Integrated Impact Assessment Report for Clinical Commissioning Policies

Policy Reference Number	A03X06		
Policy Title	Teriparatide for the treatment of osteogenesis imperfecta (Adults)		
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Section K - Activity Impact			
Theme	**Questions**	**Comments** (Include source of information and details of assumptions made and any issues with the data)	
K1 Current Patient Population & Demography / Growth	K 1.1 What is the prevalence of the disease/condition?	K1. 1 This policy proposes a **not-routinely commissioned** position for the use of teriparatide for the treatment of osteogenesis imperfecta in adults. **Osteogenesis imperfecta** (OI) is estimated to be present in 1 in every 15,000 people.[i] There may therefore be approximately 3,600 people of all ages in England with OI in 2014/15.[ii]	
	K1.2 What is the number of patients	K1.2 The population **considered for treatment** is a subset of the	

	currently eligible for the treatment under the proposed policy?	prevalent population; and those eligible for treatment may:[iii] • require treatment to prevent or reduce future fractures; and • not respond in terms of fracture reduction or do not show increased bone density after treatment with either first line (bisphosphonates) or second line treatments. It is estimated that the majority of patients with OI have low bone density and may require treatment to prevent or reduce future fractures.[iv] Adult patients typically require no treatment, rather just monitoring of their bone density and fractures. When requiring treatment, bisphosphonates are widely used and considered the prevailing standard of care for moderate to severe forms of OI. Patients tend to only use other treatments when contraindicated to bisphosphonates, or if they are ineffective.[v] It is not known exactly how many of these would require treatment with teriparatide. When the patient is stable, however, they would not require teriparatide. As such, the number of patients requiring the drug it is expected to be minimal.[vi]
	K1.3 What age group is the treatment indicated for?	K1.3 The treatment is indicated for adults (18 years and over).
	K1.4 Describe the age distribution of the patient population taking up treatment?	K1.4 OI is a genetic condition and affects people of all ages. The frequency of fractures usually decreases after puberty but may increase beyond middle age.[vii]

	K1.5 What is the current activity associated with currently routinely commissioned care for this group?	K1.5 The number of patients who currently receive teriparatide has not been established. In 2014/15 there were 3 individual funding requests (IFRs) considered by NHS England for teriparatide for OI.[viii] Typically, adults with OI receive either no treatment or the following therapies:[ix] • bisphosphonates[x] ; or • other treatments used in the management of osteoporosis.[xi] These therapies are used to reduce bone turnover but the main concern is the risk of over suppressing bone turnover which can result in poor bone quality. [xii] Unlike other treatments for OI, teriparatide works by stimulating bone formation, bone mass and thereby increasing resistance to fracture,[xiii] whereas all the other established treatments work by inhibition of bone resorption.[xiv] Following successful treatment with teriparatide, where patients no longer suffer from bone fractures and have increased bone density, patients would be monitored closely and may require antiresorptive therapy where they are not contraindicated.[xv] Following unsuccessful treatment with teriparatide, where bone density does not increase to appropriate level, patients may continue to receive antiresorptive therapies, but no longer be treated with teriparatide.[xvi]
	K1.6 What is the projected growth of the disease/condition prevalence (prior to	K1.6 No change to the future prevalence rate is anticipated. The prevalent population identified in K1.1 could grow in line with

	applying the new policy) in 2, 5, and 10 years?	population growth and is estimated to be in the region of[xvii]: • ~ 3,670 in 2016/17 (year 1) • ~ 3,690 in 2017/18 (year 2) • ~ 3,770 in 2020/21 (year 5)
	K1.7 What is the associated projected growth in activity (prior to applying the new policy) in 2,5 and 10 years?	K1.7 In the 'do nothing' scenario, activity is anticipated to remain around the same level as noted in K1.5.
	K1.8 How is the population currently distributed geographically?	K1.8 Across England, based on the evidence reviewed, no significant geographical differences in the disease have been identified.
K2 Future Patient Population & Demography	K2.1 Does the new policy: move to a non-routine commissioning position / substitute a currently routinely commissioned treatment / expand or restrict an existing treatment threshold / add an additional line / stage of treatment / other?	K2.1 This policy proposes a **non-routine commissioning** position.
	K2.2 Please describe any factors likely to affect growth in the patient population for this intervention (e.g. increased disease prevalence, increased survival).	K2.2 Although OI is a family of genetic disorders that are inherited between generations; there may be genetic and environmental factors that influence the severity of OI. There is evidence that additional genes and environmental factors, which may include nutritional status during development, may affect the severity of OI.[xviii]

