Royal Osteoporosis Society

Effective Secondary Prevention of Fragility Fractures: Clinical Standards for Fracture Liaison Services

All comments on this consultation should be submitted on the consultation response form available online at https://theros.org.uk/FLSstandardsconsultation and submitted to anne.thurston@theros.org.uk by **Sunday 28 April 2019.**

Please note that this consultation document has not been professionally proof read. Typographical errors and grammar will be corrected prior to final publication.

Effective Secondary Prevention of Fragility Fractures: Clinical Standards for Fracture Liaison Services.

Osteoporosis is the fragile bone disease associated with an increased risk of fragility (low-impact) fractures, the consequences of which are significant. Fragility fractures are:

- **Common:** 1 in 2 women and 1 in 5 men break a bone after the age of 50[1].
- **Costly to the NHS:** The hospital costs of hip fractures alone are estimated at £1.1 billion[2].
- **Life-changing to the individual:** The impact of fractures may lead to loss of mobility and independence, social isolation and depression.

Many fragility fractures could be prevented by timely interventions to reduce fracture risk. A Fracture Liaison Service systematically identifies, treats and refers to appropriate services all eligible patients aged over 50 within a local population who have suffered a fragility fracture, with the aim of reducing their risk of subsequent fractures.

As around 50% of people who experience a hip fracture have broken a bone in the past, FLS represents an ideal opportunity for intervention in the journey to avert that hip fracture.

Fracture Liaison Services (FLSs) are underpinned by evidence demonstrating that they are clinically and cost effective. The principles of evidence-based FLS are presented in the 5IQ model described in this document. By adopting these standards, evidence-based best practice can be implemented and replicated effectively across the UK to reduce the future burden of fractures, improving outcomes for patients and ensuring efficient and appropriate use of NHS resources.

Population: These standards apply to adults in the UK aged 50 or older who have had a fragility fracture.

Audience: These standards have been prepared for the following audiences:

- Adults aged 50 or older who have had a fragility fracture, their carers and families.
- Health professionals who deliver or wish to develop a Fracture Liaison Service (FLS).
- Health professionals who are involved in any part of the fragility fracture prevention pathway.
- Commissioners/funders of FLS.
- Managers involved with service provision.

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Summary of Clinical Standards for Fracture Liaison Services (FLS)

FLS are underpinned by evidence demonstrating that they are clinically and cost effective. The principles of evidence-based FLS are presented in the 5IQ model. All principles will be adhered to in order to realise service benefits.

	STANDARD	CRITERIA
1	**IDENTIFY:** People aged 50 years and over with a fragility fracture are systematically identified.	1.1 The Fracture Liaison Service identifies people aged 50 years or older with a new fragility fracture. This includes: • Newly identified vertebral fracture • A new fracture occurring whilst a patient is taking an osteoporosis drug treatment
2	**INVESTIGATE:** Investigations to assess risk of fragility fractures and falls, and possible underlying secondary causes for osteoporosis are offered to people identified by the FLS.	2.1. People identified as being at increased risk of fragility fracture are offered an assessment which will include: • A fracture risk assessment including use of FRAX or QFracture and quality-assured axial DXA including a vertebral fracture assessment where indicated. • An initial assessment of falls risk in people aged 65 or over. • Relevant laboratory and imaging investigations to identify any underlying secondary causes of osteoporosis and help inform drug treatment decisions. 2.2. Assessment will be completed within 12 weeks of fracture diagnosis.
3	**INFORM:** Information and support are offered to people (and where relevant their carers) using the FLS.	3.1. People are offered information targeted at their needs about: • Osteoporosis and risk factors for fracture. • Lifestyle interventions aimed at reducing fracture risk including nutrition and exercise. • Coping with pain and any disability associated with their fracture. • Drug treatment options for osteoporosis management - including information on benefits and side-effects. • Reducing falls risk. • Next steps in their care plan and follow-up appointments. 3.2. Information is available in a range of formats and languages, appropriate to the population served by the service. 3.3. People and their carers understand where to get further information about osteoporosis and support following their appointment. 3.4. Communications from the FLS are written in a style that can be understood by the person. They are copied to the person who has had a fracture as well as the health professionals involved in their care, including their GP. 3.5. People are engaged in discussion and decisions made to agree their care plan.
4	**INTERVENE:** Interventions to reduce the risk of fragility fractures are	4.1. People at high risk of fragility fracture are initiated on an appropriate drug treatment within 16 weeks of fracture diagnosis (i.e. within 4 weeks of the primary assessment being completed).

	STANDARD	CRITERIA
	offered to people as required.	4.2. People at high risk of falling are referred to falls prevention services and offered interventions to keep them strong, steady and independent within 16 weeks of their fracture. 4.3. People who are recommended interventions to reduce risk of fracture will be reviewed by the FLS within 16 weeks of fracture and at 52 weeks to ensure: a. Treatment has been started and and appropriately continued; b. Referral to falls reduction programmes have been actioned.
5	**INTEGRATE:** The FLS will integrate with the wider healthcare system to facilitate an inclusive patient pathway; ensuring effective case-finding, onward referrals and long-term management of osteoporosis.	5.1. The FLS staff maintain relationships with relevant in-hospital services. 5.2. The FLS staff have a good understanding of the available out-of-hospital services and how people using the FLS can access these. 5.3. Referral pathways are agreed into the FLS from relevant services. 5.4. Clear management plans are prepared to facilitate transfer of care enabling the long-term management of osteoporosis in primary care. 5.5. People who are recommended interventions to reduce risk of fracture will be reviewed annually to monitor adherence, tolerability and unwanted effects of their treatment plan. 5.6. Staff participate in a local multi-disciplinary fracture prevention interest group which meets regularly to co-ordinate, plan and develop the FLS.
6	**QUALITY:** The FLS demonstrates clinical accountablility, ongoing quality improvement, effective governance and funded access to continuing professional development for all practitioners.	6.1. A designated lead clinician is accountable for all components of the service. 6.2. The FLS is developed in line with a local fracture prevention strategy. 6.3. Core clinical data from people identified by the FLS is recorded on an operational database. 6.4. A quality assurance framework is in place which includes: • An ongoing programme of service/quality improvement including regular audit. • Participation in national audits such as the FLS-DB in England and Wales, or the Hip Fracture Audit in Scotland. • Peer review. • Patient and carer experience measures. 6.5. All members of the FLS team have assessment of professional competencies and demonstrate Continuing Professional Development. 6.6. Staff are active participants in a regional clinical or professional network.

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Introduction

Osteoporosis and fragility fractures

Osteoporosis is the most common chronic bone disease[3]. It affects men and women and leads to fragile bones which can then lead to 'fragility fractures'. These broken bones occur after low trauma, such as a minor bump or fall that would not normally cause a bone to break. These fractures are the consequence of low bone density and structural deterioration of bone tissue. The World Health Organization (WHO) has defined fragilty fracture as one which occurs due to forces equivalent to a fall from a standing height or less.

One in two women and one in five men will break a bone after the age of 50 years[1]. An estimated 500,000 fragility fractures occur in the UK every year[4]. The number of emergency admissions due to falls and fractures results in more bed-days used than from myocardial infarction (heart attack), heart failure and stroke combined[3]. At any one time, hip fractures account for occupation of over 4,000 hospital beds across England, Wales and Northern Ireland. Hip fracture accounts for the majority of hospital and outpatient costs related to all osteoporotic fractures. The hospital costs of hip fractures alone are estimated at £1.1 billion[2]. This figure excludes the high cost of social care which adds significantly to this cost.

