

ECONOMIC EVALUATION OF BLOOD GLUCOSE POINT-OF-CARE TESTING IN THE INTENSIVE CARE UNIT

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Introduction Point-of-care testing of blood glucose (BG-POCT) is essential for safe insulin infusion in critically ill patients. Costs associated with BG-POCT are considered substantial, especially when more frequent monitoring is needed as with strict glucose control aiming for lower BG-levels. The objective of this study is to estimate the incremental cost-effectiveness of a strict BG-POCT guideline versus a loose guideline, from a hospital perspective.

Methods This is a secondary analysis of a guideline implementation project aiming for normal BG-levels in three intensive care units in the Netherlands [1]. A Markov model including health states 'target glucose', 'hyperglycemia', 'hypoglycemia', and hospital death was developed to compare expected costs, number of patients within target and number of life years saved before and after guideline implementation.

Results The analysis included 1.321 and 2.175 patients 12 and 24 months before and after implementation of the guideline, respectively. The number of BG-POCT increased from 4.2 [2.6 – 6.7] to 8.7 [4.1 – 11.2] per patient per day. Costs for BG-POCT increased with 72%. When taking total hospital costs and clinical effects into account, implementation of the strict glycemic control guideline reduces hospital costs with €134 during total inpatient stay, as patients spend less time in hypo/hyperglycemic events and had shorter stays in ICU and hospital (–0.5 and –1.1 day, respectively). This translates into expected cost savings of €13 per additional patient in target glucose and €10 per additional life year saved. The model outcomes are most sensitive to changes in ICU length of stay.

Conclusion This health-economic analysis shows that additional costs of BG-POCT with implementation of a strict glucose control guideline are offset against savings generated by reduced hypo/hyperglycemic events and length of stay in ICU and hospital.

1. Schultz, M.J., et al., *Adoption and implementation of the original strict glycemic control guideline is feasible and safe in adult critically ill patients*. *Minerva Anesthesiol*, 2012. **78**(9): p. 982-95.

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