Royal College of Physicians

Falls and Fragility Fracture Audit Programme (FFFAP)

Fracture Liaison Service Database (FLS-DB) facilities audit

FLS breakpoint: opportunities for improving patient care following a fragility fracture

May 2016

In association with:

British Orthopaedic Association — Caring for Patients; Supporting Surgeons

British Geriatrics Society

RCS — Advancing Surgical Standards

age UK

National Osteoporosis Society

Falls and Fractures Alliance

Commissioned by:

HQIP — Healthcare Quality Improvement Partnership

Fracture Liaison Service Database facilities audit report

This report was prepared by the members of the Fracture Liaison Service Database (FLS-DB) project team.

M Kassim Javaid, FLS-DB clinical lead
Sunil Rai, Falls and Fragility Fracture Audit Programme (FFFAP) data coordinator
Rowena Schoo, FLS-DB and Falls project coordinator
Roz Stanley, FFFAP programme manager
Naomi Vasilakis, FLS-DB and Falls project manager
Statistical advice was provided by Carmen Tsang (Clinical Effectiveness Unit, Royal College of Surgeons of England).

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Falls and Fragility Fracture Audit Programme
The FLS-DB is commissioned by the Healthcare Quality Improvement Partnership (HQIP) and managed by the Royal College of Physicians (RCP) as part of the Falls and Fragility Fracture Audit Programme (FFFAP), alongside the National Audit of Inpatient Falls and the National Hip Fracture Database. FFFAP aims to improve the delivery of care for patients who have falls or sustain fractures through effective measurement against standards and feedback to providers.

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Royal College of Physicians
11 St Andrews Place, Regent's Park, London NW1
4LE **www.rcplondon.ac.uk**

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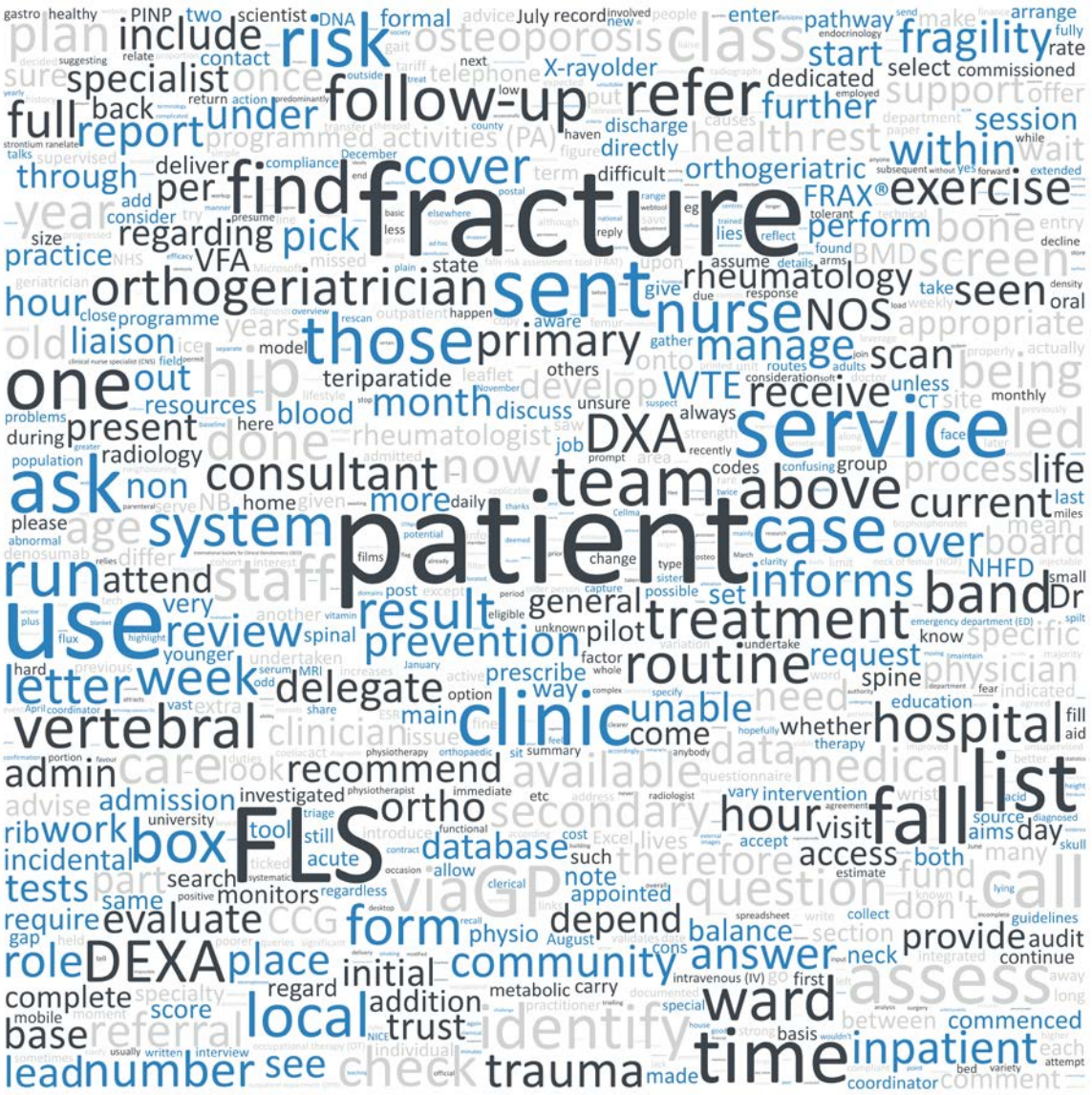

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Document purpose	To disseminate results on the quality of service provision for secondary fracture prevention in England and Wales and highlight areas for improvement.
Title	Fracture Liaison Service (FLS) Database facilities audit FLS breakpoint: opportunities for improving patient care following a fragility fracture
Author	Royal College of Physicians, Clinical Effectiveness and Evaluation Unit
Publication date	May 2016
Target audience	NHS staff in fracture care multidisciplinary teams, hospital managers and chief executives, commissioners and fragility fracture researchers.
Description	This is the first FLS-DB audit report. It provides the first detailed mapping of secondary fracture prevention services in England and Wales, evaluates the quality of these services and makes recommendations to healthcare professionals and commissioners to improve patient care.
Related publications	• *Secondary fracture prevention: first steps to a national audit. FLS-DB feasibility study summary report.* London: RCP, 2015. • *Falling standards, broken promises*: *Report of the national audit of falls and bone health in older people 2010.* London: RCP, 2011. • *Effective secondary prevention of fragility fractures: clinical standards for fracture liaison services.* National Osteoporosis Society, 2015.
Contact	**flsdb@rpclondon.ac.uk**

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Executive summary

Introduction

This audit report provides the first detailed mapping of current service provision for secondary fracture prevention within the NHS in England and Wales. The FLS-DB is delivered as part of the Falls and Fragility Fracture Audit Programme (FFFAP), which aims to improve the delivery of care for patients who have falls or sustain fractures through effective measurement against standards, feedback to providers and quality improvement initiatives.

Older people are particularly predisposed to sustaining a fracture as a result of minimal trauma, such as a fall from standing height.[1] These are called fragility fractures because the inference is that bone fragility is an important contributory factor for the fracture. Fragility fractures are both prevalent and potentially life-changing to the individuals who experience them, and increase the risk of future fragility fractures. The most serious fracture is of the hip and about half of affected people have had a previous fragility fracture.[2] Therapies and interventions approved by the National Institute for Health and Care Excellence (NICE) significantly reduce the risk of refracture by 20–70% depending on the fracture site.[3] There is a clear opportunity at the time of the index presentation to act to prevent the subsequent fracture.

Secondary fracture prevention is a complex process – it requires:

- systematic identification of patients presenting with an index fragility fracture
- consistent investigation and risk assessment
- tailored initiation of evidence-based interventions for bone health and falls prevention
- effective monitoring to ensure ongoing adherence and capture of recurrent events.

As secondary fracture prevention is a long-term and multidisciplinary task, it requires an integrated approach with colleagues based in secondary, primary and community healthcare settings.

A well-structured and appropriately funded fracture liaison service (FLS) is an effective way to coordinate secondary fracture prevention care. An FLS aims to reduce the risk of secondary fractures in people aged 50 years and over who suffer a fragility fracture by systematically identifying, treating and referring them to appropriate services.

The number of patients reliably accessing secondary prevention is currently unknown. This audit report is the first step in compiling a comprehensive picture of secondary fracture prevention in England and Wales. It aims to describe current service models, identify gaps and shortfalls in the commissioning of FLSs, and identify whether these services are fit for purpose. This information will enable us to highlight deficiencies and share best practice, which will help local services to improve the quality of care, reduce costs to the NHS incurred from fragility fractures, and improve patient care and outcomes.

Methodology

The audit was created to measure primarily against NICE technology assessments and guidance on osteoporosis, and the National Osteoporosis Society (NOS) clinical standards for FLSs. Every acute NHS trust in England and Wales, regardless of whether it has an FLS, was contacted and eligible to participate. Eighty-two sites participated in this audit (this is estimated to be just under half of eligible sites).

Key findings

The number of sites that engaged with the audit and submitted data was encouraging, given that this is the first time that FLS facilities have been audited. We hope that non-participating sites will also join the audit and use data to monitor and improve the quality of care.

The audit identified huge variation in how patients are identified, investigated, treated and monitored after a fracture.

- **Resources** – There are marked differences in FLS staffing and funding that do not correspond to estimated fragility fracture caseload.
- **Caseload** – Most FLSs are not seeing as many patients as we would expect when an estimated local caseload was calculated. Over half of the FLSs identified less than 50% of their estimated local caseload.
- **Case characteristics** – Just under one-quarter of FLSs are identifying all the main patient groups (outpatient, inpatient and vertebral fractures).
- **Blood and urine investigations** – There is a wide variation in the types of blood and urine investigations routinely tested in fragility fracture patients.
- **Falls investigations** – Just over half of the services are completing a falls assessment. Of those that do, the content of the falls assessment is not consistent. Only four sites were confident that the services they referred to could provide the best-evidenced intensity of 50 hours of strength and balance exercise training needed to reduce falls.
- **Monitoring** – Nearly half of FLSs delegated their monitoring to primary care. This means that the patient may become lost to the FLS and there may be no mechanism by which to identify whether the patient has continued with their treatment. This is important because poor persistence with osteoporosis medications is common and increases the risk of fractures. A clear responsibility for the effective long-term monitoring of patients is required. Of the services that conducted their own monitoring, around three-quarters included monitoring of patients' medication adherence, persistence and adverse effects as part of their service scope.