As well as the significant burden on health and social care resources, the impact of fractures on individuals can be devastating, leading to loss of independence, mobility and capacity to carry out everyday tasks. In a survey conducted by the Royal Osteoporosis Society of over 3,000 people living with osteoporosis, 42% felt socially isolated by their osteoporosis, 1 in 3 reported difficulty with domestic chores and over 40% of those who had fractured said they were in long-term pain they did not think would ever go away[5].

People who have had one fracture remain at a two- to three-fold greater risk of sustaining another (known as a 'secondary fracture')[6] and 23% of secondary fractures in women aged over 50 occur within 1 year of the first event[7].

Preventing fractures with Fracture Liaison Services

A Fracture Liaison Service (FLS) systematically identifies, treats and refers to appropriate services all eligible patients aged 50 and older within a local population who have suffered fragility fractures, with the aim of reducing their risk of subsequent fractures.

An FLS is an essential component of a comprehensive and integrated approach to preventing falls and fractures among people over the age of 50 years. Assessment within an FLS should be part of the pathway for all patients with a fragility fracture.

An FLS comprises a dedicated co-ordinator (often a Nurse Specialist) who works to pre-agreed protocols to case-find and then assess patients who have had a fracture. The service may be based in-hospital or in the community and requires support from a medically qualified practitioner (typically a hospital doctor or a GP with expertise in osteoporosis and fragility fracture prevention).

An estimated 58% of the UK population currently has access to an FLS.

Implementing the standards

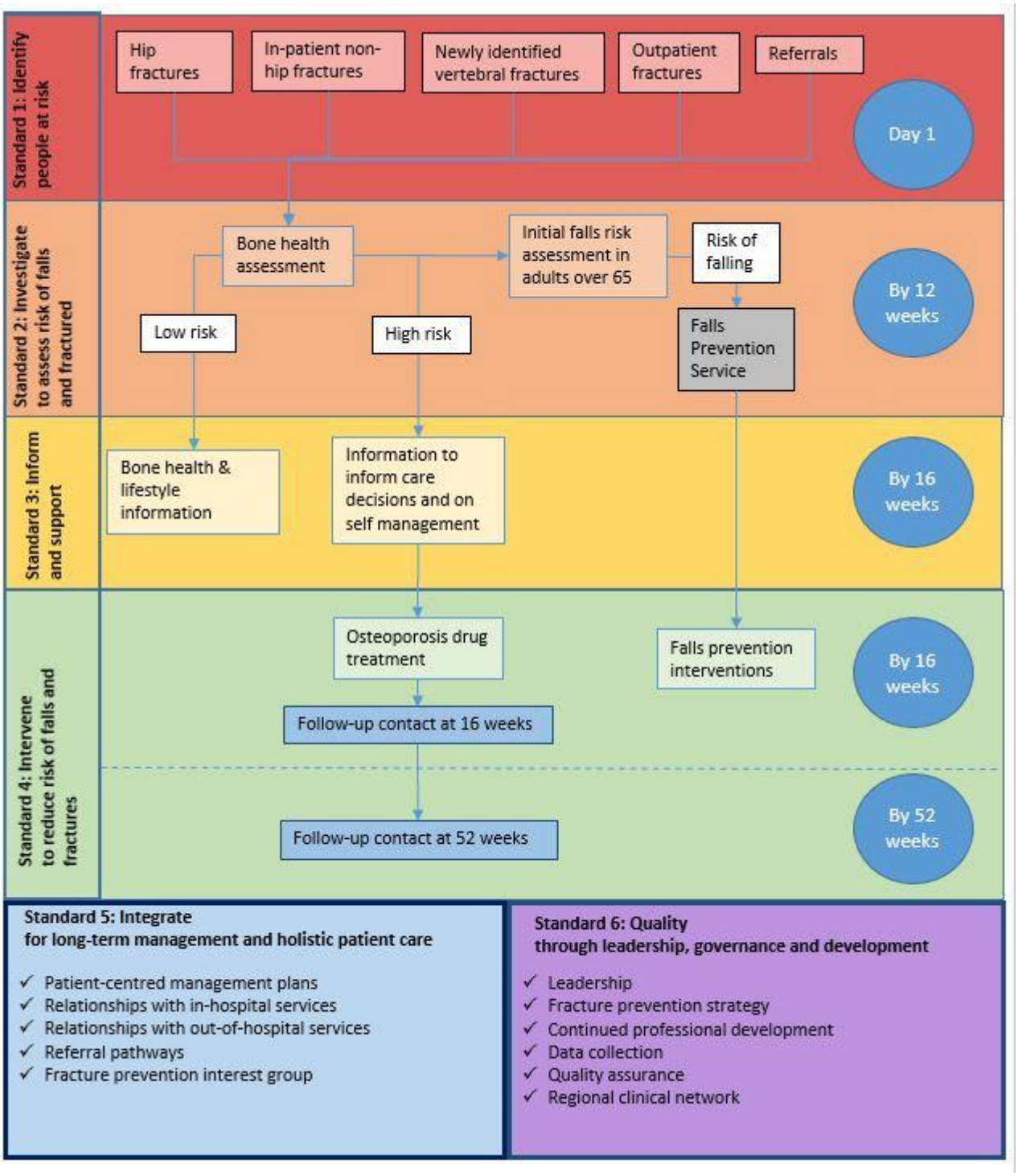
In order to effectively prevent fractures, an FLS will deliver all 6 standards outlined in this document. The methods used for doing so will vary according to staffing and resources available locally. Support in developing or improving an FLS is available from the Royal Osteoporosis Society (see p.29 for further details).

Working with national guidance and policies

These standards have been developed to be used alongside national guidance for the prevention of falls and fractures produced by National Institute of Health and Care Excellence[8–13], Scottish Intercollegiate Guidelines Network[14] and the National Osteoporosis Guideline Group[15]. Clinical protocols will be developed locally which are based on relevant national guidelines.

The standards also align with the principles of Realistic Medicine[16], Prudent Healthcare[17] and Making Every Contact Count[18], and with quality improvement programmes delivered by 'Getting It Right First Time'[19] and NHS Rightcare[20].

Components of an FLS



Your care checklist

If you're aged 50 or older and you've broken a bone, the NHS should provide the following care. Use this checklist to make sure you're getting everything you should and at the right time*.

*Adapted from *Strong bones after 50: FLS explained*[42].

Identify

STANDARD 1: People aged 50 years and over with a fragility fracture are systematically identified.

Rationale

People aged 50 years and over who have had a fragility fracture need to be identified by the FLS to ensure they undergo investigations to assess their need for intervention. Deploying a range of casefinding strategies will yield the best results. Strategies used will depend upon local service profiles.

Criteria

1.1 The FLS identifies people aged 50 years or older with a new fragility fracture. This includes:

- Newly identified vertebral fracture
- A new fracture occurring whilst a patient is taking an osteoporosis drug treatment

In practice

Identifying people aged 50 years or older with a new clinical fracture is a core responsibility of an FLS. This is undertaken by the 'FLS Co-ordinator' who is typically a dedicated Nurse Specialist, although this role may also be undertaken by Allied Health Professionals (AHPs) or non-clinical personnel.

FLSs will include for assessment all people aged 50 years or older who have sustained a new fracture or radiological fragility fracture at any skeletal site, though an exception is justified for fractures of skull, facial, digit and scaphoid bones that are typically caused by a traumatic injury. A pragmatic approach to the definition of a fragility fracture is encouraged and exclusions might only be made in the case of a road traffic collision (or other clearly significant trauma) or where a fall has clearly been from above standing height.

