
<td>4/4</td>
</tr>
<tr>
<td>Urinary incontinence</td>
<td>7/9</td>
</tr>
<tr>
<td>Vision</td>
<td>7/8</td>
</tr>
<tr>
<td>Total</td>
<td>102/119 (86)</td>
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</table>

Table 2 Proposed and accepted quality indicators by domain of care

<table>
<thead>
<tr>
<th>Domain of care</th>
<th>Accepted/proposed indicators (n/n (%))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity and follow up</td>
<td>17/17 (100)</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>13/15 (87)</td>
</tr>
<tr>
<td>Prevention</td>
<td>18/22 (82)</td>
</tr>
<tr>
<td>Screening</td>
<td>13/24 (54)</td>
</tr>
<tr>
<td>Treatment</td>
<td>41/41 (100)</td>
</tr>
<tr>
<td>Total</td>
<td>102/119 (86)</td>
</tr>
</tbody>
</table>

Box 2 Examples of quality indicators rated as invalid* by expert clinical panel

Falls and mobility disorders
ALL persons aged 65 or older should be asked about or examined for the presence of balance and/or gait disturbances at least once.

Hearing
ALL persons aged 65 or older should be offered a hearing screen at least once.

Ischaemic heart disease
IF a person aged 65 or older with established coronary heart disease smokes, THEN he or she should be offered counselling for smoking cessation at least annually.

Medication use
IF a person aged 65 or over is treated with a non-steroidal anti-inflammatory drug, THEN (1) concomitant treatment with either misoprostol or a proton pump inhibitor should be used OR (2) the non-steroidal anti-inflammatory drug that is used should be selective for cyclooxygenase 2.

Osteoporosis
ALL women aged 65 or older should be offered advice about the pharmacological prevention of osteoporosis at least once.

(Please see page for continuation.)

of evidence based indicators of care quality for older people published by RAND in the USA in October 2001. The Assessing the Care of Vulnerable Elders (ACOVE) project developed 236 quality indicators in 22 clinical areas for the health care of community dwelling people aged over 75 years. The ACOVE conditions were chosen according to their importance in older people and the potential for quality improvement. For inclusion in our study, clinical areas were selected on the basis of both prevalence and importance as a cause of disability for people aged 65 years and older in the Health Survey for England 2000. For these clinical areas we selected all 93 ACOVE quality indicators that could be used in an interview survey without the use of clinical records. Cross checks by the ACOVE researchers between interview data and medical notes where feasible had found that the ACOVE interview data were comparable with notes data, and for some indicators it appeared that respondents remembered higher rates of appropriate interventions than had been documented in the notes.

There are many similarities in the evidence base for medical practice in England and the USA, but considerable differences in the way that services are organised and financed. Previous research has suggested that quality indicators cannot simply be transferred directly between countries without an intermediate process to allow for variation in professional culture or clinical practice. We therefore recruited a panel of 10 clinical experts to rate the 93 ACOVE indicators for appropriateness for use in England, alongside another 26 indicators suggested by the panel using a modified version of the RAND/UCLA appropriateness method. The method used two rounds of anonymous ratings on a scale ranging from 1 to 9, with a face to face discussion between rounds. Panel members were supplied with literature reviews summarising the evidence base for each quality indicator.

The 16 clinical areas covered by the indicators are: continuity of care, dementia, depression, diabetes mellitus, falls and mobility disorders, hearing loss, hypertension, ischaemic heart disease, medication use, osteoarthritis, osteoporosis, pain management, screening and prevention, stroke and atrial fibrillation, urinary incontinence, and vision. The indicators were also classified into five domains of care: continuity and follow up, diagnosis, prevention, screening, and treatment. The domains of prevention and screening include the indicators in the clinical area of screening and prevention as well as those indicators in other clinical areas that refer to either screening or prevention. For example, the indicator “All persons aged 65 or older should be offered a hearing screen at least once” is in the “hearing” clinical area as well as the “screening” domain.

