Table of Contents

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Revision History

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September 2011:	Mike Bonck, RPh, Manager, Pharmaceutical Services Minor edits upon request from the Medical Directors of Anesthesiology for FHS
May 2011:	Sundari Poegoeh, PharmD, FHS Pharmaceutical Services William B. Cammarano, MD, Medical Director, Anesthesiology, SJMC Approved by the FHS PT&T Committee on May 13, 2011
May 2009:	Jamie Billotti, PharmD, FHS Pharmaceutical Services William B. Cammarano, MD, Medical Director, Anesthesiology, SJMC Approved by the FHS PT&T Committee on May 8, 2009
May 2004:	Amber O. Lienemann, PharmD, FHS Pharmaceutical Services James Stangl, MD, Prescreening Clinic (PSC) Working Group of the SJMC Anesthesia Section

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
ACNE AGENTS				
Retinoic Acid Derivative	Trifarotene Aklief®	May be continued before surgery.	No specific contraindication or interactions using this drug in the perioperative period. Avoid use on or near the surgical site.	
ANALGESIC AGENTS				
Non-selective NSAIDs	**Short T1/2:** Ibuprofen Indomethacin Diclofenac Ketoprofen Etodolac Ketorolac **Intermediate T/12:** Naproxen Sulindac Diflunisal Meloxicam **Long T1/2:** Nabumetone Piroxicam	Short half-life (2 to 6 hours): discontinue on the day before surgery Intermediate half-life (7 to 20 hours): discontinue 3 to 4 days before surgery Long half-life (>20 h): discontinue 10 days before surgery **Some physicians recommend stopping all NSAIDs 10 days before surgery*	May resume when risk of bleeding is acceptable and intravascular volume status is normal	5 half-lives should be sufficient, except in individuals with hepatic or renal dysfunction Although some experts recommend discontinuing NSAIDs based on half-life, there's a poor correlation with COX inhibition and effects on platelet aggregation. May need to consider alternative analgesics or low-dose corticosteroids for arthritis patients who are NSAIDs dependent perioperatively
COX-2 Inhibitors	Celecoxib (Celebrex®)	Stop 1-2 days before surgery, unless elimination half-life warrants earlier discontinuation **Some physicians recommend stopping 1 week before surgery*	May resume when volume status and renal function is stable	Have much less effect on platelet function than aspirin or non-selective NSAIDs Have similar effects on renal function as non-selective NSAIDs Because of lack of effect on platelet function, may not require discontinuation if benefit>risk

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
Opioids	Morphine Oxycodone Fentanyl Methadone Buprenorphine	Continue with minimal interruption in the perioperative period Anticipated minimal post-op pain: continue buprenorphine Moderate-severe post-op pain: If elected surgery may consider discontinuing buprenorphine a week before surgery and transitioning to another opioid, if necessary	Intravenous preparations are available; transdermal fentanyl (Duragesic®) can also provide flexible dosing and delivery Maximize non-opioid analgesia. Resume buprenorphine once post-op pain has resolved.	When used chronically, patients are subject to physiologic and psychological dependence. Both opioids and benzodiazepines are used frequently and safely in the routine care of perioperative patients Patients on buprenorphine may present a challenge for postoperative pain control due to antagonist effect at the kappa opioid receptor.
Urinary Analgesics	Pentosan polysulfate Sodium (Elmiron®)	Hold 12 to 24 hours prior to surgery	Depending on the type of surgery, Elmiron should be re-started at physician's discretion	Elmiron is a low-molecular weight heparin-like compound with anticoagulant and fibrinolytic effect. It is a weak anticoagulant with 1/15 the activity of heparin. Bleeding complications of ecchymosis, epistaxis, and gum hemorrhage have been reported.
Antimigraine	Eptinezumab-jjmr (Vyepti®) Erenumab-aooe (Aimovig®) Fremanezumab-vfrm (Ajovy®) Galcanezumb-gnlm (Emgality®) Rimegepant (Nurtec ODT®)	Discuss with prescribing provider	Discuss with prescribing provider	<u>Aimovig®, Ajovy®, and Emgality®</u> Given monthly or every three months and can likely be held and given post-operatively when the patient is stable (non-formulary agents) <u>Ubrelvy®</u> Taken as needed, adverse reactions primarily consist of nausea and somnolence. Drug-drug-interactions are common as this

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	Ubrogepant (Ubrelvy®)			medication is metabolized by CYP3A4.
ANTICOAGULANTS				
Vitamin K Antagonists ***See Perioperative Anticoagulation Management guidelines under quick-links on FHS home page. Updated 2017*	Warfarin (Coumadin®)	Should be stopped >5 days prior to surgery if INR supratherapeutic, 5 days prior if INR therapeutic, 3-4 days if INR subtherapeutic In patients who require temporary interruption of Warfarin and whose INR is still above 1.5 one to two days prior to surgery, 2.5 mg of oral vitamin K is suggested ***See Vitamin K – INR Reversal Protocol for patients with elevated INR despite discontinuation of warfarin* ***Bridging recommendations: Use **therapeutic-dose** SC LMWH > IV UFH in patients with mechanical heart value, atrial fibrillation or VTE at moderate or high risk for thromboembolism*	Resume warfarin on evening of or the morning after procedure or surgery The traditional management of perioperative anticoagulation, referred to as "bridging" therapy, uses preoperative and postoperative therapy with LMWH when an alternative is needed after oral anti-coagulant therapy is discontinued for several days ***Bridging recommendations: see preoperative recommendations*	*Considerations:* 1. The risk of thromboembolism if anticoagulation is discontinued (the risk is related to the indication for anticoagulation as well as the postoperative risk induced by the procedure 2. Risk of bleeding if anticoagulant is continued (procedural risk and patient-specific risk) 3. Effectiveness and safety of alternative anticoagulant interventions (i.e. "bridging" therapy) Please refer to: ACCP Evidence-Based Clinical Practice Guidelines (9th Edition) [Chest **2012;141(2)(*Suppl):e*326S-*e*350S]** and 2017 ACC Expert Consensus Decision Pathway for NVAF. ***JACC* 2017;69:**
Thrombin Inhibitor ***See Perioperative*	Dabigatran (Pradaxa®)	Surgery with low risk of bleeding: CrCl > 80: discontinue ≥24	Peak plasma level 6 hours post surgery.	Extreme caution must be considered before performing neuraxial anesthesia

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
Anticoagulation Management guidelines under quick-links on FHS home page. Updated 2017		hours before surgery CrCl 50-79: discontinue ≥36 hours before surgery CrCl 30 to 49: discontinue ≥48 hours before surgery CrCl 15-29: discontinue ≥72 hours before surgery CrCl <15: discontinue ≥96 hours before surgery Surgery with moderate or high risk of bleeding: CrCl > 80: discontinue ≥48 hours before surgery CrCl 50-79: discontinue ≥72 hours before surgery CrCl 30 to 49: discontinue ≥96 hours before surgery CrCl 15-29: discontinue ≥120 hours before surgery CrCl <15: discontinue no data	Once hemostasis has been established: Low post-procedural bleeding risk: resume DOAC within 24 hours following procedure (consider lower dose on evening of procedure) High post-procedural bleeding risk: 48-72 hours following procedure	Dabigatran should not be used for bridging warfarin due to lack of supporting literature and the perioperative bleed risk Please refer to: 2017 ACC Expert Consensus Decision Pathway for NVAF. ***JACC* 2017;69:**
Unfractionated Heparin (UFH) ***See Perioperative Anticoagulation Management guidelines under quick-links on FHS home page*	Heparin	Stop heparin infusion 4 to 6 hours prior to surgery Stop heparin infusion at least 6 hours before removing epidural catheter Stop SQ heparin 6 hours prior to surgery	Restarting UFH should be done at the surgeon's discretion For minor surgical/invasive procedures resume therapeutic dose UFH ~24 hours after procedure (or next day) For major surgery or a high bleeding risk delay initiation	

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
			for ~48 to 72 hours post-op OR administer low-dose UFH after surgery when hemostasis is secured	
Low-molecular weight heparin (LMWH) ***See Perioperative Anticoagulation Management guidelines under quick-links on FHS home page*	Enoxaparin (Lovenox®) Dalteparin (Fragmin®)	*Enoxaparin and Dalteparin:* Hold prophylactic LMWH for at least 12 hours before anticipated neuraxial anesthetic Hold LMWH for 24 hours if therapeutic dose being used prior to neuraxial anesthetic	Restarting LMWHs or Anti-Xa Inhibitors should be done at the surgeon's discretion For minor surgical/invasive procedures: resume therapeutic dose LMWH ~24 hours after procedure (or next day) and Anti-Xa Inhibitors ~6-8 hours after procedure For major surgery or a high bleeding risk: delay initiation for ~48 to 72 hours post-op OR administer low-dose LMWH or prophylactic fondaparinux after surgery when hemostasis is secured	Please refer to: ACCP Evidence-Based Clinical Practice Guidelines (9th Edition) [Chest 2012;141(2)(*Suppl):e*326S-*e*350S]
Indirect Factor Xa Inhibitor	Fondaparinux (Arixtra®)	Due to 17 hour half-life, hold at least 36 to 48 hours prior to major surgery Hold for 72 hours prior to neuraxial anesthetic. **Consult anesthesiologist	For minor surgical/invasive procedures: resume ~6-8 hours after procedure Recommended duration of bridging overlap with fondaparinux and warfarin is 5-9 days	Avoid use in spinal injury or surgery patients Extreme caution must be considered before performing neuroaxial anesthesia