Key recommendations

Service providers and commissioners (or local health boards (LHBs)) should use the data in this report to review local performance and inform quality improvement. This will require collaboration and these data should form a basis for discussion to inform and improve services.

For commissioners and LHBs

- **Commissioning** – clinical commissioning groups (CCGs) and LHBs should ensure that an effective FLS is part of its care pathway for secondary prevention of all fragility fracture groups.
- **Caseload** – CCGs and LHBs should ensure that FLSs are commissioned to identify and treat all fracture groups such as hip fracture inpatients, other (non-hip) fracture inpatients, outpatient-treated fracture patients and vertebral fractures.

For existing FLS providers

Services should review their current service to identify any gaps and variations in secondary fracture prevention and then take the necessary steps to address these issues.

- **Identification** – FLSs should ensure that there is a process to identify all patients aged 50 years and over with a new fragility fracture, including hip fracture patients and those with newly reported vertebral fractures.
- **Bone health** – FLSs should ensure that all fragility fracture patients are assessed and receive treatment for bone health in line with NICE guidance.[4,5,6]
- **Falls assessments** – FLSs should link with local falls prevention services to ensure that falls assessments are performed in line with NICE guidance, and ensure rapid access to strength and balance classes that deliver the evidence-based 50 hours of supervised exercise.[7,8]
- **Information** – FLSs should ensure that core items (such as risk factors for bone health and falls and fracture risk score) are included in communications within different parts of the NHS, including primary care, and with patients.
- **Monitoring** – FLSs should ensure that there are clear local arrangements for monitoring patients who are recommended drug therapy; these should occur within 4 months of the fracture to check successful uptake, and every 12 months to check and encourage adherence to the treatment plan. Pathways for monitoring should be agreed and responsibility for ongoing review should be specified and audited.

Full recommendations

For commissioners and LHBs

1. **Commissioning gaps** – We recommend that commissioners contact their local FLSs to understand any gaps in secondary fracture prevention in the currently commissioned service, focusing on the following.
    - a **Identification** – Systematic identification of all at-risk patients who would most benefit from further investigation, to include patients in outpatient and inpatient (including hip fracture) settings, clinical and incidental vertebral fractures.
    - b **Investigation** – Resources to deliver a standard bone health assessment and, where appropriate, a standard set of blood and urine tests. Where FLSs are also commissioned to provide a falls assessment, this should follow a standardised format. The need for assessment should be evaluated within 3 months of the index fracture.
    - c **Information** – Resources to provide standard reports to patients and primary care physicians, including standard information on date and type of fracture, risk factors for fracture/falls, medication compliance review, intervention recommendation and plans for monitoring, and a data recording system that is not spreadsheet based and can upload data to the main FLS-DB audit.
    - d **Intervention** – Medicines management to enable FLSs to offer bone protection treatments recommended by NICE technology assessments (TAs) 161/204 (including first- and second-line bone therapies). Where appropriate, FLSs should be able to refer patients to strength and balance classes that deliver the evidence-based 50 hours of supervised exercise.
    - e **Monitoring** – Resources to monitor patients who are recommended drug therapy to reduce risk of fracture within 4 months of the fracture and every 12 months.
2. **New FLSs** – We recommend that commissioners initiating a new FLS include the points listed in recommendation 1 above when developing service specifications.
3. **Additional resources** – We recommend that commissioners identify the local funding processes for potential and existing FLS providers to apply for additional resources to close any care gap as appropriate.

For existing FLS providers

4. **Identification** – FLSs should ensure that there is a process to identify all patients aged 50 years and over with a new fragility fracture, including hip fracture patients and those with newly reported vertebral fractures.
5. **Bone health** – FLSs should ensure that all fragility fracture patients are assessed and receive treatment for bone health in line with NICE guidance.[4,5,6]
6. **Falls assessments** – FLSs should link with local falls prevention services to ensure that falls assessments are performed in line with NICE guidance, and ensure rapid access to strength and balance classes that deliver the evidence-based 50 hours of supervised exercise.[7,8]

7 **Information** – FLSs should ensure that core items (such as risk factors for bone health and falls and fracture risk score) are included in communication within different parts of the NHS, including primary care, and with patients.

8 **Monitoring** – FLSs should ensure that there are clear local arrangements for monitoring patients who are recommended drug therapy; these should occur within 4 months of initiation to check successful uptake, and every 12 months to check and encourage adherence with the treatment plan. Pathways for monitoring should be agreed and responsibility for ongoing review should be specified and audited.

9 **Commissioning** – We recommend that services review their current commissioning scope with standards in identification, investigation, initiation, information and monitoring to identify any gaps in secondary fracture prevention.

10 **Information sharing** – We recommend that services contact established FLSs that are currently meeting these standards and the NOS to produce a local quality improvement plan for their service.

11 **National commonality** – We recommend that work is carried out with existing FLS providers to share best practice so that FLSs can agree locally:

- **a** a routine set of blood and urine tests for patients with fragility fracture and poor bone health
- **b** a routine set of falls assessments (based on NICE guidance) for an FLS to use if falls assessment is within the service remit
- **c** the core items to be included in reports for GPs and patients
- **d** the timing and scope of monitoring and ensure that this extends across all patient groups.

12 **Funding gaps** – We recommend working with NOS to build a business case to close any gaps in secondary fracture prevention.

13 **Coordination with hip fracture treatment** – Where the FLS is located within a service that also treats hip fractures, we recommend that the FLS and the hip fracture care service are coordinated to ensure adequate monitoring of hip fragility fracture patients and their increased comorbidities.

14 **Rapid access** – We recommend that FLSs link with existing falls prevention services to ensure rapid access to interventions delivering 50 hours or more of supervised exercise.

15 **Data record systems** – We recommend the use of robust data record systems that are not spreadsheet based and can upload data to the FLS-DB patient-centred audit.

For potential new FLS providers

16 **Support from NOS** – We recommend contacting existing FLS providers and NOS to share their knowledge and experience in developing and sustaining an FLS.

17 **FLS standards** – We recommend using the standards in identification, investigation, initiation, information and monitoring to inform the service resourcing, pathways and key performance indicators.

18 **Contact your CCG/LHB** – We recommend contacting your CCG or LHB to engage them in planning.

Introduction

Fragility fractures

Fragility fractures are a common and potentially life-changing experience for those who suffer them. One in two women and one in five men in England and Wales break a bone after the age of 50.[9] This amounts to over 500,000 fractures each year in the UK.[10] Those who suffer a fracture can experience 'loss of mobility and independence, social isolation and depression'.[9] Fragility fractures are particularly prevalent in older populations, because falls risk increases with age[11] and older people are predisposed to sustaining a fragility fracture.[1] A fragility fracture may indicate that the person has osteoporosis or another serious condition.[12] Such a fracture is therefore an important indication that further investigation into the person's bone health is required and that treatment and monitoring may be necessary.[12] A previous fracture almost doubles a patient's future fragility fracture risk.[13] Routine delivery of evidence-based secondary preventive care to patients presenting with fragility fractures provides an opportunity to highlight those at high risk of another fracture and provide treatment to prevent it from happening again.

In the context of an ageing population, the NHS currently faces an essential window of opportunity to improve care for patients at risk of suffering further fragility fractures and to prevent the NHS from becoming overwhelmed. There are 65,000 hip fractures alone each year across England, Wales and Northern Ireland.[14] The current cost of hip fracture care in the UK is estimated to be £1.9 billion, excluding any social care costs. Between one-half and two-thirds of people experiencing hip fracture have had a previous fragility fracture.[2] Current projections suggest that the number of hip fractures could increase by 65% in the next 20 years if secondary fracture prevention care does not improve.[9] If improvements are not made, hospitals and social care services could become overwhelmed.

Effective therapies to prevent future fractures are available, but the current provision of this care is not universal or consistent throughout the UK. The number of patients who access secondary prevention across the country is currently unknown. Based on data from the primary care 2012/2013 Quality and Outcomes Framework (QOF) indicators for secondary fracture prevention, fewer than one in five patients in England who had a fragility fracture requiring therapy were on therapy in the first year.[15] Routine delivery of evidence-based secondary preventive care to patients presenting with fragility fractures provides an opportunity to learn about the underlying cause of the fracture and provide treatment to prevent it from happening again.

Therapies and interventions approved by NICE significantly reduce the risk of refracture by 20–70% depending on the fracture site.[3] Effective secondary fracture prevention throughout the NHS would prevent over 46,000 avoidable fragility fractures (including nearly 20,000 hip fractures) over 5 years in the UK (NOS benefits calculator v2.8). This is an unacceptable care gap for patients, their families, the NHS providers, commissioners and policymakers. This report is the first step in understanding current secondary fracture prevention care, improving its efficacy and ultimately preventing those who suffer a fragility fracture from experiencing further fractures.

Fracture liaison services

Fracture liaison services (FLSs) were recommended by the Department of Health in its Prevention Package for Older People in 2009 to improve secondary fracture prevention.[16] FLSs aim to ensure that identification, investigation, treatment initiation, information and care integration (including monitoring) are consistently and systematically delivered to all patients with fragility fractures. Although most FLSs are led by, and based in, secondary care, some are delivered by primary care. An FLS usually comprises a dedicated healthcare practitioner who follows evidence-based protocols for secondary fracture prevention with support from a medically qualified practitioner. Despite the benefits of FLSs in terms of preventing avoidable fractures, in 2010 only 37% of healthcare providers in England, Wales and Northern Ireland had any form of FLS.[17]

Fracture Liaison Service Database (FLS-DB)

The FLS-DB comprises two principal audits: a facilities audit (presented here) and a patient-centred audit, which is collecting data about bone health investigations, treatment initiation, falls risk assessment and outcome monitoring for patients presenting with a fragility fracture in 2016 and will publish results in 2017.

This facilities audit appraises the national situation regarding the organisation of FLSs to build a more comprehensive national picture of secondary fragility fracture prevention, as well as a comparison of service models. The aim of this audit is to identify gaps and shortfalls in the commissioning of FLSs and assist the sharing of best practice, to improve the quality of care and to reduce costs to the NHS incurred from fragility fractures.

Audit methods

Sampling method

Every acute NHS trust in England and Wales, regardless of whether it has an FLS, was contacted and eligible to participate. We also contacted all members of the FLS Champions Network. Members of this network include healthcare professionals of all types who share a specialist interest in FLSs, and healthcare professionals from FLSs based in primary and community settings.

