IMPLEMENTATION OF A CONTINUOUS GLUCOSE MONITORING WORKFLOW IN A COMPLEX PRIMARY CARE CLINIC

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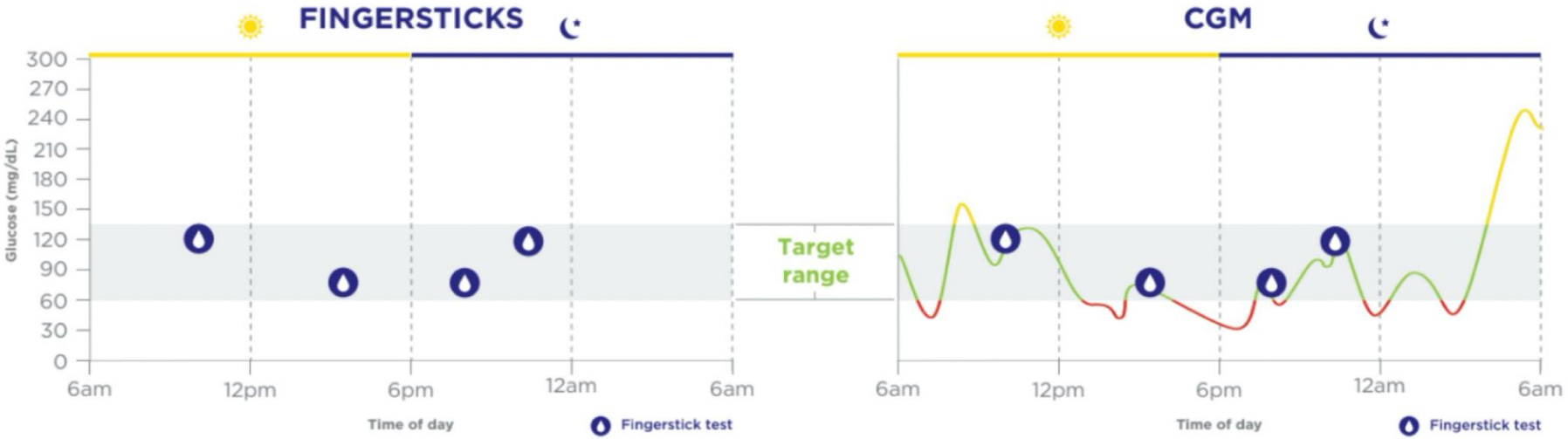
BACKGROUND AND SIGNIFICANCE

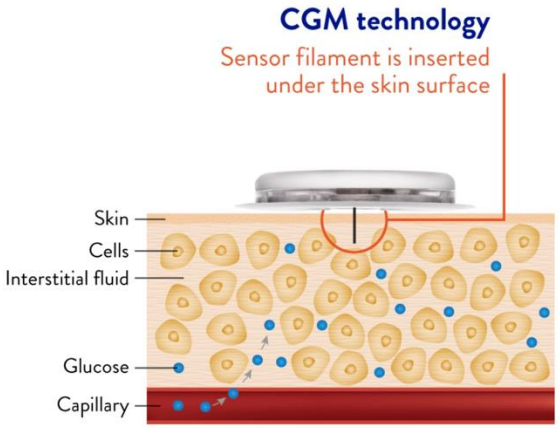
- Diabetes was the 8th leading cause of death in the US in 2021 (CDC, 2022; Hill-Briggs et al., 2021)
- Uncontrolled diabetes increases the risk for blindness, kidney failure, heart disease, stroke, and limb amputation (CDC, 2022)
- Many people with diabetes have difficulty achieving glycemic control (Beck et al., 2019; Keng et al., 2019)

