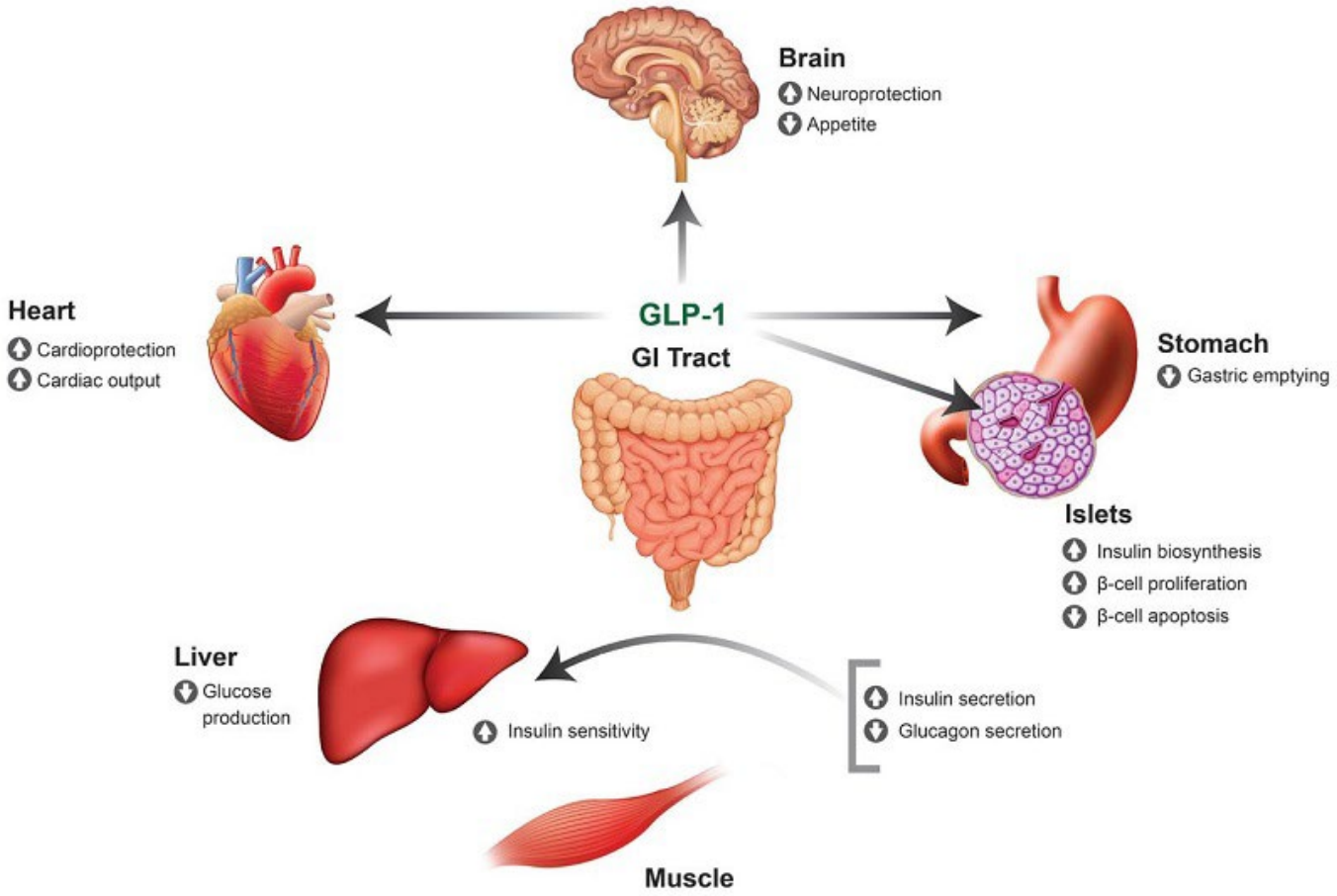
Perioperative Medication Management: GLP1s, SGLT2s, Anticoagulation

JONATHAN NESFEDER, DO

Objectives

- Review guidance on perioperative management of GLP1 receptor agonists
- Review guidance on perioperative management of SGTL2 inhibitors
- Review guidance on perioperative management of anticoagulation

GLP1 receptor agonists


Brain
Neuroprotection
Appetite
Heart
Cardioprotection
Cardiac output
GLP-1
GI Tract
Stomach
Gastric emptying
Islets
Insulin biosynthesis
β-cell proliferation
β-cell apoptosis
Liver
Glucose production
Insulin sensitivity
Insulin secretion
Glucagon secretion
Muscle

American Society of Anesthesiologists (June 2023)

On GLP1 RAs: The evidence to provide guidance for preoperative management of these drugs to prevent regurgitation and pulmonary aspiration of gastric contents is sparse limited only to several case reports.

Nevertheless, given the concerns of GLP-1 agonist-induced delayed gastric emptying and associated high risk of regurgitation and aspiration of gastric contents, the task force suggests the following for elective procedures.

