

# Preoperative Roadmap

## **FOR PROVIDERS REQUIRING ANESTHESIA SERVICES**

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## Contents

Preoperative Assessment Roadmap .....	3
Risk Stratification .....	4
Preoperative Testing Guidelines .....	6
Preoperative Medications.....	7
NPO Guidelines .....	8
APPENDICES.....	9
Appendix A: Patient Evaluation Screening Form .....	10
Appendix B: Exclusionary Criterion for JHOC.....	11
Appendix C: OSA Screening.....	12
Appendix D: Diabetic Management .....	13
Appendix E: Insulin Names and Duration of Action .....	14
Appendix F: Pacemaker/AICD Guidelines.....	15
Appendix G: Patients with Cardiac Stents .....	16
Appendix H: Surgical Blood Order Schedule .....	17

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## Preoperative Assessment Roadmap

This summary will provide all surgeons and other providers who require anesthesia services guidance to understand the process by which we hope to facilitate the best possible care for your patients. Following these directions should help ensure your patients are not cancelled or delayed the day of surgery. Please have your patients answer the questions on the Patient Evaluation Screening Form (Appendix A). For all cases scheduled for surgery (or ones you are considering for surgery), please follow this process:

1. **TRIAGE** For all patients who answered 'Yes' to any question on the above attachment, please schedule for a Preoperative Evaluation Center (PEC) visit. This will be either an Anesthesia Consult or routine visit, per the surgeon's discretion. For patients who did not answer 'Yes' to any question, they may completely bypass PEC, and simply show up the day of their procedure. All Anesthesia Consults should be scheduled by calling (410) 955-6353. All routine visits may be scheduled directly into the EPIC, Outpatient Scheduling system. Of note, the Preoperative History and Physical is required within 30 days of surgery.
2. **JHOC OUTPATIENT CASES** Please review the exclusion criterion for scheduling your outpatients in JHOC (Appendix B).
3. **TESTING AND INSTRUCTIONS** Follow the Preoperative Testing Guidelines to determine what laboratory studies and additional tests are required; as well as what medications to hold on the day of surgery, and NPO guidelines. When sending patients to PEC for their preoperative assessment, the PEC practitioners will order appropriate laboratory testing. If you would like specific testing done, please include this request in the display notes of the PEC schedule and enter these orders in Epic. Please only order lab studies that you want, and not ones that you think Anesthesia will want. . This will help eliminate unnecessary lab studies and minimize confusion regarding required lab work.
4. **OUTSIDE STUDIES** If outside facilities are utilized to generate lab studies, other diagnostic tests, or consultation reports, please obtain these results and scan them into Epic so they are available for review. Additionally, the patient should be instructed to bring copies of these results with them to PEC or the OR on the day of the procedure. For every patient requiring an ECG, please inform them to obtain a copy of a previous ECG for comparisons.
5. **PEC REVIEW OF OUTSIDE EVALUATION** Patients that do not require a PEC visit may still have reports or diagnostic tests, as well as H&Ps that should be made available 72 hours prior to surgery. This will allow a review of their findings preoperatively, and determinations made regarding fitness for procedures. Please scan these documents into Epic.

Please instruct your patients that they will be contacted the day prior to their surgery (Friday for Monday surgery) by a nurse from the Preop area to update their medication list and to relay general preoperative information to your patients. Make certain your patients have valid phone numbers in Epic as to where they may be contacted during the day.

## Risk Stratification

**Low Risk Medical Conditions** – Healthy with no medical problems (ASA I) or well controlled chronic conditions (ASA II)

**High Risk Medical Conditions** – Multiple medical comorbidities not well controlled (ASA III) or extremely compromised function secondary to comorbidities (ASA IV).

**Low Risk Surgical Procedure** – poses minimal physiological stress (ex. – outpatient surgery).

**Intermediate Risk Surgical Procedure** – Medium risk procedure with moderate physiological stress and minimal blood loss, fluid shifts, or postoperative changes.

**High Risk Surgical Procedure** – High risk procedure with significant fluid shifts, possible blood loss, as well as perioperative stress anticipated. Anticipated ICU stays postoperatively.

**Medical Conditions that may warrant an ASA III or IV status, and would benefit from a Preoperative Assessment at the PEC Center:**

### General Conditions:

- Medical Condition inhibiting ability to engage in normal daily activity – unable to climb two flights of stairs without stopping.
- Medical Condition necessitating continual assistance or monitoring at home within the past six months.
- Admission to hospital within past two months for acute or exacerbation of a chronic condition.
- History of previous serious anesthesia complication or history of Malignant Hyperthermia.

### Cardio-circulatory:

- History of angina, coronary artery disease or myocardial infarction.
- Symptomatic arrhythmias, particularly new onset A-Fib.
- Poorly controlled hypertension (systolic > 160 and/or diastolic > 100).
- History of congestive heart failure.
- History of significant valvular disease (aortic stenosis, mitral regurgitation, etc).

