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Cost-Effectiveness Analysis of an Advanced Hybrid Closed Loop System Versus Standard of Care in the Management of Type 1 Diabetes in the Netherlands

Serné EH[1], Buompensiere MI[2] , Ozdemir Saltik AZ[2], Yu J[2], de Portu S[2], Cohen O[2]
1 University of Amsterdam, Amsterdam, Netherlands 2. Medtronic International Trading Sàrl, Tolochenaz, Switzerland.

1. OBJECTIVE

An advanced hybrid closed loop (AHCL) system, with automated basal and bolus correction insulin delivery, was found to be cost-effective in various European markets, including the Netherlands, based on trials with baseline HbA1c >8% [1].

This study aimed to assess the cost-effectiveness of AHCL versus standard of care (SoC, multiple daily injections or pump with intermittently-scanned or continuous glucose monitoring) in those with baseline HbA1c <8% (64mmol/mol), still not reaching glycemic targets in the Netherlands, to address the health economics of AHCL for the full range of baseline HbA1c levels.

2. METHODS

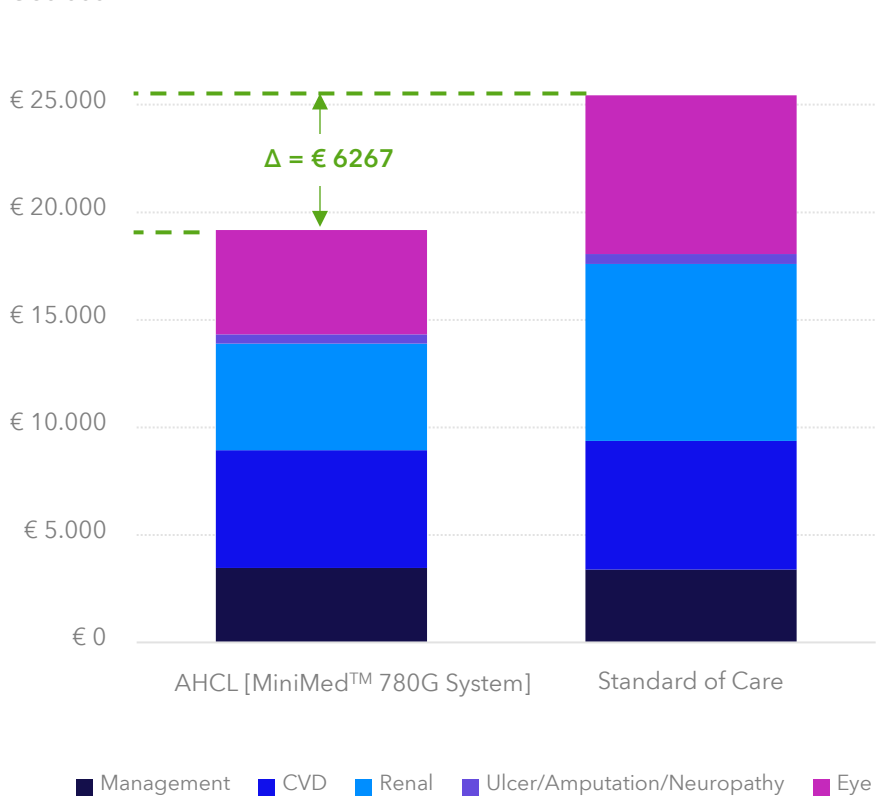
Effectiveness data were derived from a prospective, multicentre study [2], which demonstrated a 0.56% reduction in HbA1c with AHCL, from 7.43% (57 mmol/mol) at baseline to 6.88% (52 mmol/mol) after 3 months.

Costs and clinical outcomes were estimated using the IQVIA CORE Diabetes Model. A Dutch payer perspective was adopted over a lifetime for a cohort aged 39.9 [±11.8]. A willingness-to-pay threshold of €80.000 was used, and an annual discount rate of 3% was applied.

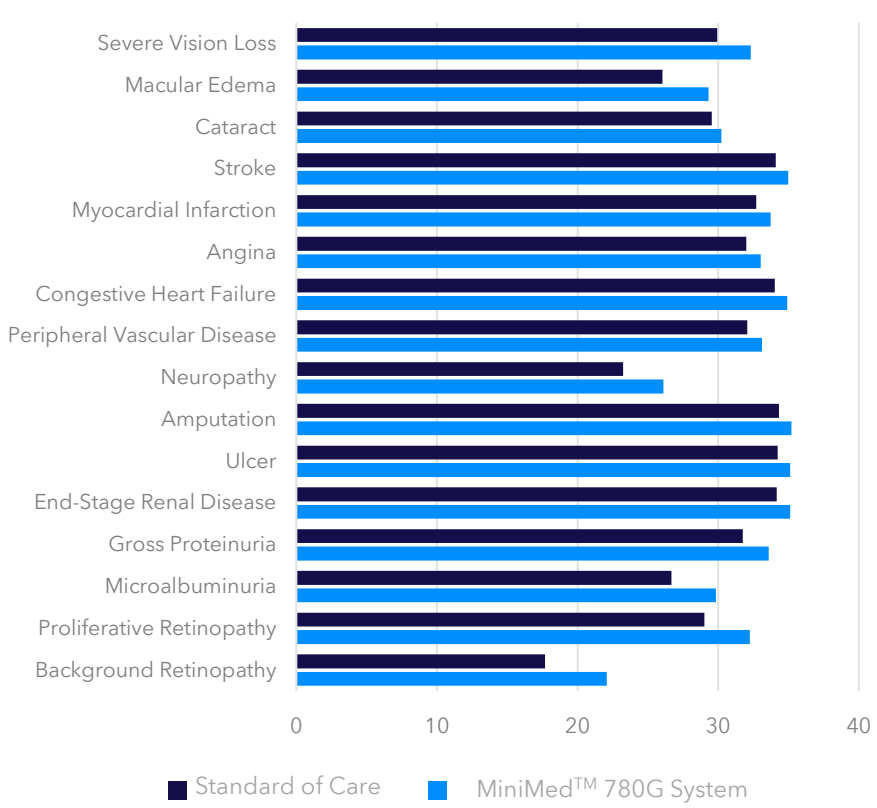
3. RESULTS

AHCL was projected to **provide 0.66 quality-adjusted life years (QALYs) gained, corresponding to 240 days more in full health** versus SoC. Total costs were €25,345 higher, with AHCL resulting in an incremental cost effectiveness ratio (ICER) of €38,536/QALY-gained. AHCL led to a lower cumulative incidence of diabetes-related complications. Higher acquisition costs were partially offset by reduced complications costs. Sensitivity analyses showed that the results were robust to changes in baseline HbA1c but sensitive to treatment effects.

Breakdown of direct costs



Time alive and free of complication [in years]



4. CONCLUSIONS

Over a lifetime, AHCL proved cost-effective, albeit more costly than SoC in persons with HbA1c of 7.43% (57 mmol/mol) not reaching glycemic targets in the Netherlands. This finding underscores the potential of AHCL in improving T1D management and its cost-effectiveness through the full range of HbA1c.

References: [1] Jendle J, et al. Diabetes Technol Ther. 2023;25(12):864-876. [2] Beato-Vibora PI, et al.Diabetes Care 2024;47:216–224.

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