

COncise adVice on Inpatient Diabetes (COVID:Diabetes): GUIDANCE FOR MANAGING INPATIENT HYPERGLYCAEMIA

DiABETES UK
KNOW DIABETES. FIGHT DIABETES.



NATIONAL INPATIENT DIABETES COVID-19 RESPONSE GROUP*

Use when:

- ✔ **Glucose above 12 mmol/l and a correction dose is appropriate for the individual patient**
- ✔ **DKA/HHS not present**

Can be used in place of variable rate intravenous insulin when infusion pumps not available

- ⚠ **DO NOT use for people with COVID-19 causing severe insulin resistance in the ICU. Contact your local diabetes team for advice in this circumstance.**
- ⚠ **After 9pm consider risk of hypoglycaemia overnight when thinking about the use of a corrective dose**

IF GLUCOSE > 12 MMOL/L AND NO INSULIN ADMINISTERED IN PREVIOUS 4 HRS CONSIDER A CORRECTIVE DOSE OF RAPID-ACTING ANALOGUE INSULIN (NOVORAPID®/HUMALOG®/APIDRA®)

- > Re-check glucose after 4 hours OR before next meal - further action may be required
- > Target glucose 6-10 mmol/l – aiming for higher end of range
- > Dose decided using one of the following 3 factors and the table below. Factors are listed in order of importance:
 1. If person uses pre-existing correction ratio (**CR**) (e.g. 1 unit insulin lowers glucose by 3 mmol/l) this should be used
 2. If person using insulin but doesn't have correction ratio, use their usual total daily insulin dose (**TDD**)
 3. If person not previously using insulin, or dose is unknown, use their **weight**
- > If the person has rapid-acting insulin with each meal the corrective dose can be added to their mealtime dose if appropriate.

GLUCOSE (MMOL/L)	CR* = 1UNIT ↓ 4 MMOL/L OR TDD** LESS THAN 50 UNITS OR WEIGHT LESS THAN 50KG	CR* = 1UNIT ↓ 3 MMOL/L OR TDD** = 50-100 UNITS OR WEIGHT BETWEEN 50-100 KG	CR* = 1UNIT ↓ 2 MMOL/L OR TDD** OVER 100 UNITS OR WEIGHT OVER 100 KG
12.0-14.9	1	1	2
15.0-16.9	2	2	3
17.0-18.9	2	3	4
19.0-20.9	3	3	5
21.0-22.9	3	4	6
23.0-24.9	4	5	7
25.0-27.0	4	5	8
Over 27	5	6	9

*CR = Correction ratio, **TDD = total daily insulin dose

- ⚠ **It is recommended that glucose is checked at least 4 times per day in people treated with insulin**

LONG-ACTING INSULIN (LEVEMIR®/ ABASAGLAR®/LANTUS®/SEMGLÉE®/ HUMULIN I®/ INSULATARD®/INSUMAN BASAL®)

- > **Already using long-acting insulin:** Continue and titrate dose (see tables below)
 - > **NOT already using long-acting insulin:** If 2 or more glucose readings in 24 hrs are > 12 mmol/l (eg, 2 or more corrective doses in previous 24 hrs)
 - » ADD long-acting insulin - total dose 0.25 units/kg/day (eg, 0.25 x 80kg = 20 units OD **OR** 10 units BD depending on the choice of basal insulin - see below).
 - » NOTE if:
 - Older (>70 yrs) or frail
 - Serum creatinine >175 umol/l
- Use a reduced long-acting insulin dose of 0.15 units/kg (eg 0.15 x 80kg = 12 units OD **OR** 6 units BD)

Recommended options (all acceptable – refer to local protocols):

Levemir® Insulin detemir 100 units/ml (U100)	<ul style="list-style-type: none"> > Two equal doses of 0.125 units/kg, 12 hrs apart > Not available in vials so insulin pen needles must be available to use with a pen device* > Can adjust either dose
Abasaglar®/Lantus®/Semglee® Insulin glargine 100 units/ml (U100)	<ul style="list-style-type: none"> > Single dose of 0.25 units/kg/24 hrs (minimises patient contact) or > Split above into 2 equal doses, 12 hrs apart > Abasaglar®/Semglee® not available in vials so insulin pen needles must be available to use with an insulin pen device**
Humulin I®/Insulatard® Isophane insulin 100 units/ml (U100)	<ul style="list-style-type: none"> > Two equal doses of 0.125 units/kg/10-14 hrs apart > Particularly suited to steroid treatment – dose given as 2/3 total long-acting insulin dose am : 1/3 total long-acting insulin dose pm

- * Only specific insulin syringes/needles should be used to administer insulin from vials

** DO NOT WITHDRAW INSULIN FROM A 3ML INSULIN PEN CARTRIDGE OR 3ML PREFILLED

DOSE ADJUSTMENT FOR LONG-ACTING INSULIN

Doses can be titrated daily, although longer-acting insulins may take 48-72 hours to reach steady state. Dose adjustments will affect blood glucose throughout the day.

ONCE daily long-acting insulin

GLUCOSE LEVEL JUST BEFORE INSULIN DOSE	
<4mmol/L	Reduce insulin by 20%
4.1-6mmol/L	Reduce insulin by 10%
6.1-12mmol/L	No change
12.1-18mmol/L	Increase insulin by 10%
>18mmol/L	Increase insulin by 20%

TWICE daily long-acting insulin

GLUCOSE LEVEL	JUST BEFORE MORNING INSULIN DOSE	JUST BEFORE EVENING INSULIN DOSE
<4mmol/L	Reduce evening insulin by 20%	Reduce morning insulin by 20%
4.1-6mmol/L	Reduce evening insulin by 10%	Reduce morning insulin by 10%
6.1-12mmol/L	No change	No change
12.1-18mmol/L	Increase evening insulin 10%	Increase morning insulin by 10%
>18mmol/L	Increase evening insulin by 20%	Increase morning insulin by 20%

Dose reduction should also be considered in the following circumstances:

- > Improving infection (as measured by falling CRP)
- > Enteral feed reducing or stopping
- > Corticosteroid treatment reducing or stopping
- > End of life care

⚠ In people recovering from COVID-19-related insulin resistance, doses may need to be reduced RAPIDLY to avoid hypoglycaemia.

As noted above, severe insulin resistance has been noted in some people with COVID-19 in the ICU. In this circumstance, suggested alternative treatment strategies include four times daily doses of Levemir[®] or twice daily doses of Lantus[®].

Contact your local diabetes team for advice.

*NATIONAL INPATIENT DIABETES COVID-19 RESPONSE GROUP:

Professor Gerry Rayman (Chair), Dr Alistair Lumb, Dr Brian Kennon, Chris Cottrell, Dr Dinesh Nagi, Emma Page, Debbie Voigt, Dr Hamish Courtney, Helen Atkins, Dr Julia Platts, Dr Kath Higgins, Professor Ketan Dhatariya, Dr Mayank Patel, Dr Parth Narendran, Professor Partha Kar, Philip Newland-Jones, Dr Rose Stewart, Dr Stephen Thomas, Dr Stuart Ritchie

Acknowledgements: London Diabetes Inpatient Network – COVID-19 • Designed by: [Leicester Diabetes Centre](#)