Adult Peri-Operative Glucose Management

**Preparation**

- Patient with any of the following criteria:
  - Type 1 diabetes mellitus (DM)
  - On insulin pump
  - History of total pancreatectomy
  - Using U-500 insulin or on > 100 units of insulin daily and hemoglobin A1c > 8.5%
  - History of diabetic ketoacidosis (DKA)
  - On systemic steroids with NEW onset hyperglycemia (glucose > 200 mg/dL)
  - New onset hyperglycemia in a patient on immune-checkpoint inhibitor therapy

- Patients with or without known Type 2 DM:
  - Hemoglobin A1c ≥ 10% or
  - Random glucose ≥ 300 mg/dL

- Patient with known Type 2 DM or known steroid induced diabetes, and surgery planned < 1 month away:
  - Hemoglobin A1c 8% - 9.9% or
  - Random glucose 180 mg/dL - 299 mg/dL

- Patient without known Type 2 DM, and surgery planned < 1 month away:
  - Hemoglobin A1c 6.5% - 9.9% or
  - Random glucose 180 mg/dL - 299 mg/dL

- Patient with or without known Type 2 DM, and surgery planned ≥ 1 month away:
  - Hemoglobin A1c 6.5% - 9.9% or
  - Fasting glucose > 125 mg/dL or
  - Random glucose 180 mg/dL - 299 mg/dL

**Guidelines for Pre-operative Referrals**

- **Presenting**
  - Refer to Endocrinology-Diabetes Service as soon as possible before surgery
  - Document anticipated date of surgery in comments section of referral
  - For urgent referral or for any patient that needs to be seen by Endocrinology-Diabetes Service within 1 week:
    - Enter order for urgent referral and select “1st on call - Outpatient Diabetes Consults Day” and
    - Page “Endocrinology-Diabetes consult-Outpatient” via the on-call system

- **Consulting**
  - Consult Endocrinology-Diabetes Service urgently:
    - Enter order for Endocrinology-Diabetes Service referral
    - Call “Endocrinology-Diabetes Outpatient Diabetes Consult Day” via on-call system and request same-day diabetes consultation
    - Refer to POEM-IM to evaluate and adjust/optimize therapy
      - POEM-IM to determine if referral to Endocrinology-Diabetes Service and diabetes educator is indicated

- **Disposition**
  - Refer to outpatient Consultative Medicine (General Internal Medicine)

**Note:** This algorithm is intended for operative procedures in the Main and/or Mays operating rooms.

POEM = Peri-Operative Evaluation and Management
POEM-IM = Peri-Operative Evaluation and Management-Internal Medicine
Adult Peri-Operative Glucose Management

Measurement and Management of Hyperglycemia in the Pre-operative Area

**PRESENTATION**

<table>
<thead>
<tr>
<th>Patient with any of the following criteria:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- History of DM</td>
</tr>
<tr>
<td>- No history of DM but hemoglobin A1c ≥ 6.5%</td>
</tr>
<tr>
<td>- BMI &gt; 35 kg/m²</td>
</tr>
<tr>
<td>- Has been receiving steroids preoperatively</td>
</tr>
</tbody>
</table>

**DISPOSITION**

- Cancel the case
- Transport symptomatic patients and all patients with Type 1 DM to ACCC for further management
- Provide handoff to the ACCC health care providers
- Patient with Type 2 DM or new onset hyperglycemia, refer to the Endocrine-Diabetes Service for same day visit

**POC glucose > 400 mg/dL**

**POC glucose 351-400 mg/dL**

See Page 3

**POC glucose 251-350 mg/dL**

See Page 4

**POC glucose > 250 mg/dL**

Yes

No

Proceed to surgery

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**Note:** This algorithm is intended for operative procedures in the Main and/or Mays operating rooms.

