Whittington Health NHS

Parkinson's Disease: inpatient management of medication

Subject:	Inpatient management of medication, Parkinson's Disease
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Policy Executive Owner:	ICAM Divisional Director
Name of originator/author:	Dr Kelli Torsney, Dr Celia Bielawski (Consultant)
Name of responsible committee/individual:	As above
Date issued:	December 2014
Review date:	3 years hence
Target audience:	All staff treating inpatients with Parkinson's Disease
Key words:	Parkinson's disease, Inpatient, Medication

➢ Criteria for use

This guideline is designed to aid the assessment and management of patients with established Parkinson's disease (PD) admitted to the Whittington Hospital. It is intended to improve inpatient care of the disease in this group, with particular emphasis on medication choice and delivery in the out of hours setting and when the patient is nil by mouth (NBM).

➢ Background/ introduction

PD is the second most common neurodegenerative disorder characterized by bradykinesia, resting tremor and rigidity with a prevalence of 1.8 in 100 people in Europe over the age of 65 years. PD patients are 1.5 times more likely to be hospitalized than non-PD patients. The most common reasons for admission are falls leading to fractures, pneumonia, encephalitis and delirium ± dementia.
Hospital admissions of PD patients are often problematic with many problems arising around medications.
A recent study conducted by Jones and Hindle, 2011, found that 74% of PD patients in the emergency department had their medications omitted or prescribed incorrectly with 61% of these developing significant sequelae. Falls, fractures, dysphagia, aspiration pneumonia and prolonged hospital stays are potential complications as well as neuroleptic malignant syndrome.

The reasons for drug errors and/or omissions include the following:

- Prescribed medications are not given as they are, or perceived to be, "unavailable" out of hours.
- There are delays in dispensing medications
- Inflexibility in timing of the drug rounds resulting in medications being given at the wrong time
- Medications are prescribed incorrectly (dose, formulation, timing) or not at all
- Medications are omitted as the patient is unable to swallow

These errors occur frequently out of hours, when on-site pharmacy and specialist PD advice are not necessarily available. To combat this, The National Institute for Health and Clinical Excellence guidelines for PD advocate self-medication but hospital wards are often not able to facilitate this.
These guidelines, summarized in table 1, are designed to ensure that the most appropriate medication can be given from the point of admission. Table 2 consists of the drugs that are available from the emergency drug cupboard (EDC) that may need to be used and substituted for the patient's usual PD medications out of hours and/or if their usual medications are not available.

➢ Inclusion/ exclusion criteria

This guideline should be used for all patients with established treated PD admitted to the Whittington Hospital.

Exclusions: It does not cover the medication adjustments required for chronic disease management in PD patients. These adjustments should **only** be made by specialists in Parkinson's disease.

➢ Clinical management

In addition to your routine clinical assessment of the patient, these aspects of history, examination and management are important to include for patients with PD:

History

1. Obtain an accurate drug history establishing what they are currently prescribed for their PD including:
    a. Medication name (brand or generic)
    b. Usual timing of medications at home
    c. Formulations of their medications, e.g dispersible, standard or controlled release

    Potential sources of information to use include:
    - Patient (including their belongings/medications list)
    - General Practitioner
    - Nursing or residential home
    - Relatives, neighbours or carers, who may also have access to the patient's home
    - Previous discharge summaries on Patient Tracking
    - Recent clinic letters from relevant specialists, obtainable from departmental secretaries.
    - Previous discharge summaries from other hospitals to which the patient may have been admitted recently
    - Patient letters in patient's old notes (A&E can obtain these 24 hours a day).
    - Patient's pharmacist
    - Patient's community matron (A&E will know if the patient has a community matron) – N.B. they work seven days a week, 9am-5pm.
2. Ask about swallowing difficulties, recurrent chest infections and other symptoms of aspiration.
3. Ask about any symptoms of cognitive impairment, depression and hallucinations. Try to ascertain whether these may be temporally related to any changes in medication. Assess for delirium.