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
Direct Factor Xa Inhibitor ***See Perioperative Anticoagulation Management guidelines under quick-links on FHS home page. Updated 2017*	Rivaroxaban (Xarelto®) Apixaban (Eliquis®) Edoxaban (Savaysa®)	Surgery with low risk of bleeding:rivaroxaban, apixabanCrCl > 30 ml/min: Discontinue ≥24 hours before surgery CrCl 15-29 ml/min: Discontinue ≥36 hours before surgery CrCl <15 ml/min: ≥48 hours before surgery Surgery with moderate or high risk of bleeding: rivaroxaban, apixabanCrCl >30 ml/min: Discontinue ≥48 hours before surgery CrCl <30 ml/min: Discontinue ≥72 before surgery Edoxaban: discontinue 24 hours prior to procedure	Once hemostasis has been established: Low post-procedural bleeding risk: resume DOAC within 24 hours following procedure (consider lower dose on evening of procedure) High post-procedural bleeding risk: 48-72 hours following procedure	Avoid use in spinal injury or surgery patients Extreme caution must be considered before performing neuroaxial anesthesia. **The manufacturer of Edoxaban does not specify, the difference between standard and high risk surgery, but if high risk of bleed might consider holding ~48 hours prior to surgery due to T ½ of ~10-14 hours. Please refer to: 2017 ACC Expert Consensus Decision Pathway for NVAF. ***JACC* 2017;69:**
	Betrixaban	Due to half-life of > 72 hours, hold at least 7-10 days prior to major surgery		Neuroaxial anesthesia: In patients who receive both betrixaban and neuraxial anesthesia, avoid removal of epidural catheter for at least 72 hours following the last betrixaban dose; avoid administration of betrixaban for at least 5 hours following catheter removal
ANTIEPILEPTICS				
	Phenytoin (Dilantin®) Carbamazepine (Tegretol®) Eslicarbazepimee	Continue medications during the perioperative period If patient will be admitted	Continue on patient's regular schedule; if oral intake is not possible utilize intravenous preparations	In outpatients who have been stable on their AED regimen, with a long-standing seizure-free history, there is probably no need to routinely check serum levels

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	Valproic acid (Depakote®) Topiramate (Topamax®) Gabapentin (Neurontin®) Levetiracetam (Keppra®) Lacosamide Lamotrigine (Lamictal®) Suxilep® Aptiom® Felbamate Clobazam Zonisamide Pregabalin Ethosuximide Diacomit® Brivaracetam Epidiolex Cenobomate (Xcopri®)	after surgery and will be NPO for 24 hours, consider obtaining baseline preoperative serum drug levels		If patient is being treated with a drug for which there is no intravenous form and delay in postoperative oral intake is anticipated, preoperative conversion to a drug for which an intravenous form is available may be considered May increase or decrease the metabolism of some anesthetic agents, especially neuromuscular blocking agents Patients with epilepsy have an increased risk for postoperative complications
ANTIHYPERLIPIDEMICS				
Bile Acid Resins	Cholestyramine (Questran®) Colesevelam Colestipol (Colestid®)	Discontinue before surgery	Resume postoperatively when patient is stable and eating a full diet	Bile sequestrants can interfere with bowel absorption of medications that may be required perioperatively
Fibric Acid Derivatives	Gemfibrozil (Lopid®) Fenofibrate	Discontinue before surgery	Resume postoperatively when patient is stable and eating a full diet	Niacin, fibric acid derivatives such as gemfibrozil, and the statins all have the potential to cause myopathy and rhabdomyolysis, especially if used in combination
HMG-CoA Reductase	Simvastatin	Continue preoperatively	Resume postoperatively when	

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
Inhibitors ("statins")	(Zocor®) Atorvastatin (Lipitor®) Lovastatin (Mevacor®) Rosuvastatin (Crestor®) Pitavastatin (Pivalo®) Pravastatin (Pravachol®) Fluvastatin	and throughout the hospital stay without interruption, if possible	patient is stable and eating a full diet	Muscle injury may occur during the perioperative period. Evidence suggests that HMG CoA reductase inhibitors (statins) may prevent vascular events in the perioperative period.
Supplements	Niacin	Discontinue before surgery	Resume postoperatively when patient is stable and eating a full diet	
Cholesterol absorption inhibitor	Ezetemibe (Zetia®)	Discontinue before surgery	Resume postoperatively when patient is stable and eating a full diet	
PCSK9 Inhibitors	Repatha® Praluent®	Can continue preoperatively Repatha $T_{1/2}$: 11-17 days Repatha $T_{1/2}$: 10-20 days	Resume postoperatively when appropriate	SQ injections given q14 days, missed doses may be administered within 7 days of scheduled administration date
Adenosine Triphosphate-Citrate Lyase (ACL) Inhibitor	Bempedoic acid (Nexletol®)	Discuss with prescribing provider	Discuss with prescribing provider	Usually taken in conjunction with statin therapy Warnings include hyperuricemia (gout) and risk for tendon rupture Associated with persistent changes in laboratory tests within the first four weeks of treatment, including increases in creatinine and blood urea nitrogen, decreases in hemoglobin and leukocytes, increases in platelet counts, increases in liver enzymes (AST and/or ALT), and increases in creatine kinase.

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
ANTIHYPERTENSIVES				
ß-blockers	Atenolol Metoprolol	Continue preoperatively and throughout the hospital stay without interruption, if possible	Resume postoperatively Several intravenous β-blockers are available for patients who have not resumed taking oral medications when postoperative doses are due	Beta blockers may have benefits when taken perioperatively by decreasing ischemia via decreased oxygen demand and by preventing/controlling arrhythmias. Potential adverse effects of perioperative beta blockage include bradycardia and hypotension
Angiotensin-Converting Enzyme Inhibitors (ACE-Inhibitors)	Lisinopril Enalapril Captopril Benazepril Ramipril Quinapril	If ACE-Inhibitors are indicated only for hypertension and the blood pressure is controlled, discontinue the day before surgery. If ACE-I is indicated for other indications or blood pressure is not controlled, contact anesthesiologist.	Resume postoperatively as long as the patient is not hypotensive and has not suffered acute renal injury Intravenous Enalaprilat may be used if the patient becomes hypertensive before resuming oral medications	Exaggeration of hemodynamic lability after induction of anesthesia has been reported with patient taking ACE-Is/ARBs. While controversial, the evidence seems to support holding ACE-Is/ARBs the morning of surgery for patients taking any of these agents indicated for hypertension
Angiotensin Receptor Blockers (ARBs)	Valsartan Irbersartan Losartan Candesartan Olmesartan	If ARBs are indicated only for hypertension and the blood pressure is controlled, discontinue 24 hours before surgery. If ARBs are used indicated for other indications or if blood pressure is not controlled, contact anesthesiologist		
Calcium Channel Blockers (CCBs)	Diltiazem Verapamil Nifedipine Amlodipine	Continue preoperatively and throughout the hospital stay without interruption, if possible – as long as heart rate and blood pressure are stable	Resume postoperatively Intravenous verapamil and diltiazem are available for patients who have not resumed taking oral	*CCBs may interact with agents used in anesthesia; may prolong neuromuscular blockade and have an additive hypotensive effect - use with caution. CCBs also act synergistically with ß-adrenergic blockers and may cause profound bradycardia and

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
			medications when postoperative doses are due	hypotension. Withholding these agents for significant bradycardia or hypotension should not result in withdrawal effects
Centrally Acting Sympatholytics	Clonidine Methyldopa Quanabenz Guanfacine	Continue perioperatively to avoid withdrawal effects, most significant with clonidine Will patient be able to take oral meds within 12 hours of preoperative dose? *If not, see next column* →	If a surgical patient who is taking oral clonidine is expected to resume it within 12 hours of the preoperative dose, oral dosing may continue If more than 12 hours are expected to pass, conversion from oral clonidine to a clonidine patch *at least 3 days before surgery* may be wise	If prolonged NPO expected, then prior to surgery, discontinue the oral dose by tapering over 2 to 3 days while initiating an equivalent dose of a clonidine patch. This provides steady dosing during the conversion Transdermal patch (Catapres-TTS) is available. Steady-state levels are achieved 2-3 days after application Each patch is used for 7 days
Direct Renin Inhibitors	Aliskiren (Tekturna®)	For patients treated for hypertension, strongly consider holding direct renin inhibitors on the morning of surgery due to the increased risk of post-anesthetic induction hemodynamic lability	Resume postoperatively as long as patient is not hypotensive and has not suffered acute renal injury	Assess risk vs. benefit between hyper- and hypotensive events intraoperatively
Direct vasodilators & Alpha adrenergic-blockers	Hydralazine Prazosin, Terazosin	Continue perioperatively when possible	Use intravenous preparations postoperatively if blood pressure is elevated and patient is unable to resume oral intake	IV hydralazine is a potent arterial dilator and may cause reflex tachycardia Use caution with intravenous formulations as the dose required is lower than the oral dose
ANTIHYPERTENSIVES (COMBINATION)				
HCTZ/ACE-Inhibitors	Benazepril/HCTZ (Lotensin®)	Refer to diuretics and ACE-Inhibitors	Refer to diuretics and ACE-Inhibitors	

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	Captopril/HCTZ (Capozide®)			
HCTZ/ARBs	Losartan/HCTZ (Hyzaar®) Valsartan/HCT (Diovan®)	Refer to diuretics and ARBs	Refer to diuretics and ARBs	
ACE-Inhibitors or ARBs & CCBs	Benazepril/ Amlodipine (Lotrel®) Enalapril/ Felodipine (Lexxel®) Trandolapril/ Verapamil (Tarka®) Valsartan/ Amlodipine (Exforge®) Perindopril arginine/ amlodipine (Prestalia®)	Refer to ACE-Inhibitors or ARBs and CCBs	Refer to ACE-Inhibitors or ARBs and CCBs	
HCTZ/ARBs/CCBs	Olmesartan/ HCTZ/ Amlodipine (Tribenzor®) Valsartan/ Amlodipine/ HCTZ (Exforge HCT®)	Refer to diuretics, ARBs, and CCBs	Refer to diuretics, ARBs, and CCBs	

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
HCTZ/ ß-blockers	Atenolol/ HCTZ Bisoprolol/ HCTZ Ziac® Metoprolol/ HCTZ Lopressor HCT®	Continue without interruptions Refer to HCTZ and ß-blockers	Resume postoperatively Refer to HCTZ and ß – blockers	
ARBs/Direct Renin Inhibitor	Aliskiren/ Valsartan (Valturna®)	Refer to ARBs and direct renin inhibitors	Refer to ARBs and direct renin inhibitors	
CCBs/Direct Renin Inhibitor	Aliskiren/ Amlodipine (Tekamlo®) Aliskiren/ Amlodipine/ HCTZ (Amturnide®)	Refer to CCBs and direct renin inhibitors	Refer to CCBs and direct renin inhibitors	
ARB/ARNI	Sacubitril/ Valsartan (Entresto®)	Refer to ARBs	Refer to ARBs	
ANTI-INFECTIVE AGENTS				
Aminoglycoside	Plazomicin (Zemdri)	Continue until the time of surgery	Resume postoperatively	May cause nephrotoxicity; monitor renal function closely May cause neuromuscular blockade in patients receiving concomitant neuromuscular blocking agents and/or with underlying neuromuscular disorders

