Parkinson's Disease and Anesthesia/Surgery

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As discussed in recent support group meetings, hospitalization and surgery can potentially exacerbate (worsen) Parkinson's disease and its symptoms. People with Parkinson's disease and their care partners should be aware of potential issues related to hospitalization and surgery.

To aid in increasing this awareness, I reviewed available medical literature and Parkinson's related websites for information related to precautions to consider when hospitalized and/or surgery is indicated.

This summary will focus primarily on medications of concern during the pre-operative, peri-operative and post-operative periods. The information presented is not intended to be totally inclusive, but a representation of the medications that may cause exacerbation of PD symptoms.

Recommendations from the Parkinson's Foundation and other sources are that the person with PD and their care partner should discuss planned or unplanned surgery and anesthesia with their surgeon and anesthesiologist. Medications of concern may best be noted as medications that can cause an **"adverse drug reaction".**

Of note, many PwP have surgical procedures with no issues. Regional anesthesia avoids neuromuscular blocking drugs and generally, there are fewer GI symptoms (nausea and vomiting) postoperatively. However, many procedures preclude the ability to utilize regional anesthesia and/or conscious sedation and general anesthesia is necessary.

Carbidopa levodopa therapy associated with anesthesia may result in the following issues: nausea, vomiting and dehydration; hypotension; *halothane* may cause arrythmias. (1, 2) PD meds (i.e carbidopa levodopa) should be given as close to initiation of surgery and may be dosed enterally (Parcopa under tongue or through NG tube with tip in the proximal small bowel) or parenterally (IV) periodically throughout surgery. Resumption of PD meds should be initiated as quickly as possible after completion of the surgery.

Medications of Concern for PwP during Hospitalization and/or Surgery (1,2,3,4,5,6)

Clinical judgment of the anesthesiologist/surgeon/physician is key. Determination that benefits of medication outweigh the potential for adverse reaction should be left to the clinician caring for the patient. This chart is intended for informational use only.

Green print reflects medications that appear to be safer for PwP
Yellow highlighted areas reflect potential for some adverse drug reaction but benefit of use may outweigh potential reactions
Red print reflects medications that are contraindicated with PD
Areas that are not highlighted reflect medications that may cause some adverse drug reactions. Use should be determined through clinical judgment of anesthesiologist and surgeon

Medication	Brand Name	Potential Adverse Reaction	Comments
Glycopyrolate bromide		*none*	*Does not cross blood-brain barrier. Preferred for premedication. Anti-cholinergic*
Ondansteron	*Zofran*		*Serotonin antagonist. Given for anti nausea and vomiting*
Ketamine *(IV induction agent)*	*Ketalar*	*Generally recognized as safe*	*May cause alterations in blood pressure.*
Etomidate	Amidate	*Generally recognized as safe*	
Thiopental	Pentothal	*Generally recognized as safe*	
Isoflurane		*Generally recognized as safe*	
Sevoflurane		*Generally recognized as safe*	

Propofol	Diprivan	May cause involuntary movements	Potential for propofol induced dyskinesia in PwP
Halothane	**Fluothane**	**Increased sensitivity to catecholamines Arrythmias**	**AVOID**
Fentanyl		Rigidity, dystonia	Clinical judgment
Meperidine		Contraindicated if taking Selegiline	Avoid if on Selegiline

Morphine		Rigidity	Pain control; clinical judgment
Metoclopramide	Reglan	Block dopamine receptors	Clinical exacerbation of PD
Butyrophenones: Droperidol, Haldoperidol	Inapsine, Haldol	Block dopamine receptors	Clinical exacerbation of PD
Risperidone, Aripirazole, Paliperidone, Chlorpromazine	Risperdal, Abilify, Invega, Thorazine	Block serotonin reuptake	Clinical exacerbation of PD
Antiemetics: Metoclopramide, Compazine, Promethazine, Droperidol	Reglan, Compazine (d/c'd in US), Phenergan, Inapsine	Block dopamine receptors	Clinical exacerbation of PD
Anti-psychotics: Nuplazid, Seroquel			Nuplazid only med approved by FDA for PD psychosis
Antiemetics: Ondansteron, Trimethobenzamide Dolasteron	Zofran, Tigan, Anzemet		

There are no clear guidelines for perioperative management of people with Parkinson's disease. (6) Intraoperatively, changes do occur and there may well be exacerbation of PD. Fine skeletal muscle tremors may emerge and may progress to rigors. ECG may reflect a pattern that may be mistaken for ventricular fibrillation - but the pattern reflects the fine skeletal muscle tremors. (1)

References:

(1) Safiya, S and Himanshu, V. *Parkinson's disease and anaesthesia.* Indian J Anaesth. 2011 May-Jun; 55(3): 228-234.
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(3) APDAParkinsons.org American Parkinson's Disease Association
(4) Parkinson.org Parkinson's Foundation
(5) Nicholson, G, Perrera, AC, Hill, GM. *Parkinson's disease and anaesthesia.* BJA: British Journal of Anaesthesia, Volume 89, Issue 6, December 2002, pages 204-216.
(6) Quinn, R. The Hospitalist. 2010, June; 2010(6).