

Specialist Palliative Care
Audit and Guidelines Group

Specialist Palliative Care Audit and Guidelines Group (SPAGG)

**Clinical Guideline for the Management of
Patients with Parkinson's disease who are
approaching the end of life**

Version 1

Contents

1. INTRODUCTION	3
1.1 Scope	3
1.2 Definitions And Abbreviations	3
2. BACKGROUND	4
2.1 Epidemiology and stages Of PD.....	4
2.2 Palliative Stage PD	4
2.3 The Dying Phase.....	5
3. MANAGEMENT OF END OF LIFE SYMPTOMS	6
3.1 General Principles.....	6
3.2 Medication Management	6
3.3 Nutrition and Hydration.....	7
3.4 Rigidity	7
3.5 Pain	7
3.6 Nausea and vomiting	8
3.7 Secretions.....	9
3.8 Terminal Agitation and Delirium.....	9
3.9 Breathlessness.....	10
4. ADVANCED THERAPIES	10
4.1 Apomorphine	10
4.2 Duodopa Intestinal Gel.....	10
4.3 Deep Brain Stimulation (DBS).....	11
REFERENCES	11
21.APPENDICES	14
Appendix 1: Switching To Orodispersible Formulations In The Dying Patient.....	15
Appendix 2: Switching To A Transdermal Rotigotine Patch In The Dying Patient	18
Appendix 3: Managing Terminal Symptoms in PD “At a Glance”	20
Appendix 4: Contraindicated Medications in patients with PD at the End of Life	22
Appendix 5: Rationalising PD Medications at the End of life	23
Appendix 6: Example Audit Form of Management of patients with Parkinson’s Disease in their last days to weeks of life.....	24
Guide History	26

1. INTRODUCTION

1.1 Scope

These guidelines apply to:

- Patients with Idiopathic Parkinson's Disease who are approaching the end of their life irrespective of the cause, either in hospital or the community;
- The guideline is not directly intended for patients with other forms of Parkinsonism – such as Progressive Supranuclear Palsy, Multiple System Atrophy, Corticobasal Degeneration, Dementia with Lewy Bodies or Vascular Parkinsonism – but many principles will be relevant.

This guideline is intended to provide specific recommendations for symptom and medication management for PD patients in the *last days or weeks of life*, whether in primary or secondary care. It is not intended to replace the abundant guidance available elsewhere for palliative patients, for example: [West Midlands Palliative Care Guidelines](#).

1.2 Definitions And Abbreviations

PD – Parkinson's Disease

CNS – Clinical Nurse Specialist

MDT- Multidisciplinary team

COMT – Catechol-O-Methyl Transferase

MAO-B – Monoamine Oxidase B inhibitor

TDS – Three times a day

QDS – Four times a day

CR – Controlled Release

ReSPECT - Recommended Summary Plan for Emergency Care and Treatment

ACP – Advance Care Plan

CSCI – Continuous subcutaneous infusion ("syringe driver")

DBS – Deep brain stimulation

PEG – Percutaneous endoscopic gastrostomy

PEG-J – Percutaneous endoscopic transgastric jejeunostomy

2. BACKGROUND

2.1 Epidemiology and stages Of PD

Idiopathic Parkinson's Disease (PD) is the second commonest neurodegenerative disorder in the UK; 1 in 37 people will be diagnosed in their lifetime. There are currently over 120,000 people living with the condition and the number is projected to rise with an ageing population.

The prognosis of patients with PD is quite variable and mainly determined by the age at which motor symptoms present. The impact on life expectancy – compared to matched controls – is greatest in those diagnosed when young and middle aged compared to those diagnosed in their 70s and 80s. Infection is the usual mode of death (especially pneumonia) as advanced disease typically co-exists with frail physical health.

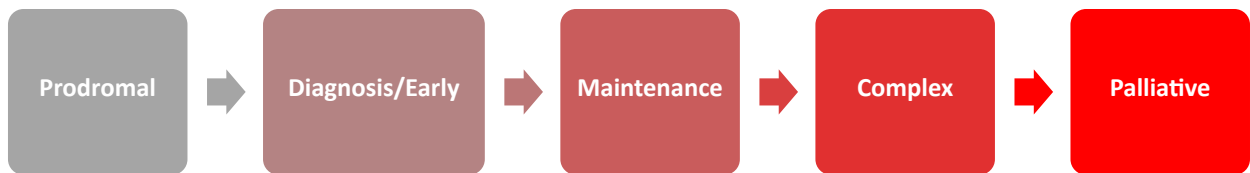


FIGURE 1: THE STAGES OF PARKINSON'S DISEASE

2.2 Palliative Stage PD

Prognostication can be challenging as each patient's clinical trajectory is different given the heterogeneous nature of Parkinson's. There is increasing recognition of clinical subtypes, for example a more rapid decline seen in those with 'diffuse malignant' phenotypes vs. those with mild 'tremor dominant' disease. The 'palliative phase' of PD is thought to last 2 years, on average, although there is no international consensus definition.

The following are suggested indicators of palliative PD:

- Waning response to dopaminergic treatments;
- Advanced dementia (+/- psychosis);
- Recurrent falls;
- Progressive weight loss;
- Frequent hospital admissions;
- Dysphagia leading to recurrent respiratory tract infections;
- Admission to a nursing home.

Clinical tools may also be helpful to identify palliative patients; examples include SPICT (Supportive & Palliative Care Indicators Tool), the Clinical Frailty Scale and the Hoehn and Yahr scale (Stage 5 correlating to late disease).

