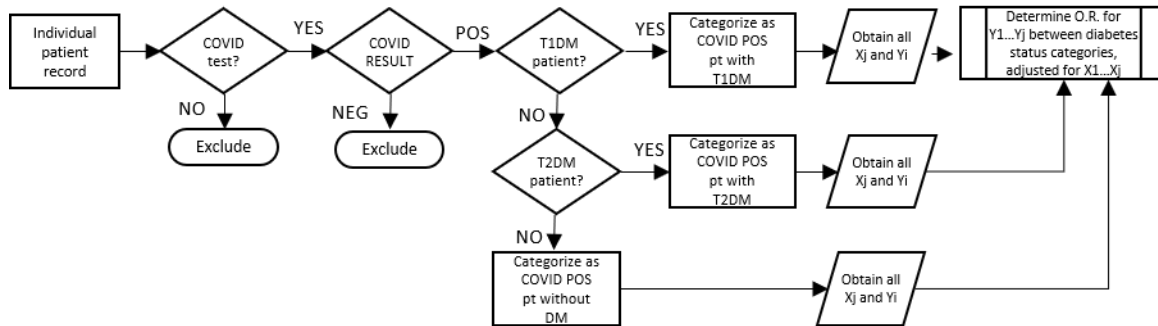Online-Only Supplemental Material

SUPPLEMENTAL TABLES

Supplemental Table 1.

Clinical outcomes for patients with COVID-19 categorized by diabetes status (no diabetes, type 1 diabetes [T1DM], or type 2 diabetes [T2DM]). * Lower acuity respiratory support denotes respiratory support less than endotracheal intubation and mechanical ventilation (e.g. oxygen by nasal canula, non-rebreather mask, continuous or bilevel positive airway pressure).

Outcomes	No diabetes (n = 6,138)	T1DM (n = 40)	T2DM (n = 273)
Hospitalization within 14 days of positive viral test, % (n)	7.1% (435)	22.5% (9)	44.3% (121)
Severity within 14 days of positive viral test, % (n)			
- No hospitalization	92.9% (5,703)	77.5% (31)	55.7% (152)
- Hospitalization without respiratory support	2.1% (127)	12.5% (5)	8.4% (23)
- Lower acuity respiratory support*	3.3% (204)	2.5% (1)	21.6% (59)
- ICU admission	0.6% (37)	5.0% (2)	3.7% (10)
- Endotracheal intubation	0.6% (39)	2.5% (1)	5.9% (16)
- Death	0.5% (28)	0% (0)	4.8% (13)

SUPPLEMENTAL FIGURES

Supplemental Figure 1: Flowsheet depicting process to identify COVID-19 cases and categorize them based on diabetes category: no diabetes mellitus (DM), type 1 diabetes (T1DM), and type 2 diabetes (T2DM). X_j = covariate of interest (e.g. age, BMI, GHb, etc). Y_i = outcome of interest (e.g. COVID-19 severity, hospitalization, diabetic ketoacidosis admission, etc.). O.R. = odds ratio.

Appendix: Inclusion and Grouping Variables, Outcomes of Interest, and Clinical Factors Collected for Data Analysis

Appendix Table 1: Inclusion and Grouping Variables

Variable Name	Variable Description	Function	Method to Obtain Variable
Z1	Records with any COVID-19 test	Requirement for record inclusion in aim 1 and 3*	EHR query
Z2	Positive COVID-19 test	Requirement for record inclusion in aim 1 and 3*	EHR query
Z3	T1DM patient **	Grouping for aim 1, inclusion for aims 2-3	EHR query
Z4	T2DM patient †	Grouping applicable to aims 3 and 4	EHR query
Z5	any patients that are neither T1DM nor T2DM patients	Grouping applicable to aim 1	EHR query
Z6	Positive viral respiratory PCR panel	Grouping applicable to aim 2	EHR query

* I.e. the records of all patients analyzed must have a positive or negative COVID-19 test for inclusion in the analysis.

** T1DM patient = any patient who has either any diagnosis code for T1DM or T1DM listed in the EHR problem list

† T2DM patient = any patient who has either any diagnosis code for T2DM or T2DM listed in the EHR problem list

Appendix Table 2: Clinical Outcomes (Dependent Variables) of Interest to be Collected for Data Analysis

Variable Name	Variable Description	Variable Type	Method to Obtain Variable
Y1	Illness severity (whichever is greatest): 0 = No hospitalization, 1 = Hospitalization for any reason, 2 = Any respiratory support other than endotracheal intubation and ventilation for any reason (e.g. oxygen by nasal canula, non-rebreather mask, cpap, bipap) 3 = ICU admission for any reason 4 = Endotracheal intubation for any reason 5 = Death within 14 days of COVID-19 test	Ordinal	EHR query (possible chart review)
Y2	Myocarditis for any reason within 14 days of COVID-19 test	Boolean	EHR query
Y3	Arrythmia for any reason within 14 days of COVID-19 test	Boolean	EHR query (possible chart review)
Y4	Acute cardiac injury for any reason within 14 days of COVID-19 test	Boolean	EHR query (possible chart review)
Y5	Acute respiratory distress syndrome for any reason within 14 days of COVID-19 test	Boolean	EHR query (possible chart review)
Y6	Shock for any reason within 14 days of COVID-19 test	Boolean	EHR query (possible chart review)
Y7	Hospitalization for diabetic ketoacidosis within 14 days of COVID-19 test	Boolean	EHR query
Y8	Positive COVID-19 test (Aim 3 only)	Boolean	EHR query

