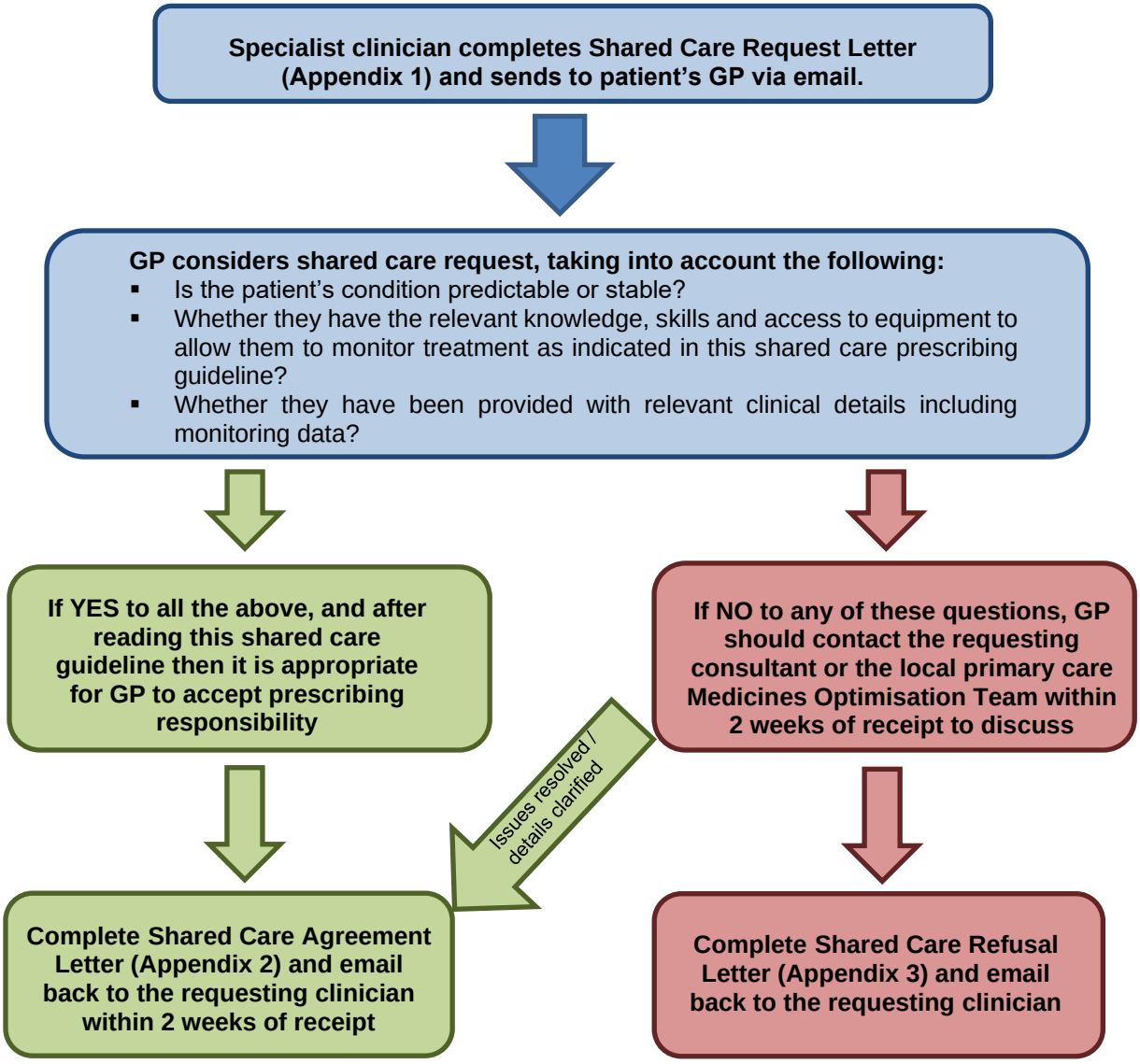
Ref: IMOCSCG007
South East London Shared Care Prescribing Guideline: Denosumab for the treatment of osteoporosis and prevention of osteoporotic fractures in adults
Approval date: December 2023 **Document review date:** December **2025**

SHARED CARE PRESCRIBING GUIDELINE

Denosumab (Prolia ®) for the Treatment of Osteoporosis and Prevention of Osteoporotic Fractures in Adults

South East London Integrated Medicines Optimisation Committee (SEL IMOC). A partnership between NHS organisations in South East London Integrated Care System: NHS South East London (covering the boroughs of Bexley/Bromley/Greenwich/ Lambeth/Lewisham and Southwark) and GSTFT/KCH /SLaM/ Oxleas NHS Foundation Trusts and Lewisham & Greenwich NHS Trust

SHARED CARE PROCESS FLOWCHART



NOTES

There may be implications for the patient where invitation to share care is declined. For example, the patient may need to be changed to an alternative treatment regimen. It would not normally be expected that shared care prescribing would be declined on the basis of cost.

Sharing of care assumes communication between the specialist, GP and patient. The intention to share care should be explained to the patient by the doctor initiating treatment. **It is important that patients are consulted about treatment and are in agreement with it**.

Prescribing should follow requirements in the South East London Interface Prescribing Policy. **The doctor who prescribes the medication legally assumes clinical responsibility for the drug and the consequences of its use. The patient's best interests are always paramount.**

If the GP is not confident to undertake these roles, then he or she is under no obligation to do so. In such an event, the total clinical responsibility for the patient for the diagnosed condition remains with the specialist. If a specialist asks the GP to prescribe this drug, the GP should reply to this request as soon as practicable.