### Respiratory:

- Asthma/COPD requiring chronic medication or with acute exacerbation and progression within past six months.
- History of major airway surgery or unusual airway anatomy (History of difficult intubation in previous anesthetic).
- Upper or lower airway tumor or obstruction.
- History of chronic respiratory distress requiring home ventilatory assistance or monitoring.

### Endocrine:

- Insulin dependent mellitus
- Adrenal disorders
- Active thyroid disease
- Morbid obesity

## Neuromuscular:

- History of seizure disorder or other significant CNS diseases (multiple sclerosis, muscular dystrophy, etc.).
- History of myopathy or other muscular disorders.

## Hepatic/Renal/Heme:

- Any active hepatobiliary disease or compromise (hepatitis).
- End stage renal disease (dialysis).
- Severe anemias (Sickle Cell, Aplastic, etc.).

## Obese/Obstructive Sleep Apnea

- BMI >35 associated with high incidence of undiagnosed OSA
- OSA associated with high incidence of respiratory failure post anesthesia
- Please complete the STOP-BANG scoring of your patient (Appendix C) to assess risk of OSA

## Preoperative ECGs:

**All surgery:** Required within 30 days only for anyone with recent changes in functional status, new or unstable angina, or progressive dyspnea.

**Low risk surgery (such as cataracts, endoscopy, superficial procedures or angio)** – None required except as noted above. Please forward copy of the most recent, old, EKG you may have on file.

**Intermediate risk surgery** – Required within 6 months for anyone with history of coronary heart disease, other significant structural heart disease such as arrhythmias, valvular disorders, peripheral vascular disease, cerebrovascular disease, insulin dependent diabetes, chronic kidney disease (creatinine > 2 mg/dL.), or extremely poor functional capacity.

**High risk surgery** – Required within 6 months for anyone with anticipated ICU postop. Also, anyone with a history of diabetes, hypertension, morbid obesity, HIV, ESRD or poor functional capacity.

## Preoperative Testing Guidelines

In an effort to reduce unnecessary testing, we are recommending utilizing the following approach:

**For all patients scheduled for low or intermediate risk surgery, only the following labs are necessary:**

- Hb/HCT on any menstruating female. For minor procedures on healthy patients, we may be able to check Hb the morning of surgery.
- Urine pregnancy test on the morning of surgery for any menstruating female.
- ECG on any patient described above in ECG Recommendations, unless we are provided with a previous tracing within six months.
- No CxR unless a history of pulmonary dysfunction with no previous CxR for one year.
- No PT/PTT unless a patient or family history of bleeding or easy bruising. If ordering these tests, only order the PT, not PTT (reserved for patients on Heparin).

This approach is only applicable on patients who have no significant comorbid conditions (ASA I or II). Any presence of significant medical conditions may require **additional testing**, and specific guidance is provided in Preoperative Guidelines on each condition. General guidelines listed below can be used to determine appropriate preoperative tests. **To help facilitate a more efficient evaluation at the PEC visit, we recommend obtaining these tests prior to the patients visit with PEC.**

- **Diabetes** – Fasting BMP; ECG for all patients with evidence of end organ damage or compromised exercise capacity. We also recommend HgA1C to assess control of diabetes (see Appendix D).
- **HTN of 5 yrs. duration and/or requiring two or meds; or Cardiac Dx** – BMP; ECG; consider ECHO, Stress Test, and/or Cardiac evaluation if symptoms significant and no previous studies within one year.
- **COPD** – PFTs if symptoms are significant; including home O2 or shortness of breath with exertion.
- **Anemia and/or Bleeding Hx** – Heme 8; Consider PT. Auto-donors need to have Hb/Hct post donation.
- **Liver dysfunction or Malnutrition** – CMP, Heme 8. Consider PT/InR.
- **High Surgical Risk Procedures** – Heme 8; CMP; Consider ECHO, Stress Test, and/or Cardiac evaluation if medical condition warrants, and no previous studies within the past year.
- **Poor Exercise Tolerance** – Heme 8; CMP; ECG; PMD evaluation; Consider ECHO, Stress Test, and/or Cardiac evaluation if no previous studies within the past year.
- **Morbid Obesity** – BMP; CMP; ECG; Consider ECHO, Stress Test, and/or Cardiac evaluation if poor exercise tolerance, and no previous studies within the past year.
- **End Stage Renal** (dialysis and/or renal failure patients) – Post dialysis labs to include Hemoglobin and BMP at a minimum; Na/K morning of surgery.
- **Pacemakers and AICDs** (Full Guidelines in Appendix F)
  - Must be interrogated at JHH and have report in Epic
  - Patients with pacemakers must be interrogated **within 6 months** of surgery
  - Patients with AICDs must be interrogated within **3 months** of surgery
  - To schedule the interrogation, please refer to Appendix F
  - Exceptions are those patients scheduled for EGD/colonoscopies/procedures that do NOT use bovie; these procedures do not require any changes to the pacemaker or AICD.
  - If there is any change to the date/time of where the surgery is being performed after the interrogation has been done, please inform the Device Clinic.
- For patients with **cardiac stents**, **PLEASE** continue 81 mg ASA up to day of surgery (see Appendix G).
- **Type & Cross/T&S** must be done at Hopkins within 30 days of surgery. Must meet two criteria to qualify as 30 day sample: no transfusions or pregnancy within past 3 months and date of surgery. Please refer to our [web site](#) or Appendix H for which cases require T&S.