* A Boolean variable has only two possible values: true or false

** The EHR query retrieves outcomes directly out of the Epic EHR via the Clarity data warehouse

Appendix Table 3: Factors (Independent Variables) of Interest to be Collected for Data Analysis (table continued on following pages)

Variable Name	Variable Description	Variable Type	Method to Obtain Variable
	GROUPING FACTORS		
X1	Diagnosis of T1DM	Boolean*	EHR query**
X2	Diagnosis of T2DM	Boolean	EHR query
X3	COVID-19 (+) PCR test	Boolean	EHR query
X4	Date of COVID-19 PCR test	Date	EHR query
X5	Viral respiratory PCR (+) panel test	Categorical	EHR query
X6	Date of viral respiratory PCR panel test	Date	EHR query
X7	Positive influenza A test in past year	Boolean	EHR query
X8	Date of positive influenza B test	Date	EHR query
X9	Positive influenza B test in past year	Boolean	EHR query
X10	Date of positive influenza B test	Date	EHR query
X11	Institution	Categorical	Manually coded
	DEMOGRAPHIC AND SOCIAL FACTORS		
X12	Date of birth	Date	EHR query
X13	Sex	Binomial	EHR query
X14	Race	Categorical	EHR query, chart review, or patient contact
X15	Hispanic ethnicity	Boolean	EHR query, chart review, or patient contact
X16	Highest level of education	Ordinal	Patient contact
X17	Household income category	Ordinal	Patient contact
X18	Insurance (public, private, or none)	Categorical	EHR query
X19	Zip code	Categorical	EHR query

Appendix Table 3 (Continued): Factors (Independent Variables) of Interest to be Collected for Data Analysis

Variable Name	Variable Description	Variable Type	Method to Obtain Variable
	CLINICAL FACTORS		
X20	BMI	Scalar	EHR query
X21	Weight	Scalar	EHR query
X22	Diagnosis of hypertension❖	Boolean	EHR query, chart review, or patient contact
X23	Diagnosis of asthma		EHR query, chart review, or patient contact
X24	Blood type	Categorical	EHR query, chart review, or patient contact
X25	Rh factor	Categorical	EHR query, chart review, or patient contact
X26	Pregnancy	Boolean	EHR query, chart review, or patient contact
X27	Flu immunization this year	Boolean	EHR query, chart review, or patient contact
X28	Smoking status	Ordinal	Chart review or patient contact
X29	Taking any ACE inhibitor❖	Boolean	EHR query, chart review, or patient contact
X30	Taking any angiotensin receptor blocker❖	Boolean	EHR query, chart review, or patient contact
X31	Taking any anti hypertension medicine other than ACE-I or ARB❖	Boolean	EHR query, chart review, or patient contact
X32	Taking any NSAID during 72-hour period prior to COVID-19 test	Boolean	Chart review or patient contact
X33	Taking any systemic glucocorticoids during 72-hour period prior to COVID-19 test	Boolean	EHR query, chart review, or patient contact
X34	Taking any antiviral medication within one week of COVID-19 test	Boolean	EHR query or chart review
X35	Any previous myocardial infarction	Boolean	EHR query, chart review, or patient contact
X36	Any previous angina	Boolean	EHR query, chart review, or patient contact
X37	Any previous congestive heart failure	Boolean	EHR query, chart review, or patient contact
X38	Any previous peripheral vascular disease	Boolean	EHR query, chart review, or patient contact
X39	Any previous cerebrovascular disease or stroke	Boolean	EHR query, chart review, or patient contact

Appendix Table 3 (Continued): Factors (Independent Variables) of Interest to be Collected for Data Analysis

Variable Name	Variable Description	Variable Type	Method to Obtain Variable
	DIABETES RELATED CLINICAL FACTORS		
X40	Hemoglobin A1c	Scalar	EHR query, chart review or patient contact
X41	T1DM or T2DM duration	Scalar	Chart review or patient contact
X42	Number of DKA admissions in the previous year	Integer	Chart review or patient contact
X43	Using a blood glucose meter, continuous glucose meter, or unknown over the prior 14 days	Categorical	Chart review or patient contact
X44	Using an insulin pump, multiple daily injections, split-mixed, no insulin regimen, or unknown, over the prior 14 days	Categorical	Chart review or patient contact
X45	Has had an established relationship with an endocrinologist within the past year	Boolean	Chart review or patient contact
X46	Any known nephropathy‡	Boolean	EHR query, chart review, or patient contact
X47	Any known retinopathy◇	Boolean	EHR query, chart review, or patient contact
X48	Any known neuropathy§	Boolean	EHR query, chart review, or patient contact
	COVID-19-RELATED STRESSORS		
X49	Degree routine was altered❖	Ordinal	Patient contact
X50	Effect on ability to get diabetes supplies❖	Ordinal	Patient contact
X51	Degree of stress from COVID-19❖	Ordinal	Patient contact

* A Boolean variable has only two possible values: true or false

** The EHR query retrieves outcomes directly out of the Epic EHR via the Clarity data warehouse

† Defined as most recent HbA1c in the past 12 months from the time of COVID-19 test

‡ Defined as "diabetic nephropathy" in patient problem list, OR patient report of "diabetic kidney disease = true" on patient contact

◇ Defined as "diabetic retinopathy" in patient problem list, description of retinopathy on chart review OR "diabetic eye

disease" on patient contact