Counting the Cost

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MSN 598-01: Health Informatics for the Advanced Practice Nurse

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11/02/2025

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Introduction

Diabetes continues to be one of the most costly and widespread chronic illnesses, affecting individuals across all age and income groups in the United States (CDC, 2024). Managing the disease demands continuous monitoring, timely treatment adjustments, and consistent lifestyle management. However, for many patients and providers, maintaining stable glucose control remains a daily struggle that often results in severe complications and high medical expenses. As health systems strive to balance patient outcomes with financial sustainability, it is imperative to examine technologies that can improve care efficiency without overwhelming available resources. One approach is Continuous Glucose Monitoring (CGM). CGM systems have emerged as a significant advancement in diabetes care by enabling real-time tracking of blood glucose levels, providing both patients and clinicians with a clearer picture of glucose trends throughout the day (Bender et al., 2025). The idea is that with more accurate, continuous data, medical decisions can better align with a patient's actual condition rather than relying solely on occasional fingerstick readings. As such, the following analysis evaluates the financial and qualitative implications of adopting CGM technology within U.S. healthcare systems, focusing on adults living with Type 2 Diabetes Mellitus.

Problem, Population, and Cost

In the U.S, managing Type 2 Diabetes Mellitus (T2DM) represents a significant challenge for individuals and for the healthcare system. According to the CDC (2024), roughly 38.4 million people of all ages, or about 11.6% of the U.S. population, had diabetes in 2021, among adults aged 18 and older, translating to about 14.7% (CDC, 2024). The burden of T2DM primarily falls on adults, as prevalence increases with age, especially among those aged 65 and above (CDC, 2024). However, some disparities arise from race, education level, and geography. For example, non-Hispanic Black and Hispanic adults show higher prevalence than non-Hispanic Whites (CDC, 2024).

Monetary Costs

Financially, the cost of T2DM is staggering. Parker et al. (2024) estimated that in 2022, the total cost for diagnosed diabetes in the U.S. reached US$412.9 billion, of which about US$306.6 billion were direct medical costs and US$106.3 billion were indirect costs (lost productivity, disability, premature death). Similarly, according to the American Diabetes Association (2024), individuals with diabetes spend roughly 2.6 times more than if they did not have the diagnosis. The costs are high because the direct medical costs increased by about 7% from 2017 to 2022, and spending on insulin alone tripled from US$8 billion in 2012 to US$22.3 billion in 2022 (American Diabetes Association, 2024). As such, these numbers show the magnitude of the problem: even if prevalence stabilizes, more people with diabetes and rising per-person costs will drive total expenditure upward.

Qualitative Costs

T2DM carries heavy human consequences. People with the disease face a higher risk of macrovascular complications (heart disease, stroke), microvascular damage (retinopathy, nephropathy, neuropathy), frequent hospitalizations, and emergency department visits (Anson et al., 2025). For example, in 2020, among adults with diabetes, there were about 232,000 hospitalizations for hyperglycemic crisis and 51,000 for hypoglycemia (CDC, 2024). Consequently, these health events result in reduced quality of life, increased dependence on caregivers, psychological strain, and more complex medication regimens (Anson et al., 2025).

Moreover, other indirect human costs include missed work, lower productivity, and disability (Parker et al., 2024).

Medical Device/Technology

Continuous Glucose Monitoring (CGM) systems are among the most practical innovations in diabetes management in recent years. Unlike traditional self-monitoring methods that require multiple daily fingerstick tests, a CGM device continuously tracks glucose levels in the interstitial fluid beneath the skin (Bender et al., 2025). It transmits readings automatically to a receiver, smartphone, or insulin pump. This process allows patients and clinicians to observe glucose trends in real time, recognize patterns, and make treatment decisions based on dynamic data rather than isolated readings. Several CGM models are currently approved by the U.S. Food and Drug Administration (FDA). These include the Dexcom G7, Abbott Freestyle Libre 3, and Medtronic Guardian Connect (Klonoff et al., 2024). All share the same core function: a small sensor inserted under the skin that measures glucose levels every few minutes and wirelessly transmits the data to a display device. The lifespan of each sensor varies from 7 to 14 days, depending on the manufacturer (Klonoff et al., 2024). These systems are designed to minimize the inconvenience of frequent finger pricks, improve adherence, and improve safety by alerting users when glucose levels are trending too high or too low (Blender et al., 2025).

From a clinical perspective, the value of CGM extends beyond convenience. Real-time monitoring enables early detection of glucose excursions that could otherwise lead to severe hypo- or hyperglycemia. For patients, seeing their glucose data in real time can encourage better self-management behaviors. In this way, CGM systems bridge the gap between patient engagement and evidence-based clinical decision-making. However, their adoption is not seamless. Device costs, insurance coverage, and the need for training remain significant barriers.

Despite these challenges, CGM devices continue to gain traction in clinical practice. Their growing presence in both primary and specialty care settings reflects increasing recognition of their clinical and financial value.

