



Newer Drugs and Devices for Management of Diabetes

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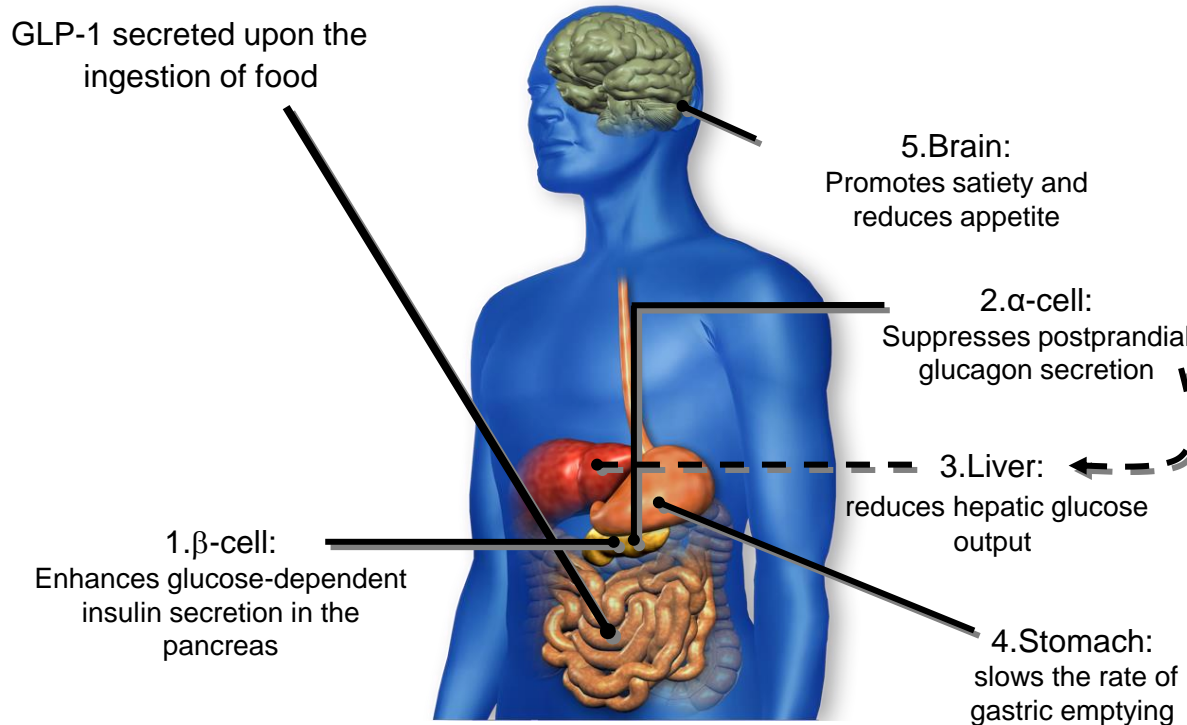
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The List (Excluding Insulin)

- Metformin
- Sulfonylureas
- Meglitinides
- Acarbose
- Thiazolidinediones
- DPP-4 inhibitors
- GLP-1 agonists (soon GLP-1/GIP and GLP-1/GIP/Glucokinase)
- SGLT-2 inhibitors

GLP-1 and DPP-IV



Nauck MA et al. *Diabetologia* 1993;36:741–744

Larsson H et al. *Acta Physiol Scand* 1997;160:413–422

Nauck MA et al. *Diabetologia* 1996;39:1546–1553

Flint A et al. *J Clin Invest* 1998;101:515–520

Zander et al. *Lancet* 2002;359:824–830.

GLP-1

- NICE has ignored them, but they have CV outcome data (liraglutide / semaglutide and dulaglutide)
- Significant weight loss
- More people at HbA_{1c} target

You Will Have Seen This



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NEWS


June 29, 2023

American Society of Anesthesiologists Consensus-Based Guidance on Preoperative Management of Patients (Adults and Children) on Glucagon-Like Peptide-1 (GLP-1) Receptor Agonists

Virish 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

Glucagon-like peptide-1 (GLP-1) receptor agonists are approved by the Food and Drug Administration for treatment of type 2 diabetes mellitus and cardiovascular risk reduction in this cohort (see table).¹ In addition, GLP-1 receptor agonists are also used for weight loss. Several entities have recommended to hold these drugs either the day before or day of the procedure.²⁻⁷ For patients on weekly dosing, it is recommended to hold the dose for a week.⁸

