Use of the electronic Frailty Index to identify vulnerable patients: an electronic Frailty Index (eFI) report for all patients aged ≥75 years was 0.19 to 0.53 (mean 0.23) for all patients aged ≥75 years. For CGA patients (mean 83 years, range 75 to 102 years). For all patients aged ≥75 years is anticipated to double between 2010 and 2030, and there is increasing UK and worldwide recognition that primary care clinicians need to know how to identify frailty and other geriatric syndromes. A number of frailty assessment tools have been developed,1 but their application in primary care clinical practice has been limited. This may be because many require resources for physical assessment of the patient. For example, the Fried Frailty Phenotype identifies physical frailty in people with three out of five of the following: unintentional weight loss, exhaustion, reduced physical activity, low grip strength, and slow gait speed.3 The first three items are generally self-reported, but grip strength and gait speed are usually measured. Low grip strength and gait speed are included in a number of other approaches to identifying frailty, such as the Gérontopôle Screening Tool,7 and the five-component FRAIL scale,8 where the assessment of gait speed is central. Both low grip strength9,10 and slow gait speed11,12 have also been proposed as useful single markers of physical frailty.

Other approaches include the use of self-reported questionnaires, such as the simple PRISMA-7 questions, which has been reported to be suitable for primary health care,13 and the 15-item Groningen Frailty Indicator.14 A Dutch study developed

INTRODUCTION

Frailty is common among older people presenting to primary care clinicians, with a prevalence reported to be around 9–10% in community-dwelling older people.1,2 Importantly, frailty is associated with poor healthcare outcomes, including increased disability, admissions to hospital and care homes, and mortality.3 Frailty is the result of physiological decline during a lifetime, leading to increased vulnerability to stressors.4 However, it is neither a certainty of ageing nor a condition of inevitable deterioration, and may be improved through appropriate interventions.5 The number of people in the UK aged ≥85 years is anticipated to double between 2010 and 2030, and there is increasing UK and worldwide recognition that primary care clinicians need to know how to identify frailty and other geriatric syndromes.6

A number of frailty assessment tools have been developed,7 but their application in primary care clinical practice has been limited. This may be because many require resources for physical assessment of the patient. For example, the Fried Frailty Phenotype identifies physical frailty in people with three out of five of the following: unintentional weight loss, exhaustion, reduced physical activity, low grip strength, and slow gait speed. The first three items are generally self-reported, but grip strength and gait speed are usually measured. Low grip strength and gait speed are included in a number of other approaches to identifying frailty, such as the Gérontopôle Screening Tool, and the five-component FRAIL scale, where the assessment of gait speed is central. Both low grip strength and slow gait speed have also been proposed as useful single markers of physical frailty.

Other approaches include the use of self-reported questionnaires, such as the simple PRISMA-7 questions, which has been reported to be suitable for primary health care, and the 15-item Groningen Frailty Indicator. A Dutch study developed

INTRODUCTION

Frailty is common among older people presenting to primary care clinicians, with a prevalence reported to be around 9–10% in community-dwelling older people. Importantly, frailty is associated with poor healthcare outcomes, including increased disability, admissions to hospital and care homes, and mortality. Frailty is the result of physiological decline during a lifetime, leading to increased vulnerability to stressors. However, it is neither a certainty of ageing nor a condition of inevitable deterioration, and may be improved through appropriate interventions. The number of people in the UK aged ≥85 years is anticipated to double between 2010 and 2030, and there is increasing UK and worldwide recognition that primary care clinicians need to know how to identify frailty and other geriatric syndromes.

A number of frailty assessment tools have been developed, but their application in primary care clinical practice has been limited. This may be because many require resources for physical assessment of the patient. For example, the Fried Frailty Phenotype identifies physical frailty in people with three out of five of the following: unintentional weight loss, exhaustion, reduced physical activity, low grip strength, and slow gait speed. The first three items are generally self-reported, but grip strength and gait speed are usually measured. Low grip strength and gait speed are included in a number of other approaches to identifying frailty, such as the Gérontopôle Screening Tool, and the five-component FRAIL scale, where the assessment of gait speed is central. Both low grip strength and slow gait speed have also been proposed as useful single markers of physical frailty.