	K 2.3 Are there likely to be changes in geography/demography of the patient population and would this impact on activity/outcomes? If yes, provide details.	K2.3 No evidence of changes.
	K2.4 What is the resulting expected net increase or decrease in the number of patients who will access the treatment per year in year 2, 5 and 10?	K2.4 The proposed policy establishes a 'not routinely commissioned' position for the relevant population (the specific cohort set out in K1.2). The number of patients who fall outside of the cohort covered by the proposed policy, or for whom exceptionality might be demonstrated, is likely to be very small. As noted in K1.5, the number of patients who currently receive the treatment could not be identified and is expected to be minimal. Under the policy, these patients would continue to receive teriparatide for up to two years.[xix] Once treatment is completed patients may require no further treatment, provided bone density has increased, or may require treatment with bisphosphonates.[xx] **No new patients are expected to receive teriparatide** and would likely receive antiresorptive therapies as described in K1.5. As such, the net decrease in patients receiving teriparatide would depend on when current patients stop receiving treatment, and future use of teriparatide is assumed to be broadly zero.[xxi]
K3 Activity	K3.1 What is the current annual activity for the target population covered under the new policy? Please provide details in accompanying excel sheet.	K3.1 Current annual activity is estimated in K1.5.
	K3.2 What will be the new activity should	K3.2 Please refer to K2.4.

	the new / revised policy be implemented in the target population? Please provide details in accompanying excel sheet. K3.3 What will be the comparative activity for the 'Next Best Alternative' or 'Do Nothing' comparator if policy is not adopted? Please details in accompanying excel sheet.	K3.3 Please refer to K2.4.
K4 Existing Patient Pathway	K4.1 If there is a relevant currently routinely commissioned treatment, what is the current patient pathway? Describe or include a figure to outline associated activity.	K4.1 Patient enters into adult bone specialist service pathway from the following sources: • Patients diagnosed with osteogenesis imperfecta in childhood who move from the paediatric to adult service as they transition into adulthood; • Patients undiagnosed in childhood who are diagnosed with osteogenesis imperfecta as adults, or adults who were diagnosed with osteogenesis imperfecta as children who had been lost from paediatric system; • Parents identified as a result of their children diagnosed with osteogenesis imperfecta; or • Adults with OI identified as part of work up for osteoporosis. These patients are all referred to a bone specialist for assessment and their medical history is reviewed, including their history of hearing and heart problems. Patients will have a bone density assessment using dual X-ray absorptiometry (DXA) to measure bone mineral density, and a biochemistry assessment. If the patient has deficiency in vitamin D, they will receive therapy to increase vitamin D levels.

		If the patient is not suffering with bone fractures, there is no need for treatment and the patient follows a programme of regular monitoring. A bone density assessment is repeated 18 to 24 months later, together with a biochemistry analysis. If the patient continues without fractures, they will have a third bone density assessment 18 to 24 months later. If bone density declines, the patient will begin treatment to prevent or reduce future fractures. First line treatment is an antiresorptive therapy of bisphosphonate, if patients are contraindicated for bisphosphonate, patients will be treated with other treatments.
	K4.2. What are the current treatment access criteria?	K4.2 Patients receive antiresorptive therapy of bisphosphonate if they have bone fractures, or if during regular assessment the patient's bone density has declined. If patients are contraindicated for bisphosphonate, patients will be treated with other treatments.
	K4.3 What are the current treatment stopping points?	K4.3 Treatment with bisphosphonates is generally recommended for around five years. Studies suggest a rapid loss of gain in bone density and anti-fracture efficacy upon withdrawal of denosumab, therefore treatment needs to be long term and measures to ensure compliant usage must be in place.
K5 Comparator (next best alternative treatment) Patient Pathway	K5.1 If there is a 'next best' alternative routinely commissioned treatment what is the current patient pathway? Describe or include a figure to outline associated activity.	K5.1 There is no comparator to teriparatide that acts in the same way and stimulates bone formation.