GIRISH P. JOSHI, M.B.B.S., M.D., BASEM B. ABDELMALAK, M.D., WADE A. WEIGEL, M.D., SULPICIO G. SORIANO, M.D., MONICA W. HARBELL, M.D., CATHERINE I. KUO, M.D., PAUL A. STRICKER, M.D., KAREN B. DOMINO, M.D., M.P.H., AMERICAN SOCIETY OF ANESTHESIOLOGISTS (ASA) TASK FORCE ON PREOPERATIVE FASTING
HTTPS://WWW.ASAHQ.ORG/ABOUT-ASA/NEWSROOM/NEWS-RELEASES/2023/06/AMERICAN-SOCIETY-OF-ANESTHESIOLOGISTS-CONSENSUS-BASED-GUIDANCE-ON-PREOPERATIVE

American Society of Anesthesiologists (June 2023)

Prior to the Procedure:

- Consider holding daily GLP1 agonists on the day of surgery
- Consider holding weekly GLP1s a week prior to surgery

Day of the Procedure:

- If GI symptoms such as severe nausea/vomiting/retching, abdominal bloating, or abdominal pain are present, consider delaying elective procedure
- There is no evidence to suggest the optimal duration of fasting for patients on GLP-1 agonists

GIRISH P. JOSHI, M.B.B.S., M.D., BASEM B. ABDELMALAK, M.D., WADE A. WEIGEL, M.D., SULPICIO G. SORIANO, M.D., MONICA W. HARBELL, M.D., CATHERINE I. KUO, M.D., PAUL A. STRICKER, M.D., KAREN B. DOMINO, M.D., M.P.H., AMERICAN SOCIETY OF ANESTHESIOLOGISTS (ASA) TASK FORCE ON PREOPERATIVE FASTING
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ASA Recommendation - Evidence

Kobori et al conducted a single center matched-pair case-control study of Japanese patients with diabetes on GLP1 therapy undergoing elective endoscopy that demonstrated association of GLP1 use and increased gastric residual

- Single center observational study
- Total number of patients with high gastric residual was low
- How generalizable?

ASA Recommendation - Evidence

Silveira et al performed a multicenter retrospective observational study of 404 elective EGD/EGD+cscopes for patients on semaglutide primarily for weight loss. Divided into two groups – had/had not taken their semaglutide in the last **-** days.

- Semaglutide use was associated with increased residual gastric contents – 24.2% in SG vs 5.1% in the NSG
- Even more highly if GI symptoms were reported
- Interestingly, a **protective** effect was found in patients undergoing EGD AND colonoscopy
- Only 1 case of pulmonary aspiration was reported

RELATIONSHIP BETWEEN PERIOPERATIVE SEMAGLUTIDE USE AND RESIDUAL GASTRIC CONTENT: A RETROSPECTIVE ANALYSIS OF PATIENTS UNDERGOING ELECTIVE UPPER ENDOSCOPY. SILVEIRA ET AL. JOURNAL OF CLINICAL ANESTHESIA. 87 (2023)

ASA Recommendation - Evidence

A 42-yr-old patient with Barrett's esophagus underwent repeat EGD – he had started semaglutide 2 months prior – and significant gastric residual was noted during the procedure. Intraoperative pulmonary aspiration occurred requiring bronchoscopy for removal of food remains. He remained asymptomatic 4 hours post procedure.

KLEIN SR, HOBAI IA. SEMAGLUTIDE, DELAYED GASTRIC EMPTYING, AND INTRAOPERATIVE PULMONARY ASPIRATION: A CASE REPORT. CAN J ANESTH. 2023.

ASA Recommendation - Evidence

Friedrichsen et al performed a double-blind parallel group trial with 72 adults with obesity randomized to semaglutide 2.4mg weekly or placebo for 20 weeks. When evaluated at 20 weeks, those on semaglutide did NOT demonstrate increased gastric emptying.

Nauck et al demonstrated that there may be rapid tachyphylaxis to the decreased gastric emptying action of GLP1 agonism in 2011 (“reaches full expression after several weeks or months”)

FRIEDRICHSEN M, BREITSCHAFT A, TADAYON S, WIZERT A, SKOVGAARD D: THE EFFECT OF SEMAGLUTIDE 2.4 MG ONCE WEEKLY ON ENERGY INTAKE, APPETITE, CONTROL OF EATING, AND GASTRIC EMPTYING IN ADULTS WITH OBESITY. DIABETES ONES METAB 2021; 23: 754-62.
NAUCK MA, KEMMERIES G, HOLST JJ, MEIER JJ. RAPID TACHYPHYLAXIS OF THE GLUCAGON-LIKE PEPTIDE 1-INDUCED DECELERATION OF GASTRIC EMPTYING IN HUMANS. DIABETES 2011; 60: 1561-5.
NAUCK MA, QUAST DR, WEFERS J, MEIER JJ. GLP-1 RECEPTOR AGONISTS IN THE TREATMENT OF TYPE 2 DIABETES – STATE-OF-THE-ART, MOLECULAR METABOLISM, VOLUME 46, 2021.

ASA Recommendation - … Evidence?

One study of Japanese patients with diabetes

- GLP1s associated with increased gastric residual

One study of Brazilian and Canadian patients with primarily obesity

- SG associated with increased gastric residual, moreso with GI symptoms, and bowel prep was protective

There is probably some increased risk of increased gastric residuals – but in whom?

- Depending on indication?
- Complications of diabetes?
- Chronicity of treatment?
- Duration of action of the GLP1 RA?

What are others saying? (CPOC)

"GLP-1 receptor agonists should be taken as normal the day prior to surgery"

"Following the press release from the American Society of Anesthesiologists on 29th June 2023 regarding the potential effects of GLP-1 Receptor Agonists on gastric emptying, this monograph is currently under review."