1. AREAS OF RESPONSIBILITY

Consultant / Specialist team responsibilities

Before agreement to shared care:

- Assess the patient and confirm clinical diagnosis of osteoporosis (DEXA scan results, fracture history) and assess relevant risk factors for an osteoporotic fracture. Establish the clinical need for denosumab.
- Ensure patient fits criteria for use of denosumab (e.g. no contraindication or caution to use and in line with formulary status).
- Secondary care specialist confirms that the patient is not hypersensitive to the active substance or to any of the excipients (including latex as the needle cover of pre-filled syringe contains dry natural rubber, a derivative of latex).

- Complete baseline blood monitoring tests:
  - Renal function
  - Corrected Calcium
  - 25 Hydroxyvitamin D level
  - Parathyroid hormone (May be indicated for patients with Chronic Kidney Disease, CKD, Stage 4 or 5 or if eGFR less than 30ml/min/1.73^2 if not checked within last year, unless under a specialist renal team)

- Review of oral/dental hygiene with patient to ensure no invasive dental procedures (e.g. implant, extraction) is planned. If necessary, refer to dental clinic or patient's own dentist if a dental examination is required prior to initiation. Ensure patient is aware to inform their dentist they are starting treatment with denosumab.

- Discuss treatment with patient and ensure they have a clear understanding of it including risks and benefits (see section 2).
- Ensure any other osteoporosis treatments such as oral bisphosphonates, raloxifene and strontium, are recommended to stop.
- Ensure that the patient is taking or advised to start calcium and vitamin D supplements if appropriate for them.

- Ensure patient understands the possible risk of low calcium (especially in high risk patients), its associated symptoms, and the need to have blood tests measuring corrected calcium level before each denosumab injection; where indicated (e.g. individuals with advanced CKD), explain that corrected calcium should be measured 2 weeks after each dose has been administered (see section 2).
- To inform patients of practical issues related to the use of denosumab, such as administration (including self-administration), storage and maximum dose – see "Advice to patients and carers" – Section 2.
- "Prolia® - Denosumab Self injection training service"- Patients can be enrolled into this service provided by Amgen which can include virtual training on self-injecting and helpline support. This is particularly useful if a patient is deemed clinically suitable to self-administer their denosumab injection.
  Email prolong.support@nhs.net or contact the team on Telephone: 0330 808 8686, for further information on registering the patient to this service.
  Specialist team can inform patient of this service and register them if suitable prior to shared care referral.

- **Initiate and administer first denosumab injection in secondary care.**

- At the time of initiating, notify GP in writing that denosumab (Prolia®) has been prescribed. The GP should be invited to share care once the patient has received their first dose from secondary care and has tolerated well. Information provided to the GP should include:
  - A copy of the shared care guideline.
  - That patient has received their first dose from secondary care and has tolerated well.
  - Information on when the patient will next be reviewed and by whom.
  - A request that the GP continue prescribing after the first dose of denosumab (every 6 months), with planned administration for at least five, and likely ten years.

After agreement to shared care:

- To continue with monitoring that will remain under the specialist's responsibility (see section 2 'clinical information')
- To review patient at the request of the GP should any problems arise (side-effects / lack of efficacy). Please see below for frequency of monitoring.

- To communicate promptly with the GP if treatment is changed. Clinic letter to be sent to GP within 2 weeks of change.
- To report any suspected adverse effects to the MHRA. To ensure that suspected adverse effects noted in primary care are reported by the GP/patient to the MHRA as well. https://yellowcard.mhra.gov.uk/

General Practitioner responsibilities

- To consider shared care proposal within 2 weeks of receipt. If agree to request to continue prescribing as detailed in shared care guideline, confirmation to the requesting consultant or specialist is required **within 2 weeks** of receipt of this guideline by completing and returning the agreement (Appendix 2).
- If do not agree to shared care, then discuss with requesting specialist or local primary care medicines management team within 2 weeks of receipt of shared care request. (Appendix 3)

After agreement to shared care:

- To provide ongoing prescriptions for denosumab 60mg subcutaneous injection (Prolia®) every 6 months, after first dose given in secondary care.
- To administer in the GP practice/by a suitably trained healthcare professional or ensure patient is adequately trained to self-administer.
- "Prolia® - Denosumab Self injection training service"- Patients can be enrolled into this service provided by Amgen which can include virtual training on self-injecting and helpline support. This is particularly useful if a patient is deemed clinically suitable to self-administer their denosumab injection and it is a service that GP's can utilise if they wish for their patient. Email prolong.support@nhs.net or contact the team on Telephone: 0330 808 8686, for further information on registering the patient to this service.
  Primary care team can inform patient of this service and register them if suitable after shared care referral.
- Ensure that denosumab is added to the patient's medication record and any other osteoporosis treatments such as oral bisphosphonates, raloxifene and strontium, are stopped and removed from the patient's repeat prescription.
- Ensure that calcium and vitamin D supplements are continued if appropriate and prescribe the formulation that the patient finds acceptable or tolerates the best, in order to maximise adherence e.g. chewable tablets, caplets or effervescent tablets.
- To advise the specialist if non-compliance is suspected.
- To agree monitoring requirements with specialist – (section 2)
- To report and seek advice regarding any concerns, for example: side-effects, co-morbidities, or lack of efficacy to the specialist team.
- To check compatibility interactions when prescribing new or stopping existing medication.
- To refer back to specialist if the patient's condition deteriorates (see section 3 for contact details). This includes problems which may not be manageable e.g. new fragility fractures, deterioration in renal function, dental issues which cannot be managed in community.
- To stop treatment on the advice of the specialist or immediately if an urgent need to stop treatment arises.
  To ensure that suspected adverse effects noted in primary care are reported by the GP/patient to the MHRA and the specialist team (see section 3 for contact details) at the initiating hospital are also informed.
  https://yellowcard.mhra.gov.uk/

