






## Diabetes UK Position Statements

# Guidelines for the management of diabetes services and patients during the COVID-19 pandemic

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on behalf of the London Inpatient Diabetes Network-COVID-19

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### Abstract

The UK National Diabetes Inpatient COVID Response Group was formed at the end of March 2020 to support the provision of diabetes inpatient care during the COVID pandemic. It was formed in response to two emerging needs. First to ensure that basic diabetes services are secured and maintained at a time when there was a call for re-deployment to support the need for general medical expertise across secondary care services. The second was to provide simple safe diabetes guidelines for use by specialists and non-specialists treating inpatients with or suspected of COVID-19 infection. To date the group, comprising UK-based specialists in diabetes, pharmacy and psychology, have produced two sets of guidelines which will be continually revised as new evidence emerges. It is supported by Diabetes UK, the Association of British Clinical Diabetologists and NHS England.

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The COVID-19 pandemic presents the greatest challenge to healthcare delivery in living memory, and the impact on community and specialist diabetes services has been immense [1]. Many existing services have been suspended and in some areas, all diabetes staff (including inpatient specialist nurses) redeployed to support general inpatient care. This has been done at short notice and without full consideration of the important role diabetes teams play in preventing harm to people with diabetes, both in hospital and in the community.

Several weeks into the pandemic, it has become increasingly apparent that support from inpatient diabetes specialists is essential. The management of people with diabetes who are acutely unwell with suspected or confirmed COVID-19 is complex [2], and many of the staff recruited to the front line are unfamiliar with managing people with diabetes. Furthermore, systems need to be in place in the community to facilitate and support early discharge and prevent readmission of people with diabetes, particularly those who have been newly started on insulin in whom rapid dose reduction is often required.

In the response to these challenges, the National Diabetes Inpatient COVID-19 Resource Group was formed in the last week of March 2020. The group comprises specialists in diabetes, pharmacy and psychology. To date the group have produced two sets of documents available on the Association of British Clinical Diabetologists and Diabetes UK web sites.

The first set ([https://abcd.care/sites/abcd.care/files/site\\_uploads/To%20the%20Diabetes%20Team\\_Final%2028004%29.docx](https://abcd.care/sites/abcd.care/files/site_uploads/To%20the%20Diabetes%20Team_Final%2028004%29.docx)), aimed at specialist teams and managers, outlines key service requirements vital to maintain patient safety while accelerating flow through the hospital. This is in addition to maintaining delivery of closely managed outpatient and community services to prevent avoidable admissions and readmissions (<https://abcd.care/resource/maintaining-acute-diabetes-services-response-covid-19>). To help plan services, an easy to use template based on the NHS 'Clinical guide for the management of acute diabetes patients during the coronavirus pandemic' [3], is provided as well as a completed template as an example of how one service has redeployed their staff (<https://abcd.care/resource/template-defining-diabetes-services-during-covid-19-pandemic> or <https://www.diabetes.org.uk/professionals/resources/coronavirus-clinical-guidance>).

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What's new?

- Diabetes specialist services help avoid unnecessary admission and readmission of people with diabetes to secondary care facilities and inpatient teams facilitate their care whilst admitted.
- Clinicians and trainees without diabetes expertise are providing diabetes care during the COVID-19 pandemic.
- This Position Statement outlines the need to maintain key elements of specialist diabetes services with a focus on delivering safe inpatient diabetes care.
- The Position Statement also outlines simple pathways for the management of inpatients with diabetes by admitting teams in secondary care.
- This Position Statement will be useful to trusts/health boards in redesigning clinical services during the COVID-19 pandemic and helping ensure that the safe care of people with diabetes.