	Please see Whittington Health Guideline: ***'Delirium in the Elderly – Assessment and Management'*** for advice on assessment of patients for delirium and for advice on appropriate sedative and antipsychotic use.

Examination

1. A bedside swallow assessment should be performed. In some cases, a swallow assessment conducted by a speech and language therapist may be needed, but this should not result in a delay in medication administration.
2. A Minimental State Examination (MMSE) or Mental Test Score (MTS) should be performed.
3. If the patient has presented with falls, assess for postural hypotension, documenting blood pressure after 5 minutes lying, and 1, 3 and 5 minutes after standing.
4. Look for signs of neuroleptic malignant syndrome, which include pyrexia, rigidity and/or confusion. This can be associated with a raised creatinine kinase (CK) and can be caused by sudden withdrawal of PD medications.

Management DOs:

- ✓ Encourage patients and their relatives to bring in the patient's own supply of medications if possible and as soon as possible. This can be used out-of-hours until a further supply can be ordered from the hospital pharmacy and explore whether the patient can administer their own medications (as per hospital pharmacy policy and NICE guidelines for PD patients).
- ✓ Use the flowchart (figure 1) in conjunction with the list of available medicines (table 1) and the conversion tables (tables 2 and 3) to aid the prescription of the appropriate PD medications. Ensure they are prescribed for the times the patient normally takes them and communicate with nursing staff and the ward pharmacist to ensure that the correct medications are given **at the prescribed times** (which may be outside of usual times that medications are given).
- ✓ If the patient has missed doses and is markedly bradykinetic, you will need to judge whether it is necessary to give a stat dose of their PD medications, depending on the severity of their symptoms and the time when the next dose is due.
- ✓ PD medications can contribute to cognitive problems including delirium, hallucinations and psychosis. If the patient's admission is precipitated by a change in cognitive state, which may be linked to an increase in PD medications, then seek specialist advice. If this is unavailable (e.g. over the weekend) then the advice is 'last in, first out', i.e. <u>gradually</u> withdraw or reduce the most recently instated or increased medication if you suspect this has contributed to the cognitive change. Always liaise with the patient's usual PD specialist at the earliest opportunity.
- ✓ For peri-operative management of patients with PD please refer to figure 2.

Management DON'Ts:

- **Don't** allow PD medications to be omitted, missed or stopped suddenly.
- **Don't** use the following medications in PD patients as they can have harmful side effects: haloperidol, metoclopramide, prochlorperazine or promethazine. Domperidone is the anti-emetic of choice in patients with PD. This can be given orally, 10-20mg TDS in liquid or tablet form, via NG tube (10-20mg liquid TDS), or PR 30mg BD suppositories can be administered.

Neuroleptic malignant syndrome.

Neuroleptic malignant syndrome is a recognized complication of withdrawal of PD medication. If suspected, check the creatine kinase and seek specialist advice, including input from neurology and the Critical Care Outreach Team. Management is beyond the scope of these guidelines, but while specialist help is awaited, care should be taken to ensure the patient is well-hydrated, their temperature is controlled, appropriate venous thromboembolic prophylaxis is commenced, and PD medications are administered as per their normal prescription.

PD patients and surgery.