An advance care plan (ACP) should be proactively discussed with the patient and/or their advocates. When a patient's condition is recognised as palliative, an MDT approach may be needed including the PD specialist (geriatrician or neurologist), Parkinson's CNS, GP and palliative care team.

Tools such as the ReSPECT (Recommended Summary Plan for Emergency Care and Treatment) or a local personalized palliative care plan are helpful to guide Advance Care Planning discussions. In a primary care setting this should also include addition to the

practice palliative care register (sometimes known as the Gold Standards Register). In secondary care these tools can also help to avoid unnecessary or unwanted admissions.

There is useful information for carer's on how to plan ahead available at [Planning Ahead | Parkinson's Foundation](#).

It is important to establish the communication needs and expectations of patients taking into account their cognitive status and if they have any specific speech, language or other communication needs. When speech is impaired, involving their family or carer is likely to facilitate better communication and identification of needs.

2.3 The Dying Phase

Whilst patients may live with 'palliative stage' PD for approximately 1-2 years, the ***last days or weeks of life*** are usually predictable due to the general trajectory of decline. If a clinician is confident there is no reversible pathology to address, typical signs include:

- Little interest in food/fluids (especially with a poor swallow);
- Sleeping most of the time or being unarousable;
- An infection which is not responding to antibiotics.

There has been growth in the literature surrounding generic care in palliative stage Parkinson's. However, such work has focused on developing tools to assess symptom burden and to facilitate ACP discussions. In contrast, there is a paucity of evidence on how best to care for ***the actively dying*** patient and therefore a lack of national or local guidance for these complex patients.

3. MANAGEMENT OF END OF LIFE SYMPTOMS

3.1 General Principles

Whenever a Parkinson's patient enters the last days or weeks of life, all medications should be reviewed and rationalised. It is imperative that the main dopaminergic drugs (outlined below) are not abruptly stopped. Specialist opinion should be sought early to assist with medication review. It is likely that specialists will already have reduced the overall dose of PD medications as dopamine responsiveness wanes and side effects become more problematic.

Rigidity and bradykinesia can be painful, disabling and distressing, limiting even basic movement and function such as swallowing. Sudden withdrawal of levodopa or dopamine agonists can theoretically precipitate the rare parkinsonism-hyperpyrexia syndrome, presenting with hyperthermia and rigidity. In addition, abruptly stopping dopamine agonists can cause withdrawal syndrome, including anxiety, panic attacks, sweating, and drug craving.

3.2 Medication Management

Patients with PD often have complex medication regimens. **The most important medications to continue are levodopa preparations** (Co-careldopa or Co-beneldopa) **and/or dopamine agonists** (Ropinirole, Pramipexole, Rotigotine, Apomorphine).

If a patient is struggling with solid tablets, some medication (with the exception of modified-release preparations) may be crushed and dispersed in water:

- Standard-release Co-careldopa tablets disperse in water;
- Co-beneldopa capsules can be switched to dispersible Madopar® tablets;
- Ropinirole and Pramipexole, which are often prescribed in modified-release formulation, should be switched to standard/immediate-release forms, which can be dispersed in water

Appendix 1 and Appendix 2 offer more specific advice and dosage calculations.

If the patient is predicted to be in their last days of life, then MAO-B inhibitors (Rasagiline, selegiline and safinamide), COMT inhibitors (entacapone and opicapone) and amantadine can be confidently 'de-prescribed'. Some of these drugs may be contributing to unnecessary polypharmacy and agitation in the dying patient (see section 3.8).

When the oral route is no longer available or desired, the relevant medications can be converted to a transdermal Rotigotine patch. See Appendix 2 for conversion tables.

There are two Online Parkinson's Calculators in popular use; PDMedCalc (pdmedcalc.co.uk) and OPTIMAL (parkinsonscalculator.com)*. Both use different formulas to calculate conversions from Levodopa to topical Rotigotine. There can be significant differences, especially when the total levodopa dose is less than 500mg with 'PDMedCalc' typically generating lower dose conversions. The current 'OPTIMAL' calculator needs updating and issues have been identified with intra-calculator variability and thus its use is not recommended by our team (nor UKCA marked). We strongly advise clinicians to use the tables in Appendix 2 but to be mindful of the need to reduce

doses in those with cognitive impairment or naive to dopamine agonists.

3.3 Nutrition and Hydration

A proactive advance care plan should be in place to manage dysphagia. This should ideally be discussed with the patient and their advocates prior to the end of life.

In the last days (or weeks) of life, the patient with PD is unlikely to be able to swallow effectively or meet their nutritional needs. In these circumstances:

- Placement of a nasogastric tube (NGT) is rarely appropriate;
- The use of intravenous or subcutaneous fluids is unlikely to add to comfort and may lead to problems such as fluid overload and increased chest secretions;
- Good oral mouth care is the best approach to manage a dry mouth.

In the uncommon scenario where a patient already has a PEG tube, continue to use this route for medication. However, consideration should be given to reducing PEG feed due to aspiration risk, especially in someone who is deeply unrousable. In the rare instance of a PEG-J tube being in place for DuoDopa administration (see Section 4.2), this is NOT to be used for enteral feeding.

There is a wealth of guidance on clinically assisted hydration and nutrition from the GMC, a joint publication from the RCP and BMA, and [West Midlands Palliative Care Guidelines](#).

3.4 Rigidity

Waning dopamine responsiveness is common in advanced disease and can result in marked rigidity. If a patient with PD is becoming more rigid at the end of life, first ensure they are receiving their medications at the correct times. Additionally, rule out constipation, which delays absorption in the small intestine.

Increasing the dose of dopaminergic therapies is unlikely to be helpful and may cause delirium and agitation. Midazolam can be used effectively for agitation caused by rigidity (see Section 3.8), and morphine can be used for pain caused by rigidity (see Section 3.5).