Identification of new clinical fracture presentations is achieved most readily by an in-hospital FLS, typically aligned to acute fracture care. In addition to using hospital IT systems, the FLS Co-ordinator can facilitate the identification of patients with new fractures through engagement in orthopaedic ward rounds, trauma team meetings and attending fracture clinics. All of these approaches afford the opportunity to meet patients personally to educate, persuade and invite them to attend for further investigation. Patients are more likely to respond to direct personal invitation.

An out-of-hospital FLS will rely on reporting from fracture clinic and/or radiology departments, so close liaison with local secondary care centre(s) needs to be established at the outset to enable seamless, continuous capture of all relevant cases. Out-of-hospital FLSs are well-placed to identify patients with prior fragility fracture history (prevalent fractures), whereas these will remain a challenge for in-hospital FLSs.

It is, however, improbable that any single approach will identify all patients with a new fracture and the FLS Co-ordinator will customise screening methods as per local systems; it is recommended that multiple strategies are used for identification to maximise yield.

An FLS will identify all the following groups:

- Managed as inpatients on acute Orthopaedic/Trauma wards.

- Managed as inpatients on General Medical/Care of the Older Person wards not requiring surgical fixation (e.g. pelvic, upper limb, acute spine fracture presentations).
- Presenting acutely and not requiring hospital admission but managed as outpatients via Orthopaedic / Emergency Medicine fracture clinics.
- Presenting acutely but not requiring hospital admission or fracture clinic follow-up.
- Vertebral fractures newly identified on radiology reports (incidental or anticipated).
- New fractures as a result of a fall during a hospital stay.
- Patients who fracture whilst away from home and present later to local orthopaedic or primary care services.

FLSs will aim to identify patients from all groups. Some examples of how this might be approached is described below:

Inpatient fractures

People who need to stay in hospital after their fracture are not only at highest future fracture risk[21,22], but also are among the most straightforward to identify.

Identify this group by:

- ✓ Liaising with orthopaedics, orthogeriatricians and trauma nurses
- ✓ Attending trauma meetings
- ✓ Using IT/informatics systems

Liaison with local Orthopaedic and Trauma teams is essential in order to agree roles and responsibilities for identifying people aged 50 or older who have had a fragility fracture and to agree access to the FLS for people under the care of Orthopaedic or Emergency Departments.

A fall during a hospital stay may result in a fracture. These will be identifiable via DATIX (or similar incident reporting systems), seen in fracture clinic or transferred to orthopaedics. It is important that these patients are identified and assessed by the FLS.

Outpatient fractures

People who have a fracture and are managed in fracture clinics are another readily recognisable group.

Identify this group by:

- ✓ Reviewing Emergency Department lists
- ✓ Sceening Fracture Clinic notes
- ✓ Reviewing primary care records
- ✓ Linking with virtual fracture clinics

Vertebral fractures

Vertebral fractures are amongst the most common osteoporosis-associated fractures. They are a powerful predictor of futher fracture, yet they often account for less than 5% of clinical fracture presentations to FLS.

Identify this group by:

- ✓ Liaising with Radiology to identify vertebral fractures which are incidental findings on images
- ✓ Carrying out Vertebral Fracture Assessment (VFA)[23,24] (see 'Investigations')

- ✓ Liaising with physiotherapy-led musculoskeletal back pain services or other interface

An FLS will link with Radiology reporting systems to identify vertebral fractures. Vertebral fractures are often identified incidentally on plain X-rays, CT and MRI scans. Guidance on identification and reporting of vertebral fractures is given by the Royal Osteoporosis Society[25]. This recommends that Radiology:

- Review the spine in all images of the chest, abdomen and pelvis
- Report vertebral fractures clearly using the term 'vertebral fracture'
- Recommend further assessment and management to reduce fracture risk

Referrals

Referrals should also be encouraged into the FLS from other services, such as GPs, Pain Clinics, interface services and falls services.

What this standard means to:
A person receiving care You will be identified by the Fracture Liaison Service if: • You are aged 50 years or older and you have broken a bone more easily than you'd expect (known as a 'fragility fracture'). • A health professional finds you have had a vertebral fracture (a broken bone in your spine). Some people can have a vertebral fracture without realising and with no obvious symptoms but they could benefit from medication to protect them from further broken bones in the future.
A member of staff You will: • Follow agreed protocols to ensure that people with fragility fractures are identified by the service. • Use imaging reports to identify people with vertebral fractures. • Work with colleagues in other departments and specialties to establish protocols to maximise the identification of people at risk of osteoporosis.
The organisation The organisation will: • Support access for FLS pactitioners to relevant IT systems that will support identification of patients presenting with a fracture • Support services such as Orthopaedics, Emergency Departments and Imaging to come together to support the work of FLS Practitioners • Have procedures in place to ensure that all inpatients and outpatients with fragility fractures are identified by the FLS. • Have procedures in place to ensure tht all images that include the spine are scrutinised for the presence of vertebral fractures and these are reported clearly with signposting to the FLS. • Put in place adequate resources to meet the demand of its population.

Measures

Identification (all fragility fractures): Percentage of patient identified compared with the local estimated case load.

Identification (spinal fractures): Percentage of patients with a spine fracture as their index fracture site.

Investigate

STANDARD 2: Investigations to assess risks of fragility fractures and falls, and possible underlying secondary causes for osteoporosis are offered to people identified by the FLS

Rationale

A comprehensive multifactorial assessment will ensure that interventions to prevent secondary fractures are appropriately targeted to the people that need them.

Prompt assessment and intervention is needed as the risk of having a further (secondary) fracture is high in the first year following a fracture. Investigations will occur as soon as feasible after the fracture so that interventions are not delayed. Investigations, results and reports will be completed within 12 weeks of the fracture diagnosis.

FRAX and QFracture are the recommended fracture risk assessment tools in the UK. They will be used in conjunction with bone mineral density (BMD) results from axial DXA. BMD measurement is an important part of clinical decision-making. It quantifies the severity of osteoporosis and establishes a baseline for future evaluation of treatment performance. BMD measurement is recommended before osteoporosis drug treatment is started wherever feasible. An initial falls risk assessment is also warranted as most fractures will result from a fall.

Criteria

2.1. People identified as being at increased risk of fragility fracture are offered an assessment which will include:

- A fracture risk assessment including use of FRAX or QFracture and quality-assured axial DXA including a vertebral fracture assessment (VFA) where indicated.
- An initial assessment of falls risk in people aged 65 or over.
- Relevant laboratory and imaging investigations to identify any underlying secondary causes of osteoporosis and help inform drug treatment decisions.

2.2. Assessment will be completed within 12 weeks of fracture diagnosis.

In Practice

Assessing fracture risk

There are two initial components to a bone health assessment; evaluation of risk factors using a fracture risk assessment tool and a dual X-ray absorptiometry (DXA) scan to measure bone mineral density (BMD).

Fracture risk assessment

Bone mineral density, a prior fracture, age and gender are the most powerful contributors to future fracture risk. These and other key risk factors have been used to develop tools which allow assessment of fracture risk.

There are several fracture risk assessment tools, including FRAX and QFracture, which have been assessed by NICE[11] and SIGN[14]. National guidance makes recommendations about how to use FRAX or QFracture in fracture risk assessment and should be used to develop local protocols.