Dataset

The FLS-DB advisory group, which includes representation from key stakeholder groups (Appendix B), derived indicators from the following evidence-based guidance:

- NICE clinical guideline 146: *Osteoporosis: assessing the risk of fragility fracture.*[4]
- NICE technology appraisal 161: *Alendronate, etidronate, risedronate, raloxifene, strontium ranelate and teriparatide for the secondary prevention of osteoporotic fragility fractures in postmenopausal women.*[18]
- NICE technology appraisal 204: *Denosumab for the prevention of osteoporotic fractures in postmenopausal women.*[6]
- NICE clinical guideline 161: *Falls in older people: assessing risk and prevention.*[7]
- NICE clinical guideline 103: *Delirium: prevention, diagnosis and management.*[19]
- NICE quality standard 86: *Falls in older people.*[8]
- National Osteoporosis Society: *Clinical standards for fracture liaison services.*[9]
- British Orthopaedic Association: *The care of patients with fragility fracture.*[2]
- International Osteoporosis Foundation: *Capture the fracture best practice framework.*[13]

The proposed dataset was presented, and feedback received, at an FLS Champions Network meeting in February 2015. The dataset was further refined by incorporating feedback from the FLS champions. A document mapping the dataset to the evidence-based guidance is available online at **www.rcplondon.ac.uk/fffap**.

Data entry

All data were entered into a secure webtool, which was designed so that each site could log in with an individual password and site code. The webtool validated the data at the point of entry and rejected invalid responses. Data presented in this report were entered between 21 September and 29 October 2015.

Data analysis

Data analysis was conducted by the FFFAP data coordinator, with guidance from the Clinical Effectiveness Unit (CEU) of the Royal College of Surgeons of England (RCS). The FLS-DB advisory group was consulted to identify key findings and recommendations.

Estimated fragility fracture caseload

We compared the numbers seen by each FLS with the estimated fragility fracture caseload derived using the methods developed in the feasibility study of the FLS-DB.[20] As part of the FLS-DB feasibility study, the 'rule of five' was developed by the RCS CEU as a method for estimating the number of fragility fractures at both hospital and CCG levels.[20] This method produces an estimated total number of fragility fractures that an FLS should expect to see, and was determined by multiplying the number of hip fractures derived from National Hip Fracture Database (NHFD) returns by five. The limitations of this simple rule are clearly apparent. The actual ratio of all

fragility fractures to hip fractures is likely to vary between catchment populations owing to variation in age structure.

Limitations

Data were self-reported by participating sites and so the report findings are dependent on the accuracy of the submitted data.

Data were collected about the facilities offered by FLSs from January to December 2014, although some FLSs may have provided data about their available service at the time of data collection in 2015 instead.

Results

Eighty-two sites participated in this audit (this is estimated to be just under half of eligible sites). Fifty-two sites reported that they had a dedicated FLS. This consisted of 65% of participating sites in England (n=48/74) and 50% of sites in Wales (n=4/8). The other 30 sites provided a fracture care service where fracture patients were seen and treated, but they did not have a dedicated FLS.

Identification

> **Guideline**: All patients aged 50 years and over with a new fragility fracture or a newly reported vertebral fracture will be systematically and proactively identified (NOS clinical standards).[9]

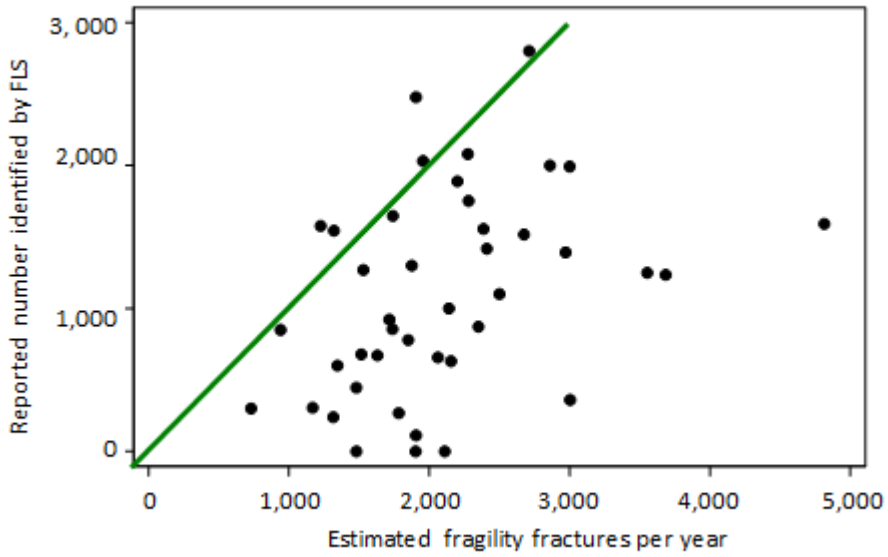
Do the services see as many patients as they should?

FLSs were asked to report the total number of fragility fracture patients seen in 2014.

Twenty-seven FLSs were able to report the number of identified patients using their own data. Thirteen FLSs estimated the number of identified patients. Nine FLSs did not report their total number of patients identified and are not included in the following section. Eight FLSs were excluded from this question owing to participation by services that opened post 2014, misunderstandings of the question, or confirmed erroneous entries.

The reported number of patients seen by each FLS ranged from under 500 to over 3,000 per year, with most FLSs seeing between 1,000 and 2,000 patients in a year.

Fig 1: Reported number of patients identified by FLS vs estimated fragility fracture caseload



The green reference line indicates where number of patients identified by FLS is the same as the estimated caseload of fragility fracture patients

Most FLSs did not see as many patients as expected:

- 24% (10/42) of FLSs identified at least 80% of the estimated fragility fracture caseload at their site
- 57% (24/42) of FLSs identified less than 50% of the estimated fragility fracture caseload at their site.

Twenty-three per cent (9/39) of FLSs in England and 33% (1/3) of FLSs in Wales saw at least 20% of their estimated fragility fracture caseload. Of these, three FLSs exceeded the estimated fragility fracture count by over 200 patients (all of these FLSs had their estimated fragility fracture number estimated using NHFD data).

However, 59% (23/39) of FLSs in England and 33% (1/3) of FLSs in Wales identified fewer than 50% of the expected number of fragility fracture patients at their site.

Which types of fracture patient are seen and which are missed?

To understand the reasons for the observed under-identification by many services, we asked FLSs to report which types of fracture patient are routinely covered in their service. A common model for identifying patients is to identify patients directly from the fracture clinic and then identify other fractures. This is reflected in the table below.

Table 1: Fracture types routinely identified by the FLS
Multiple responses were allowed

	England FLS n=48	England FLS %	Wales FLS n=4	Wales FLS %
Orthopaedic/trauma fracture outpatient clinics (eg wrist fractures)	45	93.8	4	100
Pelvic fragility fracture	38	79.2	3	75.0
Hip fracture (including inpatient fractures)	34	70.8	2	50.0
Non-hip inpatient fragility fracture on orthopaedic/ trauma wards	31	64.6	3	75.0
Presenting with a clinical vertebral fracture	30	62.5	4	100
Non-hip inpatient fracture on non-orthopaedic/ trauma ward	25	52.1	3	75.0
Rib fragility fracture	21	43.8	2	50.0
Incidental radiological vertebral fracture	15	31.3	2	50.0
Other fracture*	15	31.3	2	50.0
Vertebral fracture assessment using DXA spine imaging	8	16.7	2	50.0
No response	2	4.2	0	0.0

*Other fractures included base fifth metatarsal, knee and tibial plateau

Fewer than three-quarters of FLSs in England and fewer than half of FLSs in Wales reported that they routinely identified hip fracture patients, and just over three-fifths of FLSs in England reported that they routinely identified patients presenting with a clinical vertebral fracture. However, the most common fragility fractures occur in the spine (vertebrae), hip and wrist, and in 2010 it was estimated that in the UK there were 79,000 hip and 66,000 clinical spine fractures in women and men aged 50 years and over.[4,10] This informs the key fracture types that need to be identified by an FLS.

Table 2: Number of FLSs identifying patients from different sources

	England FLS n=48	England FLS %	Wales FLS n=4	Wales FLS %
Outpatient clinic	45	93.8	4	100
+ Non-hip inpatients	24	50.0	3	75.0
+ Hip fracture	23	47.9	2	50.0
+ Clinical vertebral	19	39.6	2	50.0
+ Incidental vertebral	10	20.8	2	50.0

Number and percentage of FLSs seeing additional fracture types. Non-hip inpatients included non-hip inpatient fragility fractures on orthopaedic/trauma wards and on non-orthopaedic/trauma wards.

A wide variety of fracture types was routinely seen by the FLSs. Twenty-three per cent (12/52) of FLSs were identifying all the major fracture types. The vast majority of FLSs are centred on patients with fragility fractures managed in an outpatient setting (such as wrist fractures), with 52% (27/52) also seeing non-hip inpatients.

Patients presenting with pelvic and/or rib fractures have specific challenges for identification, similar to vertebral fractures, in that they rarely require orthopaedic surgery and are infrequently admitted. While some FLSs identified pelvic fractures in the emergency department, the majority of FLSs only identified these patients if they were part of the orthopaedic trauma inpatient or outpatient pathway.

Table 3: Identification of patients with fragility fractures of the pelvis
Multiple responses were allowed

Pelvic fragility fractures	England FLS n=38	England FLS %	Wales FLS n=3	Wales FLS %
As inpatient	27	71.1	2	66.7
Outpatient	31	81.6	3	100
Emergency department	14	36.8	2	66.7
Community setting	7	18.4	2	66.7

Table 4: Identification of patients with fragility fractures of the rib
Multiple responses were allowed

Rib fragility fractures	England FLS n=21	England FLS %	Wales FLS n=2	Wales FLS %
As inpatient	11	52.4	1	50.0
Outpatient	19	90.5	2	100
Emergency department	6	28.6	2	100
Community setting	3	14.3	2	100

Restrictions

It should be noted that some FLSs had restrictions on the patients whom they were allowed to see, including age, gender, postcode area and type of fracture.

What methods do services use to identify patients?

To understand the different methods of identification, we asked FLSs to describe how they identified each of the main types of fragility fracture patient. The main methods used have been summarised below. (Multiple responses were allowed for the following questions.)

Identification of:

- **Hip fracture patients:** of the FLSs in England and Wales that routinely identified hip fracture patients, the main methods used were trauma lists (31%, 16/52) and visiting the orthopaedic/trauma ward (35%, 18/52); 69% (36/52) of FLSs reported that hip fracture patients are seen by the orthogeriatric service, not the FLS.
- **Non-hip fracture inpatients:** methods used by all FLSs included IT systems (44%, 23/52), fracture clinic lists (42%, 22/52) and visiting the ward (37%, 19/52).
- **Eligible patients in the outpatient setting:** 77% (37/48) of all FLSs in England reported that fracture clinic lists were used to identify eligible patients in the outpatient setting, 42% (20/48) reported that patients were referred from the fracture clinic and 42% (20/48) used IT systems. All FLSs in Wales (4/4) reported that eligible patients were referred from the fracture clinic and 50% (2/4) of FLSs in Wales reported that they identified patients using fracture clinic lists.
- **Patients with vertebral fracture:** 48% (23/48) of FLSs in England used fracture clinic lists and 17% (8/48) used emergency department lists. Fifty-four per cent (26/48) of FLSs in England used another method, including DXA services, GP audit of discharge summaries, spinal services, vertebroplasty and kyphoplasty lists. Seventy-five per cent (3/4) of FLSs in Wales used fracture clinic lists to identify patients with vertebral fractures.