	K5.2 Where there are different stopping points on the pathway please indicate how many patients out of the number starting the pathway would be expected to finish at each point (e.g. expected number dropping out due to side effects of drug, or number who don't continue to treatment after having test to determine likely success). If possible please indicate likely outcome for patient at each stopping point.	K5.2 Please refer to K4.3.
K6 New Patient Pathway	K6.1 Describe or include a figure to outline associated activity with the patient pathway for the proposed new policy. K6.2 Where there are different stopping points on the pathway please indicate how many patients out of the number starting the pathway would be expected to finish at each point (e.g. expected number dropping out due to side effects of drug, or number who don't continue to treatment after having test to determine likely success). If possible please indicate likely outcome for patient at each stopping point.	K6.1 The patient pathway does not change as this policy recommends a not routinely commissioned position for teriparatide. K6.2 No change
K7 Treatment Setting	K7.1 How is this treatment delivered to the patient? o Acute Trust: Inpatient/Daycase/	K7.1 Teriparatide would be delivered through homecare delivery.[xxii]

	Outpatient ○ Mental Health Provider: Inpatient/Outpatient ○ Community setting ○ Homecare delivery K7.2 Is there likely to be a change in delivery setting or capacity requirements, if so what? *e.g. service capacity*	K7.2 No change, proposed as not routinely commission.
K8 Coding	K8.1 In which datasets (e.g. SUS/central data collections etc.) will activity related to the new patient pathway be recorded? K8.2 How will this activity related to the new patient pathway be identified?(e.g. ICD10 codes/procedure codes)	K8.1 Not applicable given the not routinely commission position. K8.2 Not applicable given the not routinely commission position.
K9 Monitoring	K9.1 Do any new or revised requirements need to be included in the NHS Standard Contract Information Schedule? K9.2 If this treatment is a drug, what pharmacy monitoring is required?	K9.1 No, proposed as not routinely commission. K9.2 Not applicable as proposed to not routinely commission.

	K9.3 What analytical information /monitoring/ reporting is required?	K9.3 Not applicable as proposed to not routinely commission.	
	K9.4 What contract monitoring is required by supplier managers? What changes need to be in place?	K9.4 Not applicable as proposed to not routinely commission.	
	K9.5 Is there inked information required to complete quality dashboards and if so is it being incorporated into routine performance monitoring?	K9.5 Not applicable as proposed to not routinely commission.	
	K9.6 Are there any directly applicable NICE quality standards that need to be monitored in association with the new policy?	K9.6 Not applicable as proposed to not routinely commission.	
	K9.7 Do you anticipate using Blueteq or other equivalent system to guide access to treatment? If so, please outline. *See also linked question in M1 below*	K9.7 Not applicable as proposed to not routinely commission.	
Section L - Service Impact			
Theme	**Questions**	**Comments** (Include source of information and details of assumptions made and any issues with the data)	
L1 Service Organisation	L1.1 How is this service currently	L1.1 Patients with osteogenesis imperfecta are referred to a bone	

	organised? (i.e. tertiary centres, networked provision)	specialist for treatment that is overseen by a MDT. If the patient is not suffering with bone fractures, there is no need for treatment and the patient follows a programme of regular monitoring, overseen by the consultant responsible for OI in the patient's local area.
	L1.2 How will the proposed policy change the way the commissioned service is organised?	L1.2 No change expected
L2 Geography & Access	L2.1 Where do current referrals come from?	L2.1 Referrals come from the following main sources: • Patients diagnosed with osteogenesis imperfecta in childhood who move from the paediatric to adult service as they transition into adulthood; • Patients undiagnosed in childhood who are diagnosed with osteogenesis imperfecta as adults, or adults who were diagnosed with osteogenesis imperfecta as children who had been lost from paediatric system; • Parents identified as a result of their children diagnosed with osteogenesis imperfecta; or • Adults with OI identified as part of work up for osteoporosis. Referrals may also come from GPs or incidental diagnosis.
	L2.2 Will the new policy change / restrict / expand the sources of referral?	L2.2 No change

	L2.3 Is the new policy likely to improve equity of access?	L2.3 No change
	L2.4 Is the new policy likely to improve equality of access / outcomes?	L2.4 No change
L3 Implementation	L3.1 Is there a lead in time required prior to implementation and if so when could implementation be achieved if the policy is agreed?	L3.1 No, proposed not routinely commission.
	L3.2 Is there a change in provider physical infrastructure required?	L3.2 No, proposed not routinely commission.
	L3.3 Is there a change in provider staffing required?	L3.3 No, proposed not routinely commission.
	L3.4 Are there new clinical dependency / adjacency requirements that would need to be in place?	L3.4 No, proposed not routinely commission.
	L3.5 Are there changes in the support services that need to be in place?	L3.5 No, proposed not routinely commission.

