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Variable Rate Intravenous Insulin Infusion Protocol

- This protocol is not suitable for intensive care or obstetric patients.
- This protocol is not suitable for DKA/HONK patients.
- This protocol is not suitable for patients with eGFR <15 or ESRF.

Preparation

- VRIII must be prescribed on both the main prescription form ('drug cardex') and the form overleaf. Fluids should be prescribed separately on HEPMA or a fluid prescription chart.
- An **insulin syringe must always be used** to measure and prepare insulin for IV infusion. Intravenous syringes (calibrated in mls) must never be used for insulin administration or preparation. The term '**Units**' should be used in all contexts. Other abbreviations such as 'U' or 'IU' should never be used to avoid prescription errors.
- **Prepare 50 units of soluble Insulin (Novorapid or Actrapid) in 49.5mls 0.9% sodium chloride, i.e. 1 unit/ml and use a syringe pump for infusion as per scale below (Actrapid OR Novorapid, choose one option in HEPMA).**
- Intravenous fluids will be necessary for all patients with type 1 diabetes and those type 2 diabetes patients who will remain on IV insulin longer than 6 hours.
- Initially use infusion of **500mls of (0.45% saline and glucose 5%) +/- 0.15% potassium chloride, i.e. 10mmol/500mls (if Potassium <5.0mmol/L) to run through volumetric pump at a rate of 100mls/hour.**
- The above fluid regimen may need alteration in certain patients (e.g. type 1 diabetes) given their fluid status and other co-morbidities; always discuss with Anaesthetist or senior medical staff if in doubt.
- Omit Potassium in IV fluids if potassium >5.0 or in dialysis dependent patients.

Connection

- Suggest use separate IV access lines for insulin and fluids (this should be standard practice in medical wards, HDU).
- In theatres and recovery areas, insulin and glucose infusions should both be given through the same IV cannula, to prevent accidental administration of insulin without glucose. Connect the insulin line to the glucose line using a suitable Y-connector which must contain anti-reflux and anti-syphon (one way) valves to prevent retrograde flow of insulin should the cannula become blocked.
Recommended set for use is Vygon Protect-a-line 2 (Version 0832.04R)
- **Do not** use a 3-way-tap for connection of the above lines.
- **Do not** give IV drug or IV infusions through the insulin cannula.

Fluid Choice

- Fluid choice and volume should be adjusted to patient's need. Patients at risk of fluid overload (e.g. cardiac failure, renal failure) may get 10% glucose at 50mls/hour.
- The patient may require extra fluids during the perioperative period to meet their total fluid requirement. This should be assessed and replaced appropriately and infused through a separate IV cannula.

Variable Rate Insulin Infusion

- In surgical areas, start IV insulin at 0800 hours or one hour pre-operatively as per guidelines.
- The standard infusion rate is prescribed overleaf to achieve target blood glucose of 6-10mmol/L in all patients. However the latter may be adjusted depending on patient's insulin resistance and sensitivity.
- Continue fluid infusion and VRIII until the patient is eating and drinking and back to normal glucose lowering medications. (see guidelines)
- Continue both insulin and glucose infusion when transporting patients. If disconnected, new giving sets should be used to reduce the risk of infections.
- Insulin should not be administered without fluids except in HDU/ITU setting.

Laboratory Investigations

- **Check urea and electrolytes daily whilst patient on VRII.**
- **Ideally prescription and infusion of IV insulin and IV fluids should be started pre-operatively.**
- **However this should not cause any delays in starting surgical lists.**
- **Review daily to consider switching back to usual subcut insulin, if advice needed contact Diabetes Team.**

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Variable rate insulin infusion

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