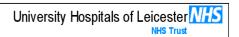
# Management of Hyperglycaemia "at the front door". Emergency department (ED) and adult assessment areas - ADULTS



Trust ref: B23/2019

#### 1. Introduction and Who Guideline applies to

1.1 This guideline details the management of hyperglycaemia (capillary blood glucose >12mmol/l) in adult patients presenting to ED and admissions areas in UHL. This includes patients with and without a known diagnosis of diabetes. The guidance is applicable for both medical and nursing staff working in these areas.

#### 2. Guideline Standards and Procedures

- 2.1 This guideline sets out in a series of flowcharts (see appendix 1) an approach to managing hyperglycaemia for all adult patients assessed in ED and the adult assessment areas.
- 2.2 If staff are unsure regarding the management of such patients despite referral to the guidance then they should seek advice from the specialist diabetes team or a senior colleague.
- 2.3 The Diabetes specialist nurse team can be contacted via ICE (electronic referral) or via switchboard (mobile phone) and this is a 7 day service 9-5pm at LRI and Mon-Fri 9-5pm at LGH and GGH. Diabetes SpR on-call via switch board Mon-Fri 9-5pm. Out of hours medical advice should be via the medical SpR on-call via switchboard.

#### 3. Education and Training

All medical and nursing staff are required to complete essential to role Insulin Safety training. This training can be accessed via HELM and is renewable on a yearly basis.

#### 4. Monitoring Compliance

Element to be monitored	Lead	Tool	Frequency	Reporting arrangements
Implementation of this guidance in appropriate areas.	Dr Kath Higgins, Dr Kate Russ, Helen Atkins, Kerry Johnston	Case note reviews, datix incident reporting	Continuous	Report to the Diabetes Inpatient Safety Committee bi-annually.

#### 5. Supporting References

None required.

#### 6. Kev Words

Hyperglycaemia, Emergency, Admissions Unit, Diabetes

CONTACT AND REVIEW DETAILS				
Guideline Lead (Name and Title): Dr Kath Higgins,	Executive Lead: Andrew Furlong, Medical			
Clinical Lead for Inpatient Diabetes Care.	Director			
Details of Changes made during review:	•			
None.				

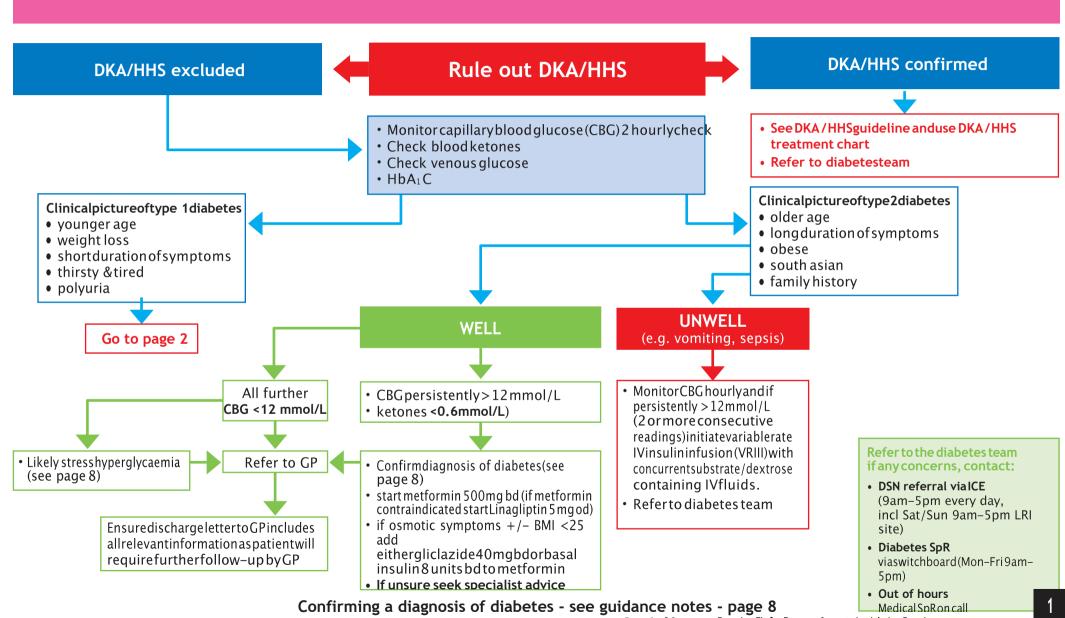


# Emergency Department (ED) and adult assessment areas

Management of Hyperglycaemia - Capillary blood glucose (CBG) > 12 mmol/L "at the frontdoor"

