Peri-Procedure Management of Patients on Sodium-glucose cotransporter-2 (SGLT-2) Inhibitors

Disclaimer: This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson’s specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient’s care. This algorithm should not be used to treat pregnant women.

Note: Patients on SGLT-2 inhibitors have an increased risk of euglycemic (glucose < 250 mg/dL) and hyperglycemic diabetic ketoacidosis (DKA) during the peri-procedure period.

PRESENTATION

Patient on SGLT-2 inhibitor and requiring surgical procedure or colonoscopy

ASSESSMENT

Was SGLT-2 inhibitor held? Yes

Proceed with procedure

No

Is the procedure urgent or emergent? Yes

Obtain basic metabolic panel (i-STAT or sent to lab) prior to procedure

No

Does patient have anion-gap metabolic acidosis? Yes

Consult Endocrinology-Diabetes and discuss risk of euglycemic DKA and need for further evaluation

No

EVALUATION

Proceed with procedure?

Yes

No

● Reschedule procedure

● See Appendix A for SGLT-2 inhibitor hold recommendations

See Page 2 for Management Post-Procedure

● Transport patient to ACCC for further assessment and management

● Provide handoff to the ACCC health care providers

ACCC = Acute Cancer Care Center

1 There are insufficient data to make recommendations regarding the need to hold SGLT-2 inhibitors for procedures other than scheduled surgery or colonoscopy

2 See Appendix A for SGLT-2 inhibitor hold recommendations

3 Anion-gap metabolic acidosis defined as bicarbonate < 18 mEq/L and anion gap > 12 [anion gap = sodium – (chloride + bicarbonate)]

4 If anion-gap metabolic acidosis based on i-STAT results, send STAT basic metabolic panel to lab for confirmation

5 Consult the inpatient Endocrinology-Diabetes Team A by the on-call system with direct provider to provider communication

6 Refer to the Hand-Off Communication Policy (MD Anderson Institutional Policy # CLN0513)
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ASSESSMENT

Obtain basic metabolic panel (i-STAT or sent to lab) after procedure

Does patient have anion-gap metabolic acidosis\(^1,2\)?

- Yes
  - Consult Endocrinology-Diabetes\(^3\)
  - Admit patient as indicated

- No
  - Planned admission post-procedure?
    - Yes
      - Consult Endocrinology-Diabetes\(^3\)
    - No

INTERVENTIONS/FOLLOW UP

- Initiate post-operative glucose management (see Inpatient Hyperglycemia – Adult algorithm)
- When patient resumes a carbohydrate containing diet\(^4\) and meets all other clinical criteria for discharge, patient can be discharged to home
- Instruct patient to resume SGLT-2 inhibitor the day after discharge

EVALUATION

Will patient resume carbohydrate containing diet on the day of procedure?

- Yes
  - When patient resumes a carbohydrate containing diet and meets all other clinical criteria for discharge, patient can be discharged to home
  - Instruct patient to resume SGLT-2 inhibitor the day after discharge

- No
  - Follow routine post-operative glucose management

\(^1\) Anion-gap metabolic acidosis defined as bicarbonate < 18 mEq/L and anion gap > 12 [anion gap = sodium – (chloride + bicarbonate)]

\(^2\) If anion-gap metabolic acidosis based on i-STAT results, send STAT basic metabolic panel to lab for confirmation

\(^3\) Consult the inpatient Endocrinology-Diabetes Team A by the on-call system with direct provider to provider communication

\(^4\) Carbohydrate containing diet includes enteral nutrition and/or total parenteral nutrition delivered at a goal rate
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**PRESENTERATION**

Post partial pancreatectomy and/or Whipple procedure and NOT able to resume a carbohydrate containing diet

- Obtain C Peptide and glucose on post-operative day 2 or 3

**ASSESSMENT**

- When patient meets all other clinical criteria for discharge, patient can be discharged to home
- Repeat C Peptide and glucose 1 to 2 weeks post discharge
- Consult Endocrinology-Diabetes for recommendations on restarting SGLT-2 inhibitors

- Is C Peptide ≥ 1 ng/mL?
  - Yes
    - Is glucose ≥ 150 mg/dL?
      - Yes
        - Consult Endocrinology-Diabetes for recommendations on restarting SGLT-2
      - No
        - See Box A on this page
  - No
    - Is glucose ≥ 150 mg/dL?
      - Yes
        - Consult Endocrinology-Diabetes for recommendations on restarting SGLT-2
      - No
        - Restart SGLT-2 inhibitors if indicated

- Obtain post prandial C Peptide and glucose

**TREATMENT/FOLLOW-UP**

- Is glucose ≥ 150 mg/dL?
  - Yes
    - Consult Endocrinology-Diabetes for recommendations on restarting SGLT-2
  - No
    - Do not restart SGLT-2 inhibitors
      - Refer to treating primary care physician (PCP)/endocrinologist to re-evaluate use of SGLT-2 inhibitor

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1 Carbohydrate containing diet includes enteral nutrition and/or total parenteral nutrition delivered at a goal rate.

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APPENDIX A: SGLT-2 Inhibitors and Recommended Hold Times

**Note:** Holding SGLT-2 inhibitors prior to surgery increases the risk for hyperglycemia.
- During the period when SGLT-2 inhibitors are held, it is essential that patients monitor their blood glucose prior to breakfast (fasting) and at bedtime (2 times daily).
- Patients should be instructed to contact their procedural/surgical team and treating primary care physician (PCP)/endocrinologist IMMEDIATELY for any glucose value > 250 mg/dL.
- If a patient is either unable to reach the treating PCP/endocrinologist or the PCP/endocrinologist is uncomfortable with management, an URGENT Endocrinology-Diabetes referral should be placed. For urgent Endocrinology-Diabetes referrals, page the outpatient team through the on-call system.

<table>
<thead>
<tr>
<th>Require holding for 3 days (72 hours)</th>
<th>Require holding for 4 days (96 hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Canagliflozin (Invokana®)</td>
<td>- Ertugliflozin (Steglatro™)</td>
</tr>
<tr>
<td>- Canagliflozin/metformin (Invokamet®)</td>
<td>- Ertugliflozin/metformin (Segluromet™)</td>
</tr>
<tr>
<td>- Canagliflozin/metformin XR (Invokamet® XR)</td>
<td>- Ertugliflozin/sitagliptin (Steglujan™)</td>
</tr>
<tr>
<td>- Dapagliflozin (Farxiga®)</td>
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<tr>
<td>- Dapagliflozin/metformin XR (Xigduo®)</td>
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<tr>
<td>- Dapagliflozin/metformin XR (Xigduo® XR)</td>
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<tr>
<td>- Dapagliflozin/saxagliptin (Qtern®)</td>
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<tr>
<td>- Dapagliflozin/saxagliptin/metformin (Qternmet® XR)</td>
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<tr>
<td>- Empagliflozin (Jardiance®)</td>
<td></td>
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<tr>
<td>- Empagliflozin/metformin (Synjardy®)</td>
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<tr>
<td>- Empagliflozin/metformin XR (Synjardy® XR)</td>
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<td>- Empagliflozin/linagliptin (Glyxambi®)</td>
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<tr>
<td>- Empagliflozin/linagliptin/metformin XR (Trijardy® XR)</td>
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</tbody>
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1 All SGLT-2 inhibitors are non-formulary
SUGGESTED READINGS


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DEVELOPMENT CREDITS

This practice consensus statement is based on majority opinion of the Peri-Procedure Management of Patients on SGLT-2 work group at the University of Texas MD Anderson Cancer Center for the patient population. These experts included:

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