NICE National Institute for Health and Care Excellence

Osteoporosis overview

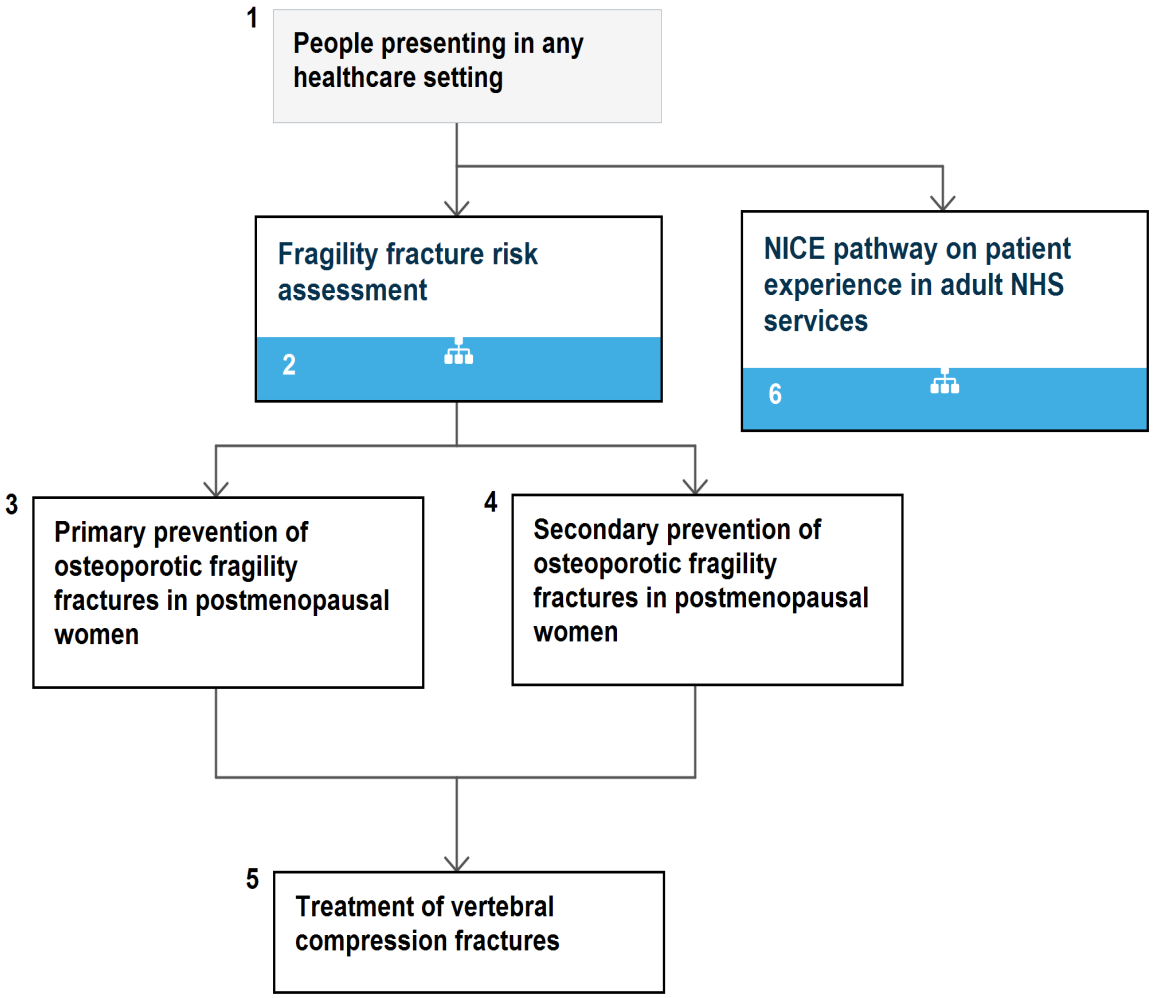
A NICE pathway brings together all NICE guidance, quality standards and materials to support implementation on a specific topic area. The pathways are interactive and designed to be used online. This pdf version gives you a single pathway diagram and uses numbering to link the boxes in the diagram to the associated recommendations.

