Optimizing Diabetes Management: Patient Education on Continuous Glucose Monitoring in the Outpatient Setting

An Evidence Review September 2024 - November 2024

Clinical Question: In adult outpatient diabetes patients, what is the quantity, quality, and consistency of the evidence on patient education and outcomes for newly prescribed continuous glucose monitors (CGM) versus current practice?

Conclusions/Key Summary of the Evidence:

This review was completed to better optimize patient education with Continuous Glucose Monitor (CGM) initiation within the outpatient ambulatory setting. **The overall quantity is consistent, and quality of the evidence is low to good** using the Johns Hopkins Evidence Based Practice Model appraisal tools (2022). Although the focus of this evidence review was on the education needed to successfully initiate CGM, the synthesis of the evidence revealed that patient education could be organized in **phases that include pre-initiation, CGM initiation, and post-initiation**. There are some key summaries of the evidence that answered the clinical question.

Although many patients with diabetes may benefit from CGM, there are factors to be taken into consideration before it is prescribed. Patients with diabetes who advocate for their own care, are motivated and technologically savvy tend to be more successful with adopting diabetes technology [2,3,7,17] but CGM use does not have to be limited to these groups. **Shared decision making** between patients, their caregivers, and knowledgeable and supportive Health Care Professionals (HCPs) is key prior to initiating CGM. [3,8,12,15] The HCPs can set the stage by explaining the CGM device, addressing concerns and explaining how it would support or hinder independence. [8, 12] Although CGM prescribers and support staff can be helpful in facilitating CGM use, registered nurses (RNs) involved with diabetes management have been shown to play a critical role.[2,6,9]

A **comprehensive assessment** prior to starting and while using CGM [5, 12] is needed to determine and address barriers and should include e-literacy, cognition, mood, dexterity, visual acuity, hearing, physical function, living setting, social context [5,9] and risk of hypoglycemia.[12] The assessment is especially important in older adults with diabetes as there may be more limitations to using CGM.

In patients with barriers to adopting CGM, **support from HCPs especially RNs, patient caregivers and peers** can be instrumental. [2,6,8,9] Diabetes care team members supporting CGM education can include RNs, pharmacists, and unlicensed staff within their scope of practice. [15] In the frail elderly, a willing, knowledgeable caregiver is needed for effective CGM use. [5] Although peer support was found to be beneficial overall, some did not like that there was no oversight of advice given. [2]

There should be an **individualized approach to CGM education** with a variety of options for patients and caregivers including in-person education, online tutorials, manufacturer guides and customer service numbers.[5, 8, 13, 14, 18] Education should consider the patient and caregiver's preference.[5]

Education should address not only applying and removing the device but include reading CGM data, glucose interpretation, troubleshooting and responding to alarms/alerts.[1,4,9,10,13,14] Educational topics should include potential complications as well as benefits of CGM use.[6,9,14] Potential complications include skin reactions, inaccuracy, interfering substances, water exposure, device failure, compression artifact, need for back up glucometer and alarm fatigue.[1] RNs also need to receive education on devices to better support patients on CGM.[6,14] Nursing involvement with CGM patient education, application, complications, insertion and removal of technological device, and data interpretation/management would benefit successful use outcomes.[1]

CGM education needs to be initial and on-going. For successful, sustained CGM use, on-going education is essential to address questions and issues that arise. CGM should also be reassessed if patients stop using the device or glycemic goals are not met.[3,7,8,12,14]

Structured educational programs from the literature include ONBOARD, SPECTRUM and Just-in-Time Adaptive Interventions can improve CGM satisfaction, acceptance, knowledge, skills and glycemic control [4,10,11]. One limitation to structured programs is that they are generally more time intensive which may be a limiting factor in a busy outpatient setting.[4,11]

HCP competencies addressing minimum standards for use of diabetes technology like CGM should be developed for all health team members in consideration of the providers education, experience, and scope of practice.[14, 15] Competencies should be reassessed including self-assessment on a regular basis.[14, 15]

