Worcestershire Acute Hospitals NHS Trust

CLINICAL GUIDELINE FOR THE INITIATION OF PRODUODOPA® FOR THE TREATMENT OF PARKINSON'S DISEASE

This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Health care professionals must be prepared to justify any deviation from this guidance.

Introduction

This guideline has been developed to enable all healthcare practitioners working within the Trust and community to have an understanding of the practice of administration of Produodopa in people with Parkinson's Disease.

Parkinson's disease (PD) is a progressive neurological disorder marked by tremor, stiffness, and bradykinesia, caused by the loss of dopamine in the brain. In advanced PD, symptoms become harder to control due to fluctuating responses to standard treatments like levodopa.
Produodopa (a combination of Foslevodopa-foscarbidopa) is a prodrug therapy delivered via continuous 24-hour subcutaneous infusion, offering more stable plasma levodopa levels. It is indicated for advanced levodopa-responsive PD with severe motor fluctuations or dyskinesia when other treatments have failed.
Due to funding constraints and strict eligibility criteria, all patients being considered for Produodopa must be referred to the multidisciplinary team (MDT) at Queen Elizabeth Hospital Birmingham (QEHB) for assessment of suitability.

This guideline is for use by all qualified and specialised healthcare professionals involved in the care of patients with Parkinson's disease.

Lead Clinician(s) Caroline Gibson	Lead Clinical Pharmacist AMS and HCD
Approved by Dr Tom Heafield on:	7th July 2025
Approved by Medicines Safety Committee on: *Where medicines are included in document.*	9th July 2025
Review Date: This is the most current document and should be used until a revised version is in place	7th July 2028

Key amendments to this guideline

Date	Amendment	Approved by:
July 2025	New document	MSC

Contents

1. Table of Abbreviations

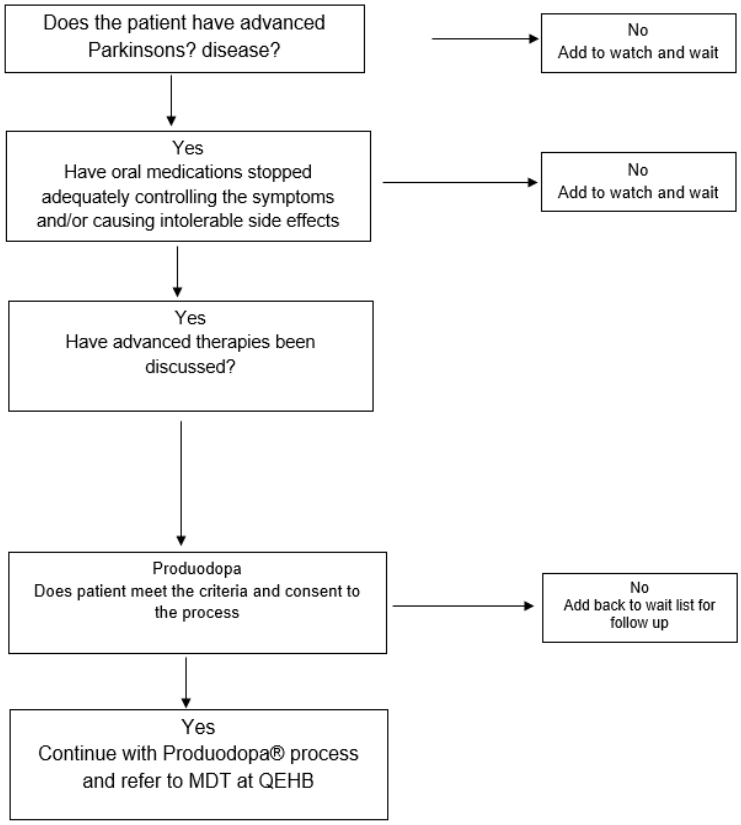
Abbreviation	Full text
COMT	Catechol-O-methyltransferase
FBC	Full Blood Count
LE	Levodopa Equivalents
MAOi	Monoamine Oxidase inhibitor
MDT	Multi Disciplinary Team
mL	millilitre
MoCA	Montreal Cognitive Assessment
MMA	Methylmalonic acid
NMSQ	Non Motor Symptom Questionnaire
PD	Parkinson's disease
PNS	Parkinson Nurse Specialist
QEHB	Queen Elizabeth Hospital Birmingham
SmPC	Summary of Product Characteristics

U/E	Urea and Electrolytes
UPDRS	Unified Parkinson Disease Rating Scale

2. Executive Summary & Key Points

2.1. Foslevodopa with Foscarbidopa (Produodopa) are produgs of Levodopa and Carbidopa respectively.
2.2. Produodopa is administered as a continuous subcutaneous infusion, 24 hours per day.
2.3. It is recommended as an option for treating advanced levodopa-responsive Parkinson's in adults whose symptoms include severe motor fluctuations and hyperkinesia or dyskinesia, when available medicines are not working well enough if they cannot have apomorphine or deep brain stimulation, or these treatments no longer control symptoms (NICE, 2023).
2.4. All people who meet criteria for Produodopa should have funding approved from the commissioning team (via completion of Blueteq form) in advance of initiation.

3. Flow Chart



4. Body of Guideline

Screening.

4.1 All people with PD thought to be suitable for Produodopa must be discussed at an advanced therapies Multi Disciplinary Team (MDT) at QEHB with a core team of Consultant Neurologist, Consultant Geriatrician, and Parkinson's Specialist Nurse

(PSN). Patients will be referred to the MDT via this electronic form link https://forms.office.com/e/wsTEqRyJcw (Microsoft Forms).