The panel was recruited through national organisations in order to reach respected clinicians with access to established networks of colleagues. Members of the British Geriatrics Society’s Special Interest Groups, the Royal College of General Practitioner’s clinical network of general practitioners with a
special interest in care of the elderly, and the Royal College of Nursing’s Gerontological Nursing Programme were invited to review the set of proposed indicators. Six consultant physicians in geriatric medicine or medicine for the elderly, three general practitioners, and one nurse made up the final panel. The pack containing the indicator set and rating forms was also sent for review to a senior consultant in old age psychiatry, a senior public health doctor, and the policy officers from Help the Aged and Age Concern, UK charitable organisations for older people. Their comments were considered at the meeting.

RESULTS

A total of 119 quality indicators were presented to the clinical panel which accepted 102 (86%) as being valid for use in England; 17 (14%) were rejected as invalid. Seventy nine of the 93 ACOVE indicators (85%) were approved with no or minor amendments, and 23 of the 26 new indicators suggested by panel members (88%) were approved.

Examples from each clinical area of the indicators rated as valid are given in box 1. The full set of quality indicators rated as valid is shown in Appendix 1 (available online at www.qshc.com/supplemental). Examples of indicators not rated as valid are given in box 2 and the full set of rejected indicators is shown in Appendix 2 (available online at www.qshc.com/supplemental). Only one indicator, which recommended advice about the pharmacological prevention of osteoporosis, was rejected due to disagreement.

Table 1 shows the number of indicators proposed and accepted in the 16 clinical areas: the number of accepted indicators varied from 3 (for continuity) to 12 (for medication use). Table 2 shows the number of indicators proposed and accepted in each of the following five domains of care: continuity and follow up, diagnosis, prevention, screening, and treatment. All of the 58 indicators in the treatment or continuity and follow up domains were accepted, but only just over half (13 of 24) of those in the screening domain were accepted.

DISCUSSION

This research reports on quality indicators developed in the USA for older people that have also been judged as valid for use in England. One hundred and two indicators of the quality of health care for people aged 65 years and older in England were rated as valid by an expert clinical panel and 79 of these are essentially unchanged from the ACOVE indicators from the USA. All 58 indicators about treatment or continuity and follow up were accepted, but only half (13 of 24) of the indicators about screening were accepted. This more conservative approach by the English panel than the USA panel to indicators about screening perhaps reflects the experience of general practitioners in England with the implications of implementing existing screening programmes—for example, breast and cervical screening. The panel discussion reflected concern about a requirement for general practitioners in England to annually seek out all older adults registered with them to ask about, for example, urinary incontinence. In the USA primary care physicians do not generally have responsibility for a population.

Further work is required to operationalise these quality indicators before use. In general, each indicator requires a minimum of two survey questions, at least one to determine whether the respondent has been diagnosed with the relevant condition, and then at least one more question to determine whether the respondent has received the intervention specified by the indicator. When applying quality indicators it is important to consider what aspects of health care are being measured. Quality can be measured across the following six generally accepted dimensions: effectiveness, efficiency, patient centredness, access, equity, and safety. The quality indicators presented in this paper are designed primarily to measure effectiveness, although they can contribute to some extent to the measurement of other dimensions of quality. Other approaches to quality assessment should be used as well to better capture other dimensions—for example, economic tools to measure efficiency.

Lending convergent validity to these indicators are the results from a study in the UK in 1997 which used the RAND/UCLA method to develop review criteria for clinical notes in general practice for angina, asthma, and non-insulin dependent diabetes mellitus. Our study concerned quality indicators for use in interview surveys of older adults, but the indicators in areas of clinical overlap are very similar to the 1997 study. For angina both panels recommended treatment of raised serum cholesterol levels, use of aspirin or antiplatelelet therapy, and advice about smoking cessation. For diabetes both panels recommended annual measurement of glycosylated haemoglobin and of proteinuria, annual examination of the feet and of the fundi through dilated pupils (although this panel recommended that the eye examination be done by a specialist rather than by any doctor), monitoring of blood pressure, treatment of raised serum cholesterol levels (although this panel set a level of 5 mmol/l as opposed to 7.8 in 1997). This panel also recommended the use of angiotensin converting enzyme inhibitors or angiotensin receptor blockers and daily aspirin therapy which were not recommended in 1997. The development of new indicators by similar processes conducted 5 years apart shows that quality indicators need regular updating to allow for advances in medical knowledge.