What barriers to the identification of patients did FLSs report?

The following table summarises the barriers faced by FLSs when identifying vertebral fractures.

Table 5: Barriers to identifying patients with vertebral fractures
Multiple responses were allowed

	England FLS n=48	England FLS %	Wales FLS n=4	Wales FLS %
Not funded	8	16.7	0	0.0
Unable to access radiology images	7	14.6	0	0.0
Still developing pathway	31	64.6	3	75.0
Other	8	16.7	1	25.0
No response	7	14.6	0	0.0

What action is taken after a patient does not attend?

Given the frailty of many patients, missed appointments are inevitable. In the event of a missed appointment, most FLSs either send a reminder letter or discharge the patient to their GP.

What methods do services use to identify fragility fractures missed by the FLS?

No method of identification will consistently identify all patients. The International Osteoporosis Foundation criteria recommend an audit process to check on missed patients.[13] Forty per cent (21/52) of FLSs have a mechanism for finding patients who were missed by the routine methods of identification. Sites who answered 'yes' to this question were asked to give details as a free text response: these included screening of fracture clinic case notes, screening of recent discharges, hospital audit, clinic lists, NHFD data, picture archiving and communication system (PACS) data, ward lists, using GP data, and patient communication after letters were sent to patients offering assessment. FLSs often require more than one method for checking that all cases have been identified.

Investigation

Guideline: Consider assessment of fracture risk in all women aged 65 years and over and all men aged 75 years and over (NICE CG146).[4]

Seventy-three per cent of FLSs in England and 50% of FLSs in Wales routinely include a fracture risk assessment with a scoring tool (such as FRAX®) as part of their investigation pathway.

Do services provide evidence-based secondary fracture prevention?

All sites provide secondary fracture prevention assessment/investigation or refer patients to other services to do this. The majority of secondary fracture protocols were developed locally and are consistent with national policy and guidance.

Table 6: How have secondary fracture prevention protocols been developed?
Multiple responses were allowed

	England FLS n=48	England FLS %	Wales FLS n=4	Wales FLS %
Have been developed locally	31	64.6	3	75.0
Are consistent with healthcare policy and guidelines agreed region-wide	20	41.7	0	0.0
Are consistent with healthcare policy and guidelines agreed nationwide (eg NICE TA161/204)	38	79.2	1	25.0
Don't know	2	4.2	0	0.0
No response	4	8.3	0	0.0

Who assesses the patient?

Most non-FLS sites were dependent on either hospital clinicians or primary care physicians for the investigation component of secondary fracture prevention, while the FLS sites delivered investigation using specialist practitioners.

Table 7: Who performs secondary fracture prevention assessments?
Multiple responses were allowed

	England FLS n=48	England FLS %	England non-FLS n=26	England non-FLS %	Wales FLS n=4	Wales FLS %	Wales non-FLS n=4	Wales non-FLS %
FLS specialist practitioner	42	87.5	0	0.0	4	100	0	0.0
Clinician specialty	20	41.7	15	57.7	2	50.0	1	25.0
Delegated to primary care physician	6	12.5	11	42.3	1	25.0	0	0.0
Other	8	16.7	4	15.4	0	0.0	1	25.0
No response	4	8.3	5	19.2	0	0.0	2	50.0

What investigations for identifying underlying secondary causes of osteoporosis are performed?

There was marked variation and inconsistency in the types of test routinely requested and restrictions on these tests. Given the large estimated national caseload of fragility fractures, this represents an easily achievable target for improving the quality and efficiency of patient care after a fragility fracture within the NHS.

Table 8: FLS routine tests for identifying underlying secondary causes of osteoporosis
Multiple responses were allowed

	England FLS n=48	England FLS %	England non-FLS n=26	England non-FLS %	Wales FLS n=4	Wales FLS %	Wales non-FLS n=4	Wales non-FLS %
Renal function tests	41	85.4	19	73.1	4	100	1	25.0
Serum calcium	40	83.3	18	69.2	4	100	1	25.0
Liver function tests	38	79.2	18	69.2	4	100	1	25.0
Full blood count	37	77.1	19	73.1	2	50.0	1	25.0
Serum alkaline phosphatase	37	77.1	17	65.4	4	100	1	25.0
Serum phosphate	37	77.1	15	57.7	4	100	1	25.0
Thyroid function	37	77.1	16	61.5	4	100	1	25.0
Serum 25-OH vitamin D	36	75.0	16	61.5	3	75.0	1	25.0
Erythrocyte sedimentation rate (ESR) / ESR liver function	29	60.4	9	34.6	1	25.0	1	25.0
Coeliac disease screen	28	58.3	6	23.1	3	75.0	1	25.0
Serum electrophoresis for myeloma screen	27	56.3	15	57.7	4	100	1	25.0
Serum parathyroid hormone	26	54.2	12	46.2	3	75.0	1	25.0
Testosterone/sex hormone-binding globulin	24	50.0	9	34.6	4	100	1	25.0
C-reactive protein	20	41.7	11	42.3	2	50.0	0	0.0
Other*	16	33.3	6	23.1	0	0.0	1	25.0
Missing	6	12.5	6	23.1	0	0.0	2	50.0
24-h urinary calcium	3	6.3	2	7.7	0	0.0	0	0.0
Spot urinary calcium	3	6.3	1	3.8	0	0.0	0	0.0

*Other routine tests included glucose, serum magnesium, prostate-specific antigen, FSH/LH, 24-h urinary cortisol, and bone markers: C-terminal telopeptide (CTX), procollagen type I N-terminal propeptide (PINP) and bone-specific alkaline phosphatase

Table 9: Cumulative proportion of FLSs performing the most frequently reported tests

	England FLS n=48	England FLS %	Wales FLS n=4	Wales FLS %
Renal function tests	41	85.4	4	100
+ Serum calcium	40	83.3	4	100
+ Serum phosphate	37	77.1	4	100
+ Serum alkaline phosphatase	36	75.0	4	100
+ Liver function tests	36	75.0	4	100

Multiple demographic and clinical restrictions limited the tests for secondary causes of osteoporosis that FLSs could perform.

What other post-fracture investigations are performed?

Despite the value of vertebral fracture assessment (VFA) and International Society for Clinical Densitometry guidance, only 25% (13/52) of FLSs used VFA routinely. NOS guidelines recommend that peripheral ultrasound and peripheral CT scans are not used; no sites reported using these.

Table 10: Other routinely used post-fracture assessment
Multiple responses were allowed

Post-fracture assessment also includes:	England FLS n=48	England FLS %	Wales FLS n=4	Wales FLS %
DXA at hip and/or spine	43	89.6	4	100
Fracture risk assessment with scoring tools such as FRAX®	35	72.9	2	50.0
Falls risk assessment for appropriate falls interventions (by referral to falls service)	32	66.7	3	75.0
Falls risk assessment for appropriate falls interventions (by FLS itself)	19	39.6	1	25.0
Vertebral fracture assessment by DXA (VFA or instant vertebral assessment (IVA))	12	25.0	1	25.0
Plain spine radiology if not done already (for unrecognised vertebral fractures)	7	14.6	2	50.0
Peripheral DXA	5	10.4	0	0.0
Other	5	10.4	0	0.0

DXA is an important component of fracture risk assessment after a fragility fracture. Sixty-two per cent (32/52) of FLSs had DXA available on the site of the FLS.

Table 11: DXA access after fragility fracture

	England FLS n=48	England FLS %	England non-FLS n=26	England non-FLS %	Wales FLS n=4	Wales FLS %	Wales non-FLS n=4	Wales non-FLS %
DXA available on site	30	62.5	18	69.2	2	50.0	1	25.0
Refer to another DXA provider	10	20.8	0	0.0	2	50.0	1	25.0
FRAX® or other risk assessment tool	1	2.1	0	0.0	0	0.0	0	0.0
Other	3	6.3	2	7.7	0	0.0	0	0.0
No response	4	8.3	6	23.1	0	0.0	2	50.0

Who reviews the investigation results?

Adequate interaction between patient and healthcare practitioner is key to the success of secondary fracture prevention. We compared which member of staff discussed the investigation results with the patient.

Table 12: Staff review of results for secondary fracture prevention

	England FLS n=48	England FLS %	Wales FLS n=4	Wales FLS %
Delegated to primary care physician	3	6.3	2	50.0
FLS specialist practitioner	38	79.2	4	100
Clinician specialty	16	33.3	2	50.0
Other*	9	18.8	1	25.0
No response	5	10.4	0	0.0

*Other included as required review of DXA scans by clinicians, falls and bone health nurses (not FLSs), surgical care practitioners

FLS specialist practitioners discussed treatment options with patients in 75% (39/52) of sites, and 48% (25/52) used clinical specialists. No FLSs reported that they delegated the assessment to a primary care physician.

Table 13: Who assesses the need for treatments?
Multiple responses were allowed

	England FLS n=45	England FLS %	Wales FLS n=2	Wales FLS %
FLS specialist practitioner	37	82.2	2	100
Clinician specialty*	24	53.3	1	50.0
Other†	8	17.8	0	0.0
No response	5	11.1	0	0.0

*Clinical specialists included geriatricians/orthogeriatric team for hip fracture patients, metabolic bone clinics, primary care rheumatology, consultant rheumatologist
†Other practitioners included orthopaedic nurse specialists, falls and bone health nurses, experienced DXA technicians, rheumatology specialist nurses

Intervention

Guideline: Patients at increased risk of further fracture will be offered appropriate bone-protection treatments (NICE TA161, NOS FLS clinical standards).[9,18]

Ninety-one per cent of FLSs in England and 50% of FLSs in Wales were able to recommend or prescribe at least one bone-specific therapy.

Guideline: Denosumab is recommended as a treatment option for the secondary prevention of osteoporotic fragility fractures only in postmenopausal women at increased risk of fractures who are unable to comply with the special instructions for administering alendronate and either risedronate or etidronate, or have an intolerance of, or a contraindication to, those treatments (NICE TA204).[6]

Fifty-six per cent of FLSs in England and all FLSs in Wales could directly recommend or prescribe denosumab.

