Retrospective controlled study shows intermittently-scanned continuous glucose monitoring (isCGM) is associated with lower HbA1c and reduced hospitalisations for diabetes events in adults with T1DM in Sweden

Katarina Eeg-Olofsson[1], David Nathanson[2], Tim Spelman[3], Mattias Kyhlstedt[3], Erik Bülow[4], Fleur Levrat-Guillen[5], Jan Bolinder[2]

[1]Sahlgrenska University Hospital and Department of Molecular & Clinical Medicine, University of Gothenburg, Sweden, [2]Department of Medicine, Karolinska University Hospital Huddinge, Karolinska Institute, Stockholm, Sweden, [3]Synergus RWE AB, Stationsvägen 18, 184 50 ÅKERSBERGA, Sweden, [4]Registercentrum, Västra Götaland, Sweden, [5]Abbott Laboratories Ltd, Maidenhead, UK

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KAROLINSKA INSTITUTET ANNO 1810 Karolinska Institutet

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Declaration

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Aim: to assess the impact of initiating isCGM, compared to BGM, on HbA1c and hospital admissions in adults with T1DM

OVERVIEW	Retrospective, controlled study with linked analysis of: • Swedish National Diabetes Register (NDR) • Swedish Prescribed Drug Register (SPDR), containing data on prescribed drugs • Swedish National Patient Register, containing hospital admission data
PATIENTS	Adults aged ≥18 years with T1DM • isCGM users, n=11,822; BGM controls, n=3,007
OUTCOMES	• Change in HbA1c up to 24 months (before vs after isCGM; isCGM users vs BGM controls) • Risk of hospitalisation for diabetes-related events (isCGM users vs BGM controls)
STATISTICAL ANALYSES	• HbA1c: PS-IPTW mean regression used for analysiss • Hospitalisations: PS-IPTW negative binomial regression used to calculate admission rates for diabetes-related events per 100 person-years of mean follow up (cases=3.3 years, controls=3.4 years) *Propensity score derived from a range of variables including age, sex, BMI, baseline HbA1c, lipid profile, renal function, smoking status, physical activity, pre-baseline comorbidity and diabetic complications*

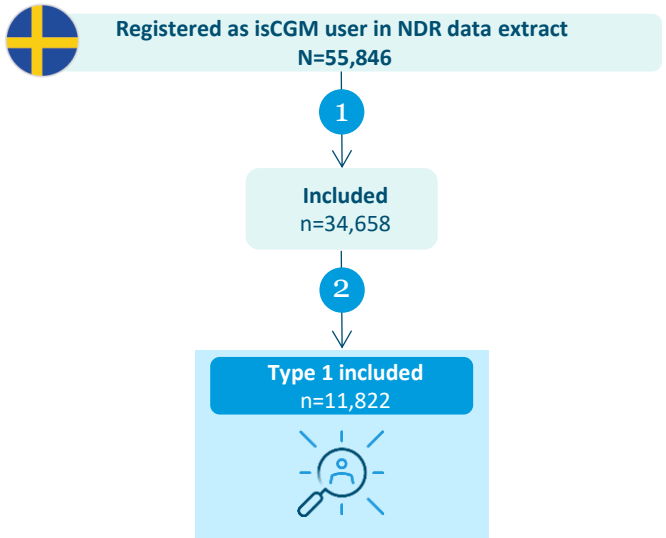
BGM=blood glucose monitoring; DKA=diabetic ketoacidosis; HbA1c=haemoglobin A1c; isCGM=intermittently-scanned continuous glucose monitoring; NDR=Swedish National Diabetes Register; NPR=Swedish National Patient Register; SPDR=Swedish Prescribed Drug Register; PS-IPTW=propensity score based inverse probability of treatment weighting; T1DM = type 1 diabetes mellitus

Results: 11,822 T1DM adults who initiated isCGM were identified

Overview of NDR analysis

Inclusion criteria

1. First recorded exposure to FreeStyle Libre system after June 1 2017
   No prior use of other CGM
2. T1DM: HbA1c baseline value 3–8 months prior to index date



