The Diabetes Care and Education Specialist's Role in Insulin Pump Therapy

Reviewed by the Professional Practice Committee

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Continuous subcutaneous insulin infusion (CSII), also known as insulin pump therapy, has been used in the United States for over 40 years, and adoption continues to expand. The current data indicate there are over 1 million people with diabetes on insulin pump therapy worldwide, with 350,000 to 515,000 in the United States.[1] Automated insulin delivery (AID) systems are recommended as the standard of care over nonautomated pumps and multiple daily injections (MDI) for people with type 1 diabetes (T1D) because these devices have the potential to reduce A1C levels, hypoglycemia events, and total daily insulin use. AID systems have largely replaced the use of non-integrated or standard insulin pumps.[2,3] Insulin pump therapy offers flexibility and can improve glucose outcomes.

The goal of this paper is to outline key topics in insulin pump therapy that diabetes care and education specialists (DCESs) should cover when educating individuals with diabetes and their families and caregivers. In addition, DCESs have a crucial role in helping individuals with diabetes gain a comprehensive understanding of available insulin pump systems and in guiding them toward selecting the option that best meets their individual needs.

This paper focuses on AID systems as the primary CSII system, which DCESs must gain and maintain expertise in as a subspecialty in diabetes care and education. These systems are programmed to respond to glucose sensor data by increasing or decreasing insulin delivery when glucose is predicted to be above or below target settings.

The Expanding Role of Diabetes Care and Education Specialists in AID Support

Diabetes care and education specialists play a crucial role in supporting individuals with diabetes in effectively using AID systems. These technologies have been shown to improve glycemic outcomes, reduce hypoglycemia, and enhance the quality of life for individuals with T1D and others requiring intensive insulin management.[4]

Specifically, DCESs are uniquely positioned to provide the following:

- Support the individual with diabetes and their caregivers as they consider, initiate, and learn to use insulin pumps and AID systems.
- Coordinate care among the health care professionals (HCPs), pump manufacturers, and pump trainers during initiation and follow-up of insulin pump therapy.
- Serve as a resource for HCPs, school staff, community organizations, and families/caregivers involved in the individual's diabetes self-management.
- Maintain up-to-date knowledge of current diabetes technologies, including insulin pumps, continuous glucose monitors (CGM), and Food and Drug

Administration (FDA) approved and emerging open-source AID systems.

To fulfill these responsibilities, DCESs are encouraged to do the following:

- Obtain advanced training in managing AID systems, including which systems allow adjustments in insulin-to-carbohydrate ratios, correction/sensitivity factors, target glucose, and exercise/activity modes.
- Achieve and maintain certification in pump training, such as becoming a certified pump trainer (CPT) for specific pump models or brands they train on, as required by the manufacturer.
- Demonstrate competence in downloading and interpreting insulin pump and CGM data and using this information to enhance treatment plans.
- Commit to ongoing education, including staying informed of system updates, software upgrades, and new technologies as they emerge.

As diabetes technology rapidly evolves, the role of DCESs is expanding beyond traditional education and troubleshooting. DCESs are essential in guiding individuals through the complex landscape of regulated and emerging diabetes self-management tools. The expertise and leadership of DCESs are critical in helping individuals with diabetes safely and effectively navigate the increasing number of insulin delivery options available. Important teaching topics include the timing of insulin dosing for meals, using the activity/exercise features (if available), and balanced eating to enhance outcomes.

All individuals with intensive insulin treatment plans should be offered the option to use pump technology.

All individuals with T1D should be offered the option of insulin pump therapy for insulin management soon after their diagnosis, depending on the individual's or family/caregiver's circumstances, needs, and preferences. Automated insulin delivery should be the preferred method of insulin delivery.[2] Data support the reduction in hypoglycemia, A1C, and the total daily insulin needs with AID use. It should be offered to individuals who require intensive insulin therapy and can manage it themselves or with the support of their caregiver.[5]

Some considerations for discontinuing insulin pump use may include the following:

- Lack of insurance or financial means to pay for an insulin pump and pump supplies
- Changes in physical or mental capacity to manage an insulin pump
- Personal choice
- Any suicidal ideation

Selecting an Insulin Pump

Helping people with diabetes select the equipment best suited to meet their needs is integral to successful diabetes self-management and sustained pump use. The ADA's Diabetes Technology Guide, ADCES's Danatech, and DiabetesWise platforms are all resources that can be accessed to help HCPs and individuals with diabetes make informed decisions about the initial choice of device(s).[6] While all insulin pumps, infusion sets, and insertion devices have basic attributes in common, there are key differences that can impact individual suitability. Although most insulin pumps can be returned to the company within a specified timeframe after initial purchase, it is uncommon for people with diabetes to do so. Once this initial trial period has passed, the user will not be eligible to switch or upgrade until the pump's warranty expires, which typically lasts 4 to 5 years. Currently, pumps can be easily upgraded by the user to the latest software, reducing the need to change systems for the most current advances in technology.

People who are not educated about their options may find themselves with devices that are mismatched to their needs. It is the DCES's responsibility to stay current with all commercially available insulin pumps, integrated sensor options, and infusion sets and insertion devices to help educate insulin pump users about their options.

Nonautomated Insulin Patch Delivery

Patch devices are insulin delivery devices that are not programmable and not integrated with a sensor. They offer people with diabetes an alternative to MDI.[7]

Patches can deliver either a set basal dose with the ability to deliver bolus in a set increments or only a preprogrammed bolus in set increments as needed by the individual. Like insulin pumps, insulin is delivered through a cannula that is inserted into the subcutaneous tissue[1] and needs to be changed either daily or every 3 to 4 days depending on the device and insulin needs of the individual. Patch devices attached to the skin using adhesives.

Although patch devices are less complex than traditional or AID insulin pump systems due to their lack of connectivity to other devices or a dosing algorithm,

using them requires guidance that can be provided during an educational session to review the functionality of the device, insulin dosing plans, troubleshooting, and developing a back-up plan when needed during their use.[2]

Open-Source Systems

Open-source systems are a type of non-FDA-approved AID system that involves users using algorithms for AID management created by open-source platforms, such as OpenAPS, AndroidAPS, and Loop, to manage insulin delivery.[8] Because these systems are highly customizable compared to commercial FDA-approved systems, they often appeal to users looking for a more personalized approach to their diabetes self-management. This technology relies on the users' knowledge, understanding, and comfort with how the system works and how to problem solve in the event of system errors or malfunctions. There is no warranty for the system.

DCESs should be aware of their use, support safety, and facilitate informed discussions about these options at the request of the person with diabetes and/or their caregivers.[9]

Pump Selection Criteria

When the decision has been made to initiate pump therapy, the first step is to verify the individual's insurance or coverage, including determining if self-pay coverage is available. Most private health insurance plans allow their members to choose any type of insulin pump and infusion set. However, government-based plans and, occasionally, private plans may cover only specific brands. Financial coverage of insulin pumps varies by state.[10] For unbiased and detailed comparisons of insulin pump features, consider referring people to third-party websites, such as Danatech (ADCES) and DiabetesWise.

Device Qualities Consideration

When a list of covered pump models is determined, the following features should be considered[11]:

- Insulin volume: Does the pump hold enough to last the person 2 to 3 days?
- Are there options for small basal rate increments?
- Screen legibility: Can the person read all on-screen text?
- Alarm and alert recognition: Can the user hear or feel them?
- Waterproof: Is it needed by the user? All tubed pumps are considered water-resistant; however, users should be aware that cracks in the pump casing may compromise the water resistance. Exceptions include patch pumps that are waterproof.
- Download capability: Is the software easy for the person to download and review? Currently, most systems provide download data via cloud technology, allowing the DCES to access the data.
- User-friendly programming: Does the dashboard or graph clearly illustrate glucose trends and insulin boluses given? Is the menu layout simple?
- Continuous glucose monitoring data: Which CGM device is it integrated with?
- Phone compatibility: Is the user's mobile phone compatible with the insulin pump and/or continuous glucose montior?
- Pump management: Can the pump be managed via a mobile phone or controller within a defined distance from the user?
- Infusion device compatibility: Which options are available? Are they suited to the needs of the individual with diabetes?
- Pump algorithm: What settings, if any, can be manually adjusted in the insulin pump (eg, target, carb ratio, correction factor, active insulin time, or basal rate)? Are auto-correction features available, and when are they initiated? Is manual operation an option?
- Look and feel of the device: What is the size, weight, and wearing options desirable for the person (eg, clips, cases, attached to the body with adhesive)? Can it be worn discreetly? Can it be easily secured for physical activity (eg, sports, sexual activity)?
- Special alerts and reminders: Are site changes, missed bolus, and customizable reminders and alerts needed?
- Tubing versus patch style: Will tubing be a hindrance? What are the lengths of various tubes?
- Customer support: What is the company's reputation and consistency in providing adequate support?

Infusion Set Selection

Just as certain insulin pumps are better suited to certain individuals, so are infusion sets. Many pumps allow users to choose from a variety of infusion set types. In contrast, others use proprietary sets that are only compatible with the manufacturer's pump. An evaluation of individual behavior, habits, and types of physical activity is necessary to determine the appropriate type of infusion set. Changes in infusion set types may become necessary over time.[12]

Variables to consider when selecting an infusion set include the type of cannula (flexible plastic versus metal), tubing, and cannula or needle length, as well as

disconnect and insertion mechanisms, angle of insertion, adhesion, and aesthetics. Most pump manufacturers recommend changing the stainless-steel infusion set every 2 days.[13] If an infusion set is not specified when the insulin pump is ordered, a default infusion set will be sent at the supplier's discretion. Using an ill-suited infusion set can result in user frustration and potentially lead to discontinuation of insulin pump therapy.

Education

Pre-pump and ongoing self-management education in how to maximize a pump should include correcting any misconceptions individuals with diabetes may have regarding insulin pump therapy. To develop an individualized education plan, DCESs must assess the individual's knowledge of diabetes, including their knowledge deficits and their preferred learning style. Age or education level should not preclude them from obtaining an insulin pump. At a minimum, the prospective pump user or caregiver should have a basic understanding of diabetes physiology and an understanding of the relationship between insulin and factors such as food, exercise, illness, and other variables that affect glucose levels. Advanced self-management using an insulin pump should incorporate a thorough knowledge of diabetes self-management skills, including the ability to troubleshoot, problem solve, recognize and respond to glucose patterns, to optimize system performance and benefits from pump therapy.

Pre-pump education varies widely based on the baseline knowledge of the person with diabetes and/or their caregiver. DCESs should refer to the Danatech website, danatech.org, or to the individual pump manufacturers for an extensive library of training materials. Pre-pump preparation should include the pump features previously mentioned. Educational programs should be tailored to the individual needs of people with diabetes. The education plan should be for people living with diabetes and their caregivers (eg, children and adolescents, older adults, people with disabilities).

Pump education objectives include the following[14]:

- Establishing glucose goals
- Ensuring competence in carbohydrate counting or basic carbohydrate portions
- Fully understanding insulin-to-carbohydrate ratios, if applicable
- Fully understanding correction (sensitivity) factors, if applicable
- Basic understanding of the algorithm and how the pump adapts to glucose readings

Individuals with diabetes and/or their caregivers should have the knowledge and skill to perform the following[15]:

- Properly manage hyperglycemia and hypoglycemia
- Properly fill and insert the cartridge/reservoir
- Insert and change infusion sets
- Detect and troubleshoot infusion set and site issues
- Manage sick days, exercise/activity, and travel
- Obtain pump supplies
- Troubleshoot and problem solve for any issues with pump use, or when and who to call for help when needed
- Determine how and where to wear the pump.
- Determine when and how to disconnect the pump, if needed
- Recognize the need for a back-up insulin plan and how to safely switch to injections
- Understand the challenges associated with overriding the pump suggestions

Insulin Pump Initiation Education

Insulin pump initiation education (ie, pump training) takes 1 to 3 hours and should be conducted in an outpatient setting (eg, in a HCP's office).[12] Pump manufacturers employ or contract with HCPs who are usually DCES certified by the pump manufacturer as certified pump trainers (CPTs). CPTs provide pump training services, following the prescribing HCP's orders for pump start.[16] The American Association of Clinical Endocrinologists consensus statement (2014) suggests there should be a more structured program to start individual education and training in the United States, more closely aligned with extended education programs in other countries, such as France and the United Kingdom.[17]

The prescribing HCP is responsible for providing and signing off on pump start orders to initiate insulin pump training. These orders should be provided to the DCES or designated pump trainer.

Pump initiation orders may include the following, depending on the system:

- Initial basal rate(s)
- Insulin-to-carbohydrate ratio(s)
- Target glucose level(s)

- Correction (or sensitivity) factor(s) and instructions for use
- Duration of insulin action or active insulin time
- Using a CGM device and associated alerts
- Total daily dose and weight of the individual with diabetes

Pump training should cover the following, at a minimum:

- Inserting and/or charging the pump battery
- Filling and inserting the insulin cartridge/reservoir with an appropriate amount of insulin
- Inserting and changing the infusion set and tubing, if applicable, with emphasis on site rotation
- Entering carbohydrate intake, announcing meals, and/or initiating correction insulin doses
- Data sharing with HCPs
- Using activity or sleep modes
- Having a backup plan in case of equipment failure
- Instructions on how users protect themselves and their pump, infusion set, sensor, and transmitter, if applicable, during certain physical activities and when undergoing some medical tests, such as a computed axial tomography (CAT) scan, magnetic resonance imaging (MRI), or X-ray, and airport scanning equipment.
- Instructions on how to prepare for and pack necessary supplies for travel within the United States as well as international.
- Contact technical support and medical personnel when necessary.

Pump initiation is best conducted at a time in the day and on the day(s) of the week when the managing HCP is available for medical management for a few days following the pump initiation.

Additionally, individuals with diabetes should be provided with information regarding when, where, and who they can contact to report glucose results or for diabetes self-management assistance (available 24/7 upon initiation) and technical assistance (eg, from the pump manufacturer and/or DCES). Information should also be provided regarding how to connect to the cloud and share data.

Follow-up visits should occur in person or virtually within 1 week after start-up, and as needed thereafter, to address any questions that may arise and determine if potential insulin adjustments in the initial settings are necessary. Behavioral support may be needed to optimize pump use.

This allows for the opportunity to review and observe an infusion set or pod site change, removing the pump syringe/cartridge, filling, and insertion. Discussions should continue between the individual and/or caregiver and the diabetes care team as needed after pump initiation for a review of insulin pump data, including glucose outcomes and trends, dosing, frequency of infusion site changes, meal announcements, alarms, and any overrides of the AID or exits from auto-mode.

Ongoing Education and Management

The foundation for using an insulin pump begins during the initial training session(s). Learning continues as insulin delivery is initiated, and the pump user learns new information, connecting prior knowledge and present experience. Because there are few life experiences that compare to the mechanical use of an insulin pump, multiple learning sessions are often necessary to master basic skills and integrate pump use into daily life. Education should be provided for 24 hours and may extend for months or years due to potential problems that can arise from occlusions, pump malfunctions, or illness.

Using CGM and integrated pump systems makes foundational learning even more imperative. It is essential for DCESs to discuss with the individual the risks of overtreating hyperglycemia and hypoglycemia, as well as making inappropriate changes in pump settings, due to the continuous availability of glucose data. Safe use requires the person to understand the concept of active insulin, insulin stacking, the use of advanced prandial delivery options (if relevant), and effective management strategies during activity, inactivity, stress, travel, or illness. (See Safe Practices in the next section.)

Teachable moments occur during follow-up calls and visits for fine-tuning insulin settings, depending on the system (some only allow bolus adjustments or potentially no adjustments by the wearer or team). DCESs must continually assess the individual or caregiver and follow up until they are able to demonstrate comfort and competence in using their pump and its features.

People with diabetes and their caregivers should be willing to stay in daily contact with the DCES as needed during the first 2 to 3 days and at designated intervals during the weeks following the initiation of insulin pump therapy, to review glucose levels and consider settings adjustments and/or discuss behavioral changes to optimize the system. Individual response to insulin

delivery via an insulin pump can vary significantly from that of MDI or an insulin pump without automation. DCESs must know how to make appropriate adjustments in insulin settings or provide behavioral change support during this time to prevent hypo- and/or hyperglycemia.

Detailed attention should be given to managing infusion sites. Issues with site reactions, infusion set tolerance and compatibility, and site adherence should be assessed at the time of the first site change and during follow-up visits. DCESs should not assume that the new or experienced insulin pump user has achieved optimal mastery of skills. They should take every opportunity during office visits to evaluate the individual's current knowledge and build on their experience toward mastery of glucose management skills.

Safe Practices

Adverse events associated with insulin pump therapy are most often related to infusion site issues or user error rather than mechanical pump failure.[18] Inadequate education and lack of ongoing support by DCESs who are knowledgeable about the benefits and limitations of insulin pumps can be contributing factors to adverse events.[19]

Cybersecurity

Malicious attacks can compromise AID systems when unauthorized remote control is present.

The FDA has issued warnings regarding cybersecurity weaknesses that have resulted in alerts for specific AID systems.[20,21]

DCESs should advise people with diabetes to do the following:

- Always keep the insulin pump and any connected devices within their or their caregiver's control.
- Be cautious with whom they share their insulin pump serial numbers or passwords.
- Consult with the insulin pump manufacturer for additional precautions.

Strategies to avoid and resolve insulin pump therapy challenges should be an educational priority and include the following:

Infusion Site Selection and Maintenance

The infusion site should be changed according to the manufacturer's recommendations, monitored for signs of inflammation, infection, lipodystrophy or leakage.

Troubleshooting and Problem Solving

Potential causes of high and low glucose levels, including catheter occlusion or dislodgement, insulin degradation if exposed to temperature extremes, battery failure, failure to keep the pump components charged, missed doses, over-correction of hyperglycemia or hypoglycemia, infusion set malfunction, mechanical pump failure, and incorrect pump programming of infusion rates or settings for date and time, should be addressed. DCESs must educate people to identify these issues and take action to resolve them. Notably, AID systems require less carbohydrate ingestion than MDI or non-AID pump systems to treat low blood glucose levels. The pump suspends insulin (often for 30 to 60 minutes) prior to an impending low blood glucose, requiring less treatment.

Managing Continuous Glucose Monitoring

It is the role of the DCES to educate people with diabetes and caregivers about the following:

- Differentiating between interstitial glucose and blood glucose results
- Placing sensors for the most accurate readings
- Inserting sensors
- Frequency of sensor changes
- Securing sensors to skin (eg, with adhesive over-patches or adhesive enhancers)
- Skin care
- Limitation to sensor readings: Availability to integrate a specific sensor with a chosen insulin pump

If glucose readings on a CGM do not match the person's symptoms, checking with a standard glucose meter is recommended to verify the glucose level. If a CGM malfunctions or disintegrates before its established wear time, new sensors should be applied and paired with the user's insulin pump, if on an AID system. Individuals should consider using over patches to help protect and prevent sensors from falling off before their full wear time is up. DCESs must educate the individual on how to properly wear the sensor with the AID system. For more information about CGM management, refer to the ADCES Paper, CGM and the DCES Role.[22]

Alerts and Alarms

DCESs should educate individuals with diabetes about the benefits and limitations of using pump alarms and alerts. Although alarms can warn the wearer about catheter occlusion, low cartridge/reservoir volume, low battery, or other mechanical or software-related

problems, pump users must not rely entirely on alerts and alarms to make them aware of potential issues that require their attention. Alerts can be set to remind users to change the infusion site, change or charge the battery, or warn of a missed bolus at a set time of day; however, such alerts must be attended to in a timely manner to prevent complications.[23–25] Too many alarms can result in alarm fatigue, and wearers may be inclined to ignore them, potentially missing some critical alerts.

Managing Hyperglycemia

People with diabetes should be educated on maintaining supplies, including extra glucose monitoring strips, ketone monitoring strips, and vials and syringes or insulin pens, in case of unanticipated hyperglycemia, if an infusion set malfunctions, or a mechanical pump failure occurs. Rapid-acting insulin should be administered with a syringe or pen when hyperglycemia persists, or ketones appear. Pump users are generally instructed to replace their infusion sets or patch pumps, as these can become compromised, leading to prolonged hyperglycemia. Individuals on insulin pump therapy need a sick day plan provided by their HCP as well as instructions on how to handle ketones while on AID systems.

Special Circumstances

Exercise

People with diabetes should review glucose data more frequently during exercise. AID systems may have a specific exercise, activity, or temporary target mode that raises the glucose target and/or lowers basal rates to prevent activity-related hypoglycemia.[26] It is recommended that this mode be initiated 60 to 90 minutes prior to the activity when possible and left on for several hours after the activity to prevent delayed hypoglycemia. If the pump does not have a mode for activity, the user should discuss options with their DCES.[27]

Travel

People with diabetes should be encouraged to carry glucose monitoring equipment, pump supplies, and low blood glucose treatments (eg, glucagon) in their carry-on luggage when flying to avoid unexpected circumstances such as lost luggage and wide temperature fluctuations in baggage compartments that can affect supplies and equipment. Some pumps must be hand-checked rather than exposed to X-rays in airport security.[28] The pump wearer should check with the Transportation Security Administration and their pump manufacturer for specific insulin pump travel guidelines.[28] Extra pump and glucose monitoring supplies should be packed, generally in quantities two times the expected amount, in case of infusion set or sensor failure.[29] They must be advised to always carry a backup system for insulin administration, such as a syringe or insulin pen with needles. Individuals may consider obtaining a travel letter from their HCP.

They should be aware of time zone changes and consider resetting their pumps to the new time zones if they will be away for an extended period. Additionally, they should set a reminder to change the time zone back when they return home. They should consider using an activity/exercise mode if their travel involves more physical activity than usual.

School and Daycare Settings

An individualized diabetes medical management and a 504 plan need to be developed for the child with special instructions for AID management during school.[30] Appropriate training must be provided for school personnel who will assist with implementing and following the plan. A 504 plan should be written in conjunction with school personnel (eg, school nurse, designated staff, principal) to clearly delineate the role of the school in implementing the medical management plan.[30] The 504 plan is developed to ensure a child with T1D receives accommodations that will ensure their diabetes is managed while at school.[30] This will offer the child the best potential for academic success. Additionally, the plan should include access to all extracurricular activities offered through the school.

Medical Procedures

People with diabetes should be informed about pump manufacturers' recommendations for insulin pumps during procedures involving radiation exposure (including X-rays) and MRI.[31] Pumps should be kept outside the imaging room until testing is completed. If the pump must be disconnected for 2 hours or longer, alternative insulin treatment should be provided.[31] DCESs should coordinate insulin pump management with the HCPs prescribing and performing procedures.

Hospitalization

DCESs should develop policies, in conjunction with other members of the interdisciplinary care team, that specify the requirements for caring for individuals who use insulin pumps during hospitalization.[32] Policies for the AID system use in hospitals are hospital specific. DCESs should be involved in developing protocols for using diabetes technology as appropriate in hospital settings.[32]

Hospital insulin pump policy content should address the following[33]:

- Assessing the competency and ability of the person with diabetes to manage their insulin therapy system
- Determining to continue (or discontinue) pump use with or without automation
- Documenting and signing documents, demonstrating understanding and acceptance of hospital policy related to insulin pump use strategies to address interruptions in insulin pump use
- Considerations for people undergoing surgery and/or procedures involving radiation or magnetic fields, or admittance to the intensive care unit

Special Populations

Older Adults

Diabetes self-management in older adults requires regular assessment of medical, psychological, functional, and social domains. Older adults should be screened annually, at a minimum, for possible changes in cognitive function, as well as a recent history of hypoglycemia and hypoglycemia unawareness.[34]

Older adults with diabetes have the potential for higher rates of functional disability, accelerated muscle loss, mobility impairment, frailty, and coexisting illnesses, such as hypertension, chronic kidney disease, coronary heart disease, and stroke, than those without diabetes. Older adults may require caregiver support for administering insulin, including the use of insulin pumps and AID systems.[34,35] Older adults and individuals with impaired dexterity or cognitive decline may require more structured education and caregiver involvement.

Key considerations for older adults using insulin pumps include the physical ability to see the pump screen, hear alarms, and have the dexterity needed to charge or replace the battery, fill and change the insulin cartridge or reservoir, insert the infusion set, wear the device comfortably, and operate its technical functions.[36] DCESs must periodically reassess the cognitive and physical function of older adults and individualize glucose targets.

Automated insulin delivery systems in this population may lead to improved overall diabetes outcomes, including a reduction in hypoglycemia and enhanced glucose management.[36] Regular re-evaluation and simplification of plans may be needed in the presence of cognitive decline, frailty, or limited caregiver support.

People With Disabilities

People with diabetes[37] who experience physical, cognitive, or sensory challenges may benefit from insulin pump therapy, as evidenced by improved glucose levels, reduced injection burden, and enhanced quality of life. For people with learning disabilities, including Down syndrome and autism spectrum disorder, insulin pumps have been shown in case reports to improve HbA1c and reduce glucose variability. For example, people with diabetes who have autism spectrum disorder and experience sensory reactions as initial barriers in pump therapy may successfully adapt to an insulin pump with the appropriate support, such as desensitization or caregiver training. Recent advancements in insulin pump technology, such as app-based controls and screen reader compatibility, can improve accessibility barriers for those with visual impairments.

Challenges like handling supplies, interpreting alerts, or interacting with complex technology can often be mitigated with tailored support, simplified pump interfaces, and integration with smart devices. AID systems should be selected with these considerations in mind, and training should be individualized to address barriers to self-management in these special populations.

It is important to address any physical limitations that may challenge the AID user, such as limited vision, hearing (alarms), and manual dexterity.

Pregnancy

Insulin pumps can be used in pregnancy. AID systems with pregnancy-specific glucose targets are recommended for pregnant individuals with T1D. AID systems without pregnancy-specific glucose targets or a pregnancy-specific algorithm may be considered for select pregnant people with T1D when working with experienced health care teams.[38] Non-pregnancy-specific AID systems may require manual workarounds and coordination with maternal-fetal medicine specialists.

Summary

DCESs with an in-depth understanding of insulin pump options who are well-trained in insulin pump therapy are critical to successfully initiating pump therapy with people with diabetes and providing ongoing support to optimize care. The 2021 National Practice Survey found that 88% of DCESs indicated they were responsible for pump initiation and 75% stated they were the go-to for technology information.[39] These influences included

recommending devices such as pumps for people with diabetes, and collaborating with other members of the diabetes care team for device selection. DCESs continue to play a pivotal role in helping people with diabetes solve problems, overcome challenges with pump and sensor wear, and make informed decisions in cases of illness and when technology malfunctions.[40]

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Elizabeth Hanna, MS, RDN, CDCES

Carla Cox, PhD, RDN, CDCES

Cassandra Henderson, MS, MD, CDCES

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