The adaptation of this US set of indicators for use in the UK has two main advantages. Firstly, since the development of quality indicators is resource intensive, it is desirable for developed indicators to be shared internationally where possible rather than developed separately in different countries. Secondly, use of the same indicators in the US and UK will allow international comparisons of the quality of health-care processes between the two countries. These indicators are designed to measure the quality of health care at the population level. They are not designed to measure the quality of health care received by an individual patient, or to underpin appraisal, assessment and revalidation of individual

Key messages

- A high proportion of a quality indicator set developed in the USA for the health care of older people were also rated as valid for use in England.
- These 102 quality indicators, covering a broad range of conditions in older adults, are now available for use in England.
- The quality indicators are intended to be used in interview surveys of patients covering both primary and secondary care, after being operationalised into appropriate survey questions.
- Use in interview surveys will facilitate simultaneous assessment of comorbidities and social conditions and will avoid the problems of data extraction from medical records.
- All the indicators in the treatment or continuity and follow up domains were rated as valid compared with only about half of the indicators in the screening domain.
professionals. These are important tasks, but they require a different approach to standard setting.20,21

Use of these indicators in a population survey to measure health system performance will allow comparisons to be made about the quality of health care received by different population groups, whether defined by socioeconomic status, wealth, health status, geography, age, or sex. Two studies using RAND quality indicators have recently shown large gaps in the quality of care in the US,4,5 but the paucity of data about the quality of health care in the UK is currently hindering quality improvement.20 The use of these indicators will provide strong signals about where quality improvement is needed, and will act as a stimulus to target quality improvement efforts at the areas with the greatest potential for improved patient care.

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The full list of quality indicators rated as valid and invalid by the expert clinical panel are shown in Appendices 1 and 2 available online at the QSHC website (www.qshc.com/supplemental).

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REFERENCES

Appendix 1: Quality indicators rated as valid* by expert clinical panel (n=102). Indicators proposed by the panel are shown in bold font (n=23)

### Continuity of Care

1. ALL persons aged 65 or older should be able to identify a doctor or primary care practice that they would call when in need of medical care or should know the phone number or other mechanism by which they can reach this source of care.

2. IF a person aged 65 or older is discharged from a hospital, THEN he or she should have a follow-up visit or telephone contact within 6 weeks of discharge.

3. IF a person aged 65 or older is deaf or does not speak English, THEN appropriate assistance for communication should be provided to facilitate communication between the older person and the doctor or nurse, such as hearing aids, an interpreter, or written or translated materials.

### Dementia

1. IF a person aged 65 or older has mild-to-moderate Alzheimer's disease, THEN the
treatment physician should discuss treatment with a cholinesterase inhibitor with the patient and the primary caregiver (if available).

2. IF a person aged 65 or older with dementia has a caregiver (and, if capable, the patient assents), THEN the physician should discuss patient safety with the patient and caregiver, provide education on how to deal with conflicts at home, and inform them about community resources for dementia, or refer them so that this discussion can take place.

3. IF a person aged 65 or older has newly diagnosed dementia, THEN the diagnosing physician should advise the patient and the primary caregiver (if available) to notify DVLA† of the diagnosis.

4. IF a person aged 65 or older has mild-to-moderate Alzheimer's disease, THEN the treating physician should tell the diagnosis to the patient and the primary caregiver (if available).

Depression

1. IF a person aged 65 or older receives a diagnosis of a new depression episode,
THEN the diagnosing physician should ask on the day of diagnosis whether the person aged 65 or older had any thoughts about suicide.