3.5 Pain

Pain is often under-recognised and should be proactively assessed and treated. Address the cause of pain and treat first where possible: consider common causes such as rigidity, urinary retention and constipation.

Pain can be a complex symptom to assess and may not relate directly to Parkinson's. In advanced PD, be mindful that non-specific and poorly localised pain can be seen as part of non-motor fluctuations.

In the last few days of life, the best approach is to maintain previous doses of dopaminergic medication rather than acutely increase. If there is any doubt, specialist opinion should be sought.

Once PD medications are optimized, other analgesics can be used. If the patient is opioid-naive and creatinine clearance is above 30mL/min, consider Morphine Sulfate

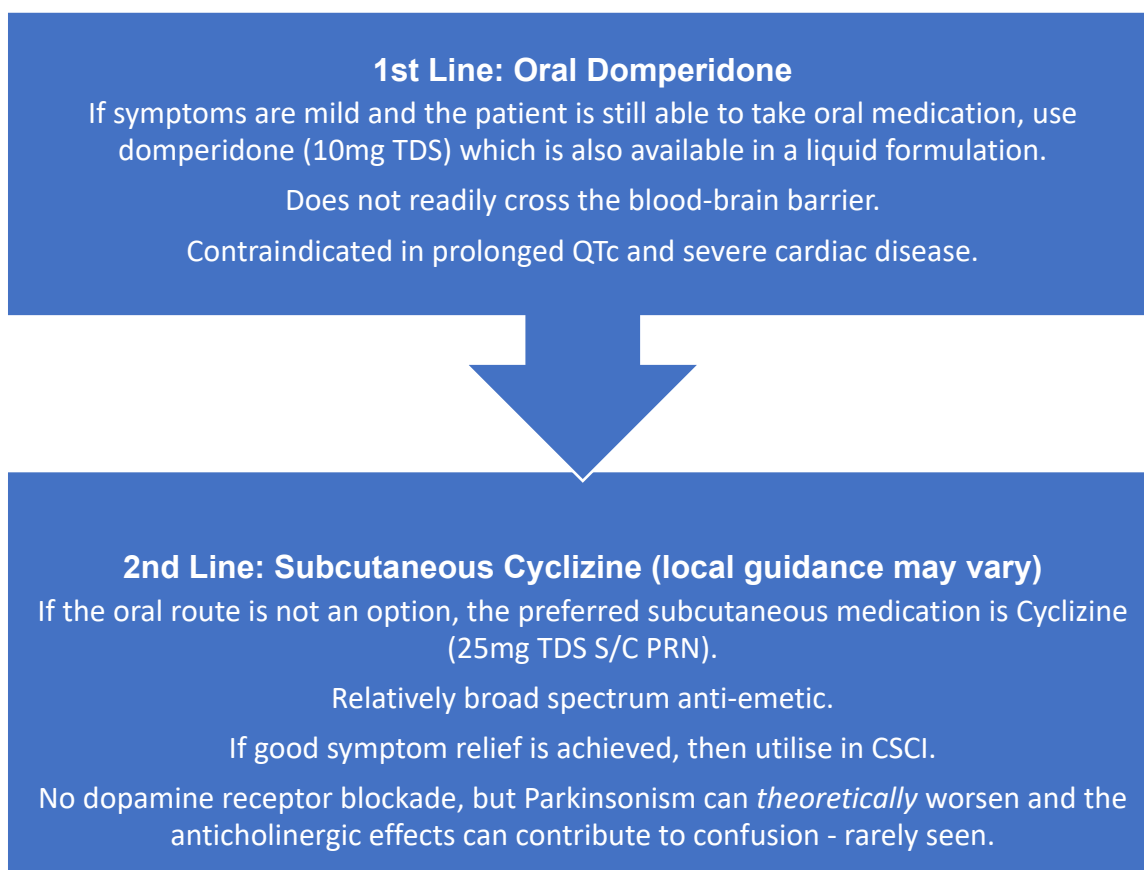
2.5mg S/C PRN in the first instance. Palliative care guidelines offer alternatives for use in reduced renal function: see section: [renal failure](#)

3.6 Nausea and vomiting

Look for causes of nausea and vomiting, including medications and constipation (a common symptom in PD), and treat accordingly.

High-quality data to guide treatment of nausea is lacking. However, medications which have a strong blockade of central dopamine receptors should be avoided: **never prescribe metoclopramide, haloperidol or prochlorperazine.**

The following flow chart suggests a stepwise approach to prescribing; note local guidance may vary when choosing an antiemetic for subcutaneous administration.



Ondansetron can be used but is less likely to be effective in the palliative setting and may contribute to constipation. **Ondansetron is contraindicated in patients receiving Apomorphine due to the risk of profound hypotension and drowsiness.**

It is worth noting that the risks and side-effects of medications, versus their benefits, may change in last days of life. Levomepromazine is usually contraindicated in PD due to high affinity for dopamine receptors but *may* be considered in extreme cases if no other therapeutic strategies are effective (e.g. intractable nausea and vomiting) – this must be discussed with a PD or palliative specialist.

3.7 Secretions

Upper airway secretions at end of life are common – at least 70% of patients are affected in most palliative settings and perhaps more in PD due to swallowing problems. Witnessing noisy and bubbly breathing is often more distressing for those at the bedside than the patient, therefore explanation is important for relatives and carers. Changing the patient’s position (if practically possible) may help postural drainage. For example, ‘high side lying’ with the patient positioned upright and their head tilted to the side.