Other approaches include the use of self-reported questionnaires, such as the simple PRISMA-7 questions, which has been reported to be suitable for primary health care, and the 15-item Groningen Frailty Indicator. A Dutch study developed

INTRODUCTION

Frailty is common among older people presenting to primary care clinicians, with a prevalence reported to be around 9–10% in community-dwelling older people. Importantly, frailty is associated with poor healthcare outcomes, including increased disability, admissions to hospital and care homes, and mortality. Frailty is the result of physiological decline during a lifetime, leading to increased vulnerability to stressors. However, it is neither a certainty of ageing nor a condition of inevitable deterioration, and may be improved through appropriate interventions. The number of people in the UK aged ≥85 years is anticipated to double between 2010 and 2030, and there is increasing UK and worldwide recognition that primary care clinicians need to know how to identify frailty and other geriatric syndromes.

A number of frailty assessment tools have been developed, but their application in primary care clinical practice has been limited. This may be because many require resources for physical assessment of the patient. For example, the Fried Frailty Phenotype identifies physical frailty in people with three out of five of the following: unintentional weight loss, exhaustion, reduced physical activity, low grip strength, and slow gait speed. The first three items are generally self-reported, but grip strength and gait speed are usually measured. Low grip strength and gait speed are included in a number of other approaches to identifying frailty, such as the Gérontopôle Screening Tool, and the five-component FRAIL scale, where the assessment of gait speed is central. Both low grip strength and slow gait speed have also been proposed as useful single markers of physical frailty.

Other approaches include the use of self-reported questionnaires, such as the simple PRISMA-7 questions, which has been reported to be suitable for primary health care, and the 15-item Groningen Frailty Indicator. A Dutch study developed
How this fits in

The electronic Frailty Index (eFI) has been developed by Clegg and colleagues to identify frailty using routine data held on primary care databases. This pilot study demonstrated that the eFI was simple and quick to use, acceptable to practice staff, and appeared to discriminate older patients referred for comprehensive geriatric assessment from the total practice population. This paper adds to existing evidence that the eFI may be useful in primary care to identify patients living with frailty, and potentially also those suitable for avoiding the unplanned admissions register.

METHOD

Patients and setting

All patients aged ≥75 years registered at one suburban primary care practice in southern England were included (n = 589). A CGA clinic run by a consultant geriatrician was established in the practice between February and June 2016. The GPs and specialist elderly care nurse were encouraged to refer any patients they thought suitable for an in-depth CGA, which took 60 to 90 minutes to conduct. Taxis were provided to maximise participation of older people who had difficulty accessing the practice, but patients unable to attend the clinic were excluded.

Data collection

Data collection took place between February and June 2016. The practice data manager was provided with instructions by one of the authors on the six commands required to run an eFI report for the entire practice list (n = 6670). Date of birth was then used to identify patients aged ≥75 years (n = 589). Data collected were age, sex,
eFI, and whether the patient had been referred to the CGA clinic (n = 18). Individual identifiers (name, address, NHS number) were removed prior to data entry. The acceptability of running the eFI report was assessed during interviews with the practice data manager, practice manager, a GP, and practice nurse.

Data analysis
Data were entered into a database and analysed using descriptive statistics (summation, minimum, maximum, mean, standard deviation, median, and prevalence). Data for all patients aged ≥75 years, including those referred to the new CGA clinic, were categorised by eFI scores using Clegg’s criteria as follows:

- score 0 to 0.12 represents patients without frailty;
- >0.12 to 0.24 represents patients with mild frailty;
- >0.24 to 0.36 represents patients with moderate frailty; and
- >0.36 represents patients with severe frailty.