	L3.6 Is there a change in provider / inter-provider governance required? (e.g. ODN arrangements / prime contractor)	L3.6 No, proposed not routinely commission.
	L3.7 Is there likely to be either an increase or decrease in the number of commissioned providers?	L3.7 No.
	L3.8 How will the revised provision be secured by NHS England as the responsible commissioner? (e.g. publication and notification of new policy, competitive selection process to secure revised provider configuration)	L3.8 No change.
L4 Collaborative Commissioning	L4.1 Is this service currently subject to or planned for collaborative commissioning arrangements? (e.g. future CCG lead, devolved commissioning arrangements)	L4.1 No
Section M - Finance Impact		
Theme	**Questions**	**Comments** (Include source of information and details of assumptions made and any issues with the data)
M1 Tariff	M1.1 Is this treatment paid under a national prices*, and if so which?	M1.1 Teriparatide is listed as a high cost drug and would therefore be excluded from national prices.
	M1.2 Is this treatment excluded from	M1.2 The drug is excluded from national prices.

	national prices?	
	M1.3 Is this covered under a local price arrangements (if so state range), and if so are you confident that the costs are not also attributable to other clinical services?	M1.3 As a high cost drug, teriparatide may be subject to local price negotiations. The price for teriparatide (Forsteo ®), listed on the dictionary of medicines is: • £272 (or £326 including VAT) for for a pack containing a 2.4ml pre-filled disposable injection.[xxiii] For a daily dose of 20 micrograms, this would cover 30 doses, but is only stable for 28 days once opened.[xxiv]
	M1.4 If a new price has been proposed how has this been derived / tested? How will we ensure that associated activity is not additionally / double charged through existing routes?	M1.4 Not applicable.
	M1.5 is VAT payable (Y/N) and if so has it been included in the costings?	M1.5 VAT would be recoverable under certain specific conditions[xxv]. It is assumed here that VAT would be recoverable for teriparatide delivered through homecare.
	M1.6 Do you envisage a prior approval / funding authorisation being required to support implementation of the new policy?	M1.6 No
M2 Average Cost per Patient	M2.1 What is the revenue cost per	M2.1 The cost per patient per year for teriparatide is expected to be

	patient in year 1?	zero following a decision to not routinely commission the drug. For reference, the cost per patient per year for teriparatide is estimated to be c. £3,550.[xxvi] This is calculated under the assumption that each patient receives a supply every four weeks, and the use in line with the recommended dose of teriparatide of 20 micrograms per day.[xxvii] As described in K1.5, patients are likely to require antiresorptive therapies when requiring treatment. This could cost in the region of £55 to £296 per year.[xxviii]
	M2.2 What is the revenue cost per patient in future years (including follow up)?	M2.2 Patients would only receive teriparatide for up to 2 years[xxix], and as such the cost per patient for teriparatide would be zero in the years after this. The cost per patient in future years for teriparatide may be flat until 2018/19 at least. The patent for teriparatide is set to expire in December 2018.[xxx] Following the expiration of the patent, the price for teriparatide may decrease, however the impact of this is unknown.
M3 Overall Cost Impact of this Policy to NHS England	M3.1 Indicate whether this is cost saving, neutral, or cost pressure to NHS England.	M3.1 This is expected to be **broadly cost neutral** to NHS England given: i. Current activity is expected to be minimal, as identified in K1.5; ii. Under the policy the future use of teriparatide for the patient group will be close to zero, as discussed in K2.4; and iii. Instead of teriparatide, patients are likely to receive antiresorptive therapy.

	M3.2 Where this has not been identified, set out the reasons why this cannot be measured.	M3.2 Not applicable.
M4 Overall cost impact of this policy to the NHS as a whole	M4.1 Indicate whether this is cost saving, neutral, or cost pressure for other parts of the NHS (e.g. providers, CCGs).	M4. This is expected to be cost neutral to other parts of the NHS.
	M4.2 Indicate whether this is cost saving, neutral, or cost pressure to the NHS as a whole.	M4.2 This is expected to be **broadly cost neutral** to the NHS as a whole.
	M4.3 Where this has not been identified, set out the reasons why this cannot be measured.	M4.3 Not applicable.
	M4.4 Are there likely to be any costs or savings for non NHS commissioners / public sector funders?	M4.4 None identified.
M5 Funding	M5.1 Where a cost pressure is indicated, state known source of funds for investment, where identified. *e.g. decommissioning less clinically or cost-effective services*	M5.1 Not applicable.
M6 Financial Risks Associated with	M6.1 What are the material financial	M6.1 Not applicable.