Resources

Monetary Resources

The purchase price of a CGM varies by brand and coverage. On average, the initial setup cost per patient, including the receiver, sensors, and transmitter, ranges from US$1,000 to US$1,500. Recurring costs for sensors typically range from US$60 to US$120 per month, depending on sensor life and insurance reimbursement. A full-year supply may cost between US$1,500 and US$2,400. For healthcare organizations deploying CGM across a diabetes population, these figures can multiply quickly. Suppose a medium-sized endocrinology clinic manages 500 patients who qualify for CGM. Even with bulk purchasing and partial insurance reimbursement, annual device costs could range from US$600,000 to US$800,000.

Training costs also need to be considered. Nursing staff, diabetes educators, and physicians must learn to operate devices, troubleshoot, and interpret data (McBride & Tietze, 2023). Training programs can cost about US $300 to $600 per clinician, plus lost productivity time during training sessions. Integrating CGM data into EHR systems may involve software updates or third-party interfaces, which can add several thousand dollars in one-time costs (Hardy et al., 2022). Another expense involves patient education. Teaching individuals to insert sensors, read data, and respond appropriately requires both clinician time and educational materials.

Non-monetary Resources

Effective use of CGM depends on collaboration among clinicians, educators, and information technology personnel (McBride & Tietze, 2023). Physicians interpret data trends, diabetes educators reinforce behavioral changes, and IT specialists ensure that the data flow between CGM systems and medical records remains reliable and secure (Hardy et al., 2022). The allocation of time across these roles can influence adoption success. Clinicians also need dedicated time to review CGM reports between patient visits. Many providers now rely on telehealth platforms that allow remote glucose monitoring. While this approach saves patients travel time, it adds to the clinician's workload outside traditional appointment hours. Institutions must consider policies that compensate for this shift in workflow.

Stakeholders and Community Resources

Primary Stakeholders

The patients themselves are the most immediate stakeholders. Their engagement determines whether the investment produces real health improvements. Patients with Type 2 diabetes must be willing to wear sensors, interpret the data, and act on alerts. Therefore, patients need clear guidance, counseling, and reassurance about how the device works and what to expect. Next are the clinicians, including endocrinologists, primary care providers, nurse practitioners, and certified diabetes educators. Their support is crucial, as they interpret CGM data and adjust treatment plans accordingly. Clinicians must believe the technology will simplify rather than complicate their workflow. Regular training, technical support, and feedback loops between clinicians and device manufacturers help maintain confidence and competence in using the system.

Administrative leadership represents another vital group. Hospital executives and clinic managers must evaluate the financial feasibility and allocate resources for device procurement, staff education, and data integration. Their endorsement can determine whether CGM adoption moves beyond pilot testing into standard practice. Payers and insurance providers are also central stakeholders. Medicare and private insurers have expanded CGM coverage for insulin-dependent individuals, but broader adoption requires negotiation over reimbursement policies. Partnerships with academic institutions and public health agencies can also enhance research and evaluation. Universities may collaborate on outcome assessments, helping measure how CGM influences hospital admissions, quality of life, or medication adherence. Data from these collaborations inform future funding and policy decisions.

Return on Investment (ROI)

Financial Perspective

For many healthcare systems, the initial outlay for CGM technology may appear high. However, emerging evidence suggests that these costs are quickly offset by reduced acute care utilization and improved disease control. For example, it was established that adults with Type 2 diabetes using CGM experienced a 44% decline in diabetes-related hospital admissions and 75% fewer emergency visits within one year of adoption (Hirsch et al., 2024).

Conclusion

CGM represents a forward-looking approach to addressing Type 2 Diabetes Mellitus, which is one of the nation’s most persistent health and financial burdens. While technology requires notable upfront investment, its potential to lower hospitalizations, improve medication adherence, and enhance patient engagement makes it an increasingly practical choice for modern healthcare organizations (Hirsch et al., 2024). The financial model presented shows that although the first year may result in net expenses, subsequent years yield measurable savings that justify the investment. Beyond monetary value, the broader rewards include patient safety, improved quality of life, and stronger clinician-patient collaboration, all of which carry lasting value (McBride & Tietze, 2023). The data also matches the shift toward value-based care, where healthcare success is determined by outcomes rather than procedure volume. As technology evolves, further reductions in device cost and improved insurance coverage will likely strengthen the financial case for CGM adoption.

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Appendices

Appendix 1: ROI

	Category	Description	Amount (USD)
1	Initial Investment	Device purchase and setup (500 patients)	**700,000.00**
2	Annual Maintenance	Sensors, training, and support	**200,000.00**
3	Total Year 1 Cost	Initial + maintenance	**900,000.00**
4	Savings - Hospital Admissions	Avoided 50 admissions ($9,000 each)	**450,000.00**
5	Savings - Emergency Visits	Avoided 100 ER visits ($1,200 each)	**120,000.00**
6	Savings - Productivity	Recovered productivity ($250 per patient)	**125,000.00**
7	Total Annual Savings	Combined direct and indirect	**695,000.00**
8	Net Cost (Year 1)	Cost minus total savings	**205,000.00**
	Sub-total		**3,395,000.00**
	Projected ROI (3 years)	Cumulative savings vs. costs	120%

Sub-total	**4,074,000.00**

ROI modeled per Hirsch et al. (2024), with costs from CDC (2024) and ADA (2024)