What are others saying? (AGA et al)

"No data to support stopping GLP-1 agonists prior to elective endoscopy"

"AGA, AASLD, ACG, ASGE and NASPGHAN recognize that … GLP-1 receptor agonists … may be associated with delayed gastric emptying .. we also acknowledge that there is little, or no data related to the relative risk of complications from aspiration."

HTTPS://GASTRO.ORG/NEWS/GI-MULTI-SOCIETY-STATEMENT-REGARDING-GLP-1-AGONISTS-AND-ENDOSCOPY/

What are others saying? (CAS)

For patients taking GLP-1s, consider holding drug for at least three half lives – for semaglutide this would be three weeks

Prolongation of the fasting time is unlikely to be required (or reasonable)

If GLP-1 cannot be held for at least three half-lives, consider performing rapid sequence induction if general anesthesia is required

Consider the use of point-of-care gastric ultrasound to assess the volume and character of any residual volume in the stomach

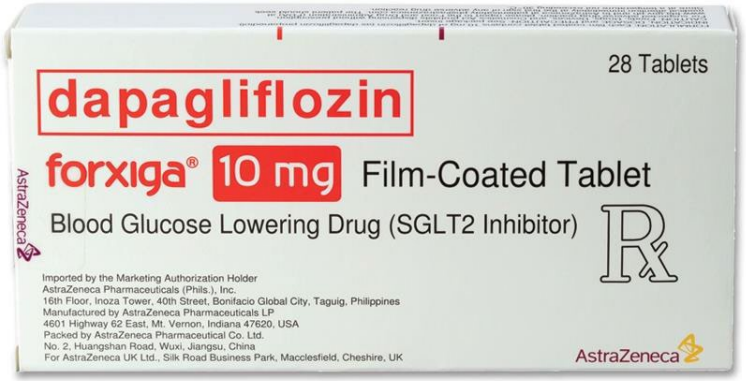
CANADIAN ANESTHESIOLOGISTS' SOCIETY
JONES, P.M., HOBAI, I.A. & MURPHY, P.M. ANESTHESIA AND GLUCAGON-LIKE PEPTIDE-1 RECEPTOR AGONISTS: PROCEED WITH CAUTION!. CAN J ANESTH/J CAN ANESTH 70, 1281–1286 (2023).

What is Tower saying?

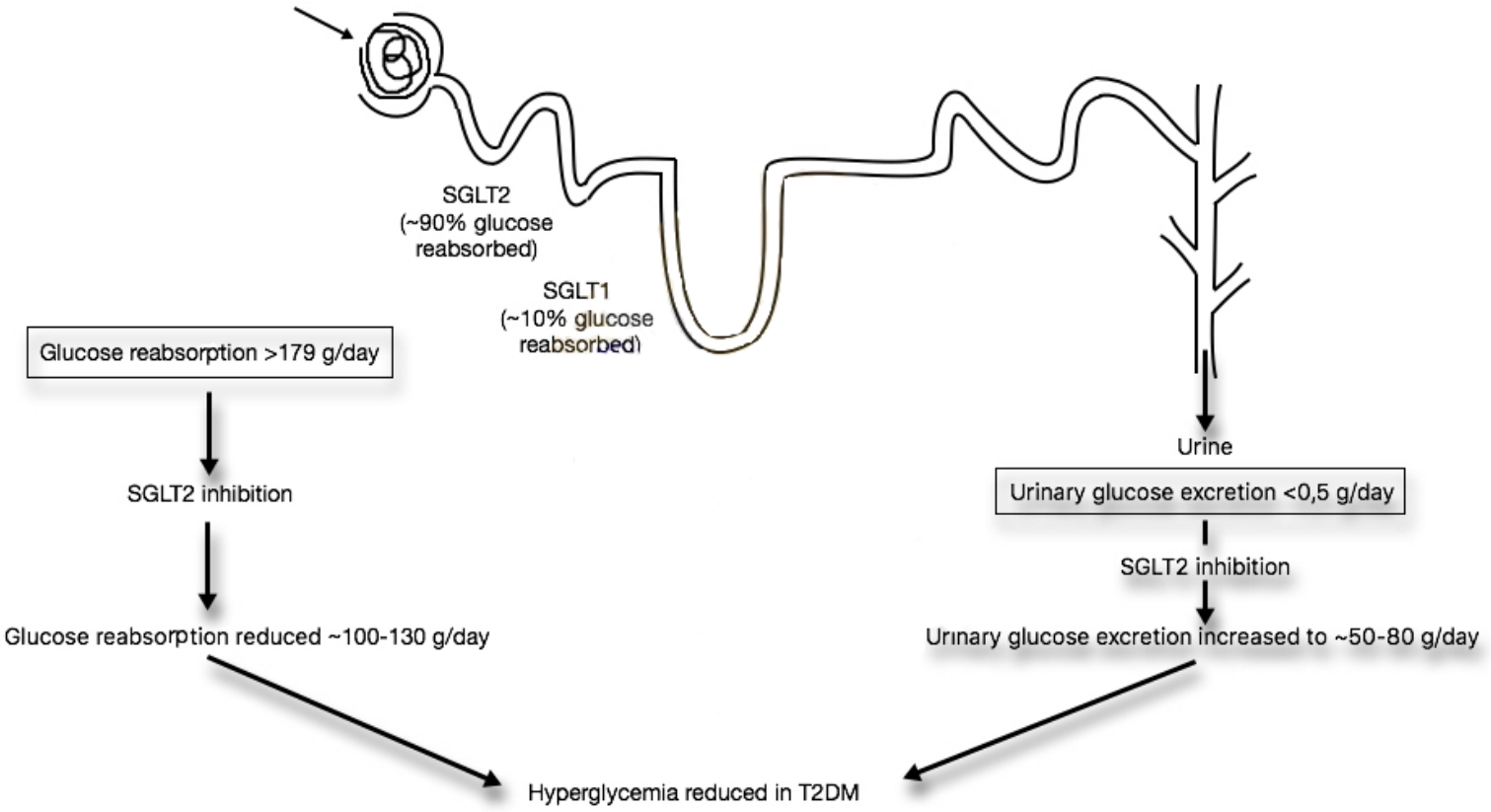
In light of mounting data demonstrating a significant increase in the percentage of patients on GLP1's with high residual gastric volumes presenting for elective EGD, we agree with the ASA recommendations pending further literature (August 2023)