What interventions are available?

Table 14: Interventions that could be recommended or initiated
Multiple responses were allowed

	England FLS n=45	England FLS %	Wales FLS n=2	Wales FLS %
Written material on maintaining bone health, lifestyle, nutrition and bone-protection treatments (must cover all risk factors or be tailored to the individual)	40	88.9	2	100
Calcium and vitamin D supplementation advice	41	91.1	2	100
Oral bisphosphonates	41	91.1	2	100
Denosumab	25	55.6	2	100
Intravenous bisphosphonates	24	53.3	2	100
Strontium ranelate	14	31.1	2	100
Additional education programmes/resources (beyond any discussion at initial contact or at FLS clinic)	18	40.0	1	50.0
Clinic follow-up by appropriate specialist if abnormalities are identified on blood tests	30	66.7	2	100
Blood tests	28	62.2	2	100
Other	10	22.2	0	0.0
No response	4	8.9	0	0.0

A proportion of the most severe fragility fracture patients will be eligible for parathyroid hormone (PTH) therapy as per NICE TA161, and 31% (16/52) of all FLSs (in England and Wales) were able to recommend the initiation of teriparatide (a form of PTH therapy).

Given the increased rate of refracture after fragility fracture, how eligible patients receive their first prescription may affect time to treatment. Twenty-five per cent (13/52) of FLSs were able to prescribe the first prescription.

Table 15: Methods for obtaining first prescription
Multiple responses were allowed

	England FLS n=45	England FLS %	Wales FLS n=2	Wales FLS %
FLS recommends therapy to orthogeriatrician and/or primary care physician	33	73.3	1	50.0
Orthogeriatrician prescribes	18	40.0	0	0.0
Metabolic bone disease / osteoporosis specialist prescribes	14	31.1	0	0.0
FLS prescribes	12	26.7	1	50.0
Other*	8	17.8	0	0.0
No response	4	8.9	0	0.0
Trauma prescribes	4	8.9	0	0.0

*Other sources included falls and bone health nurses, surgical care practitioners, orthogeriatricians / rheumatology nurse specialists

Falls interventions

Guideline: Older people who present for medical attention because of a fall or report recurrent falls in the past year should be offered a multifactorial falls risk assessment (NICE CG161, NICE QS86, NOS Clinical Standards for FLS, BOA *The care of patients with fragility fracture*).[2,7–9]

Guideline: Older people reporting a fall should be considered for strength and balance training (NICE CG161, NICE QS86).[7,8]

Eighty-one per cent of FLSs in England and 100% of FLSs in Wales either provide a falls assessment as part of their FLS or refer patients on for a falls assessment. Furthermore, we found that 69% of FLSs in England and 100% of FLSs in Wales (that provided a falls assessment) could refer patients to some form of exercise programme. Most (91% in England and 100% in Wales) of these programmes included strength and balance training, and most (94% in England and 100% in Wales) were delivered by appropriately trained professionals (OTAgo, FaMe, HELP).

Do FLSs provide a multifactorial falls risk assessment?

Fifty-four per cent (26/48) of sites in England and 25% (1/4) of sites in Wales routinely provided a falls assessment as part of their FLS. Twenty-seven per cent (13/48) of sites in England and 75% (3/4) in Wales referred patients to another provider for a falls assessment.

Fifty-eight per cent (15/26) of FLSs in England and the site in Wales that provided falls assessments reported that the assessments and interventions were provided by the same FLS staff who determine the need for secondary fracture prevention.

Table 16 shows the wide variation in content of falls assessment by FLSs when performed.

Table 16: Assessments covered by the falls risk assessment

	England FLS n=26	England FLS %	Wales FLS n=1	Wales FLS %
A formal assessment of cognition	11	42.3	0	0.0
Assessment of continence and toileting	13	50.0	1	100
Assessment of a history of falls	22	84.6	1	100
Number of falls in the past 12 months	24	92.3	1	100
Assessment for fear of falling	21	80.8	1	100
Assessment of a history of blackouts or syncope	21	80.8	1	100
Review of all medications and combinations of medications that increase falls risk	17	65.4	1	100
Assessment of gait, balance and mobility	16	61.5	1	100
A requirement to check lying and standing blood pressure	13	50.0	1	100
Pulse check for rhythm and rate	8	30.8	0	0.0
An evaluation of vision	8	30.8	1	100
No response	1	3.8	0	0.0

Table 17: Cumulative proportion of FLSs including the most frequent falls assessment questions

	England FLS n=26	England FLS %	Wales FLS n=1	Wales FLS %
Number of falls in the past 12 months	24	92.3	1	100
+ Assessment of a history of falls	21	80.8	1	100
+ Assessment for fear of falling	20	76.9	1	100
+ Assessment of a history of blackouts or syncope	19	73.1	1	100
+ Medication reviews for falls risk	15	57.7	1	100

Of the sites that reported including an assessment of cognition as part of their falls assessment, 73% (8/11) in England used AMT10. Of the 16 sites in England that reported including an assessment of gait, balance and mobility, 81% (13/16) asked about gait problems and 69% (11/16) used chair rise. Thirty-eight per cent (6/16) used a 'timed up and go' test. The one site in Wales that reported including an assessment of gait, balance and mobility used a 'timed up and go' test and chair rise test.

Are patients referred to an evidence-based falls prevention exercise programme?

Therapeutic exercise is the best-evidenced intervention for falls prevention. It is effective as a single intervention, as well as part of a multifactorial approach.

Sixty-nine per cent (18/26) of FLSs in England refer patients to exercise programmes. It is encouraging that, of those that do, most FLSs in England (94%, 17/18) refer to an exercise programme that includes strength and balance training, and most (94%, 17/18) in England refer to a validated exercise programme delivered by appropriately trained professionals (OTAgo, FaMe, HELP). The FLS in Wales that provides a multifactorial falls risk assessment also refers patients to an exercise programme that includes strength and balance training and is delivered by an appropriately trained professional.

The effective dose of strength and balance exercise training is estimated to be a minimum of 50 hours. However, only four sites (three in England and one in Wales) reported that the standard total duration of recommended exercise (supervised and unsupervised) that participants of the programme are expected to complete was 50 hours or more.[21]

As the risk of recurrent fracture is high after index fracture and bone therapy typically takes 6–12 months to reduce fracture risk significantly, it is important that there is rapid access to other interventions with shorter onset times.

There was a range of service standard waiting times for starting an exercise programme, with sites reporting 0–16 weeks and a mean waiting time of 4 weeks 3 days in England (n=18 and four missing responses). The single response from Wales was 6 weeks.

Integration

Guideline: Management plans will be patient centred and integrated between primary and secondary care (NOS clinical standards).[9]

Fifty-eight per cent of FLSs in England and 50% of FLSs in Wales were including date and type of fracture, current drug treatment recommendations, DXA – bone mineral density (BMD), fracture/fall risk factors and secondary causes of osteoporosis in reports summarising the outcomes.

To ensure timely and consistent long-term management of a patient requires effective communication within different parts of the NHS, including primary care, and with patients.

How is patient care communicated between various care providers?

Table 18: Who receives the report summarising the outcomes of assessing patient need for treatment to prevent secondary fractures?
Multiple responses were allowed

	England FLS n=48	England FLS %	Wales FLS n=4	Wales FLS %
Primary care physician	44	91.7	4	100
Patient	30	62.5	1	25.0
Service that referred to FLS	11	22.9	2	50.0
Orthopaedic surgeon or clinician responsible for fracture care	8	16.7	3	75.0
Falls service	7	14.6	1	25.0
Other	6	12.5	0	0.0
No response	3	6.3	0	0.0

Table 19: Information that is included in the report
Multiple responses were allowed

	England FLS n=48	England FLS %	Wales FLS n=4	Wales FLS %
Current drug treatment recommendations	41	85.4	4	100
Date and type of fracture	41	85.4	2	50.0
DXA – BMD	40	83.3	3	75.0
Fracture/fall risk factors	38	79.2	3	75.0
Lifestyle/health risk-factor assessment	37	77.1	3	75.0
Secondary causes of osteoporosis (if applicable)	37	77.1	4	100
Follow-up plan	36	75.0	4	100
Primary osteoporosis risk factors	36	75.0	3	75.0
Fracture risk score	30	62.5	0	0.0
Medication compliance review	28	58.3	1	25.0
DXA – vertebral fracture assessment or spine X-ray result if done instead	12	25.0	1	25.0
Other*	11	22.9	0	0.0
No response	3	6.3	0	0.0

*Other information provided in reports included social history, and bone and supplement recommendation to be switched to if intolerant to first-line suggestion

Most sites provide information on current drug recommendations (85% in England and 100% in Wales) and DXA – BMD (83% in England and 75% in Wales). Other items, such as medication compliance review (58% in England and 25% in Wales) and fracture risk score (63% in England and none in Wales), were less frequently included in the report.

Table 20: Cumulative proportion of FLSs including the main report information
Multiple responses were allowed

	England FLS n=48	England FLS %	Wales FLS n=4	Wales FLS %
Date and type of fracture	41	85.4	2	50.0
+ Current drug treatment	38	79.2	2	50.0
+ DXA – BMD	34	70.8	2	50.0
+ Fracture/fall risk factors	31	64.6	2	50.0
+ Secondary causes of osteoporosis (if applicable)	28	58.3	2	50.0

Monitoring

Guideline: Patients who are recommended drug therapy to reduce risk of fracture will be reviewed within 4 months of initiation to ensure appropriate treatment has been started, and every 12 months to monitor adherence with the treatment plan (NOS clinical standards).[9]

All FLSs in Wales and 42% of FLSs in England delegated monitoring to a primary care physician. Where monitoring is delegated to primary care, it becomes almost impossible for the FLS to track.
Seventy-nine per cent of FLSs in England included monitoring of patients' medication adherence, persistence and adverse effects as part of their service scope.

Poor adherence with osteoporosis medications may reduce their clinical effectiveness. Monitoring is critical because the non-adherence rate for the recommended first-line anti-osteoporosis medication, alendronate, is up to 70% 6 months after initiation.[22] The approval of intermittent parenteral therapies for osteoporosis, which is a long-term condition, offers a unique opportunity to address non-adherence. The rate of non-adherence to falls interventions is not known, but is likely to be at least as high.

Who performs the monitoring?

