



Clinical Commissioning Policy: Levodopa-Carbidopa Intestinal Gel (LCIG)

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Contents

Policy Statement.....	4
Equality Statement.....	4
Plain Language Summary	4
1. Introduction	5
2. Definitions	6
3. Aim and objectives	6
5. Evidence base.....	8
6. Rationale behind the policy statement	12
7. Criteria for commissioning.....	12
8. Patient pathway.....	13
9. Governance arrangements	14
10. Mechanism for funding	15
LCIG is commissioned by NHS England in line with the scope and manual for specialised neurology.....	15
11. Audit requirements	15
12. Documents which have informed this policy	15
13. Links to other policies	15
14. Date of review	16
<i>References</i>	17

Policy Statement

NHS England will commission in accordance with the criteria outlined in this document.

In creating this policy NHS England has reviewed this clinical condition and the options for its treatment. It has considered the place of this treatment in current clinical practice, whether scientific research has shown the treatment to be of benefit to patients, (including how any benefit is balanced against possible risks) and whether its use represents the best use of NHS resources.

This policy document outlines the arrangements for funding of this treatment for the population in England.

Equality Statement

Throughout the production of this document, due regard has been given to eliminate discrimination, harassment and victimisation, to advance equality of opportunity, and to foster good relations between people who share a relevant protected characteristic (as cited in under the Equality Act 2010) and those who do not share it.

Plain Language Summary

This policy relates to the use of Levodopa-Carbidopa Intestinal Gel (LCIG) for the treatment of patients with advanced Parkinson's Disease (PD).

It recommends that LCIG is specialist commissioned and that all patients are assessed for eligibility by specialist multidisciplinary teams experienced in the management of advanced Parkinson's disease. These specialist teams will be based at, or aligned to, centres that provide all specialist treatments for advanced PD including apomorphine therapy and deep brain stimulation and will include access to clinicians experienced in the placement and management of percutaneous endoscopic gastro (PEG) / jejunostomies (PEJ). All decisions regarding eligibility will be made at the specialist neurosciences centre by the MDT but Clinicians with specialist knowledge or experience in management of advanced PD who are based at tertiary neurosciences centres but without access to on-site deep brain stimulation (that would otherwise exclude them from providing the service) may initiate the treatment subject to having an MDT capable of safely providing the treatment and satisfying the other criteria detailed in this policy.

It provides the inclusion and exclusion criteria for patients being considered for the treatment and clarifies the definitions related to PD and its complications.

This policy describes the circumstances in which LCIG is routinely funded as per the patient selection clinical criteria outlined in this policy, for those patients no prior approval or individual funding requests (IFR) are required.

Information on the outcome of treatments for these patients will be collected and considered when this policy is reviewed.

1. Introduction

Parkinson's disease (PD) is a progressive neurodegenerative disorder that is one of the commonest causes of neurological disability in the UK.^{1,2} The estimated prevalence is about 160 per 100,000 population and the incidence rises with age.³ Levodopa is the mainstay of treatment supplemented with other therapies that include dopamine agonists, catechol-o-methyl transferase (COMT) inhibitors, monoamine oxidase type B (MAOB) inhibitors and other therapies.^{1,2} With progression of the disease physically disabling motor and non-motor complications occur with about 10% of patients estimated to have advanced disease. Motor complications include wearing-off effects and dyskinesia that do not adequately respond to oral medication manipulation. In such cases suitable patients are considered for a number of advanced therapies that include apomorphine subcutaneous infusions, deep brain stimulation and Levodopa Carbidopa intestinal gel (LCIG), otherwise known as Duodopa.

LCIG is a gel containing a combination of Levodopa (2000mg) and Carbidopa (200mg). It is administered as a continuous infusion using a portable pump via percutaneous jejunostomy tube. It is given via a single use cassette and generally one cassette contains a single days treatment. LCIG is licensed for the treatment of advanced levodopa-responsive PD with severe motor fluctuations and hyper/dyskinesia when available combinations of medicinal products are unsatisfactory.