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
Antileishmanial/ Antiparasitic Medications	Miltefosine	Continue until the time of surgery	Resume when the patient's GI tract is functioning properly	Continue medication for duration of therapy
Antiprotozoal and Anthelmintic	Benznidazole Moxidectin Tafenoquine (Krintafel®) Triclabendazole (Egaten®)	Continue until time of surgery Consult with infectious disease specialists Monitor for anemia	Resume postoperatively Tafenoquine: resume when GI tract is functioning properly	Continue medication for duration of therapy Benznidazole: Bone marrow depression has been reported in post-marketing case reports, but frequency is not defined. The mean plasma half-life is 13 hours. Triclabendazole: Short course of therapy for fascioliasis - only 2 doses given 12 hours apart.
Antifungal Agent, Azole Derivatives	Isavuconazole (Cresemba®)	Continue until the time of surgery	Resume postoperatively	The mean plasma half-life of isavuconazole was 130 hours in trials. Based on this data, if the doses must be held for a short period of time pre- and post-operatively, this shouldn't affect overall patient exposure to the medication.
Antitubercular	Pretomanid	Continue until the time of surgery Consult with infectious disease specialists.	Resume postoperatively	Non-formulary. Consult with infectious disease specialists prior to approval. Taken in combination with bedaquiline and linezolid, and confer a risk of anemia and thrombocytopenia which may increase bleeding times.
Carbapenem	Imipenem, cilastatin, relebactam (Recarbrio®)	Continue until the time of surgery	Resume postoperatively	Non-formulary. Consult with infectious disease specialists prior to approval.
Pleuromutilin	Lefamulin Xenleta®	Continue until the time of surgery and consult with infectious disease specialists	Resume postoperatively	The half-life of this medication is approximately 8 hours Continue medication for duration of therapy

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
				Non-formulary. Will have to be given as a patient own medication
Siderophore Cephalosporins	Cefiderocol Fetroja®	Continue until the time of surgery	Resume postoperatively	The half-life of this medication is 2-3 hours. Primarily excreted unchanged via the kidneys; monitor renal function.
Tetracycline derivatives	Seysara® Nuzyra® Xerava®	Continue until the time of surgery.	Resume postoperatively.	Non-formulary. Will have to be given as patient own medication
ANTIMOTILITY AGENT				
Sodium/Hydrogen Exchanger(NHE3) Inhibitor	Tenapanor (Ibsrela)	Medication can be taken up to the day of surgery	Resume when patient is hemodynamically stable	Medication is known to cause diarrhea and may cause dehydration among critically ill patients
Osmotic Laxatives	Lactitol (Pizensy)	Medication can be taken up to the day of surgery	May take when patient is able to take oral medications	Lactitol may reduce the absorption of concomitantly administered oral medications. Administer oral medications at least 2 hours before or 2 hours after Lactitol.
ANTINEOPLASTICS				
Oral Chemotherapy Medications	Afinitor® Alecensa® Asparlas® Ayvakit® Braftovi® Calquence® Copiktra® Cotellic® Cyclophos-phamide Daurismo® Erleada® Etoposide Farydak® Gilotrif® Gleevec®	Consult with patient's oncologist for all oral chemotherapy medications prior to surgery.	Consult with patient's oncologist.	All medications confer a risk of thrombocytopenia which may increase bleeding times. Each medication should be carefully reviewed for contraindications due to surgery complications by the oncologist, surgeon, and pharmacist post-operatively once the patient is stable. Many injectable chemotherapy medications are given in cycles and/or regimens, and it may be reasonable to schedule surgery after the completion of a cycle/regimen. However, one must always consult the patient's oncologist to prevent interruption in the appropriate

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	Hydroxyurea Ibrance® Idhifa® Inrebic® Imbruvica® Lenvatinib® Lonsurf® Lorbrena® Lynparza® Mekinist® Mektovi® Mercapto-purine Nerlynx® Ninlaro® Nubeqa® Odomzo® Pexidartinib® Piqray® Pomalyst® Polivy® Revlimid® Rolzytrek® RubracaTM Rydapt® Sutent® Tafinlar® Tagrisso® Talzenna® Tarceva® Tazverik ® Tibsovo® Varubi® Verzenio® Vitrakvi® Vitrakvi®			management of the patient's disease.

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	Vizimpro® Xeloda® Xospata® Zejula® Zydelig® Zykadia®			
Injectable Chemotherapy Medications	Arzerra® Beleodaq® Blincyto® Darzalex® Elzonris® Elzonris® Lumoxiti® Empliciti® Entyvio® Gazyva® Imlygic® Keytruda® Libtayo® Libtayo® Lumoxiti® Lutathera® Onivyde® Opdivo® Portrazza® Poteligeo® Sarclisa® Tecentriq® Unituxin® Xpovio® Yondelis®	Consult with patient's oncologist for all injectable chemotherapy medications prior to surgery.	Consult with patient's oncologist.	Many injectable chemotherapy medications are given in cycles and/or regimens, and it may be reasonable to schedule surgery after the completion of a cycle/regimen. However, one must always consult the patient's oncologist to prevent interruption in the appropriate management of the patient's disease.
Ophthalmic Agent-Vascular Endothelial Growth Factor(VEGF)	Brolucizumab (Beovu®)	Hold for at least 28 days before surgery	Hold for at least 28 days after surgery and the wound is fully healed.	VEGF Medications have the potential for arterial thromboembolic events (5%)

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
Inhibitor				
ANTIPARKINSON AGENTS				
Adenosine Receptor Antagonist	Istradefylline (Nourianz®)	Medication can be taken up to the day of surgery	May take when patient is able to take oral medication	Monitor for potential increase in serum glucose (1-2%)
Dopamine Precursor	Carbidopa/ Levodopa (Sinemet®)	Continue during the perioperative period, discontinuation may cause parkinsonian crisis, no IV form available	Resume medications at same doses as soon as possible. If a patient has a nasogastric tube, a levodopa/carbidopa solution can be delivered to the duodenum via a weighted feeding tube. Otherwise, for patients who are NPO, there are few effective alternatives that may be given IV/IM: - trihexyphenidyl - benztropine - diphenhydramine	Without treatment, muscle rigidity increases which may complicate medical care Carbidopa/levodopa interacts with many drugs used in anesthesia, increasing the risk for arrhythmias – but the benefits of continued therapy outweigh the risks
Dopamine Agonists	Bromocriptine Pramipexole Ropinirole	Dopamine agonists should be discontinued the evening before surgery to avoid postural hypotension in the perioperative periods	May be restarted when the patient resumes oral intake	
Dopamine Antagonist	Amisulpride (barhemsys)	May be administered prior to surgery at the time of induction of anesthesia	Can be intravenously administered immediately after surgery	Causes dose- and concentration-dependent QT prolongation. Recommended to avoid with other drugs known to prolong the QT interval (e.g. ondansetron).
Monoamine Oxidase Inhibitor (MAOIs) used in Parkinson's	Selegiline (Eldepryl®) Pargyline	Consult anesthesiologist FLAG CHARTS to alert that patient is on an MAOI and place stickers on chart *cautioning against the use of meperidine and indirect sympathomimetics (i.e. ephedrine)*		MAO inhibition becomes non-selective in doses greater than 10 mg/day AVOID meperidine and indirect sympathomimetics (i.e. ephedrine) may cause

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	Phenelzine Safinamide (Xadago®)			neuroleptic malignant syndrome**.** (Doak GH) Increased risk of serotonin syndrome in patients who receive methylene blue intraoperatively. Combination should be avoided unless benefit outweighs risk. Patients should not be forced to discontinue these agents. If discontinuation is warranted, taper off slowly over 2 weeks; but still follow recommended precautions above since discontinuation does not guarantee complete elimination
COMT Inhibitors	Entacapone (Comtan®) Tolcapone (Tasmar®)	Continue up to the time of surgery	For patients who are NPO, there are few effective alternatives that may be given IV/IM: - trihexyphenidyl (Artane®) - benztropine (Cogentin®) - diphenhydramine (Benadryl®)	Work by extending the duration of action of levodopa No specific contraindications regarding their use perioperatively Abrupt withdrawal can cause a syndrome similar to neuroleptic malignant syndrome (as can carbidopa/levodopa)
ANTIPLATELET AGENTS				
Salicylates	Aspirin (ASA)	Preoperative decision regarding discontinuation of aspirin administered for antiplatelet effects should be individualized and based upon conversation between patient's surgeon, PCP, neurologist, or cardiologist. For patients at high risk for cardiovascular events (e.g.	Resume ~24 hours after surgery (next morning) assuming risk of bleeding has diminished Prompt resumption of ASA should be considered for patients with or at high risk for atherosclerosis	Aspirin is continued preferentially in many cardiac surgeries because of its positive effects on mortality and cardiac morbidity Widely published experience exists regarding the safety of aspirin and NSAID use in the setting of regional anesthesia *Recommend continuing dual antiplatelet*

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
		Cardiac stents, CAD, DM, CHF, renal insufficiency, cerebrovascular disease) and those requiring CABG surgery it is recommended that ASA be continued through the operative period. Stop 5-10 days prior to surgery.		*therapy perioperatively in patients with coronary stents if surgery is required within 30-90 days of bare metal stent placement or within 12 months of drug-eluting stent placement. Elective surgery should not be performed during these critical periods. Patients with bare metal stents older than 30-90 days or drug-eluting stents older than 12 months should continue ASA therapy perioperatively with the exception of intracranial, ophthalmic and intermedulary spinal cord surgery when the risk of bleeding exceeds the risk of major cardiac event from in stent rethrombosis.*
Other Antiplatelet Drugs	Vorapaxar (Zontivity®)	Preoperative decision regarding discontinuation of antiplatelet agent should be individualized and based upon conversation between patient's surgeon, PCP, neurologist, or cardiologist. Significant inhibition of platelet aggregation remains **4 weeks** after discontinuation due to long half-life of parent drug and active metabolite (T ½ 72-96 hours; terminal T ½ 5-13 days)	Resume ~24 hours after surgery, when hemostasis is secured	Vorapaxar is typically taken in combination with aspirin and/or clopidogrel in patients with diabetes and a history of MI.(Circulation. 2015;131(12):1047-53.) Contraindicated in patient with history of stroke, TIA, ICH, or active pathological bleeding. The risk of bleeding is proportional to the patient's underlying bleeding risk.
	Ticagrelor (Brilinta®)	Preoperative decision regarding discontinuation of antiplatelet agent should be individualized and based upon conversation between patient's surgeon, PCP,	Resume ~24 hours after surgery, when hemostasis is secured	Do not start in patients planned to undergo urgent CABG. Maintenance doses of aspirin above 100mg reduce the effectiveness of ticagrelor