Patient's / Carer's responsibilities

- To contact the specialist or GP if patient does not have a clear understanding of any aspect of the treatment.
- To read the patient information leaflet included with the medication.
- To inform prescribing specialist, GP and other healthcare professionals of any other medication being taken, including over the counter products, alternative therapies or recreational drugs.
- To stop taking any other osteoporosis treatments such as oral bisphosphonates, raloxifene and strontium.
- To attend all hospital, GP and dental appointments.
- Inform dentist of ongoing treatment with denosumab. Arrange regular dental check-ups at least once a year as per routine community recommendations and maintain good oral/dental hygiene. This is important to ensure prevention of complications such as osteonecrosis of the jaw (rare side effect of denosumab).
- To inform the specialist team and GP if any invasive dental procedures (e.g. tooth extraction/implant) is planned prior to and during treatment with denosumab.
- To see a dentist if you develop symptoms that could be indicative of osteonecrosis of the jaw, such as tooth or jaw pain, signs of infection (swelling, pain, redness, pus), loose teeth or unhealed gums (e.g. following dental work).
- To take medicines as agreed and take steps to ensure that no doses are missed and not to share medicines with others.
- To report any adverse effects or warning symptoms to GP or hospital specialist.
- To seek prompt medical attention if any signs or symptoms of cellulitis develop (including swollen, red areas of skin that feel warm to touch and tender and possible symptoms of fever).
- To report any new or unusual thigh, hip and groin pain during treatment.
- To report to GP and hospital specialist team if pregnant or breastfeeding *[NB. Not in the scope of this guideline]*
- To continue to take any calcium and vitamin D supplements as advised (unless directed otherwise).
- To inform GP and hospital team of any changes in addresses or telephone contact numbers.

2. CLINICAL INFORMATION

NOTE: The information here is not exhaustive. Please also consult the current Summary of Product Characteristics (SPC) for **DENOSUMAB (Prolia 60mg)** prior to prescribing for up to date prescribing information, including detailed information on adverse effects, drug interactions, cautions and contraindications (available via www.medicines.org.uk)

Background	Denosumab (Prolia®) is a human monoclonal antibody (IgG2) that targets and binds with high affinity and specificity to RANKL, preventing activation of its receptor, RANK. RANK is found on the surface of osteoclast precursors and osteoclasts. Prevention of the RANKL/RANK interaction inhibits osteoclast formation, function and survival, thereby decreasing bone resorption in cortical and trabecular bone.
Indications Note if indication is unlicensed or not	Licensed indications: • Treatment of osteoporosis and prevention of osteoporotic fractures in postmenopausal women. • Treatment of osteoporosis and prevention of osteoporotic fractures in men at increased risk of fractures.
Place in Therapy Indicate what drugs should have been tried before this drug is considered	Denosumab is recommended as a treatment option for osteoporosis and the primary and secondary prevention of osteoporotic fragility fractures in men and post-menopausal women. Treatment is usually selected for patients who: - Are unable to comply with special instructions for administering oral bisphosphonates such as alendronate, risedronate or etidronate. - Have shown a lack of efficacy with, or are intolerant/ have a contraindication to, treatments outlined in NICE Technology Appraisal 464, 791 and 161. Denosumab can be used at all stages of kidney disease; for the purpose of this document, denosumab will only be requested for shared care in patients with normal kidney function or stable chronic kidney disease (including CKD 4 and 5); patients on dialysis will be excluded from this shared care. Denosumab for the treatment of glucocorticoid-induced osteoporosis is also excluded from the scope of this shared care guideline.

<table>
<tr><td>Locally agreed off-label use</td><td colspan="2">N/A</td></tr>
<tr><td>Initiation and ongoing dose regime

Note:
• Transfer of monitoring and prescribing to primary care is normally after the patient's dose has been optimized and with satisfactory investigation results for at least 4 weeks.
• The duration of treatment & frequency of review will be determined by the specialist, based on clinical response and tolerability.
• All dose or formulation adjustments will be the responsibility of the initiating specialist unless directions have been discussed and agreed with the primary care clinician.
• Termination of treatment will be the responsibility of the specialist.</td><td colspan="2"><u>Dose:</u>
First dose will be prescribed and given under care of initiating specialist.

Dose of denosumab is 60mg by subcutaneous injection in to the thigh, abdomen or back of arm every 6 months

<u>Duration of treatment</u>
• The optimal duration of denosumab treatment for osteoporosis has not been established. However, current NICE guidance supports treatment duration of at least 5 years followed by a clinical review, noting that the National Osteoporosis Guideline Group (NOGG) advises that safety and efficacy of denosumab is maintained over at least 10 years of treatment.
• The need for continued treatment should be reviewed periodically based on the expected benefits and potential risks/burden of denosumab on an individual patient basis.