Maria Eberts, MSN, RN. CCM, CPHQ, CDCES, Quincyann Tsai, MSN, RN; Veronica Timple PhD, RN, CCRN-K, Emma Aquino-Maneja, DNP, M.Ed, RN, CCRN, Lina Najib Kawar, PhD, RN, CNS

Introducing Diabetes technology which includes CGM processes developed by the Association of Diabetes Care and Education Specialists.[14,15] The three-step process *Identify-Configure-Collaborate (ICC) model* reinforces the key summary takeaways and is as follows:

Step 1 Using joint decision making, use the correct technology for the individual.[14,15]

Step 2 When technology is introduced, provide a plan of care that includes initial and on-going education.[14,15]

Step 3 HCP and care team should work together to make treatment decisions based on CGM data.[14,15]

Limitations:

There are limitations found in the body of literature which include the rapidly changing technology and information evolve over time and information presented must be considered along with updates and newer CGM technology and models.[1] A systematic review by Jain et al. had studies where technology assisted Diabetes Self-Management Education (DSME) were pilot driven, and no standard of care has been developed (2020). Another systematic review revealed limitations due to most of the studies being from Western countries with well-developed economies that could support technology assisted implementation for DSME [2]. Majority of the participants in the pilot study are not generalizable to other ethnic populations.[11]

Background/History:

CGM is a rapidly expanding diabetes (DM) technology. Initially it was available mostly for those with DM Type 1 but, it is now used for the management of those with DM Type 2 and DM Type 1. Use of CGM in the outpatient setting improved when the Centers for Medicare and Medicaid Services (CMS) updated their criteria in July 2021 which previously required four fingerstick blood sugar checks daily to qualify. Additional changes were made by CMS in April of 2023 to those with diabetes on at least one insulin injection per day or had documented hypoglycemia. Advances in CGM technology have made it less expensive and easier to use.[9]

The first CGM device was approved in 1999 for those with DM Type 1. They gave a reading every 5 minutes and helped in reducing variability in glucose levels and decreased diabetes related complications like diabetic ketoacidosis, strokes, amputations and death.[6] CGM measures the glucose in the interstitial fluid using a small electrochemical sensor inserted under the skin and a glucose level is measured every 1 to 5 minutes depending which device is used.[1]

Prior to CGM, fingerstick blood sugar checks were the standard of care for monitoring glucose levels and are still commonly used. One barrier to fingerstick blood sugar checks is the discomfort of finger pokes[6]. Current CGM devices are changed every 10 to 15 days eliminating or decreasing the need for painful finger sticks. There are 37.3 million people with diabetes in the United States (11.3%) and its prevalence is increasing making it the 8th leading cause of death in the US.[5,6]

CGM has given patients with DM a better tool to more effectively achieve or improve glycemic control [8,9] decreasing risk of heart disease, stroke, and many other health complications.[6] Despite these benefits, CGM has not been uniformly adopted by patients and HCPs. For patients, discomfort with technology, poor literacy, language, and cost can be barriers for CGM use.[2,5,6] For HCPs, there may be concerns and difficulties integrating CGM use into their workflows.[2] Nursing along with other HCPs are key to supporting patients and caregivers with initial CGM start up, follow up and sustained use.

Recommendations/Future Research:

- Recommendations to assess multiple domains after implementation of technology and should include training and education to family members/caregivers especially frail older populations and those with disability i.e., physical, visual, auditory limitations.[5, 6, 8, 9]

- Evaluate the acceptability of technology platforms using larger sample quantitative designs to better inform developers.[2]

- Qualitative studies on the HCPs' view on technological assisted Diabetes Self-Management Education (DSME) is limited in evidence and more research is needed.[2]

- Research is needed to include other age populations i.e., youth, high-risk individuals, prediabetes, newly diagnosed and those with comorbidities [3] and double blind RCTs to compare program results to other education programs and larger sample sizes.[4, 10]

- Advocate for policies that support time intensive CGM/diabetes education.[4]

Search Results:

The population examined in this review was restricted to adult patients with DM type 1 and/or type 2 initiating on CGM at the outpatient ambulatory setting. This review examined the emerging and evolving evidence that were highlighted as recommendations for HCPs particularly RNs when educating initiation of CGM. A total of eighteen articles with contextual links were found that pertained to the area of clinical inquiry. The final evidence consisted of two high quality level (multi-site RCTs [4] , mixed method [14)], four good quality level of evidence consisting of (systematic review [2] , prospective multi-site [10] , qualitative [11] , RCT [13]), and twelve low quality of evidence consisting of (clinical evidence review [1, 5, 6, 8, 9, 12] , expert opinion [3, 7] , clinical guideline [15, 16, 17, 18]). Each citation was ranked using the Johns Hopkins Evidenced-Based Appraisal Tools, the final appraisal grade for the quality of this evidence was deemed low to good due to the lack of rigorous research studies.

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Table 1

Structures	Processes	Outcomes
Dedicated Team, Training & Education: • RNs, Pharmacy, and other healthcare allied team members[2,9,15] • Users and Caregivers[2,5,12,16] • Peer support[2] • Joint decision making[3,15] **Characteristics for Facilitating Adoption of CGM:** • Motivated and technologically savvy patients[2,7,15,17] • Received support from healthcare team and peers[2,7,15,16] • HCP provides the right mind set when introducing CGM, address concerns and how CGM would support/hinder independence[8,12,15] • Nurse involved in DM management, most critical for facilitating CGM use[6] • Patients with Diabetes who advocate for their own care[3] • Comprehensive assessment[5,8,9,12] • Individualized approach to education[5,8,13] • Patients preferred technology that was easy to access, use, apply and had reliable information[2] • Consistent follow up for patients and caregivers[3,5,12]	The American Diabetes Association (ADA) provides clinical practice recommendations to guide clinicians in diabetes care including tools, guidelines and quality evaluations which are updated annually by diabetes after review of current literature. Continuous Glucose Monitoring Devices (CGM) is addressed in Diabetes Technology: Standards of Care in Diabetes-2024[14] American Diabetes Association Professional Practice Committee. Diabetes Technology: Standards of Care in Diabetes-2024. Diabetes Care. 2024 Jan 1;47(Suppl 1):S126-S144. doi: 10.2337/dc24-S007. PMID: 38078575; PMCID: PMC10725813. Preinitiation, CGM Initiation, Post initiation/on-going care phases need to be considered when starting CGM. These phases are supported by the Association for Diabetes Care and Education Specialist Identify-Configure-Collaborate (ICC) model. Pertains to any type of diabetes technology for diabetes management including CGM. Identify-Configure-Collaborate model developed by the Association for Diabetes Care & Education Specialists has 3 steps[15] 1. Identify the right technology for the individual using shared decision making **(Preinitiation)** 2. Configure the technology via onboarding, formulating a plan of care and providing ongoing support **(CGM initiation and post initiation)** 3. Collaborate with the care team on data driven treatment adjustments **(preinitiation, CGM initiation, post initiation)** **Pre-Initiation:** **Comprehensive Assessment** prior to initiating CGM. This is especially helpful for older adults or other vulnerable patients with diabetes. The	Just wearing CGM does not translate to health benefits unless there is engagement with it by people (patients, caregivers, healthcare providers) to improve diabetes outcomes[7,14] **Positive patient experience/outcomes with CGM:** • Diabetes technology can improve the quality of life and health outcomes for people with diabetes[1,8 12,15] • Most Randomized Controlled Trials (RCTs) with patients using CGM have been positive with lowering A1C and/or hypoglycemia in patients of all ages who wore the devices regularly[14] • In patients with Diabetes Type 2, A1C levels showed improvement and there was increased time in range (70 -180 mg/dl) even without changes in insulin or other diabetes medications although there was not a decrease in hypoglycemia rates[7,14] • Increased patient satisfaction with CGM use versus intermittent fingerstick blood sugar checks as patients can be more engaged in their diabetes care and better address hypoglycemia[8] **Negative patient experience/outcomes with CGM:** • May be more costly[8] • Wearability factor- prefer not to wear a device attached to the body • Prefer to keep diabetes private- Having diabetes may be perceived as a stigma and patients would prefer not to have CGM that is visible in public[8] • Constant reminder of diabetes- patients may not want CGM that to be repeatedly reminded CGM that may be perceived • May cause frustration with device operations, like alarm fatigue or not getting expected results[8] **Organizational related:**

