AWTTC
All Wales Therapeutics & Toxicology Centre
Canolfan Therapiwteg a Thocsicoleg Cymru Gyfan

Evidence summary report for a limited assessment

Teriparatide injection 20 micrograms/80 microlitres solution for injection in prefilled pen (AWTTC reference #6561)

Indication Treatment of osteoporosis in men at increased risk of fracture

Company: licence holders for teriparatide include Eli Lilly (Forsteo®), Gedeon-Richter (Terrosa®▼), Teva UK (Teriparatide Teva®), and Thornton-Ross (Movymia®▼). Forsteo®, Terrosa® and Movymia® are biologically produced using recombinant DNA technology. Teriparatide Teva® is a chemically synthesised bioequivalent product.

▼These medicinal products are subject to additional monitoring. This will allow quick identification of new safety information. Healthcare professionals are asked to report any suspected adverse reactions.

Background

AWMSG advice, published in 2008, does not recommend teriparatide (Forsteo®) to treat osteoporosis in men due to the case for clinical and cost-effectiveness not being proven. AWTTC reviewed the recommendation in 2013 and 2016 and requested re-engagement from the company, but no submission was received. Teriparatide received a negative recommendation following appraisal by the Scottish Medicines Consortium in 2008 due to the economic analysis being insufficiently robust.

Conditional use in men is recommended by the National Osteoporosis Guideline Group (clinical guideline 2024) (NOGG). Teriparatide is to be considered as a first line treatment option in men aged 50 years and older who are at very high fracture risk, particularly in those with vertebral fractures. In addition, it is to be considered as a second line option for men aged 50 years and older who are intolerant of bisphosphonates, particularly in those with vertebral fractures.

Teriparatide has been available for use in men in NHS England for many years and commissioning was formalised in August 2024 (NHSE teriparatide clinical commissioning policy). NHS England recommends teriparatide for men using the criteria in NICE TA161 for women. It is recommended as an alternative treatment option for the secondary prevention of osteoporotic fragility fractures in men (see Appendix 1 for full criteria):

Health boards have reported that routine availability in England has created inequity at the Wales/England border. Teriparatide has been used routinely in men in some health boards in Wales but in other health boards an individual patient funding request or a specific health board decision is required for approval. This has resulted in geographical inequity in patient access. Biosimilars have been introduced (resulting in a decrease in the medicine acquisition cost) since the original appraisal by AWMSG. Clinicians describe teriparatide as a treatment of choice for vertebral fractures or treatment failure on anti-resorptives (bisphosphonates). It would be used

to protect men from re-fracture or fragility fracture if they have very severe osteoporosis. Clinicians have commented that women with severe osteoporosis would qualify for teriparatide therapy and since there is evidence for efficacy in men it is difficult to justify differential treatment of men and women with the same disease and bone mineral density. NICE quality standard (QS149) lists teriparatide alongside other non-bisphosphonates as a drug to prevent fragility fractures. QS149 states that guidance on treatment 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.

Date of licence extension: 2007

Criteria for limited assessment

The AWMSG Scrutiny panel reviewed the request for reassessment of teriparatide and considered it was suitable for a limited assessment via the Licensed Medicines One Wales Medicines Assessment Group (LOWMAG) based on the following reasons:

- The medicine is commissioned by NHS England and recommended by the National Osteoporosis Guideline group UK and therefore the case for clinical effectiveness is established
- Due to All Wales Drug Contract pricing for biosimilars the cost of the medicine is reduced relative to the price in 2008 when AWMSG appraisal took place.

The re-assessment was motivated by the gender and geographical inequality of access to teriparatide. There is inequality of access at the Wales/England border and between Welsh health boards. Adopting the recommendation and starting criteria from the NHSE commissioning report would address these inequalities.

Comparators and place in pathway

First line options include bisphosphonates: alendronic acid and risedronate supplied as oral tablets. Denosumab, solution for injection is also available. All of these treatments are anti-resorptive treatments (mainly preventing bone loss) whilst teriparatide is anabolic (primarily promoting bone growth).

Budget impact

The recommended dose is 20 micrograms once daily via subcutaneous injection. Patients are trained to deliver the injection into the thigh or abdomen. The maximum duration of treatment is 24 months (the 24-month course should not be repeated). Following teriparatide treatment sequential therapy with anti-resorptive drugs (bisphosphonates) is required to maintain the beneficial skeletal effects.

Estimates of the number of men anticipated to receive treatment with teriparatide were based on input from health boards and clinical expert advice which estimates that initially 43 men each year would receive it. It was assumed that all men receive one year of teriparatide injections and 90% receive a second year of teriparatide (10% discontinue after one year of treatment). It was assumed there would be an increase in men treated of 10% in year 3 and 15% in year 4 due to increased diagnosis. Teriparatide would displace use of current treatment (alendronic acid,

risedronate and denosumab). Teriparatide costs were based on confidential all Wales drug contract pricing and other medicine costs were obtained from the NHS drug tariff. Teriparatide costs were based on the average product price, obtained from Wales NHS prescribing data. More than 98% of teriparatide is supplied as a homecare product.

