

How to treat hypoglycaemia on the ward

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[Hypoglycaemia](#) (US: *hypoglycemia*) or a "low BSL" is a common call on the ward. Unless you have a good story that the patient is alert, oriented and able to immediately take some form of oral carbohydrate, it must be treated as a medical emergency.

Hypoglycaemia is a potentially life-threatening medical emergency. Go assess the patient as a matter of urgency.

If the ward nurses are experienced, it is usual that resuscitation equipment and the resuscitation trolley will already be next to the bed. Before you dive into reversing the hypoglycaemia, remember the "ABCs" of resuscitation. The patient will die from airway, breathing and circulatory problems quicker than from hypoglycaemia.

In the emergency situation for adults:

50 mL of 50% dextrose intravenous as a bolus

or

glucagon hydrochloride 1 mg intravenous (or IM or S/C)

Diagnosis of hypoglycaemia

The key to diagnosis is having a high index of suspicion. It is quick and easy to measure serum glucose levels now since the invention of "fingerprick" machines. However, if hypoglycaemia is not considered, the BSL will not be measured, and the diagnosis may be missed.

Hypoglycaemia in hospital inpatients is common, in up to 28% of hospitalised diabetic patients in a general medical unit (1). The risk is higher in the elderly, those on [sulfonylurea agents](#) or insulin, polypharmacy and frequent hospital admissions (2).

Patients with hypoglycaemia have both neuroglycopenic and adrenergic symptoms (3) (4). The adrenergic symptoms often precede those from neuroglycopenia.

Adrenergic symptoms

- Sweating
- Palpitations
- Tremor
- Anxiety
- Hunger

Neuroglycopenic symptoms (progression of severity)

- Difficulty with concentration
- Headache
- Irritability
- Confusion / delirium
- Hallucinations
- Focal neurological deficits including hemiplegia
- Seizures
- Coma

Oral treatment

Where the patient is conscious and sufficiently co-operative to tolerate oral intake, reversal of the hypoglycaemia with oral carbohydrates is recommended.

3 glucose tablets

or

A cup of fruit juice or non-diet soft drink

or

6 hard sweets (e.g., barley sugars)

This should then be followed up with a longer acting carbohydrate like some fruit or sandwiches.

Parental treatment

When the patient is impaired such that oral carbohydrates are refused or the safety of their airway is questionable, it is best to use parental therapy. This can be in the form of bolus dose of intravenous dextrose (D-glucose):

50 mL of 50% dextrose intravenous

or

0.5 g/kg of dextrose (1 mL/kg of 50% dextrose) intravenous (in children and small adults up to a maximum of 25 g)

The alternative is to use glucagon hydrochloride. This is particularly useful if intravenous access cannot easily be established as it can be given intramuscularly and subcutaneously. The response when given intravenously is usually within a minute but is delayed to 5-15 minutes when given the other routes.

glucagon hydrochloride 1 mg intravenous (or intramuscular or subcutaneous)

or

glucagon hydrochloride 20 mcg/kg (in children up to a dose of 1 mg)

Remember that neither a bolus dose of glucose or glucagon lasts for long. Continuing glucose supplementation in the short term with an infusion of 5% dextrose solution may be prudent while establishing the cause of the hypoglycaemic episode.

Desperate therapies

There are occasions where the patient has a significantly lowered GCS (Glasgow coma scale), without intravenous access and glucagon hydrochloride is not available. There are still options though these are definitely not recommended unless you are "desperate".

Honey can be placed inside the patient's mouth with a gloved finger. Aim to smear between the gums and the inside of the buccal area. Mucosal absorption of the glucose and fructose in honey is quite good. Beware of aspiration.

A friend of mine who was an intern with me who found herself in this situation innovated with per rectal glucose (with 50% dextrose). It worked though the patient suffered from diarrhoea afterwards. The hospital has since stocked glucagon hydrochloride in the resuscitation trolleys.

Tips

- Don't forget to investigate why the patient developed a hypoglycaemic episode and prevent it from happening again.
- Patients who have had too large a dose of long acting insulin, and especially too large a dose of a long acting sulfonylurea are at high risk of having another hypo in the next 12 hours.
- Always remember to check the BSL in delirious patients, or patients with seizures. It may be hypoglycaemia.
- The dose of glucose required to reverse hypoglycaemia is quite flexible. Despite the above guide, usually anywhere from 10-20 g of intravenous or oral carbohydrate will be enough to bring a hypoglycaemic patient back to a fully conscious and alert mental state. At this time, further carbohydrates can be administered on a less urgent basis either orally or through an infusion.
- Remember that 50% dextrose solutions are relatively acidic and are not only painful, but also causes thrombophlebitis. Be prepared to have a second intravenous line.
- In infants and children, it is common to give the same dose of intravenous dextrose in the form of **5 mL/kg of 10% dextrose** solution.

Reference articles

(1) Kresevic DM. Slavin SM. Incidence of hypoglycemia and nutritional intake in patients on a

general medical unit. *Nursingconnections*. 2(4):33-40, 1989.

(2) Shorr RI. Ray WA. Daugherty JR. Griffin MR. Incidence and risk factors for serious hypoglycemia in older persons using insulin or sulfonylureas. *Archives of Internal Medicine*. 157(15):1681-6, 1997 Aug 11-25.

(3) Vasudevan AR., Srinivasan AR., Snow KJ. Hypoglycemia [electronic article]. *eMedicine*. Last updated: 5 July 2006. [[Link](#)]

(4) Smeeks, F. Hypoglycemia [electronic article]. *eMedicine*. Last updated: 27 April 2005. [[Link](#)]

Last Updated: Michael Tam (31 July 2006)

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