- CGM trial[8]
- Coaching on skills/strategies for responding to emotional/cognitive aspects of CGM data[11]
- Education should focus on self-management and problem-solving tasks[10]

Characteristics for Barriers Adoption of CGM:

- Poor technology competence, literacy, and language[6,16]
- Lack of ease for use and accuracy[2]
- Cognitive and physical decline with dexterity/visual impairment is challenge for CGM in older adults[12]
- Equitable Access[3]
    - Black older adults with Type II Diabetes[6,7]
    - Older Adults >60 years[5,12]
    - Structural Discrimination (low income, limited education, low health literacy)[5]

Educational Topics for patients and nurses to include[6,14]
Benefits[9] and Potential Complications[2]
Potential Complications include[2]

- Skin reactions
- Inaccuracy
- Interfering substances
- Water exposure
- Device failure

assessment should not be limited to the start of CGM but should reevaluated while using technology[5,12]

- E-literacy
- Cognition
- Mood
- Dexterity
- Visual Acuity
- Hearing
- Physical Function & Frailty
- Living Setting
- Social Context
- Risk of hypoglycemia[9]

CGM benefits, barriers and preferences should addressed through shared decision making with patients and HCP prior to initiating CGM: Potential barriers include[12,8]

- perceived as a burden
- perceived as interference with lifestyle
- financial considerations

<u>CGM Initiation</u>:
Multiple methods should be individualized, available and tailored to the patient's preference[1]. In person education should be an option[14]

Association of Diabetes Care and Education Specialists have developed a new CGM user and hypoglycemia Training Checklist[16]
New CGM (1-13) checklist:[16]

1. Sensor site selection, rotation and sensor insertion: See the manufacturer's website for the most recently approved site selection locations. Note, be sure you select the US site as some

- Higher costs initially for CGM devices and for education/assessment processes during Pre-initiation, CGM initiation and post-initiation phases
- Although structured education programs have better results (glycemic and satisfaction) they are also more costly
- More education on CGMs equates to better outcomes[14]
- Studies have seen a decrease in hospitalizations for hypo and hyperglycemia even after two years of CGM initiation[1]
- Long term cost savings due to improved glycemic control with decreased incidence of acute and chronic diabetic complications[2,14]
- Other organizational barriers include healthcare settings with limited technology infrastructure, poor integration of technology into work processes, and inadequate technical skills[2]

Healthcare Data Management:
Accurate, interactive, timely information exchange[2]
Centralization for patient reported and clinical data in Electronic Medical Record[3,15]

• Compression artifact • Need for back up glucometer • Alarm fatigue **Structured Education Program:** • Initial and Ongoing[3,8,7,12,14] • Technology Device- insert and remove[1,14,16] • CGM Data and Glucose Interpretation[1,4,9,10,13] • ONBOARD, SPECTRUM and Just-in-Time Adaptive Interventions - education programs- can improve CGM satisfaction, acceptance, knowledge and skills[10,11] • Multiple Education Resources – on-line tutorials, training videos, written education on devices, live chat, virtual education, customer service numbers[14,18] • In person training should be available[14] • Need for additional education should be assessed especially if outcomes are not being met[14] • Limitation: can be time intensive. Additional time needed when starting CGM[4,11]	countries have differing approved locations for device placement. 2. Attachment of the transmitter to the sensor, if applicable 3. Taping/securing of the sensor/transmitter, if applicable 4. Connection of the transmitter to the receiver, if applicable 5. Difference between interstitial glucose readings and blood glucose readings 6. Understanding CGM data and trends 7. Possible interference of products such as acetaminophen, salicylic acid, hydroxyurea, and high dose vitamin C 8. Calibration including timing, frequency and importance of accurate meter/fingerstick technique, if applicable 9. Education to prevent overcorrection of high glucose 10. Removal and disposal of the device 11. Basic troubleshooting tips like problem solving for site adhesiveness and skin reactions 12. How to calibrate, if applicable 13. Using a traditional blood glucose monitor to double-check readings, if applicable **CGM Education for Hypoglycemia Management**[16] New CGM (1-4) checklist for hypoglycemia:[16] 1. Setting and managing alerts/alarms 2. How to use trend arrows to adjust treatment decisions 3. Support with coping and problem solving 4. Sharing of data with caregivers and health care providers **CGM technology support for caregivers** Frail populations like the elderly and those with physical or mental deficits may benefit from CGM but may not be able to manage it independently[12] • Caregiver should be identified and provided CGM education • Caregiver may need simplified instructions	

