Integrated Impact Assessment Report for Clinical Commissioning Policies

Policy Reference Number	A03X04		
Policy Title	Cinacalcet for complex primary hyperparathyroidism		
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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 to **routinely commission** the use of cinacalcet for adults with complex primary hyperparathyroidism where surgery is indicated but has not been undertaken. **Primary hyperparathyroidism (PHPT)** has an estimated prevalence of c. 6.7 per 1,000 of the population.[i] There is therefore estimated to be approximately 285,850 adults with PHPT in England in 2014/15.[ii]	

	K1.2 What is the number of patients currently eligible for the treatment under the proposed policy?	K1.2 The population **eligible for treatment** is a subset of the prevalent population; those who meet the criteria for parathyroidectomy[iii] but are either: i. unfit for, or have refused to undergo surgery; and are either symptomatic with calcium concentration between 2.8-3.0mmol/l or have calcium concentration above 3.0mmol/l; or ii. have not been cured by surgery or have a disease pattern not amenable to surgery and have raised blood calcium concentration, as stated above. Of the 285,850 identified in K1.1, it is estimated that around 30% would meet the surgical criteria (c. 85,755 people)[iv]. Of these patients, those requiring cinacalcet can be split into two groups:[v] 1. 5% (4,290 patients) are estimated to be unfit for or refuse surgery and c. 30% of these **(1,285 patients)** may be symptomatic and have a calcium concentration between 2.8-3.0mmol/L or have a calcium concentration greater than 3.0mmol/L and require cinacalcet. 2. Of the 95% (81,465) of patients fit for surgery, 3% (2,445) may have not been cured by the parathyroidectomy[vi]. 30% of these **(735 patients)** may have a raised calcium concentration and be eligible for cinacalcet[vii]. In total there may therefore be c. **2,020 patients** currently eligible under the policy. *It should be noted that there is a real lack of evidence regarding the epidemiology for complex primary hyperparathyroidism and as such this estimate should be used with caution.*

	K1.3 What age group is the treatment indicated for?	K1.3 Cinacalcet is indicated for adults (aged 18 years and over).
	K1.4 Describe the age distribution of the patient population taking up treatment?	K1.4 PHPT is found in all age groups; although it rarely develops in children.[viii] Furthermore, the chance of developing PHPT increases with age and are most often diagnosed between the age of 60 and 70.[ix] The prevalence of PHPT is significantly higher in postmenopausal women, with a prevalence rate of 10 to 30 per 1,000 compared to 6.7 per 1,000 in the general population[x], as described in K1.1.
	K1.5 What is the current activity associated with currently routinely commissioned care for this group?	K1.5 Cinacalcet for patients with complex PHPT is currently being prescribed; however there is variation in current practice and funding arrangements across the country. For example, some areas have shared care arrangements in place with primary care. Given the uncertainty around this, the current number of patients receiving cinacalcet for complex PHPT could not be estimated. PHPT affects the parathyroid glands, causing inappropriately raised levels of parathyroid hormone relative to the concentrations of calcium in the body. In turn this causes blood calcium concentration to climb and blood phosphate concentration to fall. The definitive treatment option for these patients is parathyroidectomy.[xi] As surgery is not an option for the target patient group, they are at risk of uncontrolled calcium concentrations and may go on to develop complications such as:

		• osteoporosis, with increased risk of fractures ; • kidney stones[xii] ; or • hypercalcaemic crises requiring acute hospital admission and intravenous therapy. In the most severe cases this is a medical emergency which, if untreated, could result in seizures or a coma.[xiii] The patient group as a whole is closely monitored with regular blood tests and bone density scans. [xiv] In some cases, patients' symptoms may be treated with antiresorptive drugs that inhibit the increased bone turnover, which include: [xv] • Oestrogen-like compounds; and • Bisphosphonates. Unlike these drugs, cinacalcet is the first calcimimetic that interferes with parathyroid hormone secretion and regulates calcium homeostasis.[xvi]
	K1.6 What is the projected growth of the disease/condition prevalence (prior to applying the new policy) in 2, 5, and 10 years?	K1.6 No change to the future prevalence rate has been identified. The population of adults with PHPT identified in K1.2 could grow in line with population growth and is estimated to be in the region of[xvii]: • ~ 290k in 2016/17 (year 1) • ~ 290k in 2017/18 (year 2) • ~ 300k 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' it is estimated that the activity for the target population, which as described inK1.5 cannot be established, would grow in line with demographic growth.
	K1.8 How is the population currently distributed geographically?	K1.8 Across England, no significant geographical differences have been identified. There may, however, be geographical differences in the reported prevalence due to the variability of efficient screening and diagnosis of PHPT across England.[xviii]
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 The policy proposes that cinacalcet is to be **routinely commissioned** for adults with complex PHPT who are unsuitable for surgery. This adds an additional treatment line for the target population.
	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 Factors affecting the prevalence of PHPT are likely to include: • Detection and diagnosis methods[xix] • Vitamin D deficiency in the population;[xx] and • The use of irradiation of the neck and upper chest for benign diseases[xxi]
	K 2.3 Are there likely to be changes in geography/demography of the patient population and would this impact on	K2.3 No evidence of changes.

	activity/outcomes? If yes, provide details.	
	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 Given there is variation in current prescribing of cinacalcet for patients with complex primary hyperparathyroidism across the country, whether the policy would lead to a net increase or decrease in the number of patients accessing cinacalcet is unknown. However, as described in K1.5, this patient group is currently being closely monitored and this interaction with the health service is likely to remain unchanged whether or not these patients receive cinacalcet.
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 The number of patients currently receiving cinacalcet for complex primary hyperparathyroidism is unknown, as discussed in K1.5.
	K3.2 What will be the new activity should the new / revised policy be implemented in the target population? Please provide details in accompanying excel sheet.	K3.2 As identified in K2.4, the net increase in the number of patients receiving cinacalcet is unknown; however this is not expected to impact on their interaction with the health service for routine monitoring.[xxii]
	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 Future activity in the 'do nothing' is described in K1.7.

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 Patients in whom there is a suspicion of hyperparathyroidism will be referred by their GPs to endocrine MDTs who undertake further investigations and consider best interventions. First line treatment for primary hyperparathyroidism is surgical resection i.e. parathyroidectomy. Some patients meet the criteria for surgery but do not undergo surgery as they are either contraindicated or chose not to undertake the operation. In addition, some patients who undergo parathyroidectomy will develop residual disease that is not amendable to resection. These patients are at risk of sequelae of hypercalcaemia including renal stones, low bone mineral density (and thus fractures) and acute hypercalcaemic crises. Currently, there is no treatment pathway to manage these patients. This cohort of patients do not currently receive any treatment once ruled out of surgery and therefore there is no comparator treatment.
	K4.2. What are the current treatment access criteria?	K4.2 Criteria for parathyroidectomy include: (1) Evidence of end organ disease (e.g. low bone density, renal calculi) (2) Symptomatic PHPT (e.g. fatigue, change in cognitive status, nausea, constipation and thirst) (3) Serum calcium greater than 0.25mmol/L above the upper limit of reference range (4) Creatinine clearance less than 60ml/min (5) Low bone mineral density as evidenced by a T score less than -2.5 or previous fragility fractures

