



Royal
Osteoporosis
Society

Better bone health for everybody

Effective Secondary Prevention of Fragility Fractures:

Clinical Standards for
Fracture Liaison Services

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:** One in two women and one in five men break a bone after the age of 50¹.
- **Costly to the NHS:** The hospital costs of hip fractures alone are estimated at £1.1 billion².
- **Life-changing to the individual:** The impact of fractures may lead to loss of mobility and independence, social isolation and depression³.

Many fragility fractures could be prevented by timely interventions to reduce fracture risk. A Fracture Liaison Service (FLS) 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 past⁴, FLS represents an ideal opportunity for intervention in the journey to avert that hip fracture.

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.
- Healthcare professionals who deliver or wish to develop an FLS.
- Healthcare professionals who are involved in any part of the fragility fracture prevention pathway.
- Commissioners/funders of FLS.
- Managers involved with service provision.

Reviewed by (authors and affiliate organisations):

Stephen Gallacher	Chair, Consultant Endocrinologist, Queen Elizabeth University Hospital, Glasgow
Swapna Alexander	Consultant Geriatrician, Llandudno Hospital
Natalie Beswetherick Will Carr	Chartered Society of Physiotherapy Head of Service Delivery, Royal Osteoporosis Society (ROS)
Amanda Durber	Osteoporosis Specialist Nurse, Betsi Cadwaladr University Health Board
Neil Gittoes	Society for Endocrinology
Andy Gray	British Orthopaedic Association
Kassim Javaid	Clinical Lead, FLS-DB, Royal College of Physicians
Denise Kendrick John Lindsey	Royal College of General Practitioners Consultant Endocrinologist, Belfast Trust
Terence Ong	British Geriatrics Society
Alison Smith	Patient representative
Mike Stone	Consultant Physician and Director of Bone Research, University Hospital Llandough
Nuttan Tanna	Royal Pharmaceutical Society
Anne Thurston	Head of Quality Improvement, ROS
Fiona Wardell	NHS Healthcare Improvement Scotland

Publication date: August 2019

Date for review: August 2022

Version: 2

Acknowledgements: With thanks to the authors who contributed to the previous version of this guidance: Alastair McLellan, Alun Cooper, Frances Dockery, Graham Davenport, Victoria Goodwin, Anthony Hui, Zoe Long, Paul Mitchell, Pravin Jha, Susan Poulton and Sonya Stephenson.

Funding: The development and printing of this document was funded by the ROS. We are grateful to the authoring group for giving their time without remuneration.

Please send any comments on this practical guide to:
clinical@theros.org.uk

Supported by:



ROYAL COLLEGE OF
PHYSICIANS AND
SURGEONS OF GLASGOW

Endorsed by
**ROYAL
PHARMACEUTICAL
SOCIETY**

Contents

Summary of Clinical Standards for Fracture Liaison Services (FLS)	6
Introduction	8
Using these standards as a patient, carer or family member	10
Identify	12
Investigate	16
Inform	20
Intervene	23
Integrate	28
Quality	32
Implementing the FLS standards	36
References	38
Appendix 1: Primary care coding	40
Appendix 2: Abbreviations and definition of terms	42

Summary of Clinical Standards for Fracture Liaison Services (FLS)

The six standards described in this document are summarised below. Please refer to the relevant section for context and further information.

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. All principles will be adhered to in order to achieve benefits shown in the evidence base.

Standard	Criteria
<p>1 Identify:</p> <p>People aged 50 years and over with a fragility fracture are systematically identified.</p>	<p>1.1 The FLS identifies people aged 50 years or older with a new fragility fracture which also includes:</p> <ul style="list-style-type: none"> • Newly identified vertebral fracture. • A new fracture occurring whilst a patient is taking an osteoporosis drug treatment.
<p>2 Investigate:</p> <p>Investigations to assess risk of fragility fractures and falls and possible underlying secondary causes for osteoporosis are offered to people identified by the FLS.</p>	<p>2.1. People identified as being at increased risk of another fragility fracture are offered an assessment which will include:</p> <ul style="list-style-type: none"> • A fracture risk assessment including use of FRAX or QFracture and quality-assured axial DXA including a vertebral fracture assessment (VFA) where indicated. • An 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. <p>2.2. Assessment will be completed within 12 weeks of fracture diagnosis.</p>
<p>3 Inform:</p> <p>Information and support are offered to people (and where relevant their carers) using the FLS.</p>	<p>3.1. People are offered information according to their needs about:</p> <ul style="list-style-type: none"> • 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 - including information on benefits and side effects. • Reducing falls risk. • Next steps in their care plan including follow-up appointments. <p>3.2. Information is available in a range of formats and languages, appropriate to the population covered by the service.</p> <p>3.3. People and their carers understand where to get further information about osteoporosis and support following their appointment.</p> <p>3.4. Communications from the FLS are written in a style that can be understood by the person and their carers. Communications are copied to the person who has had a fracture as well as the healthcare professionals involved in their care, including their GP.</p> <p>People feel supported and empowered to make informed choices and reach shared decisions about their management plan.</p>