As with any assessment tool or guidance, clinical judgement should always be used. Users need to be aware of key limitiations of these risk tools to understand when to

amend the calculated fracture risk scores. These limitations include differences in fracture risk by differences in fracture site, number of fractures and recency of fracture as well as prevlance of other medical conditions such as diabetes mellitus, or drug therapies such as androgen deprivation therapy.

DXA scans

Osteoporosis is diagnosed by measuring BMD using axial DXA. BMD measurement serves as a means to quantify fracture risk and is an important aid to treatment decision-making.

Although a DXA scan should be measured in most situations after fracture, exceptions may be considered in the following instances where anti-fracture effects of drug treatments have been demonstrated in patient who do not have densitometric osteoporosis:

- In the presence of two or more vertebral fractures (where other causes of multiple vertebral fractures having been excluded).
- After hip fracture.

NICE guidance suggests that treatment may be offered to patients over the age of 75 without a DXA scan where the responsible clinician considers it to be clinically inappropriate or unfeasible[9,12,13].

VFA: As well as providing a BMD measurement, DXA can be used to assess for prevalent vertebral fractures. Quick and cheap to perform and with very low additional x-ray exposure, VFA obviates the substantially greater costs and radiation exposure of conventional plain spine radiology and can reliably identify the presence of vertebral fractures. Guidelines produced by the International Society for Clinical Densitometry[23] can be used to develop local protocols.

Other investigations

Patients believed to be at increased risk of fracture will have investigations to:

a) Assess for underlying secondary causes of osteoporosis/high fracture risk including exclusion of diseases that can present with osteoporosis and vertebral fracture (such as multiple myeloma or malignancies that metastasise to bone).
b) Guide treatment selection and ensure treatment safety.

From point of view of safe prescribing, where a bisphosphonate treatment is recommended, urea & electrolytes (U&Es) and bone profile tests (adjusted calcium, albumin and alkaline phosphatase) will be carried out as a minimum.

Other procedures may be appropriate for individual patients depending on the clinical presentation and local protocols. These may include *(adapted from NOGG 2017: Clinical Guideline for the prevention and Treatment of Osteoporosis[15]):*

- Full blood count (FBC)
- Erythrocyte sedimentation rate (ESR)
- C-reactive protein
- Liver function tests (LFTs)
- Thyroid function tests (TFTs)
- Serum protein immunoelectrophoresis, serum free light chains and urinary Bence Jones protein
- Serum 25-hydroxyvitamin D especially if planning parenteral treatment
- Plasma parathyroid hormone

- Serum testosterone, sex hormone binding globulin, follicle stimulating hormone, luteinizing hormone (in males)
- Serum prolactin
- 24 hour urinary free cortisol/overnight dexamethasone suppression test
- Endomysial and/or tissue transglutaminase antibodies
- Markers of bone turnover
- Urinary calcium excretion

Treatment recommendations should not be made without blood tests to rule out secondary causes of fractures. Laboratory tests should not be more than 3 months old at the point of making treatment decisions. It is important to recognise that clinical conditions can change rapidly and in some situations contemporary blood test results may be required.

Falls risk assessment

In line with NICE guidance on preventing falls in older adults[8], FLS staff should routinely ask people aged 65 years and older whether they have fallen in the past year and about the frequency, context and characteristics of their fall/s. Older people reporting a fall or considered at risk of falling should be observed for balance and gait deficits and considered for their ability to benefit from interventions to improve strength and balance. This may also be appropriate in people aged 50-64 seen by the FLS who have risk factors for falls. FLS co-ordinators will need adequate training and expertise in these initial assessment techniques.

An FLS will engage closely with local falls services, to determine access to appropriate pathways to ensure early falls risk assessment and intervention post-fracture. The responsibility for any subsequent multifactorial falls assessment and targeted intervention will lie primarily with local falls services but depending on local arrangements, elements of this assessment may be conducted by an FLS with relevant skills. In this situation there must be clear and timely linkage to the necessary intervention pathways (see *'Integrate'*).

What this standard means to:

A person receiving care

You will:

- You'll be asked about your medical history and may have a DXA scan (like an X-ray) and blood tests. The information gathered will be discussed between you and your health professionals so you can make decisions about what can be done to help reduce your risk of breaking a bone in the future.
- Be asked about whether you have fallen in the past year and your health professional will look at how you walk. If you have fallen two or more times, or your balance and the way you walk suggest you would benefit from specialist help, you will be invited to meet other specialist health professionals who will be able to assess your risk of falling in the future.
- Receive a copy of the final FLS report prepared by the health professionals who assess you. This will include your bone density scan results and whether you will benefit from an osteoporosis drug treatment to strengthen your bones.

A member of staff

You will:

- Carry out a comprehensive assessment considering all aspects of bone health, this may include fracture risk assessment using FRAX or QFracture DXA, VFA, blood tests and review of imaging as appropriate.

• Ask whether the person has fallen in the past year, observe their gait and balance, and refer them to falls prevention services for further assessment where indicated. • Share final FLS reports. This will include DXA and other tests results as apporpiate as well as treatment/intervention recommendations) with relevant health professionals including the GP as well as the the person who has been assessed.
The organisation The organisation will: • Support two-way referral processes between the FLS and the falls prevention service. • Ensure sufficient quality-assured DXA scanning is available in a timely manner for the population it serves. • Ensure there are appropriate staff to run the FLS within waiting time requirements and FLS Standards.

Measures

Time to FLS assessment: Percentage of patients who were assessed by the FLS within 90 days of their fracture.

Time to DXA: Percentage of patients who had a DXA ordered or recommended and were scanned within 90 days of fracture.

Falls assessment: Percentage of patients who received a falls assessment or were referred or recommended for a falls assessment.

Inform

STANDARD 3: Information and support are offered to people coming into contact with the FLS, and, where appropriate, their carers.

Rationale

By giving people and, where appropriate, their carers, information in formats that meet their needs, interests and concerns, people can be effectively supported to understand their condition and the importance of engaging with and adhering to their treatments.

Criteria

3.1. People are offered information targeted at their needs about:

- Osteoporosis and risk factors for fracture.
- Lifestyle interventions aimed at reducing fracture risk including nutrition and exercise.
- Coping with pain and any disability associated with their fracture.
- Drug treatment options for osteoporosis management - including information on benefits and side-effects.
- Reducing falls risk.
- Next steps in their care plan and follow-up appointments.

3.2. Information is available in a range of formats and languages, appropriate to the population served by the service.

3.3. People and their carers understand where to get further information about osteoporosis and support following their appointment.

3.4. Communications from the FLS are written in a style that can be understood by the person. They are copied to the person who has had a fracture as well as the health professionals involved in their care, including their GP.

3.5. People are engaged in discussion and decisions made to agree their care plan.

In practice

Patient education is an important component of an FLS. The priorities are to cover simple key points and back this up with information resources in appropriate formats.

The FLS will cover the areas outlined in criteria 3.1 and will allow sufficient time within the appointment to encourage people to ask questions, provide information about other services they will be referring people to (such as falls prevention, physiotherapy, pain clinics etc.) and explain the next steps in their care.

Giving someone a diagnosis can be overwhelming for the person concerned and people may not absorb or understand all that is explained to them. A summary of key information in an appropriate format will be offered and people will be signposted as to how to get further information following their FLS appointment. This could be by contacting staff at the FLS or through an information helpline such as the nurse-led Helpline run by the Royal Osteoporosis Society.