Table 1. Estimated costs associated with use of teriparatide for the treatment of osteoporosis in men assuming no men currently receive teriparatide

	Year 1	Year 2	Year 3	Year 4	Year 5
Number of new patients starting first year of treatment	43	43	47	49	49
Number of patients receiving second year of treatment	0	39	39	43	45
Number of men receiving teriparatide in year¶	43	82	86	92	94
Medicine acquisition costs in a market without teriparatide	£8,081	£15,409	£16,161	£17,289	£17,664
Medicines acquisition costs in a market with teriparatide	*	*	*	*	*
Teriparatide net acquisition costs	*	*	*	*	*
Teriparatide net acquisition cost reduced by 77%**	*	*	*	*	*

¶based on initial cohort of 43 men, 2 years treatment with 10% discontinuing after the first year of treatment, with 10% increase in Year 3 and 15% in Year 4.
**based on health board reports of 77% of the cohort already receiving teriparatide.
*commercial in confidence figures removed

The use of teriparatide for the treatment of osteoporosis in men is estimated to have a total net cost of approximately [commercial in confidence figure removed] in Year 1 increasing to [commercial in confidence figure removed] in Year 5 as shown in Table 1. These costs are based on teriparatide displacing existing medicines used for treatment of osteoporosis and assume no men are currently receiving teriparatide. After completion of two years of teriparatide treatment patients will resume bisphosphonate use, in line with the summary of product characteristics. Some health boards in Wales already provide access to teriparatide and it is estimated that approximately 77% of the cohort currently receive it. Taking this into consideration the effective net acquisition costs are estimated to be reduced by 77% as shown in Table 1. Prescribing costs for Jan 2023 to December 2024 are [commercial in confidence figure removed] covering predominately use in women and equivalent to approximate use in 478 people.

Additional notes

Impact on health and social care services

Teriparatide treatment is anticipated to result in reduced fractures in men with osteoporosis which would reduce cost of treatment. Clinical opinion suggests in the

absence of teriparatide, re-fracture is anticipated to occur in between 18% to 30% of patients in the relevant population over 2 years. Literature studies differ in the estimates of fracture reduction using teriparatide e.g. risk of vertebral fractures reduced by 51% and moderate or severe fractures reduced by 83% over 42 months (Kaufman et al 2004) and reduction in hip fractures by 56% over a median duration of 18 months (Perez et al 2019,). Clinical expert opinion is that the proportion of fractures avoided is between 30-45% per year. Based on Welsh data received from clinicians the average cost to the NHS per fracture is approximately £5,489 (includes acute care costs, primary care costs and social care costs). This leads to cost savings based on fracture reductions for patients varying between 2 fractures (£11,000) and 4 fractures (£22,000) in year 1 and between 4 fractures (£22,000) and 9 fractures (£49,400) in year 5. Patients are monitored 3 months after fracture and every 6 months thereafter. No additional monitoring is anticipated as a result of use of the medicine in men.

Patient factors

Clinicians describe teriparatide as a treatment of choice for vertebral fractures or treatment failure on anti-resorptives (bisphosphonates). It would be offered to men to protect them from re-fracture or fragility fracture if they have very severe osteoporosis. Re-fracture involves inpatient or outpatient attendance, reduced independence, decreased quality of life and time spent away from home.

Equality impact assessment

AWTTC have completed an Equality and Health Impact Assessment in parallel with each development stage of the project. This follows the five ways of working for public bodies, and work to achieving the wellbeing goals, outlined in the Well-Being of Future Generations (Wales) Act 2015

Additional information
This report does not cover the use of teriparatide to treat osteoporosis associated with glucocorticoid therapy. First line use of teriparatide is also outside the scope of this report.

Homecare provides the patient with injection technique training in their home with a nurse to support initiation of therapy. The Homecare delivery option offers an opportunity to monitor therapy concordance and highlight any challenges to the prescribing health care professional

Appendix 1: NHSE Inclusion, exclusion, starting and stopping criteria

Inclusion criteria
Teriparatide is recommended as an alternative treatment option for the secondary prevention of osteoporotic fragility fractures in men.

Exclusion criteria
Patients are excluded if they meet any of the following criteria:
• Severe renal impairment.
• Paediatric patients (less than 18 years), or young adults with open epiphyses.
• Hypersensitivity to the active substance or to any of the excipients
• Pre-existing hypercalcaemia
• Metabolic bone diseases (including hyperparathyroidism and Paget's disease of the bone) other than primary osteoporosis or glucocorticoid-induced osteoporosis
• Unexplained elevations of alkaline phosphatase
• Prior external beam or implant radiation therapy to the skeleton
• Patients with skeletal malignancies or bone metastases should be excluded from treatment with teriparatide

In addition, caution should be exercised in moderate renal impairment**.**

Starting criteria
Using the criteria in NICE TA161 as a guide, teriparatide is recommended as an alternative treatment option for the secondary prevention of osteoporotic fragility fractures in men:

• Who are unable to take alendronate and risedronate, or have a contraindication to or are intolerant of alendronate and risedronate (see below), or who have had an unsatisfactory response, which is defined as occurring when a man has another fragility fracture despite adhering fully to treatment for 1 year and there is evidence of a decline in BMD below his pre-treatment baseline, 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.

Because fracture incidence is related to absolute bone density regardless of gender it is important that this is taken into account when calculating fracture risk. Accordingly,

Tscores used for fracture risk calculation in men should be based on the National Health and Nutrition Examination Survey (NHANES) female reference database. The online version of the FRAX Fracture Risk Assessment Tool does this automatically if absolute bone mineral density is entered and the manufacturer of the densitometer specified.

In line with the NICE guidance, intolerance of alendronate or risedronate 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.

Dose
The adult male dose is 20 micrograms daily for a maximum of 24 months.

Stopping criteria
Treatment may be stopped if the patient has adverse reactions. The maximum total duration of treatment with teriparatide should be 24 months. The 24-month course of teriparatide should not be repeated over a patient's lifetime**.**

This report should be cited as: All Wales Therapeutics and Toxicology Centre. Evidence status report for a limited assessment. Teriparatide 20 micrograms/80 microlitres solution for injection. Reference number: 6561. May 2025.