2. IF a person aged 65 or older is diagnosed with clinical depression, THEN antidepressant treatment, talking treatment, or electroconvulsive therapy should be offered within 2 weeks after diagnosis unless within that period the patient has improved, or unless the patient has substance abuse or dependence, in which case treatment may wait until 8 weeks after the patient is in a drug- or alcohol-free state.

3. IF a person aged 65 or older has no meaningful symptom response after 6 weeks of treatment, THEN one of the following treatment options should be initiated by the 8th week of treatment: medication dose should be optimised (if initial treatment was medication), or medication should be initiated (if initial treatment was psychotherapy alone), or referral to a psychiatrist should be offered.

4. IF a person aged 65 or older receives a diagnosis of a new depression episode, THEN they should be offered a follow-up appointment within 4 weeks.

Diabetes Mellitus
1. IF a person aged 65 or older has diabetes, THEN his or her glycosylated haemoglobin or fructosamine level should be measured at least annually.

2. IF a diabetic person aged 65 or older does not have established renal disease and is not receiving an ACE† inhibitor or angiotensin II receptor blocker, THEN he or she should receive an annual test for proteinuria.

3. IF a diabetic person aged 65 or older has proteinuria not caused by a urinary tract infection, THEN he or she should be offered therapy with an ACE† inhibitor or angiotensin II receptor blocker.

4. IF a person aged 65 or older has diabetes, THEN his or her blood pressure should be checked at least annually.

5. ALL diabetic persons aged 65 or older not receiving other anticoagulation therapy should be offered daily aspirin therapy.

6. IF a diabetic person aged 65 or older has a fasting total cholesterol level of 5 mmol/L or greater, THEN he or she should be offered an intervention to lower cholesterol.
7. ALL diabetic persons aged 65 or older should be offered an annual dilated eye examination performed by an ophthalmologist, optometrist, or diabetes specialist.

7N. ALL diabetic persons aged 65 or older should be offered an annual eye examination by digital retinal photography or indirect retinoscopy performed by an ophthalmologist, optometrist, or diabetes specialist.

8. IF a diabetic person aged 65 or older has one additional cardiac risk factor (i.e., smoker, hypertension, hypercholesterolemia, or renal insufficiency/microalbuminuria), THEN he/she should be offered an ACE\(^i\) inhibitor or receptor blocker.

9. ALL diabetic persons aged 65 or older should have an annual examination of his/her feet.

10. IF a person aged 65 or older has insulin treated diabetes, is self-medicating, and is admitted to hospital, THEN they should be supported to continue self-medication in hospital

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**Falls and Mobility Disorders**
1H. IF a person aged 65 or older reported 2 or more falls in the past year, or a single fall with injury requiring treatment, THEN the physician should take a basic fall history.

1E. IF a person aged 65 or older reported 2 or more falls in the past year, or a single fall with injury requiring treatment, THEN the patient should be offered a multidisciplinary falls assessment.

2. IF a person aged 65 or older demonstrates decreased balance and/or proprioception or increased postural sway, THEN an appropriate exercise programme should be offered and an evaluation for an assistive device performed.

3. IF a person aged 65 or older is found to have problems with gait, strength (e.g., 4/5 or less on manual muscle testing or needs arms to rise from a chair), or endurance (e.g., dyspnoea on mild exertion), THEN an exercise programme or physical therapy should be offered.

4. ALL women aged 80 or older should be offered strength and balance training.
5. ALL persons aged 65 or older with balance and/or gait disturbances should be offered a multidisciplinary falls assessment.

**Hearing**

1. IF a person aged 65 or older has a problem with hearing, THEN he or she should be offered a formal audiological evaluation within 3 months.

2. IF a person aged 65 or older is a hearing aid candidate, THEN he or she should be offered hearing rehabilitation.

3. IF a person aged 65 or over who uses a hearing aid for any activities of daily living is admitted to hospital (or is in a care home), THEN the hearing impairment should be recognized and accommodated.