If resources are available, group education sessions are popular and ensure that there are a range of options to suit different preferences. These can be led by either peers or health professionals and be offered as a series of group sessions or individual meetings.

All written communications and materials need to be easily understood by the person who has had a fracture. It is good practice to ensure the person receives a copy of reports and letters from the FLS to facilitate their on-going care.

What this standard means to:

A person receiving care

You will:

- Feel informed and supported.
- Be given opportunities to ask questions, discuss options and participate in decisions about your care.
- Understand your bone health and what you can do to keep your bones strong.
- Understand your diagnosis and your risk factors for broken bones (bone density etc)
- Understand the benefits and side-effects of treatments recommended for you.
- Receive contact information for your local osteoporosis service and/or regional and national charities including the Royal Osteoporosis Society that can give you more information and support whenever you need it.
- Be given information in the format that best suits you.

A member of staff

You will:

- Ensure the information and support needs of people aged 50 and older (and where appropriate their carers) are considered at each stage of the FLS pathway.
- Tailor the information you give to meet the needs of the individual.
- Allow time for people to ask questions, discuss options and partitiicipate in decision-making.
- Reinforce the information you give verbally with other formats where appropriate.
- Provide information on bone health to everyone coming through the service.
- Provide information about the individual's risk factors for fracture including BMD.
- Provide information on treatment options, including their benefits and side-effects where appropriate.
- Ensure that people have contact information for the service and/or regional and national charities including the Royal Osteoporosis Society that can offer further information and support.
- Run group education sessions.

The organisation

The organisation will:

- Hold information in a range of formats and languages suitable for the population it serves.
- Provide sufficient time in appointments to enable discussion between people and their health professionals.
- Provide resources for regular patient education sessions to give information and support to people at risk of fragility fractures.

Measures

Understanding of where to get more information: Percentage of patients who respond to patient survey indicating that they understand where to get further information.

Involvement in management plan: Percentage of patients who respond to patient survey indicating that they felt they were jointly involved in agreeing their management plan.

Intervene

STANDARD 4: Interventions to reduce the risk of fragility fractures are offered to people as required.

Rationale

Intervention following FLS assessment will comprise a tailored package of care that addresses modifiable fracture risk factors that have been identified for each person.

There are a range of effective drug treatments for osteoporosis available and national guidance gives advice about how these will be used[9,12–15,26]. Local protocols will be developed using appropriate national guidance.

Many fragility fractures occur as a result of a fall, and many of the risk factors contributing to falls are modifiable with appropriate interventions. Though clinical trials of falls interventions have not to date demonstrated an effect upon fracture risk reduction, common sense should be adopted in promoting these proven interventions to reduce future falls risk[27,28]. Exercise can also reduce fear of falling and improve confidence[29]. It may help to promote bone strength as well as help with the symptoms caused by vertebral fractures especially postural changes and back pain[30].

Following-up with people to check that their osteoporosis drug treatment has been started and is being correctly taken is an essential component for an FLS to be effective. In population terms, adherence of at least 80% is required to achieve significant fracture risk reduction[31,32]. Attention from a health care professional can increase treatment adherence significantly[33].

Criteria

4.1. People at high risk of fragility fracture are initiated on an appropriate drug treatment within 16 weeks of fracture diagnosis.

4.2. People at high risk of falling are referred to falls prevention services and offered interventions to keep them strong, steady and independent within 16 weeks of their fracture.

4.3. People who are recommended interventions to reduce risk of fracture will be reviewed by the FLS within 16 weeks of fracture and at 52 weeks to ensure:
   a. Treatment has been started and appropriately continued;
   b. Referral to falls reduction programmes have been actioned.

In Practice

Decisions about treatment interventions will be based on information gathered through clinical assessment, and local protocols derived from national evidence-based guidance.

Osteoporosis drug treatments

The most appropriate drug treatment will be selected according to the individual's needs where modifiable fracture risk exceeds the agreed treatment threshold. Treatment choice will take into account patient preference and an analysis of benefit versus risk (side-effects). The person who has had a fragility fracture will be included in this decision-making process.

An optimal treatment choice should be supported by a strong evidence base and should have demonstated benefits in terms of reducing vertebral and non-vertebral (including hip fracture) fracture risk [9,12–15].

A generic oral bisphosphonate will be recommended as the first treatment choice for the majority of people[12]. These treatments are effective at reducing fracture risk at low cost.

A number of licensed parenteral treatments are available and feature among second- and third-line options. These offer some potential advantages over oral treatments including faster onset of action, no reliance on gastrointestinal absorption, no direct upper gastrointestinal side-effects, reduced frequency of administration and better assured adherence with therapy. Patients with complex comorbidities, cognitive impairment, multiple drug intolerances or severe fracture risk may benefit from parenteral treatment.

Supplementary treatment

Vitamin D and calcium are generally recommended concurrently with a drug treatment for osteoporosis. There is limited evidence that combined calcium & vitamin D supplementation alone may also reduce fracture risk in institutionalised frail older women[34]. A calcium calculator, such as the one developed by the University of Edinburgh[35] can help review dietary calcium intake. Where calcium intake is adequate, a vitamin D supplement alone can suffice. Further guidance on managing vitamin D deficiency in people with or at risk of bone disease is given by the Royal Osteoporosis Society[36].

Onset of effect

Different osteoporosis drug treatments are likely to have different speed of onset to achieve greatest fracture risk reduction. In clinical studies, non-vertebral fracture risk reduction has been shown with 12–18 months of oral drug treatment[37]. One meta-analysis suggests risk reduction may occur as early as 6 months after starting treatment[38]. However long an individual treatment takes to reach fracture risk reduction, it is likely to require at least several months of therapy, during which time non-pharmacological interventions such as falls risk-reduction strategies assume significant importance.

Falls prevention

The FLS will link closely with falls prevention services and ensure that people assessed as being at risk of falls are referred for appropriate interventions. In most cases, the development of an individualised multifactorial intervention will be undertaken by the falls prevention service which may comprise:

- strength and balance training
- home hazard assessment and intervention
- vision assessment and referral
- medication review with modification/withdrawal

Direct exercise programs and/or referrals for home hazard modification may take place in some FLS following initial triage assessment by the FLS. This depends on local falls service arrangements and will be agreed locally.

Regular balance exercises are recommended for anyone who is unsteady, or older than 65 years and not doing regular active leisure or sports[30].

Exercise to promote bone strength

Weight bearing exercise interventions have a benefit on both hip and spine BMD[14]. Combining weightbearing and impact exercise interventions with muscle strengthening exercise, ideally incorporating progressive resistance training, is recommended[30].

Effective follow-up

The effectiveness of an FLS is critically dependant on sufficient long-term adherence to treatment interventions. Many clinical reviews have shown long-term treatment concordance with oral bisphosphonate drug therpy to be poor. Maintaining patients on treatment is critically important in achieving reductions in future fracture risk. Most studies suggest that, where there is a problem with drug treatment, that the person taking the medication will stop taking this within the first 6 months or so.

In order to improve long-term treatment rates, patients should be advised to contact their GP or local FLS team should they have any problems or concerns about their treatment so that alternatives can be considered as required.

Furthermore, an FLS will proactively check that patients are started on the treatment recommended and agreed (see 16 week follow-up below). A further check of longer term treatment adherence is required at around 52 weeks from fracture (see annual follow-up below).

16 week follow-up: An initial follow-up contact will be carried out by the FLS within 16 weeks from fracture to check that recommended interventions have commenced, that drug treatments are taken as directed and for side-effects. This is also a good opportunity to check adherence to lifestyle measures, calcium, vitamin D, and to ask whether the person has fallen or fractured again.