GLUCOSE MONITORING

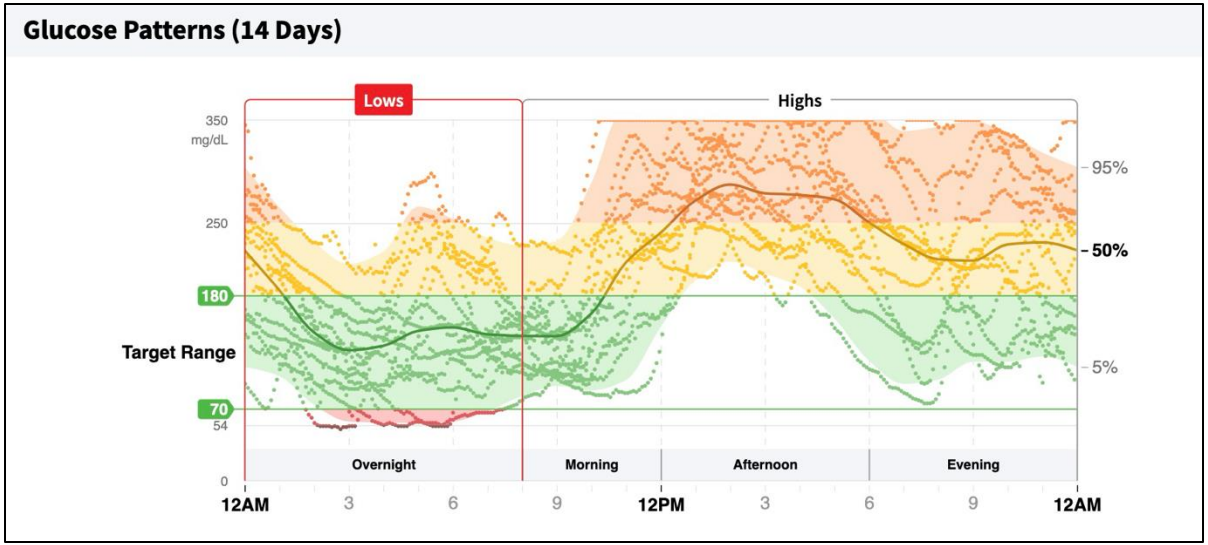


(Abbott, 2024)

CONTINUOUS GLUCOSE MONITORS



(Abbott, 2024)



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PICO QUESTION

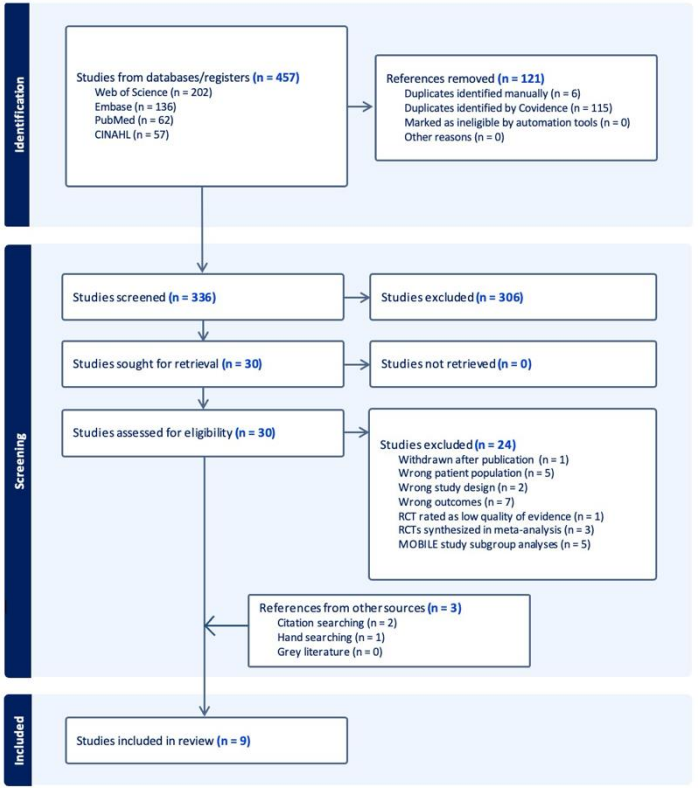
In adults with type 2 diabetes treated with non-intensive insulin regimens (**P**), what is the effect of continuous glucose monitoring (**I**) compared to blood glucose monitoring (**C**) on overall glycemic control (**O**)?

PRISMA DIAGRAM

Studies included in this systematic review (n=9):

- 1 randomized controlled trial (RCT)
- 3 systematic reviews with meta-analysis of RCTs
- 4 quasi-experimental retrospective case-control studies
- 1 non-experimental single-arm retrospective chart review

Quality of evidence ranged from level 1-A to III-A



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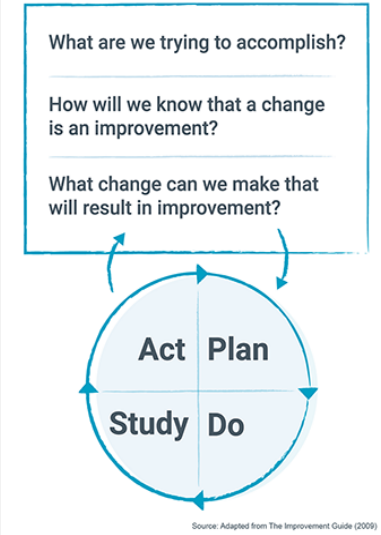
SUMMARIZING THE EVIDENCE

- ✓ The evidence supports the use of CGM rather than BGM for adults with T2D on non-intensive insulin regimens
- ✓ Patients with T2D can benefit from CGM regardless of glucose-lowering therapy
- ✓ Time-in-range (TIR) and glucose management indicator (GMI) are accurate measures of glucose control

WHAT ARE THE BEST PRACTICES FOR CGM?