Each 100ml LCIG cassette costs about £77 equating to an anticipated annual cost of £28,105 per patient per year assuming the use of one cassette daily.^{4,5} The CADD-Legacy LCIG pump, naso-intestinal kit, PEG kit, pump bag or leather shoulder harness and cassettes for the trial period are provided free-of-charge. The estimated cost for the in-hospital period for titration is £4,153 assuming a 5-day stay.⁶

Since its launch in 2007 about 200 patients have been treated in the UK but there has been variability in its availability related differing commissioning policies that had been in place across Primary Care Trusts prior to 1st April 2013. It is estimated that about 75 to 100 new patients per year will be clinically appropriate to start treatment with LCIG in England.

LCIG is an expensive therapy that should be considered in the management of patients with advanced motor complications in the absence of significant neuropsychiatric complications and be administered by multidisciplinary teams that are able to offer all advanced therapies including apomorphine and deep brain stimulation; furthermore the team should include (or have rapid access to) a gastroenterologist experienced in the placement and subsequent management of PEJ tubes.

It is therefore proposed that all patients are assessed for eligibility by specialist multidisciplinary teams experienced in the management of advanced Parkinson's disease. These specialist teams will be based at, or aligned to, centres that provide all specialist treatments for advanced PD including apomorphine therapy and deep brain stimulation and will include access to clinicians experienced in the placement and management of percutaneous endoscopic gastro (PEG) / jejunostomies (PEJ). All decisions regarding eligibility will be made at the specialist neurosciences centre by the MDT but Clinicians with specialist knowledge or experience in management

of advanced PD who are based at tertiary neurosciences centres but without access to on-site deep brain stimulation (that would otherwise exclude them from providing the service) may initiate the treatment subject to having an MDT capable of safely providing the treatment and satisfying the other criteria detailed in this policy.

2. Definitions

Deep Brain Stimulation (DBS)

Is a procedure in which stimulating electrodes are placed stereotactically into the deep structures of the brain. The electrodes are connected to an implanted pulse generator which is battery powered.

Dyskinesia

Are abnormal involuntary movements that in the context of Parkinson's disease often take the form of chorea and are a complication of long-term levodopa based medication and PD progression.

Levodopa Carbidopa Intestinal Gel (LCIG)

LCIG, otherwise known as Duodopa, is a gel formulation of levodopa-carbidopa that is given by infusion directly in to the distal duodenum or proximal jejunum. The formulation consists of finely milled levodopa and carbidopa suspended in a carboxymethylcellulose and water gel.

Off-period

A type of motor fluctuation that occurs in advanced PD that is characterised by a slowing or reduction in movement that leads to immobility, increasing tremor and disabling stiffness. They typically occur prior to the onset of action of PD medication (typically levodopa) or towards the end of its duration of action as it wears off.

Parkinson's Disease (PD)

Is a chronic disease of the brain characterised by gradually worsening tremor, muscle rigidity and difficulties with starting and stopping movements. In advanced stages of the disease there can be severe fluctuations between almost total immobility, with or without tremor, and hypermobility with abnormal involuntary movements (dyskinesia).

Percutaneous Endoscopic Jejunostomy (PEJ)

A surgical procedure guided by endoscopy that allows the placement of a tube in the jejunum for feeding or in the context LCIG, to administer delivery of the drug for optimal intestinal absorption.

3. Aim and objectives

This policy provides guidance on the use of LCIG in the management of advanced Parkinson's disease.

This policy aims to:

- Describe a policy that allows treatment with LCIG in specialist centres without the need for funding pre-approval or IFR submission

- Define inclusion and exclusion criteria for the use of LCIG
- Define starting and stopping criteria
- Describe a standard patient pathway for patients being considered for LCIG in England
- Describe the makeup of a PD Multidisciplinary team that is able to determine the appropriateness of LCIG therapy
- Describe the protocol relating to the initiation of LCIG including the test treatment given by temporary nasogastric tube

The objectives are to:

- Develop a policy that ensures the consistent and equitable access to LCIG based on patient need and those that evidence suggests have the greatest potential to benefit
- Improve the access to LCIG for patients with advanced Parkinson's Disease unresponsive to other oral therapies and unsuitable for other procedures such as apomorphine or deep brain stimulation
- Ensure appropriate patient selection and best clinical outcomes for patients treated with LCIG
- Ensure that patients treated with LCIG are considered for all potential advanced PD therapies
- Streamline the pathway to treatment by removing the requirement of funding prior approval and the need for lengthy and time consuming IFR
- Standardise the assessment, treatment and long-term monitoring of patients receiving LCIG
- Ensure that patients have access to an MDT that includes specialist gastroenterology input for the insertion and accurate placement of PEJ tubes, and providing rapid individualised access in the event of PEJ complications such as tube blockage and displacement

4. Epidemiology and needs assessment

See NICE CG35, Parkinson's Disease: Diagnosis and management in primary and secondary care,¹ SIGN guideline 113, Diagnosis and management of Parkinson's disease; a national clinical guideline.²

PD is a common, progressive neurological condition, estimated to affect 100–180 per 100,000 of the population (6–11 people per 6,000 of the general population in the UK)* and has an annual incidence of 4–20 per 100,000.³ There is a rising prevalence with age and a higher prevalence and incidence of PD in males.³ It is estimated that about 10% of patients have advanced Parkinson's disease but many of these will suffer non-motor complications including neuropsychiatric and cognitive problems that will preclude them for many treatments including LCIG.

The advanced PD patient pool potentially eligible for advanced therapies such as

DBS, Apomorphine and LCIG is uncertain. The Specialist Commissioning Policy for DBS in Movement Disorders reports a crude pro rata estimate of 300 patients per year would satisfy eligibility criteria for DBS⁸ based on extrapolated data from the East Midlands Specialised Commissioning Group.

Since it was licensed in 2006, about 200 patients have received treatment with LCIG in the UK and about 25 new patients per year start treatment in England. This small number is likely to reflect variability in commissioning and availability. With the introduction of this specialist commissioning policy and on the assumption that there will be no requirement for pre-approval of funding it is estimated that between 75 and 100 new patients would be clinically appropriate to start LCIG. Whilst this figure is an unsubstantiated estimate, it is in keeping with eligibility data in the Specialist Commissioning Policy for DBS in Movement Disorders.⁸

5. Evidence base

The Scottish Medicines Consortium (SMC) assessed duodopa in 2006. Their assessment was based on data from the study by Nyholm et al.⁹ and it was concluded that a significant improvement in on-time can be achieved in patients with advanced PD compared to oral polypharmacy. However, they concluded that the economic case had not been demonstrated and, therefore recommended that it should not be used in NHS Scotland. This was a short duration double blind cross-over study.

Since the SMC assessment a number of other studies have been performed that provide additional efficacy, safety, quality of life and cost-effectiveness data, which are summarised below.

Clinical Efficacy

In a recent study, Fernandez et al¹⁰ reported the results of a prospective 54-week study in patients with advance PD who had motor fluctuations while receiving optimized PD treatment. Interim data included 192 patients who had received LCIG, of whom 69 patients (35.9%) had completed 54-weeks of treatment, 99 (51.6%) were ongoing, and 24 (12.5%) had withdrawn from the study. Among 166 cases observed at week-12, mean OFF time decreased by 3.9 hours/day, a benefit that was maintained in 61 patients remaining at week-54 (mean reduction in OFF time of 4.6 hours/day). The mean 'ON time without troublesome dyskinesia' increased by 4.6 hours/day at week-12, and by 5.3 hours/day among patients who reached week-54. Mean OFF time was significantly reduced at all-time points (4, 12, 24, 36 and 54-weeks) among observed cases ($p < 0.001$ versus baseline). These primary efficacy measure findings were supported by secondary efficacy measures including the significant long-term improvements observed in mean UPDRS total and subscale scores ($p < 0.001$ versus baseline)¹⁰.

