Technology Guidance

Continuous subcutaneous insulin infusion therapy

for treating type 1 diabetes mellitus

Technology Guidance from the MOH Medical Technology Advisory Committee

Guidance Recommendations

The Ministry of Health's Medical Technology Advisory Committee has recommended continuous subcutaneous insulin infusion therapy (CSII) for treating type 1 diabetes mellitus, in line with the following criteria:

- ✓ CSII and its consumables can be considered as a treatment option for adults and children with type 1 diabetes mellitus:
  - who use multiple daily injections of insulin (MDI) to achieve target HbA1c but result in the person experiencing disabling hypoglycaemia, where disabling hypoglycaemia is defined as the repeated and unpredictable occurrence of hypoglycaemia that results in persistent anxiety about recurrence and is associated with a significant adverse effect on quality of life (QoL); or
  - who have unacceptably high HbA1c (i.e. at 8.5% or above) on MDI despite a high level of care, where a high level of care refers to patient adherence to structured education programmes provided by a multidisciplinary team at specialist outpatient clinics in the public healthcare sector, which comprise an endocrinologist with a special interest in CSII, a diabetes nurse educator, and a dietician; or
  - where MDI is not clinically suitable and acceptable for children younger than age 12 years, and where careful consideration is made jointly by the multidisciplinary healthcare team, the children, and their caregivers who are responsible for supervising them in using CSII instead of MDI.
- ✓ CSII should be discontinued if it does not result in a sustained improvement in glycaemic control as evidenced by a fall in HbA1c levels or an increase in time-in-range blood glucose readings, or a sustained improvement in disabling hypoglycaemia, or a sustained improvement in QoL.

Funding status

CSII is recommended for subsidy in adults and children with type 1 diabetes mellitus, in line with the abovementioned recommendations. Subsidy applies only to the devices and consumables listed in the Annex.

Updated: 1 July 2026

Technology evaluation

1.1. The MOH Medical Technology Advisory Committee ("the Committee") considered the evidence presented for the technology evaluation of continuous subcutaneous insulin infusion therapy (CSII) for the treatment of people with type 1 diabetes mellitus (T1DM). The Agency for Care Effectiveness (ACE) conducted the evaluation in consultation with clinical experts from public healthcare institutions. Published clinical and economic evidence for CSII was considered in line with its registered indications.

1.2. The evidence was used to inform the Committee's deliberations around five core decision-making criteria:

- Clinical need of patients and nature of the condition;
- Overall benefit of the technology for the patient and/or the system;
- Cost-effectiveness (value for money), which considers the incremental benefit and cost of the technology compared to existing alternatives;
- Estimated annual technology cost and the number of patients likely to benefit from the technology; and
- Organisational feasibility, which covers the potential impact of adopting the technology, especially barriers for diffusion.

1.3. Additional factors, including social and value judgments, may also inform the Committee's deliberations.

Clinical need

2.1. T1DM is a chronic metabolic disorder caused by autoimmune β-cell destruction that leads to insulin deficiency. The Committee acknowledged multiple daily injections of insulin analogues (MDI) are currently the main treatment option for local population with T1DM. The MDI regimen uses the basal-bolus approach, which combines basal injections of long-acting insulin with pre-prandial bolus injection of rapid-acting insulin. Insulin pens of rapid-acting and long-acting insulin analogues are currently subsidised.

2.2. The Committee noted that MDI do not allow basal rates of insulin to be readily adjustable once it is administered. With CSII, the infusion rates can be instantaneously adjusted, and a smaller unit of insulin can be administered. The flexible and precise adjustment of insulin doses closely mimics normal insulin secretion patterns to avert hyperglycaemia and hypoglycaemia, and may contribute to prevention of diabetic complications.

2.3. The Committee also considered the impracticalities of administering small insulin doses to very young children and midday doses of insulin to young school children.

Clinical effectiveness and safety

3.1. In line with local clinical practice, the main comparator used in the evaluation was MDI. The Committee noted that randomised controlled trials (RCTs) which compared CSII with MDI demonstrated no significant difference in the incidence of severe hypoglycaemia (SHG) and HbA1c reduction. The RCTs reported that CSII reduced HbA1c greater than MDI, but the reduction was not statistically or clinically significant. In adults using CSII, greater improvements in quality of life (QoL) and treatment satisfaction were observed, compared with MDI. Observational studies showed more favourable outcomes to CSII in reduction in HbA1c (-0.2 to -1.4%) and rate of SHG, and improvement in QoL. The HbA1c lowering effect was more pronounced in patients with high baseline HbAa1c of approximately 9%, compared to those with baseline HbA1c 7-8%.

3.2. The Committee acknowledged that none of the studies looked at long-term benefits of HbA1c reduction associated with CSII, such as prevention of microvascular and macrovascular complications. The Committee also noted that some primary studies included in systematic reviews used a conventional insulin such as neutral protamine hagedorn (NPH) insulin as a basal insulin, which may overestimate the incremental benefits of CSII.

