INSULIN INFUSION PUMP MANAGEMENT - INPATIENT

Keywords: CSII, continuous insulin infusion, subcutaneous insulin, insulin pump, diabetes in hospital

AIM

- To enable individuals whose diabetes is being treated in the outpatient setting with a continuous subcutaneous insulin infusion (CSII) can continue to be managed safely with their insulin pump during their hospitalisation.

KEY POINTS

1. Hospital staff should assume, unless otherwise advised, that the only person who can manage the pump during their hospitalisation is the patient.
2. Any changes in insulin administration will need to be made by the patient who must be competent in managing the pump and physically and mentally able to accept and institute these recommendations.

COMPETENCY

Any patient who is admitted to hospital using an insulin pump must be assessed for their competency to use their device. If they can demonstrate their physical and mental competency to manage the device, the patient should be allowed to continue on their insulin pump.

On admission to hospital, either to a ward or Emergency Department, the patient must demonstrate to the satisfaction of the assessing health professional that they have the ability to use the management program of the device and understand how to modify the program. The diabetes educator or diabetes physician on call for the hospital should be notified upon admission of a patient with an insulin pump. An urgent consultation should be obtained if there is a concern about competency of the patient to continue on pump therapy. It may be possible to rectify any issues or concerns, allowing the patient to continue on their insulin pump. If the patient is not proficient with their pump, the physician on call may institute alternative therapy.

CONTRAINDICATIONS

The use of the CSII is contra-indicated in situations where the patient’s safety may be compromised by the physical illness or mental state of the patient.

Contra-indications for CSII using an insulin pump are:

- Patients with an impaired level of consciousness.
- Labour and birth is not an absolute contraindication to the use of an insulin pump, and may be used as determined by the physician.
- Patients with critical illness requiring intensive care.
- Patients with major psychiatric disturbance.
- Diabetic ketoacidosis. Patients refusing or unwilling to participate in self care.
- Lack of infusion sets, spare batteries and other equipment required to maintain patient on CSII therapy.
- Any other medical circumstance deemed unsuitable by the supervising medical officer.

Any discontinuation of pump therapy should be preceded by a discussion with the diabetes physician, diabetes educator and obstetric team.

DOCUMENTATION

Before a patient continues on CSII as an in-patient, the following criteria must be documented.

- It must be clearly written in the medical record and on the blood glucose monitoring form that the patient is on an insulin pump.
The brand name and model of the pump must be written in the medical record.
The type of insulin used in the insulin pump must be identified and recorded in the blood glucose monitoring form.
The current basal and bolus insulin doses must be documented in the medical record.
That competency has been assessed and deemed satisfactory, as per above section.
The patient agrees to notify the medical staff of any changes they make to their insulin pump.

CONSULTATIONS

The following health professionals should be consulted:
- Diabetes Physician
- Diabetes Educator
- Dietitian.

INSULIN ADJUSTMENT

- Changes to the patient’s insulin therapy may be made at anytime by the patient provided the change is notified to the diabetes educator / medical staff, as stated above.
- Any change to the insulin regimen recommended by the diabetes educator / medical staff will be documented in the medical record and confirmed by the patient at the time of implementation, as stated above.

BLOOD GLUCOSE MONITORING

Patients on an insulin pump should perform a minimum of 4 blood glucose tests per day:
- A minimum of 4 tests per day may be performed in patients with satisfactory control.
- In patients with less satisfactory control, 6 tests per day should be performed.
- An overnight test (e.g. 02:00) may be necessary.
- Additional blood glucose levels may be undertaken at any time by the patient.
- Additional tests may be performed at the request of the medical officer or nursing / midwifery staff when clinically indicated.
- The number of tests performed each day can only be reduced on the orders of the medical officer and can NEVER be reduced to less than 4 tests per day.