	K4.3 What are the current treatment stopping points?	K4.3 Of those eligible for surgery, an estimated 5% do not undergo the procedure and have no further treatment options under the current pathway. For those who do undergo the procedure, parathyroidectomy is 97% effective at treating hyperparathyroidism and so these patients would leave the pathway following surgery. The remaining 3% have no further treatment options under the current pathway.
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. K5.2 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.	K5.1 As K4.1 K5.2 The estimated needs requirement for cinacalcet use in England is identified in K1.1.
K6 New Patient Pathway	K6.1 Describe or include a figure to outline associated activity with the patient pathway for the proposed new policy.	K6.1 and K6.2 – please refer to the policy proposition for the diagram of the pathway. Cinacalcet will be discontinued if clinically relevant reductions in

		serum calcium are not maintained or if the patient is intolerant to the medication. If it is proving effective at controlling serum calcium concentration in this patient cohort, cinacalcet will be continued long term.
	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.	
K7 Treatment Setting	K7.1 How is this treatment delivered to the patient? o Acute Trust: Inpatient/Daycase/ Outpatient o Mental Health Provider: Inpatient/Outpatient o Community setting o Homecare delivery	K7.1 How cinacalcet is delivered to the patient is variable across the country.[xxiii] In some parts of the country shared care arrangements are in place, via local agreement. Where this is the case, cinacalcet is prescribed in Primary Care. Where shared care is not place, cinacalcet is prescribed through the consultant or specialist clinician at an Acute Trust.[xxiv] The initiation of cinacalcet and titration to a stable maintenance dose will always be the responsibility of the specialised provider.
	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 anticipated change in delivery setting.

K8 Coding	K8.1 In which datasets (e.g. SUS/central data collections etc.) will activity related to the new patient pathway be recorded?	K8.1 The use of cinacalcet would be captured through hospital pharmacy monitoring,[xxv] Trusts would need to record indication to ensure that commissioners are not inappropriately charged for this indication which is not excluded from tariff. An annual audit for this indication should be undertaken for monitoring and assurance purposes.[xxvi]The use of cinacalcet in primary care can be captured through ePACT reports however this cannot identify the indication.
	K8.2 How will this activity related to the new patient pathway be identified?(e.g. ICD10 codes/procedure codes)	K8.2 Activity should be identified as described in K8.1. The relevant ICD-10 code for primary hyperparathyroidism is E21.0.[xxvii]
K9 Monitoring	K9.1 Do any new or revised requirements need to be included in the NHS Standard Contract Information Schedule?	K9.1 No.
	K9.2 If this treatment is a drug, what pharmacy monitoring is required?	K9.2 Cinacalcet is administered orally at a starting dose of 30mg, twice daily. Regular monitoring of serum calcium concentrations will dictate the titration of cinacalcet up to a maximum dose of 90mg, four times daily. Once dose adjustment has stabilised serum calcium and parathyroid hormone will be measured every 2-3 months.
	K9.3 What analytical information /monitoring/ reporting is required?	K9.3 Please refer to K8.1.
	K9.4 What contract monitoring is	K9.4. None as no changes to the NHS Shared Contract Information

	required by supplier managers? What changes need to be in place?	Schedule are expected.
	K9.5 Is there inked information required to complete quality dashboards and if so is it being incorporated into routine performance monitoring?	K9.5 No.
	K9.6 Are there any directly applicable NICE quality standards that need to be monitored in association with the new policy?	K9.6 No.
	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 A prior approval software platform would be used if available.[xxviii]
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 organised? (i.e. tertiary centres, networked provision)	L1.1 As per service specification A03/S/a.
	L1.2 How will the proposed policy change the way the commissioned	L1.2 No anticipated change.

	service is organised?	
L2 Geography & Access	L2.1 Where do current referrals come from?	L2.1 Referrals to endocrine specialists come from GPs and other specialities.
	L2.2 Will the new policy change / restrict / expand the sources of referral?	L2.2 No anticipated change to source of referral.
	L2.3 Is the new policy likely to improve equity of access?	L2.3 The new policy would provide equity of access to cinacalcet.
	L2.4 Is the new policy likely to improve equality of access / outcomes?	L2.4 The new policy would provide equality of access to cinacalcet and outcomes.
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 lead time prior to implementation.
	L3.2 Is there a change in provider physical infrastructure required?	L3.2 No anticipated provider changes.
	L3.3 Is there a change in provider staffing required?	L3.3 No anticipated change in staffing.