CGM=continuous glucose monitoring; HbA1c=haemoglobin A1c; isCGM=intermittently-scanned continuous glucose monitoring; NDR=Swedish National Diabetes Register; T1DM=type 1 diabetes mellitus

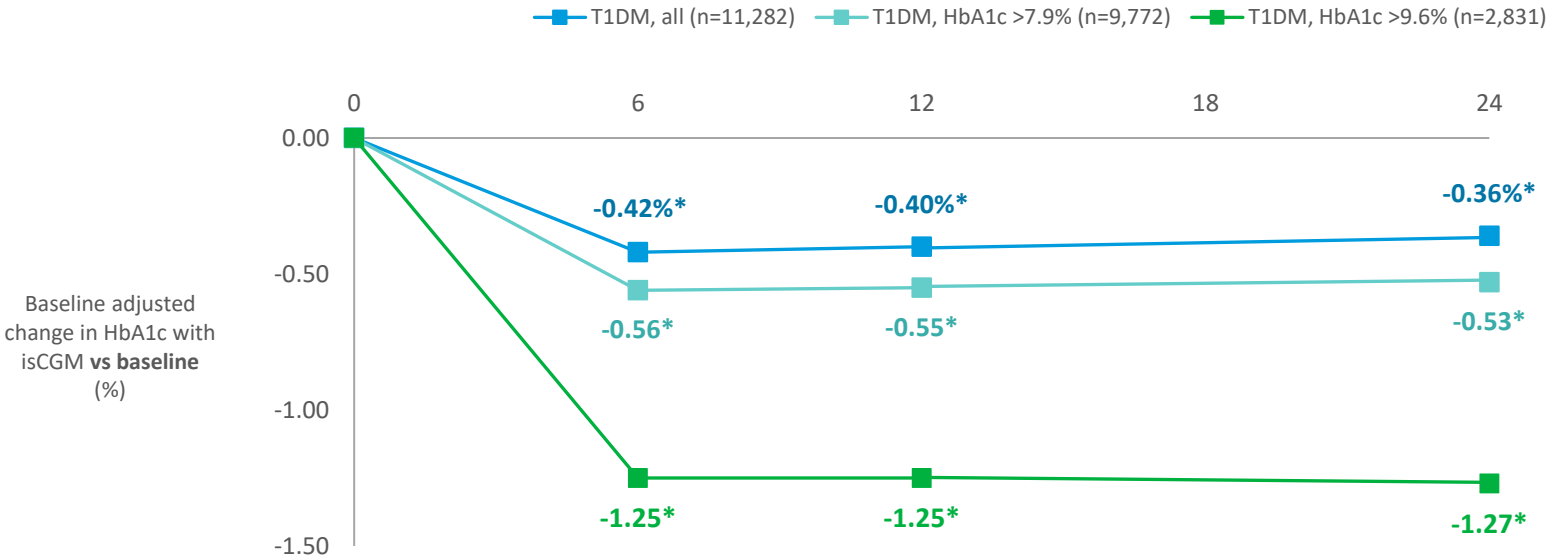
Results: adults with T1DM who initiated isCGM were matched with BGM controls

	isCGM (n=11,822)	**BGM controls** (n=3,007)	Weighted standardised difference
Mean age (yrs) *(SD)*	50.29 *(18.13)*	63.37 *(16.38)*	*-0,145*
Sex — Female, n *(%)*	4,902 *(41.5)*	1,272 *(42.3)*	*-0,010*
Sex — Male, n *(%)*	6,920 *(58.5)*	1,735 *(57.7)*	
Mean BMI (kg/m^2) *(SD)*	26.21 *(3.68)*	26.94 *(4.06)*	*-0,124*
Mean HbA1c (%) *(SD)*	7.92 *(1.31)*	7.81 *(1.23)*	*-0,003*
Mean diabetes duration (yrs) *(SD)*	22.26 *(16.52)*	23.67 *(17.61)*	*-0,130*