<u>Timing of injections</u>
• <u>Patients should not be stopped on treatment with denosumab without a clinical review</u> due to the increased risk of rebound-associated vertebral fractures.
• Doses should ideally be given within 4 weeks of the due date, however if the patient misses a prescribed dose of denosumab, the missed injection should be administered as soon as possible.
If the denosumab is to be stopped, alternative treatment such as a bisphosphonate should be given, if clinically appropriate and discussed with specialist, to support preventing the risk of rebound fractures.</td></tr>
<tr><td rowspan="4">Pharmaceutical aspects</td><td>Route of administration</td><td>Subcutaneous injection</td></tr>
<tr><td>Formulation</td><td>Solution for injection in pre-filled syringe</td></tr>
<tr><td>Administration details</td><td>Subcutaneous injection in to the thigh, abdomen or back of arm</td></tr>
<tr><td>Other important information</td><td><u>STORAGE:</u>
• Store in refrigerator (2-8°C)
• To enhance patient comfort syringe can be removed from fridge 30 minutes before administration.
• Once removed from the refrigerator, may be stored at room temperature (up to 25°C) for up to 30 days in the original container. It must be used within this 30 days period.

<u>ON DAY OF ADMINISTRATION:</u>
• Document the batch number and expiry date of denosumab in the patient primary care record (if administered in the practice).</td></tr>
<tr><td>Baseline investigations, initial monitoring and ongoing monitoring to be undertaken by specialist</td><td colspan="2">Please refer to section 1: "Consultant / Specialist team responsibilities for further information"

<u>Baseline investigations:</u>
• Renal function, corrected calcium, 25 hydroxyvitamin D level (+/- parathyroid hormone level) stable and/or in range.
• Clinical diagnosis of osteoporosis; at the discretion of the specialist, this may include DEXA scan +/- Fracture risk assessment (e.g. FRAX)

<u>Initial monitoring</u>
Monitoring at baseline and during initiation is the responsibility of the specialist; only once the patient has started and tolerated denosumab, with no anticipated further changes</td></tr>
</table>

<table>
<tr><td></td><td colspan="2">expected in the immediate future, will prescribing and monitoring be transferred to the GP.
• Patient has tolerated first dose given in secondary care.
• Post denosumab blood tests (if required i.e. corrected calcium in individuals with advanced CKD) is in range

<u>Ongoing monitoring:</u>
• Frequency – See ‘Follow up arrangements’ [page 11] .
• Monitoring may include repeat bone turnover markers, DEXA scan, and/or fracture assessment if appropriate.
• To be reviewed earlier if needed at the request of the GP as outlined in this section.</td></tr>
<tr><td rowspan="5">Ongoing monitoring requirements to be undertaken by primary care</td><td>Monitoring + Frequency</td><td>Action</td></tr>
<tr><td colspan="2">Bloods to be ordered and reviewed by PRIMARY CARE TEAM before injection administered</td></tr>
<tr><td>Corrected calcium

Prior to each dose</td><td>If corrected calcium is below reference range do not administer dose, check for symptoms of hypocalcaemia* [noted on page 10] and start/increase calcium (and vitamin D if on combined product) supplement; usually by doubling current dose (note this may become an off-label dose).

Re-check bloods 2 weeks later:
▪ If corrected calcium is in range administer denosumab dose, continue higher dose of supplement for 4 more weeks and then reduce to usual dose.

▪ If corrected calcium remains out of range contact secondary care.</td></tr>
<tr><td>Renal function - Annually</td><td>Routine monitoring of renal function once a year [more frequent at clinician’s discretion].

For patients with:
• CrCl less than 30ml/min [Cockcroft-Gault equation] OR
• CKD stage 4/5 (eGFR less than 30ml/min/1.73^2)
Ensure that corrected calcium is checked 2 weeks after each injection. See details below.</td></tr>
<tr><td>25 Hydroxyvitamin D level - Annually</td><td>• If more than 50 nmol/L, continue treatment and administer dose.

• If level between 25 to 50 nmol/L, administer next dose when due and increase vitamin D supplementation as per local guidance.

• If less than 25 nmol/L, do not administer dose if due now and initiate a loading course of colecalciferol 40,000 units once a week for 7 weeks or as per local guidance. Denosumab can be re-arranged for 2-4 weeks after loading dose has started if due.
• Ensure patient is on maintenance therapy following loading course.

NOTE:
• If the vitamin D level is less than 50nmol/L <u>AND</u> Patient has a CrCl less 30ml/min or is CKD stage 4/5 (eGFR < 30ml/min/1.73^2)
Contact secondary care for advice on whether to proceed with next dose.</td></tr>
</table>

	Parathyroid hormone - *Annually in patients with CKD4/5 who are not under specialist renal team*	If level more than 1.5 times the upper limit of reference range, only if accompanied by hypocalcaemia, do not administer dose and contact secondary care for advice.
	Bloods to be reviewed by PRIMARY CARE TEAM 2 weeks after injection administered	
	For patients with: CrCl less than 30ml/min or eGFR less than 30ml/min/1.73^2 [excluding those on dialysis] Corrected calcium must be checked **2 weeks after** injection	If corrected calcium below reference range, check for symptoms.* [noted on page 10] • If corrected calcium is below the reference range and the patient is **asymptomatic**, please start/increase calcium (and vitamin D if on combined product) supplement; usually by doubling current dose (note this may become an off-label dose) Re-check bloods 2 weeks later: • If in range, reduce supplements back to usual dose. • If serum calcium remains low on repeat blood test, contact specialist team for advice. **If the patient has symptomatic hypocalcaemia – refer acutely to A&E**
	Assessment of risk of fractures and treatment efficacy	
	FRAX score Dual-energy X-ray absorptiometry [DEXA] scan Adherence to treatment	• If clinically appropriate, DEXA scan to be completed before initiation of treatment by specialist team and then may be repeated after 5 years during ongoing treatment with denosumab, as deemed appropriate by specialist at follow-up appointments. GP's may be required to support with arranging local DEXA scans if needed following advice from specialist. For further information on the need for repeat DEXA scan, please refer to the South East London Osteoporosis Treatment Pathway. • Assessment of risk of fracture (including further FRAX assessment if deemed necessary) to be completed during secondary care specialist review. GP to refer back to secondary care if concerns regarding adherence to treatment, or if the patient fractures on denosumab (as can be considered for romosozumab).
	On day of administration	
	Document the batch number and expiry date of denosumab in the patient's primary care record.	
Adverse effects and management Any serious adverse reactions should be reported to the MHRA via the Yellow Care scheme	**Result**	**Action for GP**
	CONTRAINDICATIONS:	
	Hypocalcaemia	Do not administer, follow guidance above.
	Hypersensitivity to excipients listed in SPC, including Latex	Do not administer, contact secondary care.