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
		neurologist, or cardiologist. Discontinue 5 days before surgery		*Recommend continuing dual antiplatelet therapy perioperatively in patients with coronary stents if surgery is required within 30-90 days of bare metal stent placement or within 12 months of drug-eluting stent placement. Elective surgery should not be performed during these critical periods. Patients with bare metal stents older than 30-90 days or drug-eluting stents older than 12 months should continue ASA therapy perioperatively with the exception of intracranial, ophthalmic and intermedulary spinal cord surgery when the risk of bleeding exceeds the risk of major cardiac event from in stent rethrombosis.*
	Clopidogrel (Plavix®)	Preoperative decision regarding discontinuation of antiplatelet agent should be individualized and based upon conversation between patient's surgeon, PCP, neurologist, or cardiologist. Discontinue *at least* 5-10 days before surgery	Resume ~24 hours after surgery (next morning), when hemostasis is secured	Neuraxial anesthesia is relatively *contraindicated* if these antiplatelet agents are not discontinued 7-10 days preoperatively Consider discussing with surgeon and cardiologist about whether or not a loading dose of clopidogrel should be given at the time of resumption, since reinitiation of maintenance dose would take 5-10 days to attain maximal platelet function inhibition
	Prasugrel (Effient®)	Preoperative decision regarding discontinuation of antiplatelet agent should be individualized and based upon conversation between patient's surgeon, PCP, neurologist, or cardiologist. Discontinue at least 7 days	Resume ~ 24 hours after surgery, when hemostasis is secured	*Recommend continuing dual antiplatelet therapy perioperatively in patients with coronary stents if surgery is required within 30-90 days of bare metal stent placement or within 12 months of drug-eluting stent placement. Elective surgeries should not be performed during these critical periods. Patients with bare metal stents older than 30-90 days or drug-eluting stents older than 12 months should continue ASA therapy perioperatively.*

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
		before surgery		
	Ticlopdipine (Ticlid®)	Preoperative decision regarding discontinuation of antiplatelet agent should be individualized and based upon conversation between patient's surgeon, PCP, neurologist, or cardiologist. Discontinue 10 days before surgery	Resume ~24 hours after surgery (next morning), when hemostasis is secured	
Combination Drugs	Aspirin/ dipyridamole (Aggrenox®)	Stop 7-10 days before surgery	Resume after procedure or surgery when the risk of bleeding has diminished	
Phosphodiesterase Inhibitor	Cilostazol (Pletal®)	Stop at least 5 days before surgery **In patients who cannot discontinue 7-10 days in advance, stopping 3 days in advance may be acceptable*	Resume after procedure	Antiplatelet actions and vasodilatory effects When stopped, claudication symptoms may recur; symptoms should subside once cilostazol is reinitiated post-op.
BENZODIAZEPINES				
	Lorazepam Diazepam Alprazolam Temazepam Chlordiazepoxi-de	Continue with minimal interruption in the perioperative period IV preparations are available if needed	Resume when patient is hemodynamically stable If patient NPO, parenteral diazepam and lorazepam are available	May cause delirium in elderly patients Abrupt withdrawal can result in agitation, hypertension, delirium, and seizures
CARDIOVASCULAR MEDICATIONS				
Antianginal Medications	Nitrates Ca^{2+} Channel blockers (CCBs) β-blockers	*All* antianginal medications should be *continued* in the perioperative period	Nitrates: Once-daily oral and transdermal nitrate formulations available	*Nitrates***:** Transdermal nitrates may lose effectiveness if skin perfusion decreases during or after surgery

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	Ivabradine (Corlanor)	Ivabradine is used for angina as an off-label indication	CCBs: IV verapamil and diltiazem available ß-blockers: IV form available **Continue IV preparation until patient can resume regular PO medications**	*Calcium channel blockers* should be continued because there have been no major adverse reactions reported in the perioperative period – they appear safe and have theoretic benefit ß-*blockers* should be continued to avoid withdrawal effects; use of β-blockers has been shown to reduce cardiovascular morbidity and mortality postoperatively in some patient populations
Cardiac Glycoside	Digoxin (Lanoxin® Digitek®)	Continue perioperatively to provide stability, especially for arrhythmias Check serum digoxin and potassium levels preoperatively if clinically indicated	Due to long half-life of digoxin, it is permissible to miss one dose If patient is unable to resume oral intake of medications, it is acceptable to give IV digoxin **When switching a patient from intravenous to oral digoxin, allowances must be made for differences in bioavailability (digoxin tablets are ~60-80% bioavailable)	Patient is at risk for digoxin toxicity due mainly to physiologic stress effects, particularly acidosis, electrolyte abnormalities (especially hypokalemia), hypoxia and increased catecholamines If a pressing reason exists *or* if the physiologic status of the patient is significantly altered, a serum digoxin level should be measured preoperatively and/or postoperatively
Antiarrhythmics	Amiodarone Sotalol Procainamide Diltiazem Verapamil Dofetilide	Continue all antiarrhythmic agents	Cardiologist should be consulted if patient is taking an antiarrhythmic that has no alternative preparation, other than oral, and will be NPO for some time Multiple IV preparations available (i.e. amiodarone,	Given the relative risk of therapy vs. that of rhythm disturbances, these drugs are usually prescribed for significant arrhythmias Hypokalemia, hypomagnesemia, and hypocalcemia can all increase risk of dangerous dysrhythmias with certain antiarrhythmic agents

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
			diltiazem, etc.)	
Alpha-/Beta- Agonist	Droxidopa	At physician's discretion, however it is recommended that patients be evaluated for supine hypertension while on the medication. If persistent supine hypertension and surgery requires supine positioning, droxidopa can be held approximately 8-hours prior to surgery.	Resume postoperatively.	US Black Box Warning: Droxidopa may cause or exacerbate supine hypertension. Patients who are being treated for *neurogenic orthostatic hypotension* are sensitive to catecholamines secondary to up-regulation of catecholamine receptors Short-term supine hypertension can be managed with transdermal nitrates if no contraindications exist.
Neprilysin Inhibitor/ARB	Sacubitril and Valsartan (Entresto)	Refer to ARBs section above		
Transthyretin Stabilizer	Tafamidis (Vyndamax) Tafamidis meglumine (Vyndaqel)	Continue until time of surgery	Resume postoperatively when patient is stable and able to swallow the capsule whole	Vyndamax and Vyndaqel have not been thoroughly studied during perioperative and postoperative phases of care but does not appear to have an effect on wound healing.
CORTICOSTEROIDS				
	Prednisone Methyl-prednisolone Hydrocortisone	At physician's discretion, however it is recommended that patients continue their usual dose through the day of surgery. Suggested perioperative stress corticosteroid coverage for suppressed HPA axis patients:	Minor to moderate surgical stress: resume home dose Major surgical stress: decrease prednisone dose by 50% per day to the usual daily dose	*If a patient is taking ≥20 mg/day of prednisone or equivalent steroid for more than three weeks or on steroids for Cushing's Syndrome, perioperative coverage with hydrocortisone is necessary in accordance with magnitude of the stress.* *If a patient is taking doses of 5-20 mg/day or higher of prednisone or equivalent steroid, perioperative coverage with hydrocortisone may be necessary due to variability in HPA axis*

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
		Minor procedures or surgery under local anesthesia (eg, inguinal hernia repair): take usual morning steroid dose Moderate surgical stress (eg, lower extremity revascularization, total joint replacement): Give 50 mg hydrocortisone IV right before surgery followed by 25 mg IV every 8 hours for 24 hours Major surgical stress (eg, esophagogastrectomy, total proctocolectomy, open heart surgery): Take usual morning steroid dose. Give 100 mg hydrocortisone IV before induction of anesthesia followed by 50 mg IV every 8 hours for 24 hours.		*suppression.* *Suggested that the following groups do not need additional glucocorticoid coverage because of they do not have suppression of their HPA axis:* • *On glucocorticoid for less than 3 weeks* • *Morning doses of <5mg/day of prednisone or its equivalent for any length of time* • *Doses of <10mg/day of prednisone or its equivalent every other day* *For patients currently off glucocorticoids but used them in the past year it is suggested to undergo preoperative assessment of their HPA axis beginning with morning serum cortisol, may consider withholding steroids, watching BP, and administering a dose of hydrocortisone if the patient develops hypotension.* Steroid equivalencies: Prednisone 5 mg = Methylprednisolone 4 mg = hydrocortisone 20 mg = dexamethasone 0.75 mg
COSMETIC MEDICATIONS				
Neuromuscular Blocking Agent/Acetylcholine Release Inhibitor	Prabotulinumtoxin A-xvfs (Jeuveau)	This is a one-time IM injection for glabellar lines Do not administer on same day as surgery	Patients may receive injection after recovery from procedure	Effects may spread from the area of injection to produce symptoms consistent with botulinum toxin effects. These symptoms have been reported hours to weeks after injection. Swallowing and breathing difficulties can be life threatening and there have been reports of death.
DIABETIC MEDICATIONS				
Biguanide	Metformin (Glucophage®)	Hold the morning of surgery.	May restart drug after procedure once patient	Calculate eGFR, discontinue immediately or do not resume therapy if eGFR is < 30

