Evolution of Glucose Monitoring: How to chose the right system to optimize patient experience

E. Lynne Kelley MD, Jason Lewis R.Ph.,MS

Introduction

Continuous Glucose Monitoring (CGM) has evolved to be a key component of diabetes care with improved accuracy, ease of use and functions. However, CGM remains under-utilized and many patients discontinue use within the first year, suggesting room for improvement. There is an increasing body of literature demonstrating the benefit of CGM for improved glucose control that correlates with adherence. Access to both Flash Glucose Monitoring devices (FGM) and CGM has increased with recent regulatory approvals and corresponding reimbursement decisions. Understanding the features, benefits, and limitations of each system may assist in choosing the optimum device for each patient with diabetes thus improving patient experience as well as adherence.

System Comparison

	Senseonics Eversense®	Dexcom G5®	Medtronic Enlite™	Abbott Freestyle® Libre
Type	CGM	CGM	CGM	FGM
Sensor Duration	180 days	7 days	7 days	14 day OUS 10 days US
Population	Adult ≥18	Patients ≥2	Patients ≥16	Patients ≥4
Measurement	Non-enzymatic Fluorescence	Enzymatic	Enzymatic	Enzymatic
Sensor position	Subcutaneous	Transcutaneous	Transcutaneous	Transcutaneous
Insertion	Physician	Self	Self	Self
Warm-up	24 hours	2 hours	2 hours	1 hours OUS 12 hours US
Calibration	2x day	2x day	2x day	None
Alerts	On transmitter and receiver	On receiver	On receiver	None
Predictive Alerts	Yes, on body and display	No	Yes	No

Observations

Clarity of the glucose management objectives of each patient and their level of need for data can aid selection of the proper monitoring system. Those on intensive management may benefit from continuous real-time readings, trends and alerts from CGM while intermittent real-time readings with no calibration from FGM may be sufficient for others. Individuals with hypoglycemic unawareness may further benefit from advanced CGM systems that provide predictive and rate of change alerts that allow early intervention with meal or medication adjustments. Patients may migrate from one type of device to another depending upon lifestyle and level of control desired.

Conclusion

Currently there are two groups of patients under consideration for CGM adoption: Those who have experience with early generation devices and those who are new to CGM. Current accuracy for devices has allowed for the expectation of improved glucose management including decreased HgA1c and increased time in target. It remains to be verified if advanced features such as predictive alerts are able to drive further improvements. A thorough discussion of the differences between systems and the needs of the patient may drive improved adherence by setting realistic expectations. Longitudinal studies are now required to understand impact upon medical outcomes, quality of life and cost benefit.

Contact Information: Lynne Kelley MD, FACS Lynne.kelley@senseonics.com

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