The second three-page document, aimed at emergency departments and acute admitting teams provides guidance and an algorithm for diabetes management at the 'front door' (Fig. 1) (<https://abcd.care/resource/concise-advice-inpatient-diabetes-during-covid19-front-door-guidance> and <https://www.diabetes.org.uk/professionals/resources/coronavirus-clinical-guidance>). It recognizes that a significant number of COVID-19 positive patients not previously known to have diabetes may present with significant hyperglycaemia and therefore recommends blood glucose should be measured in all admissions. Additionally, anecdotal reports suggest unusual presentations of diabetic metabolic emergencies including people with type 2 diabetes presenting in diabetic ketoacidosis or mixed ketoacidosis and hyperosmolar hyperglycaemic state. It thus recommends that ketones be checked in everyone with known diabetes, and those without known diabetes who present with a blood glucose > 12 mmol/l whether or not they are treated with sodium-glucose co-transporter 2 inhibitors. The document contains a table outlining key differences seen in COVID positive patients based on experience from UK centres with the greatest experience of looking after these patients. There is also brief advice on glycaemic management, blood ketone levels, insulin management, patients using subcutaneous pumps and finally foot care.

The National Inpatient Diabetes COVID19 Response Group will continue to update these documents as more evidence becomes available, and will shortly be releasing guidance on the use of subcutaneous insulin for managing hyperglycaemia as well as for managing ketoacidosis in the event of intravenous insulin infusion pumps being unavailable because of increased demands for use to deliver other



NATIONAL INPATIENT DIABETES COVID-19 RESPONSE GROUP

COVID-19 infection in people with or without previously recognised diabetes increases the risk of the EMERGENCY states of hyperglycaemia with ketones, Diabetic Ketoacidosis (DKA) and hyperosmolar Hyperglycaemic State (HHS)

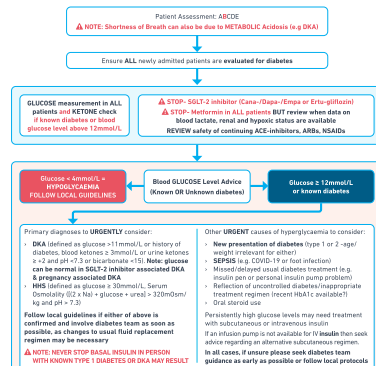
Being acutely unwell with suspected/confirmed COVID-19 requires adjustment to standard approaches to diabetes management (see table below). The guidance in this document is based on experience from UK centres with the greatest experience of looking after patients with COVID-19 disease and will be updated as more evidence becomes available.

ISSUE CHANGE SEEN	DIFFERENCE WITH COVID-19	ADJUSTED ACTION
Early in admission	People with COVID-19 infection appear to have a greater risk of hyperglycaemia with ketones including: <ul style="list-style-type: none"> <li>• People with type 2 diabetes (risk even greater if on a SGLT2 inhibitor)</li> <li>• People with newly diagnosed diabetes</li> <li>• COVID-19 disease precipitates atypical presentations of diabetic emergencies (eg mixed DKA and hyperosmolar states)</li> </ul>	<ul style="list-style-type: none"> <li>• Check blood glucose in everybody on admission</li> <li>• Check ketones in:                             <ul style="list-style-type: none"> <li>• everybody with diabetes being admitted</li> <li>• everybody with an admission glucose over 12 mmol/L</li> </ul> </li> <li>• Stop SGLT2 inhibitors in all people admitted to hospital</li> <li>• Stop Metformin in all people admitted to hospital but review when data on blood lactate, renal and hepatic status are available</li> <li>• Consider using 10-20% glucose where ketones persist despite treatment in line with usual practice</li> </ul>
Severe illness on admission	Fluid requirements may differ in those with DKA/HHS and evidence of lung leak or myocarditis	<ul style="list-style-type: none"> <li>• After restoring the circulating volume the rate of fluid replacement requires may need to be adjusted where evidence of 'lung leak' or myocarditis</li> <li>• Contact the diabetes specialist team early</li> <li>• Early involvement of the critical care team</li> </ul>
All inpatient areas	Insulin pumps may not be available to manage hyperglycaemia using intravenous insulin as these are required elsewhere (eg for sedation in ICU)	<ul style="list-style-type: none"> <li>• Use alternative IV regimens to manage hyperglycaemia</li> <li>• HHS/DKA</li> <li>• Contact the diabetes specialist team for support</li> </ul>
ICU	Significant insulin resistance seen in people with type 2 diabetes in ICU settings	<ul style="list-style-type: none"> <li>• IV insulin protocols may need amending (compare with insulin use in ICU)</li> <li>• Patients often not read prone so feeding may be significantly interrupted - parallel risk of hypoglycaemia</li> </ul>