4.1. Referrer to MDT to confirm absence of contraindications prior to MDT discussion (Appendix 1 Summary of Product Characteristics (SmPC), 2024)
4.2. MDT role to confirm inclusion criteria met (Appendix 2 Blueteq, 2024) and absence of any exclusion criteria (Appendix 3)
4.3. MDT to inform referrer outcome of MDT discussion
4.4. If Produodopa agreed, then to proceed to Pre-admission
4.5. If Produodopa not agreed, then to discharge back to referrer

Pre-admission

4.6. Assessment made to confirm pre-admission checks completed (see Appendix 4 for all checks that need to be made)
4.7. Prior to admission to day unit / outpatient clinic, PNS to liaise with Unit / area to ensure they have chair/bed available.
4.8. PNS to sign homecare registration form, initiation prescription and repeat prescription and send to Pharmacy Homecare Team, at least 4 weeks in advance, who will screen and send to Healthnet.
4.9. Healthnet will confirm with the Pharmacy Homecare Team prior to the patient's admission, which Pharmacy Department they will deliver the pump and Produodopa® vials to (as this may be dependent on which site the patient is attending for their initiation).
4.10. Pharmacy to store the pump and Produodopa® until required for date of initiation.
4.11. Week before admission date PNS to confirm further pre-admission checks completed (Appendix 8)
4.12. If significant delay between pre-admission check and admission or in event of clinical change which affects suitability for Produodopa® then not to proceed with Produodopa® and to discharge back to referrer
4.13. If pre-admission checks cannot be completed and will not be able to complete in future, then to discharge back to referrer
4.14. If all pre-admission checks completed and no issues raised, then to proceed to Admission (see below)
4.15. Patient to be made aware that they will need to bring all their usual medications in the correct labelled packaging into hospital with them and to continue to take their usual medication regime until informed otherwise by the PNS..

Admission

4.16. On Day of Admission – Patient with PD to attend clinical setting by arranged appointment for a four hour duration.
4.17. PNS collect Produodopa pump, tubing and treatment vials from Pharmacy and take to admission unit.
4.18. Produodopa prescribed as per pre-defined infusion rate (Appendix 7)
4.19. Allow removal of treatment vial from fridge 30 minutes prior to initiation to warm to room temperature.
4.20. Set-up Produodopa pump as prescribed with extra dose, higher dose, lower dose and lockouts (Higher dose as hourly dose +0.1 mL/hour; Lower dose as hourly dose -0.1 mL/hour)
4.21. Start, monitor and adjust infusion as required (Appendix 9)
4.22. If initiation unsuccessful then to liaise with clinician to consider option of further initiation trial if felt appropriate.

4.23. If initiation unsuccessful and clear of no benefit, then discharge to referring clinician
4.24. If successful initiation then confirm person with PD has been provided with discharge contact details (Appendix 10), emergency back-up medication plan, guidance in case of skin infection (Appendix 11), and provide treatment vials
4.25. Discharge from clinic setting and arrangements made for patient to return the next day for follow up and continuation of titration if needed.
4.26. Contact community PSN team to confirm follow-up arrangements (as required)

Follow-up

4.27. Person with PD reviewed by PSN (if to return to clinic setting) or community PSN within 24 hours of starting Produodopa infusion
4.28. Response, infusion site reviewed, and practice of setting up infusion reviewed as required
4.29. Dose adjustments undertaken if indicated
4.30. Further review appointments made as required. Anticipate at least one patient contact/ week
4.31. If established on treatment, then Pharmacy Homecare Team informed for continuation prescription to be completed and processed.
4.32. Clinician to review at least six monthly to ensure criteria to continue Produodopa remains and to sign six monthly prescriptions.
4.33. Clinician to obtain Blueteq continuation code every 12 months as per NICE (Appendix 12)

5. Monitoring & Suggested Quality Standards

5.1. Adherence to the guideline will be monitored by audit of treatment pathway as per standards set out in Section 3 and as per NHS England agreed criteria (Appendicies 2 and 12)

6. References, Associated Documents and Other Guidance

6.1. References

i. https://www.nice.org.uk/guidance/ta934 Accessed April 2025
ii. https://www.medicines.org.uk/emc/product/15213/smpc#gref Accessed April 2025
iii. 1205-continuation-of-foslevodopa-v1.pdf Accessed May 2025
iv. Guideline for the use of Foslevodopa with Foscarbidopa (Produodopa) in People with Parkinson's Disease. Produced by UHB Controlled Doc Number: 1379 issued 10/08/2023 (Version 1.2)

7. Methodology

7.1. This guideline was completed by author following review of UHB guidelines which was produced as a result of a review of guidelines from Nottingham University Hospitals NHS Trust and University Hospitals North Midlands NHS trust. Also referred to Greater Glasgow and Clyde guideline to produce guidance when a patient is established on Produodopa but attends WHAT as an inpatient. This guideline was then reviewed by the Neurology Team at Worcestershire Acute Hospitals NHS Trust, including Pharmacy.

APPENDICIES

APPENDIX 1 SmPC Contraindications to Produodopa

https://www.medicines.org.uk/emc/product/15213/smpc#gref Accessed Aoril 2025

Produodopa is contraindicated in patients with:

• hypersensitivity to the active substances or to any of the excipients listed in section 6.1[…as…Sodium hydroxide 10N (for pH adjustment), Hydrochloric acid, concentrated (for pH adjustment), Water for injections]

• narrow-angle glaucoma

• severe heart failure

• acute stroke

• severe cardiac arrhythmia

• non-selective MAO inhibitors and selective MAO type A inhibitors are contraindicated for use with Produodopa. These inhibitors must be discontinued at least two weeks prior to initiating therapy with Produodopa. Produodopa may be administered concomitantly with the manufacturer's recommended dose of a MAO inhibitor with selectivity for MAO type B (e.g., selegiline HCl).

No interaction studies have been performed with Produodopa. The following interactions are known from the generic combination of levodopa/carbidopa.

Caution is needed in concomitant administration of Produodopa with the following medicinal products:

Antihypertensives

Symptomatic postural hypotension has occurred when combinations of levodopa and a decarboxylase inhibitor are added to the treatment of patients already receiving anti-hypertensives. Dosage adjustment of the antihypertensive agent may be required.

Antidepressants

There have been rare reports of adverse reactions, including hypertension and dyskinesia, resulting from the concomitant administration of tricyclic antidepressants (e.g., amoxapine and trimipramine) and carbidopa/levodopa preparations.

COMT inhibitors (e.g., tolcapone, entacapone, opicapone)

Concomitant use of COMT (catechol-O-methyl transferase) inhibitors and Produodopa can increase the bioavailability of levodopa. The dose of Produodopa may need to be adjusted.

Other medicinal products

Dopamine receptor antagonists (some antipsychotics, e.g., phenothiazines, butyrophenones and risperidone and antiemetics, e.g., metoclopramide), benzodiazepines, isoniazid, phenytoin and papaverine can reduce the therapeutic effect of levodopa. Patients taking these medicinal products together with Produodopa should be observed carefully for loss of therapeutic response.