	• Caregiver should be provided information for troubleshooting **<u>Post initiation/On- going care</u>:** Structured on-going educational programs increase patient's satisfaction and have better glycemic outcomes[4, 10,11] On-going care after CGM initiation may be conducted by phone or clinical visits by diabetes nurses, PharmDs or other healthcare providers[2,4,9,15] **CGM outreach:** Should be considered at diagnosis of diabetes[7,14] • Consider outreach to the following groups: • Suboptimal A1C • ED & Hospital Utilization **Reassess CGM use periodically**[8,14] • Glucose goals are not met • CGM is impacting quality of life **HCP CGM Education:** All team members have a role in supporting diabetes technology, including non-licensed staff members[15] HCP need education in DM technology[6,14,15] Standards for minimum competency should be developed for all staff taking into consideration education, experience, and scope of practice[15] HCP competencies with DM technology should be assessed[14,15] On-going education and mentorship of care team members[15]	

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18. American Association of Clinical Endocrinology Patient Journey Diabetes - Homepage | American Association of Clinical Endocrinology (aace.com)
19. Continuous Glucose Monitor Manufacturer links on Educational Information:

Dexcom CGM Support & Technical Product Support | Dexcom

FreeStyle Libre Continuous Glucose Monitoring | FreeStyle Libre US

Guardian™ Connect Continuous Glucose Monitor | Medtronic

Evidence Search Strategies: An evidence review on the selected clinical question was conducted from September through November 2024. This snapshot of the literature examined the evidence for the quantity, quality, and consistency of the evidence for adult (greater than 18 years old) outpatient diabetic patients newly prescribed on continuous glucose monitoring (CGM) machine. To answer the final clinical question, the evidence review examined the best available evidence compared to current practice.

Search terms were broad and included: "Adult outpatient Diabetes, continuous glucose monitoring; continuous glucose monitor patient education/training, CGM, continuous glucose monitor, Diabetes technology" either alone or in combination. Electronic databases included PubMed, Clinical Key, CINAHL, Cochrane Libraries, and Google Scholar. Searches were individualized for each database for either open year and/or September 2024 or the last five years. A final informational search was conducted via the web browser Google Scholar See Database Search Methodology, Pages 16-18.

This review yielded fifty relevant hits after initial de-duplication between databases and were selected for inclusion. Seven additional duplicates were eliminated, with thirteen articles remaining and five contextual links, totaling eighteen articles for the final review. Three rounds of detailed examination of abstracts and full text articles resulted in the elimination of thirty-two articles, as they did not answer the clinical question, were outside the outpatient environment, or focused on concepts related to diabetes management other than CGM education process, or studies that included pediatric populations. The articles were ranked using the Johns Hopkins Evidence-Based Practice Model Hierarchy and Appraisal tools, See Pages 13-14.

Evidence Review Results: The final evidence consisted of two high quality level (multi-site RCTs [4], mixed method [14)], four good quality level of evidence consisting of (systematic review [2], prospective multi-site [10], qualitative [11], RCT [13]), and twelve low quality of evidence consisting of (clinical evidence review [1, 5, 6, 8, 9, 12], expert opinion [3, 7], clinical guideline [15, 16, 17, 18]). Each citation was ranked using the Johns Hopkins Evidenced-Based Appraisal Tools, the final appraisal grade for the quality of this evidence was deemed low to good due to the lack of rigorous research studies.