Table 21: Who is responsible for monitoring patients seen in the FLS?
Multiple responses were allowed

	England FLS n=48	England FLS %	Wales FLS n=4	Wales FLS %
Delegated to primary care physician	20	41.7	4	100
FLS coordinator	19	39.6	1	25.0
Specialist nurse	18	37.5	1	25.0
Other	8	16.7	2	50.0
Clinician – specialty	6	12.5	1	25.0
Rheumatologist	5	10.4	0	0.0
Orthogeriatrician	4	8.3	0	0.0
No response	3	6.3	0	0.0
Delegated to other healthcare provider	0	0.0	2	50.0

The responsibility for continued monitoring of patients is divided between FLSs and primary care. Given evidence from QOF data that prescribing medication to prevent secondary fractures is poor, it is of concern that patients may not be receiving appropriate long-term therapy.

Which patients are monitored?

Monitoring should be offered to patients initiated on bone-sparing therapy, irrespective of the type of fragility fracture.

Table 22: Percentage of patients who undergo re-evaluation by the FLS, stratified by fracture site

	Which patients undergo re-evaluation by the FLS? (n=28)											
	90% or more		50–90%		<50%		Don't know		N/A		Missing	
	n	%	n	%	n	%	n	%	n	%	n	%
Hip fracture	9	32.1	7	25.0	2	7.1	2	7.1	5	17.9	3	10.7
Non-hip fracture	8	28.6	5	17.9	3	10.7	4	14.3	4	14.3	4	14.3
Outpatient	12	42.9	9	32.1	1	3.6	2	7.1	1	3.6	3	10.7
Clinical vertebral fracture	6	21.4	6	21.4	4	14.3	3	10.7	4	14.3	5	17.9
Radiological vertebral fracture	2	7.1	2	7.1	2	7.1	3	10.7	13	46.4	6	21.4

N/A = not applicable (the FLS did not see this patient group)

What is monitored?

Most sites in England include medication adherence (82%, 23/28) and adverse effects of medication (82%, 23/28) in re-evaluation. Some sites also included refracture check (75%, 21/28), fracture risk factors (50%, 14/28) and recurrent falls (64%, 18/28). Sites could select more than one option. All sites in Wales reported that monitoring was delegated to primary care and therefore they were unable to answer these questions.

Eleven per cent (3/28) selected 'other'; their responses were diet and lifestyle advice, mobility living status and DXA scan. Eleven per cent (3/28) did not select any options.

Table 23: Cumulative proportion of FLSs including key monitoring questions

	England FLS n=28	England FLS %
Medication adherence	23	82.1
+ Medication persistence	22	78.6
+ Medication adverse effects	22	78.6
+ Refracture check	20	71.4
+ Recurrent falls	18	64.3

How is adherence assessed or re-evaluated?

Adherence is most commonly assessed or re-evaluated by telephone interview in England (82%, 23/28), with some sites also using postal questionnaire (32%, 9/28), clinic review (29%, 8/28), DXA (14%, 4/28), other methods (14%, 4/28) and prescription review (7%, 2/28). Sites could select more than one option.

When is monitoring carried out?

Most FLSs performed one evaluation within 6 months of initiating treatment for secondary fracture prevention, with fewer performing a review at 12 months. Fifty per cent (14/28) monitored patients once, 39% (11/28) of services monitored twice and no services reported monitoring three or more times.

Patient life status

Thirty-nine per cent (11/28) of FLS sites in England routinely checked the patient's life status using the NHS Spine before arranging monitoring. Forty-six per cent (13/28) reported that they did not use the NHS Spine.

Support for patients and carers – role of the National Osteoporosis Society

Given the role of the National Osteoporosis Society (NOS) in supporting patients and clinicians and also in championing the provision of an FLS for every fragility fracture patient within the UK, we asked about the level of integration with the charity at each site. A small minority of reporting sites did not know of the NOS's work, and most FLSs were using the NOS's information leaflets. Fewer were using its educational events and local support groups. The majority of FLSs are likely to be under-resourced in relation to estimated local fragility fracture caseload, and 28% (13/47) were accessing the NOS for support with service development.

Table 24: How has the NOS supported the FLS from 1 January 2014 to 31 December 2014?

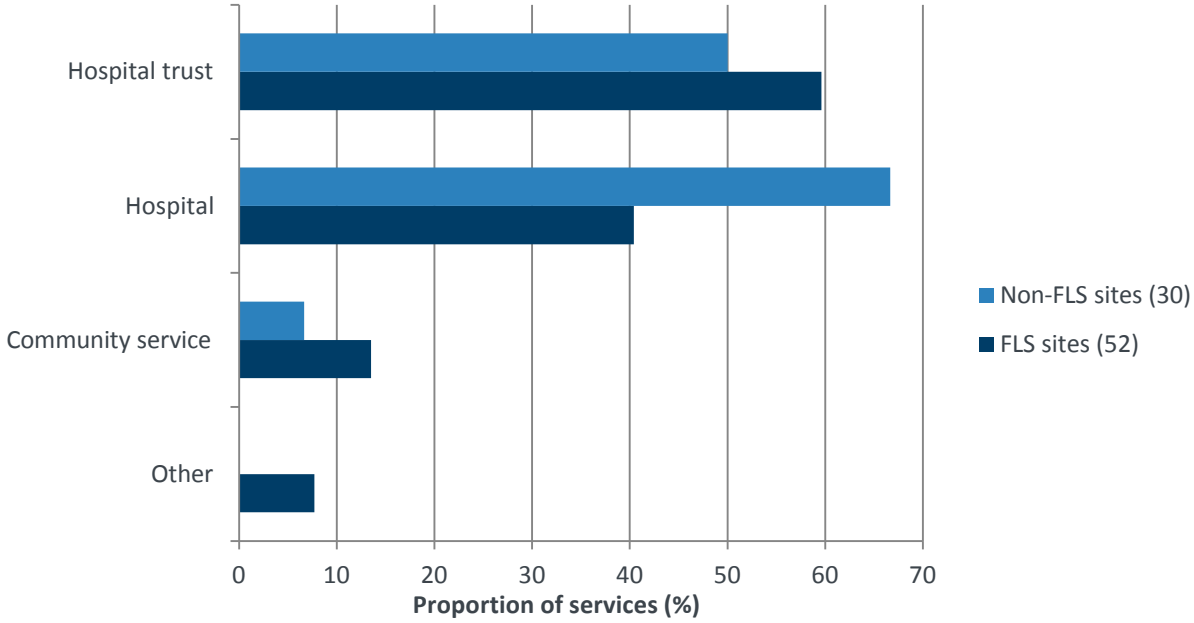
	England FLS n=45	England FLS %	Wales FLS n=2	Wales FLS %
Use NOS leaflets in the FLS	37	82.2	1	50.0
Local support group	21	46.7	1	50.0
Arrange NOS education events	16	35.6	0	0.0
Service development	12	26.7	1	50.0
No response	4	8.9	0	0.0
Other	5	11.1	1	50.0
None of the above	2	4.4	0	0.0
Don't know	2	4.4	0	0.0

Resources and commissioning

Organisation of FLS

The figure below summarises which entities the FLS or fracture care service was based around, as reported by sites. Other responses included primary care, CCG, and bridging acute and community.

Fig 2: Reporting site service structure
Multiple responses were allowed



Duration of FLS provision

We asked sites about how long FLSs had been available in any form and how long the current service specification had been in place. This was to understand the history of FLS provision within the NHS and also how frequently service specifications have changed since they were introduced, which might reflect changes in service scope and the volume of patients given the changing demographics.

Dedicated FLSs have been present within the NHS in England and Wales for over 16 years, with the majority in place for more than 5 years. Forty-seven FLSs reported what month and year they started to see patients; 34% (16/47) of these services were initiated in the past 3 years, which suggests that there has been a relatively recent increase in the commissioning of FLSs and growing recognition that secondary fracture prevention is a commissioning priority.

Fewer than half of services have changed their resourcing since they were initiated. This suggests that, despite possible changes in both volume and complexity of patients and interventions, most FLSs have been unable to secure changes to their to original service specification.

Funding and cost

One of the key barriers to universal FLS provision is lack of sustainable funding.[23] We therefore asked in detail about the current funding arrangements for each FLS.

For those with a funded FLS, 83% (43/52) were able to report how their FLS was funded. Ninety-three per cent (40/43) were funded by a single payer, with 67% (29/43) of sites solely funded by the CCG or health board, 0% from local authority, 23% (10/43) from a hospital trust and 2% (1/43) funded via a grant and using the outpatient tariff. The three English services funded from multiple sources were funded by both CCGs and hospital trust/department. The variation in funding mechanism suggests that there is not a clear source of funding for FLSs and this adds further complexity to commissioning FLSs within the NHS.

Type of contract

Most sites in England (73%, 35/48) had a contract period based as part of a general contract or block payment. Some sites (6%, 3/48) had a fixed-term contract that they needed to completely re-bid or renew, and (10%, 5/48) had a per-patient tariff contract.

Table 25: Type of current contract

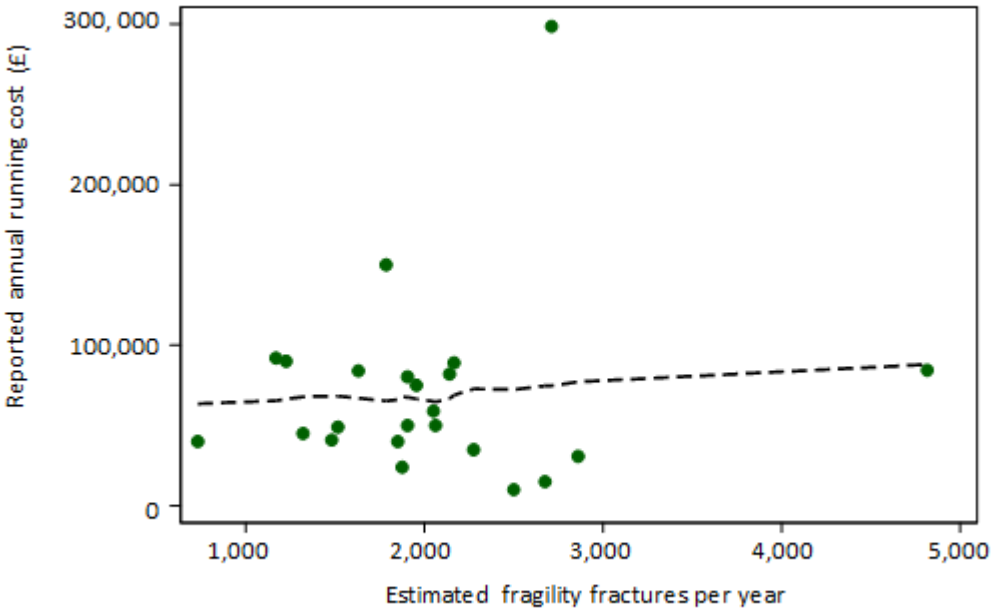
Type of contract	England FLS n=48	England FLS %	Wales FLS n=4	Wales FLS %
Pilot	1	2.1	0	0.0
Fixed term then need to completely re-bid or renew	3	6.3	1	25.0
Part of general contract or block payment	35	72.9	1	25.0
Per-patient tariff	5	10.4	0	0.0
Other*	3	6.3	2	50.0
No response	1	2.1	0	0.0

*Other responses included primary care, CCG, bridging acute and community, and hospital based

Annual cost of staff for the service

Only 48% (25/52) of FLSs were able to report their annual staff running costs. The mean annual staff running cost for an FLS in England was £72,030 (24 responses). Only one Welsh site was able to estimate its running costs, at £34,876. Given the current funding situation, it is worth debating whether a greater awareness of financial resourcing within the FLS would impact service resilience.

