AdvocateAuroraHealth		
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Scope: ☒ **AAH System** ☐ **ACH** ☐ **AAH IL Only** ☐ **AAH WI Only** ☐ **Site Only (Location Name):** ☐ **Department Only (Department Name):**		

I. PURPOSE

To provide guidance and recommendations regarding if and how to stop and/or restart common classes of medications prior to surgery. This is intended to be used as a reference and doesn't apply to all scenarios; it is not meant to replace sound clinical judgment. This is not a comprehensive list of medications; refer to drug information resources or current literature / guidelines as needed. These recommendations do not supersede patient specific medication orders. If there is a question or concern, the prescriber should be contacted.

The decision of whether to give or hold medications should always take procedure and patient-specific considerations into account. The decision depends on the type of surgery (organs involved, major vs minor), the duration, whether there will be epidural or spinal catheters placed, the urgency (elective vs emergent), and the current state of the patient's medical conditions (blood pressure/blood glucose control, renal and hepatic function, thrombotic risk, etc.).

II. SCOPE

This guideline applies to all adult and pediatric patients at any entity or facility owned and controlled by Advocate Aurora Health, Inc.

III. DEFINITIONS/ABBREVIATIONS

ACE Inhibitors = Angiotensin Converting Enzyme (ACE) Inhibitors
AKI = Acute Kidney Injury
ARBs = Angiotensin Receptor Blockers
C = cervical
DKA = Diabetic Ketoacidosis
ESI = Epidural Steroid Injections
HCTZ = Hydrochlorothiazide
L = lumbar
LVEF = Left Ventricular Ejection Fraction
MBNB = Medial Branch Nerve Blocks
PCI = Percutaneous Coronary Intervention
RFA = Radiofrequency Ablation
S = sacral
T= thoracic

IV. POLICY

Not applicable

V. PROCEDURE

A. Cardiovascular agents

Table 1. Cardiovascular Agents: ACE Inhibitors, ARBs, Diuretics, Statins, Others

Medication Class	Medication Names: Generic (Brand)	Instructions	Reason
Alpha-2 Agonists	Clonidine (Catapres) Guanfacine (Intuniv, Tenex) Methyldopa	OK to continue	Withdrawal/rebound effects if held
Angiotensin Converting Enzyme (ACE) Inhibitors and combination products	Benazepril + Amlodipine (Lotrel) Benazepril (Lotensin) Benazepril + HCTZ (Lotensin HCT) Captopril (Capoten), Captopril + HCTZ (Capozide) Enalapril (Vasotec), Enalapril + HCTZ (Vaseretic) Fosinopril (Monopril) Fosinopril + HCTZ (Monopril HCT) Lisinopril (Prinivil, Zestril) Lisinopril + HCTZ (Prinzide or Zestoretic) Moexipril (Univasc), Moexipril + HCTZ (Uniretic) Perindopril (Aceon), Perindopril + Amlodipine (Prestalia) Quinapril (Accupril), Quinapril + HCTZ (Accuretic) Ramipril (Altace) Trandolapril (Mavik) Trandolapril + Verapamil (Tarka)	Hold day of surgery	Adverse hemodynamic changes during surgery (i.e. hypotension)
Angiotensin Receptor Blockers (ARBs) and combination products	Azilsartan (Edarbi) Azilsartan + Chlorthalidone (Edarbyclor) Candesartan (Atacand) Candesartan + HCTZ (Atacand HCT) Eprosartan (Teveten), Eprosartan + HCTZ (Teveten HCT) Irbesartan (Avapro), Irbesartan + HCTZ (Avalide) Losartan (Cozaar), Losartan + HCTZ (Hyzaar) Olmesartan (Benicar), Olmesartan + Amlodipine (Azor) Olmesartan + HCTZ (Benicar HCT) Telmisartan (Micardis) Telmisartan + Amlodipine (Twynsta) Telmisartan + HCTZ (Micardis HCT) Valsartan (Diovan) Valsartan + Amlodipine (Exforge) Valsartan + Amlodipine + HCTZ (Exforge HCT)	Hold day of surgery	Adverse hemodynamic changes during surgery (i.e. hypotension)