Standard	Criteria
<p>4 Intervene:</p> <p>Interventions to reduce the risk of fragility fractures are offered to people as required.</p>	<p>4.1. People at high risk of fragility fracture are initiated on an appropriate osteoporosis drug treatment within 16 weeks of fracture diagnosis (i.e. within 4 weeks of the assessment being completed).</p> <p>4.2. People at high risk of falling are referred to falls prevention services and offered interventions within 16 weeks of their fracture to maximise balance and mobility.</p> <p>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:</p> <ul style="list-style-type: none"> • Treatment has been started and taken appropriately. • Referral to falls reduction programmes has been actioned.
<p>5 Integrate:</p> <p>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.</p>	<p>5.1. Clear management plans are prepared to facilitate transfer of patient care into primary care, enabling the long-term management of osteoporosis.</p> <p>5.2. The FLS staff maintain relationships with relevant in-hospital services.</p> <p>5.3. The FLS staff have a good understanding of the available out-of-hospital services and how people using the FLS can access these.</p> <p>5.4. Referral pathways between the FLS and relevant services are agreed.</p> <p>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.</p> <p>5.6. Staff participate in a local multidisciplinary fracture prevention interest group which meets regularly to co-ordinate, plan and develop the FLS.</p>
<p>6 Quality:</p> <p>The FLS demonstrates clinical accountability, ongoing quality improvement, effective governance and funded access to continuing professional development for all practitioners.</p>	<p>6.1. A designated lead clinician is accountable for all components of the service.</p> <p>6.2. The FLS is developed in line with a local falls and fracture prevention strategy.</p> <p>6.3. Core data from people identified by the FLS is recorded on an operational database.</p> <p>6.4. A quality assurance framework is in place that includes:</p> <ul style="list-style-type: none"> • A programme of continuous 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. <p>6.5. All members of the FLS team have assessment of professional competencies and demonstrate continuing professional development.</p> <p>6.6. Staff are active participants in a regional clinical or professional network.</p>

Introduction

Osteoporosis and fragility fractures

Osteoporosis is the most common chronic bone disease⁵. 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 a fragility 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 years¹. An estimated 500,000 fragility fractures occur in the UK every year⁶. At any one time, hip fractures account for occupation of over 3,600 hospital beds across England, Wales and Northern Ireland⁷. 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 billion². 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 ROS of more than 3,000 people living with osteoporosis, 42% felt socially isolated by their osteoporosis, one in three reported difficulty with domestic chores and more than 40% of those who had fractured said they were in long-term pain they did not think would ever go away³.

People who have had one fracture remain at a two- to three-fold greater risk of sustaining another (known as a 'secondary fracture')⁸ and 23% of secondary fractures in women aged over 50 occur within one year of the first event⁹.



Preventing fractures with Fracture Liaison Services

An 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 is centred around a dedicated co-ordinator (often a Clinical 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 any healthcare setting, either in-hospital or out-of-hospital, and requires support from a medically qualified practitioner (typically a hospital doctor or a GP with expertise in osteoporosis and fragility fracture prevention).

Implementing the standards

An estimated 59% of the UK population currently has access to an FLS, but service provision varies across the country; Scotland has 100% coverage, and Northern Ireland is close to achieving the same, while in England coverage is 53%. Consequently, implementation of these standards will range from those needing to start new services, to well-established services looking for ways improve.

In order to effectively prevent fractures, an FLS will deliver all six standards outlined in this document. The methods used for doing so will vary according to staffing and resources available locally. Tools and support in developing or improving an FLS are available from the ROS (see page 36 for further details).

Assessing service performance

Participation in national audits facilitates assessment of performance as well as a benchmark against national levels of achievement.

Services can also be assessed at a local level. Examples of audit and evidence of achievement are given for each standard. Additionally, use the 'what this means to a member of staff and the organisation' sections to assess your practice and processes.

A list of key performance indicators is included in the FLS Implementation Toolkit (see implementing the FLS standards on page 36).

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 Excellence¹⁰⁻¹⁵, Scottish Intercollegiate Guidelines Network¹⁶ and the National Osteoporosis Guideline Group¹⁷. Clinical protocols will be developed locally, based on relevant national guidelines.

The standards also align with the principles of Realistic Medicine¹⁸, Prudent Healthcare¹⁹ and Making Every Contact Count²⁰, and with quality improvement programmes delivered by 'Getting It Right First Time'²¹ and NHS RightCare²².

Using these standards as a patient, carer or family member

As well as helping health services understand how to deliver high-quality, evidence-based care, this document can be used by patients and their carers, family and friends. Each section explains what each standard means to people over the age of 50 who have broken a bone. It can help you to check whether you've received care that meets these standards and to have informed conversations with your healthcare team.

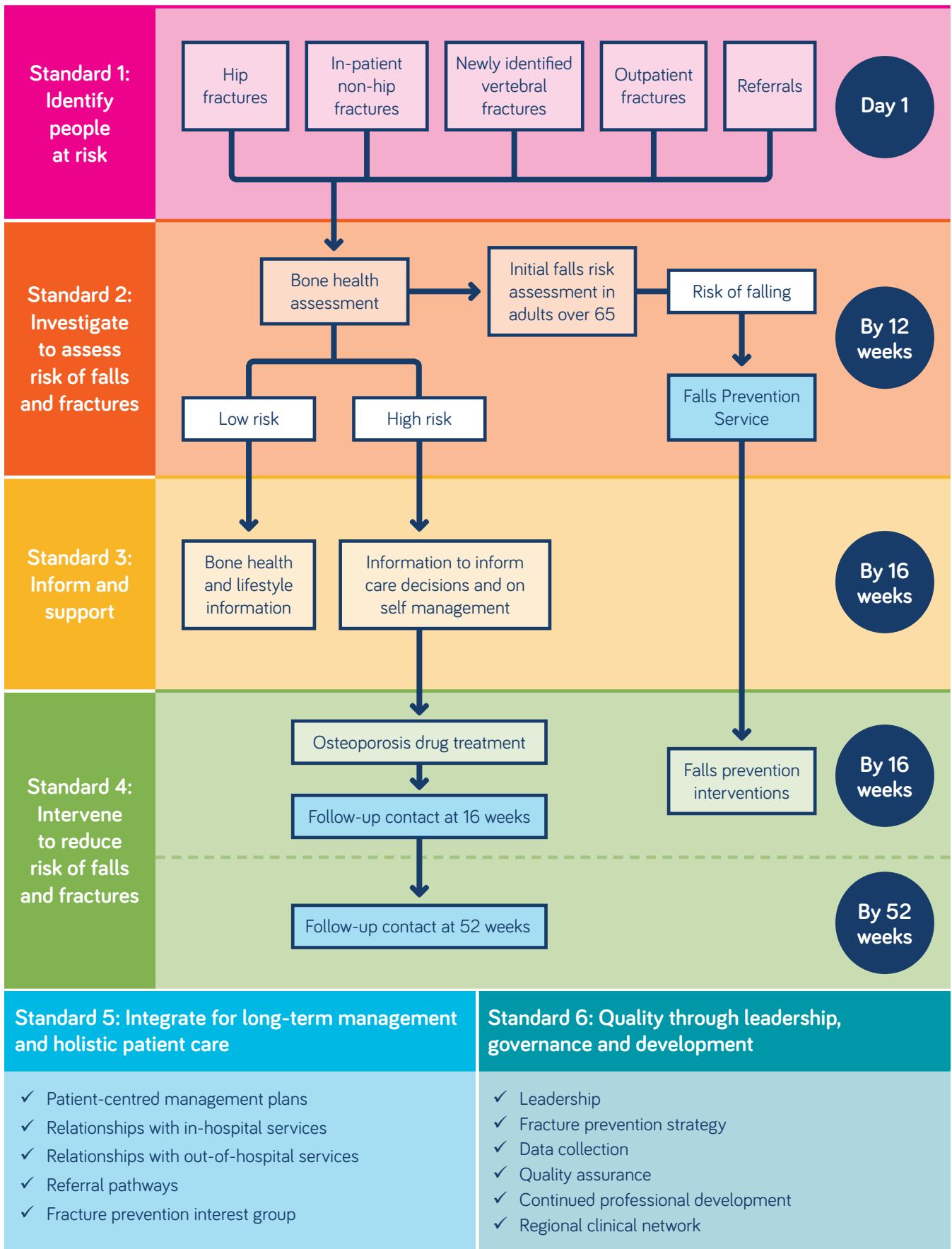
The checklist can be used by patients, their carers and families to make sure they are getting everything they should, and at the right time¹.