	Johns Hopkins Evidence-Based Practice Model Hierarchy of Evidence			
	Evidence Level	**DESCRIPTION**	**RELEVANT ARTICLES**	**ARTICLE NUMBER**
Research Evidence	Level I	• Experimental study, random controlled trial (RCT) • Explanatory mixed method design that includes only a Level I quantitative study • Systematic review of RCTs, with or without meta-analysis	2	4, 13
	Level II	• Quasi-experimental study • Explanatory mixed methods design that includes only a Level II quantitative study • Systematic review of a combination of RCTs and quasi-experimental studies, or quasi-experimental studies only, with or without meta-analysis.	3	2, 10, 11
Non-research Evidence	Level III	• Nonexperimental study • Systematic review of a combination of RCTs, quasi-experimental and nonexperimental studies or nonexperimental studies only, with or without meta-analysis. • Exploratory, convergent, or multiphasic mixed methods studies • Explanatory mixed methods design that includes only a Level III quantitative study • Qualitative study • Systematic review of qualitative studies with or without meta-synthesis	1	12
	Level IV	• Opinion of respected authorities and/or nationally recognized expert committees or consensus panels based on scientific evidence. Includes: • Clinical practice guidelines • Consensus panels/position statements		
	Level V	Based on experiential and non-research evidence. Includes: • Scoping reviews • Integrative reviews • Literature reviews • Quality improvement, program or financial evaluation • Case reports • Opinion of nationally recognized expert(s) on experiential evidence	12	1, 3, 5, 6, 7, 8, 9, 14, 15, 16, 17, 18
		Total	**18**	**18**

Adapted from Johns Hopkins Evidence-Based Practice Model for Nursing and Healthcare Professionals (2022).

Johns Hopkins Evidence-Based Practice Appraisal Tools: Evidence Grade

A High Quality: **#4 (Randomized Control Trial) #14 (Diabetes Technology: Standards of Care in Diabetes-2024) = 2 articles**
(Consistent, generalizable results; sufficient sample size for study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review including thorough reference to scientific evidence).

B Good Quality: #2 (systematic review), #10 (Prospective multi-site study), #11 (qualitative), #13 (Randomized Control Trial) = 4
(Reasonably consistent results; sufficient sample size for study design; some control, and fairly definitive conclusions; reasonably consistent recommendations based on fairly comprehensive literature review including references to scientific evidence).

C Low Quality: #1 (clinical evidence review), #3 (expert panel opinion), #5 (literature review), #6 (discursive review), #7 (expert panel opinion), #8 (literature review), #9 (literature review), #12 (evidence review), # 15 (clinical guidelines), #16 (clinical Diabetes Journal), #17 (CGM checklist), #18 (CGM device manufacturer information) = 12
(Little evidence with inconsistent results; insufficient sample size for the study design; conclusions cannot be drawn).

Adapted from Johns Hopkins Evidence-Based Practice Model for Nursing and Healthcare Professionals (2022).

Final Summary Evidence Grade = Low to Good Quality

(Although citations were ranked between moderate-to-high, the final appraisal grade for the quality of the evidence was deemed **low to good quality due to the lack of rigorous research studies with emerging and evolving evidence**. Most of the evidence was**:** (12) low quality opinion and literature reviews, (1) systematic review, (1) prospective, (1) qualitative design, (2) randomized control trials, and (1) high quality standards of care using sufficient sample sizes from research studies.

Clinical Question				
Population and/or Patient(s)	**Intervention/Interest Area**	**Comparison Intervention (Often current practice)**	**Outcome**	**Time Period (If Applicable; Optional)**
P: Adult outpatient diabetic patients newly prescribed CGM	I: Patient education/training on starting new CGM	C: Current Practice	O: Improved patient satisfaction Glucose data shared with clinic Patient continues to use CGM after 3 months Improved A1C control	T:
Final Clinical Question: In adult outpatient diabetes patients, what is the quantity, quality, and consistency of the evidence on patient education and outcomes for newly prescribed continuous glucose monitors (CGM) versus current practice?				