At the 16th Annual International Congress of Parkinson's Disease and Movement Disorders, Dublin, Ireland 2012, Olanow reported, a randomised, controlled, double-blind, double-dummy study comparing LCIG with standard oral levodopa/carbidopa immediate-release (LC-IR) tablets¹¹. Seventy-one patients were randomised with 66 completing the trial. The results demonstrated a statistically significant and

clinically meaningful improvement with levodopa/carbidopa intestinal gel (LCIG) compared with oral LC-IR with respect to the primary efficacy endpoint (change in OFF time) and the key secondary efficacy measure (ON time without troublesome dyskinesia). At week-12, LCIG significantly improved OFF time by a mean difference (least squares) of -1.91 hours ($p=0.0015$) compared with LC-IR; ON time without troublesome dyskinesia improved by a least square mean difference of 1.86 hours ($p=0.0059$). Compared to baseline there was a mean improvement in OFF time of 4.04 hours in the LCIG group compared to 2.14 hours in the LC-IR group ($p=0.0015$) There was an increase in the proportion of the day in the ON state without troublesome dyskinesia in the LCIG group compared to the LC-IR group.

DIREQT (Duodopa Infusion: Randomized Efficacy and Quality of Life Trial), was a controlled, multicentre trial involving five centres in Sweden⁹. It was a randomised, cross-over trial in 24 patients with advanced PD and compared motor fluctuations (primary endpoint) and quality of life in patients on optimized conventional combination therapies with those on LCIG infusion therapy. A significant increase in ON time ($p<0.01$) and a decrease in OFF time ($p<0.01$) were seen with infusion compared with conventional therapy. Median total UPDRS scores decreased from 53 on conventional therapy to 35 on infusion ($p<0.05$) and median PD Questionnaire-39 (PDQ-39) summary index scores decreased from 35 with conventional therapy to 25 with infusion ($p<0.01$). Of the 18 patients who completed the study, 16 chose to be treated with continuous LCIG infusion via a permanent tube system in preference to continuing conventional therapy. The authors concluded that in patients with PD with motor fluctuations and dyskinesias, continuous LCIG infusion as monotherapy offers an alternative to the treatment of patients with advanced PD with combinations of conventional medications⁹.

Twelve of the patients who completed the 6-week DIREQT were followed for up to 6-months with findings supporting the conclusions of the original study. LCIG was associated with significantly better outcomes in satisfaction with overall functioning, OFF time, ability to walk and PDQ-39 compared with conventional treatment¹².

The efficacy of LCIG has been demonstrated across other comparative studies. Reddy et al. recently demonstrated significant improvements in a group treated with LCIG compared to a similar untreated group that were clinically eligible but not given LCIG because of funding restrictions by primary care trusts (PCTs) in the UK; Improvements in UPDRS-III ($p=0.005$), UPDRS-IV ($p=0.0004$), total NMSS score ($p=0.004$), and QoL ($p=0.01$) were seen¹³.

Nilsson et al.¹⁴ evaluated the long-term efficacy of LCIG infusion in patients who received infusion treatment for up to 7 years. Patients were tested before infusion treatment whilst on optimal oral therapy, and at 3–8 months and 4–7 years of infusion treatment. Scored videos of six patients performing standardized motor tasks showed an increase in the amount of time spent in the “near normal” motor state in patients treated with LCIG compared to oral therapy. This improvement remained after 4–7 years, but was less than after 3-8 months treatment. Dyskinesias decreased after 3–8 months of LCIG, and they decreased even further after 4–7 years of treatment.¹⁴

The efficacy of LCIG is further supported by evidence from the following non-comparative studies. Eggert et al. switched 13 patients with advanced PD with motor fluctuations and dyskinesia whilst taking conventional PD therapy to continuous LCIG infusion and followed them for up to 12 months. Time spent in an OFF state represented a mean of 50% ($\pm 14\%$; $n=13$) of awake time before levodopa infusion and was reduced to a mean of 11% ($\pm 9\%$; $n=11$) of awake time after 6 months. Time spent "ON with disabling dyskinesias" represented a mean of 17% ($\pm 15\%$; $n=13$) of awake time before levodopa infusion and was reduced to a mean of 3% ($\pm 6\%$; $n=11$) of awake time after 6-months, thereby markedly increasing the time spent in a good ON state.¹⁵

Quality of Life

Antonini et al. prospectively assessed clinical and QoL changes in 9 patients with PD with severe motor fluctuations and dyskinesia who commenced LCIG. Off period duration and time with disabling dyskinesia significantly reduced in all seven patients who completed 12 months follow-up ($p < 0.01$). These changes were accompanied by significant improvements in UPDRS-II and UPDRS-IV at 12 months ($p < 0.02$) but there was no change in UPDRS-III. On the PDQ-39 there were improvements in mobility ($p < 0.01$), activities of daily living ($p < 0.01$), stigma ($p < 0.05$), and bodily discomfort ($p < 0.05$).¹⁶ A further follow up study by the same authors reported significant reductions in off- time, and dyskinesia severity accompanied by improved PDQ-39 and UPDRS part 2 at 2 years.¹⁷