www.mhra.gov.uk/yellowcard		
	CAUTIONS/SIDE EFFECTS:	
	Musculoskeletal (MSK) pain	The most common side effect (≥ 1/10) is MSK pain and pain in the extremities.
	Risk of developing infections	Check for signs of infection on day of administration, liaise with secondary care if concerns. The SPC reports that 'Common' (≥ 1/100 to < 1/10) adverse reactions of denosumab include urinary tract and upper respiratory tract infection. Furthermore, the SPC states that patients receiving denosumab may develop skin infections (predominantly cellulitis) leading to hospitalisation; this is listed as 'uncommon' (≥ 1/1,000 to < 1/100). Patients should be advised to seek prompt medical attention if they develop signs or symptoms of cellulitis. Before withdrawing treatment with denosumab, please ensure confident in causality between denosumab and cellulitis. **However it should be noted that above reports of adverse effects listed in the SPC were from initial phase II/III clinical trials and cancer patients receiving hormone ablation; there are now up to date studies, such as the FREEDOM Extension study, that reviewed the long-term safety and efficacy of denosumab treatment for up to 10 years in post-menopausal women with osteoporosis. This study demonstrated sustained low rates of vertebral fracture, and further reduction in nonvertebral fracture risk without an increased risk of infection.**
	Rare reports of osteonecrosis of the jaw (ONJ)	Remind patient to maintain good oral hygiene & regular dental check-ups at least annually (as per usual routine community recommendations). If invasive dental treatment is planned/ required, discuss with secondary care. This includes but is not limited to, dental implants and extractions. Refer to dentist if potential signs of ONJ suspected (including but not limited to: tooth/jaw pain, infection [swelling, pain, redness, pus], loose teeth). Inform secondary care of potential ONJ so treatment can be reviewed accordingly. **Please note that 10 year long-term safety data reported by the FREEDOM extension study have demonstrated that rates of ONJ on denosumab were very rare.**
	Rare reports of atypical femoral fractures (AFF)	Discuss symptoms of new or unusual thigh, hip or groin pain with secondary care. Referral for local x-ray may be required to rule out a femoral fracture. **Please note that 10 year long-term safety data reported by the FREEDOM extension study have demonstrated that rates of AFF on denosumab were very low.**

	Osteonecrosis of the external auditory canal	Frequency unknown but rarely seen; the possibility of osteonecrosis should just be considered in patients receiving denosumab who present with ear symptoms including chronic ear infections. Discuss with secondary care if concerns.
	At risk of hypocalcaemia	Ensure patient continues to have an adequate intake of calcium and vitamin D (through diet and lifestyle, but if needs be with supplements) throughout treatment. If a dietary calcium intake of 1 gram/day can be maintained, then consider vitamin D supplement alone if patient requires this. Alternatively, if a supplement is required to replace both calcium and vitamin D, a combined product should be prescribed.
	Increased risk of multiple vertebral fractures after stopping or delaying ongoing treatment	As per MHRA alert (Aug 2020), an increased risk of multiple vertebral fractures has been reported in patients within 18 months of stopping or delaying ongoing denosumab 60mg treatment for osteoporosis. Patients with a previous vertebral fracture may be at highest risk. If there is a need to stop treatment, under specialist advice, the patient will likely be given an alternative treatment (such as a bisphosphonate) to reduce the risk of rebound fractures.
**Possible symptoms of hypocalcaemia include: Paraesthesia, muscle stiffness, twitching, spasms, muscle cramps, altered mental status, tetany, seizures, QTc prolongation. Please note this list is not exhaustive.*		
Advice to patients and carers The specialist will counsel the patient with regard to the benefits and risks of treatment and will provide the patient with any relevant information and advice, including patient information leaflets on individual medicines.	**Please also refer to Page 4 (Patient's / Carer's responsibilities).** Patient to read the patient information leaflet which outlines key safety information about denosumab (Prolia®). **Prolia® Patient Information leaflet** https://www.medicines.org.uk/emc/product/568/pil *Other sources of support that can be provided to patient include:* **Royal Osteoporosis Society: Denosumab Fact Sheet** https://theros.org.uk/information-and-support/osteoporosis/treatment/denosumab/ **Prolia® – Website for patients** https://www.prolia.co.uk/honesty-box **Prolia® - Denosumab Self injection training service** Patients can be enrolled into this service provided by Amgen which can include virtual training on self-injecting and helpline support. This is particularly useful if a patient is deemed clinically suitable to self-administer their denosumab injection and it is a service that GP's can utilise if they wish for their patient. Email prolong.support@nhs.net or contact the team on Telephone: 0330 808 8686, for further information on registering the patient to this service.	
Criteria for stopping treatment e.g. poor response, adverse effects requiring cessation	Patients should not stop denosumab without a specialist review due to increased risk of vertebral fractures reported within 18 months of stopping or delaying denosumab treatment. If there is a need to stop treatment, under specialist advice, the patient will likely be given an alternative treatment (such as a bisphosphonate) to reduce the risk of rebound fractures.	