BMI=body mass index; BGM=blood glucose monitoring; HbA1c=haemoglobin A1c; isCGM=intermittently-scanned continuous glucose monitoring; T1DM=type 1 diabetes mellitus; yr=year

Results: isCGM use in adults with T1DM was associated with reductions in HbA1c

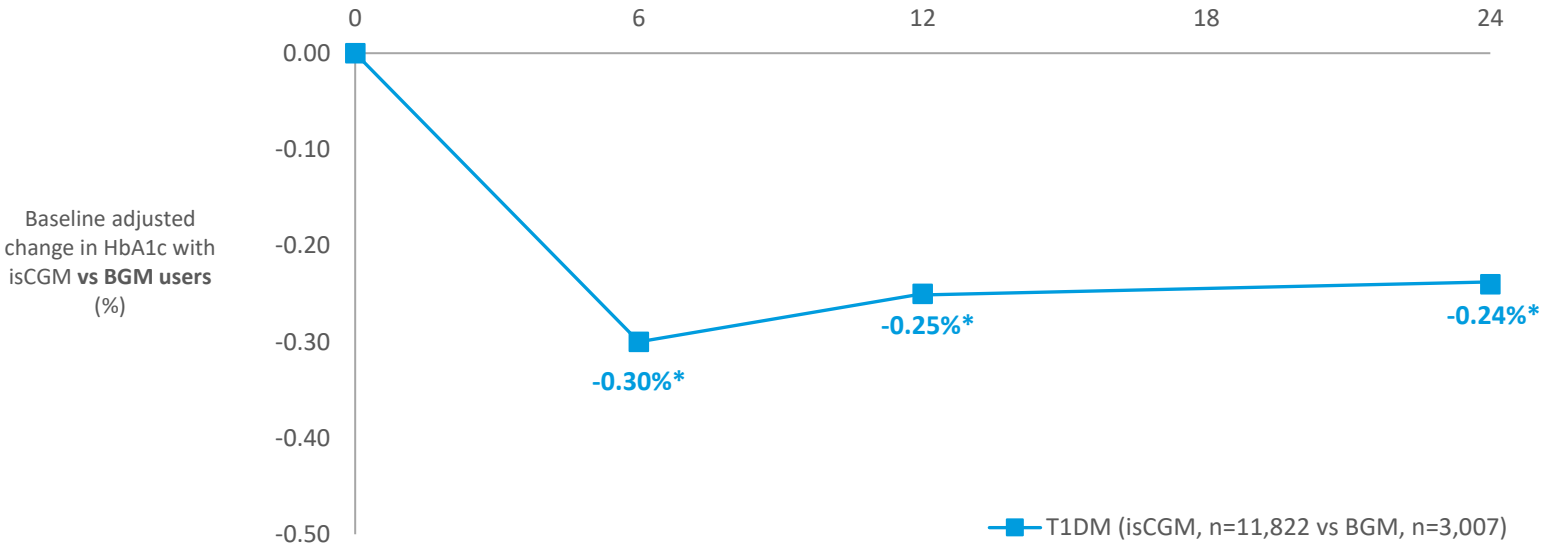
isCGM use was associated with reductions in HbA1c from baseline that were maintained to 24 months



**p<0.0001; BGM=blood glucose monitoring; HbA1c=haemoglobin A1c; isCGM=intermittently-scanned continuous glucose monitoring; T1DM=type 1 diabetes mellitus*

Results: isCGM use in adults with T1DM is associated with reductions in HbA1c compared with BGM controls