**BMI = body mass index**

**POC = point of care**

**ACCC = Acute Cancer Care Center**

1 Refer to Hand-Off Communication Policy (#CLN0513)
**Adult Peri-Operative Glucose Management**

**Measurement and Management of Hyperglycemia in the Pre-operative Area**

**PRESENTATION**

POC glucose 351-400 mg/dL

- Compelling reason to proceed with the case?
  - Yes: Obtain basic metabolic metabolic (BMP)\(^2\) prior to procedure
  - Delay the case for results
  - No: Reschedule the case
  - Obtain BMP\(^2\)

**DISPOSITION**

Is surgery a medical emergency?\(^3\)

- Yes: Transport patient to ACCC for further management and provide handoff to the ACCC health care providers\(^5\)
- No: Counsel patient on increased risk of complications, including poor wound healing and surgical site infection
  - Document patient’s understanding and willingness to proceed with surgery in the EHR
  - Start insulin infusion and proceed with surgery\(^6\)

**POC glucose 351-400 mg/dL**

- Does patient have bicarbonate < 18 mEq/L \(\text{and} \) anion-gap > 12\(^3,4\)?
  - Yes: Urgent outpatient same day referral to Endocrinology-Diabetes Service:
    - Place consultation request in EHR
    - Specify reschedule date in consult note
    - Call “Endocrinology-Diabetes Outpatient Diabetes Consult Day” via on-call system and request same-day diabetes consultation
  - No: Reschedule the case

1. Joint discussion to be held between anesthesia and surgical teams regarding medical urgency of the planned procedure
2. i-STAT or sent to lab
3. If patient has an anion gap > 12 [anion gap = sodium – (chloride + bicarbonate)] without a metabolic acidosis (bicarbonate < 18 mEq/L) \(\text{or} \) a normal anion gap metabolic acidosis (bicarbonate < 18 mEq/L and anion gap ≤ 12), DKA is not likely and other etiologies should be evaluated based on patient risk factors
4. If anion-gap metabolic acidosis based on i-STAT results, send STAT BMP to lab for confirmation
5. Refer to Hand-Off Communication Policy (#CLN0513)
6. Post-operative management:
   - For patients admitted to inpatient care
     - Initiate post-operative glucose management (see Inpatient Hyperglycemia - Adult algorithm)
     - Consult inpatient Endocrinology-Diabetes Service
   - Ambulatory surgery patients should be referred to primary care provider or outpatient Endocrinology-Diabetes Service as indicated
**Measurement and Management of Hyperglycemia in the Pre-operative Area**

**PRESENTATION**

Known history of DM?

- **Yes**
  - Consider rescheduling surgery

- **No**
  - Patient symptomatic? [1, 2]
    - **Yes**
      - Start insulin infusion and proceed with surgery [5]
    - **No**
      - Is rescheduling an option? [3, 4]
        - **Yes**
          - See Box A
        - **No**

**DISPOSITION**

Is surgery a medical emergency? [5]

- **Yes**
  - Counsel patient on increased risk of complications, including poor wound healing and surgical site infection
  - Document patient’s understanding and willingness to proceed with surgery in the EHR
  - Start insulin infusion and proceed with surgery [7]

- **No**
  - Transport patient to ACCC for further management and [6]
  - Provide handoff to the ACCC health care providers

Urgent outpatient same day referral to Endocrinology-Diabetes Service:

- Enter consultation request
  - Specify reschedule date in consult note
- Call “Endocrinology-Diabetes Outpatient Diabetes Consult Day” via on-call system and request same-day diabetes consultation

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1. Patient symptomatic with polyuria, polydypsia, nausea/vomiting
2. i-STAT or sent to lab
3. If patient has an anion gap > 12 [anion gap = sodium – (chloride + bicarbonate)] without a metabolic acidosis (bicarbonate < 18 mEq/L) or a normal anion gap metabolic acidosis (bicarbonate < 18 mEq/L and anion gap ≤ 12), DKA is not likely and other etiologies should be evaluated based on patient risk factors
4. If anion-gap metabolic acidosis based on i-STAT results, send STAT BMP to lab for confirmation
5. Joint discussion to be held between anesthesia and surgical teams regarding medical urgency of the planned procedure
6. Refer to Hand-Off Communication Policy (#CLN0513)
7. Post-operative management:
   - For patients admitted to inpatient care
     - Initiate post-operative glucose management (see Inpatient Hyperglycemia - Adult algorithm)
SUGGESTED READINGS


Adult Peri-Operative Glucose Management

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