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Inpatient management of diabetes or dexamethasone-induced hyperglycaemia in people with COVID-19

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Diabetes increases morbidity and mortality in people infected with COVID-19. Therefore, diabetes identification and treatment are critical to optimise outcomes in people with COVID-19.

This document provides guidance for the development of local guidelines for the management of diabetes or dexamethasone-induced hyperglycaemia in hospitalised patients with COVID-19. It should be read in conjunction with the ACI *Care of Adult Patients with COVID-19 in Acute Inpatient Wards*. National Guidelines recognise diabetes as a risk factor for disease progression and this may influence the decision to use drug treatments for COVID-19.

All people infected with COVID-19 (with or without diabetes) and requiring dexamethasone have an elevated risk of developing hyperglycaemia. These people require blood glucose monitoring and in some cases a change to treatment, including insulin.

Though the below recommendations for identification and management of diabetes are not specific to COVID-19, they provide guidance on optimal diabetes care during the pandemic.

All adult patients requiring hospital admission for COVID-19 should be tested for diabetes.

- Assess patients for diabetes and hyperglycaemia with serum glucose and consider a HbA1c measurement.
  - On admission: with serum glucose or a capillary (i.e. finger prick) blood glucose.
  - Throughout admission: capillary blood glucose monitoring for people with diabetes and those without diabetes requiring dexamethasone for treatment of COVID-19.
- Determine an appropriate person or team to be notified if a COVID-19 patient with diabetes or hyperglycaemia is identified. This would typically be the diabetes or endocrine team but may also be the responsible physician or diabetes educator.
- Specify clear referral criteria.
- Ensure there is a discharge plan for diabetes management and review for patients with newly identified hyperglycaemia, type 1 diabetes and type 2 diabetes. For diabetes that is detected in pregnancy, ensure regular review after discharge.
- It is advantageous to have the glucose management worklist and a dedicated inpatient diabetes team involved in identification and management of patients who are at high risk of hyperglycaemia. At a minimum there should be a pathway to access specialist diabetes care.

Purpose

When developing local guidelines, it is important to consider existing local protocols, resources and expertise. Tertiary hospitals can be contacted for examples of site-specific protocols and guidelines. The following resources can also be referred to:

- Care of Adult Patients with COVID-19 in Acute Inpatient Wards
- ADS Guide For The Management Of Diabetes During the COVID-19 pandemic
- COVID-19 Infection Prevention and Control Manual

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Newly identified hyperglycaemia	• Test HbA1c to understand glycaemic management. A normal HbA1c does not mean blood glucose monitoring and management is not required. The HbA1c threshold is 6.5% (48mmol/mol). • Define glucose criteria that determine the need for glycaemic management and notification of diabetes team or responsible clinician. • Ketones - check if a patient is known to have diabetes or if hyperglycaemia is identified. • Further management of hyperglycaemic patients would typically be according to the type 2 diabetes pathway, unless there is a suspicion of type 1 diabetes, based on ketosis, acidosis, clinical features and family history. • Consider protocols for ongoing glucose testing for patients at risk of hyperglycaemia, even if initial testing is normal. These include patients treated with steroids, enteral or parenteral feed and pancreatitis. • Ensure there is a discharge plan for confirmation of diabetes (if required), diabetes management and review.
Type 1 diabetes	• The diabetes team or responsible clinician should be notified, and the patient proactively managed daily to determine optimal insulin regimen and dosing. • Insulin, especially basal, must not be ceased. • Insulin or glucose infusion should commence if the patient has poor oral intake, is fasting, or if there are concerns about ketoacidosis. • Regular glucose monitoring must be performed. Testing is typically conducted pre- and post-meals and at bedtime. Consider testing at 0300. • Set glucose targets (typically 5–10mmol/L). • Ketone monitoring is essential. Check on arrival and define the criteria for further ketone testing and notifying the diabetes team or responsible clinician. • Define criteria for further testing for ketoacidosis (e.g. measurement of serum bicarb). • Ensure there is a discharge plan for diabetes management and review and consider follow-up by specialist diabetes outpatient service.
Type 2 diabetes	• The diabetes team or responsible clinician should be notified, and the patient proactively managed to ensure optimal insulin regimen and dosing. • Review glucose lowering medication. Have guidelines regarding the use of metformin, other oral agents and GLP-1 agonists. SGLT2 inhibitors should be ceased. • Develop criteria for commencing insulin and insulin regimen to be used. Basal bolus insulin is considered gold standard. • Regular glucose monitoring must be performed. Testing is typically conducted pre- and post-meals and at bedtime. Consider testing at 0300. • Set glucose targets (typically 5-10mmol/L). • Ketones should be checked on arrival. Define the criteria for further testing and referral to the diabetes team or responsible clinician. • Insulin or glucose infusion can commence if the patient has poor oral intake, is fasting, or there are concerns about ketoacidosis. • Ensure that there is a discharge plan for diabetes management and review.

Diabetes in pregnancy	• The diabetes team or responsible clinician should be notified, and the patient proactively managed daily by this team to determine optimal glycaemic management and medications. • Set glucose targets as per local guidelines. • If hyperglycaemia ensues, refer to local protocol. These patients should be managed with insulin, usually with a basal bolus regimen. • Ketones should be checked on arrival. Define the criteria for further testing and notifying the diabetes team. Regular ketone testing is essential for type 1 diabetes in pregnancy. • Ensure regular review after discharge.
Dexamethasone-induced hyperglycaemia	• Steroids can induce or exacerbate hyperglycaemia in people with or without diabetes. This can take 48-72 hours to develop following commencement of the steroid therapy. • All people with COVID-19 requiring dexamethasone should have their blood glucose levels monitored regularly. – For patients with diabetes, this should be at least four times per day. – For patients without diabetes, regular monitoring should occur for at least the first 48 hours. – Glucose levels generally peak at 4-12 hours after dexamethasone has been administered. • Set glucose targets (typically 5-10mmol/L) and the frequency of blood glucose level monitoring. • Consider ketone testing for patients who develop hyperglycaemia according to local guidelines. This is essential for type 1 diabetes. • Involve the diabetes team to set an individualised treatment plan. Consider glucose lowering medication, preferably insulin, to treat hyperglycaemia (larger doses than usual may be required as insulin resistance is common). SGLT2-i medicines should not be routinely prescribed in an inpatient setting. • Develop a management plan that modifies diabetes therapy upon weaning and cessation of steroid therapy. Communicate the plan to the patient and primary care provider and/or community-based services. • If required, patients should obtain, or be provided with, a blood glucose meter and test strips for ongoing monitoring post-discharge (that will last the duration of any required isolation period). • If longer term monitoring is likely to be required, register the person with National Diabetes Services Scheme to enable access to subsidised products and consumables.

Document development

This document was developed by the Inpatient Management Solution Group with representatives from the Diabetes COVID-19 Community of Practice. A series of four, one hour meetings were held to gather clinical expertise. Information was also drawn from evidence-based guidelines. The final document was endorsed by the Diabetes COVID-19 Community of Practice.

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