



# Effectiveness of Continuous Subcutaneous Insulin Infusion (CSII) in Type 2 Diabetes: Rapid HTA

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## Background

Continuous Subcutaneous Insulin Infusion (CSII) has been increasingly used in the management of type 1 diabetic (T1DM) patients to improve metabolic control and quality of life in those using multiple dose insulin regimens.<sup>[1]</sup> There is limited literature on CSII use in patients with Type 2 diabetes mellitus (T2DM).

## Fast Facts: Diabetes Mellitus

- DM is the most common metabolic disorder, its prevalence varying widely worldwide and ranging from as low as <1% to >50%. It is due to insulin deficiency or inefficiency, which results in a state of hyperglycaemia<sup>[2,3]</sup>
- 8.2% of adult Singapore residents have diabetes mellitus and 12% have demonstrable impaired glucose tolerance<sup>[4]</sup>

## Objective

To review and update existing literature on the clinical and cost effectiveness of CSII use in T2DM patients compared to Multi-Dose Injection

Population	Patients with Type 2 Diabetes Mellitus
Intervention	Use of continuous subcutaneous insulin infusion
Comparators	Multi-Dose Injection (MDI)
Outcome	Improved glycaemic control

## Technology

CSII uses a small electrical insulin pump which is planned and controlled by the user to give different specific amounts of insulin at different times of day and night.



Source:<sup>[5]</sup>

## Methods

**Search terms:** ('continuous subcutaneous insulin infusion' OR 'insulin pumps') AND ('multiple dose insulin' OR 'intensive insulin therapy') AND 'Type 2 diabetes'

**Databases:** Medline, NHS Centre for Reviews and Dissemination Database, Cochrane, National guideline Clearinghouse and NICE databases

**Search hits:** 3 meta-analyses<sup>[6,7,8]</sup>, 4 randomized controlled trials (RCT)<sup>[9,10,11,12]</sup>, 2 reviews<sup>[13,14]</sup>, 5 observational studies<sup>[15,16,17,18,19]</sup>, 1 case series<sup>[20]</sup>, 1 HTA report<sup>[21]</sup> and 1 cost evaluation study<sup>[22]</sup>

## Research & Evidence

- Two meta-analyses did not support the use of CSII in T2DM while one advocated its use in improving glycaemic control.<sup>[6,7,8]</sup>
- Although one review, observational studies and case series suggested improved glycaemic control using CSII<sup>[14-20]</sup>, another review article and the RCTs<sup>[9-13]</sup> showed conflicting results in the benefits of CSII use over MDI regimens
- Currently, CSII appears more beneficial in T1DM patients.<sup>[21]</sup>
- No guidelines or cost analyses were found for the use of CSII in T2DM patients.
- Cost evaluation studies were not available for T2DM, one of which highlighted increased cost for equipment and maintenance in CSII use in T1DM patients.<sup>[22]</sup>

## Conclusion

CSII may be more effective over MDI regimens in T2DM although there is no conclusive evidence currently. Cost is an issue, and long-term cost-benefits analyses to both the individual and healthcare systems need to be carried out.

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