

# Cost-effectiveness of insulin pump therapy for adults with type 1 diabetes

## Summary

**Objective:** To evaluate the effectiveness, safety and cost-effectiveness of advanced hybrid closed loop (AHCL) insulin pump system compared to multiple daily insulin injections with continuous glucose monitoring (MDI + CGM) for the treatment of adults with type 1 diabetes mellitus (T1DM) in Estonia.

**Methods:** To meet the objective, a literature review of the effectiveness and safety of AHCL system was composed. In addition, an overview of previously published cost-effectiveness studies comparing AHCL system to MDI + CGM was compiled. Estonian cost-effectiveness calculations were not performed as it was not possible to use any internationally recognized diabetes model (e.g. CORE diabetes model, Sheffield model). Therefore, based on the cost-effectiveness analysis, that used the CORE diabetes model, performed in 2017 in Estonia (HTA report: Cost-effectiveness of insulin pump therapy in the treatment of type 1 diabetes), the effect of changing the most important input parameters on the result of the analysis was indirectly calculated. Results were expressed in the incremental cost-effectiveness ratio (ICER) per quality-adjusted life-year (QALY) gained. A 5-year budget-impact analysis was carried out from the healthcare payer perspective.

**Results:** Based on the literature review, people with T1DM and HbA1c of at least 8% are expected to confer benefits in terms of glycaemic control with AHCL system beyond those that can be achieved with MDI + CGM. However, it should be noted, that this conclusion was based on the results of only one study – more studies with such a comparison would be needed to make firmer conclusions. Based on the cost-effectiveness analysis from the HTA report "Cost-effectiveness of insulin pump therapy in the treatment of type 1 diabetes" published in 2017 in Estonia and updated input parameters, the ICER of AHCL system would be around €95,000 per QALY gained compared to MDI + CGM. According to the budget impact analysis, reimbursement of the AHCL system would result in an additional cost of 2.2 – 6.7 million euros to the Estonian Health Insurance Fund in the year of initiation of insulin pump therapy and 1.2 – 3.7 million euros annually during the next three years compared to the MDI + CGM.

**Conclusions:** Patients with T1DM and poor glycaemic control may get the most benefit from AHCL system, however the AHCL systems don't seem to be cost-effective in Estonia.

**Citation:** Juus E, Lukka M, Volke V, Lutsar K, Jürisson M. *Insuliini pumpravi 1. tüüpi diabeediga täiskasvanutel: tervisetehnoloogia hindamise raport TTH67*. Tartu: Tartu Ülikooli peremeditsiini ja rahvatervishoiu instituut; 2023.