Day 1	The date your broken bone was identified as a 'fragility fracture' in the NHS.
By 12 weeks	You should be assessed by an FLS and, if necessary, have had a DXA scan to measure your bone density as part of your assessment.
By 16 weeks	If prescribed a drug treatment to protect you from further broken bones, you should be contacted to ensure you have started taking the drug treatment and have no side effects.
By 16 weeks	You should be asked if you have started your strength and balance exercise classes, if you were referred to one.
By 52 weeks	If prescribed osteoporosis drug treatment to improve your bone health, you should be contacted to find out how you are and ensure you are continuing to take the drug treatment.
By 3-5 years	Most osteoporosis drug treatments need to be taken for at least 3-5 years to protect your bones. Your doctor will review your bone health and discuss the next steps with you. This may be continuing the treatment you're already taking, switching to another treatment or pausing treatment for a short period.

¹ Adapted from *Strong bones after 50: FLS explained*⁴⁴.

Understanding what the Clinical Standards mean to healthcare professionals

This diagram summarises the components of an FLS outlined in this document.



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 case finding strategies will yield the best results. Strategies used will depend upon local service models and pathways.

Criteria

- 1.1 The FLS identifies people aged 50 years or older with a new fragility fracture which also 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 Clinical Nurse Specialist, although this role may also be undertaken by Allied Health Professionals (AHPs) or competent 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 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. 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 provide 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) from GP systems, whereas these will remain a challenge for in-hospital FLSs.

It is unlikely 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 aim to identify all patients from 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 vertebral 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.

Some examples of how patients may be identified are described below.

Inpatient fractures

People who need to stay in hospital after their fracture are not only at highest future fracture risk^{23,24}, but also are among the easiest to identify in a hospital-based FLS.

Identify these patients 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 incident reporting systems (such as Datix), 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 these patients by:

- ✓ Reviewing emergency department lists
- ✓ Screening fracture clinic notes
- ✓ Reviewing primary care records
- ✓ Linking with virtual fracture clinics

Vertebral fractures

Vertebral fractures are amongst the most common osteoporotic fractures. A vertebral fracture is a powerful predictor of further fracture, yet they often account for less than 5% of clinical fracture presentations to FLS.

Identify these patients by:

- ✓ Liaising with radiology to identify vertebral fractures which are incidental findings on images
- ✓ Carrying out vertebral fracture assessment (VFA)^{25,26} (see *Investigations*)
- ✓ Liaising with physiotherapy-led musculoskeletal back pain services or other interface services where people present with back pain

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 ROS²⁷. 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.

Referral into FLS

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 FLS 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 healthcare 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:

- Allow access for FLS practitioners to relevant IT systems that will support identification of patients presenting with a fracture. This may require cross-organisational collaboration.
 - 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 that all images which 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.
-

Examples of audit and evidence

Identification (all fragility fractures)

Percentage of patients identified compared with the local estimated case load.

Numerator – number of people with fragility fractures identified by the service.

Denominator – estimated total number of fragility fractures for the service (estimated by multiplying total hip fractures in patients aged over 50 by a factor of five or use FLS benefits calculator).

Identification (vertebral fractures)

Percentage of patients with a spine fracture as their index fracture site.

Numerator – number of people with vertebral fractures identified by the service.

Denominator – total number of people with fragility fractures identified by the service.

Repeat fractures

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

Numerator – number of people with a fracture already taking an osteoporosis drug treatment.

Denominator – total number of people with fragility fractures identified by the service.

Vertebral fracture reporting

Audit standards for identification and reporting of incidental vertebral fractures are outlined in 'Clinical Guidance for the Effective Identification of Vertebral Fractures'²⁷. Audit of vertebral fracture reports will quantify the diagnostic gap and inform service development, including the case for funding the vertebral fracture identification pathway.

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 begins, wherever feasible. A falls risk assessment is also important as most fractures will result from a fall.

Criteria

- 2.1. People identified as being at increased risk of another 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 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 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 that allow assessment of fracture risk.