Medication Class	Medication Names: Generic (Brand)	Instructions	Reason
	Valsartan + HCTZ (Diovan HCT) Valsartan/Nebivolol (Byvalson) Valsartan/Sacubitril (Entresto)		
Beta Blockers Beta Blocker/Diuretic Combinations	Acebutolol (Sectral) Atenolol (Tenormin) Betaxolol (Kerlone) Bisoprolol (Zebeta) Carvedilol (Coreg) Esmolol (Brevibloc) Metoprolol (Lopressor, Toprol XL) Nadolol (Corgard) Nebivolol (Bystolic) Pindolol (Visken) Propranolol (Inderal) Sotalol (Betapace) Atenolol/chlorthalidone (Tenoretic) Bisoprolol/hydrochlorothiazide (Ziac) Metoprolol/HCTZ (Lopressor HCT) Propranolol/ hydrochlorothiazide (Inderide)	OK to continue	Withdrawal/rebound effects if held
Calcium Channel Blockers and combination products	Amlodipine (Norvasc) Amlodipine + Atorvastatin (Caduet) Clevipidine (Cleviprex) Diltiazem (Cardizem) Felodipine (Plendil) Isradipine (Dynacirc) Levamlodipine (Conjupri) Nicardipine (Cardene) Nifedipine (Procardia, Adalat) Nimodipine (Nimotop) Nisoldipine (Sular) Verapamil (Calan, Covera-HS, Verelan)	OK to continue unless significant bradycardia, hypotension, or left ventricular dysfunction (LVEF < 40%)	
Digoxin	Digoxin (Lanoxin)	OK to continue	
Renin Inhibitors	Aliskiren (Tekturna), Aliskiren +HCTZ (Tekturna HCT)	Hold day of surgery	Hypotension during surgery
Vasodilators	Hydralazine (Apresoline) Hydralazine/Isosobide Dinitrate (BiDil) Isosorbide mononitrate (Imdur) Isosorbide dinitrate (Isordil, Dilatrate) Minoxidil (Loniten)	OK to continue	Increases the risk for hypertensive crisis if held

Medication Class	Medication Names: Generic (Brand)	Instructions	Reason
Statins	Atorvastatin (Lipitor) Fluvastatin (Lescol) Lovastatin (Altoprev) Pitavastatin (Livalo) Pravastatin (Pravachol) Rosuvastatin (Crestor) Simvastatin (Zocor)	OK to continue	
Diuretics	Acetazolamide (Diamox) Amiloride Amiloride/Hydrochlorothiazide (Moduretic) Bumetanide (Bumex) Chlorothiazide (Diuril) Chlorthalidone (Thalitone) Eplerenone (Inspra) Ethacrynic acid (Edecrin) Furosemide (Lasix) Hydrochlorothiazide (HCTZ, Microzide) Indapamide (Lozol) Methazolamide Metolazone (Zaroxolyn) Spironolactone (Aldactone) Spironolactone/HCTZ (Aldactazide) Torsemide (Demadex) Triamterene (Dyrenium) Triamterene / HCTZ (Dyazide, Maxzide)	Hold day of surgery	Increases the risk of hypokalemia / hypovolemia

B. Anticoagulants and antiplatelet agents

1. Anticoagulants and antiplatelet agents are commonly held prior to procedures due to an increased risk of bleeding. The risk of bleeding is higher for certain procedures and if renal or hepatic disease exists. Longer hold times are usually necessary for patients undergoing major surgery, spinal puncture, or placement of a spinal or epidural catheter or port. **The risk of a cardiovascular and/or thromboembolic event must always be weighed against the risk of bleeding for the specific patient and procedure. The risk of stent thrombosis is highest in the first 4 to 6 weeks after stent implantation**.

   a) Table 2 provides a risk classification for different types of interventional pain procedures

Table 2. Classification of Interventional Pain Procedure According to Potential Risk for Serious Bleed

LOW-Risk Procedures [a]	INTERMEDIATE-Risk Procedures[a]	HIGH-Risk Procedures
Peripheral Nerve Blocks	Interlaminar ESIs (C, T, L, S)	Spinal cord stimulation trial and implant
Peripheral joints and musculoskeletal injections	Transforaminal ESIs (C, T, L, S)	Intrathecal catheter and pump implant
Thoracic and lumbar facet MBNB and RFA	Cervical[b] facet MBNB and RFA	Percutaneous decompression laminotomy
Pocket revision and implantable pulse generator/intrathecal pump placement	Intradiscal procedures (C, T, L)	Dorsal root ganglion stimulation
Trigger point injections including piriformis injection	Sympathetic blocks (stellate, T, splanchnic, celiac, lumbar, hypogastric)	Vertebral augmentation (vertebroplasty and kyphoplasty)
Sacroiliac joint injection and sacral lateral branch blocks	Trigeminal and sphenopalatine ganglia blocks	Epiduroscopy and epidural decompression
Peripheral nerve stimulation trial and implant[c]		

[a] Patients with high bleed risk undergoing low- or intermediate-risk procedures should be treated as intermediate- or high-risk, respectively. High bleed risk may include older age, history of bleeding tendency, concurrent use of other anticoagulants/antiplatelets, liver cirrhosis or advanced liver disease, advanced renal disease.