## Preoperative Medications

As a general rule, for patients scheduled for surgery with anesthesia, we recommend all medications should be continued on the day of surgery to be taken with a sip of water prior to coming to the hospital. Exceptions to this recommendation are summarized below:


CLASS OF MEDICATIONS	MEDICATION	RECOMMENDATIONS
Oral Hypoglycemic Agents	Metformin/Glucophage Actos/ Glyburide/ Tolinase/ Avandia/ Amaryll/ all others	Hold at least 8 hours preop. Recommend holding am dose, day of surgery
Diuretics	Lasix/HCTZ	Hold am day of surgery, <u>unless</u> prescribed for CHF – these patients should take their am dose of diuretics.
ACE/ARB	Lisinopril/Lotrel/Captopril/Lotensin/ Monopril/ Prinzide/ Atacand/ Benicar/ Diovan/ Avalide / Losartan	Hold am of surgery, <u>unless</u> prescribed for CHF – these patients should take their am dose of meds.
Insulin	NPH, Regular	See Appendix E for recommendations regarding Insulin.
All Herbal and Alternative Supplements		Stop all Herbal/Alternative Supplements and preparations containing Vitamin E one week prior to surgery.

**\*In particular, it is very important for patients to take their am dosage of the following medications:**

- Beta blockers and any antiarrhythmics such as Digoxin or Calcium Channel blockers.
- Asthmatic medications including daily, rescue and as needed inhalers, Advair, Singulair and/or steroids.
- GERD medication
- Statins such as Lipitor, Zocor, Crestor, etc.
- Aspirin – unless specifically told by their surgeons, patients should continue to take their ASA, especially if they have cardiac stents.
- ACE/ARB – If prescribed as therapy for CHF, continue the morning of surgery. Alternatively, you should instruct the patient not to take these medications the morning of surgery and to bring the medication with them to the hospital in the prescription bottle.

**Please advise them to take these medications with a sip of water prior to coming to the hospital.**





## NPO Guidelines



### ADULT FASTING INSTRUCTIONS

### PLEASE READ BEFORE THE DAY OF PROCEDURE

Please note, patients are normally told to arrive 2 hours prior to their surgery start time. If you have not yet been given your surgery start time, please contact your surgeon's office.

Type of food	Examples	Latest time you can eat or drink
Clear Liquids    See Exceptions Below	Liquids you can see through: water, apple juice (no pulp), Gatorade®, black coffee or tea (with or without sugar or sweetener), <b>NO MILK, CREAM, HONEY OR ALCOHOL</b>	1 hour before you are told to arrive at the hospital  * You may only have a total of 20 ounces of clear liquids between midnight and 1 hour prior to your arrival   * You may only have 8 ounces of clear liquids in the last hour you are allowed to drink
ALL other foods and non-clear liquids  See Exceptions Below	All solid food, all liquids you are unable to see through, all candy, chewing gum and mints  	8 hours before you are told to arrive at the hospital 

**Exceptions:**

- Patients with **End Stage Kidney Disease**, scheduled for a **kidney transplant**, have **gastroparesis** (slow emptying of the stomach) or if you are **pregnant**- **CLEAR LIQUIDS MUST STOP SIX (6) HOURS BEFORE YOU ARE TOLD TO ARRIVE AT THE HOSPITAL**
- If you are having surgery under the **Enhanced Recovery After Surgery (ERAS)** protocol, please disregard these instructions and follow the instructions given to you by your surgeon.
- If your surgeon has instructed you to stay on a clear liquid diet prior to day of surgery, follow your surgeon's instructions and avoid all food and non-clear liquids.