3N. IF a person aged 65 or over who has a hearing impairment is admitted to hospital (or is in a care home), THEN the hearing impairment should be recognized and accommodated.

**Hypertension**
1. IF a person aged 65 or older is diagnosed with hypertension, THEN non-pharmacological therapy with lifestyle modification for treatment of hypertension should be recommended.

2. IF a person aged 65 or older remains hypertensive after non-pharmacological intervention, THEN pharmacological antihypertensive treatment should be initiated.

3. IF a person aged 65 or older requires pharmacotherapy for treatment of hypertension in the outpatient setting, THEN a once- or twice-daily medication should be used unless there is a need for agents that require more frequent dosing.

4. IF a person aged 65 or older requires pharmacotherapy for treatment of hypertension in the outpatient setting, THEN a once-daily medication should be used unless there is a need for agents that require more frequent dosing.

**Ischaemic Heart Disease**

1. IF a person aged 65 or older has established CHD\(^\dagger\) and LDL\(^\dagger\) cholesterol > 3 mmol/L, THEN he or she should be offered an intervention to lower cholesterol.
2. IF a person aged 65 or older has established CHD† and is not on warfarin, THEN he or she should be offered antiplatelet therapy.

3. **IF a person aged 65 or older with established CHD† smokes, THEN he or she should be offered counselling for smoking cessation.**

4. IF a person aged 65 or older has had a myocardial infarction or coronary bypass graft surgery, THEN he or she should be offered cardiac rehabilitation.

5. IF a person aged 65 or older has had a myocardial infarction, THEN he or she should be offered a beta-blocker.

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**Medication Use**

1. IF a person aged 65 or older is prescribed a new drug, THEN the patient (or, if the patient is incapable, a caregiver) should receive education about the purpose of the drug, how to take it, and expected side effects or important adverse reactions.

2. **ALL persons aged 65 or older and taking medication should have a drug regimen**
review at least annually.

3. IF a person aged 65 or older is prescribed warfarin, THEN an INR† should be determined at least every 12 weeks.

4. IF a person aged 65 or older is prescribed an oral hypoglycaemic drug, THEN chlorpropamide should not be used.

5. ALL persons aged 65 or older should not be prescribed a medication with strong anticholinergic effects if alternatives are available.

6. IF a person aged 65 or older does not need control of seizures, THEN barbiturates should not be used.

7. IF a person aged 65 or older is treated with a non-selective NSAID†, THEN the patient should be advised of the gastrointestinal and renal risks associated with this drug.

8. IF a person aged 65 or older is treated with a COX-2 selective NSAID‡, THEN the patient should be advised of the gastrointestinal and renal risks associated with this
9. IF a person aged 65 or over is treated with an NSAID† (selective or non-selective), THEN they should have a blood pressure check at least once.

10. IF a person aged 65 or over is treated with an NSAID† (selective or non-selective), THEN they should be asked about gastro-intestinal symptoms at least annually.

11. IF a person aged 65 or older is newly prescribed an oral hypoglycaemic drug, THEN glibenclamide should not be used.

12. ALL persons aged 65 or older and taking four or more medicines should have a drug regimen review every 6 months.

Osteoarthritis

1. IF a person aged 65 or older is treated for symptomatic osteoarthritis, THEN functional status and degree of pain should be assessed at least annually.
2. IF an ambulatory person aged 65 or older has had a diagnosis of symptomatic osteoarthritis of the knee for longer than 3 months and has no contraindications to exercise and is physically and mentally able to exercise, THEN a directed or supervised strengthening or aerobic exercise programme should have been prescribed at least once.

3. IF an ambulatory person aged 65 or older has a diagnosis of symptomatic osteoarthritis, THEN education regarding the natural history, treatment and self-management of the disease should be offered at least once.

4. IF oral pharmacological therapy is initiated to treat osteoarthritis among people aged 65 or older, THEN paracetamol should be the first drug used, unless there is a contraindication to use.