[b] There is a rich neck vascularity in the vicinity of the target structure(s).

[c] Peripheral neuromodulation is low to intermediate risk, depending on the location of the targeted nerve in relation to critical vessels and the invasiveness of the procedure

C = cervical; T= thoracic; L = lumbar; S = sacral

b) Table 3 below provides recommendations for medications based on procedures that are considered standard bleeding risk or high bleeding risk

(1) **Standard Bleeding Risk:** breast biopsy, cardiac catheterizations, cataract surgery, colonoscopy, electrophysiology procedures, lithotripsy, polypectomy, no additional patient specific risk factors

(2) **High Bleeding Risk:** Surgery involving major organs such as heart, neurosurgery, ophthalmologic, genitourinary, spine surgery, procedures requiring hemostasis (e.g. spinal anesthesia) or when additional patient specific risk factors are present

2. It is important to **find out the indication for use of anticoagulants and antiplatelets (e.g., coronary artery disease, valve replacement, coronary stents, cerebrovascular disease [stroke], etc.), as the recommendations may differ**.

3. **The decision to hold or continue and the optimal way to do so may need to be determined by consensus of the surgeon, anesthesiologist, cardiologist or neurologist based on the risks of bleeding and potential for thrombosis. Check with the appropriate physician for specific instructions regarding IF, WHEN, and HOW to stop and restart therapy.**

Table 3. Anticoagulants and Antiplatelets

Medication Class	Medication Name	When to Hold Before Surgery – Low or Intermediate Bleeding Risk	When to Hold Before Surgery – High Bleeding Risk	Minimum time to hold PRIOR to epidural catheter placement or spinal inj	Minimum time to RESTART after catheter removal *(must wait longer if traumatic puncture)*
Anticoagulants - Direct Thrombin Inhibitors	Argatroban	4 hours **and** aPTT <30	4 hours **and** aPTT <30	4 hours **and** aPTT <30	2 hours
	Bivalirudin (Angiomax)	2 hours	2 hours	aPTT <30	2 hours
	Dabigatran (Pradaxa)	48 hours if CrCl >30 mL/min 4-5 days if CrCl ≤ 30 mL/min	4 days if CrCl ≥ 50 mL/min 5-6 days if CrCl 31-49mL/min 6 days if CrCl ≤ 30	4 days if CrCl ≥ 50 mL/min 5-6 days if CrCl 31-49mL/min 6 days if CrCl ≤ 30	24 hours. If VTE risk very high, can give half usual dabigatran dose 12 hours after removal
Anticoagulants - Factor XA Inhibitors	Apixaban (Eliquis)	Low risk: 48 hours Intermediate risk: 72 hours	72 hours	72 hours	24 hours. If the risk of VTE is very high, can give half the usual dose 12 hours after removal
	Edoxaban (Savaysa)	48 hours if CrCl ≥ 15 mL/min	72 hours if CrCl ≥50mL/min 96 hours if CrCl 15-50mL/min	72 hours if CrCl ≥50mL/min 96 hours if CrCl 15-50mL/min	24 hours. If the risk of VTE is very high, can give half the usual dose 12 hours after removal
	Fondaparinux (Arixtra)	Low risk: 48 hours Intermediate risk: 96 hours	96 hours	48 hours (prophylactic dosing), 3-4 days (treatment dosing)	6 hours low risk; 24 hrs after intermediate and high risk
	Rivaroxaban (Xarelto)	Low risk: 24 hours Intermediate risk: 48 hours (if CrCl ≥ 15 mL/min)	72 hours if CrCl ≥30mL/min 96 hours if CrCl 15-30mL/min	72 hours if CrCl ≥30mL/min 96 hours if CrCl <30mL/min	24 hours. If VTE risk very high, can give half usual rivaroxaban dose 12 hours after removal