The GLP-1 agonists are associated with adverse gastrointestinal effects such as nausea, vomiting and delayed gastric emptying (see table). The effects on gastric emptying are reported to be reduced with long-term use.^{9,10} This is most likely through rapid tachyphylaxis at the level of vagal nerve activation.¹¹ Based on recent anecdotal reports, there are concerns that delayed gastric emptying from GLP-1 agonists can increase the risk of regurgitation and pulmonary aspiration of gastric contents during general anesthesia and deep sedation.¹²⁻¹⁴ The presence of adverse gastrointestinal symptoms (nausea, vomiting, dyspepsia, abdominal distension) in patients taking GLP-1 agonists are predictive of increased

 GET HELP

Or This (or Many Similar)

Anaesthesia 2023

Correspondence

Aspiration risk with glucagon-like peptide 1 (GLP-1) agonists

We would like to draw attention to a concerning issue regarding the use of glucagon-like peptide 1 (GLP-1) agonists, commonly prescribed for diabetes management and weight loss, and their potential impact on gastric

the duration of the drug's effect and the timing of gastric emptying restoration following drug cessation require further investigation.

Consideration should be given to performing gastric

Data

- These recommendations are based on very flimsy data
- There are no studies on GI symptoms in ambulatory individuals with T2DM / obesity
- Short acting GLP-1s (lixisenatide and exenatide) do slow gastric emptying