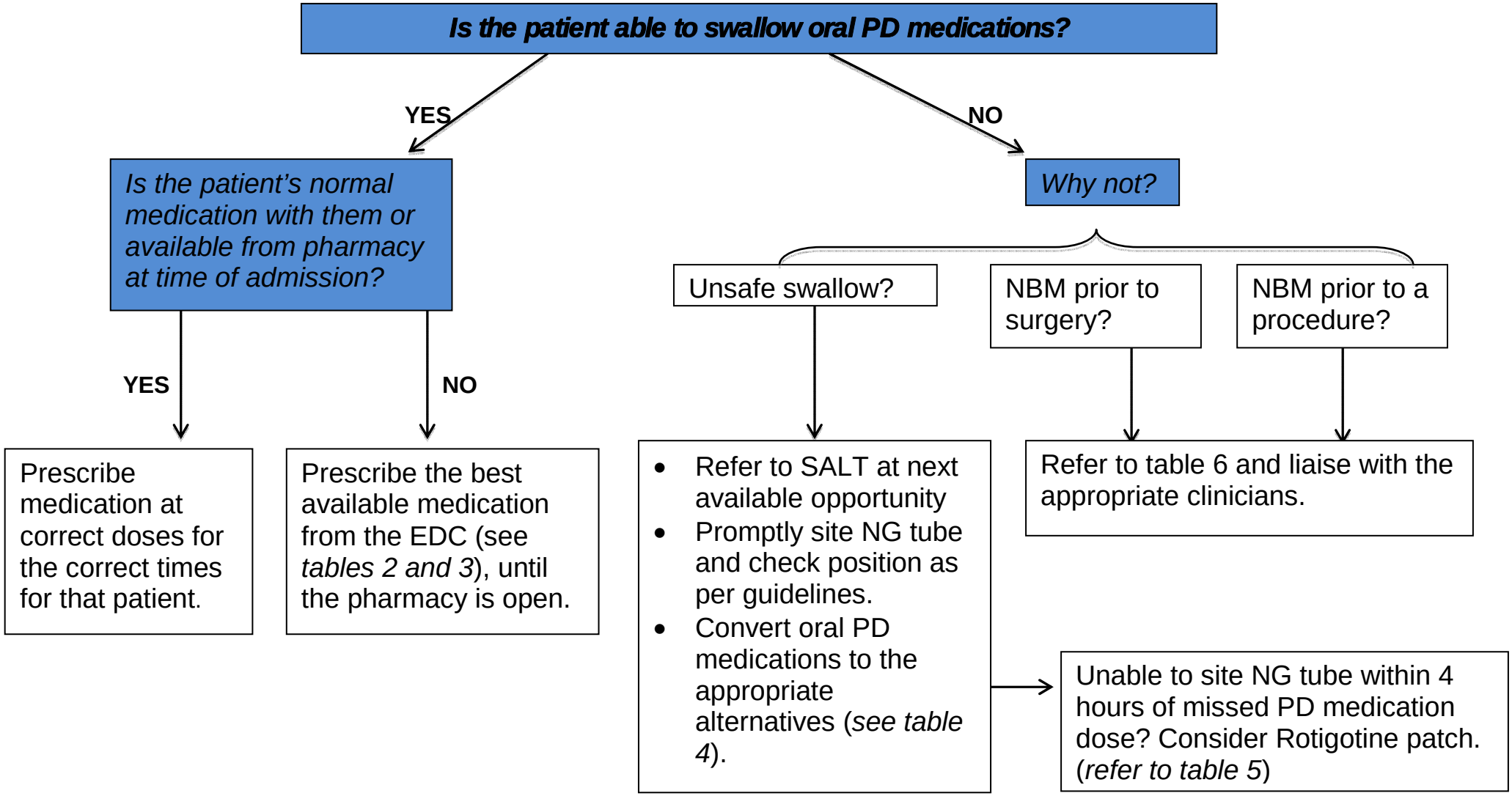
PD patients undergoing surgery are at increased risk due to their condition but also due to omission and timing of their medications. Generally, it is strongly advised to administer their PD medications as per their usual regime. In elective cases, patinets should be assessed in a pre-operative clinic so that a plan can be implemented to minimize the number of missed doses of medications. PD patients should also be placed first on the operating list where possible. Table 6 summarises how PD drug treatment can be maintained during the perioperative period.

PD patients and imaging

PD patients undergoing scans should have their medications at their usual times regardless of the scan. If they are scheduled for an abdominal ultrasound scan, they should be administered their medications with sips of water.

Table 1. PD medications: guidelines for patients on levodopa or dopamine agonist preparations who are admitted to hospital.

- Ensure the nursing staff are aware of the prescription and the importance of drug administration.
- Return to ensure the patient receives their medications on time.
- Recommence patient's usual medications as soon as possible.



EDC: Emergency drug cupboard; SALT: Speech and Language Therapist; PD: Parkinson's disease; NBM: Nil by mouth.