The prevalence of each eFI category was generated using IBM SPSS version 22 for all 589 patients aged ≥75 years and for those referred to the CGA clinic. Construct validity was assessed by comparing the difference between the mean eFI scores for all patients aged ≥75 years and those referred to the CGA clinic.

RESULTS
The age, sex, and eFI score for all 589 patients aged ≥75 years, including those referred to the CGA clinic, were collected from the primary care EHR databases by the practice data manager (Table 1). This process was completed in 5 minutes. The mean eFI scores were the same for both males and females within each group. However, the score of 0.23 for the total practice population of older people corresponded with the mild frailty category, whereas those referred to the CGA clinic had a mean score of 0.33, well within the moderate frailty category.

The prevalence of each eFI category was summated for all 589 patients aged ≥75 years registered at the participating practice [247 males, 342 females] (Figure 1), and then for all patients aged ≥75 years referred for a CGA at the GP practice [seven males, 11 females] (Figure 2). The frequencies of individual eFI scores for all 589 patients aged 75 years and over are shown in Figure 3. In all, 212 (36.0%) patients aged ≥75 years were categorised as having mild frailty, 189 (32.0%) as moderate frailty, and 69 (11.7%) as severe frailty. Patients referred for a CGA included 6.3% of those categorised as moderately frail and 7.2% of those with severe frailty.

The data manager and practice manager reported that the few minutes taken to run the eFI report was acceptable, and noted that it had the potential to identify the 2% of patients for the AUA register. The GP and nurse comments in reply to the interviewers’ questions are shown below:

‘I played with it the other day. It was great, and you could pull up your top three patients and all sorts of things.’ [GP]

‘There were patients we all know, and often they’re on our complex care register, and there’s a few younger ones that, I suppose, it’s pulled up … which we need to look at.’ [Nurse]

DISCUSSION
Summary
The eFI report was simple to run and acceptable to practice staff. The eFI was developed as a method of identifying frailty in primary care, and in this small pilot study it was feasible to stratify older patients by

<table>
<thead>
<tr>
<th>Table 1. Age, sex, and eFI scores for all patients aged ≥75 years and those referred for CGA at one primary healthcare practice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patients aged ≥75 years (n = 589)</strong></td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Mean age [range], years</td>
</tr>
<tr>
<td>Mean eFI (SD) Range</td>
</tr>
<tr>
<td>0.03 to 0.56</td>
</tr>
<tr>
<td>eFI median</td>
</tr>
</tbody>
</table>

CGA = comprehensive geriatric assessment. eFI = electronic Frailty Index. SD = standard deviation.
frailty score in a few minutes (researcher input helped instruct the database manager but did not reduce the time required to produce the eFI report for the whole database). The higher mean eFI score of those patients referred for CGA compared with the total practice population of older patients adds construct validity to the use of the eFI. Importantly, the eFI scores identified almost 12% of patients aged ≥75 years in this practice to have severe frailty. The majority of patients referred to the CGA...
The clinic had moderate frailty scores, but in proportion to the total practice population the referrals for moderate and severe frailty were similar at around 7%. This may reflect the study requirement to attend the clinic at the practice, which excluded those who were housebound, or GP decision making around selection of patients, but further investigation is required.

The same eFI report simultaneously provided information for the essential practice task of avoiding unplanned admissions, which resulted in an immediate time saving for the primary care practice.

**Strengths and limitations**

This was a small pilot study in a single primary care practice in southern England. The practice has a clinical rather than a research focus, and this was a pragmatic evaluation of the eFI in a time-pressured primary care practice in the NHS. Nevertheless, the practicality of running an eFI report in primary care to stratify an older population by frailty score was demonstrated. However, the eFI is not currently available on all EHR databases and is a screening tool, so the need for clinical judgement remains.