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		Temporarily discontinue for 48 hours following the administration of iodine contrast media **only** in patients with acute kidney injury, severe chronic kidney disease (stage IV/V, eGFR < 30) or in those undergoing arterial studies D. Withhold metformin for cardiac cases and cases in which significant blood loss is expected.	resumes a normal diet and it is certain that no acute renal dysfunction has developed (e.g. eGFR > 30); until then utilize insulin. In high risk patients undergoing radiology procedures using contrast, wait 48 hours before resuming. Preferred inpatient treatment is insulin only management.	mL/min/1.73 m^2. Assess the benefit of continuing metformin treatment in patients whose eGFR falls below 45 mL/min/1.73m^2. Metformin does not typically cause hypoglycemia unless combined with a sulfonylurea. Risk factors for developing lactic acidosis: - Renal impairment - CHF - Inadequate renal perfusion/hypovolemia
Sulfonylureas	*Short-acting*: Glyburide Glipizide Glimepiride *Long-acting:* Chlorpropamide (rarely used)	*Short-acting:* Hold the day of surgery *Long-acting:* Stop 72 hours before surgery	Do NOT restart until patient resumes a normal diet; until then utilize insulin Preferred inpatient treatment is insulin only management	Potential for hypoglycemia It is imperative that patient eats regular meals when this medication is resumed A step-up approach can be used for patients on high dose sulfonylureas, starting at low doses and adjusting them until the usual dose is reached
Thiazolidinedione **"Glitazones"**	Rosiglitazone (Avandia®) Pioglitazone (Actos®)	Discontinue on the morning of surgery	Continue once patient can tolerate oral medications Preferred inpatient treatment is insulin only management	Will not cause hypoglycemia when used as monotherapy; improves insulin sensitivity at peripheral sites and in the liver, but does not stimulate insulin release Avoid use if patients develop congestive heart failure or problematic fluid retention, or if there are liver function abnormalities
Glucagon-like Peptide	Exenatide	Discontinue on the morning	Do NOT restart until patient	May cause hypoglycemia when combined with

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
(GLP-1) analogs	(Byetta®, Bydureon®) Liraglutide (Victoza®) Dulaglutide (Trulicity®) Albiglutide (Tanzeum®) Lixisenatide (Adlyxin®)	of surgery	resumes a normal diet; until then utilize insulin Preferred inpatient treatment is insulin only management	a sulfonylurea It is imperative that patient eats regular meals when this medication is resumed May alter gastrointestinal (GI) motility and worsen postoperative state
Dipeptidyl Peptidase-4 Inhibitor	Sitagliptin (Januvia®) Saxagliptin (Onglyza®) Alogliptin (Nesina®) Linagliptin (Tradjenta®)	Discontinue on the morning of surgery	Do NOT restart until patient resumes a normal diet; until then utilize insulin Preferred inpatient treatment is insulin only management	May alter gastrointestinal (GI) motility and worsen postoperative state
α-Glucosidase Inhibitors	Acarbose (Precose®) Miglitol (Glyset®)	Discontinue on the morning of surgery	Do NOT restart until patient resumes a normal diet; until then utilize insulin Preferred inpatient treatment is insulin only management	MUST be taken with meals for efficacy.
Amylin Analog	Symlin (Pramlintide®)	Discontinue on the morning of surgery	Do NOT restart until patient resumes a normal diet; until then utilize insulin Preferred inpatient treatment is insulin only management	
Sodium-Glucose Co-Transporter 2 (SGLT2) Inhibitor	Dapagliflozin (Farxiga®) Canaglifozin	Discontinue at least three days before scheduled surgery	Do NOT restart until patient resumes a normal diet; until then utilize insulin	Monitor renal function postoperatively. If patient's eGFR <45, therapy should be held.

<table>
<tr><th>Drug Class</th><th>Examples</th><th>Preoperative Recommendations</th><th>Postoperative Recommendations</th><th>Considerations & Caveats</th></tr>
<tr><td>“gliflozin”</td><td>(Invokana®) Empagliflozin (Jardiance®)

Ertugliflozin (Steglatro®)</td><td>Discontinue at least four days before scheduled surgery</td><td>Preferred inpatient treatment is insulin only management</td><td>Not recommended during volume depletion.</td></tr>
<tr><td>Insulin</td><td colspan="4">The following recommendations are for basic overview of insulin management perioperatively and do not represent comprehensive blood glucose management guidelines due to the wide variability of diabetic pathology and insulin responsiveness.

Ideally consult anesthesiologist, endocrinologist, pharmacist or internist. May refer to CHI Franciscan Health Perioperative Glycemic Control Guidelines for more specific recommendations
<u>Short procedure (for procedures less than two hours):</u>

<table>
<tr><th>Day</th><th></th><th colspan="2">Glargine
Detemir
Degludec</th><th colspan="2">70/30
70/25</th><th colspan="2">NPH or U-500</th><th colspan="2">Lispro
Aspart
Glulisine
Regular</th><th>Insulin Pump</th></tr>
<tr><td colspan="2"></td><td>AM Dose</td><td>PM Dose</td><td>AM Dose</td><td>PM Dose</td><td>AM Dose</td><td>PM Dose</td><td>AM Dose</td><td>PM Dose</td><td>All Day</td></tr>
<tr><td>Day before surgery</td><td></td><td>Usual Dose</td><td>80%</td><td>Usual Dose</td><td>Usual Dose</td><td>Usual Dose</td><td><u>Dinner:</u> Usual dose
<u>Bedtime:</u> 50%</td><td>Usual Dose</td><td>Usual Dose</td><td>Usual basal rate and boluses for carbs</td></tr>
<tr><td rowspan="2">Day of surgery</td><td>Type 1 DM</td><td colspan="8">Give AM basal insulin dose as follows:
• NPH or U-500 insulin: 50% of usual AM dose at home
• Glargine/detemir/degludec: 75% of usual AM dose at home
• Mixed insulin: 50% of usual AM dose at home
• Short acting: HOLD any meal bolus doses

If correction scale: treat any BG > 180 mg/dl</td><td rowspan="2">Usual basal rate no boluses.

Check blood sugar q4h or sooner if you experience symptoms of hypoglycemia</td></tr>
<tr><td>Type 2 DM</td><td colspan="8">Give AM basal insulin dose as follows:
• If on basal insulin and oral diabetes medications—give 50% dose of basal (NPH, U-500, glargine/detemir/degludec insulin).
• If on basal insulin and meal-time insulin (with or without oral medications)—give 75% of basal insulin and hold prandial insulin.
• Pre-mixed insulin: 30% of usual AM dose at home

If on correction scale, treat any BG > 180 mg/dl</td></tr>
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</td></tr>
</table>

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	• Complex procedure (e.g., open heart, complex bowel surgery) or major surgery lasting greater than two hours: o Hold previous insulin regimens. Continuous insulin infusion is recommended. • Other: o For Type 1 diabetics an insulin infusion should be strongly considered. o It is recommended to start dextrose containing IV fluids while patients are NPO o For DM patients on nutritional or meal-bolus insulin, hold this insulin until after surgery; may resume when eating well. o After surgery evaluate resuming basal insulin. If NPO, it is recommended to resume only 50% of total daily dose of insulin as basal. If on an insulin mix (e.g. 70/30), patients need to be eating well to resume. If not, convert them to a different basal insulin in the interim. o As diet resumes, consider nutritional insulin when appropriate			
DIURETICS				
Potassium-sparing diuretics	Triamterene Amiloride Spironolactone	May continue without interruptions if clinically appropriate	Oral diuretics should be restarted if needed for control of hypertension, volume overload or when a normal diet is resumed. IV diuretics are good option until oral intake is adequate	The conversion from oral diuretics to IV diuretics is not equal *(example: furosemide 80 mg PO daily = furosemide 40 mg IV daily)* Consider refraining from taking diuretics the morning due to concern of hypovolemia or hypokalemia. Quick diuresis can be obtained via IV route if the need is discovered during surgery. Hypokalemia, caused by select diuretics, can theoretically increase the risk of perioperative arrhythmia, potentiate the effects of muscle relaxants, or provoke paralytic ileus.
Thiazide diuretics	HCTZ Metolazone	May continue without interruptions if clinically appropriate		
Loop diuretics	Furosemide (Lasix®) Torsemide (Demadex®) Bumetanide (Bumex®)	Continue without interruption if patient is on potassium supplement		

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	Ethychrinic Acid (Edecrin®)			
ELECTROLYTE				
	Potassium supplements	Consider checking potassium level Continue on the day of surgery	Restart when patient on oral liquids May use IV riders to correct electrolyte disturbances if patient is unable to tolerate PO intake	Hypokalemia can theoretically increase the risk of perioperative arrhythmia, potentiate the effects of muscle relaxants, or provoke paralytic ileus. Discontinue on the day of surgery if potassium-wasting diuretics are held (i.e. furosemide, HCTZ, torsemide, budesonide, chlorthalidone, indapamide, ethychrinic acid)
HEMATOLOGIC AGENTS				
Aminolevulinate Synthase 1-Directed Small Interfering Ribonucleic Acid (siRNA)	Givosiran (Givlaari®)	Discuss with prescribing provider	Discuss with prescribing provider	Given monthly as a subcutaneous injection by healthcare provider. Not recommended to miss monthly doses. Elevated ALT levels (3-5x ULN) observed within the first 3-5 months of initiating therapy. Monitor for hepatic toxicity. Monitor for signs and symptoms of anaphylaxis.
Hemoglobin S polymerization inhibitor	Voxelotor (Oxbryta)	Continue until time of surgery	Resume postoperatively	Patients with sickle cell disease should be assessed for serum hemoglobin levels prior to surgery. Half-life of this drug is 35.5 hours so minor interruptions in therapy will not impact treatment. Voxelotor may interfere with high-performance

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
				liquid chromatography measurement of Hb subtypes (HbS, HbF, HbA).
Monoclonal antibody; Anti-P-selectin	Crizanlizumab (Adakveo)	Can continue up to the month of surgery	Resume postoperatively on regularly scheduled administration day	This drug is administered IV over 30 min once a month so surgeries should ideally be planned around planned admin days. Crizanlizumab may interfere with platelet counts (falsely decrease) particularly when collected in tubes with ethylenediaminetetraacetic acid. Collect blood samples in citrate-containing tubes and run samples within 4 hours of collection. Half-life of drug is 7.6 days.
HEMATOPOIETIC AGENTS				
Activin Receptor Ligand Trap	Luspatercept (Reblozyl)	Consult with hematology specialists.	Resume postoperatively	Non-formulary. Thromboembolism risk – use with caution in patients with known thrombotic risk. Monitor closely.
Anti-Von Willebrand Factor; Monoclonal Antibody	Caplacizumab (Cablivi®)	Hold for 7 days prior to invasive procedure, dental procedures and elective surgeries.	Resume postoperatively after risk of surgical bleeding has resolved.	Caplacizumab increases the risk of bleeding; bleeding events occur commonly. Severe bleeding events(epistaxis, gingival bleeding, UGIB, metrorrhagia) were reported in clinical trials. Monitor closely for signs and symptoms of bleeding if caplacizumab is restarted.
Colony Stimulating Factors	Lusutrombopag (Mulpleta®)	Begin medication 8 – 14 days prior to scheduled procedure. **3 mg daily for 7 days**	Not indicated postoperatively	Do not use to normalize platelet counts in patients with chronic liver disease. Obtain platelet count prior to therapy administration and no more than 2 days before procedure Thromboembolism risk – use with caution in patients with known thrombotic risk and patients with chronic liver disease. Monitor closely.
Oral Iron Replacement	Ferric maltol (Accrufer)	Continue during perioperative period	Continue during postoperative period	If patient is NPO, can consider IV iron formulations, if necessary for iron deficiency