Table 2: Drugs available in the EDC

Medication	Formulation	Dose
Co-beneldopa (Madopar)	Dispersible	125mg tablets
Co-careldopa (Sinemet Plus)		25/100 tablets
Entacapone		200mg tablets
Stalevo* (Co-careldopa/Entacapone)		125/31.25/200 tablets

*Other strengths of Stalevo are available on some wards, see Table 3c.

Table 3A-3C: Equivalent medications to be prescribed for patients *who can take oral medication* but whose own medications are unavailable.

3A. Short-acting levodopa preparations constitute levodopa plus a peripheral decarboxylase inhibitor. It is important to keep the dose of levodopa (the second number in the brackets) roughly the same.

Patient's usual medication	Equivalent medication from EDC
Madopar /Co-beneldopa	
Madopar-62.5mg (12.5/50)	0.5 Madopar dispersible 125mg
Madopar-125mg (25/100)	1 Madopar dispersible 125mg
Madopar-250mg (50/200)	2 Madopar dispersible 125mg
Sinemet /Co-careldopa	
Sinemet-62.5 (12.5/50)	0.5 Sinemet Plus (25/100)
Sinemet-110 (10/100)	1 Sinemet Plus (25/100)
Sinemet-Plus (25/100)	1 Sinemet Plus (25/100)
Sinemet-275 (25/250)	2.5 Sinemet Plus (25/100)

3B. *Controlled release levodopa preparations* have approximately 70% bioavailability of the short-acting form, and a 30-50% longer half-life. Therefore the dose and dose spacing has to be adjusted accordingly when temporarily converting to a short-acting preparation from the EDC.

Patient's usual medication	Equivalent medication from EDC
Madopar C/R /controlled release Co-beneldopa	
e.g. Madopar C/R 25/100 bd	0.5 Madopar dispersible 125mg tds
Sinemet C/R /controlled release Co-careldopa	
e.g. Half Sinemet C/R (25/100) bd	0.5 Sinemet Plus (25/100) tablets tds
e.g. Sinemet C/R 50/200 b.d.	1 Sinemet Plus (25/100) tablet tds

3C. Stalevo preparations are composed of Co-careldopa (i.e. levodopa plus carbidopa, a decarboxylase inhibitor) and an additional 200mg Entacapone (COMT inhibitor) to reduce the on/off effects of levodopa. The hospital keeps different preparations of Stalevo on different wards, or alternatively you can replace the medication with an equivalent dose of Sinemet plus 200mg Entacapone (also in the EDC) given with each dose.

Patient's usual medication	**Alternative (if patient's own supply not available)**	
Stalevo (Co-careldopa + Entacapone) **NB first number in the brackets is the levodopa dose**	**Supply of Stalevo in hospital**	**Alternative (from EDC)** **NB second number in brackets is the levodopa dose**
Stalevo (50/12.5/200)	Meyrick ward	0.5 Sinemet Plus (25/100) plus Entacapone 200mg
Stalevo (100/25/200)	Cloudesley ward	1 Sinemet Plus (25/100) plus Entacapone 200mg
Stalevo (125/31.25/200)	EDC	1 and 1/4 Sinemet Plus (25/100) plus Entacapone 200mg
Stalevo (150/37.5/200)	Cavell ward	1.5 Sinemet Plus (25/100) plus Entacapone 200mg

For patients who take dopamine agonists (e.g. Ropinirole, Bromocriptine, Pramipexole): the only substitute for these, kept in the EDC, is the Rotigotine patch. (see table 5 for dosing regime).

For patients taking monoamine oxidase-B inhibitors (e.g. Selegiline, Rasagiline): there is no topical or NG tube equivalent but these drugs have mild effects and short term omission is unlikely to be problematic.

Table 4: Equivalent medications to be prescribed for patients *who can take medications via NGT* but NOT orally.

NB only dispersible preparations can be used down a NG tube.