To view the online version of this pathway visit:

http://pathways.nice.org.uk/pathways/osteoporosis

Pathway last updated: 03 September 2014

NICE *Pathways*



1 People presenting in any healthcare setting

No additional information

2 Fragility fracture risk assessment

See Osteoporosis / Fragility fracture risk assessment

3 Primary prevention of osteoporotic fragility fractures in postmenopausal women

Alendronate, etidronate, risedronate, raloxifene and strontium ranelate

This guidance relates only to treatments for the primary prevention of fragility fractures in postmenopausal women who have osteoporosis. Osteoporosis is defined by a T-score of –2.5 SD or below on DXA scanning. However, the diagnosis may be assumed in women aged 75 years or older if the responsible clinician considers a DXA scan to be clinically inappropriate or unfeasible. (T-score relates to the measurement of bone mineral density (BMD) using central (hip and/or spine) DXA scanning, and is expressed as the number of standard deviations (SD) from peak BMD.)

This guidance assumes that women who receive treatment have an adequate calcium intake and are vitamin D replete. Unless clinicians are confident that women who receive treatment meet these criteria, calcium and/or vitamin D supplementation should be considered.

This guidance does **not** cover the following:

- The treatment of women who have sustained a clinically apparent osteoporotic fragility fracture (for recommendations for the treatment of women with a prior osteoporotic fragility fracture, see secondary prevention of osteoporotic fragility fractures in postmenopausal women in this pathway).
- The use of alendronate, etidronate, risedronate, raloxifene or strontium ranelate for the primary prevention of osteoporotic fragility fractures in women with normal BMD or osteopenia (that is, women with a T-score between -1 and -2.5 SD below peak BMD).
- The use of these drugs for the primary prevention of osteoporotic fragility fractures in women who are on long-term systemic corticosteroid treatment.

Alendronate is recommended as a treatment option for the primary prevention of osteoporotic fragility fractures in the following groups:

- Women aged 70 years or older who have an independent clinical risk factor for fracture (see below) or an indicator of low BMD (see below) and who are confirmed to have osteoporosis (that is, a T-score of -2.5 SD or below). In women aged 75 years or older who have two or more independent clinical risk factors for fracture or indicators of low BMD, a DXA scan may not be required if the responsible clinician considers it to be clinically inappropriate or unfeasible.
- Women aged 65–69 years who have an independent clinical risk factor for fracture (see below) and who are confirmed to have osteoporosis (that is, a T-score of -2.5 SD or below).
- Postmenopausal women younger than 65 years who have an independent clinical risk factor for fracture (see below) and at least one additional indicator of low BMD (see below) and who are confirmed to have osteoporosis (that is, a T-score of -2.5 SD or below).
- When the decision has been made to initiate treatment with alendronate, the preparation prescribed should be chosen on the basis of the lowest acquisition cost available.

Risedronate and etidronate are recommended as alternative treatment options for the primary prevention of osteoporotic fragility fractures in postmenopausal women:

- who are unable to comply with the special instructions for the administration of alendronate, or have a contraindication to or are intolerant of alendronate (as defined below) and
- who also have a combination of T-score, age and number of independent clinical risk factors for fracture (see below) as indicated in the following table.

T-scores (SD) at (or below) which risedronate or etidronate is recommended when alendronate cannot be taken

	Number of independent clinical risk factors for fracture		
Age (years)	**0**	**1**	**2**
65–69	N/A[a]	-3.5	-3.0
70–74	-3.5	-3.0	-2.5
75 or older	-3.0	-3.0	-2.5

[a] Treatment with risedronate or etidronate is not recommended.

If a woman aged 75 years or older who has two or more independent clinical risk factors for fracture or indicators of low BMD has not previously had her BMD measured, a DXA scan may not be required if the responsible clinician considers it to be clinically inappropriate or unfeasible.

In deciding between risedronate and etidronate, clinicians and patients need to balance the overall proven effectiveness profile of the drugs against their tolerability and adverse effects in individual patients.

Strontium ranelate is recommended as an alternative treatment option for the primary prevention of osteoporotic fragility fractures in postmenopausal women:

- who are unable to comply with the special instructions for the administration of alendronate and either risedronate or etidronate, or have a contraindication to or are intolerant of alendronate and either risedronate or etidronate (as defined below) and
- who also have a combination of T-score, age and number of independent clinical risk factors for fracture (see below) as indicated in the following table.

T-scores (SD) at (or below) which strontium ranelate is recommended when alendronate and either risedronate or etidronate cannot be taken

	Number of independent clinical risk factors for fracture		
Age (years)	**0**	**1**	**2**
65–69	N/A[a]	-4.5	-4.0
70–74	-4.5	-4.0	-3.5
75 or older	-4.0	-4.0	-3.0

[a] Treatment with strontium ranelate is not recommended.

Raloxifene is not recommended as a treatment option for the primary prevention of osteoporotic fragility fractures in postmenopausal women.