If you have any questions, call the Preoperative Evaluation Center at 410-955-8533;  
Monday-Friday 7:30AM- 4:00PM



## APPENDICES

### Contents

Appendix A: Patient Evaluation Screening Form .....	10
Appendix B: Exclusionary Criterion for JHOC .....	11
Appendix C: OSA Screening .....	12
Appendix D: Diabetic Management.....	13
Appendix E: Insulin Names and Duration of Action .....	14
Appendix F: Pacemaker/AICD Guidelines.....	15
Appendix G: Patients with Cardiac Stents.....	16
Appendix H: Surgical Blood Order Schedule .....	17

## Appendix A: Patient Evaluation Screening Form



PATIENT IDENTIFICATION INFORMATION

DATE: \_\_\_\_\_ Patient Evaluation Screening Form

Please answer the following questions:			
1. Do you have sleep apnea; use CPAP or Bi-PAP and or told you need a "sleep study"?	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES	<input type="checkbox"/> NO
2. Do you have difficulty climbing stairs or walking 4 blocks? ➤ If YES, what stops you? (Check all that apply)	<input type="checkbox"/> YES <input type="checkbox"/> NO		
Chest pain <input type="checkbox"/> YES   Shortness of breath <input type="checkbox"/> YES   Pain <input type="checkbox"/> YES   Other:			
3. Do you have high blood pressure that requires three or more medications to manage?	<input type="checkbox"/> YES <input type="checkbox"/> NO		
4. Have you ever had a blood clot, stroke, carotid blockage or TIA (mini stroke)?	<input type="checkbox"/> YES <input type="checkbox"/> NO		
5. Are you currently taking blood thinners, such as Aspirin, Coumadin, Plavix, etc.?	<input type="checkbox"/> YES <input type="checkbox"/> NO		
6. Do you have problems with bleeding after surgical or dental procedures?	<input type="checkbox"/> YES <input type="checkbox"/> NO		
7. Do you have a history of liver disease or cirrhosis?	<input type="checkbox"/> YES <input type="checkbox"/> NO		
8. Have you ever had a heart attack, or problems with your heart?	<input type="checkbox"/> YES <input type="checkbox"/> NO		
9. Do you have diabetes that requires insulin treatment?	<input type="checkbox"/> YES <input type="checkbox"/> NO		
10. Have you had any problems with anesthesia other than nausea or vomiting? For example, difficult airway or awareness during surgery.	<input type="checkbox"/> YES <input type="checkbox"/> NO		
11. Do you have kidney problems (except for kidney stones or recurrent infections) that require treatment by a kidney specialist or are you on dialysis?	<input type="checkbox"/> YES <input type="checkbox"/> NO		
12. Are you pregnant or is there a chance you are pregnant?	<input type="checkbox"/> YES <input type="checkbox"/> NO		
13. Do you have or have you had any Implantable devices? ➤ If yes identify which device(s) below:	<input type="checkbox"/> YES <input type="checkbox"/> NO		
<input type="checkbox"/> Pacemaker/Defibrillator	<input type="checkbox"/> Cardiac Stent	<input type="checkbox"/> Ventricular Assist Device	<input type="checkbox"/> Insulin Pump
Year: _____	Year: _____		
14. Currently smoking 1 pack per day or more?	<input type="checkbox"/> YES <input type="checkbox"/> NO		
15. Current Alcohol: More than 2 drinks a day?	<input type="checkbox"/> YES <input type="checkbox"/> NO		
16. Current Recreational Drug use?	<input type="checkbox"/> YES <input type="checkbox"/> NO		

**To be completed by clinical staff:**

Any YES answers to the questions above indicate a patient requires a PEC visit;  
All NO answers to the questions above indicate no PEC visit is required.

**If the surgeon requires a PEC visit for another reason, please fill in the information below.**

**Surgeon Request:**

Patient to be scheduled for:  Anesthesiologist Consult  Pre Evaluation Center visit

**REASON:** \_\_\_\_\_

*Please indicate reason when requesting consult with anesthesiologist and or Pre Evaluation Center Appointment*

Surgeon/Designee: Name: \_\_\_\_\_ Date: \_\_\_\_\_

*(Please Print Clearly)*

## Appendix B: Exclusionary Criterion for JHOC

### These conditions preclude scheduling your outpatients in JHOC:

1. Inpatients are excluded; with the exception of those inpatients who will be discharged from the hospital prior to the OR procedure, and who will be discharged to home following their operative procedure.
2. Patients in whom there is a reasonable chance of requiring administration of blood products are excluded.
3. All ventilator dependent patients are excluded.
4. Patients with moderate to severe Pulmonary Hypertension (RVSP by echocardiogram 50mmHg or greater) are excluded.
5. Any case where the patient would require intra-operative invasive monitoring devices are excluded.
6. Patients with severe cardiac valvular heart disease, as defined by the American Heart Association, are excluded.
7. Patients with a Ventricular Assist Device (VAD) are excluded.
8. Patients receiving supplemental home oxygen therapy or who have a left ventricular ejection fraction (LVEF) <30% by echocardiogram may be scheduled if having very minor surgery; however must be seen in PEC for determination of appropriateness.
9. Patients less than 15 years of age, are excluded. However, exceptions may be made at the discretion of the Medical Director of Perioperative Services or designee, on a case by case basis, as special exceptions. Please refer to the "*Child Centered Care Guidelines*".
10. Patients with a BMI  $\geq$  50 are excluded.
11. Patients with OSA or those with a high risk of OSA will be allowed to be done in JHOC; however if a room air trial is not successful, these patients must be transported to the main hospital PACUs for extended recovery.