Cost effectiveness

4.1. The Committee considered the cost-effectiveness of CSII compared with MDI for adults and children with T1DM. The Committee noted that there was no local economic evaluation available. Published economic analyses reported inconsistent results majorly due to different assumptions used for glycaemic outcomes. An economic analysis which adopted data from RCT showed higher ICER, compared with the other which used an HbA1c reduction of 0.9% from a clinical database, and assumed 50% reduction of SHG episodes.

Estimated annual technology cost

5.1 The Committee estimated the annual cost to the Government of subsidising the use of CSII was less than $1 million, based on a projection of about 640 adults and children with T1DM in Singapore who could benefit from Government subsidy for CSII.

Organisational feasibility

6.1. The Committee acknowledged that structured patient education and continuous reinforcement on self-management are essential to achieve successful outcomes with CSII. All people who initiate CSII should be competent in carbohydrate counting, flexible insulin dosing, self-monitoring of blood glucose, sick day management, and troubleshooting issues that patients commonly encounter during the use of CSII. Such training would require additional resources for both the providers (e.g. skills, time, and space), and patients and their caregivers.

Recommendations

7.1. Given the available evidence, the Committee recommended subsidy for CSII for treating T1DM, in line with the following criteria:

- ✓ CSII and its consumables can be considered as a treatment option for adults and children with type 1 diabetes mellitus:
  - who use multiple daily injections of insulin (MDI) to achieve target HbA1c but result in the person experiencing disabling hypoglycaemia, where disabling hypoglycaemia is defined as the repeated and unpredictable occurrence of hypoglycaemia that results in persistent anxiety about recurrence and is associated with a significant adverse effect on quality of life (QoL); or
  - who have unacceptably high HbA1c (i.e. at 8.5% or above) on MDI despite a high level of care, where a high level of care refers to patient adherence to structured education programmes provided by a multidisciplinary team at specialist outpatient clinics in the public healthcare sector, which comprise an endocrinologist with a special interest in CSII, a diabetes nurse educator, and a dietician; or
  - where MDI is not clinically suitable and acceptable for children younger than age 12 years, and where careful consideration is made jointly by the multidisciplinary healthcare team, the children, and their caregivers who are responsible for supervising them in using CSII instead of MDI.

- ✓ CSII should be discontinued if it does not result in a sustained improvement in glycaemic control as evidenced by a fall in HbA1c levels or an increase in time-in-range blood glucose readings, or a sustained improvement in disabling hypoglycaemia, or a sustained improvement in QoL.

7.2. Subsidies apply only to models listed in the Annex of this guidance.

ANNEX

Continuous subcutaneous insulin infusion therapy for treating type 1 diabetes mellitus

Company	Category	Model[1]
Medtronic	Insulin Pump	MiniMed 700G System MiniMed Paradigm Veo 754 Insulin Pump[2]
	Infusion Set	Quickset Infusion set (Needle Length: 6/9mm | Tubing length: 60 cm) Sure T infusion set (Needle Length: 6/8mm | Tubing length: 60 cm)
	Insulin Reservoir	MiniMed Reservoir 3mL

The CSII listed in Annex are not affected by cybersecurity risk, where an unauthorised person with special technical skills and equipment could alter settings and control insulin delivery.

Note:

1. This Annex will be updated as models are revised.
    - Roche has notified that supply for Accu-Chek Combo Insulin Delivery System has been discontinued from 1 July 2026.
2. Medtronic has notified that:
    - Supply for MiniMed Paradigm Veo 754 Insulin Pump will be discontinued and replaced with the MiniMed 700G System from 1 October 2022.

VERSION HISTORY

Guidance on continuous subcutaneous insulin infusion therapy for treating type 1 diabetes

This Version History is provided to track any updates or changes to the guidance following the first publication date. It is not part of the guidance.

1.	**Publication of guidance** Date of Publication	23 Mar 2020
2.	**Amendment to Annex due to discontinuation of CSII insulin pump** Date of Publication	1 Feb 2022
3.	**Amendment to Annex due to replacement of CSII insulin pump** Date of Publication	1 Oct 2022
4.	**Amendment to Annex due to naming correction of CSII insulin pump** Date of Publication	8 Nov 2024
5.	**Amendment to Annex due to discontinuation of CSII insulin pump** Date of Publication	1 Jul 2026

Agency for Care Effectiveness - ACE Agency for Care Effectiveness (ACE)

About the Agency

The Agency for Care Effectiveness (ACE) was established by the Ministry of Health (Singapore) to drive better decision -making in healthcare through health technology assessment (HTA), clinical guidance, and education.

As the national HTA agency, ACE conducts evaluations to inform government subsidy decisions for treatments, diagnostic tests and vaccines, and produces guidance for public hospitals and institutions in Singapore.

This guidance is not, and should not be regarded as, a substitute for professional or medical advice. Please seek the advice of a qualified healthcare professional about any medical condition. The responsibility for making decisions appropriate to the circumstances of the individual patient remains with the healthcare professional.

Find out more about ACE at www.ace-hta.gov.sg/about

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