Current State of Diabetes Technology Clinics and Programs in the United States

Patricia Scalzo, M.S.N., C.N.P., CDE, Ananda Basu, M.D., and Yogish Kudva, M.D.

The number of people who use diabetes technologies, such as insulin pumps and continuous glucose sensors, continues to rise. Whereas 130,000 people with type 1 diabetes used an insulin pump in 2002, by 2007 this number had risen to approximately 375,000 people.[1] Over the next decade, when the insulin pump and glucose sensor are combined in a communicative manner in which the pump will modify insulin delivery based on continuous glucose results (closed loop), the volume of patients on insulin pumps are expected to increase dramatically.

With the anticipated future increase in use of diabetes technologies, one important question arises: How prepared are endocrinology clinics to handle this increasing patient population?

We performed benchmarking with several sites across the United States that employ diabetes technologies with their patients to find out the answer to this question. Centers that were chosen are well known for their care of patients with type 1 diabetes. Several centers declined to be interviewed. Benchmarking interviews were completed with physicians, registered nurses, nurse practitioners, registered dietitians, and administrators. Topics discussed were the referral process, marketing, structure, staff, and the use of enhanced technologies.

Several key findings emerged (see **Table 1**). Most programs do not offer a dedicated clinic for patients who utilize diabetes technologies; rather, patients are scattered throughout general diabetes and endocrinology clinics. Many programs are not consistently staffed by providers who are experts in the use of diabetes technologies, which is a recommendation of the American Association of Clinical Endocrinologist (AACE) Consensus Statement on Insulin Pump Management.[2] Not all have a structured education program to assist people with their use of diabetes technologies both pre- and post-technology exposure. Some of the programs use insulin pump company representatives to train the patients about the pump. All use vendor software to download pumps and sensors. None have initiated a solution to incorporate the pump download output into the patient electronic medical records. Most do not have an electronic system or portal available for the patient to send in data in between clinic visits for systematic remote monitoring. Most do not have a registry of their patients that utilize diabetes technologies. Many have similar identified difficulties with referral streams, such as pediatric to adult transition, shared management with OB/GYN during pregnancy, and identification of the responsibility of hospital coverage of the patient who is utilizing his/her personal diabetes technology while in the hospital. Many programs are experiencing access issues, with the patient experiencing a prolonged wait time to be able to be seen. Most of the centers have no formal marketing in place.

Author Affiliation: Endocrinology, Mayo Clinic, Rochester, Minnesota

Keywords: clinics, diabetes, status, technology

Corresponding Author: Yogish C. Kudva, M.D., Endocrinology, W 18 A, Mayo Building, Rochester, MN 55905; email address: *Kudva.yogish@mayo.edu*

Table 1.
Benchmarking Findings

	Center A	Center B	Center C	Center D	Center E
Dedicated center for diabetes technologies	No	No	Yes	Yes	No
Technology knowledgeable providers staffing clinics regularly	No	No	Yes	Yes	Yes
Training performed by pump company rep	Yes	Sometimes	Yes	N/A	No
System for technology downloads	Vendor software	Vendor software	Vendor software	Vendor software	Vendor software
Registry of patients that utilize diabetes technologies	No	No	Yes	Yes	N/A
Between visits remote review of patient data with feedback provided	Through patient portal	Through a limited patient portal	No	No	No

In conclusion, national benchmarking was conducted to assist with identification of a best practice for serving patients who currently utilize diabetes technologies. We were not able to identify a comprehensive best practice, pointing to the need for further innovations in practice to accommodate this growing population. We are pleased to see the offering of the Certified Diabetes Technology Clinician (CDTC) credential by the Diabetes Technology Society, which will assist in demonstrating competence of clinicians and accelerate this niche practice.[3]

Funding:

This study was supported by a grant (#DK085516) from the National Institute of Diabetes and Digestive and Kidney Diseases to Anandu Basu and Yogish Kudva and by NIH/NCRR CTSA Grant #UL1 TR000135 from the National Center for Advancing Translational Science (NCATS), a component of the National Institutes of Health (NIH). The contents of this article are solely the responsibility of the authors and do not necessarily represent the official views of the NIH.

Acknowledgment:

We thank clinical diabetes centers that participated in our study.

References:

1. U.S. Food and Drug Administration, General Hospital and Personal Use Medical Devices Panel. Insulin Infusion Pumps Panel Information, 2010. Accessed on January 20, 2013, at: *http://www.fda.gov/downloads/advisorycommittees/committeesmeetingmaterials/medicaldevices/medicaldevicesadvisorycommittee/generalhospitalandpersonalusedevicespanel/ucm202779.pdf*
2. American Association of Clinical Endocrinologist (AACE), Consensus Panel on Insulin Pump Management. Statement by the AACE Consensus Panel on Insulin Pump Management, 2010. Accessed on January 20, 2013, at: *https://www.aace.com/files/insulinpumpmanagement.pdf*
3. Diabetes Technology Society, CDTC Credential Program. Accessed on January 30, 2013, at: *http://clinicaldiabetestechnology.org*