	Criteria for stopping: • Serious adverse reactions which warrants the clinical decision to stop or switch treatment. Consideration of stopping or switching treatment may be made by secondary care specialist if: • New fragility fractures whilst on denosumab or continued bone loss at routine follow-up, especially for consideration of anabolic therapy. Clinical factors such as patient adherence, DEXA scan and FRAX score (if appropriate) may be reviewed by specialist with the decision to stop or switch treatment. • Poor adherence to denosumab injections which increases the risk of rebound vertebral fractures.
Follow up arrangements e.g. frequency of specialist clinic attendance	**Secondary care specialist:** • Review of therapy at **Year 5** of treatment; this can be sooner according to any local policy or if booking restrictions are in place and at the discretion of initiating clinician. Follow-up appointment should be arranged by secondary care team. • Repeat DEXA scan, if appropriate for patient, should be reviewed at Year 5 of treatment (scan may be completed locally via GP but results to be reviewed by specialist). • Following 5 years of treatment, patient can again be seen every 3-5 years if stable (or at a frequency as deemed suitable by secondary care specialist). • Review at the request of the GP if the need arises. **GP:** • Administration of denosumab injection every 6 months. • Continue to take blood tests at the frequency outlined above. • Ensure patient is booked for review with secondary care specialist after **10th denosumab injection** (5 years treatment) for review of therapy and, if clinically appropriate, DEXA scan (note: if patient opts for local DEXA scan, then please arrange and send these results to referring hospital). Following this review, secondary care team will communicate future follow-up arrangements as above. • Referral to secondary care consultant for a review earlier if unmanageable problems arise during treatment period. This may include new fragility fractures, decline in renal function or initiation on dialysis, and major dental concerns. • GP to ensure denosumab injections are **not stopped** if awaiting review by a secondary care specialist due to the risk of possible rebound vertebral fractures unless serious adverse reactions. For further information on the need for repeat DEXA scan, please refer to the South East London Osteoporosis Treatment Pathway.
Pregnancy, paternal exposure and breast feeding It is the responsibility of the specialist to provide advice on the need for contraception to male and female patients on initiation and at each review but the ongoing responsibility for providing this advice rests with both the GP and the specialist.	**Pregnancy:** Prolia is not recommended for use in pregnant women and women of child-bearing potential not using contraception. Women should be advised not to become pregnant during and for at least 5 months after treatment with Prolia. *[Nb. Not in scope of this shared care agreement i.e. treating post-menopausal women]* **Breastfeeding:** Caution. No published evidence of safety. Due to the drug's properties, low levels anticipated in milk which are likely to be degraded in infant's GI tract. Avoid in preterm infants and neonates as large protein molecules may appear in colostrum. *[Nb. Not in scope of this shared care agreement i.e. treating post-menopausal women]*
Additional information	**Where patient care is transferred from one specialist service or GP practice to another, a new shared care agreement must be completed.**

Evidence base for treatment and key references Include hyperlinks to original sources and access dates	• NICE Technology appraisal guidance [TA2040]. Published: 27 October 2010. Denosumab for the prevention of osteoporotic fractures in postmenopausal women. Available via: https://www.nice.org.uk/guidance/ta204 [Accessed online on April 2023] • Prolia, Amgen – Summary of Product Characteristics. Last updated 13/05/22. Available via: https://www.medicines.org.uk/emc/product/568/smpc [Accessed online March 2023] • Clinical Guideline for the Prevention and Treatment of Osteoporosis. National Osteoporosis Guideline Group, September 2021. Available via: https://www.nogg.org.uk/full-guideline [Accessed online March 2023] • Denosumab, Royal Osteoporosis Society. Available via: https://theros.org.uk/ [Accessed April 2023] • MHRA – Denosumab 60mg (Prolia): increased risk of multiple vertebral fractures after stopping or delaying ongoing treatment. August 2020. Available via: https://www.gov.uk/drug-safety-update/denosumab-60mg-prolia-increased-risk-of-multiple-vertebral-fractures-after-stopping-or-delaying-ongoing-treatment • MHRA - Denosumab: Monitoring recommended. December 2014. Available via: https://www.gov.uk/drug-safety-update/denosumab-monitoring-recommended • Henry G Bone et al. 10 years of denosumab treatment in postmenopausal women with osteoporosis: results from the phase 3 randomised FREEDOM trial and open-label extension. *The Lancet Diabetes & Endocrinology*, Volume 5, Issue 7 (2017); p 513-523. Available via: https://doi.org/10.1016/S2213-8587(17)30138-9 • Kendler, D.L., Cosman, F., Stad, R.K. et al. Denosumab in the Treatment of Osteoporosis: 10 Years Later: A Narrative Review. *Adv Ther* 39, 58–74 (2022). Available via: https://doi.org/10.1007/s12325-021-01936-y
To be read in conjunction with the following documents	MHRA – Denosumab 60mg (Prolia): increased risk of multiple vertebral fractures after stopping or delaying ongoing treatment. August 2020. Available via: https://www.gov.uk/drug-safety-update/denosumab-60mg-prolia-increased-risk-of-multiple-vertebral-fractures-after-stopping-or-delaying-ongoing-treatment MHRA - Denosumab: Monitoring recommended. December 2014. Available via: https://www.gov.uk/drug-safety-update/denosumab-monitoring-recommended
Local arrangements for referral Define the referral procedure from hospital to primary care prescriber & route of return should the patient's condition change.	Referral from hospital to primary care will be sent via post or email. This will include a copy of this shared care document alongside a request letter outlined in Appendix 1 or an equivalent clinic letter. **Note for GP practices – check local arrangements for the prescribing and administration of denosumab in primary care.** Referral back from primary care to hospital regarding clinical concerns, should be done through the appropriate contact details outlined in section 3.