Gap in literature identifying best practices for CGM implementation in primary care

Institute for Healthcare Improvement (IHI)
Model for Improvement



IDENTIFYING AN OPPORTUNITY FOR IMPROVEMENT

- ❑ Shadow with project mentors in Endocrinology specialty setting
- ❑ Observe workflow for CGM care
- ❑ Compare the workflows in different settings

PROJECT DESIGN

Purpose: To implement a CGM workflow in a complex primary care clinic to increase the use of CGM data in clinical decision-making

Method: Using the PDSA methodology, workflow processes for clinic nurses, providers, and clinical pharmacists were examined and improved to support the project goals

Setting: Complex primary care clinic at an urban, academic healthcare system

Patient population: Adult patients of the clinic with insulin-treated diabetes who actively use CGM (n≈60; ~ 40 pts using smartphone app; ~ 20 pts using manual reader)

Procedures: Assigned clinic nurses (n=3) uploaded CGM logs as pre-charting to the visit, which were then used by clinicians during clinical encounters

CLINIC-SPECIFIC CONSIDERATIONS

- ❑ Assemble project team
- ❑ Which team members will implement the workflow?
- ❑ What to do on days with reduced staffing?

SPECIFIC AIMS

To provide CGM-driven diabetes care at routine clinic visits in 50% of the patients with active CGM during the project timeframe

SOCIAL DRIVERS OF HEALTH

- Disparity in diabetes technology prescriptions in vulnerable and under-resourced populations (Galindo et al., 2022; Kanbour et al., 2023; Ni et al., 2023)

- Complex medical and social needs among the patient population

This QI project aims to optimize the use of CGM systems among a vulnerable patient population

ETHICAL PRINCIPLES

Beneficence – obligation of the healthcare team to act for the benefit of the patient

- Promote patient health and wellbeing with use of CGM

Justice – fair, equitable, and appropriate treatment of patients

- Promote health equity by strategically using CGM data during clinic visits

Project Timeline	Summer 2024	Fall 2024	Spring 2025
Project proposal			
IRB approval: exempt from IRB oversight			
Create supporting documents for the workflow			
Work with IT department to customize daily schedule and install device drivers			
Discuss anticipated staffing needs with unit-level nursing leadership			
Train staff on new CGM workflow			
Implement the new CGM workflow and provide on-site support during launch			
Start collecting clinical and financial data			
Weekly staff meetings to discuss progress			
Evaluate the results of project implementation			
Follow-up plan/ plan for future: Share results; Next steps for sustainability			

Change 1: Identify CGM patients on daily schedule/ upload CGM log workflow

Change 2: Manual upload of CGM reader with Yellow USB cord

Change 3: Documentation complete, CPT codes placed

(NYC Department of Education, n.d.)

SOFT ROLL-OUT

- Opportunity for practicing/coaching on the workflow before go-live date
- CGM logs took an average of 3 minutes (range of 1-7 minutes) to upload for each patient
- The team became more efficient in CGM uploading as the project progressed

DATA COLLECTION

Process Measures

- ❑ How many patients using a smartphone had AGP uploaded?
- ❑ How many patients using a manual reader had AGP uploaded?

Outcome Measures

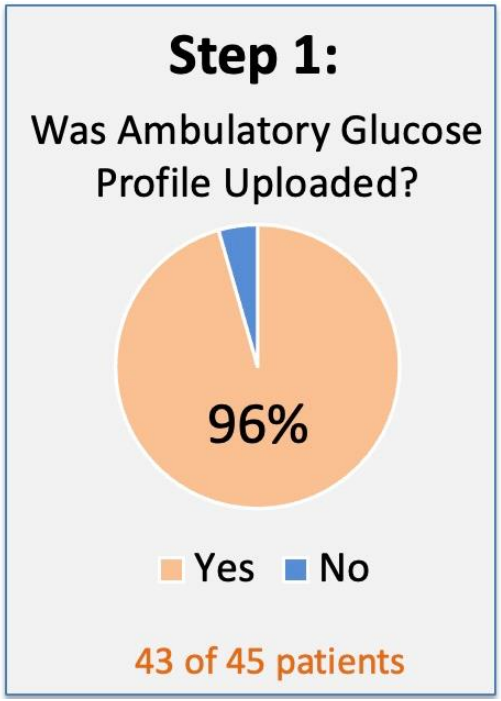
- ❑ How often was CGM care provided, documented, and billed (CPT code 95251)?
- ❑ Was CGM data used correctly by provider?