Updated, July 2015

## Appendix C: OSA Screening

**Have you ever been diagnosed with Obstructive Sleep Apnea (OSA) by undergoing a sleep study or Polysomnogram?** YES NO

If YES, were you prescribed a CPAP or a dental device? YES NO

If you answered YES to BOTH of the above, SKIP the following questionnaire. Otherwise, please answer the questions below

**Snoring?** YES NO

Do you **Snore Loudly** (louder than talking or loud enough to be heard through closed doors) ?

**Tired?** YES NO

Do you often feel **Tired, Fatigued, or Sleepy** during the daytime ?

**Observed?** YES NO

Has anyone **Observed** you **Stop Breathing** during your sleep ?

**Pressure?** YES NO

Do you have or are being treated for **High Blood Pressure** ?

**Body Mass Index more than 35 ?** YES NO

**Age older than 50 ?** YES NO

**Neck size large ?** YES NO

Do you have a **Neck that Measures** more than 16 inches / 40 cm around (measure at Adam's Apple)

**Gender = Male ?** YES NO

Low risk of OSA: Yes to 0-2 questions

Intermediate risk of OSA: Yes to 3-4 questions

High risk of OSA: Yes to 5-8 questions.

**STOP-BANG SCORE / 8**

CHECK if you have any of the following medical problems

- |   |   |
|---|---|
| <input type="checkbox"/> Asthma or COPD/Emphysema | <input type="checkbox"/> Atrial Fibrillation  |
| <input type="checkbox"/> Heart Failure            | <input type="checkbox"/> Peripheral Vascular Disease  |
| <input type="checkbox"/> History of stroke        | <input type="checkbox"/> Muscular dystrophy / Myasthenia  |
| <input type="checkbox"/> I currently smoke        | <input type="checkbox"/> I have had pain for $\geq 3$ months for which I take opioid medications at least every other day |

*Chung F et al. Anesthesiology 2008; 108: 812-821, and Chung F et al Br J Anaesth 2012; 108:768-775.*

## Appendix D: Diabetic Management

## General Considerations for the Diabetic Patient:

- Schedule insulin-dependent diabetic patients early in the day (by noon). If unable to schedule by noon, please have patient arrive at hospital by 9 am regardless of the time of their surgery.
- Have patients bring insulin medications to the facility.
- Preoperative evaluation may include the level of glycemic control, i.e. by blood glucose (BG) levels and glycosylated hemoglobin A1c. Patient's with an A1c >8.5% may benefit from further evaluation prior to elective surgery in an attempt to reduce surgical site infections.
- Optimal intraoperative BG level: 180 mg/dL or less.
- Have the patient take BG at bedtime; if > 180 mg/dL take insulin according to patient's individualized instructions<sup>2</sup>.
- Elective cases should be postponed in patients with fasting BG>400 mg/dl or in patients with significant complications of hyperglycemia such as severe dehydration, ketoacidosis, and hyperosmolar non-ketotic states<sup>1</sup>. Postponing elective cases is always up to the discretion of the provider.

Table 1 Pre-Operative Antidiabetic Guidelines\* 1,2,3

Type of Medication	DAY & EVENING BEFORE Surgery	MORNING of Surgery
<b>Oral Agents</b>	Continue all oral agents. *If the patient has renal dysfunction or is likely to receive IV contrast, you may want to discontinue metformin 24-48 hours prior to surgery. Hold metformin if undergoing bowel preparation.	Hold.
<b>Non-insulin injectable</b> Examples: Byetta (exenatide), Victoza (liraglutide)	Continue.	Hold.
<b>Short/rapid- acting Insulin</b> Examples: Novolog (Aspart), Humalog (Lispro), Apidra (Glulisine), Novolin R or Humulin R (Regular)	Maintain usual meal plan & insulin dose.	Hold.
<b>Intermediate-Acting Insulin</b> (taken twice daily) Examples: Novolin-N, Humulin-N (NPH)	Take usual morning dose and 75% of the usual evening dose.	Take 50% of the usual morning dose.
<b>Long-Acting Insulin</b> Examples: Lantus (Glargine), Levemir (Detemir)		
➤ Taken once daily in the morning	Take usual morning dose.	Take 50% of the usual morning dose.
➤ Taken once daily in the evening	Take 75% of the usual evening dose.	Do not take any insulin.
➤ Taken twice daily	Take usual morning dose and 75% of the usual evening dose.	Take 50% of the usual morning dose.
<b>Pre-Mixed Insulins</b> (e.g. 70/30; 75/25; 50/50) (taken twice daily)	Take usual morning dose and 75% of evening dose.	Take 50% of the usual morning dose.
<b>Insulin Pump</b>	Maintain usual meal plan & basal rate.	Maintain basal rate.