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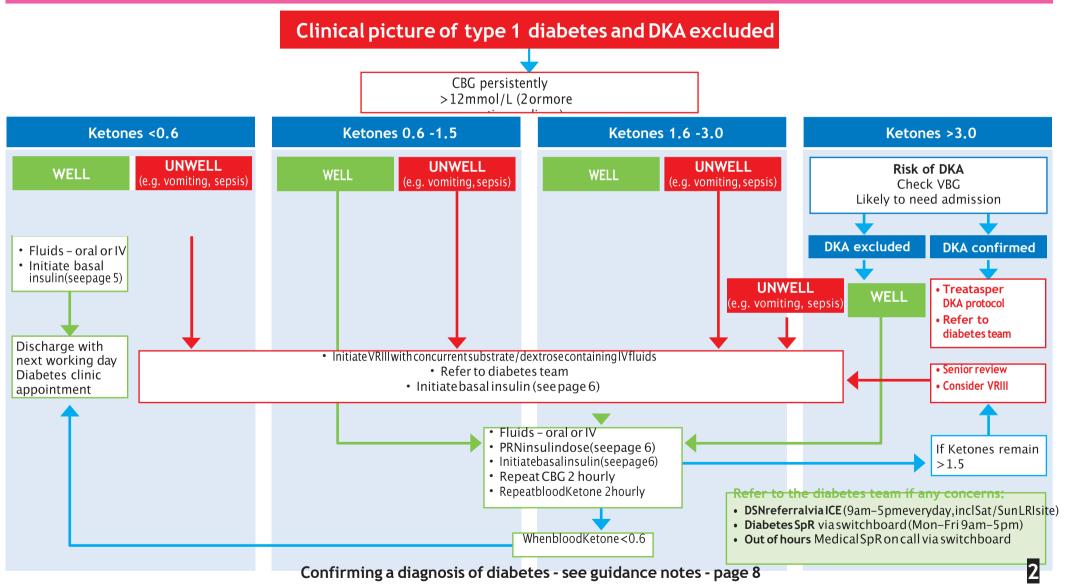








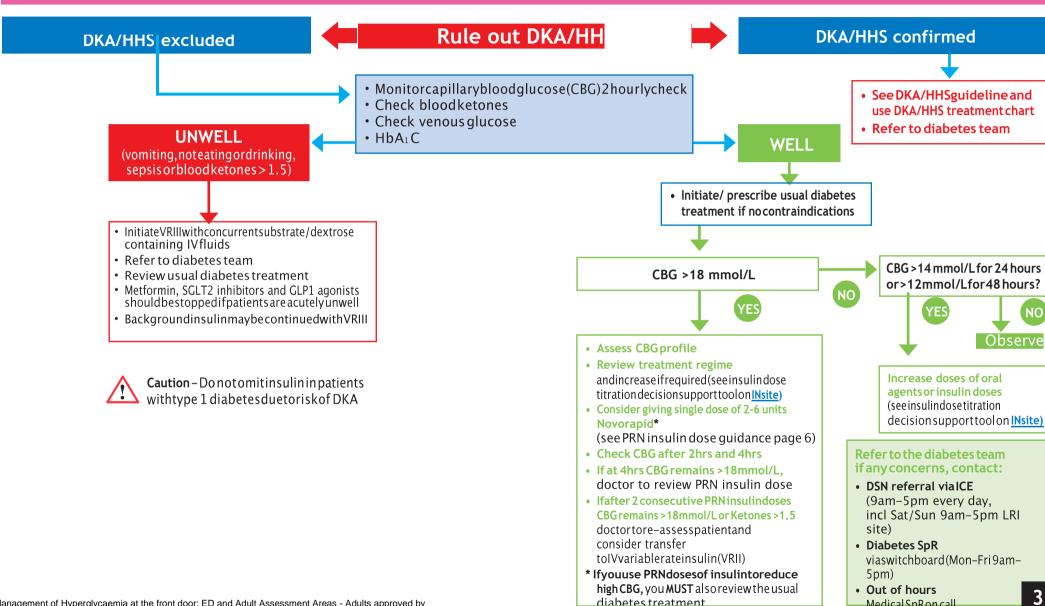
# Hyperglycaemia (CBG > 12 mmol/L) - Patient NOT KNOWN to have Diabetes "at the front door"







