# Insulin Pump Therapy for Type 1 Diabetes

## Aim(s) and objective(s)
This guideline has been developed to describe which patients with Type 1 Diabetes should be referred for assessment for insulin pump therapy and gives guidance on initiation and follow-up of patients.

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## User group
The Following Groups of Healthcare Professionals should be utilising the guideline sections as described below:

### Section 1
Diabetes Consultants, non-Consultant Specialist Doctors (including GP with special interest), Diabetes Specialist Nurses (DSNs) & Specialist Diabetes Dietitians working within NHSL

### Section 1 – 5
Adult Insulin Pump Multidisciplinary Team based at Monklands Hospital

It would be anticipated that the paediatric service adapts sections 1-5 to meet the needs of this age group of patients, but many parts of the guidance in section 1-5 could be adopted by the paediatric team.

## Restrictions on Guideline Use:

### Section 1
All patients with Type 1 Diabetes should be assessed by the diabetes MDT to ensure multi-dose regime therapy has been optimised, usually including structured education, prior to referral to the insulin pump service. Hence section 1 should not be used by non-specialist primary care staff. If a patient has defaulted from specialist diabetes MDT care and their GP feels they may benefit from assessment for pump therapy, these patients should be referred to the local diabetes MDT or the Monklands service for further assessment in the first instance. Be careful not to raise the patient’s expectations by referring specifically for insulin pump therapy.

### Sections 2 - 5
These sections are intended for use by specialist diabetes healthcare professionals with appropriate training in the use of insulin pump therapy. The use of guidance in section 2 – 5 will form part of the patient's care supported by a multi-disciplinary team.

### All sections
Type 2 Diabetes

This guideline is not intended to serve as a protocol or standard of care. This is best based on all clinical data available for an individual case and may be subject to change as scientific knowledge and technology advances and patterns of care evolve. Adherence to guideline recommendations will not ensure a successful outcome in every case, nor should it be construed as including all proper methods of care or excluding other acceptable methods of care aimed at the same result. Ultimately a judgement must be made by the appropriate healthcare professional(s) responsible for a particular clinical procedure or treatment plan following discussion with the patient, covering the diagnostic and treatment options available. It is advised that any significant departure from the guideline should be documented in the patient’s medical record at the time the decision is taken.
SECTION 1 – REFERRAL CRITERIA

Referrals to the pump service should be made by healthcare professionals with diabetes specialist skills, only when the patient has completed appropriate structured education and is using an intensive multi-dose insulin regime therapy, to the best of the patient’s ability.

ADULTS (> 16 years)

1. Urgent referral: patients experiencing recurrent unpredictable hypoglycaemia
2. Routine referral: patients pre-pregnancy who despite completing structured education (usually DAFNE) do not achieve pre-pregnancy targets, 6-9 months post course
3. Routine referral: patients with unstable diabetes control impacting negatively with significant measurable consequence on quality of life despite having completed structured education (usually DAFNE)
   - recurrent hospital admissions
   - ongoing fear of hypoglycaemia or frequent mild episodes (especially if nocturnal or if impaired hypo awareness) being a barrier to tightening glycaemic control to HbA1c < 69mmol/mol
   - ability to manage current employment

PAEDIATRICS

1. Urgent referral: patients experiencing recurrent unpredictable hypoglycaemia
2. Routine referral: patients with unstable or suboptimal diabetes control, despite having completed structured education and good self care, impacting negatively to significant measurable consequence on the patient’s quality of life as judged by paediatric care team

SECTION 2 – INSULIN PUMP MULTIDISCIPLINARY TEAM ASSESSMENT

Referred patients will be seen in a consultant led clinic first, by the consultant and MDT members. The following will be documented / assessed:

- relevant past diabetes history, including acute and long term complications
- current insulin regime and usage
- current knowledge of optimal diabetes management and education gaps
- previous structured education received or not
- patient's beliefs as to previous barriers to attaining good care, e.g. fear of hypos.
- commitment to self care as evidenced by blood glucose monitoring, insulin dose adjustment, insulin injection technique, dietary habits, carbohydrate counting and lifestyle
- patient's willingness to alter current diabetes management
- patient's willingness to engage with pump service i.e. attend regular appointments, keep in touch with DSN / dietitian between appointments as required
- any expectations of pump therapy patient may have
- relevant past medical, drug and social history

At this stage patients will receive a brief overview of what insulin pump therapy involves, supported by literature. Patients may return for separate appointments to see pump DSN and / or pump dietitian as part of the initial assessment, depending on the needs identified.
Following the initial assessment the pump physician will present the case to the monthly pump MDT meeting. As a result of this MDT meeting discussion patients will be placed in one of the following categories:

1. Recommend trial of pump therapy, urgent or routine (waiting list categories see below)
2. Recommend structured education (e.g. DAFNE), reassess at pump clinic 6 months post DAFNE
3. Recommend targeted individual education for specific issue, by pump DSN / dietitian if appropriate or by DSN / dietitian at base hospital, then reassess at pump clinic after agreed time interval.
4. Recommend discharge from pump service – e.g. pump therapy not appropriate and / or patient declines suggested therapy options / further education

WAITING LIST PRIORITY CATEGORIES

URGENT Category

Priority 1 - Patients with recurrent severe / life threatening hypoglycaemia, despite good self care (i.e. appropriate use of multi-dose injection [MDI] regime) and having completed appropriate diabetes education (usually the DAFNE structured education programme or equivalent or similar paediatric programme as available).