If secretions are problematic despite conservative measures, Hyoscine Butylbromide can be used as in most other end-of-life situations. Prescribe Hyoscine Butylbromide 20mg S/C PRN, but have a low threshold for starting a CSCI early in the development of secretions. A typical starting dose of Hyoscine Butylbromide in a CSCI is 60mg/24 hours.

It should be noted that Hyoscine Butylbromide and Cyclizine should not be mixed in the same syringe driver, as the latter may crystallise. Therefore, if both anti-secretory and antiemetic drugs are required in CSCI, it is recommended to use Glycopyrronium with Cyclizine, negating the need for two syringe drivers. A typical starting dose of Glycopyrronium via CSCI is 600 micrograms/24 hours.

Glycopyrronium and Hyoscine Butylbromide do not cross the blood brain barrier and are unlikely to cause side effects such as drowsiness and confusion.

3.8 Terminal Agitation and Delirium

First, address potentially reversible causes such as constipation, urinary retention or pain.

A number of specific drugs are contraindicated in Parkinson’s due to blockade of central dopamine receptors which can worsen Parkinsonism and contribute to agitation. Review the drug chart to ensure these are not prescribed.

DRUG TYPE	EXAMPLES OF CONTRAINDICATED DRUGS
Antipsychotics	Haloperidol, Chlorpromazine, Promazine, Aripiprazole, Risperidone, Olanzapine
Anti-emetics	Metoclopramide, Prochlorperazine

If reversible causes have been addressed, prescribe PRN Midazolam 2.5mg – 5mg S/C PRN hourly. If 3 or more doses are used in a 24 hour period consider starting a CSCI. Consult palliative care guidelines for dose adjustment in renal impairment: [Renal Failure](#)

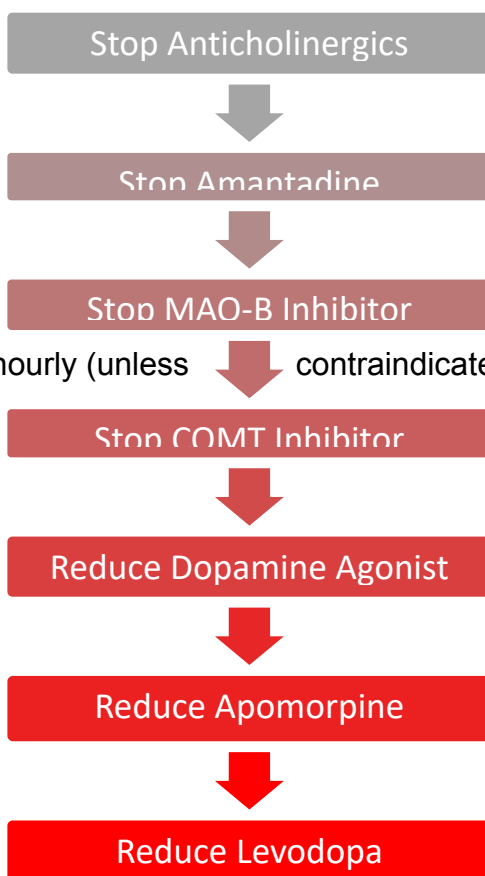
A reduction in dopaminergic therapies *might* be needed in the event of agitation and hallucinations. In such cases, there will be a ‘trade-off’ between increased rigidity and the relief of an agitated delirium. This should be discussed with a PD specialist.

A suggested stepwise approach to review dopaminergic and anticholinergic therapies is outlined below, considering efficacy and side effect profiles. In most settings, PD medications should have been rationalised by a specialist in the palliative phase *before* the patient is actively dying.

3.9 Breathlessness

Dyspnoea can be palliative situations. 2.5mg–5mg S/C PRN hourly (unless more doses are used starting a CSCI.

managed as in most other Prescribe Morphine Sulfate contraindicated by renal impairment); if 3 or in a 24 hour period consider



4. ADVANCED THERAPIES

4.1 Apomorphine

Apomorphine is a dopamine agonist. Due to extensive hepatic 1st-pass metabolism, it can only be administered subcutaneously, either as intermittent injections (APO-go® Pen), or a continuous infusion (APO-go® Pump). Despite its name, it is neither an opioid derivative, nor a controlled drug.

Apomorphine is used (uncommonly) in some PD patients with complex disease including disabling motor fluctuations which have not responded to other pharmacological measures. **Apomorphine is not initiated in the dying patient.** If the patient is already on Apomorphine, continue the same dose and do not stop treatment.

Patients and/or carers will be trained in the use and maintenance of APO-go® pumps. If the patient lacks capacity or is too unwell and there is no support from trained caregivers, contact their regular APO nurse in normal working hours. Alternatively, call the manufacturer's dedicated 24 hour helpline on 0844 880 1327.

4.2 Duodopa Intestinal Gel

This is rarely used 'advanced therapy' for those with complex stage PD and severe motor fluctuations. Levodopa/Carbidopa gel is administered via a portable pump into the duodenum or upper jejunum by a percutaneous endoscopic transgastric jejunostomy (PEG-J).

Patients who are established on Duodopa need to continue the infusion at the normal

rate. If the PEG-J tube is blocked or the bowel is not working, discontinue the infusion, commence a rotigotine patch and obtain a specialist opinion as soon as possible. The Duodopa manufacturer's dedicated 24hour helpline is available on 0844 880 1327.

4.3 Deep Brain Stimulation (DBS)

DBS involves stimulation of target sites within the brain which are affected by Parkinson's. Electrodes are connected to a subcutaneous neurostimulator, usually in the chest area (similar to a cardiac pacemaker).

DBS settings can only be altered by an external handheld device and are not changed routinely in the dying patient.