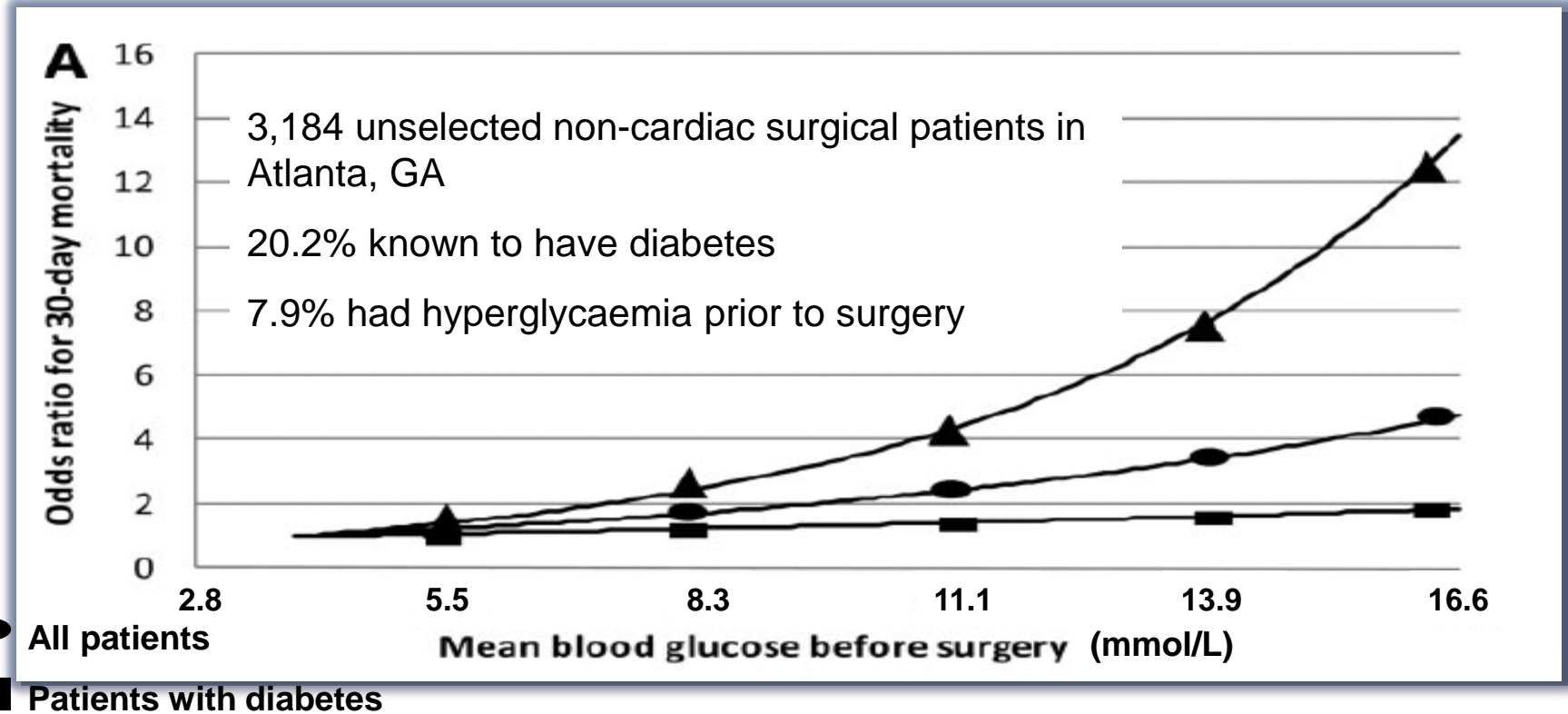
Data

- There are no data on longer acting (weekly) GLP-1s
- ASA guidelines currently state that for sedation or GA, CHO containing fluids can be consumed up to 2 hours prior to procedure – implying the aspiration risk is very low

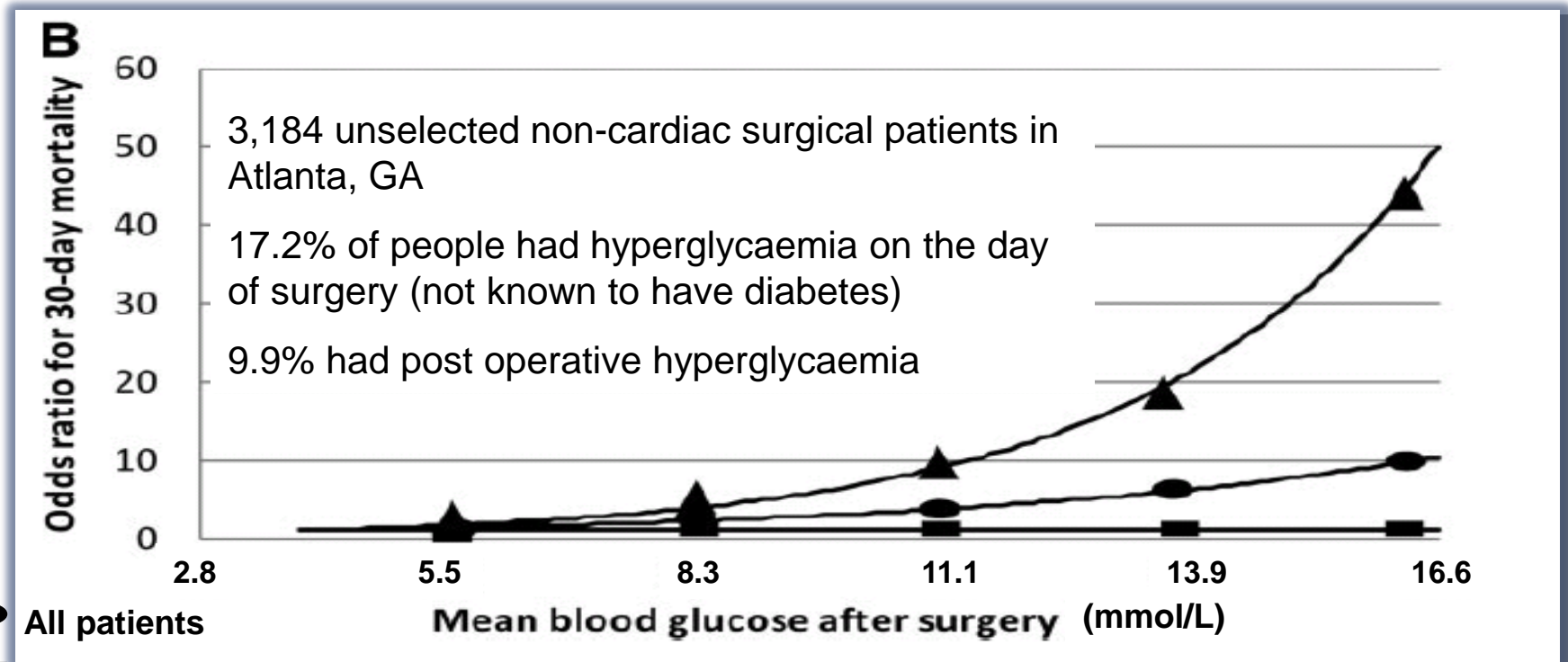
The Guidance Makes No Sense

- The risk of stopping them is that hyperglycaemia will further reduce gastric emptying in those with gastric autonomic neuropathy
- That pre-operative hyperglycaemia will lead to postponing the procedure (or post-operative harm)

Do High Glucose Levels Cause Harm?



