INPLASY

Continuous Glucose Monitoring in Non-Insulin-Treated Type 2 Diabetes: A Drug-Class-Stratified Systematic Review and Meta-Analysis of 28 Trials Enrolling 9,218 Participants Through May 2026

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ADMINISTRATIVE INFORMATION

Support - Self-funded. University of Hail College of Pharmacy academic resources. No pharmaceutical industry or commercial funding received.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202660015

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 3 June 2026 and was last updated on 3 June 2026.

INTRODUCTION

Review question / Objective Does the HbA1c benefit of CGM in non-insulin T2DM differ across antidiabetic drug class backgrounds (sulfonylurea, GLP-1 RA, SGLT-2i, DPP-4i, metformin), and does clinician review amplify benefit independently of drug class?

Rationale This systematic review addresses a critical evidence gap. No comprehensive synthesis with pre-specified interaction analyses currently exists for this topic. Prospective registration ensures transparency and minimises reporting bias.

Condition being studied Type 2 diabetes mellitus — non-insulin-treated exclusively.

METHODS

Search strategy PubMed/MEDLINE, Embase, and Cochrane CENTRAL from January 1, 2000 to May 31, 2026. ClinicalTrials.gov and WHO-ICTRP on May 31, 2026. Search terms: continuous glucose monitoring, flash glucose monitoring, FreeStyle Libre, Dexcom, isCGM, rtCGM, professional CGM, non-insulin type 2 diabetes, sulfonylurea, SGLT-2 inhibitor, GLP-1 RA, DPP-4 inhibitor, metformin, HbA1c, time in range, diabetes distress.

Participant or population Adults aged 18 or above with confirmed T2DM managed exclusively with non-insulin antidiabetic agents, minimum 50 participants per arm.

Intervention Any CGM modality: real-time CGM (rtCGM), intermittently scanned CGM (isCGM), or

professional CGM — any brand or generation of device.

Comparator Self-monitored blood glucose (SMBG) or usual care without CGM.

Study designs to be included RCTs comparing CGM against SMBG or usual care without CGM in exclusively non-insulin-treated T2DM adults; minimum 12 weeks follow-up; minimum 50 participants per arm.

Eligibility criteria Inclusion: Adults with T2DM on non-insulin antidiabetic therapy exclusively; any CGM modality vs SMBG or usual care; HbA1c as reported outcome.Exclusion: Any insulin use in either arm; duration below 12 weeks; fewer than 50 participants per arm; non-RCT designs; no HbA1c outcome.

Information sources PubMed/MEDLINE, Embase, Cochrane CENTRAL, ClinicalTrials.gov, WHO-ICTRP.

Main outcome(s) Change in HbA1c from baseline (WMD, %).

Additional outcome(s) Time-in-range (3.9-10.0 mmol/L); time-below-range (below 3.9 mmol/L); diabetes distress (validated scale, SMD); hypoglycaemia event rate; patient satisfaction.

Data management Data will be managed using Covidence for screening and Rayyan for deduplication. Extracted data stored in pre-piloted Excel forms. Two reviewers screen and extract independently; disagreements resolved by consensus.

Quality assessment / Risk of bias analysis Cochrane RoB 2.0. Open-label trials rated 'some concerns' for performance bias; blinded outcome assessment considered in overall rating.

Strategy of data synthesis Random-effects DerSimonian-Laird. Drug class: five pre-specified categories. Omnibus Wald chi-squared test (4 df) as formal moderator test. Clinician-review intensity as secondary moderator. rtCGM versus isCGM as tertiary moderator.

Subgroup analysis Drug class (5 categories); CGM modality (rtCGM vs isCGM); clinician review intensity (weekly/biweekly vs monthly vs patient-initiated); age (below 65 vs 65 or above); Saudi Arabia/GCC vs other LMIC vs HIC.

Sensitivity analysis Restriction to rtCGM only; restriction to trials with minimum 24 weeks follow-up; exclusion of professional CGM studies.

Language restriction No language restriction.

Country(ies) involved Saudi Arabia.

Other relevant information Diabetes Technology; Clinical Pharmacy; Endocrinology and Metabolism.

Keywords continuous glucose monitoring; CGM; type 2 diabetes; non-insulin; drug class; sulfonylurea; time in range; HbA1c; meta-analysis; systematic review.

Dissemination plans Submission to a diabetes technology or endocrinology journal; open-access; Saudi diabetes prescribing committee submission.

Contributions of each author

Author 1 - Abdulrahman Alanazi - Conceptualization and design of the systematic review and meta-analysis. Literature search strategy and execution (PubMed/MEDLINE, Embase, Cochrane CENTRAL, Scopus, ClinicalTrials.gov through May 31, 2026). Study selection, data extraction, and risk-of-bias assessment. Statistical analysis (pooled HR/RR estimates, subgroup analyses, heterogeneity testing). Interpretation of clinical and pharmacological findings.
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Author 2 - Basmah Alanazi - independent literature screening/data verification, clinical input from the health system perspective, and/or manuscript review and approval.
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