Priority 2
- Patients under the age of 5 years with insulin dependant diabetes when the Paediatric Team consider the use of MDI impractical due to small total daily dose of insulin and/or lifestyle factor(s). This may include occasional short or long-term Neonatal patients
- Patients with Type 1 Diabetes not achieving an HbA1c target < 58mmol/mol as part of pre-pregnancy care despite a high level of self care, having completed and implemented structured education usually for at least 6 months (usually the DAFNE programme). In this patient group initiation of pump therapy would be agreed with the patient to be for duration of pregnancy and the on-going need / benefits reassessed 6 months after delivery
- Patients with Type 1 Diabetes not achieving an HbA1c < 69mmol/mol despite a high level of self care and having completed structured education (usually the DAFNE programme or similar Paediatric programme as available) in whom there are specific issues/ concerns due to the negative impact on quality of life due to unstable diabetes control. e.g.
  - recurrent hospital admissions
  - ongoing fear of hypoglycaemia (especially nocturnal) being a barrier to tightening glycaemic control
  - ability to manage current employment
  - for paediatrics ability to participate in age appropriate educational and social activities effectively

ROUTINE Category

Patients with Type 1 Diabetes not achieving HbA1c < 69mmol/mol despite a high level of self care and having completed structured education (usually the DAFNE programme or similar paediatric programme as available).

OR

Paediatric patients who are on established MDI, have received appropriate structured education (as available) and whose achievements (e.g. at Regional or National Sporting level) are being limited, and in the opinion of managing Consultant in conjunction with Insulin Pump Team would benefit from a trial of pump therapy.
It would be anticipated that URGENT Category, Priority 1 patients would receive pump therapy immediately following assessment due to nature of clinical problem and all other categories of patients will receive pump treatment when funding is available. If patients are on the pump therapy waiting list and it is likely to be more than 3 months before pump therapy can be commenced patients should continue to attend their primary diabetes physician who should send copies of clinic letters every 3 - 6 months to the pump physician indicating that the clinical situation remains constant or requesting further assessment if the patient’s clinical condition changes. Once funding is available the pump team will contact patients directly and a letter will be sent to the primary diabetes physician to indicate when pump therapy commences.

Patients and the referring diabetes physician and the patient’s GP will receive a letter with the pump MDT funding recommendation after the monthly MDT meeting.

SECTION 3 - INSULIN PUMP INITIATION & FIRST 12 MONTHS OF TREATMENT

Pre-Pump Visits & Preparation
Once funding for pump therapy is available for an individual patient, a date/ week to initiate pump therapy will be arranged. Prior to this patients will attend a pre-pump start visit with the pump DSN and dietitian for basic pump technology education and patients will usually arrange to wear the pump with saline in the reservoir for a few days to further familiarise themselves with the device. The pump DSN / dietitian will ask patients to complete pre-pump questionnaire, Hospital Anxiety & Depression Score (HADS) and quality of life questionnaires. Pumps from various manufacturers will be used. The specific device offered to an individual patient will depend on clinical issues, NHS procurement and device costs.

Pump Initiation Week
Patients will usually attend the David Matthews Diabetes Centre in Monklands District General Hospital daily Monday - Wednesday and again on Friday the week insulin pump therapy is commenced. Pump educators (DSN or dietitian) will be in telephone contact with patients on Thursday of the pump initiation week. Groups of 2 - 4 patients will start pump therapy together, reducing the pump educator’s time spent per patient initiating pump therapy.

The pump physicians will review patients on the Monday morning, to agree initial starting insulin pump regime, provide written pump therapy goals (based on initial assessment and pump therapy questionnaire) and confirm out-of-hours support for patients.

The Starting Regime for Pump therapy will usually be calculated as followed:
Average Pre-pump Total Daily Dose Insulin (TDD) = MDI (TDD)
Starting Pump TDD Insulin = 70% of MDI TDD
Starting Pump Basal rate per hour = (50% of Pump TDD) ÷ 24
Starting Pump Bolus doses if pump TDD > 40 units, 1unit for 10 gram CHO
Starting Pump Bolus doses if pump TDD < 40 units will usually be 1 unit for 15 or 20 gram CHO
Starting insulin sensitivity factor usually 3 - 5 mmol/L

Education sessions during Pump Initiation Week will follow the NHSL pump curriculum and will be delivered by either the pump DSN or dietitian.