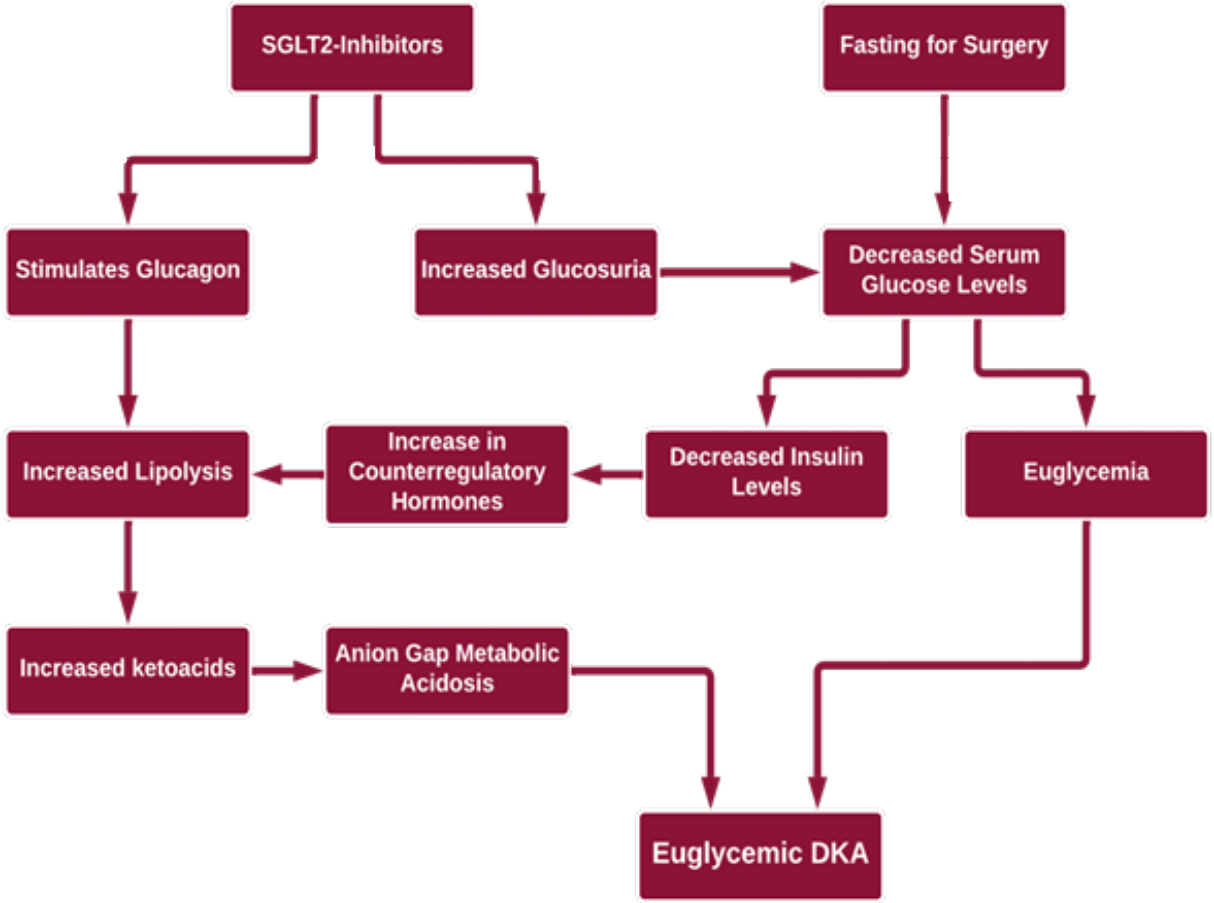
If GLP1 is not held, the surgical/procedural/anesthesia team will determine timing and management of the patient's care

Precautionary Principle



SGLT2 inhibitors


SGLT2
(~90% glucose
reabsorbed)
SGLT1
(~10% glucose
reabsorbed)
Glucose reabsorption >179 g/day
SGLT2 inhibition
Glucose reabsorption reduced ~100-130 g/day
Urine
Urinary glucose excretion <0,5 g/day
SGLT2 inhibition
Urinary glucose excretion increased to ~50-80 g/day
Hyperglycemia reduced in T2DM


SGLT2-Inhibitors
Fasting for Surgery
Stimulates Glucagon
Increased Glucosuria
Decreased Serum Glucose Levels
Increased Lipolysis
Increase in Counterregulatory Hormones
Decreased Insulin Levels
Euglycemia
Increased ketoacids
Anion Gap Metabolic Acidosis
Euglycemic DKA

