Government of **Western Australia**
South Metropolitan Health Service
Fiona Stanley Fremantle Hospitals Group

Evaluating an education initiative targeting diabetes and lipid management following coronary artery bypass graft surgery

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Background

Guidelines advocate multifactorial cardiovascular risk management in patients with diabetes and cardiovascular disease.

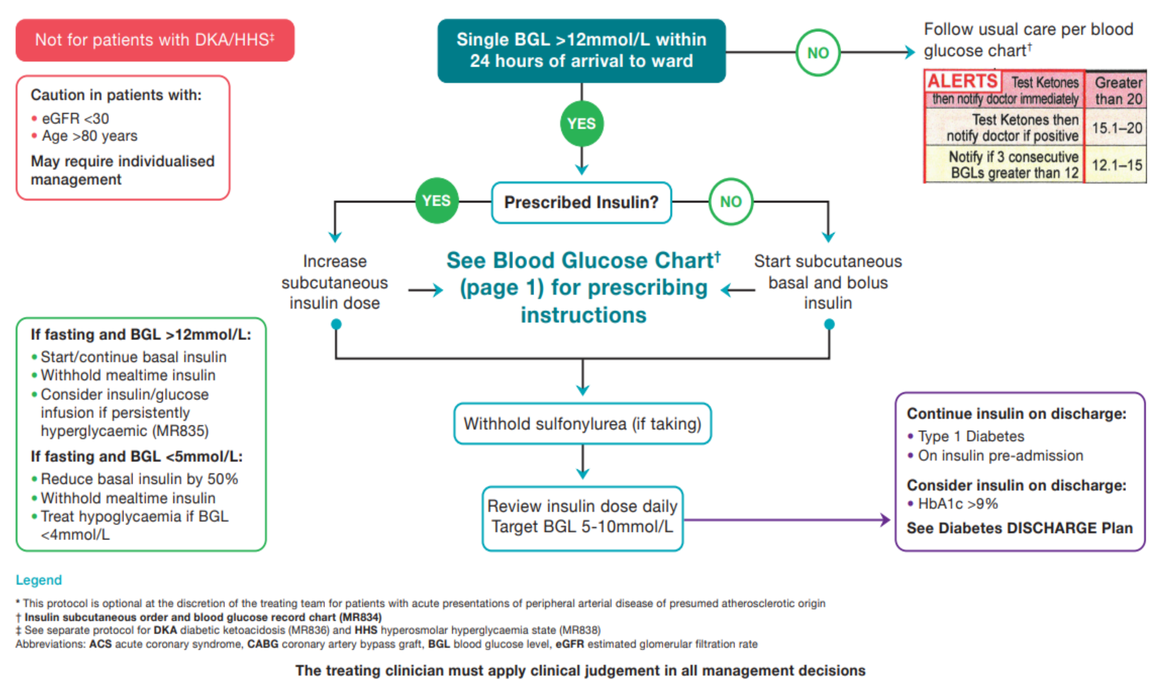
Objectives

To evaluate the impacts of decision-support algorithms on glycaemia and lipid-lowering in the cardiothoracic unit.

Methods

This was a single-site, pre- (Oct18-Jul19) and post-intervention (Nov19-Jun20) analysis of glucose and lipid management in patients hospitalised with diabetes undergoing CABG surgery. The intervention involved multidisciplinary algorithm design, pharmacist-led education and availability of algorithms as posters. Cardiothoracic surgeons were encouraged to treat hyperglycaemia with basal-bolus insulin and selectively initiate secondary preventative therapies. Target blood glucose was defined as between 5 to 10 mmol/L.