Medication Class	Medication Name	When to Hold Before Surgery – Low or Intermediate Bleeding Risk	When to Hold Before Surgery – High Bleeding Risk	Minimum time to hold PRIOR to epidural catheter placement or spinal inj	Minimum time to RESTART after catheter removal *(must wait longer if traumatic puncture)*
Anticoagulants - Heparin	Heparin IV	6 hours	6 hours	6 hours (PTT < 33)	2 hours. Time to resume may be up to 24 hr if traumatic puncture
	Heparin SubQ	6 hours	24 hours	6 hours	2 hours after low-risk; 6-8 hours after intermediate- and high-risk
Anticoagulants - Low molecular weight heparin	Enoxaparin (Lovenox) **Prophylactic dosing**	12 hours	12 hours	12 hours	4 hours low risk; 12-24 hrs after intermediate and high risk
Anticoagulants - Low molecular weight heparin	Enoxaparin (Lovenox) or Dalteparin (Fragmin) **Treatment dosing**	24 hours	24 hours	24 hours	4 hours low risk; 12-24 hrs after intermediate and high risk
Anticoagulants - Warfarin	**Warfarin (Coumadin) – be sure to consider thrombotic risk and need for bridging with low molecular weight heparin or heparin**	Low risk: Shared assessment risk and decision between treating physicians recommended. Intermediate risk: 5 days **and** INR ≤ 1.2	5 days **and** INR ≤ 1.2	5 days **and** INR < 1.2	6 hours
Antiplatelets – Aspirin & aspirin-containing products	Aspirin - Shared assessment risk and decision between treating physicians recommended.	**Patients with CAD, recent stent placement, stroke, should be continued on aspirin whenever possible.** Peripheral Vascular or Cardiac Surgery: patients may be asked by the surgeon to continue aspirin until time of surgery	4-6 days (especially ophthalmologic [not cataract], neurosurgical, ortho spine procedures)	6 days	24 hours

Medication Class	Medication Name	When to Hold Before Surgery – Low or Intermediate Bleeding Risk	When to Hold Before Surgery – High Bleeding Risk	Minimum time to hold PRIOR to epidural catheter placement or spinal inj	Minimum time to RESTART after catheter removal *(must wait longer if traumatic puncture)*
	Aspirin and aspirin-containing products **used for analgesia** (Excedrin, Fiorinal, Soma Compound, Norgesic, Percodan)	7 days	7 days	6 days	24 hours
Antiplatelets	Cilostazol (Pletal)	Continue	48 hours	48 hours	24 hours
	Dipyridamole (Persantine)	Continue	48 hours	48 hours	24 hours
	Aspirin/ dipyridamole (Aggrenox)	**Patients with CAD, recent stent placement, stroke, should be continued on aspirin whenever possible.** Peripheral Vascular or Cardiac Surgery: patients may be asked by the surgeon to continue aspirin until time of surgery	4-6 days (especially ophthalmologic [not cataract], neurosurgical, ortho spine procedures)	6 days	24 hours
Antiplatelets – P2Y12 Inhibitors **Refer to disclaimer above re: indication & stents: risks vs benefits of stopping (and timing) should be carefully assessed between treating physicians**	Cangrelor (Kengreal)	3 hours	3 hours	3 hours	24 hours
	Clopidogrel (Plavix) – **clarify with cardiology if post PCI/stent/or recent intervention**	7 days	7 days	7 days	12 hours; 24 hours if loading dose
	Prasugrel (Effient) **clarify with cardiology if post PCI/stent/or recent intervention**	7-10 days	7-10 days	7 days	24 hours
	Ticagrelor (Brilinta) **clarify with cardiology if post PCI/stent/or recent intervention**	5 days	5 days	5 days	24 hours

Medication Class	Medication Name	When to Hold Before Surgery – Low or Intermediate Bleeding Risk	When to Hold Before Surgery – High Bleeding Risk	Minimum time to hold PRIOR to epidural catheter placement or spinal inj	Minimum time to RESTART after catheter removal *(must wait longer if traumatic puncture)*
Antiplatelets – Glycoprotein Inhibitors	Eptifibatide (Integrilin)	Low risk: 8 hours Intermediate risk: 24 hour	24 hours	24 hours	8-12 hours
	Tirofiban (Aggrastat)	Low risk: 8 hours Intermediate risk: 24 hour	24 hours	24 hours	8-12 hours
Antiplatelets - Analgesics Cox-2 Inhibitors	Celecoxib (Celebrex)	OK to continue	OK to continue	No restrictions	No restrictions
Antiplatelets - Analgesics Short-acting NSAIDs	Diclofenac (Cataflam, Voltaren) Ibuprofen (Advil, Motrin) Ibuprofen/Hydrocodone (Vicoprofen) Ibuprofen/Oxycodone (Combunox) Fenoprofen (Nalfon) Ketoprofen Ketorolac (Toradol) Meclofenamate Mefenamic Acid Tolmetin	24 hours	24 hours	24 hours	24 hours
	Diflunisal Etodolac (Lodine) Indomethacin (Indocin) Flurbiprofen	48 hours	48 hours	48 hours	24 hours
Antiplatelets - Analgesics Long-acting NSAIDs	Meloxicam (Mobic) Sulindac Naproxen (Aleve, Anaprox, Naprosyn)	96 hours	96 hours	96 hours	24 hours
	Nabumetone (Relafen)	6 days	6 days	6 days	24 hours
	Oxaprozin (Daypro) Piroxicam (Feldene)	10 days	10 days	10 days	24 hours

C. Antidiabetic Medications

1. Consider baseline needs, length and type of surgery. Refer to primary care provider and/or health care provider managing patients' diabetes for specific instructions.