Independent clinical risk factors

For the purposes of this guidance, independent clinical risk factors for fracture are parental history of hip fracture, alcohol intake of 4 or more units per day, and rheumatoid arthritis.

Indicators of low BMD

For the purposes of this guidance, indicators of low BMD are low body mass index (defined as less than 22 kg/m^2), medical conditions such as ankylosing spondylitis, Crohn's disease, conditions that result in prolonged immobility, and untreated premature menopause. Rheumatoid arthritis is also a medical condition indicative of low BMD.

Intolerance

For the purposes of this guidance, intolerance of alendronate, risedronate or etidronate is defined as persistent upper gastrointestinal disturbance that is sufficiently severe to warrant discontinuation of treatment, and that occurs even though the instructions for administration have been followed correctly.

Primary prevention

For the purposes of this guidance, primary prevention refers to opportunistic identification, during visits to a healthcare professional for any reason, of postmenopausal women who are at risk of osteoporotic fragility fractures and who could benefit from drug treatment. It does not imply a dedicated screening programme.

Women currently receiving treatment

Women who are currently receiving treatment with one of the drugs covered by this guidance, but for whom treatment would not have been recommended according to this guidance, should have the option to continue treatment until they and their clinicians consider it appropriate to stop.

These recommendations are from alendronate, etidronate, risedronate, raloxifene and strontium ranelate for the primary prevention of osteoporotic fragility fractures in postmenopausal women (NICE technology appraisal guidance 160).

NICE has written information for the public explaining the guidance on alendronate, etidronate, risedronate, raloxifene and strontium ranelate for the primary prevention of osteoporotic fragility fractures.

Denosumab

Denosumab is recommended as a treatment option for the primary prevention of osteoporotic fragility fractures only in postmenopausal women at increased risk of fractures:

- who are unable to comply with the special instructions for administering alendronate and either risedronate or etidronate, or have an intolerance of, or a contraindication to, those treatments and
- who have a combination of T-score, age and number of independent clinical risk factors for fracture (see below) as indicated in the following table.

T-scores (SD) at (or below) which denosumab is recommended when alendronate and either risedronate or etidronate are unsuitable

	Number of independent clinical risk factors for fracture		
Age (years)	**0**	**1**	**2**
65–69	N/A[a]	-4.5	-4.0
70–74	-4.5	-4.0	-3.5
75 or older	-4.0	-4.0	-3.0
[a] Treatment with denosumab is not recommended.			

Independent clinical risk factors

For the purposes of this guidance, independent clinical risk factors for fracture are parental history of hip fracture, alcohol intake of 4 or more units per day, and rheumatoid arthritis.

Women currently receiving treatment

People currently receiving denosumab for the primary prevention of osteoporotic fragility fractures who do not meet the criteria specified above should have the option to continue treatment until they and their clinician consider it appropriate to stop.

These recommendations relating to primary prevention of osteoporotic fragility fractures are from denosumab for the prevention of osteoporotic fractures in postmenopausal women (NICE technology appraisal guidance 204).

NICE has written information for the public explaining the guidance on denosumab.

Resources

The following implementation tools are relevant to this part of the pathway.

Alendronate, etidronate, risedronate, raloxifene and strontium ranelate for the primary prevention of osteoporotic fragility fractures in postmenopausal women: audit support

Denosumab for the prevention of osteoporotic fractures in postmenopausal women: audit support

Alendronate, etidronate, risedronate, raloxifene and strontium ranelate for the primary prevention of osteoporotic fragility fractures in postmenopausal women: costing template

Denosumab for the prevention of osteoporotic fractures in postmenopausal women: costing statement

Alendronate, etidronate, risedronate, raloxifene and strontium ranelate for the primary prevention of osteoporotic fragility fractures in postmenopausal women: slide set

4 Secondary prevention of osteoporotic fragility fractures in postmenopausal women

Alendronate, etidronate, risedronate, raloxifene, strontium ranelate and teriparatide

This guidance relates only to treatments for the secondary prevention of fragility fractures in postmenopausal women who have osteoporosis and have sustained a clinically apparent

osteoporotic fragility fracture. Osteoporosis is defined by a T-score of -2.5 SD or below on DXA scanning (please note: T-score relates to the measurement of BMD using central [hip and/or spine] DXA scanning, and is expressed as the number of SD from peak BMD). However, the diagnosis may be assumed in women aged 75 years or older if the responsible clinician considers a DXA scan to be clinically inappropriate or unfeasible.

This guidance assumes that women who receive treatment have an adequate calcium intake and are vitamin D replete. Unless clinicians are confident that women who receive treatment meet these criteria, calcium and/or vitamin D supplementation should be considered.