Evidence for SGLT2s and EDKA

- Peters AL, Buschur EO, Buse JB, Cohan P, Diner JC, Hirsch IB. Euglycemic Diabetic Ketoacidosis: A Potential Complication of Treatment With Sodium-Glucose Cotransporter 2 Inhibition. Diabetes Care. **2015 Sep – 13 episodes of SGLT2i associated EDKA**

- Ueda P, Svanström H, Melbye M, Eliasson B, Svensson AM, Franzén S, Gudbjörnsdottir S, Hveem K, Jonasson C, Pasternak B. Sodium glucose cotransporter 2 inhibitors and risk of serious adverse events: nationwide register-based cohort study. BMJ. **2018 Nov 14 – Large cohorts from Sweden and Denmark confirm relationship with EKDA.**

- Chacko B, Whitley M, Beckmann U, Murray K, Rowley M: Postoperative euglycaemic diabetic keto-acidosis associated with sodium-glucose cotransporter-2 inhibitors (gliflozins): A report of two cases and review of the literature. Anaesth Intensive Care **2018; 46:215–9 – Hold SGTL2 3 days prior to surgery.**

- Jean-Charles Preiser, Bruna Provenzano, Wasineeart Mongkolpun, Katarina Halenarova, Miriam Cnop; Perioperative Management of Oral Glucose-lowering Drugs in the Patient with Type 2 Diabetes. Anesthesiology **2020 – Hold SGLT2 on day of surgery.**

- Branco A, Fatima R, Liblik K, Jackson R, Payne D, El-Diasty M. Euglycemic Diabetic Ketoacidosis Associated With Sodium-Glucose Cotransporter-2 Inhibitors After Cardiac Surgery: A Review of Current Literature. J Cardiothorac Vasc Anesth. **2022 Oct – Narrative review of 17 papers describing SGLT2 associated EKDA in perioperative cardiac surgical patients.**

- Mehta PB, Robinson A, Burkhardt D, Rushakoff RJ. Inpatient Perioperative Euglycemic Diabetic Ketoacidosis Due to Sodium-Glucose Cotransporter-2 Inhibitors - Lessons From a Case Series and Strategies to Decrease Incidence. Endocr Pract. **2022 Sep – retrospective study of SGLT2 associated EKDA perioperatively; more common in emergency surgeries as SGLT2s were not held as they were routinely 3 days prior to elective surgeries.**

FDA revises labeling for SGLT2 Inhibitors

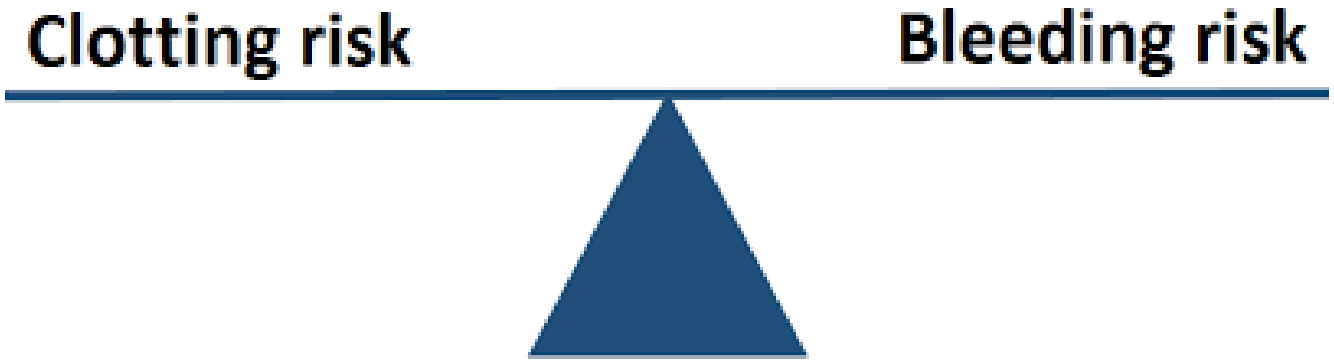
Updated 3/19/20 and revised 3/15/22

To lessen the risk of developing ketoacidosis after surgery, FDA has approved changes to the prescribing information for SGLT2 inhibitor medicines. Health care professionals should consider stopping canagliflozin, dapagliflozin, and empagliflozin at least three days before, and ertugliflozin at least four days before scheduled surgery.

What does Tower say?

- Four days prior to surgery: discontinue SGLT2 inhibitors (Jan 2023)

Perioperative Management of Anticoagulation



Clotting Risk

Table 1—*[Introduction] Suggested Risk Stratification for Perioperative Thromboembolism*