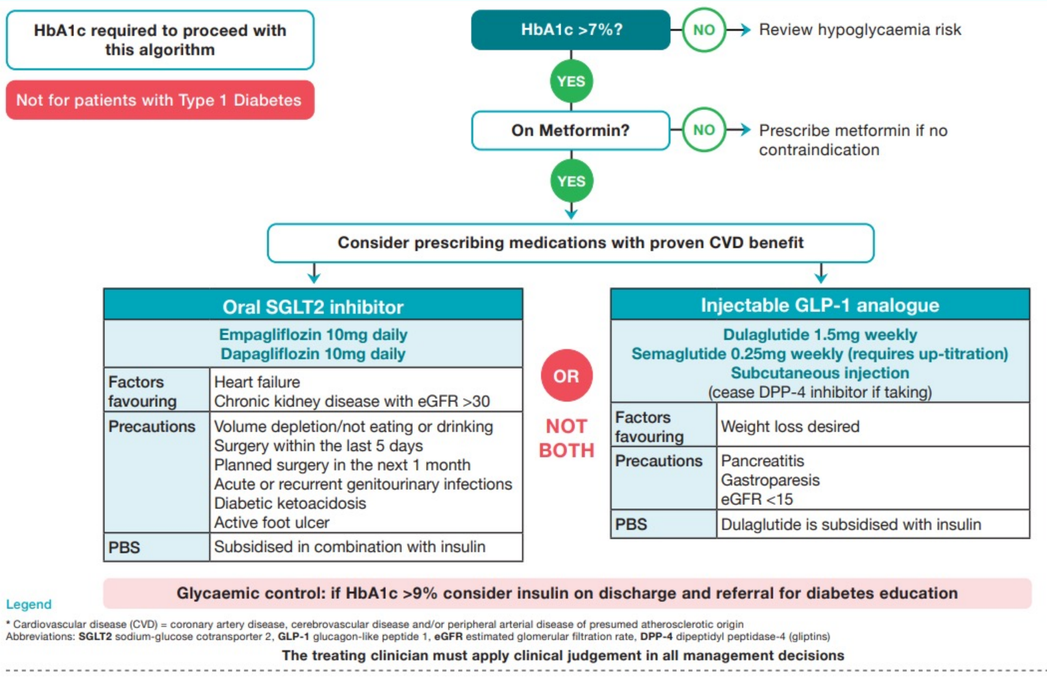
Inpatient Glucose Control:
for patients with ACS or CABG and Diabetes*



Legend
* This protocol is optional at the discretion of the treating team for patients with acute presentations of peripheral arterial disease of presumed atherosclerotic origin
† **Insulin subcutaneous order and blood glucose record chart (MR834)**
‡ See separate protocol for **DKA** diabetic ketoacidosis (MR836) and **HHS** hyperosmolar hyperglycaemia state (MR838)
Abbreviations: **ACS** acute coronary syndrome, **CABG** coronary artery bypass graft, **BGL** blood glucose level, **eGFR** estimated glomerular filtration rate

The treating clinician must apply clinical judgement in all management decisions

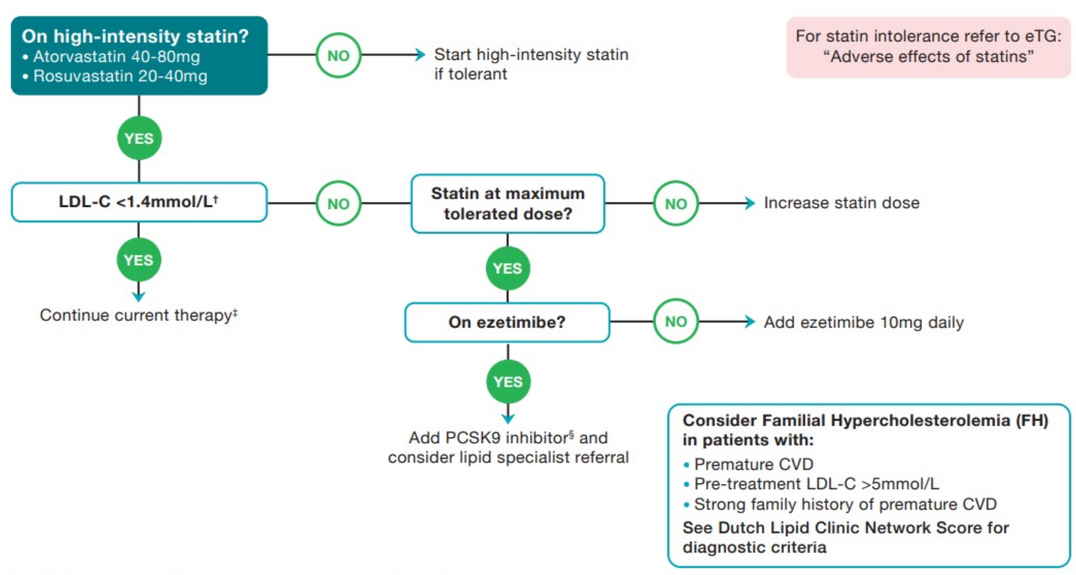
Diabetes DISCHARGE plan:
for patients with CVD* and Type 2 Diabetes