MAO inhibitors are contraindicated in patients taking Produodopa, with the exception of MAO-B selective inhibitors (for instance selegiline HCl). The dose of Produodopa may need to be reduced when a MAO inhibitor selective for type B is added.

Concomitant use of selegiline and levodopa/carbidopa has been associated with serious orthostatic hypotension.

Amantadine has synergistic effect with levodopa and may increase levodopa related adverse events. An adjustment of the dose of Produodopa may be needed.

Sympathomimetics (e.g., adrenergic drugs not limited to - salbutamol, phenylephrine, isoproterenol, dobutamine) may increase cardiovascular adverse events related to levodopa.

Foscarbidopa has been identified as a potential inducer of CYP1A2 in vitro. Care should be taken when prescribing Produodopa in combination with sensitive CYP1A2 substrates (e.g., fluvoxamine, clozapine, caffeine, theophylline, duloxetine and melatonin). No clinical DDI studies have been conducted to assess the clinical relevance of this finding.

• conditions in which medication with adrenergic activity are contraindicated, e.g., pheochromocytoma, hyperthyroidism and Cushing's syndrome.

Because levodopa may activate malignant melanoma, Produodopa should not be used in patients with suspicious undiagnosed skin lesions or a history of melanoma.

APPENDIX 2 Blueteq Initiation criteria

https://www.blueteq-secure.co.uk/trust/default.aspx Accessed April 2025

Please indicate whether patient meets the following criteria:	**Please tick**
1. I confirm that the patient is an adult with advanced levodopa-responsive Parkinson's whose symptoms include severe motor fluctuations and hyperkinesia or dyskinesia.	Yes No * Required
2. I confirm that the patient cannot have apomorphine, or apomorphine no longer controls symptoms.	Yes No * Required
3. I confirm that the patient cannot have deep brain stimulation (DBS), or DBS no longer controls symptoms.	Yes No * Required
4. I confirm that the patient's eligibility has been agreed through a PD clinical network linked to a specialised neurosciences centre or designated PD MDT at a specialised neurosciences centre and it has been agreed that foslevodopa-foscarbidopa is the most appropriate therapy.	Yes No * Required
5. I confirm that the patient will receive the licensed dose and frequency of foslevodopa-foscarbidopa in line with its marketing authorisation.	Yes No * Required

APPENDIX 3 Additional Produodopa exclusion criteria

Exclusion criteria to Produodopa initiation in addition to those from SmPC (Appendix 1)

- Significant dementia
- Significant psychotic symptoms
- Significant co-morbidities that are likely to compromise the potential benefit of Produodopa e.g. conditions that increase risk of skin infections
- The presence of any contraindications as detailed in the Produodopa SmPC (Appendix 1).
- Lack of social support/appropriate carer to administer the Produodopa if appropriate

APPENDIX 4 Pre-admission checklist

Awareness of:

- Treatment aims
- Possible risks and side effects
- Administration and titration procedure
- Commitment to long term follow up with regular review
- Carer support
- Fridge size required to accommodate medication

Completion of:

- Baseline assessments
  - -Blood tests (FBC, U/E, Vitamin B12, MMA, Folate)
  - -PD specific assessment e.g. UPDRS, PKG request, NMSQ (Appendix 5)
  - -Cognitive assessment e.g. MoCA (Appendix 6)
  - -Nerve conduction study if appropriate
- Consent to receive medications via Health net (home care)
- Consent to undertake trial of Produodopa
- Education about infusion and pump
- Conversion of medication to alternative option if required e.g. from Apomorphine in advance of Produodopa initiation admission, discontinue MAOi
- Calculation of Produodopa doses recorded in CLIP (see Appendix 7)
- Schedule for emergency back-up oral medication to be used in event of Produodopa pump failure documented in CLIP and to ensure person has sufficient home stock available
- Homecare registration form } To be sent to Pharmacy Homecare Team who
- Initiation prescription } will then forward to Healthnet ideally 4 weeks before
- Repeat prescription } and at least 14 days prior to planned admission
- Blueteq form and authorisation code recorded in CLIP

Request of:

- Admission date to hospital clinic.

APPENDIX 5 PD NMS Questionnaire

PD NMS QUESTIONNAIRE

Name: ..... Date: ..... Age: .....

Centre ID: Male ☐ Female ☐

NON-MOVEMENT PROBLEMS IN PARKINSON'S

The movement symptoms of Parkinson's are well known. However, other problems can sometimes occur as part of the condition or its treatment. It is important that the doctor knows about these, particularly if they are troublesome for you.

A range of problems is listed below. Please tick the box 'Yes' if you have experienced it **during the past month.** The doctor or nurse may ask you some questions to help decide. If you have **not** experienced the problem in the past month tick the 'No' box. You should answer 'No' even if you have had the problem in the past but not in the past month.

Have you experienced any of the following in the last month?

	Yes	No
1. Dribbling of saliva during the daytime	☐	☐
2. Loss or change in your ability to taste or smell	☐	☐
3. Difficulty swallowing food or drink or problems with choking	☐	☐
4. Vomiting or feelings of sickness (nausea)	☐	☐
5. Constipation (less than 3 bowel movements a week) or having to strain to pass a stool (faeces)	☐	☐
6. Bowel (fecal) incontinence	☐	☐
7. Feeling that your bowel emptying is incomplete after having been to the toilet	☐	☐
8. A sense of urgency to pass urine makes you rush to the toilet	☐	☐
9. Getting up regularly at night to pass urine	☐	☐
10. Unexplained pains (not due to known conditions such as arthritis)	☐	☐
11. Unexplained change in weight (not due to change in diet)	☐	☐
12. Problems remembering things that have happened recently or forgetting to do things	☐	☐
13. Loss of interest in what is happening around you or doing things	☐	☐
14. Seeing or hearing things that you know or are told are not there	☐	☐
15. Difficulty concentrating or staying focussed	☐	☐
16. Feeling sad, 'low' or 'blue'	☐	☐
17. Feeling anxious, frightened or panicky	☐	☐
18. Feeling less interested in sex or more interested in sex	☐	☐
19. Finding it difficult to have sex when you try	☐	☐
20. Feeling light headed, dizzy or weak standing from sitting or lying	☐	☐
21. Falling	☐	☐
22. Finding it difficult to stay awake during activities such as working, driving or eating	☐	☐
23. Difficulty getting to sleep at night or staying asleep at night	☐	☐
24. Intense, vivid dreams or frightening dreams	☐	☐
25. Talking or moving about in your sleep as if you are 'acting' out a dream	☐	☐
26. Unpleasant sensations in your legs at night or while resting, and a feeling that you need to move	☐	☐
27. Swelling of your legs	☐	☐
28. Excessive sweating	☐	☐
29. Double vision	☐	☐
30. Believing things are happening to you that other people say are not true	☐	☐