Risk Stratum	Indication for VKA Therapy		
	Mechanical Heart Valve	Atrial Fibrillation	VTE
High[a]	• Any mitral valve prosthesis • Any caged-ball or tilting disc aortic valve prosthesis • Recent (within 6 mo) stroke or transient ischemic attack	• $CHADS_2$ score of 5 or 6 • Recent (within 3 mo) stroke or transient ischemic attack • Rheumatic valvular heart disease	• Recent (within 3 mo) VTE • Severe thrombophilia (eg, deficiency of protein C, protein S, or antithrombin; antiphospholipid antibodies; multiple abnormalities)
Moderate	• Bileaflet aortic valve prosthesis and one or more of the of following risk factors: atrial fibrillation, prior stroke or transient ischemic attack, hypertension, diabetes, congestive heart failure, age > 75 y	• $CHADS_2$ score of 3 or 4	• VTE within the past 3-12 mo • Nonsevere thrombophilia (eg, heterozygous factor V Leiden or prothrombin gene mutation) • Recurrent VTE • Active cancer (treated within 6 mo or palliative)
Low	• Bileaflet aortic valve prosthesis without atrial fibrillation and no other risk factors for stroke	• $CHADS_2$ score of 0 to 2 (assuming no prior stroke or transient ischemic attack)	• VTE > 12 mo previous and no other risk factors

$CHADS_2$ = congestive heart failure, hypertension, age ≥ 75 years, diabetes mellitus, and stroke or transient ischemic attack; VKA = vitamin K antagonist.
[a]High-risk patients may also include those with a prior stroke or transient ischemic attack occurring > 3 mo before the planned surgery and a $CHADS_2$ score < 5, those with prior thromboembolism during temporary interruption of VKAs, or those undergoing certain types of surgery associated with an increased risk for stroke or other thromboembolism (eg, cardiac valve replacement, carotid endarterectomy, major vascular surgery).

DOUKETIS JD, SPYROPOULOS AC, SPENCER FA, ET AL. PERIOPERATIVE MANAGEMENT OF ANTITHROMBOTIC THERAPY: ANTITHROMBOTIC THERAPY AND PREVENTION OF THROMBOSIS, 9TH ED: AMERICAN COLLEGE OF CHEST PHYSICIANS EVIDENCE-BASED CLINICAL PRACTICE GUIDELINES. CHEST 2012; 141(2 SUPPL):E326S

Bleeding Risk

What is “major” bleeding?

- Fatal bleeding
- Critical anatomic site (intracranial, etc.)
- Requires surgery to correct
- Lowers Hgb by 2g/dL
- Requires transfusion >= 2 units pRBCs

MEHRAN R, RAO SV, BHATT DL, GIBSON CM, CAIXETA A, EIKELBOOM J, KAUL S, WIVIOTT SD, MENON V, NIKOLSKY E, SEREBRUANY V, VALGIMIGLI M, VRANCKX P, TAGGART D, SABIK JF, CUTLIP DE, KRUCOFF MW, OHMAN EM, STEG PG, WHITE H. STANDARDIZED BLEEDING DEFINITIONS FOR CARDIOVASCULAR CLINICAL TRIALS: A CONSENSUS REPORT FROM THE BLEEDING ACADEMIC RESEARCH CONSORTIUM. CIRCULATION. 2011 JUN 14;123(23):2736-47. DOI: 10.1161/CIRCULATIONAHA.110.009449. PMID: 21670242.

Bleeding Risk

HAS-BLED score

Condition	Points
H - Hypertension	1
A - Abnormal renal or liver function (1 point each)	1 or 2
S - Stroke	1
B - Bleeding	1
L - Labile INRs	1
E - Elderly (> 65 years)	1
D - Drugs or alcohol (1 point each)	1 or 2

HAS-BLED score	Bleeds per 100 patient-years
0	1.13
1	1.02
2	1.88
3	3.74
4	8.70
5	12.5

Note: HAS-BLED has been validated for warfarin, but not for the new anticoagulants.

Pisters R et al. Chest 2010;138(5):1093-1100.

High (2-day risk of major bleed 2%-4%)
Heart valve replacement
Coronary artery bypass
Abdominal aortic aneurysm repair
Neurosurgical/urologic/head and neck/abdominal/breast cancer surgery
Bilateral knee replacement
Laminectomy
Transurethral prostate resection
Kidney biopsy
Polypectomy, variceal treatment, biliary sphincterectomy, pneumatic dilatation
PEG placement
Endoscopically guided fine-needle aspiration
Multiple tooth extractions
Vascular and general surgery
Any major operation (procedure duration > 45 minutes)
Low (2-day risk of major bleed 0%-2%)
Cholecystectomy
Abdominal hysterectomy
Gastrointestinal endoscopy ± biopsy, enteroscopy, biliary/pancreatic stent without sphincterotomy, endonosonography without fine-needle aspiration
Pacemaker and cardiac defribillator insertion and electrophysiologic testing
Simple dental extractions
Carpal tunnel repair
Knee/hip replacement and shoulder/foot/hand surgery and arthroscopy
Dilatation and curettage
Skin cancer excision
Abdominal hernia repair
Hemorrhoidal surgery
Axillary node dissection
Hydrocele repair
Cataract and noncataract eye surgery
Noncoronary angiography
Bronchoscopy ± biopsy
Central venous catheter removal
Cutaneous and bladder/prostate/thyroid/breast/lymph node biopsies

This table is based on definitions derived from surgical/subspecialty societies in anticoagulant bridging or anticoagulant bridging management studies.