Fig 3: Reported annual running costs and estimated fragility fractures



As can be seen by in Fig 3, there was no relationship between FLSs' reported annual costs and their estimated fragility fracture caseloads. This underlines the need to ensure that each FLS is effective and that FLSs routinely review their service with their commissioners to identify gaps in resourcing that are leading to potentially suboptimal levels of care.

Funding for DXA

DXA scanning is recommended by NICE TA161 and CG146 to inform risk stratification; however, it remains unclear whether this should be included within the FLS funding envelope. Forty-six per cent (22/48) of all FLS sites in England received additional funding for DXA scanning. None of the sites in Wales received additional funding.

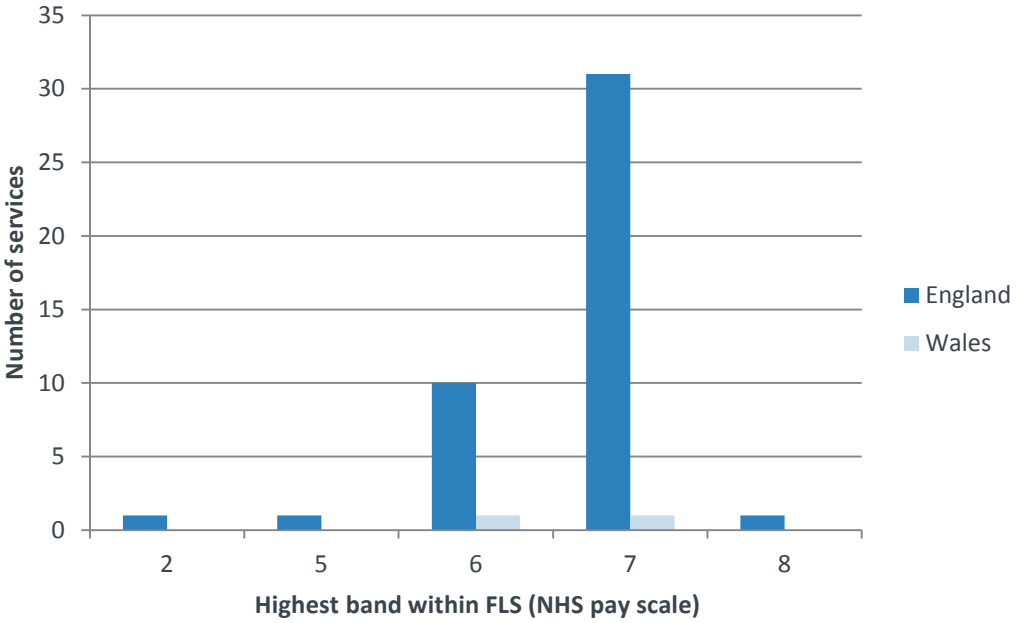
Of the sites that did receive additional funding for DXA scanning, 32% (7/22) received this as a block contract, 41% (9/22) received funding per scan, and 23% (5/22) received this money through other arrangements.

Staff hours

We asked about the type, seniority and number of staff within each FLS. Eighty-eight per cent (46/52) of FLSs reported their staff numbers, grades and hours. FLSs were predominantly led by band 7 practitioners, with some FLSs also headed by band 5 and 6 staff.

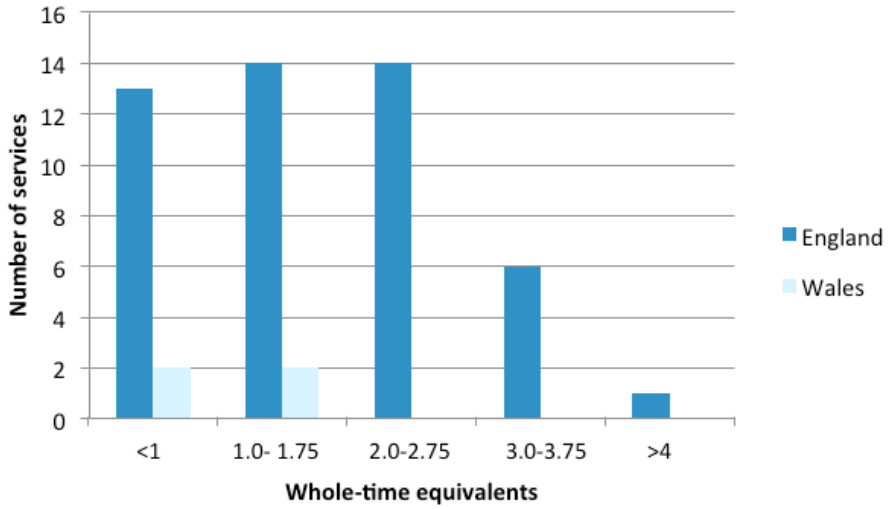
The whole-time equivalents (WTEs) of staff running the FLS were reported in terms of the type of staff (administrators, nurses, radiographers, physiotherapists and others) and by staff band. For this report, we aggregated the total number of hours by role (administrator / nurse / other vs radiographer vs physiotherapist) and we identified the highest band employed by organisation.

Fig 4: Highest nurse / admin / other non-medical band within the FLS



One site only reported administrative support (band 2). They explained that this was because the funding that they receive from the CCG covers the cost of the administrative staff member, who identifies patients. However, additional support from an osteoporosis consultant nurse and a clinical scientist are not covered by the CCG funding.

Fig 5: Total number of non-consultant staff hours per service

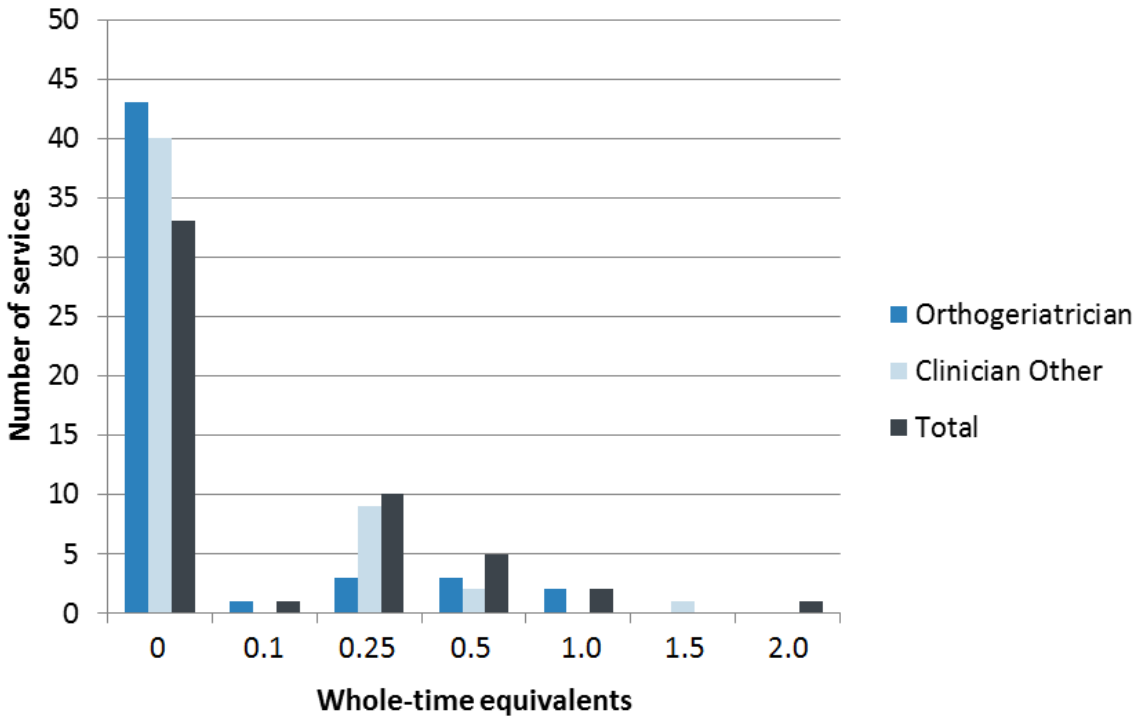


Whole-time equivalents of nurse, administrator and 'others' within the FLS

There was a wide range of WTEs of non-medical staff per service; the highest amount was 6 WTE. Fifteen per cent (7/48) of FLSs in England also reported radiographer time (band 5–7) as part of their service resourcing. One FLS in England also included a band 6 physiotherapist.

Nineteen per cent (9/48) of services reported clinician time as part of the FLS. No service from Wales included clinician time.

Fig 6: Total number of clinician hours dedicated to FLS



0 WTE = number of services with no clinician hours dedicated to FLS.

There was no association between the amount of non-medical WTE, specialist nurse WTE, administrator staff WTE and medical WTE and the estimated number of fragility fracture caseload.

Data records

Table 26: Patient data recording mechanism

Type of database	England FLS n=48	England FLS %	Wales FLS n=4	Wales FLS %
None	2	4.2	0	0.0
Excel	26	54.2	3	75.0
Access	5	10.4	0	0.0
Locally developed	9	18.8	0	0.0
Commercial	1	2.1	1	25.0
Other*	5	10.4	0	0.0
Missing	0	0	0	0.0

*Three other responses were given: SystmOne electronic patient records, Elfin, and Glasgow Integrated System for the Management of Osteoporosis

Most sites were using Excel as their primary recording mechanism. This is at odds with current IT policy for data security. The need within the NHS to record data to inform service quality and value, together with the lack of effective coding of some fragility fracture patients within other routine medical records, eg outpatient events and fracture site coding, highlights the need for relational databases to ensure accurate data entry and reporting. The larger numbers of patients eligible for their data to be included in the ongoing patient-centred FLS-DB audit also highlights the need for efficient recording systems. This is reflected by nine FLSs developing their own local databases.

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We would like to thank the FLS champions and those from non-FLS sites who gave their time and effort to engage with this audit.