Searchable Question
Key Search Terms: Adult outpatient Diabetes, continuous glucose monitoring; continuous glucose monitor and patient education/training, CGM, Diabetes technology
Inclusion Criteria: adult outpatient diabetes 18 or older, newly prescribed CGM, US, International studies, Human only
Exclusion Criteria: Pediatrics, inpatient, pregnant/OB patients, non-human
Limiters (Open year or year ranges, age ranges, and language, etc.): 5 years 2019-2024. Age 18 or over, English only
Databases: Cochrane Library, PubMed, Clinical Key, CINAHL, Google Scholar,
Professional Organizations: American Diabetes Association, Association of Diabetes Care and Education Specialists, Dexcom, Freestyle Libre

Search Date(s): Limiters 2019-2024 of review

Literature search topic/clinical question: In adult outpatient diabetes patients, what is the quantity, quality, and consistency of the evidence on patient education and outcomes for newly prescribed continuous glucose monitors (CGM) versus current practice?

Database	Key Word(s) and/or Controlled Vocabulary Terms #	Total References Identified (hits)	No. of Relevant References	No. of Total Duplicate Articles	No. of Articles Selected for Review	No. of Articles Excluded	Final Total Relevant References
Name: PubMed **Years: 2019-2024**	(((((Adult outpatient Diabetes) AND (continuous glucose monitoring)) OR (continuous glucose monitor patient education training)) AND (continuous glucose monitor)) AND (Diabetes technology)) AND (("2019/01/01"[Date - Publication] : "3000"[Date - Publication]))	79	9	0	9	6	**3**
Name: Clinical key **Years: 2019-2024**	adult diabetes mellitus continuous glucose monitoring	741	103	4	15	9	**6**

Name: CINAHL **Years: 2019-2024**	Diabetes mellitus OR (continuous glucose monitoring or cgm or continuous glucose monitor)	10	1	0	0	0	0
Name: Cochrane Library **Years: 2019-2024**	Adult diabetes outpatient continuous glucose monitoring	132	14	2	7	7	0
Name: Google Scholar **Years: 2019-2024**	adult outpatient diabetes continuous glucose monitoring	1. 17,200	0	1	0	0	**1**

Name: Google Scholar **Years: 2019-2024**	CGM patient education/training	356	12	0	12	11	1
Name: Google Scholar **Years: 2019-2024**	CGM	2,430	0	0	0	0	0
Name: PubMed/Google Scholar **Years: 2019 - 2024**	adult outpatient diabetes patient* and continuous glucose monitors	43 PubMed 17,200 Google Scholar	0	0	7	5	2
TOTAL ARTICLES for Review =							**13**

#Controlled vocabulary (subject terms, MESH terms, tagged terms specific to database)

*Use the first database as the main comparison for subsequent database searches and identifying duplicate articles

*Reference/Contextual Links	*Reference/Contextual Links
Citation 1: American Diabetes Association (ADA), Association of Diabetes Care & Education Specialists, American Citation 2: Association of Clinical Endocrinology CGM Device Manufacturers: Dexcom, Freestyle Libre, Guardian Dexcom CGM Support & Technical Product Support | Dexcom	Citation:3. Diabetes Technology: Standards of Care in Diabetes—2024 | Diabetes Care | American Diabetes Association (diabetesjournals.org) Citation 4. Patient Journey Diabetes - Homepage | American Association of Clinical Endocrinology (aace.com) Citation 5.CGM l Simple Training Checklist l danatech (adces.org)

Total Articles Included in Literature Review: Database (13) + Contextual Links (5) = 18

*Additional articles/information found in references lists and/or article review
#Controlled vocabulary (subject terms, MESH terms, tagged terms specific to database)
*Use the first database as the main comparison for subsequent database searches and identifying duplicate articles

Purpose/intended Audience

Because we want everyone in our communities to have the healthiest lives possible, we are making our evidence reviews available to the communities we serve to help Californians and others lead healthier lives.

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