\*Developed in Conjunction with the Johns Hopkins Inpatient Diabetes Management Service

<sup>1</sup> Joshi GP, Chung F, Vann MA, et al. Society for Ambulatory Anesthesia consensus statement on perioperative blood glucose management in diabetic patients undergoing surgery. *Anesth Analg*; 2010; 111:1378-87.

<sup>2</sup> Joslin Diabetes Center and Joslin Clinic. Guideline for inpatient management of surgical and ICU patients (pre-, peri and postoperative care). 2009. Available at: [http://www.joslin.org/docs/Inpatient\\_Guideline\\_10-02-09.pdf](http://www.joslin.org/docs/Inpatient_Guideline_10-02-09.pdf)

<sup>3</sup> Sara M. Alexanian, Marie E. McDonnell, and Shamsuddin Akhtar. Creating a Perioperative Glycemic Control Program. *Anesthesiology Research and Practice*; Vol. 2011, Article ID 465974, 9 pages, 2011.

## Appendix E: Insulin Names and Duration of Action

Type of Insulin & Brand Names	Onset	Peak	Duration	Role in Blood Sugar Management
<b>Rapid-Acting</b>				
Lispro (Humalog)	15-30 min.	30-90 min.	3-5 hours	Rapid-acting insulin covers insulin needs for meals eaten at the same time as the injection. This type of insulin is often used with longer-acting insulin.
Aspart (Novolog)	10-20 min.	40-50 min.	3-5 hours	
Glulisine (Apidra)	20-30 min.	30-90 min.	1-2 ½ hours	
<b>Short-Acting</b>				
Regular ( R ) humulin or novolin	30 min-1 hour	2-5 hours	5-8 hours	Short-acting insulin covers insulin needs for meals eaten within 30-60 minutes.
Velosulin for use in the insulin pump)	30 min.-1 hour	2-3 hours	2-3 hours	
<b>Intermediate-Acting</b>				
NPH (N)	1-2 hours	4-12 hours	18-24 hours	Intermediate-acting insulin covers insulin needs for about half the day or overnight. This type of insulin is often combined with a rapid-or short-acting type.
<b>Long-Acting</b>				
Insulin glargine (Lantus)	1-1 ½ hours	No peak time. Insulin is delivered at a steady level.	20-24 hours	Long-acting insulin covers insulin needs for about one full day. This type is often combined, when needed, with rapid- or short-acting insulin.
Insulin detemir (Levemir)	1-2 hours	6-8 hours	Up to 24 hours	
<b>Pre-Mixed*</b>				
Humulin 70/30	30 min.	2-4 hours	14-24 hours	These products are generally taken two or three times a day before mealtime.
Novolin 70/30	30 min	2-12 hours	Up to 24 hours	
Novolog 70/30	10-20 min.	1-4 hours	Up to 24 hours	
Humulin 50/50	30 min.	2-5 hours	18-24 hours	
Humalog mix 75-25	15 min.	30 min-2 ½ hours	16-20 hours	
Premixed insulins combine specific amounts of intermediate-acting and short-acting insulin in one bottle or insulin pen. (The numbers following the brand name indicate the percentage of each type of insulin.)				

### Appendix F: Pacemaker/AICD Guidelines

- All patients with a Pacemaker or AICD **must be interrogated at JHH** prior to any surgical or interventional procedure requiring electrocautery. This means that minor procedures (like endoscopy, bronchoscopy, or other minor procedures) that do NOT use bovie are not required to be seen.
- Pacemakers must be interrogated **within 6 months** of the procedure date. AICDs must be interrogated **within 3 months** of the procedure date
- If the patient comes thru PEC, it is the responsibility of the Surgical MOC or OR Scheduler to arrange the Device Check for the day of the PEC appointment
- To schedule a device check, please follow these steps
  - Email the Device Clinic at [device-service@jhmi.edu](mailto:device-service@jhmi.edu)
  - Include in the body of the note:
    - Pt name and Hx#
    - DOS/Time/OR Venue
    - Name of manufacturer of device
    - Surgeon's name and contact information –the Device Clinic will get the cautery information from the surgeon's office directly
    - Indication for the device (if you know)
    - Your name and phone # in case they have any questions
- Once you email them, call them directly at 5-1143 to see if and when they may be able to accommodate the patient.
- If the OR date, time or venue changes after the interrogation has been completed, you must notify the Device Clinic (5-1143) of the changes.