Table 4. Antidiabetic Medications

Drug Class	Drugs in Class	Instructions	Reason
Oral Antidiabetics			
Alpha-glucosidase inhibitors	Acarbose (Precose) Miglitol (Glyset)	Hold day of surgery	Increased risk of hypoglycemia
DPP-4 Inhibitors	Alogliptin (Nesina) Alogliptin/Pioglitazone (Oseni) Linagliptin (Tradjenta) Saxagliptin (Onglyza) Sitagliptin (Januvia)		
Thiazolidinediones	Pioglitazone (Actos) Rosiglitazone (Avandia)		
Insulin secretagogues (sulfonylureas, glinides)	Chlorpropamide (Diabinese) Glimepiride (Amaryl) Glipizide (Glucotrol) Glyburide (Micronase,Diabeta) Nateglinide (Starlix) Repaglinide (Prandin) Tolazamide (Tolinase) Tolbutamide (Orinase)		
Biguanides	Metformin (Glucophage) Metformin-containing products	Hold day of surgery	Risk of lactic acidosis
SGLT-2 Inhibitors (all oral)	Canagliflozin (Invokana) Dapaglifozin (Farxiga) Dapagliflozin/Saxagliptin (Qtern) Empagliflozin (Jardiance) Empagliflozin/Linagliptin (Glyxambi)	Hold at least 3 days before surgery	Increased risk of euglycemic DKA, urogenital infections, AKI, dehydration, and hypotension
	Ertugliflozin (Steglatro) Ertugliflozin/Sitagliptin (Steglujan)	Hold at least 4 days before surgery	

Drug Class	Drugs in Class	Instructions	Reason
Intermediate and long acting (basal) insulin	NPH (HumuLIN N, NovoLIN N)	Take 50% of AM dose day of surgery Day before surgery: Consider 25% dose reduction on evening before surgery **Give a 30 gm carbohydrate PM snack the night prior to surgery, unless directed otherwise**	Increased risk of hypoglycemia
	NPH 70%/Regular 30% (HumuLINn/NovoLIN Mix 70/30) Lispro protamine 75%/Lispro 25% (HumaLog Mix 75/25) Aspart protamine 70%/Aspart 30% (NovoLog Mix 70/30)	Mixes: Take 50% of AM dose day of surgery (hold if BG<140) **Give a 30 gm carbohydrate PM snack the night prior to surgery, unless directed otherwise**	
	Degludec insulin (Tresiba) Detemir insulin (Levemir) Glargine insulin (Basaglar, Lantus, Toujeo)	Take 50% of AM dose day of surgery Day before surgery: Take the usual AM dose of long-acting insulin and 85-90% of PM dose. **Give a 30 gm carbohydrate PM snack the night prior to surgery, unless directed otherwise.**	
Short and rapid-acting insulin	Aspart insulin (NovoLog) Glulisine insulin (Apidra) Lispro insulin (HumaLog) Regular insulin (Humulin R, Novolin R) Regular Insulin, inhaled (Afrezza)	Hold day of surgery (last dose is with dinner night before surgery); decrease basal rate by 10-15% if on a continuous pump **Give a 30 gm carbohydrate PM snack the night prior to surgery, unless directed otherwise.**	Increased risk of hypoglycemia
Injectable Antidiabetics/ Non-insulin GLP-1 agonists	Dulaglutide (Trulicity) Exenatide (Bydureon, Byetta) Liraglutide (Victoza, Saxenda) Liraglutide + Degludec (Xultophy) Lixisenatide (Adlyxin) Lixisenatide + Glargine (Soliqua) Pramlintide acetate (Symlin) Semaglutide (Ozempic)	Before day of surgery: f or GI surgeries or concerns for nausea, vomiting, or gut dysfunction, consider holding the weekly dose within 8 days of surgery. Day of surgery: if weekly dose is due on morning of surgery, delay until later in the day after surgery or as instructed by physician	Increased risk of hypoglycemia