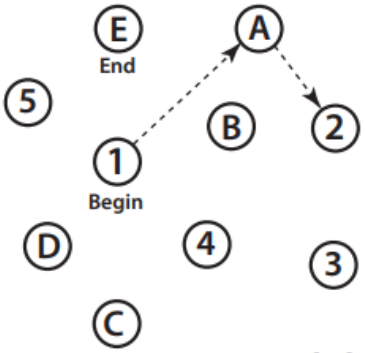
Developed and validated by the International PD Non Motor Group

APPENDIX 6 MOCA

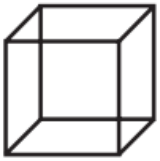
MONTREAL COGNITIVE ASSESSMENT (MOCA)

NAME :
Education : Date of birth :
Sex : DATE :

VISUOSPATIAL / EXECUTIVE



Copy cube



[ ] [ ]

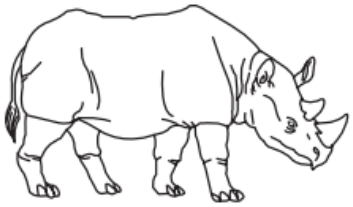
Draw CLOCK (Ten past eleven) (3 points)

[ ] Contour [ ] Numbers [ ] Hands

POINTS ___/5

NAMING

[ ]



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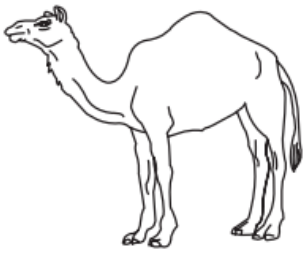

[ ] ___/3

MEMORY Read list of words, subject must repeat them. Do 2 trials, even if 1st trial is successful. Do a recall after 5 minutes.

	FACE	VELVET	CHURCH	DAISY	RED
1st trial					
2nd trial					

No points

ATTENTION Read list of digits (1 digit/ sec.).

Subject has to repeat them in the forward order [ ] 2 1 8 5 4
Subject has to repeat them in the backward order [ ] 7 4 2 ___/2

Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors
[ ] F B A C M N A A J K L B A F A K D E A A A J A M O F A A B ___/1

Serial 7 subtraction starting at 100 [ ] 93 [ ] 86 [ ] 79 [ ] 72 [ ] 65
4 or 5 correct subtractions: **3 pts**, 2 or 3 correct: **2 pts**, 1 correct: **1 pt**, 0 correct: **0 pt** ___/3

LANGUAGE Repeat : I only know that John is the one to help today. [ ]
The cat always hid under the couch when dogs were in the room. [ ] ___/2

Fluency / Name maximum number of words in one minute that begin with the letter F [ ] _____ (N ≥ 11 words) ___/1

ABSTRACTION Similarity between e.g. banana - orange = fruit [ ] train – bicycle [ ] watch - ruler ___/2

DELAYED RECALL

	Has to recall words WITH NO CUE	FACE [ ]	VELVET [ ]	CHURCH [ ]	DAISY [ ]	RED [ ]	Points for UNCUED recall only
Optional	Category cue						
	Multiple choice cue						

___/5

ORIENTATION [ ] Date [ ] Month [ ] Year [ ] Day [ ] Place [ ] City ___/6

© Z.Nasreddine MD Version 7.1 **www.mocatest.org** Normal ≥ 26 / 30

TOTAL ___/30
Add 1 point if ≤ 12 yr edu

Administered by: _____

APPENDIX 7 Produodopa dose calculation guide

https://www.medicines.org.uk/emc/product/15213/smpc#gref Accessed April 2025

Posology

Produodopa is administered as a continuous subcutaneous infusion, 24 hours per day.

The recommended starting infusion rate of Produodopa is determined by converting the daytime levodopa intake to levodopa equivalents (LE) and then increasing it to account for a 24-hour administration (see Initiation of treatment). The dose may be adjusted to reach a clinical response that maximises the functional "On" time and minimises the number and duration of "Off" episodes and "On" episodes with troublesome dyskinesia. The maximum recommended daily dose of foslevodopa is 6000 mg (or 25 ml of Produodopa per day equivalent to approximately 4260 mg levodopa per day).

Produodopa replaces levodopa-containing medications and catechol-O-methyl transferase (COMT)-inhibitors. If required, other classes of medicinal products for Parkinson's disease can be taken concurrently.

Initiation of treatment

Patients selected for treatment with Produodopa should be capable of understanding and using the delivery system themselves or with assistance from a caregiver.

Patients should be trained on the proper use of Produodopa and the delivery system (see Method of administration) prior to initiating treatment with Produodopa and, as necessary, thereafter.

Three steps are required to initiate treatment with Produodopa.

• Step 1: Calculate the LE based on the levodopa-containing medications used during the patient's awake time.

• Step 2: Determine the hourly infusion rate of Produodopa.

• Step 3: Determine the volume of the loading dose.

Step 1: Calculate the LE based on the levodopa-containing medications used during the patient's awake time.

The levodopa amount from all levodopa-containing formulations used during the awake time of the day (typically 16-hour/day) should be converted to LE using the appropriate dose multiplication factor from Table 1 and then summed. For this calculation, only consider levodopa and COMT inhibitors. Do not include rescue levodopa or any other anti-Parkinsonian medication or therapy, including medications taken outside of awake time (e.g., night-time dosing) in this calculation. If any COMT inhibitors are taken within a 24-hour period, regardless of the COMT inhibitor dose, a correction factor should be applied to the sum of LE as presented in Table 1.

