Tele-Management of Diabetes in the Post-COVID-19 Era

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With the first sunrise of 2020, the world woke up to a completely new reality; the era of COVID-19 had begun. What was first reported as an outbreak of pneumonia in Wuhan on the last day of the year before quickly became a pandemic, influencing nearly every human being, either directly or indirectly [1].

This resulted in the implementation of widespread public health measures that were unprecedented in human history. Personal protective procedures such as the use of masks and gloves, hand hygiene measures, sneezing precautions, environmental sterilization, and restrictions on local or international movement became the norm. Diagnosed cases were isolated, and known contacts were put in quarantine. Even whole countries were placed under lockdown, if needed.

Stay-at-home measures and physical distancing guidelines were mandated. In the blink of an eye, we were living in a different world. As far as healthcare was concerned, providers and resources were rapidly redeployed towards the in-patient management of people affected by COVID-19. All non-emergency clinic visits and elective procedures were cancelled. Whenever possible, patients were remotely managed with the help tele-health technology.

We learnt from experience that patients with diabetes were at a higher risk for severe illness from COVID-19 [2]. Therefore, most scheduled clinic visits for diabetes management were also converted into tele-health consultations.

Although the majority of our colleagues in diabetes management think that things would go back to normal, we do need to ask ourselves what lasting impact would this epidemic have in the outpatient management of diabetes in a post-COVID-19 world? In terms of the usual management of diabetes, the normal process to date has focussed around multiple clinic visits over the course of a year, with the time interval determined by the severity of the disease as well as the availability of appointments with the healthcare providers.

However, as time passes, tele-health continues to assume a larger role in clinical diabetes management, given the ongoing restrictions in place. Therefore, it would be better to start comprehending this paradigm shift in clinical management as well as be acquainted with what technology has to offer. Generally, telehealth technology can be utilized at 3 different levels in outpatient diabetes management.

First Level

This level has been most commonly utilized in the current scenario and is usually referred to as teleconsultation. Here, a 2-way audiovisual link is established between the patient and the healthcare provider via a commercially available software or application and the consultation follows as a normal video-assisted conversa-

tion. Although it is simple to use, most diabetes care providers find it inadequate, given the lack of objective data that are usually available in a normal clinic visit. This includes vital signs as well as the data downloaded from the blood glucose monitor, sensor, insulin pump, or a point of care A1c testing device. Once the conversation ends, there is also a need to document the interaction in the electronic health record (EHR) separately, as the teleconsult software is usually not integrated with the EHR. This increases the time spent for each visit. There are connectivity-related technical issues that occur as well, such as poor Wi-Fi or mobile connection, erratic sound, or a distorted image. These are common to all the 3 levels mentioned here.

Second Level

The second level is quite similar to the first 1 but here the healthcare provider has to take the extra step and access to detailed patient data by logging on to the Web site provided by the manufacturer of the blood glucose monitor or the continuous glucose monitoring sensor. Most companies are providing this feature to their consumers. This allows the providers to make a better judgement in terms of recommending any therapeutic changes. Once again, the A1c result may still not be available unless the patient goes to a laboratory, and the results are available ahead of time. Data integration into the EHR also remains an issue here as well and in fact a bit more complicated, as the data from the blood glucose data from the device Web site needs integration as well.

Third Level

The third level involves the use of remote patient monitoring technology. The patient has the devices, such as a glucometer or sensor, blood pressure apparatus, weighing machine, an integrated pillbox, etc. at home. All these devices are connected to a central monitoring facility connected to the EHR at the healthcare provider's location.

The data are consistently monitored using artificial intelligence-based algorithms that have been pre-set individual parameters for each patient. Dedicated triage staff needs to be assigned for this purpose. Whenever a data point is found to be outside these pre-specified ranges, an alarm is generated for the triage staff to evaluate and escalate as needed.

These data can then be forwarded to the treating physician on their mobile device for their action if indicated. The audiovisual capability is generally integrated into the EHR, and the data from the devices flow directly into it, saving time.

Point-of-care testing devices, including those for A1c, lipid profile, serum chemistry, urine micro albumin, etc. are now available for home use, and the results can be integrated into the EHR. The connected pillbox has a built-in reminder system as well as the ability to transmit a signal once the medication is taken out of the slot. This helps ensure compliance, which is frequently lacking in the management of a chronic disease such as diabetes. This would lead to a decreased number of physical clinic visits but a far more consistent monitoring and timely interventions.

These different levels will likely lead to a paradigm shift in how diabetes is managed on an outpatient basis. The healthcare providers, based on the diabetes control required by an individual patient, will likely determine the level of care. This would necessitate a reallocation of resources away from the current brick and mortar model, towards integration of technology and re-training of clinical staff to effectively utilize it.

There is a concern about reluctance towards adoption of this technology by general practitioners, based mostly on time-related or financial concerns. These concerns are true for any changes to the usual practice, technological, or otherwise. Utilized properly, this will, in fact, help save time, as the physician will interact with the patient for the entire duration of the virtual visit, avoiding the time spent in administrative processes. Since this technology is mostly cloud-based, for those practices that are already computerized, the financial impact will be minimal, as no new equipment needs to be procured.

Obviously, this may not be an option in a limited-resource environment. At the patient end, the adoption may be somewhat easier for the younger patients as is seen with any new technology and one should expect some degree of resistance from the older patients. In terms of reimbursements, for example, in the USA, Centres for Medicare & Medicaid Services have issued a list of services payable under the Medicare Physician Fee Schedule when furnished via telehealth and have also published the necessary HCPCS/CPT Codes [3]. Others are following suit on a global level.

Finally, technology in terms of both hardware and software is available. However, one has to be careful in selecting the solution that fulfils the particular requirements of any given practice. Welcome to this new world.

Conflict of Interest Statement

No conflicts of interest to disclose.

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References

- 1 WHO. Coronavirus Disease (COVID-19): events as they happen.
- 2 American Diabetes Association. How COVID-19 impacts people with diabetes.
- 3 U.S. Centers for Medicare & Medicaid Services. List of services payable under the Medicare Physician Fee Schedule when furnished via telehealth.