Do High Glucose Levels Cause Harm?



- All patients
- Patients with diabetes
- ▲ Patients without diabetes

Global GLP-1 Shortage



Department
of Health &
Social Care



Medicine Supply Notification

MSN/2023/061

GLP-1 receptor agonists* used in the management of type 2 diabetes

*Annex 4 lists individual medicines affected

Tier 3 – high impact*

Date of issue: 27/06/2023

Link: [Medicines Supply Tool](#)

Summary

- There are very limited, intermittent supplies of all glucagon-like peptide-1 receptor agonists (GLP-1 RAs) licensed in the management of Type 2 Diabetes Mellitus (T2DM).

ABCD and PCDS Response



Association of
**British Clinical
Diabetologists**

PCDS
Primary Care Diabetes Society

Glucagon-Like-Peptide 1 Receptor Agonist National Shortage

Guidance from the Primary Care Diabetes Society (PCDS) and Association of British Clinical Diabetologists (ABCD)

Authors (listed alphabetically)

Hannah Beba¹, Kevin Cahill², Ketan Dhatariya³, Jane Diggle⁴, Clare Hambling⁵, Nicola Milne⁶, Philip Newland-Jones⁷

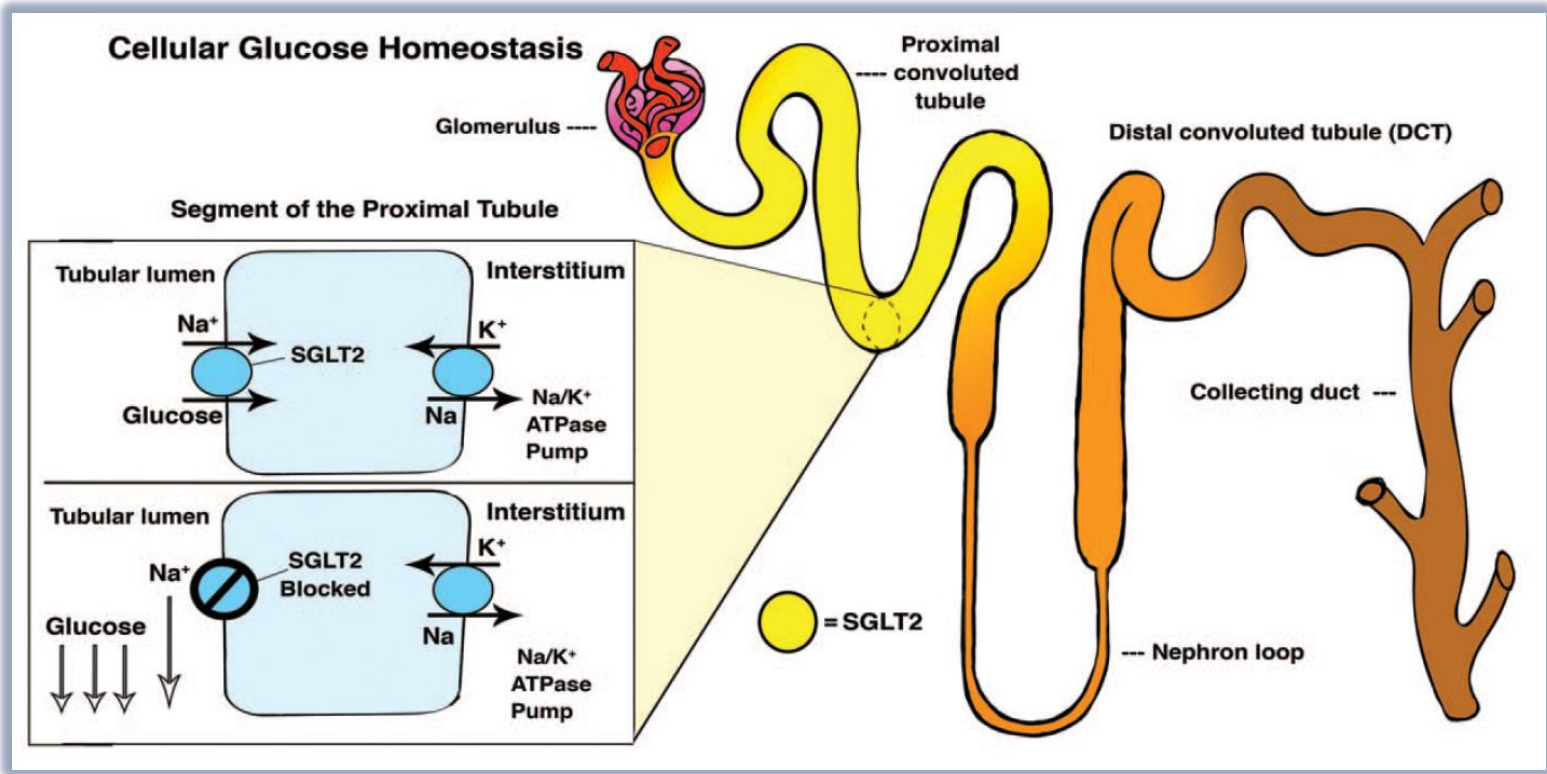
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2. Clinical Fellow, Office of the Chief Pharmaceutical Officer
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Re-introduction