This guidance does not cover the following:

- The use of alendronate, etidronate, risedronate, raloxifene, strontium ranelate or teriparatide for the secondary prevention of osteoporotic fragility fractures in women with normal BMD or osteopenia (that is, women with a T score between -1 and -2.5 SD below peak BMD).
- The use of these drugs for the secondary prevention of osteoporotic fragility fractures in women who are on long-term systemic corticosteroid treatment.

Alendronate is recommended as a treatment option for the secondary prevention of osteoporotic fragility fractures in postmenopausal women who are confirmed to have osteoporosis (that is, a T-score of -2.5 SD or below). In women aged 75 years or older, a DXA scan may not be required if the responsible clinician considers it to be clinically inappropriate or unfeasible. When the decision has been made to initiate treatment with alendronate, the preparation prescribed should be chosen on the basis of the lowest acquisition cost available.

Risedronate and etidronate are recommended as alternative treatment options for the secondary prevention of osteoporotic fragility fractures in postmenopausal women:

- who are unable to comply with the special instructions for the administration of alendronate, or have a contraindication to or are intolerant of alendronate (as defined below) **and**
- who also have a combination of T-score, age and number of independent clinical risk factors for fracture (see below) as indicated in the following table.

T-scores (SD) at (or below) which risedronate or etidronate is recommended when alendronate cannot be taken

	Number of independent clinical risk factors for fracture

Age (years)	0	1	2
50–54	Treatment with risedronate or etidronate is not recommended.	-3.0	-2.5
55–59	-3.0	-3.0	-2.5
60–64	-3.0	-3.0	-2.5
65–69	-3.0	-2.5	-2.5
70 or older	-2.5	-2.5	-2.5

If a woman aged 75 years or older has not previously had her BMD measured, a DXA scan may not be required if the responsible clinician considers it to be clinically inappropriate or unfeasible.

In deciding between risedronate and etidronate, clinicians and patients need to balance the overall proven effectiveness profile of the drugs against their tolerability and adverse effects in individual patients.

Strontium ranelate and raloxifene are recommended as alternative treatment options for the secondary prevention of osteoporotic fragility fractures in postmenopausal women:

- who are unable to comply with the special instructions for the administration of alendronate and either risedronate or etidronate, or have a contraindication to or are intolerant of alendronate and either risedronate or etidronate (as defined below) **and**
- who also have a combination of T-score, age and number of independent clinical risk factors for fracture (see below) as indicated in the following table.

T-scores (SD) at (or below) which strontium ranelate or raloxifene is recommended when alendronate and either risedronate or etidronate cannot be taken

	Number of independent clinical risk factors for fracture		
Age (years)	**0**	**1**	**2**

50–54	Treatment with raloxifene or strontium ranelate is not recommended.	-3.5	-3.5
55–59	-4.0	-3.5	-3.5
60–64	-4.0	-3.5	-3.5
65–69	-4.0	-3.5	-3.0
70–74	-3.0	-3.0	-2.5
75 or older	-3.0	-2.5	-2.5

If a woman aged 75 years or older who has one or more independent clinical risk factors for fracture or indicators of low BMD has not previously had her BMD measured, a DXA scan may not be required if the responsible clinician considers it to be clinically inappropriate or unfeasible.

For the purposes of this guidance, indicators of low BMD are low body mass index (defined as less than 22 kg/m^2), medical conditions such as ankylosing spondylitis, Crohn's disease, conditions that result in prolonged immobility, and untreated premature menopause. Rheumatoid arthritis is also a medical condition indicative of low BMD.

In deciding between strontium ranelate and raloxifene, clinicians and patients need to balance the overall proven effectiveness profile of these drugs against their tolerability and other effects in individual patients.

Teriparatide is recommended as an alternative treatment option for the secondary prevention of osteoporotic fragility fractures in postmenopausal women:

- who are unable to take alendronate and either risedronate or etidronate, or have a contraindication to or are intolerant of alendronate and either risedronate or etidronate (as defined in below), **or** who have a contraindication to, or are intolerant of strontium ranelate (as defined in below), **or** who have had an unsatisfactory response (as defined in below) to treatment with alendronate, risedronate or etidronate **and**
- who are 65 years or older and have a T-score of -4.0 SD or below, or a T-score of -3.5 SD or below plus more than two fractures, **or** who are aged 55–64 years and have a T-score of -4 SD or below plus more than two fractures.