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
				anemia and concerns for surgery recovery: • Ferric carboymaltose • Ferric gluconate • Iron sucrose
Tyrosine Kinase Inhibitor	Fostamatinib (Tavalisse®)	Continue during perioperative period	Continue during perioperative period	Fostamatinib is utilized for chronic immune thrombocytopenia. Monitor CBC and ensure patient's platelet levels are adequate to proceed with surgery.
Thrombopoietin receptor agonist	Doptelet®	Begin therapy 10 to 13 days prior to the scheduled procedure. Patients should undergo procedure 5 to 8 days after the last dose.		Platelet count should be obtained prior to therapy initiation and on the day of the procedure.
HERBAL SUPPLEMENTS				
Echinacea		No data on discontinuation		Echinacea is associated with allergic reactions and immune stimulation. There is potential to decrease metabolism of certain perioperative medications such as cyclosporine, midazolam, lidocaine, and CCB
Ephedra (ma huang)		Discontinue at least 24 hours before surgery		Ephedra may increase the risk of heart attack and stroke
Garlic		Discontinue at least 7 days before surgery	Herbal supplements are not part of hospital formulary. Patients must bring their own supply if continuation after surgery is indicated.	Garlic irreversibly inhibits platelets aggregation in a dose-dependent manner, which may increase risk of bleeding Garlic may lower blood pressure
Ginkgo		Discontinue at least 36 hours before surgery		**Ginkgo may cause inhibition of platelet-activating factor, which increase risk of bleeding after surgery**

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
Ginseng	American Ginseng Asian Ginseng	Discontinue at least 7 days before surgery		**Ginseng may cause hypoglycemia** Ginseng may irreversibly inhibit platelet aggregation Ginseng may cause tachycardia and hypertension
Kava		Discontinue at least 24 hours before surgery		Kava may increase sedative effect of anesthetics by potentiating GABA inhibitory neurotransmission
St. John's Wort		Discontinue at least 5 days before surgery		St. John's Wort is known to cause an increase in metabolism of certain perioperative medications such as cyclosporine, midazolam, lidocaine, and CCB
Valerian		Ideally tapered weeks before surgery; if not withdrawal is treated with benzodiazepines		Valerian may increase the sedative effect of anesthetics and can be associated with benzodiazepine like withdrawal
All other unlisted herbals and Vitamin E supplements	Black Cohosh Chamomile CoQ10 Feverfew Ginger Goldenseal Saw Palmetto	Discontinue at least 14 days prior to surgery		Various coagulation disorders, sedation, hemodynamic changes, electrolyte disturbances, and other unknown complications
HEPATITIS C MEDICATIONS				
NS3/4A Protease Inhibitors (PIs)	Sofosbuvir (Sovaldi®) Simeprevir (Olysio®)	Discuss with prescribing provider.	Discuss with prescribing provider.	Elective surgeries should not be performed on patients with active HCV medications indicating active HCV Fatal drug interactions with steroids and other

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	Ledipasvir/Sofosbuvir (Harvoni®) Ombitasvir/Paritaprevir/Ritonavir/ Dasabuvir (Viekira Pak®) Glecaprevir/pibrentasivir (Mavyret™) Sofosbuvir/velpatasvir/voxilaprevir (Vosevi®)			CYP3A4 metabolized drugs, consult pharmacist if concomitant use
Pegylated Interferon Alfa	Pegasys®	Discuss with prescribing provider.	Discuss with prescribing provider.	Elective surgeries should not be performed on patients with active HCV medications indicating active HCV
Nucleoside Analogs	Ribavirin	Discuss with prescribing provider.	Discuss with prescribing provider.	Elective surgeries should not be performed on patients with active HCV medications indicating active HCV
HIV MEDICATIONS				
Antiretrovirals	Abacavir Bictegravir Emtricitabine Diadnosine Dolutegravir Doravirine Lamivudine	Continue through perioperative period when feasible. Otherwise stop all ART together	Resume all drugs together, in full doses, when the patient's GI tract is functioning properly	Prevention of drug-resistance is paramount and irregular dosing should be avoided Prolonged midazolam effect have been observed with some antiretroviral medications Protease inhibitors (E.g., Atazanavir, Darunavir,

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	Stavudine Tenofovir Zidovudine			Indinavir, Ritonavir) will decrease metabolism of midazolam, leading to prolonged sedation and respiratory depression
HORMONES				
Oral Contraceptives (OCs)	Estrogen Progestin	**Final decision should be based upon the clinical judgment of the anesthesiologist, consult surgeon, or prescribing physician.** <u>Low to moderate risk of VTE:</u> May continue up to and including the day of surgery for procedures with low to moderate risk of venous thromboembolism. <u>High risk of VTE:</u> Discontinue 4 to 6 weeks before surgery for procedures with high risk of venous thromboembolism. Instruct on alternate forms of contraception and obtain serum pregnancy test immediately before surgery if OC is held. Consider DVT prophylaxis for major/high-risk surgery If the plan is to continue OC therapy during hospital	If decision is *not* to discontinue OCs, then continue perioperatively without interruption; however, patient must bring own OCs (hospital will not supply OCs) If OCs were discontinued preoperatively, resume when the period of elevated risk or postoperative immobility has passed	The risk of thrombosis increases within four months of initiation and decreases to previous levels within three months of stopping treatment, therefore it may be wise to stop OCs at least 4-6 weeks before surgery – especially for high-risk surgeries (such as major orthopedic surgeries). **Instruct on alternate forms of contraception and obtain serum pregnancy test immediately before surgery if OC is held.** The medical risks of unanticipated pregnancy may outweigh the increased protection of VTE. Estrogen is the major hormonal risk for the increased risk of VTE, but progestin may also play a role. Oral contraceptives with greater estrogen content (≥35 mcg) have a higher risk of thromboembolism compared with those with lower estrogen content (≤30 mcg).

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
		stay, then patient must bring her own, since hospital will not provide OCs		
Hormone Replacement Therapy (HRT)	Alora® Angeliq® Climara® Climara Pro® Combipatch® Delestrogen® Duavee® Estraderm® Estrasorb® Femring® Osphena® Prefest® Prempro® Premarin® Vivelle®	**Final decision should be based upon the clinical judgment of the anesthesiologist, consult surgeon, or prescribing physician.** Continue up to and including the day of surgery for procedures with low to moderate risk of venous thromboembolism. When possible, discontinue 4 to 6 weeks before surgery for procedures with high risk for thromboembolism. Consider DVT prophylaxis for major/high-risk surgery	Resume when tolerating oral medications and the period of elevated risk or postoperative immobility has passed.	Major concern related to the perioperative period is for increasing the risk of venous thromboembolism (VTE). It is most prudent to discontinue HRT since the risks of stopping therapy are very small, however, comfort issues can exist if HRT is discontinued preoperatively. May consider discontinuing therapy *at least* 4 weeks or more before any major surgery if patient is at high-risk for VTE. The Heart and Estrogen/progestin Replacement Study (HERS) convincingly demonstrated that hormone replacement therapy increases risk of VTE. Risks increase with lower-extremity fractures, inpatient surgery and non-surgical hospitalizations (increased risk for up to 90 days).
Alpha-Melanocyte Stimulating Hormone Analog	Afamelanotide (Scenesse)	Do not administer on the same day of surgery	Patients may receive injection after recovery from procedure	Adamelanotide is administered as an implant every 2 months. Apparent half-life is 15 hours and may undergo hydrolysis, however its metabolic profile has not been fully characterized.
HYPNOTICS & SLEEP AIDS				
Benzodiazepines (Short	Temazepam	If taken more than 8 hours	Resume when patient is	Abrupt withdrawal of chronic benzodiazepines

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
Acting)	Triazolam	prior to anesthesia or used chronically, patient may have a dose the night before surgery If elderly (greater than 65 years old) consult physician or anesthesiologist IV alternatives for benzodiazepines may be available if patient is NPO	hemodynamically stable postoperatively	may lead to negative consequences, must evaluate risk vs. benefit in individual patients. Since hypnotics are sometimes dosed prior to surgery, anesthesiologist should be informed if patient has taken hypnotic the night before
Benzodiazepines (Long Acting)	Estazolam Flurazepam Quazepam			
Non-Benzodiazepine Hypnotics	Eszopiclone Zolpidem Zopiclone Zaleplon			
Melatonin and Melatonin Receptor Agonists	Melatonin Bremelanotide (Vyleesi ®) Ramelteon (Rozarem®) Tasimelteon (Hetlioz®)			
Orexin Receptor Antagonist	Suvorexant (Belsomra®)	Not enough data to support use prior to surgery. Recommend holding bedtime dose the night prior to operation		Medication has a half-life of up to 12 hours and residual levels of drug can remain in the blood well after waking
MULTIPLE SCLEROSIS MEDICATIONS				
Disease Modifying Agents	Aubagio® Avonex® Betaseron® Copaxone® Extavia® Fingolimod (Gilenya®) Glatopa® Interferon (Rebif®) Lemtrada® Mitoxantrone® (Novantrone®)	Consult prescribing doctor to devise a perioperative plan.	Consult prescribing doctor to devise a postoperative plan.	Cardio toxicity and liver toxicity are possible side effects with Gilenya®, and Novantrone® (mitoxantrone). Novantrone® (mitoxantrone), Rebif®, Tysabri®, and Zinbryta® monitor closely surrounding surgery. Lemtrada® can cause severe, life-threatening autoimmune conditions, such as immune thrombocytopenia and anti-glomerular basement membrane disease. Monitor CBC with differential and SCr closely