- Missing 2 or more doses means going back to a lower dose

How Do SGLT-2 Inhibitors Work?



FDA Guidance

FDA revises labels of SGLT2 inhibitors for diabetes to include warnings about too much acid in the blood and serious urinary tract infections

FDA Drug Safety Communication

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Drug Alerts and Statements

Information about
Nitrosamine Impurities in
Medications

Medication Guides

Drug Safety Communications

3-19-2020 Update; Revised 3-15-2022

To lessen the risk of developing ketoacidosis after surgery, FDA has approved changes to the prescribing information for SGLT2 inhibitors [empagliflozin](#), [dapagliflozin](#), and [ertugliflozin](#) at least three days before, and [ertugliflozin](#) at least four days before scheduled surgery.

This communication provides updated information to the FDA Drug Safety Communication: FDA warns that SGLT2 inhibitors for diabetes may result in a serious condition of too much acid in the blood issued on [May 15, 2015](#).

Safety Announcement

[12-4-2015] A U.S. Food and Drug Administration (FDA) safety review has resulted in

Content current as of:
03/16/2022

Regulated Product(s)
Drugs

CPOC Guidance

Diabetes medication	Day prior to admission	Timing of surgery	
		Patient for am surgery	Patient for pm surgery
Acarbose	Take as normal	Omit morning dose if not eating	Give morning dose if eating
Meglitinide (repaglinide or nateglinide)	Take as normal	Omit morning dose if not eating	Give morning dose if eating
Metformin (AND eGFR >60 ml/min/1.73m ² OR procedure not requiring use of contrast media ^{2,3})	Take as normal	If taken once or twice a day – take as normal If taken three times per day, omit lunchtime dose	If taken once or twice a day – take as normal If taken three times per day, do not take lunchtime dose
Sulphonylurea (eg glibenclamide, gliclazide, glipizide, glimiperide)	Take as normal	Omit on morning of surgery If taken twice daily, take evening dose if eating	Do not take on day of surgery
Pioglitazone	Take as normal	Take as normal	Take as normal
DPP4 inhibitor (eg sitagliptin, vildagliptin, saxagliptin, alogliptin, linagliptin)	Take as normal	Take as normal	Take as normal
GLP-1 Receptor Agonist (eg exenatide, liraglutide, lixisenatide, dulaglutide, semaglutide) Daily/Weekly administration	Take as normal	Take as normal	Take as normal
SGLT-2 inhibitors (eg dapagliflozin, canagliflozin, empagliflozin, ertugliflozin)	Omit on day before surgery	Omit on day of surgery	Omit on day of surgery

Half Life

- The half-life of these drugs is between 12 and 13 hours
- It takes 5 half lives to reach a steady state
- What is the evidence that DKA risk is lower if the drug is stopped 3 days before (1.5% left) or 24 hours before (25%)?