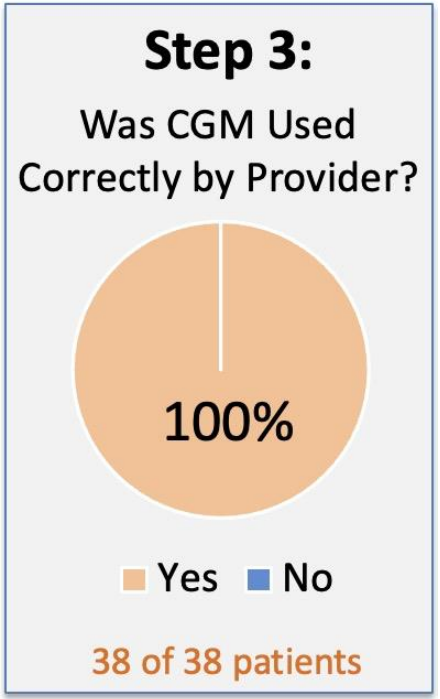
Additional Data Collected:

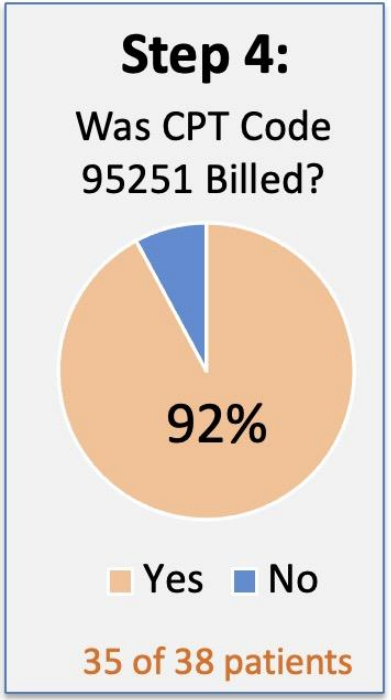
- ❑ Type of visit
- ❑ Staffing patterns for the clinic day
- ❑ Which team member uploaded CGM logs
- ❑ Team member satisfaction with the CGM workflow process

QI PROJECT RESULTS

Cumulative Percentages of CGM Workflow (Weeks 1 – 8)







REASONS FOR INCOMPLETE CGM WORKFLOW

When AGP was not uploaded (n=2)

- ✓ Limited nursing staff to complete the workflow
- ✓ Patient seen twice in one week

When CGM was not discussed at the visit (n=5)

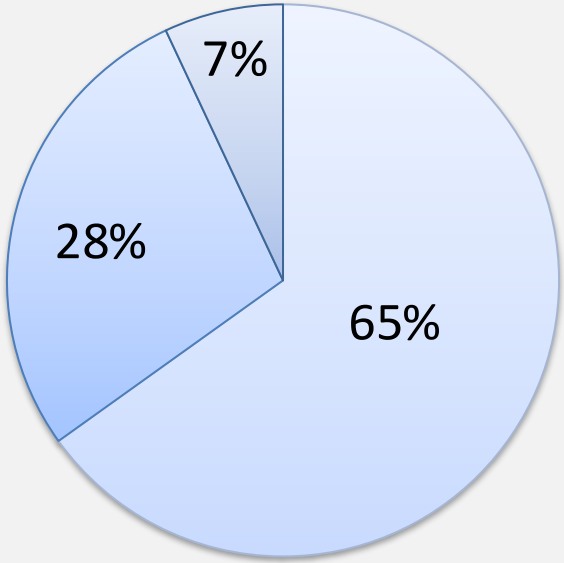
- ✓ Busy clinic schedule
- ✓ Patient actively followed by Endocrinology
- ✓ In-person visit changed to telehealth visit

When CPT code 95251 was not billed (n=3)

- ✓ Provider forgot to place CPT billing code
- ✓ Uncertainty on correct billing when patient was seen by two providers at a visit

Who Uploaded CGM Logs to EHR? (Weeks 1 – 8)

Pharmacist: 3 of 43 patients



Providers (NP & MD): 12 of 43 patients

Nurses: 28 of 43 patients

CLOSED LOOP COMMUNICATION WITH PROJECT TEAM MEMBERS

- Nurses were able to easily complete the workflow on days with adequate staffing
- Providers readily used the CGM logs when they were uploaded to the EHR
- CGM workflow added value to the clinic and improved the quality of patient interactions for diabetes care

REIMBURSEMENT FOR CGM INTERPRETATION

CPT Code 95251: Reimbursement of $35 Per Instance Work RVUs: 0.7, Equivalent to a Level 2 Established Visit, Per Instance		
	8-Week Project Timeframe (x 35 Instances)	**Projected Over 1 Year with Current Case Load**
CPT Code 95251 Reimbursement ($35 Per Instance)	$1225	$7350
Work RVUs for Provider (0.7 Per Instance)	24.5	147

UNINTENDED ETHICAL PROBLEM?