After death the DBS device does not need to be switched off. If the patient is to be cremated, alert the bereavement team, as the funeral directors need to be informed.

REFERENCES

These guidelines have been adapted, with kind permission from the authors, from:

Sandwell and West Birmingham NHS Trust (2024) *Management of Patients with Parkinson's Disease who are Approaching the End of Life*.

1. Alty, J. et al. (2015) 'What to do when people with Parkinson's disease cannot take their usual oral medications', *Practical Neurology* 16: pp. 122-128. doi: <https://doi.org/10.1136/practneurol-2015-001267>
2. Brennan, K.A. and Genever, R.W. (2010) 'Managing Parkinson's disease during surgery', *The BMJ*, 341:pp. 990-993. doi: <https://doi.org/10.1136/bmj.c5718>
3. British Medical Association, Royal College of Physicians (2023). Clinically-assisted nutrition and hydration (CANH) and adults who lack the capacity to consent: Guidance for decision-making in England and Wales. Available at <https://www.bma.org.uk/media/1161/bma-clinically-assisted-nutrition-hydration-canh-full-guidance.pdf>. Updated 26th April 2023
4. General Medical Council (2022). Treatment and care towards the end of life: good practice in decision making content. Available at: <https://www.gmc-uk.org/professional-standards/professional-standards-for-doctors/treatment-and-care-towards-the-end-of-life>. Updated 15th March 2022
5. Hindmarsh, J., Hindmarsh, S. and Lee, M. (2021) 'Idiopathic Parkinson's Disease at the End of Life: A Retrospective Evaluation of Symptom Prevalence, Pharmacological Symptom Management and Transdermal Rotigotine Dosing',

Clinical Drug Investigation, 41(8):pp. 675-683. doi: <https://doi.org/10.1007/s40261-021-01054-1>

6. Jones, S.L. *et al.* (2011) 'Parkinson's disease in the acute hospital', *Clinical Medicine*, 11(1): pp. 84-88. doi: <https://doi.org/10.7861/clinmedicine.11-1-84>
7. MacMahon, M. *et al.* (2012) 'Management of Parkinson's disease in the Acute Hospital Environment', *Journal of the Royal College of Physicians of Edinburgh*, 42:pp. 157-62. doi: <http://doi.org/10.4997/JRCPE.2012.215>
8. National Institute for Health and Care Excellence (NICE) (1998) *Clinical Knowledge Summaries – Parkinson's Disease – Management – Scenario: End-stage Parkinson's Disease*. Available at: <https://cks.nice.org.uk/topics/parkinsons-disease/management/end-stage-parkinsons-disease/> Updated: August 2023
9. NHS Greater Glasgow and Clyde Area Drug and Therapeutics Committee (2021) 'Parkinson's disease and Palliative Care' Available at: <https://ggcmedicines.org.uk/blog/medicines-update/parkinson-s-disease-and-palliative-care/> Updated: 13 September 2023
10. Richfield, E.W., Jones, E.J. and Alty, J.E. (2013) 'Palliative Care for Parkinson's Disease: a Summary of the Evidence and Future Directions.' *Palliative Medicine*, 27(9):pp. 805-810. doi: <https://doi.org/10.1177/0269216313495287>
11. Rogers, A. *et al.* (2022) 'The Terminal Phase in Parkinson's Disease: a Mixed Methods Systematic Review', *British Journal of Neuroscience Nursing*, 18 (1): pp. 12-19. doi: <https://doi.org/10.12968/bjnn.2022.18.1.12>
12. Sheung Ching Ng, J. (2018) 'Palliative Care for Parkinson's Disease', *Annals of Palliative Medicine*, 7(3):pp. 296-303. doi: <https://doi.org/10.21037/apm.2017.12.02>
13. Smyth, J.A. (2015) *The NEWT Guidelines for Administration of Medication to Patients with Enteral Feeding Tubes or Swallowing Difficulties*, Print version, 3rd edn. Wales: Betsi Cadwaladr University Local Health Board (East). ISBN: 978-0-9552515-3-5
14. Specialist Pharmacy Service (2022) *Parkinson's Disease Medicines in Swallowing Difficulties*. Available at: <https://www.sps.nhs.uk/articles/parkinsons-disease-medicines-in-swallowing-difficulties/>
15. Titova, N. and Chaudhuri, K.R. (2017) 'Chapter Forty-Four - Palliative Care and Nonmotor Symptoms in Parkinson's Disease and Parkinsonism', in Titova, N. and Chaudhuri, K.R. (eds.) *International Review of Neurobiology* Volume 134, Academic Press, Pages 1239-1255. doi: <https://doi.org/10.1016/bs.irn.2017.05.014>
16. UK Parkinson's Excellence Network (2024) 'Excellence Network data dashboards'. Available at: <https://parkinsonsuk.hsj.co.uk>

17. West Midlands Palliative Care Physicians (WMPCP): *Guidelines for the Use of Drugs in Symptom control*. Available at: [West Midlands Guidelines for the use of drugs in Symptom Control](#) Updated: 2024
18. Wilcock, A., Howard, P. and Charlesworth, S. (eds.) (2022) 'Palliative Care Formulary PCF8' 8th edn. England: Pharmaceutical Press. ISBN: 9780857114372
19. Jost ST et al *Mov Dis* 202. Levodopa Dose Equivalency in Parkinson's Disease: Updated Systematic Review and Proposals.
20. Tomlinson CL, Stowe R, Patel S, Rick C, Gray R, Clarke CE. Systematic review of levodopa dose equivalency reporting in Parkinson's disease. *Mov Disord*. 2010

21.APPENDICES

Appendix 1: Switching To Orodispersible Formulations In The Dying Patient;

Appendix 2: Switching To A Transdermal Rotigotine Patch In The Dying Patient;

Appendix 3: Managing Terminal Symptoms in PD “At a Glance”;

Appendix 4: Contraindicated Medications in patients with PD at the End of Life;

Appendix 5: Rationalising PD Medications at the End of life;

Appendix 6: Example Audit Form of Management of Patients with Parkinson’s Disease in their last days to weeks of life.