There are several fracture risk assessment tools, including FRAX and QFracture, which have been assessed by NICE¹³ and SIGN¹⁶. 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 limitations 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 prevalence 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 osteoporosis drug treatments

have been demonstrated in patients who do not have osteoporosis as defined by a bone density measurement:

- In the presence of two or more vertebral fractures (where other causes of multiple vertebral fractures have been excluded¹⁶).
- 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^{11,14,15}.

Vertebral Fracture Assessment (VFA)

As well as providing a BMD measurement, DXA can be used to assess for vertebral fractures. Quick to perform and with very low additional X-ray exposure, VFA avoids 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 Densitometry²⁵ can be used to develop local protocols.

Other investigations

Patients believed to be at increased risk of fracture will have investigations to guide treatment selection and ensure treatment safety. From the point of view of safe prescribing, where a bisphosphonate treatment is recommended, urea & electrolytes (U&Es) with estimated glomerular filtration rate (eGFR) and bone profile tests (adjusted calcium, albumin and alkaline phosphatase) will be carried out as a minimum in all cases.

Laboratory tests should not be more than three 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.

Other procedures may be appropriate for individual patients depending on the clinical presentation and local protocols in order to assess for underlying secondary causes of osteoporosis and high fracture risk. These may include (adapted from *NOGG 2017: Clinical Guideline for the prevention and Treatment of Osteoporosis*¹⁷):

- 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.

Falls risk assessment

In line with NICE guidance on preventing falls in older adults¹⁰, 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 work 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 referral to the necessary intervention pathways (see *Integrate*).

What this standard means to:

A person receiving care

You will:

- 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 healthcare 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 healthcare 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 healthcare 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 healthcare 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 (including DXA scan and tests results, as well as treatment and intervention recommendations) with relevant healthcare professionals and 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 and reporting 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.
-

Examples of audit and evidence

Time to FLS assessment

Percentage of patients who were assessed by the FLS within 12 weeks of their fracture:

Numerator – people who have had an assessment within 12 weeks.

Denominator – total number of people identified by the FLS.

Waiting time to FLS assessment

Average waiting time to FLS assessment.

Time to DXA

Percentage of patients who had a DXA ordered or recommended and were scanned within 12 weeks of fracture.

Numerator – number of people who were scanned within 12 weeks.

Denominator – number of patients who had a DXA ordered or recommended.

Falls assessment

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

Numerator – number of people who receive or were referred for a falls risk assessment.

Denominator – total number of people seen by the FLS.

Correspondence to people

Percentage of people who were sent copies of correspondence.

Numerator – number of people who were sent a copy of correspondence from the FLS.

Denominator – total number of people seen by the FLS.

Clarity of correspondence

Proportion of respondents to the patient satisfaction survey who found copies of correspondence from the FLS easy to understand.

Numerator – number of people who felt that correspondence was easy to understand.

Denominator – total number of people who responded to the patient satisfaction survey.

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 adhering to their treatments and interventions.

Criteria

- 3.1. People are offered information according to 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 healthcare professionals involved in their care, including their GP.
- 3.5. People feel supported and empowered to make informed choices and reach shared decisions about their management 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. Where a patient lacks mental capacity to make decisions, appropriate carers, family or friends will be involved in discussions and decisions.

Giving someone a diagnosis can be overwhelming for the person concerned and people may not absorb or understand all that is explained to them during their appointment. 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 may include useful websites, by contacting staff at the FLS or through an information helpline such as the nurse-led Helpline run by the ROS.

If resources are available, group education sessions are popular and ensure that there is a range of options to suit different preferences. These can be led by either peers or healthcare 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, or their carer. It is good practice to ensure the person receives a copy of reports and letters from the FLS to facilitate their on-going management²⁸.

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.
- Understand how to take treatments recommended for you and what to do if you have any difficulty taking your treatment.
- Receive contact information for your local osteoporosis service and/or regional and national charities, including the ROS, which 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 participate 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 ROS, which 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 healthcare professionals.
- Provide resources for regular patient education sessions to give information and support to people at risk of fragility fractures.

Examples of audit and evidence

Understanding of where to get more information

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

Numerator – number of people who understood where to get further information.

Denominator – total number of people who responded to the patient satisfaction survey.

Involvement in management plan

Percentage of patients who respond to patient survey and agreed they felt they were jointly involved in agreeing their management plan.

Numerator – number of people who felt they were jointly involved in agreeing their management plan.

Denominator – total number of people who responded to the patient satisfaction survey.

Group education sessions

Proportion of people seen by the service who were invited to attend a patient education session.

Numerator – number of people invited to attend a patient education session.

Denominator – total number of people seen by the FLS.

Proportion of people invited by the service who attended a patient education session.

Numerator – number of people who attended a patient education session.

Denominator – total number of people invited to attend a patient education session.

Proportion of people who found the patient education session useful.

Numerator – number of people who responded that they found the education session useful.

Denominator – total number of people who attended a patient education session.

Providing targeted information to meet an individual's needs

Various techniques can be used to evaluate how information is given and gain feedback to help staff reflect on and improve practice. These include pathway feedback, shadowing by peers or expert patients, focus groups and case studies. Feedback can form part of an annual appraisal process as well as on-going team meetings.

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 is a range of effective osteoporosis drug treatments available and national guidance gives advice about how these will be used^{11,14-17,29}. 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^{30,31}. Exercise can also reduce fear of falling and improve confidence³². It may help to promote bone strength as well as help with the symptoms caused by vertebral fractures, especially postural changes and back pain³³.

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. Attention from a healthcare professional can increase treatment adherence significantly³⁴. In population terms, adherence of at least 80% is required to achieve significant fracture risk reduction³⁵.

Criteria

- 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 four weeks of the assessment being completed).
- 4.2. People at high risk of falling are referred to falls prevention services and offered interventions within 16 weeks of their fracture to maximise balance and mobility.
- 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 taken appropriately.
 - 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 osteoporosis drug treatment will be selected according to the individual's needs. 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 demonstrated benefits in terms of reducing vertebral and non-vertebral (including hip fracture) fracture risk^{11,14-17}. Treatment decisions will also take into account the individual's circumstances (physical, social, comorbidities, phobias (e.g. needles)) and preferences.