Evidence

- None
- Reply from MHRA – 5/6/23 (after waiting 6 months)
- We have searched the MHRA’s medicines safety database for relevant UK Yellow Cards and have identified 88 cases where patients taking SGLT-2 inhibitors have experienced a DKA event (including euglycemic DKA) during the peri-operative period (until a data-lock point of 11th April 2023). However, information on whether the SGLT2 inhibitor was stopped before the surgery tended to be limited with only 22 reports noting this information. Where provided, the majority of reports cited the day prior to surgery. There were examples of cases where the SGLT2 inhibitor was stopped 2 or 3 days prior yet the patient still experienced a DKA event.

Thus Stopping 3 Days Prior Makes No Sense

- The risk of stopping them is that hyperglycaemia will further reduce gastric emptying in those with gastric autonomic neuropathy
- That pre-operative hyperglycaemia will lead to postponing the procedure (or post-operative harm)





Summary – Newer Drugs

- Newer agents have clear CV benefits
- The guidance from ASA and FDA about stopping GLP-1 and SGLT2i is not evidence based
- The resulting hyperglycaemia may result in harm

Devices

Symposium/Special Issue

Continuous Glucose Monitoring Within Hospital: A Scoping Review and Summary of Guidelines From the Joint British Diabetes Societies for Inpatient Care

Parizad Avari, MBBS, PhD^{1,2} , Alistair Lumb, MBBS, MA, PhD³, Daniel Flanagan, MD, FRCP⁴, Gerry Rayman, MD, FRCP⁵ , Shivani Misra, BMedSci, MBBS, MSc, MRCP, FRCPATH, PhD², Ketan Dhatariya, MBBS, MSc, MD, MS, FRCP, PhD⁶ , and Pratik Choudhary, MBBS, PhD, FRCP⁷ ; on behalf of the Joint British Diabetes Societies for Inpatient Care

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Symposium/Special Issue

Insulin Pumps and Hybrid Close Loop Systems Within Hospital: A Scoping Review and Practical Guidance From the Joint British Diabetes Societies for Inpatient Care

Parizad Avari, MBBS, PhD^{1,2} , Alistair Lumb, MBBS, MA, PhD³, Daniel Flanagan, MD, FRCP⁴, Gerry Rayman, MD, FRCP⁵ , Shivani Misra, BMedSci, MBBS, MSc, MRCP, FRCPATH, PhD², Pratik Choudhary, MBBS, PhD, FRCP⁶ , and Ketan Dhatariya, MBBS, MSc, MD, MS, FRCP, PhD⁷ ; on behalf of the Joint British Diabetes Societies for Inpatient Care

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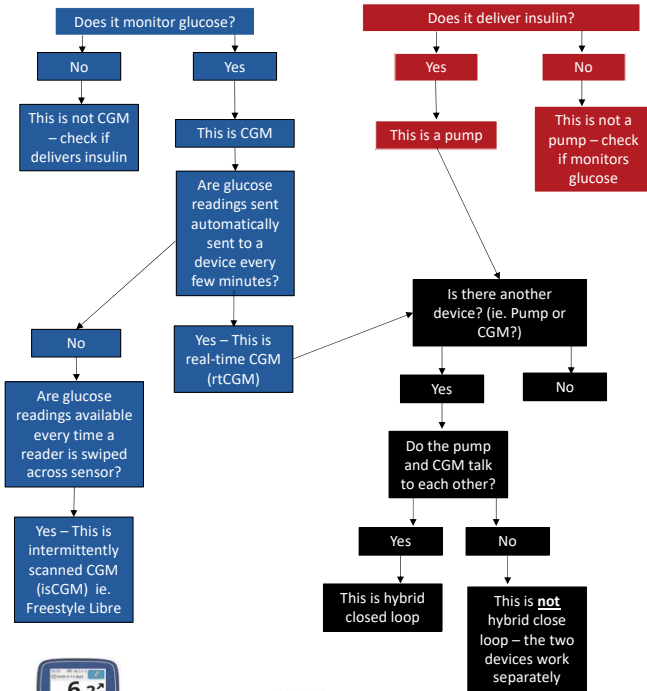