D. Opioid and Non-Opioid Analgesics

Table 5. Opioid and Non-Opioid Analgesics

Drug Class	Drugs in Class	Instructions	Reason
Opioid Antagonists	Naloxone (Narcan)	Notify anesthesiology if patient was given a dose within 4 hours of surgery	Increased risk of respiratory depression and reduction of opioid efficacy Can precipitate withdrawal effects
	Naltrexone (Vivitrol, Revia)	Hold oral naltrexone 3-4 days prior to surgery Hold IM naltrexone 24-30 days after the last injection prior to surgery	
Opioid Agonist-Antagonists	Buprenorphine (Butrans, Subutex) Buprenorphine-Naloxone (Suboxone, Bunavail, Zubsolv, Cassipa)	Consult prescribing physician to determine if okay to continue perioperatively	Increased risk of QTc prolongation, serotonin syndrome, paralytic ileus, reduced analgesic effect, and precipitation of withdrawal effects
Alpha-Adrenergic Blocking Agents	Ergotamine (Ergomar)	Hold at least 2 days prior to surgery	Increased risk of peripheral vasoconstriction and serotonin syndrome
Barbiturates	Butalbital (only available in combination with codeine, caffeine, acetaminophen, aspirin, and other medications)	Taper over 2 weeks if used long-term and able to taper Otherwise continue perioperatively and do not stop abruptly	Increased risk of hypotension, respiratory depression, acute withdrawal
Serotonin Receptor Agonists	Almotriptan (Axert) Eletriptan (Relpax) Frovatriptan (Frovan) Naratriptan (Amerge) Rizatriptan (Maxalt) Sumatriptan (Imitrex) Zolmitriptan (Zomig)	Hold day of surgery	Increased risk of serotonin syndrome
Centrally Acting Muscle Relaxants	Carisoprodol (Soma) Cyclobenzaprine (Flexeril, Amrix) Metaxalone (Skelaxin) Methocarbamol (Robaxin) Orphenadrine (Norflex)	Hold day of surgery Taper carisoprodol over 4-9 days if able	Increased risk of anticholinergic effects, sedation, and withdrawal symptoms (Soma withdrawal)

E. Psychotropic Medications

1. It is generally not recommended to hold psychotropic agents due to risks of withdrawal and worsening psychiatric condition. In agents with serotonergic activity, consider risks vs benefits of bleeding risk. For example, if patient is also taking antiplatelet therapy and procedure has a high risk of bleeding, consider tapering off serotonergic medication in coordination with prescriber prior to surgery.
2. Monoamine oxidase inhibitors (MAOIs) can generally be continued as long as the anesthesiologist is aware and able to utilize MAOI-safe anesthesia and the treating provider believes temporary discontinuation will exacerbate or precipitate a depressive episode.

Table 6. Psychotropic Medications

Drug Class	Drugs in Class	Instructions	Reason
Antipsychotics	Haloperidol (Haldol) Lurasidone (Latuda) Olanzapine (Zyprexa) Risperidone (Risperdal) Ziprasidone (Geodon)	OK to continue	
Benzodiazepines (Antianxiety agents)	Alprazolam (Xanax) Buspirone (Buspar) Clonazepam (Klonopin) Diazepam (Valium) Lorazepam (Ativan) Temazepam (Restoril)	OK to continue	Risk of withdrawal if stopped abruptly
Monoamine Oxidase Inhibitors (MAOIs)	Isocarboxazid (Marplan) Phenelzine (Nardil) Tranylcypromine (Parnate)	Taper off 2 weeks prior to surgery if possible; if not, use MAOI-safe anesthesia techniques	Drug interactions (e.g., ephedrine, meperidine, methadone, tramadol), which could cause a hypertensive crisis
	Rasagiline (Azilect)	OK to continue; notify Anesthesia	
	Safinamide (Xadago) Selegiline patch (Emsam)	DC at least 10 days prior to surgery if possible	
Selective Serotonin Reuptake Inhibitors (SSRIs)	Citalopram (Celexa) Escitalopram (Lexapro) Fluoxetine (Prozac) Fluvoxamine (Luvox) Paroxetine (Paxil) Sertraline (Zoloft)	OK to continue; routine DC not recommended. If at high risk for bleed, coordinate taper with treating psychiatrist	Risk of withdrawal if stopped abruptly; increased bleed risk if on concurrent anticoagulants/antiplatelets