Legend
* Cardiovascular disease (CVD) = coronary artery disease, cerebrovascular disease and/or peripheral arterial disease of presumed atherosclerotic origin
Abbreviations: **SGLT2** sodium-glucose cotransporter 2, **GLP-1** glucagon-like peptide 1, **eGFR** estimated glomerular filtration rate, **DPP-4** dipeptidyl peptidase-4 (gliptins)

The treating clinician must apply clinical judgement in all management decisions

Lipid Lowering Therapy:
for patients with CVD* and Diabetes



Legend
* Cardiovascular disease (CVD) = coronary artery disease, cerebrovascular disease and/or peripheral arterial disease of presumed atherosclerotic origin
† Represents very-high-risk category from 2019 ESC/EAS guidelines for the management of dyslipidaemias
‡ Consider increasing statin dose to maximum tolerated dose or add ezetimibe if recurrent CVD events
§ Evolocumab is PBS subsidised for patients with diabetes and symptomatic CVD with LDL-C >2.6 mmol/L on maximum tolerated statin, ezetimibe and lifestyle therapy, and if they are aged >60 years, have microalbuminuria, or are Aboriginal or Torres Straits Islanders, after specialist review.

The treating clinician must apply clinical judgement in all management decisions

Results

A total of 200 patients were included; 100 pre-intervention and 100 post-intervention with similar baseline characteristics (mean age 63 years, 78% male, ≥96% type 2 diabetes and mean HbA1c 7.9±1.9% versus 8.1±1.8%).

Following our intervention we found:

☒ No improvement in inpatient glycaemic control (blood glucose measurements in target range 55.5% vs. 57.0%, p=0.441), with a consistently low incidence of inpatient hypoglycaemia (0.78% vs. 1.18%, p=0.474),

☑ Fewer endocrinology consultations (59.0% versus 45.0%, p=0.048),

☒ >90% of patients pre- and post-intervention were prescribed guideline recommended high-intensity statin, although non-statin lipid-lowering agents remained <10% despite patients not achieving LDL-C targets of <1.4mmol/L, and

☑ No 30-day readmissions for diabetic ketoacidosis occurred in patients prescribed SGLT2 inhibitors.

Discussion

1. Pharmacist champions are required to sustain momentum for change and tackle therapeutic inertia.
2. Surgical stress and variable diet, affecting insulin administration, confounded glycaemia in our study.
3. Networked glucose meters that upload to centralised systems with inbuilt benchmarks, alerts and electronic decision-support tools may be required to 'close-the-loop' on inpatient glucose management.
4. Early SGLT2 initiation after CABG surgery was not associated with 30-day DKA presentations in our study.
5. Pharmacist prescribing can target preventative diabetes care (e.g. SGLT2/GLP-1 or non-statin lipid lowering therapies) whilst medical colleagues focus on the presenting complaint.