Analysis of the data from Fernandez's study confirmed that there are significant and clinically meaningful improvements in disease specific and global QoL, measures of function and clinical impression in patients treated with LCIG compared to baseline^{18, 19}. Functional, QoL and clinical impression ratings that showed significant improvements from baseline to the final evaluation were: PDQ-39 Summary Index (and all but one subdomain score), UPDRS parts II and III, EQ-5D, EQ-VAS and CGI-Improvement. The 39-item PD Questionnaire (PDQ-39), the European Quality of Life-5 Dimensions index (EQ-5D) and the European Quality of Life Visual Analog Scale (EQ-VAS) all indicated significant improvements in QoL ($p < 0.001$ versus baseline) as early as week-4 (PDQ-39: $n=309$; EQ-5D: $n=316$; EQ-VAS: $n=316$) and these QoL improvements were sustained until week-54 ($n=228$).¹⁰

In Olanow and colleagues' study population, assessments of function and QoL showed significant improvements in UPDRS part II, PDQ-39 and EQ-VAS on LCIG compared to LC-IR at week-12.²⁰ On PDQ-39 there were significant improvements on mobility, ADL, and communication sub-domains. The EQ-VAS was also significantly improved by LCIG relative to LC-IR ($p=0.0033$).²⁰ The retrospective studies by Devos et al²¹ and Santos-Garcia et al²² provided further supportive evidence of sustained improvements in QoL data.

Improvements in quality of life measured on PDQ-39 and diary data were reported in an open label prospective study from Foltynie and colleagues.²³ The patients were typical of those that would be seen in specialist neurosciences centres in the UK. The 12 reported patients had all tried apomorphine and had been reviewed by the specialist MDT for consideration of DBS; two had previously undergone surgery but the remainder were unsuitable for various reasons. One of the patients did not

proceed to PEJ tube insertion due to insufficient improvement after naso-jejunal trial. Significant improvement in PDQ-39 summary score was seen compared to baseline, as well as on subscores for mobility, sense of stigma and cognition. However review of individual scores showed improvements in 6/11 and unchanged scores in 5/11. Among the 5/11 with unchanged quality of life scores, three had significant improvements in diary on-time that the authors considered may have been due to unrealistic expectations. Three patients did not continue treatment beyond 3-months.²³

Safety

Safety issues regarding LCIG can be divided into adverse drug reactions, adverse events (AEs) related to PEG-J surgery and technical complications with the pump or tubing. Safety profile data is summarised in the Duodopa Intestinal Gel Summary of Product Characteristics.⁷

Cost Effectiveness

LCIG has not been specifically reviewed by NICE. The Clinical Guideline on PD (CG 35),¹ was published in June 2006 but was prepared before LCIG (LCIG) was licensed in November 2005. The guideline is currently being updated and the outcome is awaited.

The Scottish Medicines Consortium (SMC) assessed Duodopa soon after its licensing in 2006.²⁴ The cost effectiveness was based on the data submitted by the manufacturer, based on a five year Markov model with an annual cycle length and with the comparator being standard care. The five year cost for the duodopa arm was estimated as £134,000, as against £66,000 for the standard care arm. Quality adjusted life years (QALY) per patient in the duodopa were estimated as 1.1 as against 0.2 for the standard care arm; resulting in an incremental cost per QALY of £76,000. Further analysis and extrapolation resulted in wide variability in estimated QALY. Based on uncertainties around the utility mapping exercise and resultant quality of life estimates and the coupled with the high estimates for QALY, the SMC concluded that the cost effectiveness had not been demonstrated.²⁴