Table 1. Calculating the Levodopa Equivalents (LE)

Levodopa formulation	Dose multiplication factor
Immediate-release, including enteral suspension	**1**
Sustained-release, controlled-release or prolonged-release[a]	**0.75**
If any COMT inhibitor is used, multiply sum of calculated LE from above by **1.33**[a]	
[a] The levodopa contained in combined LD/CD/COMT-inhibitor formulations count as immediate-release and needs to be added to the LE from all other sources of levodopa before the sum is multiplied for the COMT-inhibitors correction factor (i.e., do not apply COMT correction factor to single LE). CD = carbidopa; LD = levodopa; COMT = catechol-O-methyl transferase; LE = levodopa equivalents.	

Step 2: Determine the hourly infusion rate of Produodopa.

Refer to Table 2 for suggested Produodopa starting infusion rates based on the LE calculated in Step 1.
The hourly infusion rate for Produodopa in Table 2 is based on a patient's LE intake during a typical 16-hour awake time (LE_{16}).
If the LE determined in Step 1 were based on an awake time either longer or shorter than 16 hours, the LE should be adjusted to a 16-hour period. To adjust to a 16-hour period, take the LE calculated in Step 1, divide by the number of hours the patient is typically awake, and then multiply by 16. Then refer to Table 2 for Produodopa suggested starting infusion rates. An alternative is to calculate the starting hourly infusion rate according to the formula given under Table 2, where X is the number of patient's awake hours/day.
The hourly infusion rate determined in this step should be entered as the Base infusion rate when programming the pump (refer to the pump instructions for use for details).

Table 2. Suggested Produodopa starting hourly infusion rate

LE_{16} (LE from all oral LD-containing medications taken over 16-hour awake time (mg))	**Suggested Produodopa starting hourly infusion rate (ml/hr)[a] administered over 24 hours**
< 400	0.15
400-499	0.15-0.17
500-599	0.17-0.20
600-699	0.20-0.24
700-799	0.24-0.27
800-899	0.27-0.30
900-999	0.30-0.34
1000-1099	0.34-0.37
1100-1199	0.37-0.40
1200-1299	0.40-0.44
1300-1399	0.44-0.47
1400-1499	0.47-0.51
1500-1599	0.51-0.54
1600-1699	0.54-0.57
1700-1799	0.57-0.61
1800-1899	0.61-0.64
1900-1999	0.64-0.68
2000-2099	0.68-0.71
2100-2199	0.71-0.74
2200-2299	0.74-0.78
2300-2399	0.78-0.81
2400-2499	0.81-0.84
2500-2599	0.84-0.88
2600-2699	0.88-0.91
2700-2799	0.91-0.94

2800-2899	0.94-0.98
2900-2999	0.98-1.01
3000-3099	1.01-1.04
>3100	1.04

[a] The hourly infusion rate can be calculated using the following formula, where X is the number of patient's awake hours used to determine the LE (e.g., X=16, in the table above).
Hourly infusion rate (ml/hr) = [(LE · 0.92 · 1.41)/240]/X
Assumptions used to generate the " Suggested Produodopa starting hourly infusion rate" :
• Total daily LE over 16 hours are increased by 50% to account for 24-hour dosing
• Subcutaneous foslevodopa is 8% more bioavailable than enterally absorbed levodopa
• The molecular weight ratio between foslevodopa and levodopa is 1.41:1
• One millilitre of Produodopa contains 240 mg of foslevodopa and 12 mg of foscarbidopa
• Most patients with PD are treated with oral PD medications during their waking time (typically 16-hour/day treatment period); once the amount of foslevodopa needed over the 16-hour period has been calculated, it is divided by 240 mg to determine the number of millilitres needed over the 16-hour period, and then divided over 16 hours to establish the hourly infusion rate
LE = levodopa equivalents; LD = levodopa.

Step 3: Determine the volume of the loading dose.
A loading dose can be administered immediately prior to commencing the hourly infusion to quickly achieve symptomatic control when starting Produodopa therapy in an "Off" state (or if the pump has been off for more than 3 hours). Loading doses can be administered either via the pump or using oral immediate-release carbidopa-levodopa tablets.
Table 3 provides the recommended loading dose volume (ml) of Produodopa to be programmed into the pump (refer to the pump instructions for use for details) and the corresponding amount of immediate-release levodopa (mg), regardless of the peripheral inhibitor of the DOPA decarboxylase (e.g., carbidopa, benserazide) co-administered.

Table 3. Determination of Produodopa volume recommended for the loading dose

Recommended loading dose volume (ml) to be programmed into the pump	Approximate corresponding levodopa amount (mg)
0.6	100
0.9-1.2	150-200
1.5-1.8	250-300
2.0	350
0.1 ml of Produodopa contains 24 mg foslevodopa (equivalent to approximately 17 mg of levodopa). The pump is capable of delivering a loading dose ranging from 0.1 ml to a maximum of 3.0 ml, in increments of 0.1 ml.	

Optimisation and maintenance

The healthcare professional may adjust the starting hourly infusion rate to achieve the optimal clinical response for the patient. The hourly infusion rate should be delivered continuously over the 24-hour daily infusion period. If desired, the healthcare professional can program and

enable 2 alternative hourly infusion rates (Low/High). All infusion rates may be adjusted in increments of 0.01 ml/hr (which is equivalent to approximately 1.7 mg of levodopa/hour) and should not exceed 1.04 ml/hr (or approximately 4260 mg levodopa per day [6000 mg of foslevodopa per day]). The pump incorporates secure access to dose configuration to prevent patients from making changes to their pre-programmed flow rates or Extra Dose functionality. Produodopa can be taken alone or, if necessary, with other concurrent medicinal products for Parkinson's disease, based on the judgement of the healthcare professional. A reduction in other concomitant medications for Parkinson's disease, followed by an adjustment in Produodopa dosage, may be considered during Produodopa infusion. The concomitant use of Produodopa with other levodopa-containing medications or with medicinal products that significantly regulate synaptic dopamine levels (such as COMT inhibitors) has not been studied.

Alternative flow rate

The pump also allows for 2 alternative infusion rate options to be programmed for patient use (Low/High). The alternative infusion rates must be enabled and pre-programmed by the healthcare professional and may be selected by patients to account for changes in functional demand, e.g., lowering the dosage at night-time or increasing the dose for prolonged intense activity (refer to the pump instructions for use for details).