Charges from CPT code 95251 ($30 – $50 per instance) may be passed to the patient depending on their insurance coverage/deductible

Recommendation:

- Patients can opt-out of billing if it becomes cost prohibitive
- Clinicians should provide the same level of care to all patients regardless of billing status

RETURN ON INVESTMENT (ROI)

	Net Profit	Total Cost of Investment	***Cost invested to make the practice change:*** Salary for NP time to develop workflow process, provide initial staff training	***Cost to implement the CGM workflow:*** Salary for RN "CGM Champion" to conduct additional 2-hour training sessions x 4 per year	RN salary x 1	LPN salary x 2
8-Week Project Timeframe	$1225.00	$3501.22	$3240.00	-----	$116.10	$145.12
Projected Over 1 Year	$7350.00	$5239.32	$3240.00	$432.00	$696.60	$870.72

Data Definition for ROI: Net Profit / Total Cost of the Investment

ROI for 8-Week Project Timeframe

[$1225.00/$3501.22] x 100% = 34.9%

Projected ROI Over 1 year

[$7350.00/$5239.32] x 100% = 140.3%

COST SAVINGS & CLINICAL IMPACT

Clinically meaningful improvements in HbA1c and reduced health care resource utilization with CGM use in T2D regardless of medication regimen (Norman et al., 2025)

CGMs → Number Needed to Treat (Karter et al., 2021):

- To avoid 1 hypoglycemic event in T2D: 25 patients
- To achieve HbA1c < 8% in T2D: 6 patients

RECOMMENDATION:

ADOPT AND ADAPT THE CHANGE!

- ✓ Train additional clinic nurses on the CGM workflow
- ✓ Recommend daily nurse assignments for CGM
- ✓ Create standard operating procedures, nursing competency, and CGM toolkits
- ✓ Implement CGM workflow in similar primary care clinics

NEXT STEPS FOR DISSEMINATION

- Present results & recommendations to clinic leadership team
- 2025 VCNP Annual Conference poster presentation
- UVA Libra Database
- Journal of Diabetes Science and Technology
- Replicate the CGM workflow in similar clinical areas and compare results

IN SUMMARY

- CGMs are cost-effective, evidence based, and supported by CPGs
- Inconsistent use of CGM in primary care due to lack of systematic integration
- Interprofessional teamwork to implement clinic workflow process improvements supports the delivery of CGM care
- Recommend implementing a CGM workflow in similar primary care clinics to enhance quality of patient care and improve clinical outcomes

KEY TERMS

Ambulatory Glucose Profile (AGP) – summary of CGM data provided by CGM software for duration of the sensor wear-time. Includes:

Time in Range (glucose 70-180)
Time above range level 1 (glucose 180-250)
Time above range level 2 (glucose above 250)
Time below range level 1 (glucose 55-70)
Time below range level 2 (glucose < 55)
Coefficient of variation (variability in CGM glucose trends)

Glucose pattern insights (GPI) – used by general practitioners to help make treatment decisions based on CGM data

Glucose management indicator (GMI) – a short-term approximation of hemoglobin A1c using the current CGM data

CGM reader or receiver – a glucometer-style handheld device that pairs up with a specific brand of CGM sensor; requires manual upload

CGM sensor – glucose sensor that is inserted subcutaneously and measures interstitial glucose levels

Clinical inertia – a failure to initiate or intensify therapy according to the guidelines

KEY TERMS

Intermittently-scanned CGM – CGM device that needs to be scanned every 8 hours for glucose readings

Interstitial glucose level – glucose level in the fluid surrounding the cells

Non-intensive insulin regimen – long-acting insulin once or twice daily without pre-prandial or correction insulin dosing

Problematic hypoglycemia – frequent, severe, or nocturnal hypoglycemia

Real-time CGM – a CGM device with a sensor the user does not need to scan every 8 hours to obtain glucose readings

Yellow cord – yellow USB cord approved by the manufacturer to use for manually uploading CGM data from a reader/receiver to the corresponding online dashboard

QUESTIONS?

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