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Appendices

Appendix A – Glossary

- A **fracture liaison service (FLS)** is a service that systematically identifies, treats and refers to appropriate services eligible patients aged 50 years and over within a local population who have suffered a fragility fracture, with the aim of reducing their risk of subsequent fractures.
- A **site** is defined as a hospital, primary care practice, network and/or other community service managing fragility fractures.
- A **fragility fracture** is a fracture that occurs after low trauma (equivalent to a fall from standing height or less), excluding skull, face and digits.
- A **clinical spine fracture** is defined as a clinical episode of care due to the symptoms of the spine fracture.
- **Monitoring** includes any review performed at the patient level to ascertain medication use, refracture and/or falls.
- The **Quality and Outcomes Framework (QOF)** is the annual reward and incentive programme detailing GP practice achievement results. It rewards GP practices for the provision of quality care and helps to standardise improvement in the delivery of primary medical services.

Appendix B – Structure and governance

FLS-DB advisory group

Jonathan Bayly, visiting professor of osteoporosis and falls management, Royal College of General Practitioners
Kate Bennett, physiotherapist, AGILE and Chartered Society of Physiotherapy
Rachel Bradley, consultant in care of the elderly, British Geriatrics Society
Will Carr, service development project manager, National Osteoporosis Society
Gavin Clunie, consultant rheumatologist and metabolic bone physician, British Society for Rheumatology
Frances Dockery, consultant physician, British Geriatrics Society
Neil Gittoes, consultant endocrinologist and associate medical director, Society for Endocrinology
Celia Gregson, consultant senior lecturer and arthritis research UK clinician scientist, University of Bristol
Xavier Griffin, consultant orthopaedic trauma surgeon, British Orthopaedic Association
Anne Hendry, care quality improvement bundles expert, Royal College of Nursing
Debbie Jannaway, consultant nurse for falls and osteoporosis and patient safety, Royal College of Nursing
M Kassim Javaid, associate professor in metabolic bone disease, Oxford NIHR Musculoskeletal BRU, University of Oxford and FLS-DB clinical lead
Tim Jones, commissioning adviser, National Osteoporosis Society
Finbarr Martin, FFFAP programme chair and clinical lead
Iona Price, Patient and Carer Network, RCP
Sunil Rai, FFFAP data coordinator
Rowena Schoo, Falls Workstream and FLS-DB project coordinator
Roz Stanley, FFFAP programme manager
David Stephens, locum and portfolio GP, Royal College of General Practitioners
Sonya Stephenson, service development project manager, National Osteoporosis Society
Anne Thurston, head of policy, National Osteoporosis Society
Naomi Vasilakis, Falls Workstream and FLS-DB project manager
Helen Williams, innovation and improvement manager, NHS Vale of York CCG

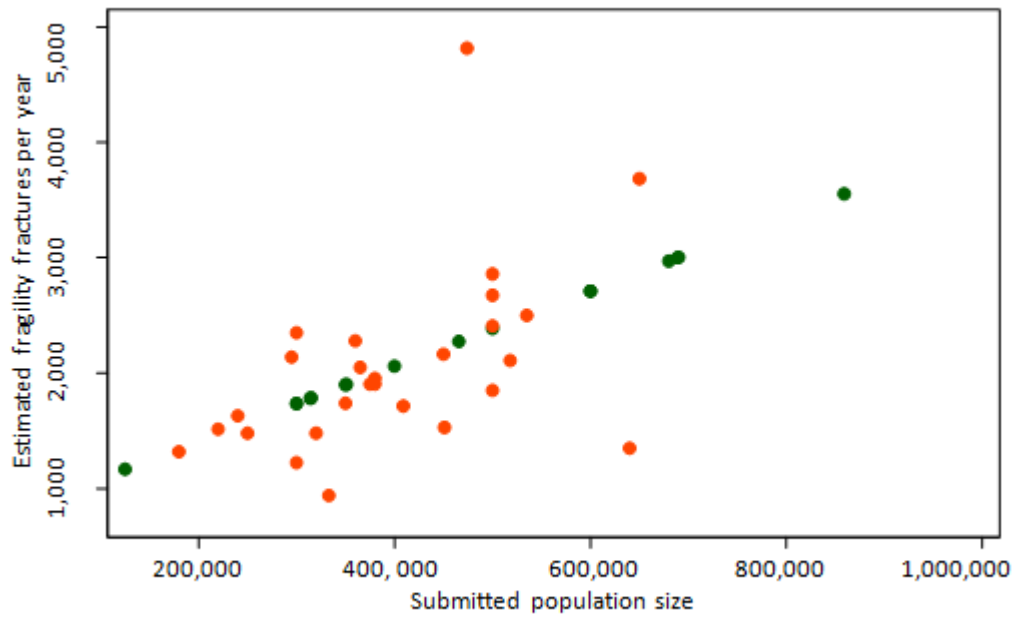
FFFAP board

Chris Boulton, NHFD project manager, RCP
Rhona Buckingham, Clinical Effectiveness and Evaluation Unit (CEEU) operations director, RCP
Tim Chesser, British Orthopaedic Association
David Cromwell, Clinical Effectiveness Unit, Royal College of Surgeons of England
M Kassim Javaid, FLS-DB clinical lead
Antony Johansen, NHFD clinical lead, orthogeriatric medicine
Finbarr Martin, FFFAP programme chair and clinical lead
Shelagh O'Riordan, Falls Workstream clinical lead
Roz Stanley, FFFAP programme manager
Kevin Stewart, CEEU clinical director, RCP
Naomi Vasilakis, Falls Workstream and FLS-DB project manager
Rob Wakeman, NHFD clinical lead, orthopaedic surgery

Appendix C – Estimated local caseload

Eighty-two sites with 52 FLSs submitted data. Two services covered the same geographical site. Thirty-five per cent (18/52) of FLSs were unable to be mapped to the NHFD. We compared the 27 FLSs that reported population size and were identifiable within the NHFD to estimate the hip fracture numbers that were not mapped to NHFD but did report their estimated population size (n=16) (Fig 7). Eleven per cent (2/18) did not report a population estimate; their estimated number of fragility fractures was not able to be calculated and they were excluded from results comparing FLSs with their estimated fragility fracture caseload.

Fig 7: Estimated fragility fractures for each FLS, mapped to NHFD and population size



Orange points represent sites with hip fracture counts from NHFD; green points represent sites with derived hip fracture counts using reported population size

The limitations of this simple rule are clearly apparent. The actual ratio of all fragility fractures to hip fractures is likely to vary between catchment populations owing to variation in age structure. Further, the estimated number of fragility fractures in 16 FLSs was derived from the population size, and in two FLSs could not be determined. However, the method serves as a valuable tool because the number of fragility fractures currently cannot be reliably obtained from other sources. Further work is needed to validate the estimated number of fragility fractures.

Appendix D – Participating sites

Participating sites in England	
FLSs	**Sites without an FLS**
Aintree University Hospital	Derriford Hospital
Ashford and St Peter's Hospitals NHS Foundation Trust	Harrogate District Hospital
Barnet Hospital Fracture Liaison Service	James Paget University Hospitals NHS Foundation Trust
Basildon Hospital	Kingston Hospital NHS Foundation Trust
Bone Protection Service, NHS Vale of York CCG	Leeds General Infirmary
Briggs Unit, Brighton General Hospital	Luton and Dunstable Hospital
Bromley Healthcare Falls and Fracture Prevention Service	Maidstone and Tunbridge Wells NHS Trust
Broomfield Hospital	Musgrove Park Hospital
Crawley CCG FLS West Sussex	Norfolk and Norwich University Hospitals NHS Foundation Trust
Croydon University Hospital	North Devon District Hospital
Diana Princess of Wales Hospital	North Manchester General Hospital
Dorset County Hospital	Northampton General Hospital NHS Trust
East Kent Hospitals University NHS Foundation Trust	Pinderfields Hospital
East Lancashire Hospitals NHS Trust	Royal Devon and Exeter NHS Foundation Trust
East Surrey Hospital	Royal Lancaster Infirmary
Epsom and St Helier University Hospitals NHS Trust	Royal Oldham Hospital
Fracture Liaison Service, Haywood Hospital	Scunthorpe General Hospital
Gloucestershire Care Services NHS Trust	Sheffield Teaching Hospitals NHS Foundation Trust
Guys and St Thomas' NHS Foundation Trust	South Tyneside District Hospital
James Cook University Hospital	Stepping Hill Hospital
King's College Hospital	The Great Western Hospital
Medway NHS Foundation Trust	University Hospitals of Leicester NHS Trust
North Bristol NHS Trust	University Hospitals Southampton NHS Foundation Trust
North Tees and Hartlepool NHS Foundation Trust	Warwick Hospital
Nottingham Community Falls and Bone Health Service	Whiston Hospital
Nottingham University Hospitals	Whittington Hospital
Oxford University Hospitals NHS Trust	
Poole Hospital NHS Foundation Trust	
Portsmouth and South East Hampshire Fracture Liaison Service	
Queen Elizabeth Hospital, Woolwich	
Royal Derby Hospital	
Royal Surrey County Hospital	
Royal United Hospital, Bath	
Royal Victoria Infirmary / Newcastle upon Tyne Hospitals NHS Foundation Trust	
Royal Wolverhampton Hospital NHS Trust	
Sandwell and West Birmingham Hospitals NHS Trust	
St George's Hospital	
Stoke Mandeville Hospital	
Sunderland Royal Hospital	
The Ipswich Hospital NHS Trust	
The Rotherham NHS Foundation Trust	
University Hospital Lewisham	
University Hospital North Durham and Darlington Memorial Hospital	
University Hospitals Birmingham NHS Foundation Trust	
University Hospitals Bristol NHS Foundation Trust	
West Berkshire Fracture Liaison Service	
West Suffolk Fracture Liaison Service	
Yeovil Hospital	

Participating sites in Wales	
FLSs	**Sites without an FLS**
Aneurin Bevan University Health Board Morriston Hospital (Abertawe Bro Morgannwg University Health Board) University Hospital Llandough Ysbyty Gwynedd / Ysbyty Glan Clwyd	Hywel Dda Local Health Board Prince Charles Hospital Princess of Wales Hospital, Bridgend Royal Glamorgan Hospital

This report is the first step by the FLS-DB towards understanding and evaluating secondary fracture prevention in England and Wales in order to improve patient care.

The FLS-DB aims to provide sites with the data they need to improve their services and demonstrate their efficiency.

Falls and Fragility Fracture Audit Programme (FFFAP)

A suite of linked national clinical audits, driving improvements in care; managed by the Royal College of Physicians

- **Falls Pathway Workstream**
- **Fracture Liaison Service Database (FLS-DB)**
- **National Hip Fracture Database (NHFD)**

Royal College of Physicians

Falls and Fragility Fracture Audit Programme (FFFAP)