Extra doses

If enabled by their healthcare professional, patients may self-administer an Extra Dose to manage acute " Off" symptoms experienced during continuous infusion. The Extra Dose volume can be chosen from 5 options (see Table 4). The Extra Dose feature is limited to no more than 1 extra dose per hour. If 5 or more extra doses are used by the patient during the 24-hour/day treatment period, a revision of the Base Infusion Rate should be considered. The ability to enable this function, as well as the minimum time required between extra doses, is determined by the healthcare professional and cannot be modified by the patient (refer to the pump instructions for use for details on programming the Extra Dose feature).

Table 4. Extra dose option for Produodopa

Produodopa volume (ml)	**Levodopa equivalents (mg)**
0.10	17
0.15	25.5
0.20	34
0.25	42.5
0.30	51

APPENDIX 8 Pre-admission checklist

Week prior to admission checklist:

Confirm:

Blood tests obtained (see Appendix 4) are normal/ sought advice from responsible clinician if required.

n.b. If Vitamin B12 less than normal or low normal with raised MMA then replacement advised prior to Produodopa initiation

PKG resulted

Date of admission with day case unit

Date of admission with person due to commence Produodopa

Medication unchanged since pre-admission visit – if change made then to recalculate and document Produodopa dose in CLIP as required (Appendix 7)

Person due to commence Produodopa knows to continue to take their usual medication and to bring all their medication with them to the day case unit / out patient clinic in labelled packaging

Date of admission known to named community PSN and community PSN have received training in use of Produodopa

WAHT Pharmacy team in receipt of Produodopa pump, tubing, and medication vials

Produodopa pump battery charged

Blueteq approval code documented in medical notes

APPENDIX 9 Admission checklist

Person with PD admitted having taken usual morning medication
At time of next Levodopa medication commence Produodopa infusion instead
Stop COMT at time of infusion starting (if required)
Dopamine agonist (apart from Apomorphine) to continue

APPENDIX 10 Discharge contact details

A helpline is provided by HealthNet (the service partner for Abbvie) and is available for patients, carers and HCP's for ongoing support.

Tel 0808 175 6665
Monday - Friday 8am – 8pm
Saturday – Sunday (incl. Bank holidays) 8am – 5pm
Out-of-hours voicemail available

PSN Julie Pittaway Tel: 07751 729343
Mon-Fri 8a.m-4p.m
Email: julie.pittaway1@nhs.net

Community PSN team Tel: 01527 488172
Mon-Fri 8a.m-4p.m
Email: whcnhs.dutyparkinsons@nhs.net

WAHT Pharmacy Homecare team
Email: wah-tr.pharmacyhomecare@nhs.net

APPENDIX 11 Instructions to patient to recognise skin infection and actions to be taken if found

(Adapted From Produodopa Patient Guide Abbvie Version 1.0)

How to recognise an infusion site infection or infusion site reaction

Look for skin changes where the cannula goes into your skin. The skin changes may happen with or without a fever and include:

- redness
- warm to touch
- swelling
- tenderness/pain

An untreated skin infection can sometimes spread and cause sepsis. The possible symptoms of sepsis include:

- Feeling very unwell
- Not passing urine all day
- Continual vomiting and being unable to keep any food down
- A rash that does not fade when you roll a glass over it (if applicable)
- A very high or low temperature, feeling hot or cold to the touch, or shivering
- Acting confused, slurred speech or not making sense
- Blue, grey, pale or blotchy skin, lips or tongue – on brown or black skin, this may be easier to see on the palms of the hands or soles of the feet
- Difficulty breathing, breathlessness or breathing very fast

What you should do if you have an infusion site infection or infusion site reaction

Change your infusion site immediately – do not wait for 3 days. If your skin shows any signs of a reaction or infection then call your doctor, nurse or pharmacist for advice. If you have a rash that's red, swollen, tender and warm and the affected area is getting bigger then contact your doctor as soon as possible.

Seek immediate medical attention if you develop any symptoms of sepsis.

Do not reuse an infected site for at least 12 days or until it has healed.

APPENDIX 12 Blueteq continuation form
https://www.blueteq-secure.co.uk/trust/default.aspx accessed April 2025

Please indicate whether patient meets the following criteria:	Please tick
1. I confirm that the patient remains eligible for foslevodopa-foscarbidopa as per NICE TA934.	○ Yes ○ No * Required
2. I confirm that the patient has had an adequate response to foslevodopa-foscarbidopa.	○ Yes ○ No * Required
3. I confirm that the patient will receive the licensed dose and frequency of foslevodopa-foscarbidopa in line with its marketing authorisation.	○ Yes ○ No * Required

APPENDIX 13 Continuation of Foslevodopa-foscarbidopa (Produodopa®) for hospital inpatients.

All patients admitted to hospital on foslevodopa/foscarbidopa (Produodopa®) should be referred to the Parkinson's nurse specialist (PDNS) or pharmacist for advice as soon as possible.

General Information

• All patients (including their carers) admitted to hospital on Produodopa® will have received training and information on how to use the pump and will have been supplied with an information package along with details of who to contact in the event of problems arising with the pump. Patients (including their carers) are familiar and competent in using the Vyafusor pump, staff should encourage them to maintain the patient on the pump during their hospital stay, where appropriate.
• If for any reason the patient/carer cannot safely continue the pump in hospital, the emergency Parkinson's disease oral drug regimen should be initiated and the local PD team contacted for advice.
• Produodopa® is not stocked on any site within WAHT.
• Patients will be supplied with their Produodopa® via Homecare (a four-week supply is normally issued at a time) therefore patients should always have a supply at home which should be brought in during an emergency admission to hospital. If patients are admitted without a supply of Produodopa® they should be commenced on the emergency Parkinson's disease oral drug regimen until their own supply can be brought in.
• The Vyafusor pumps are not stocked on any site within WAHT patients should be maintained on their own pump on admission to hospital.
• Produodopa® is a combination of foslevodopa/foscarbidopa in 10ml vials: Each 1ml contains 240mg foslevodopa and 12mg foscarbidopa.

