

Sustaining telehealth in pediatric diabetology beyond COVID-19: How to set the tone

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Abstract

In the post-COVID-19 era, telehealth experience and knowledge must be structured to deliver high-quality care. Type 1 diabetes is a chronic disease that lends itself to being a model for telehealth diffusion, especially in the pediatric setting where the use of cloud-connected technologies is widespread. Here, we present “how to set the tone” and manage a telemedicine session according to our experiences and those reported in the literature, according to the health professional perspective. A practical workflow on how healthcare professionals can structure a virtual diabetes clinic is reported, as well as critical issues related to limits in physical examination, communication registers, relationships, and visit settings. A proactive virtual visit model could be feasible, stratifying patients according to continuous glucose monitoring metrics, and personalized interventions can be provided to each patient. Analysis of benefits and hassles due to telehealth for each patient has to be considered, as well as their personal perspective, expectations, and reported barriers, mainly related to connection issues and digital literacy.

Keywords

Telehealth, telemedicine, type 1 diabetes, pediatric

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Introduction

Since the start of the COVID-19 pandemic, telehealth services have increased significantly and have become an essential method for treating patients, keeping all parties safe and healthy; both small practices and large institutions have pivoted their in-person care model to virtual care to provide continuous care of patients with chronic disease.^{1–3}

To date, in less urgent times, individuals and organizations must provide telehealth with the experience or knowledge essential to deliver high-quality care via telehealth.^{4,5} Healthcare providers have to set specific ground rules to ensure that the standards of care remain equivalent between the in-person and virtual settings.⁵

Type 1 diabetes (T1D) lends itself to telehealth due to the critical component of self-management and remote monitoring with continuous glucose monitoring (CGM) systems, smart connected pens, and insulin pumps. These instruments provide accurate and reliable data that can be shared electronically with apps and clouds through an

increasingly passive data download.⁶ Virtual education is also feasible through e-learning platforms and can improve knowledge and self-care.⁷ To date, telehealth, above all in pediatric diabetology, has been demonstrated as feasible and influential on clinical and psychological outcomes. Telehealth may be a useful supplement to usual care to improve glycemic control^{8,9}: studies implementing telehealth programs reported a mean reduction in HbA1c of -0.18% – -0.28% at 12 months after the intervention,^{8,9} and the effect on HbA1c appeared greatest in trials with higher HbA1c at baseline⁹; telehealth had no effect on

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hypoglycemic episodes.⁹ A recent study partially replacing in-person visits with monthly video consultations reported stable HbA1c, while mean sensor glucose level and glucose management indicator decreased.¹⁰

Regarding psychological outcomes, people with T1D reported satisfaction with telehealth and interest in its continued use,¹¹ and their diabetes-specific burden and distress decreased¹⁰ without a convincing effect on the quality of life.^{8,9} Telemedical care could partially replace some activities of the traditional in-person visit but did not replace it completely.^{8–12}

How to set the tone

To set the tone and manage the telemedicine sessions, healthcare professionals can structure a virtual diabetes clinic with doctor visits every 15 minutes on established days, as proposed by the Harvard Medical School.¹³ Sessions can be shorter or longer according to the objective of the video consultation,⁶ and if the visit is substitutive of the quarterly in-person appointments, a slot of time for nurse, dietitian, and psychologist consultation has to be arranged.⁶

Patients' criteria to access this modality has to be programmed, as all the people with T1D who live far away from the clinic could be good candidates, but the availability of technological devices to connect with the center (CGM, smart pen, and insulin pump) and data sharing are prerequisites. Analysis of benefits and hassles due to telehealth for each patient has to be considered, as well as their personal perspective and expectations. Adherence to at least one in-person visit during the year to perform the annual review, as indicated by ISPAD 2022 guidelines, has to be guaranteed.^{6,14,15}

The same guidelines suggest that team roles and responsibilities must be pre-planned to deliver a successful telehealth encounter. Patients have to be preliminarily contacted by the data manager to be prepared for the telehealth consultation. They have to know in advance the platform that will be used, test the internet connection, and check that glucose and insulin pump data have been downloaded.⁶ Subjects with T1D have to be engaged to ensure effective care delivery, and clinicians should suggest providing a location at home with few distractions and switching the video camera on.⁶ Patients must feel that their privacy and personal data are secure during telehealth consultation, and they should be aware that the session cannot be recorded.⁶ Clinicians will explain that it will be important to respect the time that has been allotted to guarantee on-time sessions for all the other people attending the virtual clinic.¹⁵

Quarterly visits conducted by telehealth consultation, follow the workflow of in-person visits as reported by ISPAD guidelines,⁶ and virtual visits can start with the welcome by the nurse, who asks about recent general and

diabetes-related health, patient's needs, priorities, barriers, and ongoing insulin dosages.^{6,16}

Subsequently, physicians and patients share CGM data interpretation from the cloud, which follows adjustments to therapy, advice on behavioral aspects, prescriptions of drugs and exams, and requests for medical certificates.⁶

At the end of the visit, the nurse checks the medical device supply, answers any technical questions, and shares with the patient a follow-up plan and the next appointment.^{6,11} Distribution of medical devices, such as consumable material for CGM and insulin pumps that were usually given to patients during the quarterly visit at the pediatric diabetology centers, can be home delivered.

Dietary and psychological consultations that are provided at the in-person visits can be delivered at the virtual pediatric diabetes clinic based on the behavioral and lifestyle goals that have been established during the previous telehealth visit, booking proper slots of time. Finally, reimbursement of telehealth visits provided by the doctor, dietitian, or psychologist must be recognized, as in our country.^{2,16}

The proactive and personalized virtual visit model

The post-COVID-19 telehealth model in pediatric diabetology goes over the quarterly fixed appointments, and virtual visits can be an occasional *substitute* for an in-person visit, or *in addition*, whether delivered only a few weeks after another to monitor the achievement of the established goal. *Proactive* virtual visits are a step forward, where the patient is managed according to a population approach. The two most studied models, the Diabeter CloudCare Netherlands and the Stanford TIDE (Timely Interventions for Diabetes Excellence platform) implemented this approach,^{17–22} that moves from a wait-and-see medicine method to an initiative one, with patients contacted outside of traditional appointments, because critical values emerge from glucose telemonitoring.⁶ Patients belonging to the clinic are evaluated and stratified by metabolic compensation based on CGM metrics codified by an international consensus that defines whether the patient is in reasonable metabolic control or at risk,²³ and through a triage system, subjects are contacted with teleconsultation by telephone or telemedicine visits, for a personalized intervention.²¹

The Stanford algorithm analyses each week's CGM data in a dashboard. According to this model, people with T1D who present a percentage of "time CGM worn" < 70% are contacted to understand the reason for insufficient readings.²⁰ Subjects with T1D with a percentage of "time CGM worn" > 70%, are eligible for remote review, and the following "flags" are considered: TIR < 65%–70%, and/or hypoglycemia level 1 > 4%, and/or hypoglycemia level 2 > 1%. These children–adolescents are ranked in descending order of priority for review based on the number of

“flags” they present.^{20,22} This tool helps clinicians manage their entire T1D clinic population, and in the future, advisors, virtual coaches, or an avatar as a doctor will handle glucose patterns and reinforce healthy lifestyles (diet and exercise) or therapy goals (such as insulin waiting time or dose adjustments).²⁴ As represented by Levine’s connected care pyramid (Figure 1), personalized interventions provided to each patient can change in complexity over time, where the patient can move up or down the side of a pyramid, from the virtual diabetes clinic that is at the top of the pyramid to apps that are useful as virtual coach and are the base of the pyramid as they are available to everyone that is motivated to use it.²⁵

Limits in telehealth

The limits of technology applied to telehealth pose a variety of challenges. Firstly, how will we establish the same level of communication and relationships if we cannot meet patients face-to-face? Trust is more complex to establish in a virtual conversation than in person, but patients with diabetes have an established relationship with their providers and they know the competence and reliability of their diabetology staff. Given that physical contact is impossible in the virtual world, clinician–patient relationships can be established using skills that demonstrate a patient-centered approach: body language and facial cues

can be used to create connection; empathy can be shown by actively listening to the patient, with empathetic responses, providing detailed information and explaining proper treatment options.¹⁶

Secondly, clinical evaluation is limited in telehealth and also in pediatric diabetology, as some symptoms and conditions must be evaluated in person, and measurement of height, weight, and evaluation of lipodystrophy are not appropriate for virtual care and, therefore, must be postponed until the in-person visit.

Regarding the visit setting, telemedicine enters patients’ homes, and clinicians receive a different insight into patients’ living situations and surroundings that can help generate better treatment plans. Most of the patients report no problems showing places and habits of their private sphere, while other patients feel uncomfortable sharing their living space; therefore, they share a virtual background. Telehealth can also facilitate family members’ involvement in care, although some patients may not freely discuss their symptoms and concerns in a constricted home setting.

We reported the healthcare professional perspective, but the quick transition to telehealth during the COVID-19 pandemic resulted in telehealth being forced into existing healthcare delivery, and this process could have exacerbated disparities in access to telehealth. Studies have demonstrated lower telemedicine use by populations with

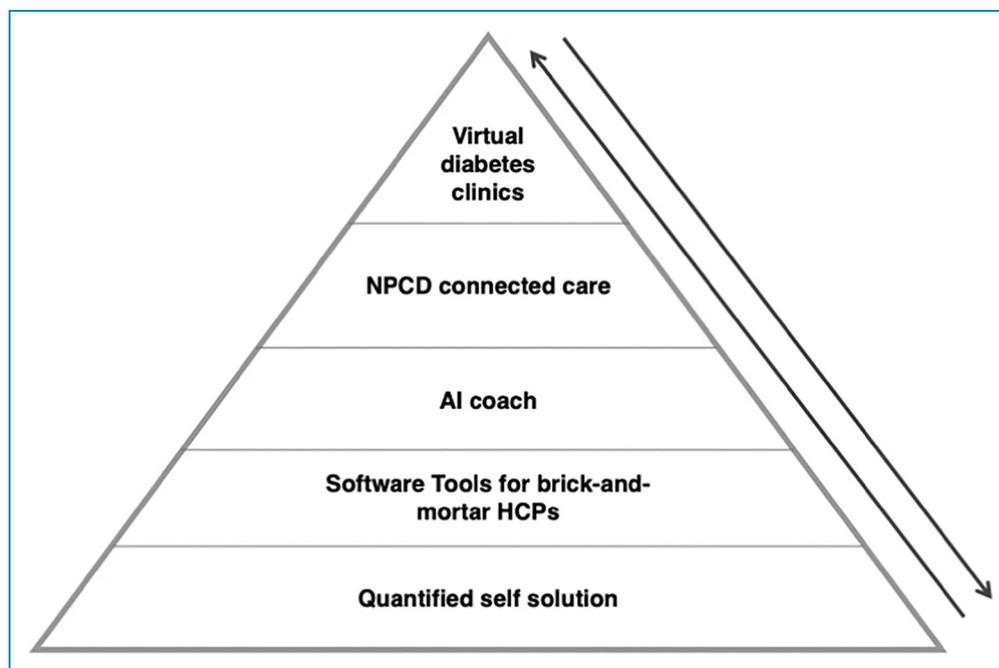


Figure 1. This is a risk stratification pyramid reported by Levine et al.,²² showing different levels of connected diabetes care that subjects can escalate and de-escalate based on their clinical need and individual preferences. NPCD: non-physician clinician-driven connected care; AI: artificial intelligence; HCP: healthcare provider. The figure comes from an open access article²² distributed under the terms of the Creative Commons CC BY license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

public insurance, minority race or ethnicity, and non-English language preferences.^{11,26–28} These disparities in use may also be partially driven by limited access to broadband internet and reduced digital literacy; other people reported emerging concerns regarding the privacy and safety of their medical records.¹¹

Conclusions

In summary, to set the tone and manage the telemedicine sessions in the post-COVID-19 era, the visit workflow must be revised regarding patients' selection, preliminary rules, team roles, responsibilities, times, and dedicated agenda. Some modules lend themselves to telehealth (glucose metrics, education, and prescriptions) while physical examination, "warm" relationships, moments of confidence, and advice that involves the emotional sphere remain limited to in-person visits.

The proactive and personalized virtual visit model is feasible for youths with T1D by stratifying patients according to CGM metrics, and according to an initiative medicine approach, the telehealth service has the potential to provide a personalized intervention based on patients' needs, ensuring more equitable access to care. In the future, most of the routinary "gluco-centric" modules will probably be handled by an avatar as a doctor, while face-to-face consultations with healthcare professionals will be available upon request to share clinical and psychological issues related to the different treatment options for T1D.

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