

7.4 Variable Rate Insulin Infusion

An intravenous insulin infusion is prepared by using prefilled syringes or by making up a 50 mL syringe with 50 units of Actrapid® with 49.5 mL of 0.9% sodium chloride solution.

Local protocols are usually available and should be followed.

7.4.1 VRII algorithm

For individuals not previously on insulin, start insulin at $(0.02 \text{ unit/kg/hour} \times \text{Body weight})$.

Blood glucose should be monitored hourly and the rate adjusted as appropriate.

For insulin treated individuals, the initial insulin infusion hourly rate can be calculated as follows;

Initial infusion rate (units/hr) = Total daily dose insulin (TDD)/24.

Table 7 - Initial insulin infusion dose calculation

Initial Insulin Infusion Dose	
For patients previously on insulin Total insulin used/day (unit/day) = total daily dose (TDD) insulin	Initial Dose (unit/hour) = $(\text{TDD} \div 24 \text{ hours})$
For patients not previously on insulin	Initial dose (unit/hour) = $0.02 \times \text{Body weight in kg}$

The following is a sample algorithm for on-going insulin infusion rate adjustment can be used (adapted and modified from NSW ACI algorithm). This particular algorithm considers the current glycaemia as well as the glycaemic trend based on the previous BGL reading. Local protocols may vary, and should be used where available instead of this sample algorithm. Please note that insulin dose adjustments and initial insulin dosing based on these algorithms are not meant to replace sound medical judgment.

For the algorithm, please refer to *Table 8: Algorithm for Insulin rate adjustments and titration* on page 34. This table considers the glycaemic trend (not just the current BGL) and target BGL range of 7.5-10 mmol/L to avoid hypoglycaemia, while maintaining BGL below 10 mmol/L. The BGL ranges are not evenly spaced in the algorithm to allow smaller changes to the infusion rate when the BGL is close to the target range. The algorithm assumes that BGL is checked hourly during insulin dose titration.

All unexplained hypoglycaemia and hyperglycaemia should be investigated and causative factors corrected.

7.4.2 Cessation of VRII

VRII is usually not ceased in the first 24 hours if it has been initiated intra-operatively.

For more details regarding cessation, please refer to *7.7.2 Cessation of VRII* on page 33.

7.4.3 Insulin Pumps

For management of the insulin pump pre-operatively, please refer to section 6.5 Insulin Pumps on page 26.

While we recommend continuing the insulin pump in general, it should be discontinued when VRII has to be initiated during surgery. This is to reduce the number of variables and potential issues arising from multiple concurrent sources of insulin while the BGL is unstable in the intra-operative period. A malfunctioning insulin pump during surgery cannot be reviewed until the postoperative period.

As for all people with type 1 diabetes, BGL should be monitored hourly intra-operatively.