**Appendix 1**

**Calculating an Insulin Dose**

* Insulin-to-Carbohydrate (I:C) Ratio : The ratio of insulin a patient will administer per gram of carbohydrate consumed. An I:C ratio of 1:10 means that 1 unit of insulin will be given per 10 grams of carbohydrate. Note that D5% fluids contain 5g of dextrose per 100mL of fluid.
* Correction Factor (CF) or Insulin Sensitivity Factor (ISF): The expected decrease in blood glucose (BG) after administering 1 unit of insulin. A CF of 50 means that 1 unit of insulin is expected to decrease the BG by 50mg/dL. For example, if a patient has a current BG of 300mg/dL, a target BG of 150mg/dL and a CF of 50, then 3 units of insulin should be administered to lower the BG by 150mg/dL to target range.
* Both the I:C and CF or ISF are patient-specific and should be documented in previous endocrinology notes or obtained from the patient prior to the procedure. If the CF or ISF is not available from the patient records, it can be approximated by dividing 1500 by the patient’s average total daily dose (TDD) of insulin in the prior week. For example, if the patient’s average TDD of insulin is 50 units, the CF is (1500 ÷ 50) = 30.
* Insulin requirements may be altered perioperatively due to fasting, nausea, stress, pain and/or inactivity. The patient’s usual I:C ratio and CF should be used to determine initial subcutaneous insulin dosing, but subsequent adjustments may be required due to these factors.

**Appendix 2**

**Continuous Subcutaneous Insulin Infusion (CSII, insulin pump) and Continuous Glucose Monitoring (CGM)**

* Preoperatively, patients with insulin pumps should be instructed to place the infusion cannula site outside the surgical field, avoiding dependent/pressure areas. Ideally, the site should be changed within 3 days preoperatively to minimize risk of intraoperative malfunction.17
* Before initiating anesthesia, a competent caregiver or trained diabetes care provider must confirm the pump is functioning properly and the site is intact,17,30 and review pump settings with the anesthesia team.
* If insulin pump therapy is suspended perioperatively, the pump should be physically removed from the patient and an intravenous insulin infusion started.
* The use of insulin pumps in certain clinical scenarios varies by manufacturer. In general, the following recommendations have been made:
  + Radiology:17,30
    - Insulin pumps must be removed for magnetic resonance imaging (MRI).
    - Due to concern for device dysfunction with ionizing radiation, manufacturers recommend removal of the device for computed tomography (CT) and nuclear medicine scans, cardiac catheterization (with ionizing radiation) or automated implantable cardioverter defibrillator (AICD)/pacemaker implantation, and therapeutic radiation oncology.
    - If the pump remains on the patient for X-ray or fluoroscopy, it should be out of the direct radiation field and covered with a lead apron.
  + Electrocautery:17,30
    - Pumps have been used safely in the presence of electrocautery. However, there is theoretical risk of pump malfunction or burns to the patient, especially if the patient uses an infusion set with a metal needle. Confirm pump has a plastic (not metal) infusion needle preoperatively. For patients with metal infusion sets, consult institutional policy regarding continued use of the insulin pump for minor procedures.
    - Position the pump as far as possible from surgical and/or electrocautery site to minimize risk of pump malfunction due to diathermy.
* CGMs should not be worn in the setting of MRI, CT, or high-frequency electrical heat (diathermy) treatment, such as electrocautery. They have not all been tested in these settings.

**Appendix 3**

**Hypoglycemia Management**

* Hypoglycemia requires treatment when blood glucose (BG) is <70 mg/dL or if the patient is symptomatic.10
* Every effort should be made to treat hypoglycemia with additional dextrose, rather than discontinuing basal insulin. Basal insulin (subcutaneous insulin pump or intravenous insulin infusion) can be suspended, if necessary, for no more than 30 minutes,12 but should be restarted as soon as possible to prevent ketosis.
* If intravenous access is established, administer 2 mL/kg of 10% dextrose in normal saline (D10%NS) intravenously followed by D10%NS at the patient’s maintenance rate.
* Preoperatively, oral sugar-containing clear fluids can be given if time to surgery is greater than 2 hours, or if no alternative is available.
* Postoperatively, consider oral sugar-containing fluids, oral glucose gel or glucose tablets for hypoglycemia if the patient can tolerate oral intake.
* Hypoglycemia treatment should raise BG by approximately 50-70 mg/dL. Approximately 9 grams of sugar is needed for a 30 kg child and 15 grams for a 50 kg child (0.3 grams/kg).10 1 ounce of 100% fruit juice typically contains 3-5 grams.
* For severe hypoglycemia (BG <60 mg/dL and/or neurologic impairment) without intravenous access, give glucagon intramuscularly (0.5mg for patients < 25kg; 1mg for patients > 25kg).10 Intranasal glucagon (Baqsimi™), 3 mg irrespective of weight, has recently been approved for use in children ages four years and above.38
* Recheck BG every 15 minutes until >100 mg/dL.10