Follow-up will allow people to describe non-adherence and encourage them to express any doubts and concerns about their treatment. It will also include tools to reinforce the importance of the treatment, an assessment of correct understanding of the administration of the treatment and suggestions of how to remember to take the treatment as directed.

This 16 week follow-up should also be used to make sure that referrals to other associated services (such as falls services) have been actioned.

52 week follow-up: Follow-up contact described above will be repeated at 52 weeks from fracture by the FLS. Following this, long-term management after this will be transferred to community based services and future annual follow-up and osteoporosis drug treatment reviews will be carried out in the community (see Integrate).

What this standard means to:
A person receiving care You will: • Be offered an osteoporosis drug treatment within 16 weeks of your fracture if required. • Understand the importance of taking your treatment regularly and as directed and understand the reasons these instructions are important. • Take treatments as directed by your health professional and speak to your GP, pharmacist or local FLS team if you have any difficulties or concerns. • Understand when and where you will have your next dose if you have been recommended an injectable osteoporosis treatment. • Be invited to meet health professionals who can help you stay strong, steady and independent if you have fallen more than twice in the past 12 months, have injured yourself by falling or your balance and the way you walk suggest you would benefit from specialist help. • Understand when you next need to speak to a health professional to review the osteoporosis drug treatment recommended for you.

- Be asked how you are taking your osteoporosis drug treatment, any side effects or other problems taking it within 16 weeks and again within a year after your broken bone.

A member of staff

You will:

- Discuss treatment options with the individual and provide information about the benefits and side-effects to inform decision-making.
- Explain how the recommended treatment is taken and why these instructions are important.
- Explain when treatment will be reviewed and anticipated initial treatment duration.
- Explain what the person with osteoporosis should do if they have any difficulties or concerns about their medication
- Refer to falls prevention services where appropriate.
-

The organisation

The organisation will:

- Have robust systems to ensure that people initiated on an injectable treatement receive the next dose at the right time.
- Ensure that the osteoporosis service has strong links and two-way referral protocols with the falls prevention services.
- Support processes to ensure patients on long-term therapy have treatment reviews in place.

Measures

Bone therapy recommended: Percentage of patients who were recommended anti-osteoporosis medication

Strength and balance training: The percentage of non-hip fracture patients who had attended a strength and balance class within 16 weeks of their fracture

Monitoring contact 12–16 weeks post fracture: The percentage of patients who were followed up between 12 and 16 weeks following their fracture.

Commenced bone therapy by first follow-up: The percentage of patients who had commenced (or were continuing) anti-osteoporosis medication.

Adherence to prescribed anti-osteoporosis medication at 52 weeks post fracture: The percentage of patients who had confirmed adherence to a prescribed anti-osteoporosis medication at 12 months post fracture.

Rate of prescribed medicines in primary care per 1000 people aged 50 and over.

Integrate

STANDARD 5: The FLS will integrate with the wider healthcare system to facilitate an inclusive patient pathway; ensuring effective case-finding, onward referrals and long-term management of osteoporosis.

Rationale

An FLS can be based in hospital or in the community. Regardless, in order to be effective, the FLS will be integrated with other services and the wider fracture prevention care pathway. This enables an FLS to maximise case-finding, refer to appropriate services to meet a patient's needs and ensure transfer of care to facilitate long-term management of osteoporosis.

Osteoporosis drug treatments need to be taken correctly for long periods in order to gain maximum benefit. Ensuring good communication amongst health professionals delivering fracture preventative care enables long-term support for patients to maximise treatment adherence and benefits.

Criteria

5.1. The FLS staff maintain relationships with relevant in-hospital services.

5.2. The FLS staff have a good understanding of the available out-of-hospital services and how people using the FLS can access these.

5.3. Referral pathways are agreed into the FLS from relevant services.

5.4. Clear management plans are prepared to facilitate transfer of care enabling the long-term management of osteoporosis in primary care.

5.5. People who are recommended interventions to reduce risk of fracture will be reviewed annually to monitor adherence, tolerability and unwanted effects of their treatment plan.

5.6. Staff participate in a local multi-disciplinary fracture prevention interest group which meets regularly to co-ordinate, plan and develop the FLS.

In Practice

Case-finding

In order to identify people aged 50 years or older, an FLS will maintain relationships with relevant in-hospital services. The role and responsibilities of FLS staff will be defined so that unambiguous working practices can be established. As a minimum, the FLS should establish ways of working with:

- Emergency department
- Fracture clinic
- Orthopaedic & Trauma department
- Radiology department

Some other medical conditions and drug treatments can increase fracture risk, for example HIV and diabetes mellitus, and the use of anti-epileptic therapies, cancer treatments and gluco-corticosteroids. FLS has a role in linking to services where

patients' bone health may be compromised. Their role can include patient and clinician education as well as fracture risk assessment where fractures have occurred.

Where the FLS identifies a person who has fractured while away from their normal place of residence, robust processes will be put in place to ensure that the person's GP and the FLS in their area are informed.

Referrals to meet patients' needs

Contact with an FLS presents an opportunity for associated health needs to be considered. This should be tailored for the individual and may include referral to other services such as falls prevention, pain management, rehabilitation, mental health, and support with lifestyle changes.

Management plans

Long-term treatment of osteoporosis will be managed by the GP. Clear management plans from the FLS will outline the recommendations for treatment and review timescales. The FLS report will support transfer of care and long-term management of osteoporosis by the patient's primary care team. A report template will be created with input from GPs and patients, and feedback should be invited to ensure the report meets their needs. Inclusion of the following information is recommended:

- Patient demographics and unique identifier
- Details of fragility fracture(s)
- Current osteoporosis treatment
- Results of assessments including fracture risk assessment, BMD results and laboratory tests
- Management recommendations including treatment changes, recommended review dates and circumstances for re-referral.
- Appropriate primary care codes including the fracture site and type of fracture (e.g. osteoporotic). See *Appendix 2* for suggested codes.

Annual follow-up and long-term management

While the FLS will carry out initial follow-up contact by 16 weeks and at 52 weeks, further annual reviews should be completed outside of the FLS. How this is done in practice will depend on local capability and capacity. Examples include via a GP or another member of the primary care team, or a community pharmacist. It can be carried out as part of a Medication Usage Review, at a face-to-face appointment, by questionnaires or over the telephone[39].

A reassessment of fracture risk will be carried out by the GP at 3 years (for intravenous zoledronic acid) or 5 years (for oral bisphosphonate) to determine whether it is appropriate to continue drug treatment or take a 'drug holiday'. Denosumab treatment should only be discontinued after advice from a specialist in bone metabolism. A description of the process around this is given in NOGG guidance[15] and adapted into a flowchart by the Royal Osteoporosis Society[40].

When a drug holiday is used as part of the treatment schedule for bisphosphonates, it is important that people remain calcium and vitamin D replete and at the end of this break they either automatically restart osteoporosis drug treatment or are reassessed to determine whether osteoporosis drug treatment should be reinstated. A fragility fracture during this treatment holiday will be considered an indication to restart treatment.

Fracture prevention interest group

Regular virtual or face-to-face meetings of a fracture prevention interest group are used to plan service development, provide peer support and facilitate the sharing of standardised, high-quality care. The group will be multi-disciplinary and ideally multi-organisational with representatives from all stakeholders in falls, bone health and fracture prevention. This will include commissioners and service managers as well as health professionals from in-hospital and out-of-hospital services.