CONCISE ADVICE ON INPATIENT DIABETES (COVID:Diabetes): GUIDANCE

COVID-19 infection in people with or without previously recognised diabetes increases the risk of the EMERGENCY states of hyperglycaemia with ketones, Diabetic Ketoacidosis (DKA) and Hyperosmolar Hyperglycaemic State (HHS)

Management of Acute Diabetes at the Front Door for Emergency Departments & Acute Medical Units



FURTHER ADVICE ON INPATIENT DIABETES (COVID:Diabetes):

**BLOOD KETONE LEVEL ADVICE**

Blood ketones: less than 0.6 mmol/L = SAFE level  
 Blood ketones 1.0 - 2.9 mmol/L = INCREASED DKA RISK

- PO or IV fluids
- Consider rapid acting insulin if glucose above 16mmol/L + 1 unit rapid acting insulin typically expected to lower glucose by anywhere between 1-3mmol/L. Recheck in 2 hours.

**Blood ketones 3mmol/L or greater then check pH and bicarbonate (venous blood gas). DKA confirmed if high ketones accompanied by:**

- Blood glucose > 11 mmol/L (or history of diabetes) and pH < 7.3 or bicarbonate < 15

NOTE: Glucose can be <11 mmol/L if patients are on SGLT-2 inhibitor treatment, pregnant AND/OR severe COVID-19 infection

**INSULIN ADVICE - ALWAYS ASK IF YOUR PATIENT IS ON INSULIN**

- ALWAYS CONTINUE USUAL LONG ACTING BASAL INSULIN
- Patients who are very sick or not eating should have a Variable Rate Intravenous Insulin Infusion (VRIII) (sliding scale), with usual basal subcutaneous (SC) insulin continued alongside
- If an infusion pump is not available for IV insulin, contact diabetes team or follow local protocols for an alternative subcutaneous regimen

**PATIENTS USING WEARABLE DIABETES TECHNOLOGY**

- If patients are unable to manage their personal insulin pump and no specialist advice is immediately available, start a VRIII or SC basal insulin regimen then remove the pump and stop IV safety. If SC regime required and not able to feed, do not take daily insulin dose from pump then the following would be safe: calculate total daily insulin dose using 0.5 units/kg and give half the total dose as basal/background insulin and half as bolus/mealtime rapid acting insulin. Example: 0.5 units x 80 kg = total daily insulin dose of 40 units. Give half dose 19 units as basal insulin and 19 units as bolus insulin (5 units at each meal-time). Ensure that pump is disconnected AFTER SC basal insulin given.
- Continuous glucose monitors (CGM) and FreeStyle Libre (FSL) devices can be left on the patient but conventional capillary glucose monitoring will still be necessary
- For imaging, insulin pumps, Continuous Glucose Monitors (CGM) and FreeStyle Libre (FSL) devices need to be removed for magnetic scans such as MRI

**FOOTNOTES**

- ALWAYS need to exclude acute foot infection (may be the source of sepsis) or critical limb ischaemia
- ALWAYS ensure foot intact and protected
- TAKE ACTION ON ACUTE FOOT DISEASE AS PER LOCAL DIABETIC FOOT PROTOCOLS

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 Designed by: Leicester Diabetes Centre

FIGURE 1 Concise advice on inpatient diabetes.

therapies. The group is also continuing to work on patient-facing resources to support preparation for any potential hospital admission, and safe discharge advice for inpatient staff.

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None.

**Competing interests**

None declared.

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**References**

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