	L3.4 Are there new clinical dependency / adjacency requirements that would need to be in place?	L3.4 No anticipated changes.
	L3.5 Are there changes in the support services that need to be in place?	L3.5 No anticipated changes.
	L3.6 Is there a change in provider / inter-provider governance required? (e.g. ODN arrangements / prime contractor)	L3.6 No anticipated changes.
	L3.7 Is there likely to be either an increase or decrease in the number of commissioned providers?	L3.7 No anticipated changes.
	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 The use of cinacalcet will need prior authorisation from the nominated lead clinician at the specialised endocrinology centre.[xxix]
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 plans for collaborative commissioning.

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 Cinacalcet for complex primary hyperparathyroidism is not listed as a high cost drug and would therefore be included within the tariff. Payment by Results (PbR) guidance (2013/14) states that other than for renal dialysis, relevant tariff prices are intended to reimburse the associated costs of cinacalcet.[xxx]
	M1.2 Is this treatment excluded from national prices?	M1.1 No.
	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 The list price for cinacalcet (Mimpara®) is: • 30mg 28-tab pack: £126 or £151 including VAT[xxxi] • 60mg 28-tab pack: £232 or £278 including VAT[xxxii] • 90mg 28-tab pack: £348 or £418 including VAT[xxxiii] The patent for cinacalcet (Mimpara®) is expected to expire in 2019.[xxxiv] Following the expiration of the patent in the UK, generics may enter the market shortly after. The European Medicines Agency has approved a generic version of cinacalcet (Mylan) to be used to treat hyperparathyroidism.[xxxv] How this would be used and priced in England, however, is unclear.
	M1.4 If a new price has been proposed	M1.4 N/A

	how has this been derived / tested? How will we ensure that associated activity is not additionally / double charged through existing routes?	
	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[xxxvi]. It is assumed here that VAT would not be recoverable and is therefore included in the calculations in sections M2 and M3.
	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 patient in year 1?	M2.1 The annual cost per patient will depend on the dose regimen and treatment duration. The recommended starting dosage for cinacalcet is 30mg twice daily.[xxxvii] This dosage is then titrated every 2 to 4 weeks to a maximum dose of 90mg 4 times daily.[xxxviii] Patients typically take the drug lifelong[xxxix]. Although there may be a large range in maintenance dose, based on a sample of current practice, it is estimated that the majority of patients are maintained on a dose of 60 mg/day of cinacalcet.[xl] A weighted average annual maintenance dose is estimated to be **£4,235**.[xli, xlii] Whilst a benefit of cinacalcet is to prevent complications associated with PHPT, such as osteoporosis, kidney stones and hypercalcaemic crises, these have not been quantified given the uncertainty around

		the number of patients impacted. Costs associated with the monitoring and supervision of the drug are not expected to change with the policy.[xliii]
	M2.2 What is the revenue cost per patient in future years (including follow up)?	M2.2 The cost per patient in future years is likely to remain equal to that in estimated in M2.1. As mentioned in M1.3, this price may change if generics enter the market after 2019; however the impact of this is uncertain.
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 As described in M1.1, cinacalcet is not listed as a high cost drug for this indication and is therefore reimbursed through the tariff. From NHS England's perspective, there would be no change in expenditure from the 'do nothing' for this patient group as cinacalcet is included within tariff and as stated in K2.4, receiving cinacalcet is not expected to impact on a patient's interaction with the health service. As such the policy is estimated to be **cost neutral to NHS England**.
	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).	M4.1 There is uncertainty, and expected to be wide variation, around the current practice across the country for prescribing cinacalcet for patients with complex primary hyperparathyroidism. It is known that some providers have shared care arrangements in place with their GPs while others do not. Whether this is cost saving, neutral of a cost pressure to other parts of the NHS will depend on:

		• **Providers**. Whether they are currently over or under prescribing compared to the criteria in the proposed policy and the extent to which this is adequately reimbursed by the tariff[xliv]; and • **CCGs.** The degree to which shared care is in place. It should be noted that the introduction of any shared care arrangement would be via local agreement with CCGs. Given the points above, it is unclear whether this policy is cost saving, cost neutral or a cost pressure for other parts of the NHS. Aside from the direct cost impacts, there could be savings to other parts of the NHS from a reduction in the complications associated with PHPT, as described in M2.2. Given the uncertainty around activity, however, this has not been quantified.
	M4.2 Indicate whether this is cost saving, neutral, or cost pressure to the NHS as a whole.	M4.2 As described in M3.1 and M4.1, this is expected to be cost neutral to NHS England, be cost neutral or represent a cost pressure to the NHS as a whole depending on current practice.
	M4.3 Where this has not been identified, set out the reasons why this cannot be measured.	M4.3 The financial impact for NHS England has been identified in M3.1, and is expected to be cost neutral. The financial impact on other parts of the NHS, however, is uncertain given the uncertainty across: i) The epidemiology for complex primary hyperparathyroidism, and therefore the size of the target population for cinacalcet;

		ii) Current practice for prescribing cinacalcet by indication; and iii) Current funding arrangements (e.g. reimbursed through tariff or through shared care arrangements) The extent to which a routinely commissioned policy impacts upon current practice would determine the financial impact to the other parts of the NHS. Given the uncertainty described above, however, this has not been quantified.
	M4.4 Are there likely to be any costs or savings for non NHS commissioners / public sector funders?	M4.4 N/A
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 Implementing this Policy	M6.1 What are the material financial risks to implementing this policy?	M6.1 No material financial risks have been identified. The key areas of uncertainty are highlighted in M4.3.
	M6.2 Can these be mitigated, if so how?	M6.2 Not applicable.
	M6.3 What scenarios (differential assumptions) have been explicitly tested	M6.3 Given the uncertainty noted in M4.3, no scenarios have been

	to generate best case, worst case and most likely total cost scenarios?	generated.
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 – M7.2 No evidence for cost effectiveness demonstrated.
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 No. M8.2 N/A

[i] Yu, N., Donnan, P., Murphy, M. and Leese, G. (2009). Epidemiology of primary hyperparathyroidism in Tayside, Scotland, UK. Clinical Endocrinology, 71(4), pp.485-493.

[ii] This applies the prevalence rate to ONS (2012) population projections for England in 2014/15.

[iii] Please refer to K4.2 for the surgical criteria.

[iv] Based on discussions with the policy working group

[v] Assumptions are based on discussions with the policy working group

[vi] Policy proposition

[vii] (Ca > 3.00 or 3.00>Ca>2.85)

[viii] Lawson ML, Miller SF, Ellis G, Filler RM, Kooh SW (1996). Primary hyperparathyroidism in a paediatric hospital. Qjm 1996;89(12):921-32.

[ix] Dobrinja, C., Silvestri, M. and de Manzini, N. (2012). Primary Hyperparathyroidism in Older People: Surgical Treatment with Minimally Invasive Approaches and Outcome. International Journal of Endocrinology, 2012, pp.1-6.

[x] MacKenzie-Feder, J., Sirrs, S., Anderson, D., Sharif, J. and Khan, A. (2011). Primary Hyperparathyroidism: An Overview. International Journal of Endocrinology, 2011, pp.1-8.

[xi] Please refer to the policy proposition.

[xii] Please refer to the policy proposition.

[xiii] Policy proposition

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

[xv] Vestergaard, P. (2006). Current Pharmacological Options for the Management of Primary Hyperparathyroidism. Drugs, 66(17), pp.2189-2211. [online] available at : http://www.ncbi.nlm.nih.gov/pubmed/17137403. [Accessed 25 Nov. 2015].