What this standard means to:
A person receiving care You will: • Be seen within an integrated FLS which has good links to other relevant services based in hospital and in the community. • Experience seemless, interconnected services for bone health and falls prevention. • Be invited to meet other health professionals who can help you, for example a physiotherapist or pain relief specialist. • Be referred by FLS to other clinical services (either in primary or secondary care) depending upon your clinical need. • Have your response to treatment (including your risk of breaking a bone) reassessed after 3 or 5 years to check that your treatment is still right for you.
A member of staff You will: • Prepare management plans that can be understood by the person who has fractured and facilitate transfer of their care to their primary care team. • Have knowledge of local services that will support the person to recover from their fracture and reduce their risk of future fractures. • Ensure that the FLS has strong and effective communication links with relevant in-hospital and community-based services ensure that people are supported to access other services that they might need.
The organisation The organisation will: • Support processes that allow seamless referrals across different services relevant to FLS.

Measures

In-hospital case-finding: Percentage of patients identified through liaison with each relevant in-hospital department.

Number of referrals: Percentage of patients referred by the FLS to other relevant services in line with patients' needs.

FLS reports: Percentage of GPs who are satisfied that the FLS reports meet their needs. Also consider compliments, complaints and queries.

Repeat fractures: Number of patients identified with a fracture already on an osteoporosis drug treatment.

Quality

STANDARD 6: The FLS demonstrates clinical accountability, effective governance, robust professional development and ongoing service improvement.

Rationale

Leadership, governance, professional accountability and staff development are essential to providing an efficient, coordinated and consistent service that meets the needs of its patients.

In order to deliver high-quality care, staff will demonstrate the necessary professional competencies and will participate in CPD to maintain their knowledge.

Service improvement involves individual staff, work teams and organisations looking at how making changes to the way they work can help improve patient care by making services better. Regional varKassimiation in care is minimised through audit and peer support.

Criteria

6.1. A designated lead clinician is accountable for all components of the service.

6.2. The FLS is developed in line with a local fracture prevention strategy.

6.3. Core clinical data from people identified by the FLS is recorded on an operational database.

6.4. A quality assurance framework is in place which includes:

- An ongoing programme of service/quality improvement including regular audit.
- Participation in national audits such as the FLS-DB in England and Wales, or the Hip Fracture Audit in Scotland.
- Peer review.
- Patient and carer experience measures.

6.5. All members of the FLS team have assessment of professional competencies and demonstrate Continuing Professional Development.

6.6. Staff are active participants in a regional clinical or professional network.

In Practice

Accountability and governance

Clear lines of responsibility ensure that complex healthcare systems work most effectively for the benefit of patients. Within the FLS, a designated clinical lead will drive improvement and ensure that all components of the service are connected. Agreed indicators will be monitored regularly and reported to commissioners or service managers. It is advisable to establish a risk register for the FLS and ensure that risks are esculated according to local risk management protocols.

Service improvement

The following elements of a quality assurance framework will be put in place in order to continually improve the FLS.

Strategy: Working with the fracture prevention interest group (see Integrate), a fracture prevention strategy will provide a road-map for development and improvement of the service.

Operational database: An operational database is a necessity for any FLS. Efficient databases reduce the administration burden and store data in a form that can be exported for audit and reporting purposes.The database should record:

- Patient identification
- Investigation of bone health
- DXA
- Falls risk
- Treatment initiation/recommendation
- Referrals to other services, e.g. falls prevention
- Monitoring treatment concordance at 16 and 52 weeks post-fracture.

Any data collection tool may potentially be used as the basis of the database. Whatever IT solution is put in place, it must work in line with local NHS e-Health strategies and integrate with other clinical IT applications (such as patient administration, DXA scanning and laboratories). It is also helpful if data can be extracted for the national audit purposes (see below) where applicable.

Audit: The service will put in place an audit programme which is incorporated in local goverance processes to measure its performance against these standards.

For sites in England and Wales, detailed dataset of core questions is provided by the Fracture Liaison Service Database (FLS-DB). The FLS-DB provides site specific feedback to inform service improvement and national benchmarking. The dataset within the FLS-DB is based on nationally asured documents such as NICE and SIGN guidance as well as these Clinical Standards. Through engagement in national audit, a greater understanding of secondary fracture prevention can be achieved, and standards improved to ensure consistently high quality of care.

Key performance Indicators: Commisioners and service planners will work with proivders to identify key performance indicators (KPI) by which to monitor the quality and impact of the FLS. Aligning local quantitative measures of performance with the national audit dataset is recommended. This means data can be captured once and effectively used for multiple purposes. A list of recommended KPIs is given in *Appendix 1*.

Peer review: Peer review is offered by some professional bodies or it may be organised informally between sites with FLS. Regardless of the approach used, it should bring stakeholders together to assess clinical care against agreed standards and ensure that clinical teams' voices are heard and help shape the future delivery of the service. Peer review is beneficial to all participants, allowing time for reflection, problem solving and sharing of good practice. It also addresses agendas of clinical governance and revalidation.

Professional Development

Competency Framework for Health Professionals Working in Fracture Prevention[41] provides pragmatic competencies and is a practical working document for all health professionals regardless of where the FLS is based. It can be used for facilitating CPD, aiding performance appraisal, identifying gaps in competency, highlighting specific training needs and providing a framework to help recruitment and selection procedures.

In order to provide safe and clinically effective care and management, it is recommended that all health professionals within the FLS team will maintain appropriate CPD. Various courses, conferences and meetings exist across the UK and beyond, that provide evidence-based knowledge on osteoporosis and secondary fracture prevention. Staff will be supported by their employers to undertake necessary CPD activities. Participation in a regional clinical or professional networks is also a valuable tool for professional development, learning and sharing of good practice.

The Royal Osteoporosis Society has developed an online Fracture Prevention Practitioner (FPP) course which aims to provide accredited, easily accessible training to establish a knowledge quality standard and certification at a basic and advanced level. Content includes modules on epidemiology of osteoporosis, fracture risk assessment, osteoporosis management, falls assessment and management and complex cases.

The Royal Osteoporosis Society hosts a biennial conference, a biennial FLS champions' summit in Scotland and annual FLS champions' summit in England. These meetings aim to provide state of the art updates for FLS practitioners and an environment to share experiences and knowledge between FLSs.

What this standard means to:
A person receiving care You will: • Receive good quality care that meets current guidance and reflects up-to-date practice from all the health professionals you come into contact with. • Receive care from motivated staff with the right knowledge and skills for their role. • Be able to make informed decisions about your care.
A member of staff You will: • Feel supported and motivated. • Be able to demonstrate competencies relevant to your role. • Have formal and informal opportunities to develop your knowledge and skills. • Carry out audits relevant to your area of work. • Be an active member of the local fracture prevention interest group. • Be an active member of a regional clinical/professional network. • Be an active member of national networks/ meetings. • Be able to question practice and discuss different approaches to care.
The organisation The organisation will: • Have networks in place to support the development of services and sharing of knowledge. • Allow access to and support for a database that is specifically set up for the purposes of the FLS • Have a multi-disciplinary Fracture Prevention Interest Group. • Have a Fracture Prevention Strategy that includes falls and bone health. • Carry out regular audits, review the results and seek to continually develop and improve. • For England and Wales, provide administrative support for upload to national audits. • Have a professional accountability framework with clear lines of responsibility.

- Benchmark the service locally and nationally through engagement with national audit.