Avari P et al J Diab Sci Tech 2023;17(3):611-624

Avari P et al J Diab Sci Tech 2023;17(3):625-634

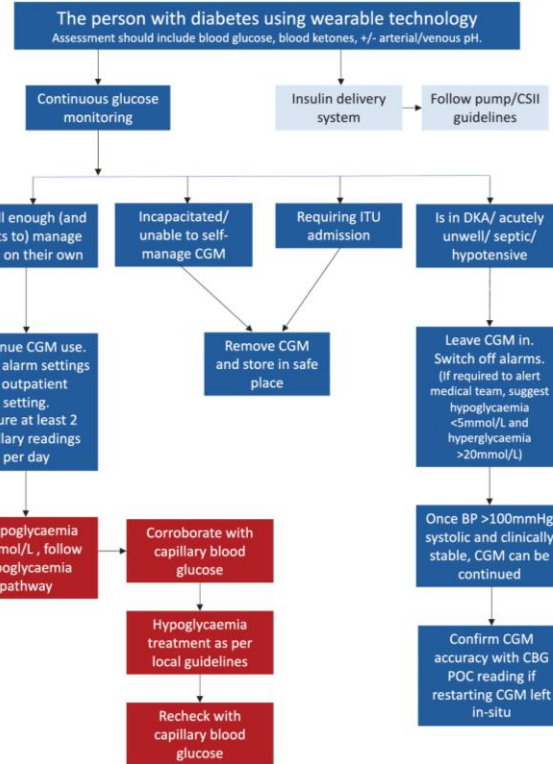
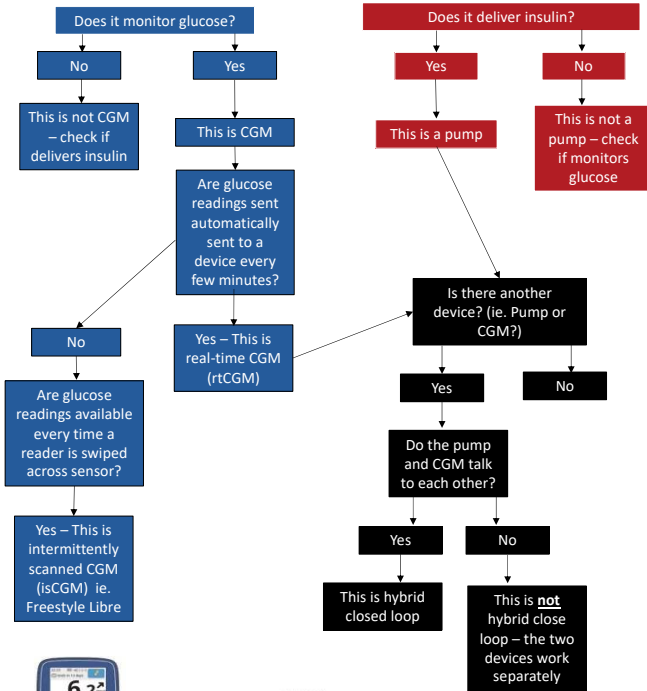
Identification