[xvi] Vestergaard, P. (2006). Current Pharmacological Options for the Management of Primary Hyperparathyroidism. Drugs, 66(17), pp.2189-2211. [online] available at : http://www.ncbi.nlm.nih.gov/pubmed/17137403. [Accessed 25 Nov. 2015].

[xvii] Demographic growth rates are sourced from ONS (2012), Population projections. The demographic growth rate for the over 18s is applied.

[xviii] Åkerstrom , G. and Lundgren, E. (2001). Surgical Treatment: Evidence-Based and Problem-Oriented. Primary hyperparathyroidism. Department of Surgery, University Hospital, Uppsala, Sweden.) [online] available at http://www.ncbi.nlm.nih.gov/books/NBK7007/ [Accessed 25 Nov. 2015].

[xix] Åkerstrom , G. and Lundgren, E. (2001). Surgical Treatment: Evidence-Based and Problem-Oriented. Primary hyperparathyroidism. Department of Surgery, University Hospital, Uppsala, Sweden.) [online] available at http://www.ncbi.nlm.nih.gov/books/NBK7007/ [Accessed 25 Nov. 2015].

[xx] Adami, S., Marcocci, C. and Gatti, D. (2002). Epidemiology of primary hyperparathyroidism in Europe. J Bone Miner Res., [online] Suppl 2:N18-23. Available at: http://www.ncbi.nlm.nih.gov/pubmed/12412773 [Accessed 25 Nov. 2015].

[xxi] Adami, S., Marcocci, C. and Gatti, D. (2002). Epidemiology of primary hyperparathyroidism in Europe. J Bone Miner Res., [online] Suppl 2:N18-23. Available at: http://www.ncbi.nlm.nih.gov/pubmed/12412773 [Accessed 25 Nov. 2015].

[xxii] Based on discussions with the policy working group

[xxiii] Based on discussions with the policy working group

[xxiv] Based on discussions with the policy working group

[xxv] Based on discussions with the policy working group

[xxvi] Based on discussions with the policy working group

[xxvii] International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10), WHO Version for 2016.

[xxviii] Based on discussions with the policy working group

[xxix] Policy proposition

[xxx] Payment by Results Guidance for 2013-14 (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/214902/PbR-Guidance-2013-14.pdf)

[xxxi] Dictionary of Medicines. [Online] available at http://dmd.medicines.org.uk/DesktopDefault.aspx?AMPP=8955511000001106&toc=nofloat [Accessed 25 Nov. 2015].

[xxxii] Dictionary of Medicines. [Online] available at http://dmd.medicines.org.uk/DesktopDefault.aspx?AMPP=8957311000001108&toc=nofloat [Accessed 25 Nov. 2015].

[xxxiii] Dictionary of Medicines. [Online] available http://dmd.medicines.org.uk/DesktopDefault.aspx?AMPP=8959611000001108&toc=nofloat [Accessed 25 Nov. 2015].

[xxxiv] The supplementary protection certificate is not set to expire until 2019 (UKMi data).

[xxxv] European Medicines Agency (2015). EPAR summary for the public: Cinacalcet Mylan.

[xxxvi] 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)

[xxxvii] Policy proposition

[xxxviii] Policy proposition

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

[xl] Based on the data supplied by PHPT clinicians to the policy working group.

[xli] The weighting was calculated from survey data containing the dose maintenance (mg/day) for patients; around 80% - 60 mg/day dose, 7% - 120 mg/day dose, 13% - 180 mg/day dose.

[xlii] Based on NHS pharmacy data, the weighted average cost could be c.£4,145. This data, however, does not differentiate between the patient groups receiving the drug.

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

[xliv] Where prescribing in secondary care increases, and the cost is captured by the tariff, this could increase the costs captured by references costs and therefore flow through to the tariff in subsequent years. This cost would then be picked up by the commissioner. Source: based on discussions with NHS England Finance Lead.