ALEX C. SPYROPOULOS, JAMES D. DOUKETIS; HOW I TREAT ANTICOAGULATED PATIENTS UNDERGOING AN ELECTIVE PROCEDURE OR SURGERY. BLOOD 2012; 120 (15)

Circulation

ORIGINAL RESEARCH ARTICLE

Development and Validation of the DOAC Score: A Novel Bleeding Risk Prediction Tool for Patients With Atrial Fibrillation on Direct-Acting Oral Anticoagulants

Rahul Aggarwal, MD; Christian T. Ruff, MD, MPH; Saverio Virdone, MSc; Sylvie Perreault, BPharm, PhD; Ajay K. Kakkar, MBBS, PhD; Michael G. Palazzolo, MPH; Marc Dorais, MSc; Gloria Kayani, BSc; Daniel E. Singer, MD; Eric Secemsky, MD; Jonathan Piccini, MD, MHS; Usman A. Tahir, MD, MBI; Changyu Shen, PhD; Robert W. Yeh, MD, MSc

AGGARWAL R, RUFF CT, VIRDONE S, PERREAULT S, KAKKAR AK, PALAZZOLO MG, DORAIS M, KAYANI G, SINGER DE, SECEMSKY E, ET AL. DEVELOPMENT AND VALIDATION OF THE DOAC SCORE: A NOVEL BLEEDING RISK PREDICTION TOOL FOR PATIENTS WITH ATRIAL FIBRILLATION ON DIRECT-ACTING ORAL ANTICOAGULANTS.CIRCULATION. 2023; 148:936–946. DOI: 10.1161/CIRCULATIONAHA.123.064556

DOAC Score

The risk score was developed among 5684 patients in the RE-LY trial (Randomized Evaluation of Long-Term Anticoagulation Therapy)

Further developed in 12 296 individuals in the GARFIELD-AF registry (Global Anticoagulant Registry in the Field-Atrial Fibrillation)

Then validated among 25 586 individuals in the COMBINE-AF trials (A Collaboration Between Multiple Institutions to Better Investigate Non-Vitamin K Antagonist Oral Anticoagulant Use in Atrial Fibrillation) as well as 11 945 individuals in the Quebec Régie de l'Assurance Maladie du Québec and Med-Echo Administrative Databases (RAMQ) administrative database.

The DOAC Score had moderate discrimination in all cohorts and outperformed the HAS-BLED score.

AGGARWAL R, RUFF CT, VIRDONE S, PERREAULT S, KAKKAR AK, PALAZZOLO MG, DORAIS M, KAYANI G, SINGER DE, SECEMSKY E, ET AL. DEVELOPMENT AND VALIDATION OF THE DOAC SCORE: A NOVEL BLEEDING RISK PREDICTION TOOL FOR PATIENTS WITH ATRIAL FIBRILLATION ON DIRECT-ACTING ORAL ANTICOAGULANTS.CIRCULATION. 2023; 148:936–946. DOI: 10.1161/CIRCULATIONAHA.123.064556

DOAC Score

Clinical risk prediction tool	Points
Age, y	
65–69	2
70–74	3
75–79	4
≥80	5
Creatinine clearance/estimated glomerular filtration rate (mL/min)	
30–60	1
<30	2
Underweight (body mass index <18.5 kg/m^2)	1
Stroke/transient ischemic attack/embolism history	1
Diabetes	1
Hypertension	1
Antiplatelet use	
Aspirin	2
Dual-antiplatelet	3
Nonsteroidal anti-inflammatory (NSAID) use	1
Bleeding history	3
Liver disease*	2
Total score range: 0–10 (Maximum 10 points – individuals with scores ≥ 10 are assigned a score of 10)	

AGGARWAL R, RUFF CT, VIRDONE S, PERREAULT S, KAKKAR AK, PALAZZOLO MG, DORAIS M, KAYANI G, SINGER DE, SECEMSKY E, ET AL. DEVELOPMENT AND VALIDATION OF THE DOAC SCORE: A NOVEL BLEEDING RISK PREDICTION TOOL FOR PATIENTS WITH ATRIAL FIBRILLATION ON DIRECT-ACTING ORAL ANTICOAGULANTS.CIRCULATION. 2023; 148:936–946. DOI: 10.1161/CIRCULATIONAHA.123.064556

DOAC Score

Table 4. One-Year Bleeding Rates by Risk Category for Individuals in the Development and Validation Cohorts

Risk category (risk score)	RE-LY (N=5684)		GARFIELD-AF (N=12 296)		COMBINE-AF (N=25 586)		RAMQ (N=11 945)	
	N (Major bleeding events)	One-year rate	N (major bleeding events)	One-year rate	N (major bleeding events)	One-year rate	N (major bleeding events)	One-year rate
Very low (0–3)	767 (2)	0.8%	4360 (14)	0.3%	6038 (82)	1.5%	1832 (10)	0.6%
Low (4–5)	1249 (21)	1.6%	3735 (33)	0.9%	6630 (123)	2.0%	2834 (40)	1.4%
Moderate (6–7)	1727 (53)	3.4%	3263 (60)	1.9%	7348 (197)	3.1%	3418 (72)	2.1%
High (8–9)	1296 (87)	6.9%	748 (17)	2.4%	4015 (188)	5.4%	2274 (76)	3.3%
Very High (10)	645 (73)	13.9%	190 (7)	3.7%	1555 (102)	7.7%	1587 (60)	3.7%

AGGARWAL R, RUFF CT, VIRDONE S, PERREAULT S, KAKKAR AK, PALAZZOLO MG, DORAIS M, KAYANI G, SINGER DE, SECEMSKY E, ET AL. DEVELOPMENT AND VALIDATION OF THE DOAC SCORE: A NOVEL BLEEDING RISK PREDICTION TOOL FOR PATIENTS WITH ATRIAL FIBRILLATION ON DIRECT-ACTING ORAL ANTICOAGULANTS.CIRCULATION. 2023; 148:936–946. DOI: 10.1161/CIRCULATIONAHA.123.064556