Identify which diabetes technology your patient is using



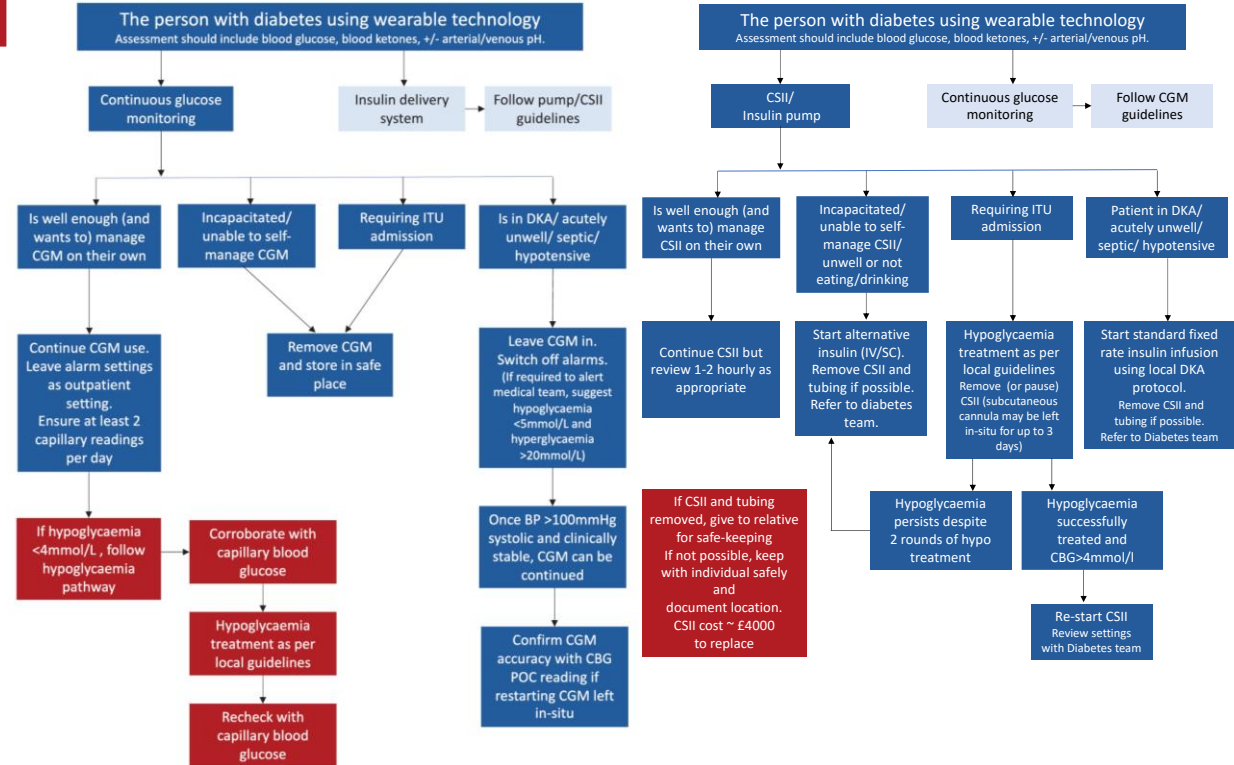
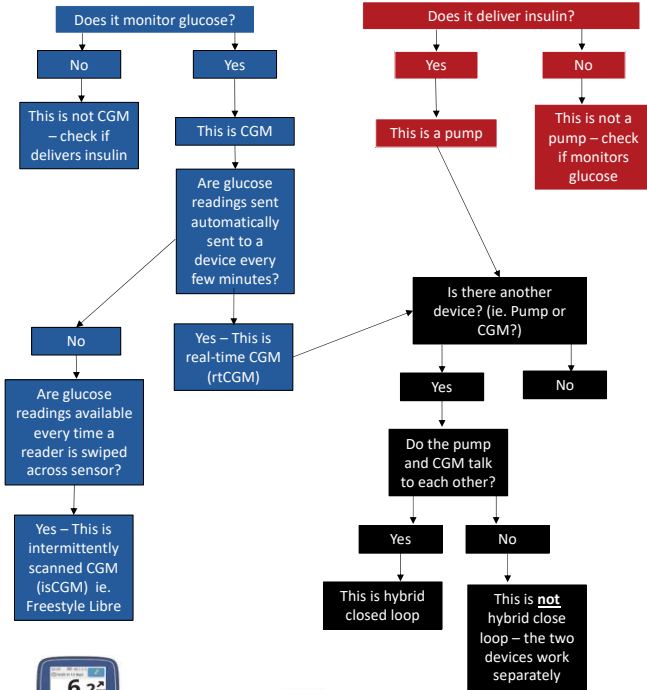
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Identification

Identify which diabetes technology your patient is using



Devices

- If the person with diabetes is unable to look after themselves, remove the device (PUT THEM ON INSULIN) and label and store the technology safely
- If in doubt – ASK!!!!!!!!!!!!!!

CGM and CSII During Elective Surgery

<ul style="list-style-type: none">• CGM may be used to guide capillary or blood gas glucose monitoring• Should not be used to base treatment decisions• CGM sensor should be situated away from the operative site and the diathermy pad(s)• Do not use in event of intra-operative hypotension or haemorrhage <p><i>Minor procedures (e.g. OGD/colonoscopy)</i></p> <ul style="list-style-type: none">• CGM can be continued	<p><i>Major surgical procedures (>1 missed meal):</i></p> <ul style="list-style-type: none">• Stop CSII, remove pump and store in safe place <p><i>Minor procedures (no more than 1 missed meal with/without sedation eg OGD/colonoscopy)</i></p> <ul style="list-style-type: none">• Can continue using CSII device**• Only a Teflon cannula should be used (steel needles contraindicated due to hypothetical risk of diathermy conduction)• During fasting, standard basal rates may be continued• CSII should be situated away from the operative site and the diathermy pad(s). <p>Further guidance and checklists found in Appendix and UK Centre for Perioperative Care.</p>
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Newer Drugs and Devices for Management of Diabetes

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