A generic oral bisphosphonate will be recommended as the first treatment choice for the majority of people¹⁴. These treatments are effective at reducing fracture risk at low cost.

A number of licensed injectable 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 some evidence that combined calcium and vitamin D supplementation alone may reduce fracture risk in frail older women living in care homes³⁶. A calcium calculator, such as the one developed by the University of Edinburgh³⁷ 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 ROS³⁸.

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 treatment³⁹. One meta-analysis suggests risk reduction may occur as early as six months after starting treatment⁴⁰. 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:

- Muscle strength and balance training.
- Home hazard assessment and intervention.
- Vision assessment and onward referral if required.
- Medication review with modification/withdrawal.

Direct exercise programs and/or referrals for home hazard modification may take place in some FLSs 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 sports³³.

Exercise to promote bone strength

Weight-bearing exercise interventions have a benefit on both hip and spine BMD¹⁶. Combining weight-bearing and impact exercise interventions with muscle strengthening exercise, ideally incorporating progressive resistance training, is recommended. Further advice is given in *Strong, Steady and Straight: An expert consensus statement on Physical Activity and Exercise for osteoporosis*³³.

Effective follow-up

The effectiveness of an FLS is critically dependant on sufficient long-term adherence to interventions. Many clinical reviews have shown long-term treatment concordance with oral bisphosphonate drug therapy 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, the person taking the medication will stop taking this within the first six 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, and if so, to check that osteoporosis 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 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 where adherence with recommended osteoporosis drug treatments will be checked. Following this, long-term management will be transferred to primary care (see *Integrate* on page 28).

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 healthcare 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 healthcare 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 healthcare professional to review the osteoporosis drug treatment recommended for you.
- Be asked how you are taking your osteoporosis drug treatment, if you have 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 osteoporosis drug 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.
- Follow-up with people within 16 weeks to check recommended treatment has been started.
- Follow-up with people at 52 weeks to check adherence to treatment.

The organisation

The organisation will:

- Have robust systems to ensure that people initiated on an injectable treatment 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.
-

Examples of audit and evidence

Bone therapy recommended

Percentage of patients who were recommended an osteoporosis drug treatment.

Numerator – number of people recommended an osteoporosis treatment.

Denominator – total number of people seen by the FLS.

Monitoring contact within 16 weeks post fracture

The percentage of patients who were followed up within 16 weeks following their fracture.

Numerator – number of people followed-up by the FLS within 16 weeks of their fracture.

Denominator – total number of people seen by the FLS.

Commenced osteoporosis drug treatment by first follow-up

The percentage of patients who had commenced (or were continuing) an osteoporosis drug treatment.

Numerator – number of people indicating that treatment had started during their 16-week follow-up.

Denominator – total number of people seen by the FLS/ or number of people followed-up by the FLS by 16 weeks.

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

Numerator – number of people who had attended a strength and balance class within 16 weeks of their fracture

Denominator – number of non-hip fracture patients seen by the FLS/ or number of people followed-up by the FLS by 16 weeks/ or number of non-hip fracture patients referred to the falls prevention service.

Monitoring contact at 52 weeks post fracture

The percentage of patients who were followed up at 52 weeks following their fracture.

Numerator – number of people followed-up by the FLS at 52 weeks of their fracture.

Denominator – total number of people seen by the FLS.

Adherence to prescribed anti-osteoporosis medication at 52 weeks post fracture

The percentage of patients who had confirmed adherence to a prescribed osteoporosis drug treatment at 52 weeks post fracture.

Numerator – number of people indicating that they are taking treatment correctly as prescribed during their 52-week follow-up.

Denominator – total number of people seen by the FLS, or number of people followed-up by the FLS by 16 weeks.

Rate of prescribed medicines in primary care per 1,000 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 either in-hospital or out-of-hospital. Regardless of healthcare setting, 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 healthcare professionals delivering fracture preventative care enables long-term support for patients to maximise treatment adherence and benefits.

Criteria

- 5.1. Clear management plans are prepared to facilitate transfer of care enabling the long-term management of osteoporosis in primary care.
- 5.2. The FLS staff maintain relationships with relevant in-hospital services.
- 5.3. The FLS staff have a good understanding of the available out-of-hospital services and how people using the FLS can access these.
- 5.4. Referral pathways between the FLS and relevant services are agreed.
- 5.5. Staff participate in a local multidisciplinary fracture prevention interest group that 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. As a minimum, the FLS should establish ways of working with:

- Emergency department
- Fracture clinic
- Orthopaedic and trauma department
- Radiology department

Where the FLS identifies a person who has fractured while away from their normal place of residence (known as 'out of area'), 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 and long-term management of osteoporosis

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 to 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:

- Personal information and unique identifier.
- Details of fragility fracture(s).
- Current osteoporosis drug 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.

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 telephone⁴¹.

A reassessment of fracture risk will be carried out by the GP or by referral to the osteoporosis service at three years (for intravenous zoledronic acid or denosumab) or five years (for oral bisphosphonate) to determine whether it is appropriate to continue osteoporosis 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 guidance¹⁷ and adapted into a flowchart by the ROS⁴².

When a drug holiday is used as part of the treatment schedule for bisphosphonates, it is important that people have sufficient calcium and vitamin D 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 multidisciplinary and ideally multi-organisational, with representatives from all stakeholders in falls, bone health and fracture prevention and will include patient representatives. This will include commissioners and service managers as well as healthcare 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 seamless services for bone health and falls prevention.
- If appropriate, be invited to meet other healthcare 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 three or five 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 effective communication links with relevant in-hospital and out-of-hospital services so that people can access other services that they might need.

The organisation

The organisation will:

- Support processes that allow seamless referrals across different services and healthcare settings.
-

Examples of audit and evidence

In-hospital case finding

Percentage of patients identified through liaison with each relevant in-hospital department.