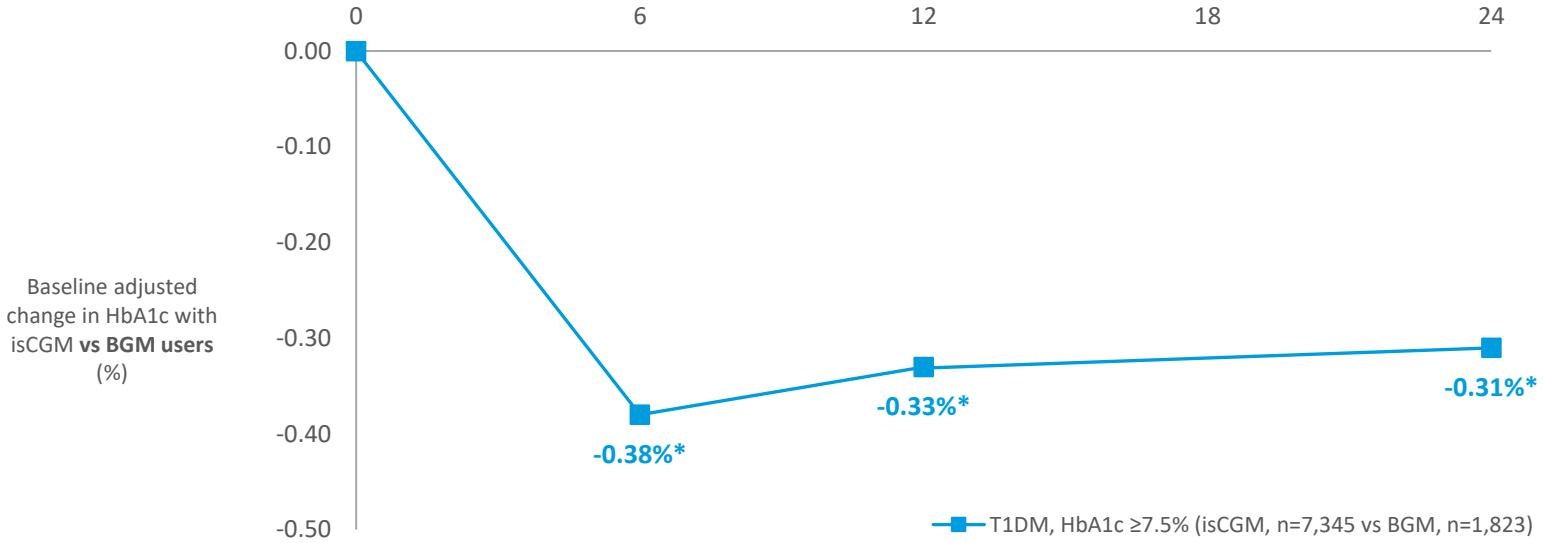
isCGM use was associated with reductions in HbA1c compared with BGM controls that were maintained to 24 months



**p<0.001*
BGM=blood glucose monitoring; HbA1c=haemoglobin A1c; isCGM=intermittently-scanned continuous glucose monitoring; T1DM=type 1 diabetes mellitus

Results: isCGM use in adults with T1DM with suboptimal control with HbA1c ≥7.5% (58.5 mmol/mol) was associated with reductions in HbA1c compared with BGM controls

