

**Title** INSULIN PUMP THERAPY FOR TYPE 1 AND TYPE 2 DIABETES

**Agency** HTA Malaysia, Health Technology Assessment Section, Medical Development Division, Ministry of Health Malaysia  
Level 4, Block E1, Parcel E, Presint 1,  
Federal Government Administrative Center, 62590 Putrajaya, Malaysia  
Tel: +603 88831229, Fax: +603 88831230; htamalaysia@moh.gov.my, www.moh.gov.my

**Reference** Technology Review Report - 011/2015, online:  
[http://www.moh.gov.my/index.php/database\\_stores/attach\\_download/347/281](http://www.moh.gov.my/index.php/database_stores/attach_download/347/281)

No retrievable evidence on quality of life.

### **Aim**

To review evidence on the effectiveness, safety and cost-effectiveness of insulin pump therapy compared with multiple daily injections for type 1 and type 2 diabetes.

### **Conclusions and results**

#### **Safety**

##### **Type 1 Diabetes**

There was no significant difference between the hypoglycaemic events for continuous subcutaneous insulin infusion (CSII) and multiple daily injections (MDI) in most trials. There was no significant difference between CSII and MDI, although the absolute number of ketoacidosis episodes was higher with CSII. The number of ketoacidosis episodes could be reduced with the usage of newer generation CSII and the proper management and training for the usage of CSII.

##### **Type 2 Diabetes**

Only limited hyperglycaemia, hypoglycaemia and ketoacidosis cases were reported in the studies.

##### **Pregnancy**

There was no significant difference in maternal hypoglycaemia and hyperglycaemia events between CSII and MDI.

#### **Effectiveness**

##### **Type 1 Diabetes**

Greater reduction of glycated haemoglobin in the CSII compared to MDI. However, the difference did not reach statistical significance in some studies. Some studies reported significant reduction of glycated haemoglobin in patients treated with CSII compared with MDI during short term follow-up (up to four months) and in those with inadequate glycaemic control.

##### **Insulin dosage**

Studies showed reduction in insulin dosage with CSII as compared to MDI.

##### **Quality of life (QoL)**

HTA reports reported no significant difference in Quality of life (QoL) for CSII compared with MDI. However, for adult patients with inadequate glycaemic control, significant improvement in various aspects of QoL was observed in CSII groups compared with the MDI groups.

##### **Type 2 Diabetes**

No retrievable evidence on the insulin dosage reduction with CSII as compared to MDI.

##### **Quality of life (QoL)**

##### **Pregnancy**

There was lower glycated haemoglobin in CSII than MDI but the differences were not statistically significant. No significant difference in pregnancy outcome such as macrosomia and operative birth.

##### **Insulin dosage**

Lower insulin units were needed for the CSII as compared to MDI.

##### **Quality of life (QoL)**

No retrievable evidence on the quality of life.

#### **Cost/Cost-Effectiveness**

One HTA report stated the estimated additional cost of CSII compared to MDI varies from £1,091 per annum to £1,680 per annum, according to the type of the insulin pump and the estimated life of the device. These estimates include the costs for the insulin pump, the consumables associated with delivery of CSII, and an allowance for the initial education required when patients switch from MDI to CSII. A cost utility analysis compared the CSII and MDI reported the incremental cost-effectiveness ratio (ICER) with CSII was £11,461. (Standard deviation: £3,656).

#### **Recommendations (if any)**

Insulin pump therapy can be used for treatment of selected cases of type 1 diabetes. However for type 2 diabetes, insulin pump therapy may be used for research purpose to provide more quality evidence.

#### **Methods**

Electronic databases were searched, which included PubMed, Medline, Journal @ Ovid full text via OVID, OVID EBM Reviews - Cochrane central register of controlled trials, EBM Reviews - Cochrane database of systematic review and from non-scientific database - Google search engine. In addition, a cross-referencing of the articles retrieved was also carried out accordingly to the topic. Relevant articles were critically appraised and evidence graded using US/Canadian Preventive Services Task Force.

#### **Further research/reviews required**

Studies on cost-effectiveness is warranted

#### **Written by**

Lee Sit Wai, MaHTAS, Malaysia