# Hyperglycaemia (CBG > 12 mmol/L) - Patient <u>KNOWN</u> to have Diabetes "atthe front door"







### Hyperglycaemia (CBG > 12 mmol/L) - Patient KNOWN to have Diabetes "atthe front door"

### Insulin treated patients who attend ED without their insulin

- 1
- <u>Insulinbrands/sanddosesknown</u>-everyeffortshouldbemadetoobtaincorrectinsulinfromeither pharmacy or AMU insulin fridge.
- If insulin brand/s and doses known but insulin not available refer to the Emergency Insulin Substitution chartoverpage(page5). This charts hould also be displayed on the AMU insulinfridge door. When usual regime identified transfer patient to usual regime when appropriate.
- 2
- <u>Ifinsulinbrand/sanddoses unknown</u> manage patient according to "Hyperglycaemia (CBG>12mmol/l) in ED patient NOT KNOWN to have diabetes clinical picture of type 1 diabetes" (page 2). This willensure patients with type 1 diabetes who present without any insulin history do not develop DKA in ED.
- · Refer to diabetesteam.
- · When usual regime identified transfer patient to usual regime when appropriate.



# **Emergency Insulin Substitutionchart**

• Forusewhen patients regularins ulin is unavailable.

- Please reduce the dose of substitute insulin by 10%.
- Compatible substitute in sulins are kept as stock on AMU.

Action	Name of usual Insulin	Compatible substitute insulin
Ultra-rapid acting	Fiasp	Novorapid
	Apidra	Novorapid/Humalog
Danid acting	Humalog(100units/ml)	Novorapid
Rapid acting	Humalog(200 units/ml)	Humalog (100units/ml)/Novorapid
	Novorapid	Humalog
	Actrapid	All wards keep Actrapid as stock
Short acting	HumulinS	Actrapid
Silore acting	HypurinPorcineneutral	Actrapid
	InsumanRapid	Actrapid
	Humulinl	Insuman Basal
Intermediate action	HypurinPorcineIsophane	HumulinI/InsumanBasal
Intermediate acting	Insulatard	HumulinI/InsumanBasal
	InsumanBasal	Humulin I
	HumalogMix25	Novomix 30/Humulin M3
Rapid/Intermediate Mix	HumalogMix50	Novomix 30/Humulin M3
	Novomix30	HumulinM3
	HumulinM3	Novomix 30
Short/Intermediate Mix	HypurinPorcine30/70Mix	Humulin M3/Novomix 30
	InsumanComb15	HumulinI/InsumanBasal
	InsumanComb25	Humulin M3/Novomix 30
	InsumanComb50	Humulin M3/Novomix 30
	Abasaglar	Lantus
	Lantus	Abasaglar
	Levemir	Abasaglar/Lantus
Long acting	Semglee	Lantus
	Toujeo(300units/ml)	Abasaglar/Lantus/Tresiba
	Tresiba(100units/ml)	Abasaglar/Lantus
	Tresiba(200units/ml)	Tresiba(100units/ml)/Abasaglar/Lantus/Toujeo 5



### Hyperglycaemia (CBG > 12 mmol/L) - "atthe frontdoor" - guidance notes

**Oral fluids** = One litre of water or sugar free squash over 1 hour, repeat once if required.

Metformin - do not start if eGFR <45

**Basal insulin** – for clinical picture of type 2 diabetes – either Insuman Basal or Humulin I sc 8 units bd. For clinical picture of type 1 diabetes – Levemir sc 8 units bd.

Standard CBG target for inpatients with diabetes 6-10 mmol/l (4-12mmol/l acceptable)

Conservative CBG target: Frail older patients 7.8–10mmol/l, moderate/severe frailty and end of life 7.8–15mmol/l. Avoid hypoglcyaemia (CBG <4.0)

#### PRN insulin doses:

• Guidance for PRN insulin doses given in table (below).

For patients with conservative target range consider reducing PRN insulin dose.

Note: As a guide, 1 unit of Novorapid will reduce CBG by 3 mmol/L

Caution: Some patients with type 1 diabetes, particularly if slim/newly diagnosed, are very sensitive to insulin. Review PRN insulindose in context of their usual insulindose, use PRN insulindoses with caution – can result in hypoglycaemia\*

#### Note to nursing staff

Annotate the ACTUAL number of units administered and repeat CBGat2and4hrsafter PRN insulindose.