Numerator – number of patients identified from each in-hospital department.

Denominator – total number of patients identified.

Number of onward referrals

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

Numerator – number of patients referred by the FLS to each other relevant service.

Denominator – total number of patients identified.

FLS reports

Percentage of GPs who are satisfied that the FLS reports meet their needs.

Numerator – number of GPs who are satisfied with the FLS report.

Denominator – number of GPs consulted.

Also consider compliments, complaints and queries.

Three to five year osteoporosis treatment review

Percentage of people seen by the service who are already taking an osteoporosis drug treatment but have not had a treatment review at three to five years.

Numerator – number of people who have exceeded three or five years of osteoporosis drug treatment without a treatment review.

Denominator – number of people seen by the service who are already taking an osteoporosis drug treatment.

Fracture prevention interest group

Evidence of membership, attendance, agendas and minutes.

Quality

Standard 6: The FLS demonstrates clinical accountability, effective governance, 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 variation 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 falls and fracture prevention strategy.
- 6.3. Core data from people identified by the FLS is recorded on an operational database.
- 6.4. A quality assurance framework is in place which includes:
 - A programme of continuous 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 (CPD).
- 6.6. Staff are active participants in a regional clinical or professional network.

In practice

Accountability and governance

Clear lines of responsibility support effective delivery of complex healthcare systems for the benefit of patients. Within the FLS, a designated clinical lead will be responsible for improvement and ensuring 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 managed or escalated 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* on page 28), 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 governance 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 assured documents such as NICE and SIGN guidance as well as these 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: Commissioners and service planners will work with providers 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 included in the FLS Toolkit (see page 36 for more information).

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

The *Competency Framework for Health Professionals Working in Fracture Prevention*⁴³ provides pragmatic competencies and is a practical working document for all healthcare 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 healthcare professionals within the FLS team will maintain appropriate CPD. Various courses, conferences and meetings exist across the UK and beyond, which provide evidence-based knowledge on osteoporosis and secondary fracture prevention. Participation in a regional clinical or professional network is also a valuable tool for professional development and sharing of good practice.

The ROS 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 ROS hosts a biennial conference, a biennial FLS champions' summit in Scotland and annual FLS champions' summits in England. These meetings provide the latest 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 healthcare 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.
- Contribute to the local fracture prevention interest group by either:
 - Becoming a member, actively communicating with your colleagues to represent their views and keep them informed; or
 - Working with your representative.
- 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 an inclusive multidisciplinary 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.
-

Examples of audit and evidence

Professional development

Percentage of FLS staff who have completed an accredited course or learning programme appropriate to their role.

Numerator – Number of FLS staff who have completed an accredited learning programme appropriate to their role in the last 52 weeks.

Denominator – Total number of FLS staff.

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

Numerator – Number of FLS staff who have attended at least one regional or national meeting or workshop in the last 52 weeks.

Denominator – Total number of FLS staff.

Patient Satisfaction with FLS

Annual patient satisfaction completed. Use as a baseline in year one and develop action plan with commissioners and service planners to address any issues.

Recording data

Data is recorded for local audit purposes and uploaded to national audit (where available).

Continuous improvement

Examples include plan of audit cycles, completed audit cycles show improvement, and details of patient and public involvement in service improvement.

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 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 ROS 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. The SDLs work regionally in partnership with their Development Manager colleagues. This team is particularly experienced in volunteer and event management, and supports the provision of information to people affected by the condition i.e. patient education or newly diagnosed sessions. As a combined regional team, they are able to provide a holistic offer of support to health services, people affected by osteoporosis and healthcare professionals.

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 resources and templates 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.

The FLS Implementation Toolkit is online at: <https://theros.org.uk/healthcare-professionals/fracture-liaison-services/>

Contact us:

Email: fls@theros.org.uk

Phone: 01761 471771

References

1. Van Staa TP, Dennison EM, Leufkens HGM, Cooper C. Epidemiology of fractures in England and Wales. *Bone*. 2001;29(6):517-522. doi:10.1016/S8756-3282(01)00614-7
2. Leal J, Gray AM, Prieto-Alhambra D, et al. Impact of hip fracture on hospital care costs: a population-based study. *Osteoporos Int*. 2016. doi:10.1007/s00198-015-3277-9
3. National Osteoporosis Society. *Life with Osteoporosis: The Untold Story*. Bath; 2014. <https://nos.org.uk/media/1859/life-with-osteoporosis.pdf>. Accessed January 22, 2019.
4. Department of Health. *Falls and Fractures: Effective Interventions in Health and Social Care*; 2009. doi:10.1016/j.jamda.2007.04.008
5. Mauck KF, Clarke BL. Diagnosis, Screening, Prevention, and Treatment of Osteoporosis. *Mayo Clin Proc*. 2006;81(5):662-672. doi:10.4065/81.5.662
6. Svedbom A, Hernlund E, Ivergård M, et al. Osteoporosis in the European Union: A compendium of country-specific reports. *Arch Osteoporos*. 2013;8(1-2). doi:10.1007/s11657-013-0137-0
7. NHFD. *National Hip Fracture Database (NHFD) Annual Report 2018*; 2018. doi:10.1016/j.jamda.2007.04.008
8. van Staa TP, van Staa TP, van Staa TP, Leufkens HGM, Cooper C. *thurston/Downloads/staa_02_doesafractureatonesite.pdf*. Does a Fracture at One Site Predict Later Fractures at Other Sites? A British Cohort Study. *Osteoporos Int*. 2002;13(8):624-629. doi:10.1007/s001980200084
9. Van Geel CM, Van Helden S, Geusens PP, Winkens B, Dinant G-J, Rheum A. Clinical subsequent fractures cluster in time after first fractures Concise report. *Ann Rheum Dis*. 2009;68:99-102. doi:10.1136/ard.2008.092775
10. National Institute for Health and Care Excellence. *Falls in Older People: Assessing Risk and Prevention. Clinical Guideline (CG 161)*. London NICE; 2013. <https://www.nice.org.uk/guidance/cg161/resources/falls-in-older-people-assessing-risk-and-prevention-35109686728645>. Accessed July 30, 2018.
11. National Institute of Health and Care Excellence. *Raloxifene and Teriparatide for the Secondary Prevention of Osteoporotic Fragility Fractures in Postmenopausal Women (TA 161)*. London; 2018. <https://www.nice.org.uk/guidance/ta161/resources/raloxifene-and-teriparatide-for-the-secondary-prevention-of-osteoporotic-fragility-fractures-in-postmenopausal-women-pdf-82598370170821>. Accessed January 22, 2019.
12. National Institute of Health and Care Excellence. *Osteoporosis Quality Standard (QS149)*. London; 2017. <https://www.nice.org.uk/guidance/qs149/resources/osteoporosis-pdf-75545487906757>. Accessed January 22, 2019.
13. National Institute of Health and Care Excellence. *Osteoporosis: Assessing the Risk of Fragility Fracture (CG146)*. London; 2012. <https://www.nice.org.uk/guidance/cg146/resources/osteoporosis-assessing-the-risk-of-fragility-fracture-pdf-35109574194373>. Accessed January 22, 2019.
14. National Institute for Health and Care Excellence. *Bisphosphonates for Treating Osteoporosis (TA 464)*. London; 2017. <https://www.nice.org.uk/guidance/ta464/resources/bisphosphonates-for-treating-osteoporosis-pdf-82604905556677>. Accessed January 22, 2019.
15. National Institute of Health and Care Excellence. *Denosumab for the Prevention of Osteoporotic Fractures in Postmenopausal Women (TA 204)*. London; 2010. <https://www.nice.org.uk/guidance/ta204/resources/denosumab-for-the-prevention-of-osteoporotic-fractures-in-postmenopausal-women-pdf-82600189194949>. Accessed January 22, 2019.
16. Scottish Intercollegiate Guidelines Network. *SIGN Guideline 142: Management of Osteoporosis and the Prevention of Fragility Fractures*. Edinburgh; 2015. <http://www.sign.ac.uk/assets/sign142.pdf>.
17. National Osteoporosis Guideline Group (NOGG). *NOGG 2017: Clinical Guideline for the Prevention and Treatment of Osteoporosis*; 2017. doi:10.1007/s11657-017-0324-5
18. Calderwood C. *Realising Realistic Medicine: Chief Medical Officer's Annual Report 2015/16*; 2017. <http://www.gov.scot/Resource/0051/00514513.pdf>.
19. GIG Cymru NHS Wales. *Prudent Healthcare: Securing Health and Well-Being for Future Generations*; 2016. www.prudenthealthcare.wales.
20. NHS Health Education England. *Making Every Contact Count (MECC)*. <https://www.makingeverycontactcount.co.uk/>. Accessed March 1, 2019.
21. Getting It Right First Time - GIRFT. <https://gettingitrightfirsttime.co.uk/>. Accessed January 22, 2019.
22. NHS RightCare. <https://www.england.nhs.uk/rightcare/>. Accessed January 22, 2019.
23. Robinson CM. Refractures in Patients at Least Forty-five Years Old. *J Bone Jt Surg*. 2002;84(9):1528-1533.

24. Melton LJ, Atkinson EJ, Cooper C, O'Fallon WM, Riggs BL. Vertebral fractures predict subsequent fractures. *Osteoporos Int*. 1999;10(3):214-221. <http://www.ncbi.nlm.nih.gov/pubmed/10525713>. Accessed January 22, 2019.
25. International Society for Clinical Densitometry. 2015 ISCD Official Positions - Adult - International Society for Clinical Densitometry (ISCD). <https://www.iscd.org/official-positions/2015-iscd-official-positions-adult/>. Published 2015. Accessed February 19, 2019.
26. Gallacher SJ, Gallagher AP, McQuillan C, Mitchell PJ, Dixon T. The prevalence of vertebral fracture amongst patients presenting with non-vertebral fractures. *Osteoporos Int*. 2007;18(2):185-192. doi:10.1007/s00198-006-0211-1
27. National Osteoporosis Society. *Clinical Guidance for the Effective Identification of Vertebral Fractures*. Bath; 2017. <https://nos.org.uk/media/99101/vertebral-fractures-guidelines.pdf>.
28. General Medical Council. *Good Medical Practice*; 2013.
29. National Institute of Health and Care Excellence. *Raloxifene for the Primary Prevention of Osteoporotic Fragility Fractures in Postmenopausal Women (TA 160)*. London; 2018. <https://www.nice.org.uk/guidance/ta160/resources/raloxifene-for-the-primary-prevention-of-osteoporotic-fragility-fractures-in-postmenopausal-women-pdf-82598368491205>. Accessed January 22, 2019.
30. Gillespie L, Robertson M, Gillespie W, et al. Interventions for preventing falls in older people living in the community. *Cochrane Database Syst Rev*. 2012;9(9):CD007146. doi:10.1002/14651858.CD007146.pub3.Copyright
31. Kanis JA, McCloskey E V, Johansson H, Cooper C, Rizzoli R, Reginster J-Y. European guidance for the diagnosis and management of osteoporosis in postmenopausal women. *Osteoporos Int*. 2013;24:23-57. doi:10.1007/s00198-012-2074-y
32. Kendrick D, Kumar A, Carpenter H, et al. Exercise for reducing fear of falling in older people living in the community. *Cochrane Database Syst Rev*. November 2014. doi:10.1002/14651858.CD009848.pub2
33. The National Osteoporosis Society. *Strong, Steady and Straight*. 2018:36.
34. Clowes JA, Peel NFA, Eastell R. The impact of monitoring on adherence and persistence with antiresorptive treatment for postmenopausal osteoporosis: A randomized controlled trial. *J Clin Endocrinol Metab*. 2004;89(3):1117-1123. doi:10.1210/jc.2003-030501
35. 20915 - (2002) Risks and Benefits of Estrogen Plus Progestin in healthy postmenopausal women - principle results from the WHI RCT.
36. Chapuy MC, Arlot ME, Delmans PD, Meunier PJ. Effect of calcium and cholecalciferol treatment for three years on hip fractures in elderly women. *Bmj*. 1994;308(6936):1081. doi:10.1136/bmj.308.6936.1081
37. Centre for Genomic & Experimental Medicine. CGEM Calcium Calculator. University of Edinburgh. <http://www.cgem.ed.ac.uk/research/rheumatological/calcium-calculator/>. Accessed February 22, 2019.
38. National Osteoporosis Society. *Vitamin D and Bone Health : A Practical Clinical Guideline for Patient Management*. Bath; 2018.
39. Black, Dennis M, Cummings, et al. Randomised trial of effect of alendronate on risk of fracture in women with existing vertebral fractures. *Lancet*. 1996;348.
40. Silverman SL, Watts NB, Delmas PD, Lange JL, Lindsay R. Effectiveness of bisphosphonates on nonvertebral and hip fractures in the first year of therapy: The risedronate and alendronate (REAL) cohort study. *Osteoporos Int*. 2007;18(1):25-34. doi:10.1007/s00198-006-0274-z
41. Elliott RA, Barber N, Clifford S, Horne R, Hartley E. The cost effectiveness of a telephone-based pharmacy advisory service to improve adherence to newly prescribed medicines. *Pharm World Sci*. 2007;30(1):17-23. doi:10.1007/s11096-007-9134-y
42. National Osteoporosis Society. Duration of osteoporosis treatment. 2018;(June).
43. Royal Osteoporosis Society. *Competency Framework For Fracture Prevention Practitioners*; 2016.
44. Royal College of Physicians. Strong bones after 50 Fracture liaison services explained A guide for patients, carers and families. 2018;(March):1-16.