More recently, Lowin et al concluded that LCIG was a cost-effective treatment in advanced PD in the UK.²³ They used a simple Markov model to compare the costs and outcomes associated with LCIG treatment with those of the best available standard care (SC) in the UK.²⁵ The model cohort was representative of patients with advanced Parkinson's disease (PD) initiating treatment with LCIG with patients experiencing more than 50% of waking time in the OFF state at treatment initiation. Analysis was conducted from the NHS and Personal Social Services perspective. In the base-case analysis, lifetime costs were estimated at £201,192 per patient for LCIG compared with £161,548 for SC. Expected life-years gained (LYG) per patient were 5.3 for LCIG and 4.53 for SC, while the expected Quality Adjusted Life Years (QALYs) were estimated at 1.88 and 0.78 respectively. The model estimated an incremental cost per LYG of £51,741 for LCIG versus SC and an incremental cost per QALY of £36,024. The analysis was sensitive to time on treatment, health state on treatment and estimates of long-term benefit and resulted in incremental cost effectiveness ratio (ICER) ranging between £32,167 and £66,421. These cost-effectiveness estimates are within the envelope of acceptability usually used by

NICE with respect to orphan drugs.

6. Rationale behind the policy statement

This policy states the LCIG should be provided at specialist neurosciences centres following strict inclusion and exclusion criteria.

LCIG is an expensive therapy licensed for management of advanced Parkinson's Disease and needs to be considered with other advanced therapies, such as subcutaneous apomorphine infusions and deep brain stimulation.

Approval of LCIG following standard protocol will allow prospective monitoring, audit and outcome data collection that will guide further reviews.

7. Criteria for commissioning

Patients assessed at a designated specialist neurosciences centre and satisfying the criteria below

Inclusion Criteria

Patients should satisfy all the following criteria:

- Advanced levodopa-responsive PD with severe motor fluctuations, including significantly disabling off periods and/or dyskinesia that have not responded satisfactorily to available combinations of PD medications
- Have at least 50% 'off' periods
- The patient should not be disabled by symptoms unlikely to respond to levodopa
- Disease course of at least 5-years thereby reducing likelihood of atypical Parkinson's such as PSP or MSA
- Further reasonable drug therapeutic options are contraindicated due to co-morbidities or late-PD disease complications
- Unable to tolerate or unsuitable for apomorphine
- Unsuitable for DBS, has refused to consent for DBS or DBS has failed
- Positive trial to LCIG administered by temporary NG tube (see starting criteria)

Exclusion Criteria

The presence of one or more of the following would exclude LCIG therapy:

- Abnormal upper gastro-intestinal anatomy
- Significant dementia
- Significant psychotic symptoms
- Significant co-morbidities that are likely to compromise the potential benefit of LCIG

- The presence of any contraindication as detailed in the LCIG summary of product characteristics (SPC)⁷
- Lack of social support / appropriate carer to administer the LCIG if appropriate

Starting Criteria

- A positive test of the clinical response to LCIG administered via a temporary naso-jejunal tube is required before a permanent tube is inserted

Stopping Criteria

- Patients will be treated as long as they continue to derive benefit as judged by discussions with patient, carers and after formal rating scale assessments
- Unacceptable adverse effects of the drug
- Loss of ambulation¹
- Development of significant dementia, psychosis or other PD-related complications should prompt careful review of clinical utility of on-going treatment and discussion with other members of MDT.
- Development of peripheral neuropathy unresponsive to metabolic replacement
- Patient choice
- Hardware problems that can include recurrent PEJ tube displacement especially if related to patient compliance
- Treatment with LCIG using a permanent tube can be discontinued at any time by withdrawing the tube and letting the wound heal.

8. Patient pathway

In the proposed pathway, patients must be assessed by a specialist clinician based at a designated PD MDT at a specialist neurosciences centre that is experienced in all potential advanced PD therapies, including apomorphine and deep brain stimulation.

Clinicians with specialist knowledge or experience in management of advanced PD who are based at tertiary neurosciences centres but without access to on-site deep brain stimulation (that would otherwise exclude them from providing the service) may provide the service but must ensure that decisions on treatment eligibility have been approved through an MDT based at the specialised neurosciences centre to ensure standardised criteria are satisfied, that patients have been considered for all potential treatments and that ongoing monitoring and audit are reported via the MDT in compliance with defined criteria.