5. IF oral pharmacological therapy for osteoarthritis is changed from paracetamol to a different oral agent among people aged 65 or older, THEN the patient should have had a trial of maximum dose paracetamol (suitable for age/co-morbidities).

6. IF a person aged 65 or older with severe symptomatic osteoarthritis of the knee or hip has failed to respond to non-pharmacological and pharmacological therapy,
THEN the patient should be offered referral to an orthopaedic surgeon to be evaluated for total joint replacement within 6 months unless surgery is contraindicated.

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**Osteoporosis**

1. **ALL women aged 65 or older should be offered advice at least once regarding intake of dietary calcium and vitamin D and weight-bearing exercises.**

2. **ALL women aged 65 or older who smoke should be offered advice at least once about smoking cessation.**

3. IF a person aged 65 or older has untreated osteoporosis, THEN calcium and vitamin D supplements should be recommended at least once.

4. IF a person aged 65 or older is taking corticosteroids at a dose of 7.5mg per day or more for more than 1 month, THEN the patient should be offered calcium and vitamin D and a biphosphonate.

5. IF a woman aged 65 or older is newly diagnosed with osteoporosis, THEN the patient should be offered treatment with hormone replacement therapy, SERMs†,
bisphosphonates, calcitonin, or calcium and vitamin D within 3 months of diagnosis.

6. IF a person aged 65 or older with a high risk of osteoporosis has a BMD† ‘T score’ below –2.5, THEN the patient should be offered treatment with one or more of the following: alendronate, calcitonin, calcitriol, cyclic etidronate, hormone replacement therapy, raloxifene, residronate, or vitamin D and calcium.

7. IF a person aged 65 or older has had a low trauma fracture or vertebral fracture, THEN they should be assessed for the risk of osteoporosis and falls.

(‘Low trauma fracture’ here means a fracture resulting from trauma equivalent to, or less than, a fall from standing height.)

Pain Management

1. ALL persons aged 65 or older should be asked about persistent pain at new patient visits.

2H. IF a person aged 65 or older has a newly reported chronic painful condition, THEN a targeted history should be performed within 1 month.
2E. IF a person aged 65 or older has a newly reported chronic painful condition, THEN a physical exam should be performed within 1 month.

3. IF a person aged 65 or older with chronic pain is treated with opioids, THEN he or she should be offered treatment to prevent constipation.

4. IF a person aged 65 or older has a newly reported chronic painful condition, THEN treatment should be offered.

5. IF a person aged 65 or older is treated for a chronic painful condition, THEN he or she should be assessed for a response within 6 weeks.

6. IF a person aged 65 or older is treated for a chronic painful condition, THEN he or she should be screened for depression at least annually.

Screening and Prevention

1. ALL persons aged 65 or older should be asked at least once about their history of alcohol use and standardised screening questionnaires (e.g., CAGE†, AUDIT†) may be
used to screen for problem drinking.

2. ALL persons aged 65 or older should be asked about tobacco use and nicotine dependence.

3. IF a person aged 65 or older uses tobacco regularly, THEN he or she should be offered advice and/or pharmacological therapy to stop tobacco use at least once.

4. ALL persons aged 65 or older should receive an assessment of their activity level, and be advised about the benefits of regular physical activity at least once.

4N. ALL persons aged 65 or older should be advised about the benefits of regular physical activity at least once.

5. IF a person aged 65 or older has valvular or congenital heart disease, intracardiac valvular prosthesis, hypertrophic cardiomyopathy, mitral valve prolapse with regurgitation or previous episode of endocarditis and a high-risk procedure is planned, THEN endocarditis prophylaxis should be given.

6. IF a person aged 65 or older has no history of anaphylactic hypersensitivity to eggs
or to other components of the influenza vaccine, THEN the patient should be offered an annual influenza vaccination.