**Comparison with existing literature**

The finding that 11.7% of the total practice population had high frailty scores is in keeping with current literature that estimates the prevalence of frailty at around 10%. The British Geriatrics Society has called for all health and social care staff to assess older people for frailty at each encounter, and there is recognition that time-pressured primary care staff need a simple and quick tool to achieve this. The management of frailty requires a screening tool to identify patients for in-depth assessment through a CGA process.

**Implications for research and practice**

This pilot study adds to existing evidence that the eFI is quick and simple to use, and could be important in primary care to stratify practice populations by frailty, and also identify the most vulnerable patients for the AUA register. Additionally, researchers in primary health care may find eFI a practical and effective method to screen populations to identify potential study participants living with frailty. The experience of using the eFI in this study would support the need for further evaluation in clinical practice.

---

**Funding**

This pilot study was one component of research funded by the National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care (CLAHRC) Wessex. The views expressed are those of the authors and not necessarily those of the NHS, the NIHR, or the Department of Health. This study was supported by the Faculty of Medicine at the University of Southampton. Helen Clare Roberts and Avan Sayer received support from the NIHR Southampton Biomedical Research Centre.

**Ethical approval**

This pilot was one component of a study approved by the NHS South Central Research Ethics Committee [15/SC/0711].

**Provenance**

Freely submitted; externally peer reviewed.

**Competing interests**

The authors have declared no competing interests.

**Acknowledgements**

The authors would like to thank the staff and patients of the participating primary care practice for their time and cooperation.

---

**Discuss this article**

Contribute and read comments about this article: bjgp.org/letters

---

**Figure 3. Frequencies of electronic Frailty Index (eFI) for all patients aged ≥75 years.**

Clegg’s criteria are as follows:

- 0 to 0.12 represents patients without frailty
- >0.12 to 0.24 represents patients with mild frailty
- >0.24 to 0.36 represents patients with moderate frailty
- >0.36 represents patients with severe frailty

---

**Ethical approval**

This pilot was one component of a study approved by the NHS South Central Research Ethics Committee [15/SC/0711].

**Provenance**

Freely submitted; externally peer reviewed.

**Competing interests**

The authors have declared no competing interests.

**Acknowledgements**

The authors would like to thank the staff and patients of the participating primary care practice for their time and cooperation.

---

**Discuss this article**

Contribute and read comments about this article: bjgp.org/letters

---

**Figure 3. Frequencies of electronic Frailty Index (eFI) for all patients aged ≥75 years.**

Clegg’s criteria are as follows:

- 0 to 0.12 represents patients without frailty
- >0.12 to 0.24 represents patients with mild frailty
- >0.24 to 0.36 represents patients with moderate frailty
- >0.36 represents patients with severe frailty

---

**Ethical approval**

This pilot was one component of a study approved by the NHS South Central Research Ethics Committee [15/SC/0711].

**Provenance**

Freely submitted; externally peer reviewed.

**Competing interests**

The authors have declared no competing interests.

**Acknowledgements**

The authors would like to thank the staff and patients of the participating primary care practice for their time and cooperation.

---

**Discuss this article**

Contribute and read comments about this article: bjgp.org/letters

---

**Figure 3. Frequencies of electronic Frailty Index (eFI) for all patients aged ≥75 years.**

Clegg’s criteria are as follows:

- 0 to 0.12 represents patients without frailty
- >0.12 to 0.24 represents patients with mild frailty
- >0.24 to 0.36 represents patients with moderate frailty
- >0.36 represents patients with severe frailty

---

**Ethical approval**

This pilot was one component of a study approved by the NHS South Central Research Ethics Committee [15/SC/0711].

**Provenance**

Freely submitted; externally peer reviewed.

**Competing interests**

The authors have declared no competing interests.

**Acknowledgements**

The authors would like to thank the staff and patients of the participating primary care practice for their time and cooperation.

---

**Discuss this article**

Contribute and read comments about this article: bjgp.org/letters

---
REFERENCES