Note: Charts have been adapted from the Sandwell and West Birmingham NHS Trust (2018) *Management of Patients with Parkinson’s Disease who are Approaching the End of Life*.

Appendix 1: Switching To Orodispersible Formulations In The Dying Patient

Medication	Formulation	Recommendation
Co-beneldopa (contains benserazide and levodopa) Brand: Madopar®	Dispersible Madopar® tablets	Continue – no change required. Tablets disperse in 10 ml of water within 2 minutes to give a cloudy white dispersion.
	Capsule	Convert to dispersible Madopar® tablets.
	Modified release tablets – Madopar CR®	Convert to dispersible Madopar® tablets and reduce dose by about 30%, for example: <ul style="list-style-type: none"> • 50/200mg CR converts to 1 tablet 25/100mg + 1 tablet 12.5/50mg • 25/100mg CR to 1 tablet 12.5/50mg
Co-careldopa (contains carbidopa and levodopa) Brands include: Sinemet® and Caramet®	Tablets (standard release) – includes Sinemet Plus®	Continue – no change required as tablets will disperse in water. Tablets disperse in 10 ml of water within 2 minutes to form a bright yellow dispersion. Care must be taken to administer whole dose owing to the tendency for settlement to the bottom of the container / syringe.
	Controlled release tablets – e.g. Half Sinemet CR® and Sinemet CR®	Convert to dispersible Madopar® tablets and reduce dose by about 30%, for example: <ul style="list-style-type: none"> • 50/200mg CR converts to 1 tablet 25/100mg + 1 tablet 12.5/50mg • 25/100mg CR to 1 tablet 12.5/50mg
Entacapone	Tablets (standard release)	<p>Unlikely any meaningful impact - consider stopping.</p> Difficult to disperse and has a bitter taste.

Medication	Formulation	Recommendation
<p>Opicapone</p> <p>Brand: Ongentys®</p>	Capsule	<p>Unlikely any meaningful impact - consider stopping.</p> <p>No information available on crushing from Manufacturer and difficult to disperse.</p>
<p>Levodopa/Carbidopa/Entacapone</p> <p>Brands include: Stalevo®, Sastravi®, Stanek®</p>	Tablets (standard release)	Switch to Co-careldopa or Sinemet® and entacapone – the latter can be omitted.
<p>Pramipexole</p> <p>Brands include: Mirapexin® and Pipexus®</p>	Tablets (standard release)	Continue current regimen, tablets will disperse in 10mL of water.
	Modified release tablets	Convert to standard release and change total daily dose to TDS regimen.
<p>Ropinirole</p> <p>Brands include: Requip®, Adarte®</p>	Tablets (standard release)	Continue current regimen. Tablets will disperse in 10mL of water to give fine dispersion.
	Modified release tablets	Convert to standard release and change total daily dose to TDS regimen.
<p>Rasagiline</p> <p>Brand: Azilect®</p>	<p>Tablets (standard release)</p> <p>*oral suspension or solution are only available by special order from manufacturer</p>	<p>Unlikely any meaningful impact - consider stopping.</p> <p>If wish to continue, tablets can be crushed and mixed in water.</p>
<p>Selegiline</p> <p>Brands include: Eldepryl® and Zelapar®</p>	Tablets (standard release)	<p>Unlikely any meaningful impact - consider stopping.</p> <p>If wish to continue, tablets will disperse in water.</p>
	Oro-dispersible tablets <u>Note:</u> 1.25mg = 10mg standard release tablet	<p>Unlikely any meaningful impact - consider stopping.</p> <p>No change if oral route is safe.</p>

Medication	Formulation	Recommendation
<p style="text-align: center;">Amantadine</p>	<p style="text-align: center;">Capsule</p>	<p>May contribute to agitation in the dying patient. Consider stopping.</p> <p>If strong desire to continue, capsules can be opened and dissolved in water, or a liquid formulation can be prescribed.</p>
<p style="text-align: center;">Safinamide</p> <p style="text-align: center;">Brand: Xadago®</p>	<p style="text-align: center;">Tablet</p>	<p>Unlikely any meaningful impact - consider stopping</p> <p>No information available on crushing from Manufacturer.</p>

See References 1,2,6,7,13,14

Appendix 2: Switching To A Transdermal Rotigotine Patch In The Dying Patient

- If usually taking Levodopa and Dopamine agonists, calculate Rotigotine patch conversions for both and add together;
- The maximum dose is 16mg / 24 hours. Beware that patients on very large doses of Levodopa and/or Dopamine agonists can be relatively under-dosed, despite the maximum dose of Rotigotine;
- Patches are available in 2mg / 4mg / 6mg / 8mg strengths, meaning only approximate dose conversions can be made - do not cut patches to achieve correct dose;
- Look out for side effects such as vomiting, skin reactions, hypotension, hallucinations and increased confusion. Dopamine agonists can cause Impulse Control Disorders (ICD's) but in the dying phase this is unlikely to be an issue.

Caution in patients with delirium and dementia - it is advisable to under-dose the conversion by 2mg or, if the Rotigotine patch dose is 10mg or more, by 4mg.