7. IF a smoker aged 65 or older develops pneumonia, THEN the smoker should be advised to quit smoking.

8. ALL persons aged 65 or older should be advised to have an eye evaluation every 2 years that includes the essential components of a comprehensive eye exam.

9. ALL persons aged 65 or older with chronic disease should be weighed at each medical outpatient consultation.

10. ALL persons aged 65 or older with chronic disease should be weighed at least annually.

**Stroke and Atrial Fibrillation**

1. IF a person aged 65 or older has atrial fibrillation > 48-hour duration and has any "high risk" condition:
   - impaired left ventricle function
- female gender
- hypertension or systolic blood pressure > 160 mmHg
- prior ischaemic stroke, transient ischaemic attack, or systemic embolism,

THEN he or she should be offered oral anticoagulation therapy, or antiplatelet therapy.

2. IF a person aged 65 or older is admitted to the hospital with a diagnosis of acute ischaemic or haemorrhagic stroke, THEN he or she should be admitted to a specialized acute or combined acute and rehabilitative stroke unit, or transferred to a specialized stroke unit if such a unit is available in the hospital.

3. IF a person aged 65 or older has had a previous stroke, THEN the patient should be offered appropriate stroke prophylaxis with antiplatelet agents or warfarin.

4. IF a person aged 65 or older has had a previous stroke, THEN the patient should be offered antihypertensive medication.

**Urinary Incontinence**

1. ALL persons aged 65 or older should be asked by their doctor or nurse during the new patient medical or consultation about the presence or absence of urinary
incontinence.

2. IF a person aged 65 or older has new urinary incontinence that persists for over 1 month or urinary incontinence at the time of a new evaluation, THEN a targeted history should be obtained about each of the following: (1) characteristics of voiding, (2) ability to get to the toilet, (3) prior treatment for urinary incontinence, (4) importance of the problem to the patient, and (5) mental status.

3. IF a person aged 65 or older has urinary incontinence that persists for over 1 month after consulting a doctor, THEN a targeted physical exam should be performed that includes (1) a rectal exam and (2) a genital system exam (including a pelvic exam for women).

4. IF a person aged 65 or older has new urinary incontinence or urinary incontinence at the time of a new evaluation, THEN treatment options should be discussed.

5. IF a cognitively intact person aged 65 or older who is capable of independent toileting has documented stress, urge, or mixed incontinence without evidence of haematuria or high post-void residual, THEN behavioural treatment should be offered.
6. IF a person aged 65 or older has new urinary incontinence that persists for over 1 month or urinary incontinence at the time of a new evaluation, THEN a dipstick urinalysis and/or mid-stream urine sample should be obtained.

7. **IF a person aged 65 or older has new urinary incontinence that persists for over one month, THEN they should be offered a full incontinence assessment.**

**Vision**

1. IF a person aged 65 or older has sudden-onset visual changes, eye pain, corneal opacity, or severe purulent discharge, THEN the patient should be offered an examination within 72 hours by a person skilled at ophthalmic examination.

2. IF a person aged 65 or older develops progression of a chronic visual deficit that now interferes with his or her ability to carry out needed or desired activities, THEN he or she should be offered an ophthalmic examination by a person skilled at ophthalmic examination within 2 months.

3. IF a person aged 65 or older is diagnosed with a cataract, THEN he or she should be advised to have an annual assessment of visual function with respect to his or her
ability to carry out needed or desired activities.

4. IF a person aged 65 or older is diagnosed with a cataract that limits the patient’s ability to carry out needed or desire activities, THEN cataract extraction should be offered.

5. IF a person aged 65 or older undergoes cataract surgery, THEN a follow-up ocular exam should occur within 7 days and re-examination should occur within 3 months.

6. IF a person aged 65 or older who has been prescribed an ocular therapeutic regimen is admitted to hospital, THEN the regimen should be administered in the hospital unless contra-indicated.

7. IF a person aged 65 or older who uses corrective lenses for any activities of daily living is admitted to hospital (or a care home) and his or her corrective lenses are at the hospital (or care home), THEN the corrective lenses should be readily accessible to the person aged 65 or older.