Independent clinical risk factors

For the purposes of this guidance, independent clinical risk factors for fracture are parental history of hip fracture, alcohol intake of 4 or more units per day, and rheumatoid arthritis.

Intolerance

For the purposes of this guidance, intolerance of alendronate, risedronate or etidronate is defined as persistent upper gastrointestinal disturbance that is sufficiently severe to warrant discontinuation of treatment, and that occurs even though the instructions for administration have been followed correctly.

For the purposes of this guidance, intolerance of strontium ranelate is defined as persistent nausea or diarrhoea, either of which warrants discontinuation of treatment.

Unsatisfactory response

For the purposes of this guidance, an unsatisfactory response is defined as occurring when a woman has another fragility fracture despite adhering fully to treatment for 1 year and there is evidence of a decline in BMD below her pre-treatment baseline.

Women currently receiving treatment

Women who are currently receiving treatment with one of the drugs covered by this guidance, but for whom treatment would not have been recommended according to this guidance, should have the option to continue treatment until they and their clinicians consider it appropriate to stop.

These recommendations are from alendronate, etidronate, risedronate, raloxifene, strontium ranelate and teriparatide for the secondary prevention of osteoporotic fragility fractures in postmenopausal women. (NICE technology appraisal guidance 161).

NICE has written information for the public explaining the guidance on alendronate, etidronate, risedronate, raloxifene, strontium ranelate and teriparatide for the secondary prevention of osteoporotic fragility fractures in postmenopausal women.

Denosumab

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

Women currently receiving treatment

People currently receiving denosumab for the secondary prevention of osteoporotic fragility fractures who do not meet the criteria specified should have the option to continue treatment until they and their clinician consider it appropriate to stop.

These recommendations relating to secondary prevention of osteoporotic fragility fractures are from denosumab for the prevention of osteoporotic fractures in postmenopausal women. (NICE technology appraisal guidance 204).

NICE has written information for the public explaining the guidance on denosumab.

Resources

The following implementation tools are relevant to this part of the pathway.

Alendronate, etidronate, risedronate, raloxifene, strontium ranelate and teriparatide for the secondary prevention of osteoporotic fragility fractures in postmenopausal women: audit support

Denosumab for the prevention of osteoporotic fractures in postmenopausal women: audit support

Alendronate, etidronate, risedronate, raloxifene, strontium ranelate and teriparatide for the secondary prevention of osteoporotic fragility fractures in postmenopausal women: costing template

Denosumab for the prevention of osteoporotic fractures in postmenopausal women: costing statement

Alendronate, etidronate, risedronate, raloxifene, strontium ranelate and teriparatide for the secondary prevention of osteoporotic fragility fractures in postmenopausal women: slide set

5 Treatment of vertebral compression fractures

Percutaneous vertebroplasty, and percutaneous balloon kyphoplasty without stenting, are recommended as options for treating osteoporotic vertebral compression fractures only in people:

- who have severe ongoing pain after a recent, unhealed vertebral fracture despite optimal pain management **and**
- in whom the pain has been confirmed to be at the level of the fracture by physical examination and imaging.

These recommendations are from percutaneous vertebroplasty and percutaneous balloon kyphoplasty for treating osteoporotic vertebral compression fractures (NICE technology appraisal guidance 279).

NICE has produced information for the public explaining the guidance on percutaneous vertebroplasty and percutaneous balloon kyphoplasty without stenting.

Resources

The following implementation tools are relevant to this part of the pathway.

TA279: costing statement

6 NICE pathway on patient experience in adult NHS services

See Patient experience in adult NHS services / Patient experience in adult NHS services overview

Glossary

Sources

Percutaneous vertebroplasty and percutaneous balloon kyphoplasty for treating osteoporotic vertebral compression fractures. NICE technology appraisal guidance 279 (2013)

Denosumab for the prevention of osteoporotic fractures in postmenopausal women. NICE technology appraisal guidance 204 (2010)

Alendronate, etidronate, risedronate, raloxifene, strontium ranelate and teriparatide for the secondary prevention of osteoporotic fragility fractures in postmenopausal women. NICE technology appraisal guidance 161 (2011)

Alendronate, etidronate, risedronate, raloxifene and strontium ranelate for the primary prevention of osteoporotic fragility fractures in postmenopausal women. NICE technology appraisal guidance 160 (2011)

Your responsibility

The guidance in this pathway represents the view of NICE, which was arrived at after careful consideration of the evidence available. Those working in the NHS, local authorities, the wider public, voluntary and community sectors and the private sector should take it into account when carrying out their professional, managerial or voluntary duties. Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way which would be inconsistent with compliance with those duties.

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