Drug Class	Drugs in Class	Instructions	Reason
Selective Serotonin Norepinephrine Reuptake Inhibitors (SNRIs)	Desvenlafaxine (Pristiq) Duloxetine (Cymbalta) Venlafaxine (Effexor) Milnacipran (Savella)	OK to continue; routine DC not recommended. If at high risk for bleed, consider coordinating taper with treating psychiatrist	Risk of withdrawal if stopped abruptly; increased bleed risk if on concurrent anticoagulants/antiplatelets
Tricyclic Antidepressants	Amitriptyline (Elavil) Clomipramine (Anafranil) Desipramine (Norpramin) Imipramine (Tofranil) Nortriptyline (Pamelor)	OK to continue; however, if patient is at high risk for perioperative arrhythmias, consider coordinating taper with treating provider over a period of 7-14 days prior to surgery	Risk of arrhythmia in certain patients
Mood stabilizing agents	Lithium Divalproex / valproic acid (Depakote)	OK to continue	

F. Hormonal Therapies

Table 7. Hormonal Medications

Drug Class	Drugs in Class	Instructions	Reason
Estrogen Replacement Therapy	Conjugated estrogens (Premarin), other products containing estrogen	Hold 4 weeks prior to surgery **if mod-high DVT risk procedure**	Increased risk of thromboembolism
Estrogen Receptor Modulators	Raloxifene (Evista) Tamoxifen (Nolvadex)	Ok to continue if taking for breast cancer prevention or treatment; otherwise hold at least 7 days prior to surgery	Increased risk of thromboembolism and wound complications
Oral Contraceptives and Patches	Multiple brands	Ok to continue for low DVT risk surgeries because risk of pregnancy if withheld **Hold 4 weeks if mod-high DVT risk (age, obesity, immobility, recent stroke or trauma, or cancer) or as instructed by physician. Consider risk of unwanted pregnancy vs VTE risk**	Increased risk of thromboembolism
Androgenic Hormones	Testosterone Methyltestosterone	Ok to continue	Increased risk of thromboembolism

G. Urologic Medications

Table 8. Urologic Medications

Drug Class	Drugs in Class	Instructions	Reason
5-Alpha reductase inhibitors	Dutasteride (Avodart) Finasteride (Proscar)	OK to continue	
Alpha-1 adrenergic antagonists	Alfuzosin (Uroxatral) Doxazosin (Cardura) Prazosin (Minipress) Silodosin (Rapaflo) Tamsulosin (Flomax) Terazosin	OK to continue; however, increased risk of floppy iris syndrome If given prior to cataract surgery	
Anticholinergic Bladder Dysfunction Medications	Darifenacin (Enablex) Fesoterodine (Toviaz) Flavoxate (Urispas) Oxybutynin (Ditropan, Ditropan XL) Solifenacin (Vesicare) Tolterodine (Detrol, Detrol LA) Trospium (Sanctura, Sanctrua XR)	Hold day of surgery	May reduce catheter-related bladder discomfort, but high potential for adverse effects in older patients
PDE-5 Inhibitors	Avanafil (Stendra) Sildenafil (Revatio, Viagra) Tadalafil (Adcirca, Cialis) Vardenafil (Levitra, Staxyn)	OK to continue if used for pulmonary hypertension; Hold 3 days prior to surgery if used for urologic indications	Increased risk for intraoperative hypotension
Urinary Analgesic	Pentosan Polysulfate Sodium (Elmiron)	Hold 5 days prior to surgery	Increased risk of bleeding

H. **Immunosuppressants and Rheumatologic Agents**

1. Patients with organ transplants should be continued on immunosuppressants.
2. Patients taking immunosuppressants for other disease (e.g., rheumatoid arthritis, Crohn's) – coordinate holding / redosing with provider

Table 9. Immunosuppressants & Rheumatologic Medications

Drug Class	Drugs in Class	Instructions	Reason
Biologics	Adalimumab (Humira) Etanercept (Enbrel) Infliximab (Remicade, biosimilars)	Hold prior to surgery; schedule surgery at end of dosing cycle and resume at least 14 days after surgery in the absence of wound healing problems, surgical site infection, or system infection; coordinate with provider	Impaired wound healing, increased risk of infection
Immunomodulators	Hydroxychloroquine (Plaquenil) Leflunomide (Arava) Methotrexate Sulfasalazine	OK to continue	
Immunosuppressants	Azathioprine Cyclosporine Sirolimus (Rapamune) Tacrolimus (Prograf)	OK to continue	Risk of rejection

I. **Diet Medications**

Table 10. Diet Medications

Drug Class	Drugs in Class	Instructions	Reason
Anorexiant	Benzphetamine Diethylpropion Phendimetrazine Phentermine (Adipex, Lomaira)	DC 7 days prior to surgery	
	Phentermine/topiramate (Qsymia)	DC 7 days prior to surgery Note: to prevent seizures from abrupt withdrawal, take a dose every other day for at least 1 week before stopping treatment	
Lipase Inhibitor	Orlistat (ALLi, Xenical)	Hold day of surgery	Administered with a meal containing fat