DEVICE MANAGEMENT

- The patient is responsible for ensuring the correct operation of the insulin pump.
- The patient will rotate the infusion set consistent with the recommendations for the device. This will be every three days, unless other documentation is provided.
- The patient will make the adjustments to the insulin pump’s program.
- The patient will be responsible for all bolus dose administration.
- The insulin pump may need to be discontinued temporarily during a number of circumstances during hospitalisation. In this situation, discontinuation of the insulin pump for more than 30 minutes may result in significant hyperglycaemia.
- Such circumstances where the insulin pump needs to be temporarily disconnected includes:
  - Any radiological investigation (pump must be removed)
  - CT Scan (pump must be removed)
  - MRI scan (pump must be removed, including metal cannula)
  - Physiotherapy (depending on the therapy)
  - Hydrotherapy (if pump is not water-proof).

Patients whose insulin pump needs to be discontinued for longer than 30 minutes may need to be
considered for an injection of subcutaneous insulin, e.g. subcutaneous soluble insulin (Actrapid, Humulin R, Humalog, Novorapid or Apidra) to cover their short term requirements.

Patients needing to be regularly disconnected from their insulin pump should be considered for basal/bolus subcutaneous insulin injection therapy.

**OPERATIONS AND PROCEDURES**

- The use of the CSII in operating theatres, procedure rooms etc is not contraindicated. Its use must be considered carefully in consultation between the anaesthetist, surgeon, physician, diabetes educator and patient.
- Potentially the insulin pump, by delivering stable and consistent insulin administration over hours can provide excellent peri-operative blood glucose control.
- In the basal infusion mode only, it can be considered “equivalent” to a very long acting insulin.
- As with all patients with diabetes undergoing surgery, patients who are unconscious need to be monitored carefully during and after their surgical procedure. Their blood glucose should be measured frequently while their conscious state is impaired.

**PATIENTS CONTINUING ON CSII PERI-OPERATIVELY**

- The patient must consent to continuing on the insulin pump therapy peri-operatively.
- CSII and IV insulin should not run at the same time.
- The infusion site must be placed away from the operation site with consideration also given to where a diathermy pad may be placed. Ensure the insertion cannula is plastic, not metal. If the pump is to be used during surgery, the patient must replace metal cannulas with plastic insertion cannulas before any surgical procedures that may involve diathermy.
- An identification tag must be attached to the patient that states that the patient is using an insulin pump. This should be sited in a readily visible position appropriate to the procedure to be undertaken.
- The anaesthetist must have access to the insulin pump during surgery to enable it to be turned off or disconnected if necessary.
- The patients BGLs must be monitored every hour peri-operatively until they have satisfactorily regained consciousness and the patient is capable of making decisions regarding managing their insulin pump.
- In the event of the blood glucose levels increasing to an unsatisfactory level peri-operatively, the diabetes physician on-call should be notified and switching to an IV insulin infusion should be considered.
- In the event of the BGL levels falling below 4mmol/L peri-operatively, the insulin pump must be turned and / or disconnected. Once euglycaemia is restored, CSII may be recommenced, either at a lower insulin infusion rate (if the medical staff are able to programme the device) or at a higher IV glucose infusion rate to prevent further episodes of hypoglycaemia. Alternatively, the insulin pump may remain off and an IV insulin infusion commenced to control the patients BGLs.
- The use of CSII in major procedures should only be considered in rare circumstances due to the strong possibility that an adjustment to the patients’ insulin therapy will be required during the prolonged peri-operative period. Discontinuation of the insulin pump and commencement of IV insulin therapy is recommended in this situation.

**PATIENTS NOT CONTINUING ON CSII PERI-OPERATIVELY**

- Patients whose insulin pump is discontinued prior to surgery will require an intravenous insulin infusion.
- Discontinuation of the insulin pump even for short periods of time with no alternative source of insulin may result in the rapid development of hyperglycaemia and the patient should be carefully monitored.
- The CSII can be recommenced when (a) the patient has regained full consciousness and (b) it is considered medically appropriate.
REFERENCES / STANDARDS


National Standards – 1.7.1
Legislation - Nil

Other related documents – Nil

RESPONSIBILITY

<table>
<thead>
<tr>
<th>Policy Sponsor</th>
<th>Nursing &amp; Midwifery Director OGCCU</th>
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<tbody>
<tr>
<td>Initial Endorsement</td>
<td>April 2011</td>
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<td>April 2014</td>
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<td>Review date</td>
<td>April 2017</td>
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