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	Ocrevus® Plegridy® Siponimod (Mayzent®) Tecfidera® Tysabri® Zinbryta®			Respiratory function decreases have been reported with Gilenya®, and Mayzent®. ***All drugs decrease immune function and increase risk for infections*** ***Agents are typically recommended to be stopped 1 – 2 weeks before a procedure and resumed 1 – 2 weeks after surgery to lower the risk of surgical site infections; consult with orthopedics and rheumatology regarding specific medications***
MUSCULAR DYSTROPHY				
Antisense Oligonucleotide	Golodirsen (Vyondys 53)	Is administered as an injection once weekly. Recommend to not administer on the same day of surgery due to risk of injection site reactions and ability to heal.	No specific contraindications related to resuming postoperatively. Recommend to avoid injection in surgical site.	Golodrisen has an accelerated approval in December 2019 for Duchenne muscular dystrophy. There have not been adequate studies to assess its use preoperatively and postoperatively.
MYASTHENIA GRAVIS (MG) MEDICATIONS				
Acetylcholinesterase Inhibitors	Pyridostigmine (Mestnion®) Neostigmine (Prostigmin®)	Continue the morning of surgery to prevent muscle weakness that could impair weaning from mechanical ventilation and surgical recovery	Intravenous preparations of these drugs at 1/30 the oral dose are given every 4 to 6 hours when surgery begins and are continued until the patient resumes oral intake	Note: response to neuromuscular blocking agents (NMBAs) may be variable in such patients
Glucocorticoids	Prednisone Dexamethasone Prednisolone	Continue regimen if: any dose <3 weeks, morning prednisone <5 mg (or equivalent) for any duration, or <10 mg		Patients whose treatment for MG includes glucocorticoids may be at risk for hypothalamic pituitary axis suppression (HPA) and adrenal insufficiency in the perioperative period, and may require administration of stress-dose

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
		prednisone (or equivalent) every other day are not at risk for HPA suppression Stress-dose glucocorticoids should be administered prior to induction for patients who have been taking prednisone 20 mg or greater (or equivalent) for >3 weeks		glucocorticoids, depending on the surgical procedure
Immunotherapy	Azathioprine Cyclophosphamide Cyclosporine Methotrexate Mycophenolate Rituximab Tacrolimus	No published data Consult patient's neurologist IV cyclosporine and azathioprine are available Perioperative therapy interruptions are not likely to have significant symptomatic effect for this indication	Consult patient's neurologist	
OSTEOPOROSIS AGENTS				
Selective Estrogen Receptor Modulators	Tamoxifen Raloxifene (Evista®)	Stop at least 4 weeks before surgery, UNLESS these drugs are being used to treat breast cancer, if so – contact oncologist May be continued for low-	Resume when period of postoperative immobilization has passed (non-oncologic surgeries)	Have either estrogen receptor agonist or antagonist effects, depending on the tissue in which they are acting Both increase the risk of VTE quantitatively similar to estrogen

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
		risk surgeries.		
Bisphosphonates	Alendronate (Fosamax®) Ibandronate (Boniva®) Risedronate (Actonel®)	Discontinue at least 7 days before surgery Discontinue agents for 3 months before elective dental surgery, if bisphosphonate treatment exceeds 3 years or if glucocorticoids are used	Best to withhold this medication postoperatively	Given the difficulty for hospitalized patients to comply with the requirement to remain upright for 30 min and take with a full glass of water, it is more practical to withhold this medication
Calcitonin	Miacalcin® (nasal spray)	May be continued before surgery	No specific contraindications or interactions to using this drug in the perioperative period	
Monoclonal Antibody	Romosozumab (Evenity®)	Osteoporosis agents are generally recommended to be discontinued preoperatively due to the increased risk for adverse outcomes perioperatively.		Administered subcutaneously once monthly for 12 months; anabolic effects wane after 12 months of use.
PHARMACOLOGIC CHAPERONE				
Fabry's Disease	Migalastat (Galafold)	Discuss with prescribing provider	Discuss with prescribing provider	
PSORIASIS MEDICATIONS				
DMARDs, PDE-4 Inhibitors	Otezla® (apremilast)	May be continued before surgery	May restart when patient is tolerating oral medications	
Topical Corticosteroid	Calcipotrien and betamethasone dipropionate (Enstilar®)	May be continued before surgery	No specific contraindications or interactions to using this drug in the perioperative period. Avoid surgery site.	

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
IgG monoclonal antibody	Brodalumab (Siliq®) Guselkumab (Tremfaya®) Risankizumab (Skyrizi®) Secukinumab (Cosentyx®) Tildrakizumab (Ilumya®) Ustekinumab (Stelara®)	Biologic agents are commonly recommended to be STOPPED prior to surgery and recommended that surgery is scheduled at the end of the dosing cycle.	Discuss with prescribing provider.	Most are given weekly to monthly and can likely be held and given post-operatively when the patient is stable. Risankizumab may increase risk of infections (22% of patients' experienced the adverse reaction of infection in clinical trials). RESUME medications ≥ 14 days after surgery as long as the patient is not experiencing wound healing problems, surgical site infection(s), or systemic infection.
Please see Rheumatoid Arthritis section for other medications used for psoriasis				
PSYCHIATRIC MEDICATIONS				
GABA A Receptor Positive Modulator	Brexanolone (Zulresso®)	No compelling reason to avoid brexanolone within a certain timeframe of surgery. Postpone surgery until continuous infusion is complete. Can interrupt infusion if needed and resume later. Lack of data on how long "interruption" can be.	May give brexanolone after surgery.	Brexanolone is given as a continuous IV infusion over 60 hours for postpartum depression. REMS program associated with use. Major side effects: Excessive sedation and hypoxia. Monitor patients closely.
Anorexiants	Bupropion/naltrexone (Contrave)	Hold Contrave for at least 24 hours prior to surgery (due to naltrexone's 5 hour half-life) but ideally for up to 48 hours prior to surgery to allow for complete cessation of opioid antagonism	Resume Contrave 7 days after cessation of opioid therapy	Continue the bupropion component of Contrave during the perioperative period. Naltrexone component is an opioid antagonist and there are case reports of patients on Contrave having inadequate pain control post-operatively. If Contrave is not held >24 hours prior to surgery, monitor patients response to

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
				opioids and be prepared to decrease opioid doses once naltrexone is eliminated from body/opioid antagonism is overcome.
Tricyclic Antidepressants (TCAs)	Amitriptyline Nortriptyline Imipramine Desipramine	May be continued preoperatively with caution Continue therapy up to and including day of surgery for patients on high doses. Patients on low doses and in whom perioperative arrhythmia is a concern should discontinue for 7 days prior to surgery.	May restart when patient is tolerating oral medications	**If hypotension is encountered, and a vasopressor is needed, the response to therapy may be difficult to predict** Most authors recommend cautious continuation of these agents through the perioperative period, since serious perioperative problems attributed to TCAs are rare. Increased risk of serotonin syndrome in patients who receive methylene blue intraoperatively. Combination should be avoided unless benefit outweighs risk. Continuation may increase the potential for arrhythmias. Abrupt withdrawal can lead to insomnia, nausea, headache, increased salivation, and increased sweating.
SSRIs (including agents with partial SSRI activity), SNRIs	Fluoxetine (Prozac®) Paroxetine (Paxil®) Brintellix®	No compelling indications to withhold SSRIs perioperatively Discontinue therapy 3 weeks prior to surgery in patients undergoing high bleed risk procedures (such as certain CNS procedures)	Restart once patient can take PO meds – mainly agents that may result in a withdrawal syndrome after discontinuation (i.e., Paxil®) Recommend alternative therapy if patient requires antiplatelet agents as secondary prevention	There have been reports of "serotonin syndrome" after concurrent use with tramadol (Ultram®); may also increase INR if patients are on warfarin Increased risk of serotonin syndrome in patients who receive methylene blue intraoperatively. Combination should be avoided unless benefit outweighs risk.
Monoamine Oxidase Inhibitor (MAOIs)	Selegiline (Eldepryl®) Pargyline	Consult anesthesiologist FLAG CHARTS to alert that patient is on an MAOI and place stickers on chart *cautioning against the use of*		MAO inhibition becomes non-selective in doses greater than 10 mg/day AVOID meperidine and indirect

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	Phenelzine	*meperidine and indirect sympathomimetics (i.e. ephedrine)* Make every effort to continue perioperatively since patients on MAOIs tend to have severe depression refractory to other agents In patients with severe, life-threatening depression, in whom the risk of suicide with discontinuation of MAOIs is significant, consideration should be given to continuing MAOI therapy perioperatively combined with an appropriate anesthetic technique		sympathomimetics (i.e. ephedrine) may cause neuroleptic malignant syndrome and severe hypertensive crisis**.** (Doak GH) Patients should not be forced to discontinue these agents If discontinuation is warranted, taper off slowly over 2 weeks; but still follow recommended precautions above since discontinuation does not guarantee complete elimination Increased risk of serotonin syndrome in patients who receive methylene blue intraoperatively. Combination should be avoided unless benefit outweighs risk.
Antipsychotics	Olanzapine (Zyprexa®) Ziprasidone (Geodon®) Risperidone (Risperdal®)	May continue perioperatively if QTc remains stable. May need to consider holding dose or utilizing agents with shorter half-life if medications that can prolong QTc are used during or after surgery.	Make sure to restart medication once patient is able to take oral medications Parenteral formulations are available for haloperidol, chlorpromazine, aripiprazole, olanzapine, and ziprasidone if therapy is needed but patient is NPO.	Alpha-adrenergic blockade with risperidone can be significant There have been reports of IV use of antipsychotics increasing risk of sedation, hypotension, or QTc prolongation. Atypical antipsychotics may increase risk of tachycardia Avoid ketamine use as this may decrease the seizure threshold
Mood Stabilizer	Lithium (Lithobid®) Valproate (Depakote®**)**	May be continued preoperatively. If patient undergoing major surgery, consider discontinuation 2-3 days before If medically indicated. If serum levels are not in toxic range, renal	Serum drug levels should be monitored before and after surgery and any time that renal clearance may be affected	Lithium may potentiate the effect of depolarizing and competitive neuromuscular blocking agents Assess risk vs benefit of holding medication in patients with a history of psychosis. If patient stable, may disrupt mental state