## Appendix G: Patients with Cardiac Stents

### The Johns Hopkins Hospital Antiplatelet Bridging for Patients with Cardiac Stents

Cardiac stent patients on dual antiplatelet therapy (DAP - aspirin & antiplatelet agents) pose a clinical challenge during surgeries or invasive procedures. The risk of uncontrolled bleeding if DAP therapy is continued versus acute stent thrombosis if DAP is discontinued in the perioperative period presents a clinical dilemma. To help guide perioperative DAP therapy and improve clinical outcomes for patients with coronary stents, a JHH multidisciplinary task force has developed the following one-page decision support tool (please see below).

In addition, the Pre-operative Evaluation Center (PEC) has agreed to assist the attending providers with perioperative management of patients on DAP therapy. A mandatory field in ORMIS for documenting whether the patient has a coronary stent will be used to help facilitate the scheduling of pre-operative/pre-procedural PEC appointments for these patients. If the scheduled case will occur within one week of the posting, the PEC clinic coordinator should be called (410-283-3510) to facilitate a stent patient appointment.

If you would like someone from the task force to present the program goals and assist with staff education, please contact the task force chair, Sean Berenholtz, MD, MHS at [sberenho@jhmi.edu](mailto:sberenho@jhmi.edu). If you have questions regarding this information, please contact Steven Jones, MD, Cardiology ([sjones64@jhmi.edu](mailto:sjones64@jhmi.edu)); Michael Streiff, MD, Hematology ([mstreif@jhmi.edu](mailto:mstreif@jhmi.edu)), or Sean Berenholtz, MD, Anesthesiology and Critical Care Medicine ([sberenho@jhmi.edu](mailto:sberenho@jhmi.edu)).

#### Antiplatelet Bridging Tool for Patients with Cardiac Stents

1. Postpone Elective Procedures until minimum duration of dual antiplatelet therapy (DAP) is complete, unless DAP can be continued without interruption throughout the periprocedure period.

Minimum Duration Stent Implantation	
<b>Bare Metal Stent (BMS)</b>	<b>1 month</b>
<b>Drug Eluting Stent (DES)</b>	<b>12 months</b>

2. High Risk Stent Thrombosis: Consult cardiology and refer to PEC.

<u>Consult Cardiology and Refer to PEC 14 days prior to procedure for antiplatelet management for:</u>
Surgery required prior to minimum DAP (Bare Metal Stent < 1 month, Drug eluting stent < 12 months)
Any episodes of stent thrombosis

3. For urgent surgery or patient deemed high risk of thrombosis, consider intravenous antiplatelet bridge therapy (IV IIb/IIIa inhibitor) with Cardiology Consult.
4. If minimum antiplatelet duration met and patient does not have high risk factors above, stop antiplatelet according to the table below:

Antiplatelet	Maximum Holding Time
Clopidogrel	5 days
Prasugrel	7 days
Ticagrelor	5 days

5. Continue low-dose aspirin (81 mg) throughout the periprocedure period for all patients, except patients at high risk for bleeding.

High Bleed Risk- Aspirin may be held for maximum of 5 days
Intracranial Procedures
Posterior Chamber of eye
Spinal Canal
TURP, Cystoprostatectomy

6. Post-operative initiation of antiplatelet therapy should begin as soon as adequate hemostasis is achieved. Patients can be restarted on their home dual antiplatelet therapy. A loading dose of their antiplatelet can be considered.



## Appendix H: Surgical Blood Order Schedule

### SURGICAL BLOOD ORDER SCHEDULE

Cardiac Surgery	
Case Category	Rec
Heart or lung transplant	T/C 4U
Minimally invasive valve	T/C 4U
Revision sternotomy	T/C 4U
CABG/valve	T/C 4U
Open heart surgery	T/C 4U
Assist device	T/C 4U
Cardiac/major vascular	T/C 4U
Open ventricle	T/C 4U
CABG	T/C 2U
Cardiac wound surgery	T/C 2U
Percutaneous cardiac	T/C 2U
Pericardium	T/C 2U
Lead extraction	T/C 2U
AI/CD/pacemaker placement	T/S

General Surgery	
Case Category	Rec
AP resection	T/C 2U
Intra-abdominal GI	T/C 2U
Whipple or pancreatic	T/C 2U
Liver resection	T/C 2U
Retroperitoneal	T/C 2U
Substernal	T/C 2U
Bone marrow harvest	T/S
Hernia – Ventral/Incisional	T/S
Hernia – Inguinal/Umbilical	No Sample
Appendectomy	No Sample
Abdomen/chest/soft tissue	No Sample
Lap. or open cholecystectomy	No Sample
Thyroid/parathyroid	No Sample
Central venous access	No Sample
Any Breast – except w/flaps	No Sample