Interrupting Warfarin

Stop: 5 days prior to elective surgery

Restart: 12-24 hours after surgery

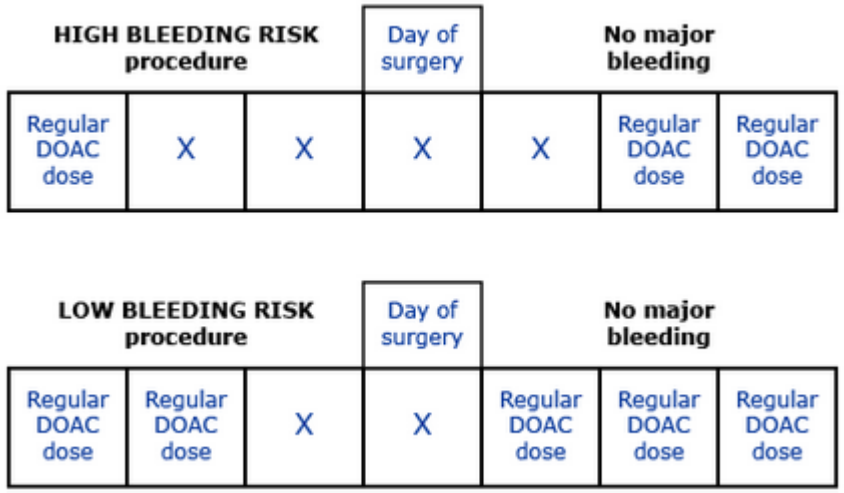
Bridge?

- Rarely
  - Mechanical mitral valve, mechanical aortic valve with additional risks
  - CHAD2s 5-6, prior embolic stroke within 3 months
  - VTE within previous 3 months
- Why not?
  - BRIDGE 2015 – AF, LMWH vs placebo, no reduction in thrombotic risk, but increased bleeding with LMWH
  - PERIOP-2 2021 – AF, MV, LMWH preop then LMWH vs placebo, no reduction in thrombotic risk or increase in bleeding
  - RE-LY (2009), ROCKET-AF (2011), ARISTOLE (2011) and real-world data from ORBIT-AF showed no effect on major outcomes with bridging vs non-bridging
  - Baumgartner et al SR in 2019: no reduction in thrombosis, increased bleeding with bridging for VTE patients
  - Siegal et al SR/MA in 2012: no reduction in thrombosis, increased bleeding with bridging for any indication

BAUMGARTNER C, DE KOUCHKOVSKY I, WHITAKER E, FANG MC. PERIPROCEDURAL BRIDGING IN PATIENTS WITH VENOUS THROMBOEMBOLISM: A SYSTEMATIC REVIEW. AM J MED. 2019 JUN;132(6):722-732.E7.
SIEGAL D, YUDIN J, KAATZ S, DOUKETIS JD, LIM W, SPYROPOULOS AC. PERIPROCEDURAL HEPARIN BRIDGING IN PATIENTS RECEIVING VITAMIN K ANTAGONISTS: SYSTEMATIC REVIEW AND META-ANALYSIS OF BLEEDING AND THROMBOEMBOLIC RATES. CIRCULATION. 2012 SEP 25

Interrupting DOACs

"PAUSE" approach:



Bridge? Nope.

JAMES DOUKETIS, ALEX C. SPYROPOULOS, JOANNE M DUNCAN, MARC CARRIER, GREGOIRE LE GAL, ALFONSO J TAFUR, THOMAS VANASSCHE, PETER VERHAMME, SUDEEP P SHIVAKUMAR, PETER L. GROSS, AGNES YUET YING LEE, ERIK YEO, SUSAN SOLYMOSS, JEANNINE KASSIS, GENEVIEVE LE TEMPLIER, STEPHEN KOWALSKI, MARK BLOSTEIN, VINAY SHAH, ELIZABETH MACKAY, CYNTHIA M. WU, NATHAN CLARK, SHANNON M. BATES, FRED SPENCER, ELENI ARNAOUTOGLOU, MICHIEL COPPENS, DONALD M. ARNOLD, JOSEPH A CAPRINI, NA LI, KAREN MOFFAT, SYED SUMMER, SAM SCHULMAN; PERIOPERATIVE ANTICOAGULANT USE FOR SURGERY EVALUATION (PAUSE) STUDY: A PERIOPERATIVE MANAGEMENT PLAN FOR PATIENTS WITH ATRIAL FIBRILLATION WHO ARE RECEIVING A DIRECT ORAL ANTICOAGULANT. BLOOD 2018

Return to Objectives

- Review guidance on perioperative management of GLP1 receptor agonists
  - Hold daily on day of surgery, hold weekly 1 week prior
  - Data quite limited, but reasonable to employ the “precautionary principle”
- Review guidance on perioperative management of SGTL2 inhibitors
  - Hold 3 days prior to surgery (4 for ertugliflozin) due to risk of EDKA
- Review guidance on perioperative management of anticoagulation
  - Evaluate thrombotic vs bleeding risk (new DOAC score)
  - Stop warfarin 5 days prior, restart 12-24 hours after, probably don’t need to bridge outside of specific circumstances
  - Interrupt DOACs using the PAUSE strategy

Thanks!