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
		function is normal and fluid/electrolyte levels are stable, lithium may be continued before minor surgery.		Lithium may require increased monitoring of fluid, electrolyte, and thyroid levels
Other Commonly Used Antidepressants	Bupropion (Wellbutrin®) Venlafaxine (Effexor®)	No compelling indications to withhold preoperatively	Restart once patient can take oral medications	These agents do not have any known interactions with anesthetic agents Venlafaxine is associated with withdrawal syndromes and should be restarted once patient is able to tolerate
Stimulants	Phentermine (Adipex-P®)	Hold medication 7 days prior to surgery	Restart when patient can take oral medications and is clinically stable	Phentermine may be associated with hypotension perioperatively due to catecholamine depletion. Hypertension was observed in patients using phentermine during the induction phase intraoperatively. Monitor blood pressure and body temperature for any autonomic impairment
PULMONARY MEDICATIONS				
PDE Inhibitor - Nonselective	Theophylline TheoDur®	Discontinue evening before surgery. Use nebulized or inhaled beta agonists or anticholinergics	Resume with PO intake.	There is no data indicating whether continuation of theophylline in the perioperative period decreases pulmonary complications. Theophylline has the potential to cause arrhythmias and neurotoxicity at a level beyond the therapeutic range and theophylline metabolism is affected by many common perioperative medications. No known adverse effects but very narrow range between therapeutic and toxic level.
Inhaled Medications	Albuterol	Continue until surgery	Continue through	PLEASE have patient bring their inhalers

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	Duoneb® QVAR® Pulmicort® Symbicort® Breo Ellipta® Anoro Ellipta® Incruse Ellipta® Arnuity Ellipta® Flovent® Xopenex® Asmanex® Dulera® Serevent® Advair® Spiriva® Alvesco® Striverdi Respimat® Stiolto Respimat® Utibron Neohaler® Trelegy Ellipta® Yupelri®	PLEASE have patient bring their inhalers (MDIs) to the holding area.	perioperative period May substitute nebulized treatments (i.e. albuterol and ipratropium) until patient can resume inhalers	(MDIs) to the holding area **Some patients may require an increase in their steroid dose for 1-2 weeks preoperatively
Cystic Fibrosis Transmembrane Conductance Regulator Corrector	Symdeko® Trikafta®	Continue until time of surgery Consult with infectious disease specialists	Resume postoperatively	If a dose is missed ≤6 hours of the usual time it is taken, take the dose as soon as possible; if >6 hours has passed since the missed dose, skip the missed dose and resume the normal dosing schedule.
Oral Medications	Accolate® Singulair® Zyflo® Esbriet®	Consider continuing through the morning of surgery	May be started after surgery following the patient's normal schedule for taking these drugs	Little is known about the implications of stopping treatment and there are no known drug interactions between these agents and anesthetics

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	Ofev® Daliresp®			
PULMONARY HYPERTENSION & ERECTILE DYSFUNCTION MEDICATIONS				
PDE-5 Inhibitors	Sildenafil (Viagra®) (Revatio®) Tadalafil (Cialis®, Adcirca®) Vardenafil (Levitra®, Staxyn®)	Erectile dysfunction: discontinue at least 7 days before surgery Pulmonary Hypertension: should be continued during perioperative period		PDE-5 Inhibitors increase concentration and half-life of cGMP, which leads to relaxation of pulmonary arterial smooth muscle, and subsequently decrease pulmonary pressure PDE-5 Inhibitors are vasodilators, when combined with other vasodilators can result in life-threatening hypotension Patients with PAH are at high risk of complications and death when undergoing anesthesia, mechanical ventilation, and major surgery. There is not a clear standard but in general PAH medications should be continued without interruption.
Endothelin Receptor Antagonist	Bosentan (Tracleer®) Ambrisentan (Letairis®) Macitentan (Opsumit®)	Should be continued during perioperative period	Should be continued during the postoperative period	Patients with PAH are at high risk of complications and death when undergoing anesthesia, mechanical ventilation, and major surgery. There is not a clear standard but in general PAH medications should be continued without interruption.
Soluble Guanylate Cyclase Stimulator	Riociguat (Adempas®)	Discuss alternative treatment options to manage pulmonary hypertension preoperatively.	Discuss with prescribing provider	Phase 4 trials showed increase rates of non-surgical bleeds with possibility of fatal outcome. Risk versus benefit and alternative therapy preoperatively should be considered.
Prostacyclin receptor	Selexipag	Continue during	Continue during the	New drug with limited data. Current adverse

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
agonist (selective)	(Uptravi®)	perioperative period	postoperative period	events did not show increased bleeding or hypotension with use. Does not appear to have drug interactions with typical anesthetic agents.
REVERSAL/ANTIDOTES				
Potassium Antidote	Lokelma® Patiromer (Veltassa®) Sodium Polystyrene Sulfonate (Kayexalate®)	May continue through day before surgery if clinically appropriate	Resume on outpatient basis as clinically appropriate	Oral medications should not be administered 2 hours before or after Lokelma Oral medications should not be administered 6 hours before or 6 hours after Veltassa® Avoid use in patients with abnormal post-operative bowel motility disorders.
Alpha$_2$-Adrenergic Agonist	Lucemyra	Discuss with prescribing provider	Discuss with prescribing provider.	*Discontinuation of therapy:* Decrease dose gradually over 2 to 4 days. Abrupt discontinuation may cause marked rise in blood pressure, anxiety, chills, and diarrhea. Patients who have been treated with lofexide may respond to lower opiod doses than previously used.
Monoclonal antibody	Takhzyro®	Discuss with prescribing provider.	Discuss with prescribing provider.	It is critical to develop definitive perioperative plans for angioedema prophylaxis, intraoperative management, and rescue if indicated for patients with hereditary angioedema (HAE) or acquired angioedema (AAE). Takhzyro is dosed every 2 weeks to every 4 weeks. Other agents can be dosed as frequent as every other day or twice weekly and have short-

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
				term/pre-procedural prophylaxis dosing.
RHEUMATOID ARTHRITIS MEDICATIONS				
Antimetabolite	Methotrexate (MTX)	Recommended to continue perioperatively in patients with normal renal function and held for 2 weeks preoperatively in patients with renal impairment, infection, or bone marrow suppression **Contact patient's rheumatologist	Physician's discretion whether to continue or not– check serum creatinine Some physicians hold MTX for 2 weeks postoperatively to ensure appropriate wound healing Some physicians restart MTX ASAP after surgery to avoid a rebound flare in arthritis	Concerns exist regarding the effect of MTX on wound healing. Recent data suggests that MTX did not cause significant problems with wound healing
Antirheumatic (dihydroorotate dehydrogenase inhibitor)	Leflunomide (Arava®)	Some physicians recommend stopping 2-3 weeks before surgery given the long half-life, however lack of known risk increase suggests it is reasonable to continue the drug up until surgery Contact patient's rheumatologist	Some physicians recommend holding leflunomide for 2 weeks after surgery	Use caution in patients with renal failure or sepsis Studies have shown leflunomide to be associated with an increased risk of post-operative wound complications
Disease Modifying Agents	Upadacitinib Rinvoq®	Consult prescribing doctor to devise a perioperative plan	Consult prescribing doctor to devise a postoperative plan	The half-life of this medication is 8-14 hours. Upadacitinib can decrease immune function thereby increase risk for infections and increase risk of thromboembolism.
TNF-alpha inhibitors	Etanercept (Enbrel®) Infliximab (Remicade®)	Recommend holding at least 1 week before surgery Contact patient's	Recommend holding 1 week after surgery Consider resuming once the	

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
	Adalimumab (Humira®)	rheumatologist	wound is fully healed. Contact patient's rheumatologist	
Antirheumatic	Sulfasalazine, azathioprine	Some physicians recommend continuing during the perioperative period and holding it the day of surgery. Contact patient's rheumatologist	Resume after surgery	
	Hydroxy-chloroquine	Continue without interruption	May continue when able to tolerate oral medications	
	colchicine, gold, cyclo-phosphamide	Discontinue the night before surgery		
STIMULANTS or ANTI-NARCOLEPTICS				
Central Nervous System Stimulant	Pitolisant (Wakix®)	It has been reported that central nervous system stimulants can be used safely during the preoperative period.		Pitolisant is primarily used to increase wakefulness in patients with narcolepsy. Relevant adverse effects include prolonged QT interval and tachycardia.
Dopamine and Norepinephrine Reuptake Inhibitor	Solriamfetol (Sunosi)	No compelling reason not to take up to the day of surgery.	No compelling reason not to resume the day after surgery if desired. Risk/benefit discussion should be had with patient; patient may be able to withhold drug while inpt and can resume once recovered from surgery.	May cause dose-dependent increases in BP and heart rate.

Drug Class	Examples	Preoperative Recommendations	Postoperative Recommendations	Considerations & Caveats
THYROID MEDICATIONS				
Thyroid Products	Levothyroxine Synthroid® Levothroid® Levoxyl® Liothyronine (Cytomel®)	Continue medications during the perioperative period	Resume patient's usual schedule If NPO status is prolonged greater than 5 days, intravenous L-thyroxine may be administered	Levothyroxine has a long half-life (6-7 days), missing several doses is unlikely to adversely affect patient's thyroid status For patients with predicted NPO post-operatively may give a full week of PO levothyroxine as one dose the day prior to surgery.
Antithyroid Medications	Propylthiouracil Methimazole (Tapazole®)	Continue medications during the perioperative period	Resume patient's usual schedule May be given via the nasogastric tube, if necessary, during the perioperative period	Maintaining control of hyperthyroidism is necessary for safe surgery and recovery Methimazole has a longer duration of action and may be given once a day, making it preferable for patients undergoing long surgery ß-blockers may be used to control the effects of hyperthyroidism **In patients who exhibit thyroid storm, propranolol should only be administered with caution due to possibility of cardiovascular collapse**
Insulin-like growth factor-1 receptor inhibitor	Teprotumumab-trbw (Tepezza®)	Contact prescribing physician	Contact prescribing physician	This medication is dosed every 3 weeks and has a long half-life of 20 days Infusion related reactions including hypertension, tachycardia, dyspnea, feeling hot, headache, and muscular pain have been reported with this medication.
Parathyroid	Natpara®	Continue medications during perioperative period	Continue during postoperative period	The manufacturer of Natpara recommends avoiding abrupt interruption or discontinuation

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