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

Tin AS¹, Gardner DSL², Goh SY², Chow WL¹
¹SingHealth Centre for Health Services Research, Singapore Health Services Pte Ltd
²Department of Endocrinology, Singapore General Hospital, Singapore

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.[¹] There is limited literature on CSII use in patients with Type 2 diabetes mellitus (T2DM).

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

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[²,³]
• 8.2% of adult Singapore residents have diabetes mellitus and 12% have demonstrable impaired glucose tolerance [⁴]

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.

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[⁶,⁷,⁸], 4 randomized controlled trials (RCT)[⁹,¹⁰,¹¹,¹²], 2 reviews[¹³,¹⁴], 5 observational studies[¹⁵,¹⁶,¹⁷,¹⁸,¹⁹], 1 case series[²⁰], 1 HTA report[²¹] and 1 cost evaluation study[²²]

Research & Evidence
• Two meta-analyses did not support the use of CSII in T2DM while one advocated its use in improving glycaemic control.[⁶,⁷,⁸]
• Although one review, observation studies and case series suggested improved glycaemic control using CSII[¹⁴-²⁰], another review article and the RCTs[⁹-¹³] showed conflicting results in the benefits of CSII use over MDI regimens
• Currently, CSII appears more beneficial in T1DM patients.[²¹]
• 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.[²²]

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.

REFERENCES