¹ Unless there are other significant extenuating reasons for continuation such as severe painful dystonia unresponsive to other therapy. Other criteria will be at the treating clinicians discretion with decisions made in conjunction with other members of the MDT. Treatment will continue until the lead clinician judges that there is insufficient clinical improvement to justify on-going therapy.

Patients approved for LCIG by MDT are referred to the local MDT pathway to initiate treatment following the approved local management pathway that will normally include:

- Pre-test dose clinical assessment and blood screening as per local pathway (Consider U&E, FBC, LFT, B12, B6, Vit D)
- Formal Rating scale scores to include: Hoehn and Yahr, UPDRS, On-Off Diary for 3 consecutive days, PDQ-39.
- Test dose LCIG
- Placement of PEJ
- Initiation of treatment
- Titration of LCIG and withdrawal of PD therapies as clinically indicated².

The MDT managing patients being assessed for LCIG should include a core membership of:

- At least one Tertiary centre-based Consultant Neurologist specialising in Movement Disorders or Parkinson's Disease and experienced in assessment of patients for DBS, apomorphine and LCIG
- Movement Disorders or Parkinson's Disease Specialist Nurse
- Consultant Gastroenterologist experienced in PEG/PEJ tube insertion
- Neurosciences Pharmacist

In addition to the core membership; referring secondary/tertiary care physicians can be invited to join the MDT to contribute to decisions relating to patients under their care or in the event of disagreement between patients/carers and clinicians, or between clinicians, with regard to interpretation of stopping criteria.

9. Governance arrangements

LCIG should only be available in specialist neuroscience centres that agree to publish their results using established PD-related outcome measures. This should include complication rates related to PEJ tube placement and subsequent PEJ management.

For other governance arrangements see Specialist Neurosciences Service specification.

² It is expected that the vast majority of patients will receive LCIG over a 16 hour daytime period with withdrawal of most if not all dopaminergic medication. However, some patients may still require overnight treatment for nocturnal off period symptoms and appropriate treatments could include oral levodopa preparations or dopamine agonists.

10. Mechanism for funding

LCIG is commissioned by NHS England in line with the scope and manual for specialised neurology.

It is recommended that LCIG be funded only within the remit of this policy document.

11. Audit requirements

Providers will be expected to provide information on activity and outcomes on request.

Core data to include:

Annual activity figures:

- Hospital Length of Stay
- Therapy complications

Baseline severity and annual progression based on:

- UPDRS
- PDQ39
- On-off diary over 3 consecutive days
- Hoehn and Yahr status

12. Documents which have informed this policy

NICE CG35. Parkinson's Disease: Diagnosis and management in primary and secondary care ¹.

SIGN guideline 113, Diagnosis and management of Parkinson's disease; a national clinical guideline ².

13. Links to other policies

This policy follows the principles set out in the ethical framework that govern the commissioning of NHS healthcare and those policies dealing with the approach to experimental treatments and processes for the management of individual funding requests (IFR).

In England, the NICE Clinical Guideline on Parkinson's Disease (CG 35)¹ was published in June 2006 but was prepared before LCIG (LCIG) was licensed in November 2005. The guideline is currently being updated and the outcome is awaited.

SIGN (Scottish Intercollegiate Guideline Network) guideline 113 for the Diagnosis

and Pharmacological Management of Parkinson's Disease issued in January 2010, does not support the routine use of intraduodenal levodopa, but advises that, "Patients who have impaired quality of life due to motor fluctuations, and who are not responding to alterations in their oral medication, should be considered for their suitability for other therapies, such as apomorphine, intraduodenal levodopa or surgery"².

The Scottish Medicines Consortium assessed Duodopa in 2006 based on the pivotal data submitted by the manufacturing company that was available at the time.²⁴ They recommended that it should not be commissioned in NHS Scotland as the economic case was insufficient to justify its use, however they acknowledged that a significant improvement in on-time had been achieved in the pivotal studies. This data has been supplemented by further studies and the recent cost-effectiveness study by Lowin et al.²⁵

This policy links to the published NHS England Policy for Deep Brain Stimulation for Movement Disorders.

14. Date of review

This policy will be reviewed in April 2016 unless data received indicates that the proposed review date should be brought forward or delayed.

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