

# Osteoporosis

Quality standard

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[www.nice.org.uk/guidance/qs149](https://www.nice.org.uk/guidance/qs149)

# Contents

Quality statements .....	4
Quality statement 1: Assessment of fragility fracture risk .....	5
Quality statement.....	5
Rationale .....	5
Quality measures.....	5
What the quality statement means for different audiences.....	7
Source guidance.....	7
Definitions of terms used in this quality statement .....	7
Quality statement 2: Starting drug treatment .....	9
Quality statement.....	9
Rationale .....	9
Quality measures.....	9
What the quality statement means for different audiences.....	10
Source guidance.....	11
Definitions of terms used in this quality statement .....	11
Equality and diversity considerations .....	12
Quality statement 3: Adverse effects and adherence to treatment.....	13
Quality statement.....	13
Rationale .....	13
Quality measures.....	13
What the quality statement means for different audiences.....	14
Source guidance.....	15
Definitions of terms used in this quality statement .....	15
Quality statement 4: Long-term follow-up .....	17
Quality statement.....	17
Rationale .....	17
Quality measures.....	17

What the quality statement means for different audiences.....	18
Source guidance.....	19
Definitions of terms used in this quality statement .....	19
Update information .....	21
About this quality standard .....	22
Diversity, equality and language.....	22

This standard is based on CG146, CG76, NG5 and NG56.

This standard should be read in conjunction with QS143, QS86, QS16 and QS81.

## Quality statements

Statement 1 Adults who have had a fragility fracture or use systemic glucocorticoids or have a history of falls have an assessment of their fracture risk.

Statement 2 Adults at high risk of fragility fracture are offered drug treatment to reduce fracture risk.

Statement 3 Adults prescribed drug treatment to reduce fracture risk are asked about adverse effects and adherence to treatment at each medication review.

Statement 4 Adults having long-term bisphosphonate therapy have a review of the need for continuing treatment.

# Quality statement 1: Assessment of fragility fracture risk

## Quality statement

Adults who have had a fragility fracture or use systemic glucocorticoids or have a history of falls have an assessment of their fracture risk.

## Rationale

Risk assessment of adults who may be at increased risk of a fragility fracture enables healthcare professionals to estimate their fracture risk. This can be used to consider options for prevention and treatment, which will reduce the risk of future fractures.

## Quality measures

The following measures can be used to assess the quality of care or service provision specified in the statement. They are examples of how the statement can be measured and can be adapted and used flexibly.

## Structure

Evidence of local arrangements to ensure that adults who have had a fragility fracture, use systemic glucocorticoids or have a history of falls, have an assessment of their fracture risk.

**Data source:** Local data collection, for example, service specifications. The [Royal College of Physicians' Fracture Liaison Service Database](#) collects data on whether there is a dedicated fracture liaison service.

## Process

a) Proportion of adults who have had a fragility fracture who have an assessment of their fracture risk.

Numerator – the number in the denominator who have an assessment of their fracture risk.

Denominator – the number of adults who have had a fragility fracture.

**Data source:** Local data collection, for example, local audit of patient records. The [NHS Quality and Outcomes Framework](#) captures data on patients aged 50 to 74 with a record of a fragility fracture and a diagnosis of osteoporosis confirmed on dual-energy X-ray absorptiometry (DXA) scan, and aged 75 or over with a record of a fragility fracture and a diagnosis of osteoporosis. The [Royal College of Physicians' Fracture Liaison Service Database](#) collects data on people aged 50 years and over who have had a fragility fracture, including whether the risk of fracture was assessed using FRAX or Q-Fracture.

b) Proportion of adults who use systemic glucocorticoids who have an assessment of their fracture risk.

Numerator – the number in the denominator who have an assessment of their fracture risk.

Denominator – the number of adults who use systemic glucocorticoids.

**Data source:** Local data collection, for example, local audit of patient records.

c) Proportion of adults aged 50 and over who have a history of falls who have an assessment of their fracture risk.

Numerator – the number in the denominator who have an assessment of their fracture risk.

Denominator – the number of adults aged 50 and over who have a history of falls.

**Data source:** Local data collection, for example, local audit of patient records.

## Outcome

Incidence of fragility fractures.

**Data source:** Local data collection, for example, local audit of patient records. The [Royal College of Physicians' Fracture Liaison Service Database](#) collects data on people aged 50 years and over who have had a fragility fracture.

## What the quality statement means for different audiences

**Service providers** (general practices, secondary care services and fracture liaison services) ensure that systems are in place for adults who have had a fragility fracture, use systemic glucocorticoids or have a history of falls, to have an assessment of their fracture risk.

**Healthcare professionals** (GPs, specialists, specialist nurses and fracture liaison practitioners) assess fracture risk, or confirm that assessment has taken place, in adults who have had a fragility fracture, use systemic glucocorticoids or have a history of falls, to estimate their risk of fracture and determine their treatment options.

**Commissioners** ensure that they commission services in which adults who have had a fragility fracture, use systemic glucocorticoids or have a history of falls, have their fracture risk assessed.

**Adults who have had a fragility fracture or falls in the past, or who are taking steroid treatment** have their risk of fracture assessed. Fragility fractures happen in people with fragile bones that break easily, usually older people with osteoporosis. There are treatments available to help prevent fractures in people who are at increased risk. An assessment can help to decide if treatment will reduce the chance of having a fracture.

## Source guidance

[Osteoporosis: assessing the risk of fragility fracture. NICE guideline CG146 \(2012, updated 2017\), recommendations 1.1 and 1.2](#)

## Definitions of terms used in this quality statement

### Fragility fracture

Fragility fractures are fractures that result from mechanical forces that would not ordinarily result in fracture, known as low-level (or 'low energy') trauma. The World Health Organization has quantified this as forces equivalent to a fall from a standing height or less. Fragility fractures occur most commonly in the spine (vertebrae), hip (proximal femur)

and wrist (distal radius). They may also occur in the arm (humerus), pelvis, ribs and other bones. [[NICE's guideline on osteoporosis: assessing the risk of fragility fracture, introduction](#)]

## Use of systemic glucocorticoids

Adults currently using systemic glucocorticoids, or who have been using systemic glucocorticoids for more than 3 months, at a dose of prednisolone of 5 mg daily or more (or equivalent doses of other glucocorticoids). [Expert opinion and the [University of Sheffield's FRAX fracture risk assessment tool](#)]

## History of falls

One or more falls in the last 12 months. A fall is defined as an event which causes a person to, unintentionally, rest on the ground or other lower level. Adults aged 50 and over should have a fracture risk assessment if they have a history of falls. [[NICE's clinical knowledge summary on falls – risk assessment](#) and [NICE's guideline on osteoporosis: assessing the risk of fragility fracture, recommendations 1.1 and 1.2](#)]

## Assessment of fracture risk

An assessment of fracture risk should include estimating absolute fracture risk (for example, the predicted risk of major osteoporotic or hip fracture over 10 years, expressed as a percentage). Either FRAX (without a bone mineral density [BMD] value if a DXA scan has not previously been undertaken) or QFracture should be used within their allowed age ranges. Above the upper age limits defined by the tools, consider people to be at high risk. Measure BMD to assess fracture risk in people aged under 40 years. [Adapted from [NICE's guideline on osteoporosis: assessing the risk of fragility fracture, recommendations 1.3, 1.4 and 1.9](#)]

# Quality statement 2: Starting drug treatment

## Quality statement

Adults at high risk of fragility fracture are offered drug treatment to reduce fracture risk.

## Rationale

Fragility fractures can cause substantial pain and severe disability, often leading to a reduced quality of life and sometimes to decreased life expectancy. Taking drug treatment to improve bone density reduces the chance of future fractures and related problems.

## Quality measures

The following measures can be used to assess the quality of care or service provision specified in the statement. They are examples of how the statement can be measured and can be adapted and used flexibly.

## Structure

Evidence of local arrangements to ensure that adults at high risk of fragility fracture are offered drug treatment to reduce fracture risk.

**Data source:** Local data collection, for example, local protocols. The [Fracture Liaison Service Database](#) (FLS-DB) collects data on which interventions can be recommended or started by the fracture liaison service.

## Process

Proportion of adults at high risk of fragility fracture receiving drug treatment to reduce fracture risk.

Numerator – the number in the denominator who receive drug treatment to reduce fracture

risk.

Denominator – the number of adults at high risk of fragility fracture.

**Data source:** Local data collection, for example, local audit of patient records. The [NHS Quality and Outcomes Framework](#) captures data on patients aged 50 to 74 with a record of a fragility fracture and a diagnosis of osteoporosis confirmed on dual-energy X-ray absorptiometry (DXA) scan, and aged 75 or over with a record of a fragility fracture and a diagnosis of osteoporosis, who are currently treated with an appropriate bone-sparing agent. The [Royal College of Physicians' Fracture Liaison Service Database](#) collects data on people aged 50 years and over who have had a fragility fracture, and records if drug treatment to reduce fracture risk is recommended and, if so, which treatment.

## Outcomes

a) Incidence of fragility fractures.

**Data source:** Local data collection, for example, local audit of patient records. The [Royal College of Physicians' Fracture Liaison Service Database](#) collects data on people aged 50 years and over who have had a fragility fracture.

b) Hospital admission rates for fragility fractures.

**Data source:** Local data collection, for example, [NHS Digital's Hospital episode statistics](#).

## What the quality statement means for different audiences

**Service providers** (general practices and secondary care services) ensure that systems are in place for adults at high risk of fragility fracture to be offered drug treatment to reduce fracture risk.

**Healthcare professionals** (GPs, specialists and specialist nurses) are aware of when to prescribe drug treatments to reduce fracture risk, and offer them to adults at high risk of fragility fracture.

**Commissioners** ensure that they commission services in which adults at high risk of

fragility fracture are offered drug treatment to reduce fracture risk.

**Adults with a high chance of fragility fracture** are offered medicine to help strengthen their bones and prevent fractures.

## Source guidance

- [Clinical guideline for the prevention and treatment of osteoporosis. National Osteoporosis Guideline Group \(2017\), section 6 and section 11, recommendation 7](#)
- [Osteoporosis – prevention of fragility fractures. NICE clinical knowledge summary \(2021, updated 2024\)](#)

## Definitions of terms used in this quality statement

### At high risk of fragility fracture

Women with a prior fragility fracture (particularly hip or vertebral fracture) and men and women with a 10-year probability of a major osteoporotic fracture derived from FRAX, above the upper assessment threshold, should be considered for treatment (see table 1). Men and women with a 10-year probability between the upper and lower assessment threshold should be referred for bone mineral density measurement and their fracture probability reassessed. If their 10-year fracture probability is above the intervention threshold after reassessment (see table 1), treatment should be offered.

**Table 1 Lower and upper assessment thresholds and intervention thresholds for major osteoporotic fracture probability based on fracture probabilities derived from FRAX (BMI set to 25 kg/m<sup>2</sup>)**

Age (years)	Lower assessment threshold	Upper assessment threshold	Intervention threshold
40	2.6	7.1	5.9
45	2.7	7.2	6.0
50	3.4	8.6	7.2
55	4.5	11	9.4
60	5.9	14	12
65	8.4	19	16

Age (years)	Lower assessment threshold	Upper assessment threshold	Intervention threshold
≥70	11	24	20

Table reproduced with permission from McCloskey et al. (2015) FRAX-based assessment and intervention thresholds – an exploration of thresholds in women aged 50 years and older in the UK. *Osteoporosis International* 26 (8), 2091–9. [Adapted from [National Osteoporosis Guideline Group's Clinical guideline for the prevention and treatment of osteoporosis](#), section 11, recommendation 7]

## Drug treatment to reduce fracture risk

Drugs that can be prescribed to prevent fragility fractures include bisphosphonates (alendronate, ibandronate, risedronate and zoledronic acid) and non-bisphosphonates (raloxifene, denosumab, teriparatide, calcitriol and hormone replacement therapy). [Adapted from [National Osteoporosis Guideline Group's Clinical guideline for the prevention and treatment of osteoporosis](#), section 6]

Full details of the licensed indications for these drugs can be found in the [summary of product characteristics](#). At the time of publication (April 2017), some bisphosphonate and non-bisphosphonate drugs were off label for this use. See [NICE's information on prescribing medicines](#).

## Equality and diversity considerations

Guidance on treatment to prevent fragility fractures has been focused on treating post-menopausal women, because of their increased risk. Clinicians should ensure that other populations who might benefit from recommended treatments are also considered.

# Quality statement 3: Adverse effects and adherence to treatment

## Quality statement

Adults prescribed drug treatment to reduce fracture risk are asked about adverse effects and adherence to treatment at each medication review.

## Rationale

People prescribed drugs to prevent fragility fractures sometimes stop taking them because of adverse effects. Adherence to treatment, including taking their medicine by the recommended method, is needed to ensure that fracture risk is reduced effectively. Checking how well a person is managing their treatment at each medication review means that any problems can be discussed and their treatment adjusted if needed, which will improve adherence and quality of life.

## Quality measures

The following measures can be used to assess the quality of care or service provision specified in the statement. They are examples of how the statement can be measured and can be adapted and used flexibly.

## Structure

Evidence of local arrangements to ensure that adults prescribed drug treatment to reduce fracture risk are asked about adverse effects and adherence to treatment at each medication review.

**Data source:** Local data collection, for example, service specifications.

## Process

Proportion of medication reviews for adults prescribed drug treatment to reduce fracture

risk that include a record of adverse effects and adherence to treatment.

Numerator – the number in the denominator that include a record of adverse effects and adherence to treatment.

Denominator – the number of medication reviews for adults prescribed drug treatment to reduce fracture risk.

**Data source:** Local data collection, for example, local audit of patient records.

## Outcomes

a) Adults adhering to drug treatment to reduce fracture risk.

**Data source:** Local data collection, for example, local audit of patient records. The [Royal College of Physicians' Fracture Liaison Service Database](#) records adherence to drug treatment at 52 weeks.

b) Incidence of fragility fracture.

**Data source:** Local data collection, for example, local audit of patient records. The [Royal College of Physicians' Fracture Liaison Service Database](#) collects data on people aged 50 years and over who have had a fragility fracture.

## What the quality statement means for different audiences

**Service providers** (general practices, secondary care services and pharmacies) ensure that systems are in place for adults prescribed drug treatment to reduce fracture risk to be asked if they have had any adverse effects and about adherence to treatment at each medication review.

**Healthcare professionals** (GPs, specialists, specialist nurses and pharmacists) carry out medication reviews with adults prescribed drug treatments to reduce fracture risk. At the reviews, they ask if the person has had any adverse effects and if they are taking their medicine by the recommended method and as prescribed. If any problems are raised, these should be discussed and treatment adjusted if needed, which may involve input

from a specialist.

**Commissioners** ensure that they commission services in which adults prescribed drug treatment to reduce fracture risk are asked if they have had any adverse effects and about adherence to treatment at each medication review.

**Adults taking medicine to help prevent fractures** have regular medicine reviews with their doctor to check if they are having any side effects, such as heartburn or reflux, and that they are taking the medicine correctly. The review gives the chance for any problems to be discussed and treatment can be adjusted if needed to help with side effects.

## Source guidance

- [Osteoporosis – prevention of fragility fractures. NICE clinical knowledge summary \(2021, updated 2024\)](#)
- [Medicines optimisation. NICE guideline NG5 \(2015\), recommendations 1.4.1 and 1.4.3](#)
- [Medicines adherence. NICE guideline CG76 \(2009\), recommendations 1.1.21 and 1.3.3](#)

## Definitions of terms used in this quality statement

### Drug treatment to reduce fracture risk

Drugs that can be prescribed to prevent fragility fractures include bisphosphonates (alendronate, ibandronate, risedronate and zoledronic acid) and non-bisphosphonates (raloxifene, denosumab, teriparatide, calcitriol and hormone replacement therapy).

[Adapted from [National Osteoporosis Guideline Group's Clinical guideline for the prevention and treatment of osteoporosis](#), section 6]

Full details of the licensed indications for these drugs can be found in the [summary of product characteristics](#). At the time of publication (April 2017), some bisphosphonate and non-bisphosphonate drugs were off label for this use. See [NICE's information on prescribing medicines](#).

## Medication review

The review should include:

- asking about adverse effects, including upper gastrointestinal adverse effects (such as dyspepsia or reflux), symptoms of atypical fracture (including new onset hip, groin, or thigh pain), and dental problems
- asking about adherence to treatment, including following the recommended method of taking the treatment
- discussing alternative treatment options if adverse effects are unacceptable or the person has difficulty adhering to treatment.

[Expert opinion and [NICE's clinical knowledge summary on osteoporosis – prevention of fragility fractures](#)]

# Quality statement 4: Long-term follow-up

## Quality statement

Adults having long-term bisphosphonate therapy have a review of the need for continuing treatment.

## Rationale

The optimal duration of bisphosphonate therapy is unclear and there are possible adverse effects of long-term treatment. A medication review for people having long-term bisphosphonate therapy gives the opportunity to consider whether continuing treatment is the best option, or if treatment should be changed or stopped. The response to treatment may also be evaluated to help determine whether to continue treatment.

## Quality measures

The following measures can be used to assess the quality of care or service provision specified in the statement. They are examples of how the statement can be measured and can be adapted and used flexibly.

## Structure

a) Evidence of local arrangements to ensure that adults taking zoledronic acid for 3 years have a review of the need for continuing treatment.

**Data source:** Local data collection, for example, local protocols.

b) Evidence of local arrangements to ensure that adults taking alendronate, ibandronate or risedronate for 5 years have a review of the need for continuing treatment.

**Data source:** Local data collection, for example, local protocols.

## Process

a) Proportion of adults taking zoledronic acid for 3 years who have a review of the need for continuing treatment.

Numerator – the number in the denominator who have a review of the need for continuing treatment.

Denominator – the number of adults taking zoledronic acid for 3 years.

**Data source:** Local data collection, for example, local audit of patient records.

b) Proportion of adults taking alendronate, ibandronate or risedronate for 5 years who have a review of the need for continuing treatment.

Numerator – the number in the denominator who have a review of the need for continuing treatment.

Denominator – the number of adults taking alendronate, ibandronate or risedronate for 5 years.

**Data source:** Local data collection, for example, local audit of patient records.

## Outcomes

a) Patient satisfaction with long-term bisphosphonate therapy.

**Data source:** Local data collection, for example, patient surveys.

b) Health-related quality of life for adults having long-term bisphosphonate therapy.

**Data source:** Local data collection, for example, patient surveys.

## What the quality statement means for different audiences

**Service providers** (general practices, secondary care services and pharmacies) ensure

that systems are in place for adults having long-term bisphosphonate therapy to have a review of the need for continuing treatment.

**Healthcare professionals** (GPs, specialists, specialist nurses and pharmacists) offer adults having long-term bisphosphonate therapy a medication review to discuss the risks and benefits of continuing treatment and assess their response to treatment, if needed.

**Commissioners** ensure that they commission services in which adults having long-term bisphosphonate therapy have a review of the need for continuing treatment.

**Adults taking a type of medicine called a bisphosphonate over a long time to help prevent fractures** have a review to discuss the risks and benefits of continuing with the treatment. They might also have a scan to check whether their bone strength has improved to help decide whether to continue treatment.

## Source guidance

- [Clinical guideline for the prevention and treatment of osteoporosis. National Osteoporosis Guideline Group \(2017\), section 7, recommendations 1 and 6](#)
- [Multimorbidity: clinical assessment and management. NICE guideline NG56 \(2016\), recommendation 1.6.16](#)

## Definitions of terms used in this quality statement

### Long-term bisphosphonate therapy

Adults who have been taking zoledronic acid for 3 years or alendronate, ibandronate or risedronate for 5 years should have a review of the need for continuing treatment.

[[National Osteoporosis Guideline Group's Clinical guideline for the prevention and treatment of osteoporosis](#), section 7, recommendation 6]

### Review of the need for continuing treatment

Continuation of treatment is recommended for people with any of the following risk factors:

- age over 75 years
- previous hip or vertebral fracture
- one or more low trauma fractures during treatment (after poor adherence to treatment, for example less than 80% of treatment has been taken, and causes of secondary osteoporosis have been excluded)
- current treatment with oral glucocorticoids of 7.5 mg or more prednisolone/day or equivalent.

For people without risk factors, arrange a dual-energy X-ray absorptiometry (DXA) scan and consider:

- Continuing treatment if the T-score is less than -2.5, and reassessing fracture risk and bone mineral density (BMD) every 3 to 5 years.
- Stopping treatment if the T-score is greater than -2.5, and reassessing their fracture risk and BMD after 2 years.

[Adapted from [NICE's clinical knowledge summary on osteoporosis – prevention of fragility fractures](#) and [National Osteoporosis Guideline Group's Clinical guideline for the prevention and treatment of osteoporosis, section 7, recommendation 4](#)]

# Update information

## Minor changes since publication

**March 2022:** The definition of history of falls in statement 1 has been updated to align with the definition of falls in [NICE's clinical knowledge summary for falls – risk assessment](#). The data source for outcome measure a) for statement 3 has also been updated.

**July 2018:** The [Fracture Liaison Service Database](#) has been added to the data sources for measures in statements 1, 2 and 3.

**October 2017:** Information about drug licensing for bisphosphonate and non-bisphosphonate drugs has been included in the definitions sections for statements 2 and 3.

**June 2017:** The definition of drug treatment to reduce fracture risk in quality statements 2 and 3 has been updated to remove reference to strontium ranelate. This change has been made in order to match the [National Osteoporosis Guideline Group's Clinical guideline for the prevention and treatment of osteoporosis](#).

## About this quality standard

NICE quality standards describe high-priority areas for quality improvement in a defined care or service area. Each standard consists of a prioritised set of specific, concise and measurable statements. NICE quality standards draw on existing NICE or NICE-accredited guidance that provides an underpinning, comprehensive set of recommendations, and are designed to support the measurement of improvement.

Expected levels of achievement for quality measures are not specified. Quality standards are intended to drive up the quality of care, and so achievement levels of 100% should be aspired to (or 0% if the quality statement states that something should not be done). However, this may not always be appropriate in practice. Taking account of safety, shared decision-making, choice and professional judgement, desired levels of achievement should be defined locally.

Information about [how NICE quality standards are developed](#) is available from the NICE website.

See our [webpage on quality standards advisory committees](#) for details about our standing committees. Information about the topic experts invited to join the standing members is available on the [webpage for this quality standard](#).

NICE has produced a [quality standard service improvement template](#) to help providers make an initial assessment of their service compared with a selection of quality statements. This tool is updated monthly to include new quality standards.

NICE guidance and quality standards apply in England and Wales. Decisions on how they apply in Scotland and Northern Ireland are made by the Scottish government and Northern Ireland Executive. NICE quality standards may include references to organisations or people responsible for commissioning or providing care that may be relevant only to England.

## Diversity, equality and language

Equality issues were considered during development and [equality assessments for this quality standard](#) are available. Any specific issues identified during development of the

quality statements are highlighted in each statement.

Commissioners and providers should aim to achieve the quality standard in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity and foster good relations. Nothing in this quality standard should be interpreted in a way that would be inconsistent with compliance with those duties.

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## Endorsing organisation

This quality standard has been endorsed by NHS England, as required by the Health and Social Care Act (2012)

## Supporting organisations

Many organisations share NICE's commitment to quality improvement using evidence-based guidance. The following supporting organisations have recognised the benefit of the quality standard in improving care for patients, carers, service users and members of the public. They have agreed to work with NICE to ensure that those commissioning or providing services are made aware of and encouraged to use the quality standard.

- [Bone Research Society](#)
- [National Osteoporosis Society](#)
- [Royal College of Nursing \(RCN\)](#)
- [Society and College of Radiographers \(SOR\)](#)
- [British Geriatrics Society](#)