Patient's usual medication	Equivalent medication to be given via NGT
Madopar / Co-beneldopa (second number in brackets is the levodopa dose)	
Madopar-62.5mg capsules (12.5/50)	0.5 Madopar dispersible 125mg
Madopar-125mg capsules (25/100)	1 Madopar dispersible 125mg
Madopar-250mg capsules (50/200)	2 Madopar dispersible 125mg
Sinemet / Co-careldopa	
Sinemet-62.5 (12.5/50)	0.5 Madopar dispersible 125mg
Sinemet-110 (10/100)	1 Madopar dispersible 125mg
Sinemet-Plus (25/100)	1 Madopar dispersible 125mg
Sinemet 275 (25/250)	2.5 Madopar dispersible 125mg

Controlled release levodopa preparations have approximately 70% bioavailability of the short-acting form, and a 30-50% longer half-life. Therefore the dose and dose spacing has to be adjusted accordingly when converting to a dispersible preparation.

Patient's usual medication	Equivalent medication from EDC
Madopar C/R /controlled release co-beneldopa	
e.g. Madopar C/R 25/100 bd	0.5 Madopar dispersible 125mg tds
Sinemet C/R /controlled release co-careldopa	
e.g. Sinemet C/R 50/200 b.d.	1 Madopar dispersible 125mg tds

Stalevo preparations:
Stalevo preparations are composed of Co-careldopa (levodopa plus carbidopa, a decarboxylase inhibitor) and an additional 200mg Entacapone (COMT inhibitor) to reduce the on/off effects of levodopa. The hospital keeps different preparations of Stalevo on different wards (table 3c) and it can be crushed and dispersed for use down an NG tube. Entacapone is also readily dispersible although it is brightly coloured and may stain the NG tube if not crushed properly.
If you cannot obtain the correct strength of Stalevo, you can replace the medication with an equivalent dose of dispersible Madopar plus Entacapone 200mg (found in the EDC) to put down the NG tube.

Table 5. Rotigotine Patch: Conversion formula for PD patients unable to have enteral medications (including NG medications) and who require dopaminergic drugs in topical forms.