Prescribing of Produodopa ®

• Produodopa® should be prescribed in accordance with WAHT guidelines. The drug should be prescribed on EPMA and a paper infusion chart completed with details of dose and flow rate. Prescribers should be aware some patients will have a different dose/flow rate for overnight and separate infusion charts would be required.
• The dose/infusion rate should only be changed by a PD Specialist.
• If not able to administer Produodopa®, the admitting ward prescriber should commence the patient on their emergency Parkinson's disease oral medication regimen. Details of the emergency drug prescription are documented on the patient's clinic letters and available on Clip. If no oral access is available, prescribers should refer to the Guideline on the Medicines Management of Parkinson's Disease Patients with Compromised Oral Administration (**WHAT-PHA-030**)

Patients may be on Produodopa® alone or with other concurrent medicinal products for Parkinson's disease. Prescribers should ensure an accurate medication history has been obtained prior to prescribing.

Storage

• Store and transport refrigerated 2◦ C - 8◦ C
• Vials may be stored at room temperature up to a maximum of 30◦ C for a single period of up to 28 days. Once a vial has been stored at room temperature, do not return the product to the refrigerator.

• Produodopa® may vary from colourless to yellow to brown and may have a purple or red tint. Variations in colour are expected and have no impact on product quality. The solution may become darker in colour after piercing of the vial stopper or while in the syringe.
• Once opened, vials should be used immediately.
• If refrigerated prior to use, remove the vial from the refrigerator and allow to sit at room temperature out of direct sunlight for 30 minutes before administering.

Infusion device set up

Patients (including their carers) are familiar and competent in using the Vyafusor pump, staff should encourage them to maintain the patient on the pump during their hospital stay, where appropriate

• Produodopa® is administered as a continuous subcutaneous infusion, 24 hours per day using a Vyafuser pump.
• Only the Vyafusor pump should be used for the administration of Produodopa®
• The usual subcutaneous site of infusion is the abdomen, avoiding the 5cm radius area from the navel. The infusion set (cannula) can remain in place for 3 days when the medication is infused continuously.
• Aseptic technique should be followed when setting up the infusion.
• The infusion site should be rotated and a new infusion set used at least every 3 days.
• New infusion sites should be at least 2.5cm from sites used within the previous 12 days. Do not infuse into areas where the site is tender, bruised, red or hard to touch.
• Produodopa® vials are single use only. Once the content of the vial is transferred to the syringe, the contents of the syringe should be administered within 24 hours.
• Discard any used medication vials and syringes into a medication waste disposal bin. Syringes must be discarded after 24hours, even if residual product remains.
• Further details on setting up the pump are available via this link:

https://www.abbviepro.com/content/dam/abbvie-pro/uk/produodopa/resources-patients/Infusion%20Setup%20Leaflet%20digital%20version.pdf

Interruption of therapy
• Sudden discontinuation or rapid dose reduction of Produodopa®, without administration of alternative dopaminergic therapy, should be avoided.
• Produodopa® can be interrupted without further actions for brief periods of time, e.g. if the patient is showering.
• For interruptions longer than 1 hour, a new infusion set (tubing and cannula) should be used and rotated to a different infusion site.
• If the infusion has been interrupted for longer than 3 hours, the patient may self-administer a loading dose, if enabled on the pump set-up, to quickly re-establish control. If no loading dose is set on the device, an oral loading dose should be given (use the first dose from their emergency Parkinson's disease oral medication regimen).
• If the infusion is interrupted for a prolonged time (>24hours) or permanently discontinued, patients should be commenced on their emergency Parkinson's disease oral medication regimen. Details of the emergency drug prescription is documented on the patient's clinic letters and available on Clip. Ensure local Parkinson's team contacted for advice on ongoing management.

Patient Monitoring
• A sudden or gradual worsening of bradykinesia may indicate an obstruction in the device and should be investigated.

• Infusion site events are common (>10%) including infusion site reactions and infections. Patients should be monitored for any skin changes at the infusion site that could indicate a potential infection including redness associated with warmth, swelling, pain and discolouration when pressure is applied. A new infusion set should be used if any of these skin changes are observed.
• As with all levodopa combinations, patients should be carefully observed if Produodopa® is abruptly reduced or discontinued due to the risk of Neuroleptic Malignant Syndrome (NMS)
• Further information regarding drug interactions, adverse effects and contra-indications of Produodopa® can be found in the Summary of Product Characteristics (SPC) Produodopa 240 mg/ml + 12 mg/ml solution for infusion - Summary of Product Characteristics (SmPC) - (emc) (medicines.org.uk) or the British National Formulary (BNF)

See **APPENDIX 10** on details of who to contact for advice.

APPENDIX 14 Produodopa® Treatment Chart

SEE BELOW

Please attach patient sticker here or record
NAME:.....
NHS No.
HOSP No:
DOB
D D M M Y Y Y Y
Male ☐ Female ☐

Produodopa Treatment Chart

Worcestershire NHS
Acute Hospitals NHS Trust

ALLERGIES		NONE KNOWN	
DATE	DRUG / OTHER	REACTION DETAILS	

WARD		CONS	

Produodopa 240 mg/ml + 12 mg/ml solution for infusion containing foslevodopa and foscarbidopa to be given via subcutaneous infusion using Vyafuser Pump (see guideline for calculation of rates on initiation and medical notes for current maintenance dose)

Prescribed By Signature:	Print Name:	Date:

DATE	Batch No. for medication	Site of Infusion	START TIME (hrs)	STOP TIME (hrs)	LOADING DOSE (mls)	BASE INFUSION RATE (mls/hr)	INFUSION FLOW RATE (LOW) (mls/hr)	INFUSION FLOW RATE (HIGH) (mls/hr)	EXTRA DOSE (mls)	SYRINGE PREPARED BY	SYRINGE CHECKED BY	RATE SET BY	RATE CHECKED BY

Monitoring

Page/ Section of Key Document	Key control:	Checks to be carried out to confirm compliance with the Policy:	How often the check will be carried out:	Responsible for carrying out the check:	Results of check reported to: (Responsible for also ensuring actions are developed to address any areas of non-compliance)	Frequency of reporting:
	WHAT?	HOW?	WHEN?	WHO?	WHERE?	WHEN?
P1	ONLY patients who have been recommend this treatment by the MDT at QEHB will be prescribed	Every Prescription (with /without registration form) will be clinically checked by the Pharmacy Homecare Team and will ensure a Blueteq has been completed	Every time a prescription is written	Homecare Team and PSN	Deviations from guideline recommendations will be referred back to PSN / neurology team and prescription sent to homecare company once issues are resolved.	Each time a reportable issue arises..