Appendix 1: Primary care coding

Fragility fracture

	Read 2	CTV3	SNOMED
Fragility fracture	N331N	XaNSP%	306171000000106
Osteoporosis	N330.%	N330.%	<<64859006

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	SNOMED
Lumbar DXA scan result osteoporotic	58EM.	XalTb	391075000
Femoral neck DXA scan result osteoporotic	58EV.	XaPE2	440100002
Hip DXA scan result osteoporotic	58EG.	XalTW	391070005
Hip DXA scan T score	58EE.	XalTU	391068001
Lumbar spine DXA scan T score	58EK.	XalTZ	1083701000000107
Femoral neck DXA scan T score	58ES.	XaPDy	440050006

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	SNOMED
Hospital dispensed			
Teriparatide therapy	8BP1.	XaKb0	416362002
Denosumab therapy	8BPW.	Xaagz	700139004
Zoledronic acid therapy	8BPY.	Xaah1	700105003
Ibandronic acid therapy	8BPX.	Xaah0	700106002

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	SNOMED
Referral to falls service	8Hk1.	XaLqJ	247541000000106
Refer for falls assessment	66aF.	XaISu	717091000000109
Falls risk assessment referral	9Og0.	XaJ9V	717091000000109
Multidisciplinary falls assessment done	9Og6.	XaJLD	408555007
Group exercise programme	8E7A.	Xaltq	401167006

Appendix 2: 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.
NICE	National Institute for Health and Care Excellence
SIGN	Scottish Intercollegiate Guidelines Network
FRAX	An online diagnostic tool used to evaluate the 10-year probability of fracture risk.
QFracture	An online calculator used to estimate an individual's risk of developing hip fracture or osteoporotic fracture (hip, spine, wrist or shoulder) over 10 years
In-hospital services	Healthcare provided in a hospital setting.
Out-of-hospital services	Any healthcare provided in a setting other than a hospital.
Community care	Health services you receive close to your home or in your home, for example, health visiting, physiotherapy or speech and language therapy.
Primary care	The advice and treatment you receive from your local GP.

About us

The Royal Osteoporosis Society is the only UK-wide charity dedicated to ending the pain and suffering caused by osteoporosis. The Charity works tirelessly to help and support people with the condition as well as promoting good bone health to prevent osteoporosis. We do this by:

- Providing a range of information resources covering all aspects of osteoporosis for healthcare professionals and the public
- Providing a free helpline staffed by nurses with specialist knowledge of osteoporosis and bone health
- Investing in research to ensure future generations are freed from the burden of osteoporosis
- Influencing government and campaigning to improve and maintain essential services
- Educating healthcare professionals to ensure they are kept up to date about osteoporosis – through events, accredited training courses and our leading conference on osteoporosis and bone health
- Working in partnership with the NHS to set up and improve Fracture Liaison Services which can reduce the number of fractures caused by osteoporosis

To find out more about our information, support and services, visit our website: theros.org.uk



@RoyalOsteoPro



01761 471771 (General Enquiries)



0808 800 0035 (specialist nurse Helpline)



theros.org.uk



Camerton, Bath BA2 0PJ

Professional Membership

Professional membership of the Royal Osteoporosis Society will ensure you become better informed and able to deliver the best care possible to people with osteoporosis or fractures.

As a professional member, you'll have all the information you need at your fingertips and will stay up to date on best practice, care, delivery, new treatments and the latest news on osteoporosis research findings.

You'll also feel proud to be part of an organisation working hard to help those affected by osteoporosis.

To **join a growing network of professional members** like you, call our membership team on **01761 473287** or visit **theros.org.uk/HCPs**

President: HRH The Duchess of Cornwall

Royal Osteoporosis Society is a registered charity no. 1102712 in England and Wales, no. SC039755 in Scotland, no. (pending) in Guernsey and no. (pending) in Isle of Man. Registered as a company limited by guarantee in England and Wales no. 4995013, and no. (pending) in Isle of Man. Registered address: Camerton, Bath BA2 0PJ.

Formerly the National Osteoporosis Society.

Published August 2019.