

## SL1 Virtual Diabetes Clinic during COVID and Beyond-Data management and impact on health care cost

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Diabetes prevalence continues to increase globally with current estimates at 463 million people with both Type 1 (T1D) and Type 2 diabetes (T2D). Both T1D and T2D are increasing at the rate of ~4% annually and about 1/3 of patients remain undiagnosed. The overall prevalence of diabetes in the USA is ~9%. The highest concentration globally is in the Middle East. As expected, all patients with T1D and about 20% of patients with T2D require insulin therapy for managing their diabetes effectively during their lifetime.

Diabetes also affects communities of color disproportionately higher. For example, the highest prevalence of diabetes in the USA is amongst Native Americans (14.7%), which is nearly two times higher than Caucasians. African Americans and Hispanics also have higher prevalence of diabetes in the USA. It's also known that 50% of the Asian population in the USA are likely to be diagnosed with end-stage kidney disease. Similarly, African Americans and LatinX have a 3.5 and 1.4-fold higher risk of getting end-stage kidney disease and diabetes-related amputations when compared with Caucasians. It's also known that LatinX, African Americans, and Native Americans are much less likely to be offered new technologies like continuous subcutaneous insulin infusion (CSII/insulin pumps) and continuous glucose monitors (CGMs). Use of technology, especially CGMs, is expected to remove many of the social barriers and disparities in care for people with diabetes.

For the past 18 months, the COVID-19 pandemic has globally effected more than 215 countries and as of June 05, 2021 there were 175 million cases of COVID-19 reported globally. Unfortunately, about 3.5 million people have died from COVID-19. Specifically, the US reported about 34 million cases with the total number of deaths approximating 600,000 people. In Europe, there were 50 million cases reported resulting in 1.2 million deaths. To date, the exact prevalence of the infection is currently unknown; however, for herd immunity, it is believed that if 70-80% of the population should be either infected or vaccinated. Prevalence of diabetes and hypertension is significantly higher in patients effected by COVID-19. And similarly, is the case with morbidity and mortality associated with diabetes and COVID-19. Majority of this relationship is related to poor glucose control, especially in patients with Type 1 diabetes (T1D). Similarly healthcare cost implications have been enormous world-wide.

Many new-onset patients with T1D delayed seeking medical advice during COVID-19 because of the risk of infection. Many hospitals noted a higher number of patients presenting with diabetic ketoacidosis (DKA) because of the delay in diagnosing T1D. Similar concerns were noted by many of the physicians managing diabetes during pregnancy. However, in many instances, most diabetes care including patients with DKA could be effectively managed remotely by using newer technologies like CGM, insulin pumps, and hybrid closed-loop systems. In several instances, even the pump and CGM initiation were initiated remotely with no adverse outcomes. Virtual care gave a similar or better Time in Range (TIR) for glucose levels with no increase in Time Below Range (TBR) during the virtual care period.

In addition several new CGMs and Hybrid Closed-Loop (HCL) systems have made diabetes management much easier especially during the pandemic.



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Satish K. Garg is Professor of Medicine and Pediatrics at the Adult Clinic of the Barbara Davis Center for Diabetes of the University of Colorado School of Medicine in Denver, Colorado. He joined the faculty of the Barbara Davis Center in 1992 and became the founder and director of the Adult Clinic. He established and holds two Garg Endowed Chairs (clinical and clinical research) at the University of Colorado Denver. His team is one of the top teams world-wide in clinical trials involving insulin analogues and novel methods of insulin delivery (pens, pumps, oral, buccal and inhaled) and non-insulin adjunctive treatment options for Type 1 Diabetes. Other areas of interest include continuous glucose monitors, evaluating the accuracy of meters at high altitude, and artificial pancreas systems.

Dr. Garg received a medical degree in medicine at Punjab University in Ludhiana, India, where he also completed a residency in internal medicine at Christian Medical College and Hospital. He completed fellowships in adult endocrinology and diabetes at the Post Graduate Institute of Medical Education and Research (PGIMER) in Chandigarh, India, and in pediatric endocrinology and diabetes at the University of Colorado at Denver and Health Sciences Center. He is board certified in internal medicine and endocrinology and diabetes.

Dr. Garg is the Editor in chief of Diabetes *Technology and Therapeutics* journal since 2006 and Chair of the planning committee for Clinical Therapeutics and New Technology area for 2007 and 2008 Annual American Diabetes Associations meetings. He is the director of HYPERLINK "<http://www.atdcconference.com/>" ATDC Diabetes Conference, in Keystone, since 2005. He is a member of the many Endocrine and Diabetes Societies such as: International Diabetes Federation, the American Diabetes Association, the Endocrine Society of India, and the European Association of Study for Diabetes, the Regional Pediatric Endocrine Society of Colorado, the Research Society for Study of Diabetes Mellitus, and numerous other professional societies in both the United States and India. He is an international lecturer and speaker—he received several international oration awards—and has published many chapters in the books, on the editorial boards for many of the diabetes journals globally and has published more than 325 original manuscripts in peer-review journals.