*Definition of valid = median greater than 6 on a scale of 1-9, with no disagreement (disagreement defined as 3 or more ratings in the 1-3 region, together with 3 or more
ratings in the 7-9 region)

†DVLA = Driver and Vehicle Licensing Agency; ACE = angiotensin converting enzyme; CHD = coronary heart disease; LDL = low-density lipoprotein; INR = international normalised ratio; NSAID = non-steroidal anti-inflammatory drug; SERM = selective oestrogen receptor modulator; BMD = bone mineral density; CAGE = have you ever felt you should Cut down on your drinking; have people Annoyed you by criticising your drinking; have you ever felt Guilty about your drinking; have you ever taken an Eye-opener?; AUDIT = alcohol use disorders identification test.
Appendix 2: Quality indicators rated as invalid* by expert clinical panel (n=17). Indicators proposed by the panel are shown in bold font (n=3)

**Falls and Mobility Disorders**

1. ALL persons aged 65 or older should be asked at least annually about the occurrence of recent falls.

2. ALL persons aged 65 or older should be asked about or examined for the presence of balance and/or gait disturbances at least once.

**Hearing**

1. ALL persons aged 65 or older should be offered a hearing screen at least once.

**Ischaemic Heart Disease**

1. IF a person aged 65 or older with established CHD† smokes, THEN he or she should be offered counselling for smoking cessation at least annually.
Medication Use

1a. IF a person aged 65 or over is treated with an NSAID†, THEN (1) concomitant treatment with either misoprostol or a proton pump inhibitor should be used OR (2) the NSAID† that is used should be selective for COX-2†.

1b. IF a person aged 65 or over is treated with an NSAID† (selective or non-selective) AND takes aspirin daily, THEN concomitant treatment with either misoprostol or a proton pump inhibitor should be used.

Osteoporosis

1. ALL women aged 65 or older who smoke should be offered advice annually about smoking cessation.

2. ALL women aged 65 or older should be offered advice about the pharmacological prevention of osteoporosis at least once.

(The only indicator rejected due to disagreement)

3. IF a person aged 65 or older has one of the following risk factors for
osteoporosis: previous low trauma fracture, hypogonadism, chronic steroid use, comorbidity (with gastrointestinal disease, chronic liver disease, hyperparathyroidism or hyperthyroidism) or radiological osteopenia, THEN the patient should be offered measurement of BMD†.

Pain Management

1. ALL persons aged 65 or older should be asked about persistent pain every 2 years.

Screening and Prevention

1. ALL persons aged 65 or older should be asked about who would be a surrogate decision maker, or whether they have an advance directive indicating their surrogate decision maker.

2. ALL persons aged 65 or over should be asked about life-sustaining treatment preferences, or about an advance directive.

3. ALL persons aged 65 or older should be weighed at each physician office visit.
4. **ALL persons aged 65 or older with chronic disease should be weighed at each physician office visit.**

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**Urinary Incontinence**

1. **ALL persons aged 65 or older should be asked by their doctor or nurse annually about the presence or absence of urinary incontinence.**

2. **IF a person aged 65 or older has new urinary incontinence that persists for over 1 month or urinary incontinence at the time of a new evaluation, THEN a dipstick urinalysis and post-void residual should be obtained.**

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**Vision**

1. **IF a person aged 65 or older develops progression of a chronic visual deficit that now interferes with his or her ability to carry out needed or desired activities, THEN he or she should have a blood pressure check, be examined for atrial fibrillation and carotid bruits, and have a blood glucose sample taken.**

*Definition of invalid = median 6 or less on a scale of 1-9, or median >6 with
disagreement (disagreement defined as 3 or more ratings in the 1-3 region, together with 3 or more ratings in the 7-9 region)

†CHD = coronary heart disease; NSAID = non-steroidal anti-inflammatory drug; COX = cyclooxygenase; BMD = bone mineral density.