Measures

Patient Satisfaction with FLS: Annual patient satisfaction completed. Use as a baseline in year 1 and develop action plan with commissioners and service planners to address any issues.

Foundation training: Percentage of FLS staff who have completed foundation Fracture Prevention Practitioner training.

Advanced training: Percentage of FLS staff who have completed advanced Fracture Prevention Practitioner training.

Professional development: Percentage of FLS staff who have attended at least one regional or national meeting or workshop.

Implementing the FLS standards

There are many variations in the models of provision of FLS dependent on local assets, existing service pathways and local health system priorities. However, by adopting these Clinical Standards, the principles of evidenced-based best practice can be replicated effectively across the UK.

Establishment of any new service requires time and dedication. Since 2015, the Royal Osteoporosis Society has been supporting the development of FLS across the UK. A team of specialist Service Delivery Leads (SDLs) with clinical and commissioning experience works with sites to support new service development or quality improvement of existing services; to increase the coverage of secondary fracture prevention to all fracture types. The SDLs work regionally in partnership with their Development Manager colleagues. This team is particularly experienced in volunteer and event management and support the provision of information to people affected by the condition i.e. patient education or newly diagnosed session. As a combined regional team they are able to provide a holistic offer of support to health services, people affected by osteoporosis, health professionals and other local supporters.

Operating in an economic climate where health budgets are tightly constrained, investment in new services must demonstrate both a solid evidence base and a strong business case. The ROS has produced a suite of evidence-based online resources to support FLS development and improvement. A comprehensive FLS Implementation Toolkit supports providers and payers in the commissioning and service improvement process. Users can create a compelling, evidence-based business case without the need for advanced skills in costing, modelling or other health economic techniques.

In addition to the online resources, the ROS offers:

- facilitation of engagement with stakeholders, including commissioners and NHS management to generate commitment to FLS and ensure that services are sustained
- bespoke and expert support from inception to launch of an FLS, including development of the business case, service specification, and resource and capacity planning
- assistance with induction and training of the FLS Coordinator
- advice regarding relevant protocols and care pathways for the service
- support for quality improvement to enable the development of an FLS to meet the UK FLS Clinical Standards, including periodic gap analysis and networking with peers
- advice regarding data collection and methods of analysis, reporting, and evaluation

These services and resources are provided free of charge.

Find out more online at:
https://theros.org.uk/healthcare-professionals/fracture-liaison-services/implementation-toolkit/

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Appendix 1: Core key performance indicators for Fracture Liaison Services

While measures are suggested for each standard, the measures below should be used as the key performance indicators for an FLS.

Indicator	Type	Source	Description	Standard (months from commencement or improvement)			Note
				6	12	24	
Identification (all fragility fractures)	Clinical process measure	Local database or FLSDB	Percentage of patients identified compared with the local estimated case load	50%	70%	90%	
Identification (spinal fractures)	Clinical process measure	Local database or FLSDB	Percentage of patients with a spine fracture as their index fracture site				No standard recommended
Time to FLS assessment	Clinical process measure	Local database or FLSDB	Percentage of patients who were assessed by the FLS within 90 days of their fracture	70%	80%	90%	
Time to DXA	Patient experience	Local database or FLSDB	Percentage of patients who had a DXA ordered or recommended and were scanned within 90 days of fracture	70%	80%	90%	Data also available through provider access to FLSDB dashboard
Falls assessment	Clinical process measure	Local database or FLSDB	Percentage of patients who received a falls assessment or were referred or recommended for a falls assessment	70%	80%	90%	
Bone therapy recommended	Clinical process measure	Local database or FLSDB	Percentage of patients who were recommended anti-osteoporosis medication				No standard recommended

Strength and balance training	Clinical process measure	Local database or FLSDB	The percentage of non-hip fracture patients who had attended a strength and Local database or balance class within 16 weeks of their fracture				No standard recommended
Monitoring contact 12–16 weeks post fracture	Outcome	Local database or FLSDB	The percentage of patients who were followed up between 12 and 16 weeks following their fracture	50%	70%	90%	
Commenced bone therapy by first follow-up	Outcome	Local database or FLSDB	The percentage of patients who had commenced (or were continuing) anti-osteoporosis medication.				No standard recommended
Adherence to prescribed anti-osteoporosis medication at 12 months post fracture	Outcome	FLSDB	The percentage of patients who had confirmed adherence to a prescribed anti-osteoporosis medication at 12 months post fracture	50%	70%	90%	
Rate of prescribed medicines in primary care per 1000 people aged 50 and over	Outcome	ROS	The rate of prescribed medicines per 1000 people aged 50 and over increases	Increase in rate	Increase in rate	Increase in rate	Numerator - number of prescription items dispensed in period for listed medicines. Denominator - patients registered with relevant GP practices aged 50 years and over divided by 1000. Contact t.jones@theros.org.uk
Patient satisfaction with the FLS	Patient experience	Local data collection	Annual patient satisfaction completed. Use as a baseline in year 1 and develop action plan with commissioners and service planners to address any issues				No standard recommended. Template questionnaire available at: https://theros.org.uk/healthcare-professionals/fracture-liaison-services/implementation-toolkit/

Appendix 2: Primary care coding

Fragility fracture

	Read 2	CTV3
Fragility fracture	N331N	XaNSP%
Osteoporosis	N330.%	N330.%

DXA results

Ideally a report of a DXA result will contain both the relevant qualitative and the quantitative findings for at least one of the osteoporotic sites, as follows:

	Read 2	CTV3
Lumbar DXA scan result osteoporotic	58EM.	XaITb
Femoral neck DXA scan result osteoporotic	58EV.	XaPE2
Hip DXA scan result osteoporotic	58EG.	XaITW
Hip DXA scan T score	58EE.	XaITU
Lumbar spine DXA scan T score	58EK.	XaITZ
Femoral neck DXA scan T score	58ES.	XaPDy

Drug treatments

Prescribed agents are automatically coded by the issue of a prescription through the GP system. An exception would be long interval agents prescribed in hospital such as PTH, ibandronate, zoledronate and denosumab. Where this is the case, the following codes can be added to primary care systems:

	Read 2	CTV3
Hospital dispensed		
Teriparatide therapy	8BP1.	XaKb0
Denosumab therapy	8BPW.	Xaagz
Zoledronic acid therapy	8BPY.	Xaah1
Ibandronic acid therapy	8BPX.	Xaah0

Falls

Falls assessments and interventions are important to consider in patients who have sustained a fracture following a fall. They are not included in QOF, but some suitable codes are as follows:

	Read 2	CTV3
Referral to falls service	8Hk1.	XaLqJ
Refer for falls assessment	66aF.	XaISu
Falls risk assessment referral	9Og0.	XaJ9V
Multidisciplinary falls assessment done	9Og6.	XaJLD
Group exercise programme	8E7A.	XaItq

Appendix 3: Abbreviations and definition of terms

DXA	**Dual energy X-ray absorptiometry:** The technique used to measure bone density and diagnose osteoporosis
FLS	**Fracture Liaison Service**: a service which systematically identifies, treats and refers to appropriate services all eligible patients aged 50 and older within a local population who have suffered fragility fractures, with the aim of reducing their risk of subsequent fractures.
Fragility Fracture	A broken bone (fracture) resulting from a low impact, such as a fall from standing height or less.
VFA	**Vertebral Fracture Assessment:** The technique used to assess for the presence of prevalent vertebral fractures as performed as part of a DXA assessment