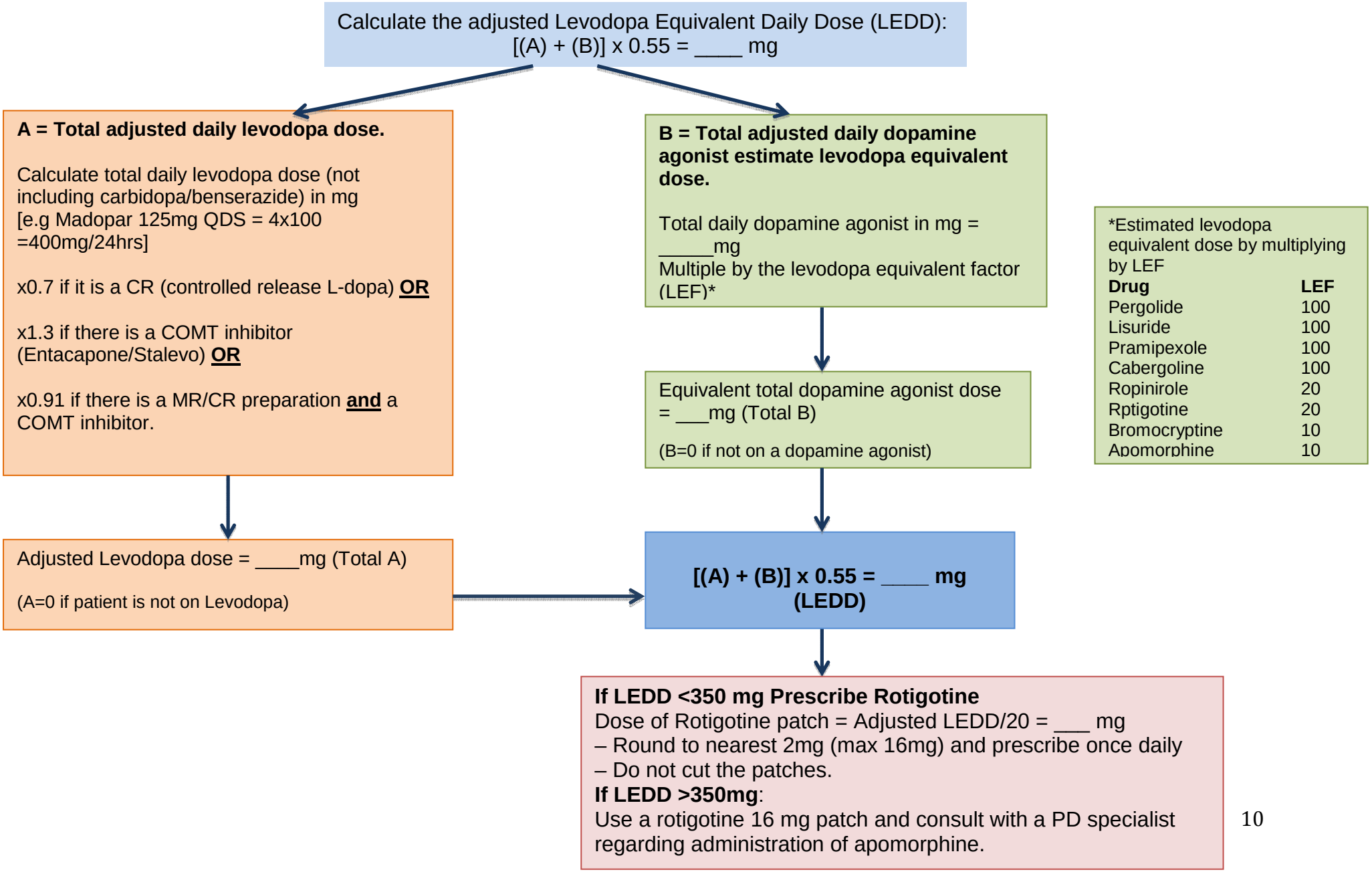
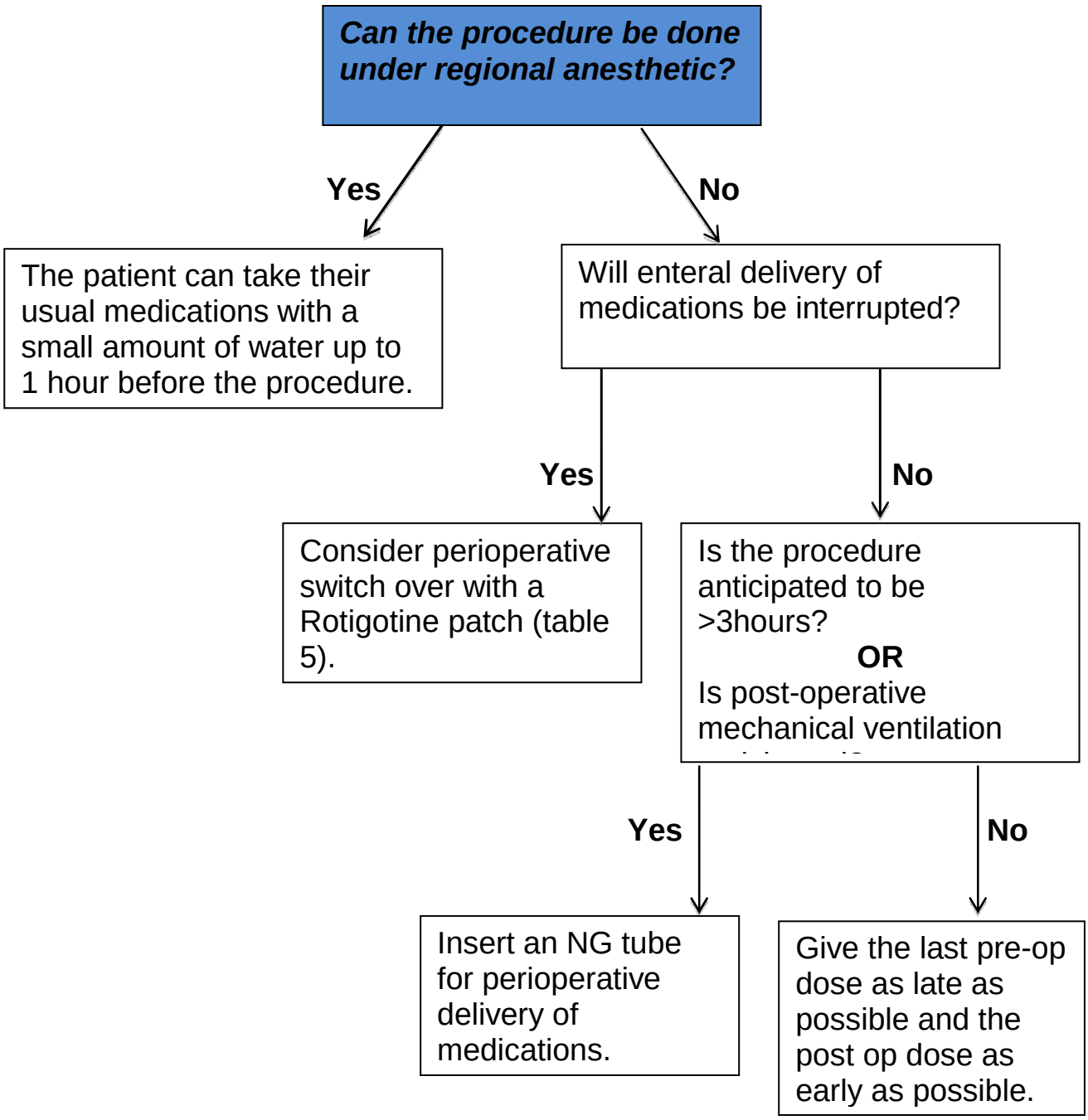