Implementing this Policy	risks to implementing this policy? M6.2 Can these be mitigated, if so how? M6.3 What scenarios (differential assumptions) have been explicitly tested to generate best case, worst case and most likely total cost scenarios?	 M6.2 Not applicable. M6.3 Not applicable.
M7 Value for Money	M7.1 What evidence is available that the treatment is cost effective? *e.g. NICE appraisal, clinical trials or peer reviewed literature* M7.2 What issues or risks are associated with this assessment? *e.g. quality or availability of evidence*	M7.1 and M7.2 There is currently no evidence on comparative clinical or cost effectiveness of teriparatide with other conventional therapies for OI.
M8 Cost Profile	M8.1 Are there non-recurrent capital or revenue costs associated with this policy? *e.g. Transitional costs, periodical costs* M8.2 If so, confirm the source of funds to meet these costs.	M8.1 None identified. M8.2 Not applicable.

[i] Brittle Bone Society. (2015). Osteogenesis Imperfecta Factsheet. [Online] available at: http://brittlebone.org/assets/files/87045%20General%20Factsheet.pdf [accessed on 06/01/2015].

[ii] This applies the prevalence rates to ONS (2012) population projections for the population of England in 2014.

[iii] Based on discussions with the policy working group.

[iv] Osteogenesis Imperfecta Foundation. (2007) Bone Mineral Density: What it means and How to Measure it. [Online] available at: http://www.oif.org/site/DocServer/Bone_Mineral_Density.pdf?docID=7185 [accessed 6th January 2016]

[v] Policy proposition

[vi] Based on discussions with the policy working group

[vii] Smith, S. and Marini, J. (2015). Osteogenesis Imperfecta. [Online] available at: http://www.ncbi.nlm.nih.gov/books/NBK279109/ [accessed 6th January 2016]

[viii] Based on discussions with the policy working group.

[ix] Based on discussions with the policy working group.

[x] These were the relevant comparators listed in the Scottish Medicines Consortium No. (490/08). Accessed online via: http://www.scottishmedicines.org.uk/files/teriparatide__Forsteo__FINAL_July_2008.doc_for_website.pdf

[xi] Based on discussions with the policy working group)

[xii] Rejnmark, L. and Mosekilde, L. (2011). New and Emerging Antiresorptive Treatments in Osteoporosis. Current Drug Safety, 6(2), pp.75-88.

[xiii] Based on discussions with the policy working group

[xiv] Policy proposition

[xv] Based on discussions with the policy working group.

[xvi] Based on discussions with the policy working group.

[xvii] Demographic growth rates are sourced from ONS (2012), Population projections.

[xviii] Wang, X., Pei, Y., Dou, J., Lu, J., Li, J. and Lv, Z. (2015). Identification of a novel COL1A1 frameshift mutation, c.700delG, in a Chinese osteogenesis imperfecta family. Genetics and Molecular Biology, 38(1), pp.1-7.

[xix] Please refer to the policy proposition.

[xx] Based on discussions with the policy working group.

[xxi] Please note that a subset of elderly women with OI may satisfy NICE TAG161 for osteoporosis and may receive teriparatide through this route. (Source: based on discussions with the policy working group)

[xxii] Based on discussions with the policy working group.

[xxiii] Dmd.medicines.org.uk, (2016). Dictionary of Medicines and Devices Browser Portal. [online] Available at: http://dmd.medicines.org.uk/DesktopDefault.aspx?AMPP=19606811000001108&toc=nofloat [Accessed 6 Jan. 2016].

[xxiv] NHS Northern Treatment Advisory Group (2015), Teriparatide (Forsteo®) for the treatment of bisphosphonate-induced atypical fractures. [Online] available at: http://ntag.nhs.uk/docs/app/NTAG-Appraisal%20Report-Teriparatide-for-atypical-fractures-final.pdf.

[xxv] Please refer to Section 3.2 of VAT Notice 701/557 (https://www.gov.uk/government/publications/vat-notice-70157-health-professionals-and-pharmaceutical-products/vat-notice-70157-health-professionals-and-pharmaceutical-products)

[xxvi] As a point of triangulation, the estimated cost annual cost based on IFR submissions is £3,262.

[xxvii] Based on discussions with the policy working group.

[xxviii] NICE technology appraisal guidance [TA161], Alendronate, etidronate, risedronate, raloxifene, strontium ranelate and teriparatide for the secondary prevention of osteoporotic fragility fractures in postmenopausal women. [Online] available at: https://www.nice.org.uk/guidance/ta161/chapter/the-technologies. Figures exclude VAT.

[xxix] Based on discussions with the policy working group.

[xxx] This is the date at which the Supplementary Protection Certificate (SPC) is due to expire.