Switching Oral Dopamine Agonists to Rotigotine Patch

Pramipexole Standard Release (salt content dose)	Pramipexole Modified Release (salt content dose)	Ropinirole Standard Release	Ropinirole Modified Release	Rotigotine Transdermal Patch Equivalent
0.125 mg TDS	375 micrograms	0.75mg TDS	2 mg/day	2 mg/24 hours
0.25 mg TDS	750 micrograms	1 mg TDS	4 mg/day	4 mg/24 hours
0.5mg TDS	1.5 mg	2 mg TDS	6 mg/day	6 mg/24 hours
0.75 mg TDS	2.25 mg	3 mg TDS	8 mg/day	8 mg/24 hours
1 mg TDS	3 mg	4 mg TDS	12 mg/day	12 mg/24 hours
1.25 mg TDS	3.75mg	6 mg TDS	16 mg/day	14 mg/24 hours
1.5 mg TDS	4.5 mg	8 mg TDS	24 mg/day	16 mg/24 hours

See References 2, 19, 20

Switching Levodopa to Rotigotine Patch

Current Levodopa Regimen	Rotigotine Transdermal Patch Equivalent
Madopar® or Sinemet® 62.5 mg BD	2 mg /24 hours
Madopar CR® 125mg or Half Sinemet CR® 125mg	2 mg /24 hours
Madopar® or Sinemet® 62.5 mg TDS	4mg /24 hours
Sinemet CR® 250mg	4mg /24 hours
Madopar® or Sinemet® 62.5 mg QDS	6 mg /24 hours
Madopar® or Sinemet® 125 mg TDS	8 mg /24 hours
Madopar® or Sinemet® 125 mg QDS	10 mg /24 hours
Madopar® or Sinemet® 187.5 mg TDS	12 mg /24 hours
Madopar® or Sinemet® 187.5 mg QDS	16 mg /24 hours
Madopar® or Sinemet® 250 mg TDS	16 mg /24 hours
Madopar® or Sinemet® 250 mg QDS	16 mg /24 hours
Stalevo® 50/12.5/200 mg TDS	6 mg /24 hours
Stalevo® 100/25/200 mg TDS	10 mg /24 hours
Stalevo® 100/25/200 mg QDS	14 mg /24 hours
Stalevo® 150/37.5/200 mg TDS	16 mg /24 hours
Stalevo® 200/50/200 mg TDS	16 mg /24 hours

See References 1,2,6,7,13,14,18

Appendix 3: Managing Terminal Symptoms in PD “At a Glance”

Symptom	1 st / 2 nd line medications	Notes
Rigidity	<p>1st line: Midazolam 2.5mg – 5mg S/C PRN hourly max. 30mg/24h</p> <p>+/-Morphine, if pain is associated with it (see below)</p>	<ol style="list-style-type: none"> 1. Ensure they are receiving their medications at the correct times. 2. Rule out constipation, which delays absorption. 3. Increasing the dose of dopaminergic therapies is unlikely to be helpful and may cause delirium / agitation.
Pain	<p>1st line: Morphine Sulfate 2.5mg-5mg S/C PRN hourly max. 30mg/24h</p> <p>if opioid-naïve & creatinine clearance above 30mL/min</p>	<ol style="list-style-type: none"> 1. Rule out reversible causes such as rigidity, urinary retention and constipation. 2. Best to maintain previous doses of dopaminergic medication rather than acutely increase. 3. Once PD medications are optimized, other analgesics can be used. 4. See general Palliative Care guidance.
Nausea and Vomiting	<p>1st line: Domperidone PO 10mg TDS</p> <p>2nd line: Cyclizine S/C 25mg TDS max 150mg/24h</p>	<ol style="list-style-type: none"> 1. Rule out reversible causes including medications and constipation. 2. Local guidance may vary – ondansetron can be used but is constipating and is contraindicated with Apomorphine. 3. Levomepromazine is usually contraindicated but <i>may</i> be used in extreme cases – must discuss with PD or Palliative specialist.
Secretions	<p>1st line: Hyoscine Butylbromide 20mg S/C PRN 4 hourly max 120mg/24h</p> <p>2nd line: Glycopyrronium 200micrograms S/C PRN 4 hourly max. 2.4mg/24h</p>	<ol style="list-style-type: none"> 1. May be more distressing for those at bedside than patient. 2. Changing the patient’s position, e.g. ‘high side lying’ may help. 3. Low threshold for starting a CSCI early - typical starting dose of hyoscine butylbromide is 60mg/24h. 4. Hyoscine butylbromide and Cyclizine should not be mixed in the same syringe driver- if required, use glycopyrronium –typical starting dose is 600 micrograms/24h.

Symptom	1 st / 2 nd line medications	Notes
Terminal Agitation and Delirium	1st line: Midazolam 2.5mg – 5mg S/C PRN hourly max. 30mg/24h	<ol style="list-style-type: none"> 1. Address reversible causes such as constipation, urinary retention or pain; 2. If 3 or more doses are used in a 24 hour period consider starting a CSCI. 3. Consult palliative care guidelines for dose adjustment in renal impairment: 4. Avoid contraindicated drugs (see Appendix 4). 5. A reduction in dopaminergic therapies <i>might</i> be needed but there will be a ‘trade-off’ between increased rigidity and relief of an agitated delirium – should discuss with a PD specialist. 6. See also Appendix 5: Rationalising PD Medications at the End of Life.
Breathlessness	1st line: Morphine Sulfate 2.5mg–5mg S/C PRN hourly max. 30mg/24h If creatinine clearance above 30mL/min	<ol style="list-style-type: none"> 1. Can be managed as in most other palliative situations. See general guidance on breathlessness. 2. If 3 or more doses are used in a 24hr period, consider starting a continuous subcutaneous infusion see: Syringe Driver Pump – West Midlands Palliative Care.