References

See Page 5.

1. Adapted from Guideline for the use of Foslevodopa with Foscarbidopa (Produodpa) in People with Parkinson's *University Hospital Birmingham NHS Trust* Issued: 10/08/2023

Contribution List

This key document has been circulated to the following individuals for consultation:

Designation
Dr Tom Heafield (Consultant Neurologist)
Dr Pravin Tourane ((Consultant Neurologist)
Dr Laura Alvis Castano (Consultant Neurologist)
Julie Pittaway (Parkinson's Specialist Nurse)
Julie Day (Clinical Nurse Specialist for Neurology - Epilepsy)
Lynn Clements (Acute Neurology ACP)
Ke Xin Tan (Clinical Pharmacist)
Lindsay Stewart (Lead Pharmacist Specialty Medicine - WRH)
Hugh Morrow (Lead Pharmacist – Procurement, Homecare & High Cost Medicines)

This key document has been circulated to the chair(s) of the following committee's / groups for comments:

Committee
Neurology Clinical Directorate
Medicines Safety Committee

Supporting Document 1 - Equality Impact Assessment Tool

To be completed by the key document author and included as an appendix to key document when submitted to the appropriate committee for consideration and approval.

Herefordshire & Worcestershire STP - Equality Impact Assessment (EIA) Form

Please read EIA guidelines when completing this form

Section 1 - Name of Organisation (please tick)

Herefordshire & Worcestershire STP		Herefordshire Council		Herefordshire CCG	
Worcestershire Acute Hospitals NHS Trust	✓	Worcestershire County Council		Worcestershire CCGs	
Worcestershire Health and Care NHS Trust		Wye Valley NHS Trust		Other (please state)	

Name of Lead for Activity	

Details of individuals completing this assessment	Name	Job title	e-mail contact
	Caroline Gibson	Lead Clinical Pharmacist Ambulatory Medicines and High Cost Drugs	caroline.gibson7@nhs.net
Date assessment completed	12/05/2025		

Section 2

Activity being assessed (e.g. policy/procedure, document, service redesign, policy, strategy etc.)	Title: CLINICAL GUIDELINE FOR THE USE OF PRODUODOPA FOR THE TREATMENT OF PARKINSON'S DISEASE			
What is the aim, purpose and/or intended outcomes of this Activity?	Implement a guideline to support staff in initiating Produodopa Infusion in patients with advanced Parkinson's Disease.			
Who will be affected by the development & implementation of this activity?	❑	Service User	☒	Staff
	☒	Patient	❑	Communities
	❑	Carers	❑	Other _____
	❑	Visitors	❑	

Is this:	❑ Review of an existing activity ☒ New activity ❑ Planning to withdraw or reduce a service, activity or presence?
What information and evidence have you reviewed to help inform this assessment? (Please name sources, eg demographic information for patients / services / staff groups affected, complaints etc.	There is no specific information for equality impact in the implementation of this guideline that is relevant for a review
Summary of engagement or consultation undertaken (e.g. who and how have you engaged with, or why do you believe this is not required)	See contribution list.
Summary of relevant findings	

Section 3
Please consider the potential impact of this activity (during development & implementation) on each of the equality groups outlined below. **Please tick one or more impact box below for each Equality Group and explain your rationale**. Please note it is possible for the potential impact to be both positive and negative within the same equality group and this should be recorded. Remember to consider the impact on e.g. staff, public, patients, carers etc. in these equality groups.

Equality Group	Potential positive impact	Potential neutral impact	Potential negative impact	Please explain your reasons for any potential positive, neutral or negative impact identified
Age		√		This guideline will have neutral impact on all equality groups.
Disability		√		
Gender Reassignment		√		
Marriage & Civil Partnerships		√		
Pregnancy & Maternity		√		
Race including Traveling Communities		√		
Religion & Belief		√		

Equality Group	Potential positive impact	Potential neutral impact	Potential negative impact	Please explain your reasons for any potential positive, neutral or negative impact identified
Sex		√		
Sexual Orientation		√		
Other Vulnerable and Disadvantaged Groups (e.g. carers; care leavers; homeless; Social/Economic deprivation, travelling communities etc.)		√		
Health Inequalities (any preventable, unfair & unjust differences in health status between groups, populations or individuals that arise from the unequal distribution of social, environmental & economic conditions within societies)		√		

Section 4

What actions will you take to mitigate any potential negative impacts?	Risk identified	Actions required to reduce / eliminate negative impact	Who will lead on the action?	Timeframe
		.		
How will you monitor these actions?				

When will you review this EIA? (e.g in a service redesign, this EIA should be revisited regularly throughout the design & implementation)	

Section 5 - Please read and agree to the following Equality Statement

1. Equality Statement

1.1. All public bodies have a statutory duty under the Equality Act 2010 to set out arrangements to assess and consult on how their policies and functions impact on the 9 protected characteristics: Age; Disability; Gender Reassignment; Marriage & Civil Partnership; Pregnancy & Maternity; Race; Religion & Belief; Sex; Sexual Orientation

1.2. Our Organisations will challenge discrimination, promote equality, respect human rights, and aims to design and implement services, policies and measures that meet the diverse needs of our service, and population, ensuring that none are placed at a disadvantage over others.

1.3. All staff are expected to deliver services and provide services and care in a manner which respects the individuality of service users, patients, carer's etc, and as such treat them and members of the workforce respectfully, paying due regard to the 9 protected characteristics.

Signature of person completing EIA	Caroline Gibson
Date signed	09/07/2025
Comments:	
Signature of person the Leader Person for this activity	Dr Tom Heafield
Date signed	09/07/2025
Comments:	

Supporting Document 2 – Financial Impact Assessment

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

	Title of document:	Yes/No
1.	Does the implementation of this document require any additional Capital resources	No
2.	Does the implementation of this document require additional revenue	No
3.	Does the implementation of this document require additional manpower	No
4.	Does the implementation of this document release any manpower costs through a change in practice	No
5.	Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programmes or allocated training times for staff	No
	Other comments:	

If the response to any of the above is yes, please complete a business case and which is signed by your Finance Manager and Directorate Manager for consideration by the Accountable Director before progressing to the relevant committee for approval.