Table 6. PD patients and surgery: Guidelines for the management of PD patients during the perioperative period.



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Appendix A

Plan for Dissemination and implementation plan of new Procedural Documents

To be completed and attached to any document which guides practice when submitted to the appropriate committee for consideration and approval.

Acknowledgement: University Hospitals of Leicester NHS Trust

Title of document:	**Inpatient management of patients with Parkinson's Disease.**		
Date finalised:	**July 2011 (reviewed and re-issued December 2014)**	**Dissemination lead: Print name and contact details**	**Dr C Bielawski**
Previous document already being used?	**NO**		
If yes, in what format and where?	**N/A**		
Proposed action to retrieve out-of-date copies of the document:	**N/A**		
To be disseminated to:	**How will it be disseminated/implemented, who will do it and when?**	**Paper or Electronic**	**Comments**
To all relevant health care professionals at the Whittington	**Intranet uploading (replacement of version 1.0)**	**E**	
Is a training programme required?	**Junior medical staff training programme**		
Who is responsible for the training programme?	**Dr C. Bielawski**		

Appendix B

Equality Impact Assessment Tool

To be completed and attached to any procedural document when submitted to the appropriate committee for consideration and approval.

Impact (= relevance) **1 Low** **2 Medium** **3 High**	**Evidence for impact assessment (monitoring, statistics, consultation, research, etc**	**Evidential gaps (what info do you need but don't have)**	**Action to take to fill evidential gap**	**Other issues**
Race	**1**	**1**	**1**	**1**
Disability	**1**	**1**	**1**	**1**
Gender	**1**	**1**	**1**	**1**
Age	**1**	**1**	**1**	**1**
Sexual Orientation	**1**	**1**	**1**	**1**
Religion and belief	**1**	**1**	**1**	**1**

Once the initial screening has been completed, a full assessment is only required if:

- The impact is potentially discriminatory under equality or anti-discrimination legislation
- Any of the key equality groups are identified as being potentially disadvantaged or negatively impacted by the policy or service
- The impact is assessed to be of high significance.

If you have identified a potential discriminatory impact of this procedural document, please refer it to relevant Head of Department, together with any suggestions as to the action required to avoid/reduce this impact.