See References 17,18

Appendix 4: Contraindicated Medications in patients with PD at the End of Life

DRUG TYPE	EXAMPLES OF CONTRAINDICATED DRUGS
Antipsychotics	Haloperidol, Chlorpromazine, Promazine, Aripiprazole, Risperidone, Olanzapine
Anti-emetics	Metoclopramide, Prochlorperazine

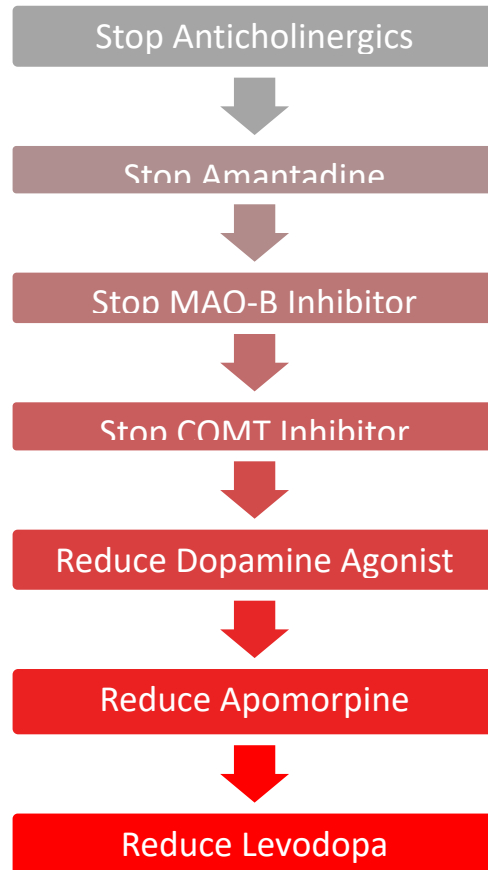
Note:

- **Ondansetron is contraindicated with Apomorphine - risk of profound hypotension and drowsiness;**
- Levomepromazine is usually contraindicated in PD due to high affinity for dopamine receptors but *may* be considered in extreme cases if no other therapeutic strategies are effective (e.g. intractable nausea and vomiting) – this must be discussed with a PD or palliative specialist.

See References 9,18

Appendix 5: Rationalising PD Medications at the End of life

A suggested stepwise approach to review Dopaminergic and Anticholinergic therapies is outlined below, considering efficacy and side effect profiles. In most settings, PD medications should have been rationalised by a specialist in the palliative phase *before* the patient is actively dying.



Appendix 6: Example Audit Form of Management of patients with Parkinson's Disease in their last days to weeks of life

Date	
Setting (please circle)	Hospice IPU Hospital Community Other
Patient age	
Patient sex	
Appropriate PD medication rationalisation? (please circle) If no, reason documented?	YES / NO / NA YES / NO Reason:
Appropriate conversion to orodispersible formulation? (please circle) If no, reason documented?	YES / NO / NA YES / NO Reason:
Appropriate conversion to Rotigotine patch? (please circle) If no, reason documented?	YES / NO / NA YES / NO Reason:
Avoidance of contra-indicated medications? (please circle) If no, reason documented?	YES / NO / NA YES / NO Reason:
Appropriate medication for rigidity (Midazolam)? (please circle) If no, reason documented?	YES / NO / NA YES / NO Reason:
Appropriate medication for N&V (PO Domperidone/SC Cyclizine*) (please circle) If no, reason documented?	YES / NO / NA YES / NO Reason:
Appropriate medication for agitation/delirium (Midazolam +/- reduction in dopaminergic meds)? (please circle) If no, reason documented?	YES / NO / NA YES / NO Reason
Cyclizine/Hyoscine Butylbromide combination in CSCI avoided? (please circle) If no, reason documented?	YES / NO / NA YES / NO Reason
Preferred place of death achieved? If no, reason why?	YES / NO / NA Reason

* note: local guidance may vary when choosing an antiemetic for subcutaneous administration

Guide History

<u>Document Title</u>	Clinical Guideline for the Management of Patients with Parkinson's disease who are approaching the end of life	
<u>Document Date</u>	July 2024	
<u>Document Purpose and Intended Audience</u>	This guideline is intended to provide specific recommendations for symptom and medication management for patients with Parkinson's disease in the <i>last days or weeks of life</i>, whether in primary or secondary care.	
<u>Authors</u>	Dr Lawrence Greensall and Dr Hannah Currie	
<u>Review and Contributions</u>	Dr Asim Majeed – Consultant Geriatrician Alison Fletcher and Rose Crouch – Parkinson's Clinical Nurse Specialists Dr Rebecca Dawber, Dr Mariam George and Dr Anna Lock – Palliative Care Consultants Dr Sam Niaz- Palliative Care Registrar, Dr Rosanna Montgomery Specialty Doctor in Palliative care, Dr Rebecca Edwards Stroke Registrar and Specialty Doctor in Palliative Care	
<u>Consultation Process</u>	Adapted from Guidance in use at Sandwell and West Birmingham NHS Trust	
<u>Review Date (must be within three years)</u>	<u>July 2027</u>	
<u>Approval Signatures:</u> <u>SPAGG chair</u> <u>SPAGG deputy chair</u> <u>SPAGG secretary</u>		
<u>Date Approved by SPAGG:</u>		
<u>Version</u>	<u>Date</u>	<u>Summary of change/ process</u>
1		<u>Endorsed and approved by SPAGG</u>