CBG (mmol/L)	PRN insulin dose (units)
18.1-25	4
≥ 25.1	6

- If CBG remains > 18 mmol/L at 4 hrs repeat PRN insulin dose
- Ifafter2 consecutive PRN insulindoses CBG remains > 18 mmol/L doctorto assess patient and consider transfer to VRIII
- Max frequency PRN insulin dose is four hourly

<sup>\*</sup> If hypoglycaemia occurs treat immediately using the Hypoglycaemia treatment algorithm



### Hyperglycaemia(CBG>12mmol/L)-"atthefrontdoor"-guidancenotescontinued

Senior review – ensure all patients with confirmed or possible type 1 diabetes, unwell or being discharged directly from E.D. have as enior ED medical review within the department. Senior medical review if discharging / admitting from adult assessmentareas.

How to book an appointment in Diabetes clinic Ring extension 4919 and leave patient details and reason for clinic appointment.

**NOTE:** if patients require same day review – these patients should be referred directly to DSN via ICE or to Diabetes SpR/Medical SpR on-call.

Patients who use a continuous subcutaneous insulin infusion (CSII) or insulin pump – assess patient, assessment should include CBG, blood ketones and VBGandinitiateappropriatemanagement depending onwell/unwell. If DKAconfirmedtreat as per DKA protocol. If not DKA but unwellstartal ternative insulin (VRIII). If requires treatment for DKA or VRIII remove insulin pump and tubing when IV insulin treatment initiated. If well assess patient, establish with patient if any concerns regarding function of pump, if no concerns continue pump at basal rate, if PRN doses of insulin required patient is likely to be able to administer via the pump and increase basal rate accordingly. If concerns regarding function of pump, or competency of the patient to self manage, then refer patient urgently

to diabetes team for review (medical SpR out of hours), initiate alternative insulin regime immediately (example alternative s.c insulin regime would include s.c Levemir b.d ands.cNovorapidwithmeals). Insulinpumps hould be discontinued 60 mins after initiation of s.c Levemir and 2 hourly CBG and blood ketone measurement in ED to prevent DKA developing.

If insulin pump and tubing removed give to relative or patient for safe keeping. CSII costs £4,000 to replace.

#### Abbreviations used:

ED emergency department		
CBG capillary blood glucose		
VBG venous bloodgas		
DKA diabetic ketoacidosis		
CSII continuoussubcutaneousinsulininfusion		
HHS hyperosmolarhyperglycaemicstate		
VRIII variable rate iv insulin infusion		
GPAU GP assessmentunit		
PRN per required need		
AMU acute medical unit		
CDU ClinicalDecisions Unit.		

# Refer to the diabetes team ifanyconcerns, contact:

- DSN referral via ICE (9am-5pm every day, incl Sat/Sun 9am-5pm LRI site)
- Diabetes SpR via switchboard (Mon-Fri9am-5pm)
- Out of hours Medical SpRon call







### Hyperglycaemia (CBG > 12 mmol/L) - "atthe frontdoor" - guidance notes

### Confirming a diagnosis of diabetes. Hyperglycaemia in patients who are acutely unwell falls into 3 categories:

- Patients already KNOWN to have diabetes (type 1 or type 2)
- · Stress hyperglycaemia transient and normalises after discharge
- PatientsNOTKNOWNtohavediabeteswhoarepresentingwithanewdiagnosisofdiabetes. Diabetespersistsfollowingdischarge.

#### WHO diagnostic criteria for diagnosing diabetes:-



Diabetes symptoms plus:

• random venous plasma glucose ≥11.1mmol/L

OR

• fasting venous plasmaglucose ≥ 7.0 mmol/L

OR

2 If no symptoms, at least 2 confirmatory blood tests required taken on seperated ays

OR

HbA<sub>1</sub>C >6.5% / 48 mmol/L and symptoms present. If HbA<sub>1</sub>C >6.5% and no symptoms, patient is at risk of diabetes and needs follow-up with GP.

If patients are unwell or have possible type 1 diabetes then diagnosis likely to be confirmed in hospital.

 $If patients \, are \, well \, and \, have \, possible \, type \, 2 \, diabetes \, diagnosis \, may be \, confirmed \, at \, follow-up \, with \, GP.$ 

# Refer to the diabetes team if any concerns, contact:

- DSN referral via ICE (9am-5pm every day, incl Sat/Sun 9am-5pm LRI site)
- Diabetes SpR via switchboard (Mon-Fri9am-5pm)
- Out of hours
   MedicalSpRoncall