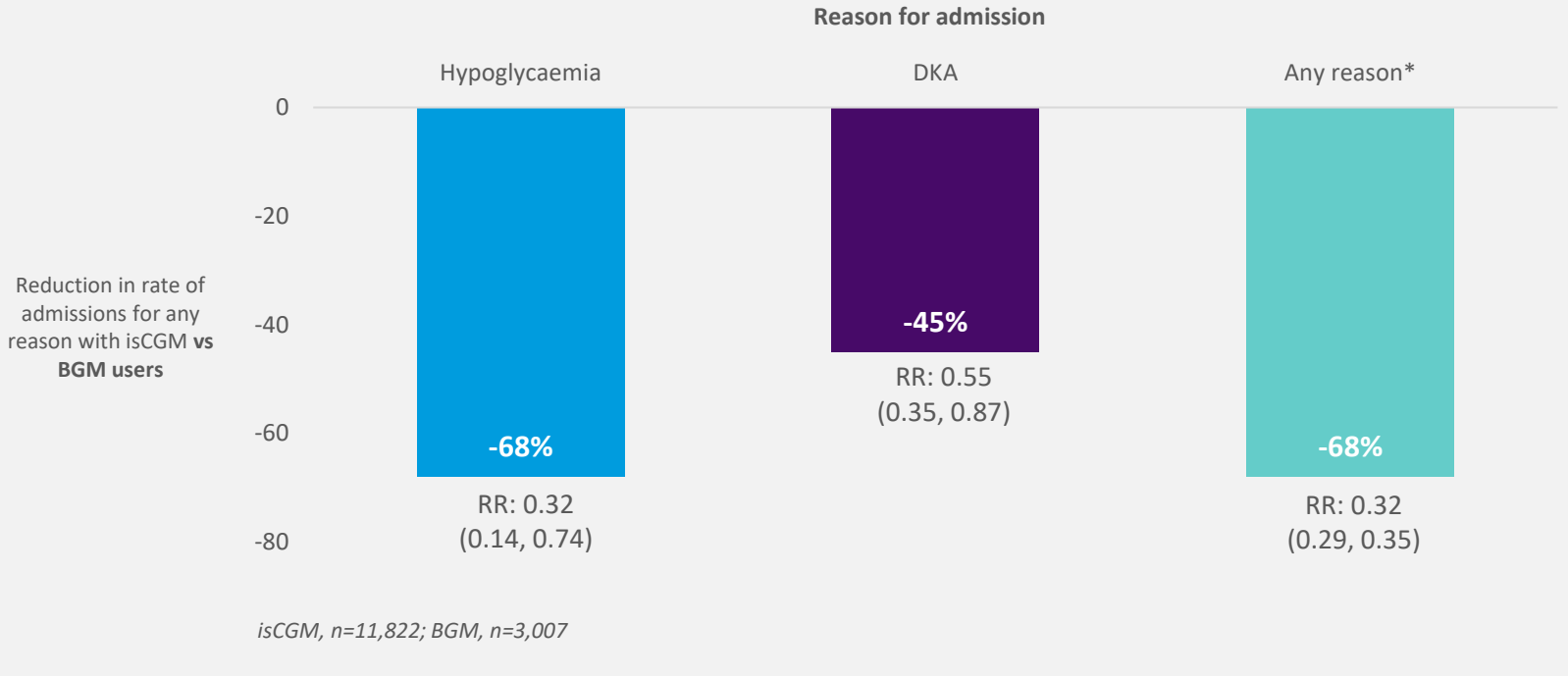
In people with baseline HbA1c ≥7.5%, isCGM use was associated with reductions in HbA1c compared with BGM controls that were maintained to 24 months



**p<0.001; BGM=blood glucose monitoring; HbA1c=haemoglobin A1c; isCGM=intermittently-scanned continuous glucose monitoring; T1DM=type 1 diabetes mellitus*

Analysis
vs BGM controls

Results: isCGM use in adults with T1DM is associated with a significantly lower risk of hospitalisation for hypoglycemia, DKA and hospitalisation for any reason



isCGM, n=11,822; BGM, n=3,007

*Comparison made with PS-IPTW negative binomial regression; *Not limited to hypoglycemia or DKA*
BGM=blood glucose monitoring; DKA=diabetic ketoacidosis; isCGM=intermittently scanned continuous glucose monitoring; PS-IPTW=propensity-score based inverse probability of treatment weighting; RR=relative risk; T1DM=type 1 diabetes mellitus

Conclusion: in adults with T1DM, initiating isCGM is associated with reduced HbA1c and reduced rates of hospitalisation compared with BGM controls

- This real-world retrospective cohort study of adults with T1DM has demonstrated significant reductions in HbA1c six months after being prescribed isCGM
  - Reductions in HbA1c are positively correlated with baseline HbA1c, and are persistent for 24 months
- isCGM use in people with T1DM is associated with a significant reduction in the risk of hospital admissions for diabetes-related complications, including hypoglycaemia and DKA, and hospitalisation for any reason
- These outcomes have:
  - Direct consequences for optimising health-related outcomes for people with T1DM
  - Implications for the long-term cost-effectiveness of isCGM use in people with T1DM

BGM=blood glucose monitoring; DKA=diabetic ketoacidosis; HbA1c=haemoglobin A1c; isCGM=intermittently-scanned continuous glucose monitoring; T1DM=type 1 diabetes mellitus