Gynecological Surgery	
Case Category	Rec
Uterus open	T/C 2U
Open pelvic	T/C 2U
Uterus/ovary	T/S
Total vaginal hysterectomy	T/S
Cystectomy robotic assisted	T/S
Cystoscopy	No Sample
External genitalia	No Sample
GYN cervix	No Sample
Hysteroscopy	No Sample
Superficial wound	No Sample

Neurosurgery	
Case Category	Rec
Thoracic/Lumbar/Sacral fusion	T/C 4U
Spine tumor	T/C 2U
Posterior cervical spine fusion	T/C 2U
Spine Incision and Drainage	T/C 2U
Intracranial tumor / aneurysm	T/C 2U
Laminectomy/discectomy	T/S
Spine hardware removal/biopsy	T/S
ACDF	No Sample
Extracranial	No Sample
Nerve procedure	No Sample
CSF/shunt procedure	No Sample

Obstetrics	
Case Category	Rec
Complex Cesarean (Accreta, Percreta, Previa, etc.)	T/C 4U
Repeat Cesarean	T/C 2U
Routine Primary Cesarean	T/S
Vaginal Delivery	T/S
D&C/D&E/Genetic Termination	T/S
Tubal Ligation	No Sample
Cerclage	No Sample

Orthopedic Surgery	
Case Category	Rec
Thoracic/Lumbar/Sacral fusion	T/C 4U
Pelvic orthopedic	T/C 4U
Open hip	T/C 2U
Femur open	T/C 2U
Above/below knee amputation	T/C 2U
Humerus open	T/S
Fasciotomy	T/S
Shoulder Incision & Drainage	T/S
Tibial/fibular	T/S
Total knee replacement	T/S
Shoulder open	T/S
Knee open	T/S
Thigh soft tissue	No Sample
Ortho external fixation	No Sample
Peripheral nerve/tendon	No Sample
Lower extremity I&D	No Sample
Hand orthopedic	No Sample
Upper extremity arthroscopy	No Sample
Upper extremity open	No Sample
Podiatry/Foot	No Sample
Hip closed/percutaneous	No Sample
Lower extremity arthroscopic	No Sample
Shoulder closed	No Sample
Tibial/fibular closed	No Sample

Otolaryngology Surgery	
Case Category	Rec
Laryngectomy	T/C 2U
Facial reconstruction	T/C 2U
Cranial surgery	T/C 2U
Radical neck dissection	T/C 2U
Carotid body tumor	T/C 2U
Mandibular surgery	T/S
Neck dissection	T/S
Mastoidectomy	No Sample
Parotidectomy	No Sample
Facial plastic	No Sample
Oral surgery	No Sample
Sinus surgery	No Sample
Thyroid/parathyroidectomy	No Sample
Suspension laryngoscopy	No Sample
Bronchoscopy	No Sample
Cochlear implant	No Sample
EGD	No Sample
External ear	No Sample
Inner ear	No Sample
Tonsillectomy/adenoidectomy	No Sample
Tympanomastoid	No Sample

Thoracic Surgery	
Case Category	Rec
Esophageal open	T/C 2U
Sternal procedure	T/C 2U
Chest wall	T/C 2U
Thoracotomy	T/C 2U
Pectus repair	T/C 2U
VATS	T/S
Mediastinoscopy	T/S
EGD/FOB	No Sample
Central venous access	No Sample

Urology	
Case Category	Rec
Cystoprostatectomy	T/C 2U
Urology open	T/C 2U
Nephrectomy	T/C 2U
Lap/Robotic kidney/adrenal	T/S
RRP	T/S
Percutaneous nephrolithotomy	T/S
Robotic RRP	No Sample
External genitalia/Penile	No Sample
TURP	No Sample
Cysto/ureter/urethra	No Sample
TURBT	No Sample

Vascular/Transplant Surgery	
Case Category	Rec
Liver transplant	T/C 15U
Thoracoabdominal aortic	T/C 15U
Major liver resection	T/C 4U
Major vascular	T/C 4U
Exploratory lap. vascular	T/C 4U
Kidney pancreas transplant	T/C 2U
Major endovascular	T/C 2U
Above/below knee amputation	T/C 2U
Nephrectomy/kidney transplant	T/C 2U
Organ procurement	T/C 2U
Peripheral vascular	T/C 2U
Vascular wound I and D	T/C 2U
Carotid vascular	T/S
AV fistula	T/S
Peripheral endovascular	T/S
Angio/Arteriogram	No Sample
Peripheral wound I&D	No Sample
1st rib resection/thoracic outlet	No Sample
Superficial or skin	No Sample
Foot/toe amputation/debride	No Sample
Central venous access	No Sample

**If the procedure you are looking for is not on this list then choose the procedure that most closely resembles that procedure.**

**\*Emergency Release blood is available for ALL cases and carries a risk of minor transfusion reaction of 1 in 1,000 cases.**