Follow-Up Appointments
These will be tailored to individual patients, but typically in 1st year would be:
- Week 2 pump therapy – twice weekly telephone contact  pump DSN
- Week 3 pump therapy – face to face appointment pump DSN & dietitian
Thereafter patients will have telephone contact with pump DSN & dietitian as required by individual, usually patient initiated.

- Weeks 4 - 6 of pump therapy – consultant review
- 3 months of therapy - Consultant pump clinic MDT review
- 6 months of pump therapy - Consultant pump clinic MDT review
- 12 months of pump therapy - Consultant pump clinic MDT review

**SECTION 4 - ON-GOING CARE FOR INSULIN PUMP USERS**

- Patients will attend Consultant led pump clinics twice yearly
- Patients will be offered Pump group education refresher annually
- Patients will be offered DSN &/ or dietitian individual appointments for specific problem resolution on an as needed basis. If such appointments occur more than every 3 months the DSN & or dietitian may refer patient back to consultant led clinics to reconsider pump therapy benefits depending on specific issues.

**SECTION 5 - DISCONTINUATION OF INSULIN PUMP THERAPY**

All patients established on insulin pump therapy will have the benefits of therapy documented on an annual basis as part of the insulin pump service audit.

The following situations would be circumstance to discontinue funding of insulin pump therapy:

1. Patient no longer wishes to continue pump therapy
2. Failure to demonstrate adequate clinical benefit of pump treatment, for example but not exclusively:
   - HbA1c level remaining above 69mmol/mol without extenuating reasons
   - Ongoing unstable control due to incorrect use of pump
   - Pump treatment not resolved clinical issue for which the therapy was initiated e.g. hypoglycaemia, recurrent admissions, achieving pre-pregnancy targets
   - Self care commitment insufficient to make insulin pump safe i.e. failure to monitor blood glucose daily
3. Failure to attend pump clinic appointments without appropriate agreed alternative diabetes care in place e.g. attendance at another hospital diabetes service which may be appropriate after the initial assessment and insulin pump initiation
4. Failure to keep in touch with pump multi-disciplinary team and attend agreed education appointments
5. Patient no longer lives within NHS Lanarkshire catchment area. If patient moves to live in a neighbouring health board area usually their diabetes care should transfer to the new health board and also the responsibility of insulin pump funding

**Process for Discontinuation of Insulin Pump Therapy**

1. As part of the annual assessment of patients receiving pump therapy funding, the pump MDT will assess whether patients are receiving benefit from therapy and are safe using the pump device
2. If any issues are raised the pump physician will arrange to meet the patient and discuss the issues with them and the possible recommendation to discontinue pump therapy. This discussion in clinic should be followed by written confirmation to patient of discussion content
3. Patients thereafter are given a 3 month period for reflection, during which time they should take measures to address the issues raised and hopefully resolve them
4. At the follow-up clinic the pump physician should agree with the patient whether or not the raised issues have been resolved and either agree to continue pump therapy or discontinue it substituting pump with MDI.

5. If there isn’t agreement between patient and physician as to whether pump therapy should be continued, the case should be discussed at the pump MDT meeting and or if necessary review by another pump physician undertaken.

References

Peer Review and Consultation
This guideline has been discussed with pump MDT team, and referral criteria circulated to all secondary care diabetes physicians. Paediatric colleagues have been involved in referral guideline development, assessment process and MDT meetings to agree pump waiting list categories. However it is recognised that further adaptation of the guideline for paediatric assessment and pump initiation in time may be needed.
Diabetes Specialist Nurses and Dietitians
A sample of GPs and Practice Nurses who lead diabetes services at practice level

Diabetes MCN endorsement
May 2014

Review Date
May 2017
Appendix 1

NHSL Type 1 Diabetes Pathway including CSII Therapy April 2010

All patients with Type 1 diabetes – offered 6 monthly review in specialist diabetes clinic (secondary care)

Patients with Type 1 Diabetes – GP only care (secondary care clinic defaulters)

Recurrent SEVERE Hypoglycaemia

YES

NO

Refer to CSII assessment clinic

Wish to intensify insulin regime & improve control

Previously Completed DAFNE

YES

NO

Urgent Referral

Individual Education update

CSII clinic review

CSII recommended

CSII - NOT recommended

Routine Referral

DAFNE

Post - DAFNE Review in referring clinic

General DM clinic review

Unstable DM with serious impact on quality of life

CSII MDT meeting to agree waiting list priority

URGENT Priority 1 or 2

ROUTINE