3. COMMUNICATION AND SUPPORT

King's College and Princess Royal Hospitals switchboard: 0203 299 9000	
Osteoporosis Clinic, Rheumatology at Orpington	
Rheumatology Consultants: Dr Sarah Medley Dr Richard Campbell Dr Mohammed Sharif Dr Katherine Irving Dr Dee Sreerangaiah Dr Andrew Rutherford	Email: Kch-tr.orprheumpatientqueries@nhs.net Phone: 01689 865 232
Endocrinology at Princess Royal University Hospital	
Endocrinology Consultant Dr Georgios Dimitriadis	Email: kch-tr.br-endocrinologymedsecs-pruh@nhs.net Phone: 01689 866 076
Department of Gerontology at Princess Royal University Hospital	
Gerontology Consultant Dr A Abdulla Dr Thirumagal Rajeevan Femur Fracture CNS Julie Brooker	Phone: 01689 863 709 Phone: 01689 864 624 Pager: 790 via main switch 01689 863 000
Metabolic Bone at Denmark Hill	
Consultants Dr Rama Chandra Dr Nandini Rao	Phone: 020 3299 4181
Elderly Care at Denmark Hill	
Osteoporosis (Elderly Care) consultant Dr Daniel Bailey Infusion suite Betty Alexander Suite (Older Person Assessment Unit)	Phone: 0203 299 6085 Email: danielbailey2@nhs.net Phone: 0203 299 6185 Email: kch-tr.kopaubas@nhs.net
Guy's and St. Thomas' Hospital switchboard: 0207 188 7188	
Osteoporosis Clinic, Rheumatology	
Consultant/specialist team Professor Frances Williams Professor Emma Duncan Rheumatology Pharmacists Rheumatology Specialist Nurses	**Tel**: Rheumatology Reg via hospital switchboard 0207 188 7188 bleep 0307 **Email**: gst-tr.rheumandlupus@nhs.net Clinical Nurse Specialist helpline: 020 7188 5896
Fracture Liaison Service, Department of Ageing and Health	
Consultant Geriatrician: Dr Fionna Martin Fracture Liaison Specialist Nurses Jude Powell (CNS) Sarah Rounding (CNS) Molly Khosla (Deputy CNS)	**Email**: gst-tr.fractureliaisonservice@nhs.net **Administrator**: 020 7188 2076 **Clinical Nurse Specialists:** 020 7188 7188 ext 51602

Endocrinology. Department of Diabetes and Endocrine	
Consultant/specialist team Professor Emma Duncan Professor Geeta Hampson Diabetes and Endocrine Specialist Nurses Diabetes and Endocrine Specialist Pharmacists	**Tel:** 020 7188 7188 ext 81981 or 81987 **Email**: gst-tr.DiabetesAndEndocrine@nhs.net
Medication – Prescribing advice, interactions, availability of medicines	
Lead Pharmacist: Hira Saeed [Rheumatology/Metabolic Bone] (Alternative Rheumatology contacts and other departments/speciality Lead pharmacists as above)	**For Guy's and St Thomas' Medicines Information:** **Tel:** 020 718 83849 / 83855 / 88750 (Mon to Fri 9am-5.30pm) **Email**: medicinesinformation@gstt.nhs.uk
Lewisham and Greenwich NHS Trust switchboard: **University Hospital Lewisham: 020 8333 3000** **Queen Elizabeth Hospital: 020 8836 6000**	
Consultant/specialist team Consultant Geriatrician Dr Rohini Yadav Osteoporosis/Fracture Liaison Clinical Nurse Specialist Lorraine Stork	Clinical Nurse Specialists: Tel: 02088364328 Email: lorrainestork@nhs.net
Medication – Prescribing advice, interactions, availability of medicines Valentia Katemba (Lead Pharmacist for Specialist Medicine - Rheumatology) Tel: 020 8333 3202 Email: lg.SpecialistPharmacist@nhs.net	**For Lewisham and Greenwich Medicines Information Helpline:** Tel: 020 8836 4900 (Monday to Friday between 9.00am-5.00pm)

Appendix 1: Shared Care Request letter (Specialist to Primary Care Prescriber)

Dear *[insert Primary Care Prescriber's name]*

Patient name: *[insert patient's name]*
Date of birth: *[insert date of birth]*
NHS Number*:* *[insert NHS Number]*
Diagnosis: *[insert diagnosis]*

As per the agreed South East London shared care prescribing guideline for ***DENOSUMAB*** **for the treatment of Osteoporosis and Prevention of Osteoporotic Fractures in Adults**, this patient is now suitable for prescribing to move to primary care.

The patient fulfils criteria for shared care and I am therefore requesting your agreement to participate in shared care. Where baseline investigations are set out in the shared care protocol, I have carried these out.