J. **Herbals/Vitamins/Supplements**

1. There are unknown risks with any herbal or dietary supplement

Table 11. Herbals/Supplements/Vitamins

Drug Class	Drugs in Class	Instructions for Holding	Reason
Cannabis and derivatives	Marijuana or hemp-derived (cannabidiol) products	Hold for at least 3 days; Hold for 2 weeks in marijuana smokers	Cannabinoids may have sympathetic hyperactivity with acute use, airway irritability in smokers, impaired temperature regulation, interactions w/anesthesia, increased risk of perioperative coronary vasospasm
	Cannabidiol solution (Epidiolex)	FDA approved products OK to continue for recognized indications (epilepsy, chemo-induced nausea)	
Supplements that may affect bleeding risk	Aloe, agrimony, angelica, anise, arnica, asafoetida, aspen, black haw, black tea extract (black or green tea as a beverage can be continued), bladder wrack (Fucus), bogbean, boldo, bromelain, buchu, capsicum, cat's claw, celery, chamomile, clove, danshen, devil's claw, dong quai, evodia, fenugreek, feverfew, garlic, german sarsaparilla, ginger, ginkgo, ginseng (American, Panax and Siberian), guarana, horse chestnut, horseradish, inositol nicotinate, licorice, meadowsweet, onion, Pau d'Arco, policosanol, poplar, prickly ash (Northern), quassia, red clover, resveratrol, saw palmetto, senega, sweet clover, sweet woodruff, tamarind, tonka beans, turmeric, vanadium, wild carrot, wild lettuce, willow, wintergreen	Hold for 2 weeks	May interact with anesthetic agents and/or affect platelet function, increasing the risk of bleeding
	Chondroitin, glucosamine	Hold for 48 hours	
Supplements that may cause CNS depression	Kava, lemon balm, skullcap	Hold for 2 weeks	Increased sedative effects
	Theanine, L-tryptophan	Hold for 24 hours	
	German chamomile, hops, lavender extract, melatonin, passionflower, valerian root	OK to continue	
Supplements that may affect blood glucose	Agaricus mushroom, aloe, alpha-lipoic acid, American ginseng, banaba, bitter melon, Cassia cinnamon, chromium, fenugreek,	Hold for 2 weeks if possible	May affect blood glucose; if not stopped, monitor blood glucose closely

	glucomannan, Gymnema, Panax ginseng, prickly pear cactus, vanadium		
Supplements that may have cardiovascular effects	Andrographis, bitter orange, caffeine supplements (coffee/tea are ok to continue), casein peptides, coenzyme Q10, danshen, dimethylamylamine, ephedra, garlic, guarana, horny goat weed, kola nut, licorice root, nettle, pycnogenol, yerba mate, yohimbine	Hold for 2 weeks	Increased risk of adverse cardiovascular effects
	L-arginine, N-acetylcysteine	Hold for 24 hours	
Supplements that may affect serotonin	St. John's wort	Hold for 2 weeks	Potential for drug interactions
	5-hydroxytryptophan, L-tryptophan, S-adenosylmethionine	Hold for 24 hours	
Other Supplements	Fish Oil	OK to continue	Concerns about increased bleeding risk have not been seen in studies
	Echinachea, Garcinia cambogia, goldenseal, grapefruit extract, hu zhang, indole-3-carbinol, iprif lavone, kratom, quercetin, Schisandra (OK to continue if using with immunosuppressants), phenylalanine (OK to continue if using in pts with lung disease)	Hold for 2 weeks	Multiple effects and/or drug interactions
Vitamins	Multivitamins, prenatal vitamins, iron, vitamin D	Hold day of surgery	
	Vitamin E	Hold for 2 weeks	Increased bleeding risk

K. GI Agents

Drug Class	Drugs in Class	Instructions	Reason
Histamine-H2 Antagonists (H2 blockers)	Cimetidine Famotidine (Pepcid) Nizatidine	OK to continue	
Proton Pump Inhibitors (PPIs)	Dexlansoprazole (Dexilant) Esomeprazole (Nexium) Lansoprazole (Prevacid) Omeprazole (Prilosec) Pantoprazole (Protonix) Rabeprazole (Aciphex)	OK to continue	

VI. CROSS REFERENCES

Pre-Anesthesia Evaluation Guidelines

VII. RESOURCES AND REFERENCES

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VIII. ATTACHMENTS

Not Applicable

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