

Diabetes Care During the COVID-19 Pandemic

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In 2018, the National Center for Health Statistics reported that 10.1% of US adults aged 18 years or older had diagnosed diabetes.¹ The high prescription cost of antidiabetic drugs remains a public concern, and its impact on the health of diabetic patients during the COVID-19 epidemic season does not look promising. Diabetes, especially type 2 diabetes (T2D), is a chronic inflammatory state that can lead to an ineffective immune response. Patients with COVID-19 and uncontrolled diabetes have an increased risk for medical complications, including death.²

The best early data regarding COVID-19 and diabetes comes from research out of Wuhan, China, in which a meta-analysis of more than 45,000 patients showed diabetes to be the second most common comorbidity, with a prevalence of 8%.³ Also from Wuhan, among 1099 patients with COVID-19, those with diabetes were more than twice as likely to have severe disease and 3.5 times more likely to require intensive care unit (ICU) care, to require mechanical ventilation, and/or to die.^{4,5} Among 52 critically ill patients, those with diabetes were more than twice as likely not to survive.⁵ Early studies from Italy and the United States similarly showed a higher prevalence of diabetes among patients with COVID-19 who were hospitalized and particularly those in the ICU.⁶ A more recent meta-analysis of

30 studies enrolling 6452 patients showed significantly increased severity, mortality, acute respiratory distress syndrome, and disease progression.⁷ COVID-19 also may cause diabetic ketoacidosis and diabetic ketoacidosis.⁸

It is important to highlight that there is no greater risk of contracting COVID-19 infection in patients with diabetes, but the severity of the infection is greater. Other bacterial and viral infections are also more likely in persons with diabetes, so pneumococcal and influenza vaccination are important for these patients.

The potential risk factors that may increase morbidity among inpatients with COVID-19 and diabetes include corticosteroid therapy, altered and less-frequent glucose monitoring, isolation from physicians, and inappropriate discontinuation of angiotensin-receptor blockers and angiotensin-converting enzyme inhibitors.⁹

MANAGEMENT PEARLS FOR PERSONS WITH DIABETES

Keeping a euglycemic state is important to help avoid COVID-19–related complications; however, it is not clear whether any specific glycemic therapy may prevent or decrease the medical burden, especially in patients who require mechanical ventilation. Antihyperglycemic agents that can cause volume depletion (such as sodium-glucose cotransporter 2 inhibitors) or hypoglycemia (such as sulfonylureas) should be avoided. Dosage of oral antidiabetes drugs may need to be adjusted or reduced.¹⁰

Dipeptidyl peptidase-4 (DPP-4) inhibitors are commonly used to treat patients with T2D, and their use has been postulated as a potential preventive strategy to reduce the risk of progression to respiratory failure in patients with diabetes who have COVID-19.^{6,11} DPP-4 was identified as a functional receptor for the spike protein of the Middle East respiratory syndrome coronavirus (MERS-CoV), and its presence increases inflammation in T2D patients. Promising results have been obtained with the use of DPP-4 inhibitors in MERS-CoV–infected mice¹¹; however, on the other hand, DPP-4 inhibitors have been associated with an increased risk of upper respiratory infections but not pneumonia.¹² The use of DPP-4 inhibitors as a preventive strategy to reduce COVID-19–related complications remains unclear.

As with any persons who are at risk for COVID-19, those with diabetes should follow guidelines for social distancing,

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Table. Medical Resources for COVID-19 and Diabetes		
American Association of Clinical Endocrinologists	COVID-19 Resources: Telehealth, Updates and More	https://www.aace.com/covid-19
American College of Physicians	Coronavirus Disease 2019 (COVID-19): Information for Internists	https://www.acponline.org/clinical-information/clinical-resources-products/coronavirus-disease-2019-covid-19-information-for-internists
American Diabetes Association	Diabetes and Coronavirus	https://www.diabetes.org/coronavirus-covid-19
Centers for Disease Control and Prevention	Coronavirus (COVID-19)	https://www.cdc.gov/coronavirus/2019-ncov/
Centers for Medicare and Medicaid Services	Medicare Telemedicine Health Care Provider Fact Sheet	https://www.cms.gov/newsroom/fact-sheets/medicare-telemedicine-health-care-provider-fact-sheet
COVID in Diabetes	Collaborative Open-Access Virtually Individualized Decision-Algorithms for Inpatient Diabetes	https://www.covidindiabetes.org/
Federation of State Medical Boards	U.S. States and Territories Modifying Requirements for Telehealth in Response to COVID-19	https://www.fsmb.org/siteassets/advocacy/pdf/states-waiving-licensure-requirements-for-telehealth-in-response-to-covid-19.pdf
World Health Organization	Rolling Updates on Coronavirus Disease (COVID-19)	https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen

mask-wearing, frequent handwashing, and avoiding touching the face. During times with extensive local community transmission, persons should avoid nonessential travel and close-contact activities such as entertainment venues, sporting events, and even public service such as jury duty or in-person voting.

With shelter-in-place orders, persons are likely to be much less active overall and will need to adjust diabetes medications accordingly. Weight gain is possible, and grocery shopping can be a particular challenge for persons with diabetes, since the food supply chain will have significant changes and shortages.

Another concern for all persons with medical conditions, but particularly for those with diabetes, is the potential for medication supply shortages, since many are manufactured overseas and require redistribution in the United States. Patients should try to maintain a minimum of a 1-week supply in advance of need and should contact their physician should the supplies or medications be deemed unavailable so that alternative strategies can be arranged. A similar issue is the sudden increase in unemployment numbers with subsequent losses in revenue, as well as loss of or other changes in health insurance coverage. Some pharmaceutical companies have developed programs to provide significant patient assistance for insulin during the COVID-19 crisis. Even before the COVID-19 pandemic, 11% to 15% of adults with diabetes did not take their medications as prescribed, with the greatest risk factors being lack of insurance and age greater than 65 years.¹ Physicians therefore will need to be vigilant and flexible in developing safe and affordable regimens.

It is important to keep in mind special considerations in patients with type 1 diabetes, since they should measure blood glucose and urinary ketones frequently if fever with hyperglycemia occurs. Their insulin regimen might need to be changed actively to maintain euglycemia. Insulin is the safest method to control hyperglycemia in all persons with diabetes, particularly those in the hospital; in general, one should avoid oral antidiabetic drugs.¹³

The role of continuous glucose monitoring (CGM) in the hospital setting is a promising approach for blood glucose monitoring in these patients to minimize contact between patients and nurses; however, its safety is still in evaluation in clinical trials. Practitioners need to be aware that some commonly prescribed medications such as acetaminophen, atenolol, and lisinopril may interfere with some types of CGM reading, particularly some older monitor models.¹⁴

It has been postulated that COVID-19 may destroy pancreatic islets through its functional angiotensin-converting enzyme 2 receptor located in the pancreas, making patients with diabetes more susceptible to the infection and to diabetes progression.¹⁵ Practitioners need to maintain vigilance as to whether pancreatic inflammation reported in patients with COVID-19 with and without diabetes leads to worsening or new-onset diabetes, respectively.⁶ A special consideration about glucose metabolism is when chloroquine or hydroxychloroquine is used, since either may produce low blood glucose levels.

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OUTPATIENT VISITS AND DOCUMENTATION

More than 50 US health systems already have telemedicine programs, and they have been partially implemented in most of the outpatient clinics.¹⁶ State, insurer, and Medicare/Medicaid guidelines dictate how and when telemedicine visits may be billed, and interstate billing may require physician licensure in the state in which the patient is residing at the time of the visit. Documentation guidelines to certify medical devices such as insulin pumps and continuous glucose monitors are relatively unclear at this point, so it will be important to include as many of the necessary elements previously required for such, whenever possible.

Patients with diabetes should have regular dilated eye examinations and foot care, but the timing and scheduling need to be adjusted based on benefit versus risk during times of extensive community transmission of COVID-19, when staying home may be safer. Certainly, patients with high-risk symptoms need appropriate examination, often with specialty referral.

Work releases and restrictions require medical judgment, but persons in high-risk contact positions may need extended leaves of absence, reassignment, or temporary disability for their protection. ■

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