I can confirm that the following has happened with regard to this treatment:

	Specialist to complete
The patient has been initiated on this therapy and has been on an optimised dose for the following period of time:	
Baseline investigation and monitoring as set out in the shared care documents have been completed and were satisfactory	*Yes / No*
The condition being treated has a predictable course of progression and the patient can be suitably maintained by primary care	*Yes / No*
The risks and benefits of treatment have been explained to the patient	*Yes / No*
The patient is on or recommended to start adequate calcium +/- vitamin D supplements (if clinically appropriate)	*Yes / No*
The roles of the specialist/specialist team/ Primary Care Prescriber / Patient and pharmacist have been explained and agreed	*Yes / No*
The patient has agreed to this shared care arrangement, understands the need for ongoing monitoring, and has agreed to attend all necessary appointments	*Yes / No*
I have enclosed a copy of the shared care protocol which covers this treatment	*Yes / No*
I have included with the letter copies of the information the patient has received	*Yes / No*
I have provided the patient with sufficient medication to last until	*N/A (treatment initiated in secondary care)*
I have arranged a follow up with this patient in the following timeframe (please specify)	

Treatment was started on *[insert date started]* and the current dose is *60mg subcutaneous injection every 6 months*.

If you are in agreement, please undertake monitoring and treatment from *[insert date]* NB: date must be at least 1 month from initiation of treatment.

The next blood monitoring is due on *[insert date]* and should be continued in line with the shared care guideline.

Please could you reply to this request for shared care and initiation of the suggested medication to either accept or decline within 14 days.

Appendix 2: Shared Care Agreement Letter (Primary Care Prescriber to Specialist)

Primary Care Prescriber Response

Dear *[insert Doctor's name]*

Patient *[insert Patient's name]*

NHS Number *[insert NHS Number]*

Identifier *[insert patient's date of birth and/oraddress]*

Thank you for your request for me to accept prescribing responsibility for this patient under a shared care agreement and to provide the following treatment

Medicine	Route	Dose & frequency
Denosumab 60mg Pre-Filled Syringe (Prolia®)	Subcutaneous Injection	60mg subcutaneous injection every 6 months

I can confirm that I am willing to take on this responsibility from *[insert date]* and will complete the monitoring as set out in the shared care protocol for this medicine/condition.

Primary Care Prescriber signature: _____ Date: _____

Primary Care Prescriber address/practice stamp:

Appendix 3: Shared Care Refusal Letter (Primary Care Prescriber to Specialist)

Re*:*

Patient *[insert Patient's name]*

NHS Number *[insert NHS Number]*

Identifier *[insert patient's date of birth and/oraddress]*

Thank you for your request for me to accept prescribing responsibility for this patient.

In the interest of patient safety, the local NHS in South East London have classified *DENOSUMAB* as a Shared Care medicine, and requires a number of conditions to be met before transfer can be made to primary care.

I regret to inform you that in this instance I am unable to take on responsibility due to the following:

		Tick which apply
1.	**The prescriber does not feel clinically confident in managing this individual patient's condition, and there is a sound clinical basis for refusing to accept shared care** As the patients primary care prescriber I do not feel clinically confident to manage this patient's condition because *[insert reason]*. I have consulted with other primary care prescribers in my practice who support my decision. This is not an issue which would be resolved through adequate and appropriate training of prescribers within my practice. **I have discussed my decision with the patient and request that prescribing for this individual remain with you as the specialist, due to the sound clinical basis given above.**	
2.	**The medicine or condition does not fall within the criteria defining suitability for inclusion in a shared care arrangement** As the medicine requested to be prescribed is not included on the national list of shared care drugs as identified by RMOC (Regional Medicines Optimisation Committees) or is not a locally agreed shared care medicine I am unable to accept clinical responsibility for prescribing this medication at this time. **Until this medicine is identified either nationally or locally as requiring shared care the responsibility for providing this patient with their medication remains with you**	
3.	**A minimum duration of supply by the initiating clinician** As the patient has not had the minimum supply of medication to be provided by the initiating specialist I am unable to take clinical responsibility for prescribing this medication at this time. Therefore can you please contact the patient as soon as possible in order to provide them with the medication that you have recommended. ***Until the patient has had the appropriate length of supply the responsibility for providing the patient with their medication remains with you.***	
4.	**Initiation and optimisation by the initiating specialist** As the patient has not been optimised on this medication I am unable to take clinical responsibility for prescribing this medication at this time. Therefore can you please contact the patient as soon as possible in order to provide them with the medication that you have recommended. ***Until the patient is optimised on this medication the responsibility for providing the patient with their medication remains with you.***	
5.	**Shared Care Protocol not received**	

	As legal responsibility for clinical care lies with the clinician who signs the prescription, I need to ensure that I am in possession of sufficient clinical information for me to be confident to prescribe this treatment for my patient and it is clear where each of our responsibilities lie to ensure the patient is safely managed***.*** For this reason I am unable to take clinical responsibility for prescribing this medication at this time, therefore would you please contact the patient as soon as possible in order to provide them with the medication that you have recommended. ***Until I receive the appropriate SCP, responsibility for providing the patient with their medication remains with you.***	
6.	**Other (Primary Care Prescriber to complete if there are other reasons why shared care cannot be accepted. NB: Capacity issues to be discussed with local primary care Medicines Optimisation Team prior to returning this form)**	

I would be willing to consider prescribing for this patient once the above criteria have been met for this treatment.

NHS England 'Responsibility for prescribing between Primary & Secondary/Tertiary care' guidance (2018) states that "when decisions are made to transfer clinical and prescribing responsibility for a patient between care settings, it is of the utmost importance that the GP feels clinically competent to prescribe the necessary medicines. It is therefore essential that a transfer involving medicines with which GPs would not normally be familiar should not take place without full local agreement, and the dissemination of sufficient, up-to-date information to individual GPs." In this case we would also see the term GP being interchangeable with the term Primary Care Prescriber.

Please do not hesitate to contact me if you wish to discuss any aspect of my letter in more detail and I hope to receive more information regarding this shared care agreement as soon as possible

Yours sincerely

Primary Care Prescriber signature: _____ Date: _____

Primary Care Prescriber address/practice stamp: