

Disclaimer

The FDA chose a specific outcome algorithm that met its need for a given medical product-outcome assessment. The use of a specific outcome algorithm in a Sentinel assessment should not be interpreted as an endorsement from FDA to use the algorithm for all safety assessments. Investigators should always consider the objective, study design, analytic approach, and data source of a given medical product safety assessment when choosing the outcome algorithm. The suitability of an outcome algorithm may change when applied to different scenarios. For additional information, please refer to the

<u>Best Practices for Conducting and Reporting Pharmacoepidemiologic Safety Studies Using Electronic Healthcare Data</u> guidance document provided by the FDA.



Overview

Title	Critical COVID-19 Algorithm Defined in "Racial Differences in COVID-19 Outcomes (2020-2021)"
Request ID	cder_mpl2p_wp033
Description	This report lists Current Procedural Terminology, Fourth Edition (CPT-4), Current Procedural Terminology, Second Edition (CPT-2), Current Procedural Terminology, Third Edition (CPT-3), Healthcare Common Procedure Coding System, Level II (HCPCS), International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM), International Classification of Diseases, Tenth Revision, Procedural Coding System (ICD-10-PCS), and Revenue (RE) Codes and algorithms used to define Critical COVID-19 in this request. For additional information about the algorithm and how it was defined relative to the cohort and exposures of interest in the inferential analysis, see the analysis page here: https://www.sentinelinitiative.org/assessments/drugs/individual-drug-queries/comparison-race-and-ethnicity-covid-19-testing
Outcome	Critical COVID-19
Algorithm to Define Outcome	Critical COVID-19 outcomes were defined using CPT-4, CPT-2, CPT-3, HCPCS, ICD-10-CM, ICD-10-PCS, and RE procedure and diagnosis codes that occurred in the inpatient care setting in the principal diagnosis position. An outcome of interest was included if the individual had no evidence of the outcome in any care setting in the six months (183 days) prior to the outcome of interest.
Query Period	April 1, 2020 - March 31, 2021
Request Send Date	July 11, 2022



Glossary

Care Setting - type of medical encounter or facility where the exposure, event, or condition code was recorded. Possible care settings include: Inpatient Hospital Stay (IP), Non-Acute Institutional Stay (IS), Emergency Department (ED), Ambulatory Visit (AV), and Other Ambulatory Visit (OA). For laboratory results, possible care settings include: Emergency department (E), Home (H), Inpatient (I). Outpatient (O). or Unknown or missing (U)

Outcome - outcome of interest (either primary or secondary)

Principal Diagnosis (PDX) - diagnosis or condition established to be chiefly responsible for admission of the patient to the hospital. 'P' = principal diagnosis, 'S' = secondary diagnosis, 'X' = unspecified diagnosis, '.' = blank. Along with the Care Setting values, forms the Caresetting/PDX parameter.

Query Period - period in which the modular program looks for exposures and outcomes of interest **Request Send Date** - date the request was sent to Sentinel Data Partners



U07.1 COVID-19, virus identified [code effective April 1, 2020] Diagnosis Intubation and Mechanical Ventilation O9HN7BZ Insertion of Airway into Nasopharynx, Via Natural or Artificial Opening Procedure O9HN8BZ Insertion of Endotracheal Airway into Trachea, Percutaneous Approach Procedure OBH13EZ Insertion of Endotracheal Airway into Trachea, Via Natural or Artificial Opening Procedure OBH17EZ Insertion of Endotracheal Airway into Trachea, Via Natural or Artificial Opening Procedure OBH18EZ Insertion of Endotracheal Airway into Trachea, Via Natural or Artificial Opening Procedure Endoscopic OCHY7BZ Insertion of Airway into Mouth and Throat, Via Natural or Artificial Opening Procedure OCHY8BZ Insertion of Airway into Mouth and Throat, Via Natural or Artificial Opening Procedure Endoscopic ODH57BZ Insertion of Airway into Esophagus, Via Natural or Artificial Opening Procedure ODH58BZ Insertion of Airway into Esophagus, Via Natural or Artificial Opening Procedure OWHQ73Z Insertion of Infusion Device into Respiratory Tract, Via Natural or Artificial Opening Procedure OWHQ77Z Insertion of Other Device into Respiratory Tract, Via Natural or Artificial Opening Procedure
Insertion and Mechanical Ventilation
O9HN7BZ Insertion of Airway into Nasopharynx, Via Natural or Artificial Opening Procedure O9HN8BZ Insertion of Airway into Nasopharynx, Via Natural or Artificial Opening Endoscopic Procedure OBH13EZ Insertion of Endotracheal Airway into Trachea, Percutaneous Approach Procedure OBH17EZ Insertion of Endotracheal Airway into Trachea, Via Natural or Artificial Opening Procedure OBH18EZ Insertion of Endotracheal Airway into Trachea, Via Natural or Artificial Opening Procedure Endoscopic OCHY7BZ Insertion of Airway into Mouth and Throat, Via Natural or Artificial Opening Procedure OCHY8BZ Insertion of Airway into Mouth and Throat, Via Natural or Artificial Opening Procedure Endoscopic ODH57BZ Insertion of Airway into Esophagus, Via Natural or Artificial Opening Procedure ODH58BZ Insertion of Airway into Esophagus, Via Natural or Artificial Opening Endoscopic OWHQ73Z Insertion of Infusion Device into Respiratory Tract, Via Natural or Artificial Opening Procedure
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0WHQ7YZ Insertion of Other Device into Respiratory Tract, Via Natural or Artificial Opening Procedure
own Q712 Instition of other bevice into respiratory fract, via ratural of Artificial opening
31500 Intubation, endotracheal, emergency procedure Procedure
4168F Patient receiving care in the intensive care unit (ICU) and receiving mechanical Procedure
ventilation, 24 hours or less (CRIT)
5A09357 Assistance with Respiratory Ventilation, Less than 24 Consecutive Hours, Continuous Procedure
Positive Airway Pressure
5A09457 Assistance with Respiratory Ventilation, 24-96 Consecutive Hours, Continuous Positive Procedure
Airway Pressure
5A09557 Assistance with Respiratory Ventilation, Greater than 96 Consecutive Hours, Procedure
Continuous Positive Airway Pressure
5A1935Z Respiratory Ventilation, Less than 24 Consecutive Hours Procedure
5A1945Z Respiratory Ventilation, 24-96 Consecutive Hours Procedure 5A1955Z Respiratory Ventilation. Greater than 96 Consecutive Hours Procedure
91000 Esophageal intubation and collection of washings for cytology, including preparation Procedure of specimens (separate procedure)
94002 Ventilation assist and management, initiation of pressure or volume preset ventilators Procedure
for assisted or controlled breathing; hospital inpatient/observation, initial day
for assisted or controlled breathing, hospital inpatient/observation, initial day
94003 Ventilation assist and management, initiation of pressure or volume preset ventilators Procedure
for assisted or controlled breathing; hospital inpatient/observation, each subsequent
day
94004 Ventilation assist and management, initiation of pressure or volume preset ventilators Procedure
for assisted or controlled breathing; nursing facility, per day
94656 Ventilation assist and management, initiation of pressure or volume preset ventilators Procedure
for assisted or controlled breathing; first day
94657 Ventilation assist and management, initiation of pressure or volume preset ventilators Procedure
for assisted or controlled breathing; subsequent days
94662 Continuous negative pressure ventilation (CNP), initiation and management Procedure



Code	Description	Code Category
A0396	ALS specialized service disposable supplies; esophageal intubation	Procedure
A4483	Moisture exchanger, disposable, for use with invasive mechanical ventilation	Procedure
E0481	Intrapulmonary percussive ventilation system and related accessories	Procedure
Intensive C	Care Unit (ICU) Admission	
0188T	Remote real-time interactive video-conferenced critical care, evaluation and	Procedure
	management of the critically ill or critically injured patient; first 30-74 minutes	
0189T	Remote real-time interactive video-conferenced critical care, evaluation and	Procedure
	management of the critically ill or critically injured patient; each additional 30 minutes	
0581F	(List separately in addition to code for primary service) Patient transferred directly from anesthetizing location to critical care unit (Peri2)	Procedure
200	ICU general	Procedure
201	ICU surgical	Procedure
202	ICU medical	Procedure
203	ICU pediatric	Procedure
204	ICU psychiatric stay	Procedure
206	ICU intermediate	Procedure
207	ICU burn care	Procedure
208	ICU trauma	Procedure
209	ICU other	Procedure
210	CCU	Procedure
211	CCU myo infarc	Procedure
212	CCU pulmonary	Procedure
213	CCU transplant	Procedure
214	CCU intermediate	Procedure
219	CCU other	Procedure
99160	Critical Care, Initial, Including The Diagnostic And Therapeutic Services And Direction Of Care Of The Critically III Or Multiply Injured Or Comatose Patient, Requiring The Prolonged Presence Of The Physician; First Hour	Procedure
99162	Critical Care, Initial, Including The Diagnostic And Therapeutic Services And Direction Of Care Of The Critically III Or Multiply Injured Or Comatose Patient, Requiring The Prolonged Presence Of The Physician; Each Additional 30 Minutes	Procedure
99171	Critical Care, Subsequent Follow-up Visit; Brief Examination, Evaluation And/or Treatment For Same Illness	Procedure
99289	Critical care services delivered by a physician, face-to-face, during an interfacility transport of critically ill or critically injured pediatric patient, 24 months of age or less; first 30-74 minutes of hands on care during transport	Procedure
99290	Critical care services delivered by a physician, face-to-face, during an interfacility transport of critically ill or critically injured pediatric patient, 24 months of age or less; each additional 30 minutes (List separately in addition to code for primary service)	Procedure
99291	Critical care, evaluation and management of the critically ill or critically injured patient; first 30-74 minutes	Procedure



Code	Description	Code Category
99292	Critical care, evaluation and management of the critically ill or critically injured	Procedure
	patient; each additional 30 minutes (List separately in addition to code for primary service)	
99293	Initial inpatient pediatric critical care, per day, for the evaluation and management of	Procedure
	a critically ill infant or young child, 29 days through 24 months of age	
99294	Subsequent inpatient pediatric critical care, per day, for the evaluation and	Procedure
	management of a critically ill infant or young child, 29 days through 24 months of age	
99295	Initial inpatient neonatal critical care, per day, for the evaluation and management of	Procedure
00206	a critically ill neonate, 28 days of age or less	Dan en de en
99296	Subsequent inpatient neonatal critical care, per day, for the evaluation and management of a critically ill neonate, 28 days of age or less	Procedure
99466	Critical care face-to-face services, during an interfacility transport of critically ill or	Procedure
	critically injured pediatric patient, 24 months of age or younger; first 30-74 minutes of hands-on care during transport	
99467	Critical care face-to-face services, during an interfacility transport of critically ill or	Procedure
	critically injured pediatric patient, 24 months of age or younger; each additional 30	
	minutes (List separately in addition to code for primary service)	
99468	Initial inpatient neonatal critical care, per day, for the evaluation and management of	Procedure
	a critically ill neonate, 28 days of age or younger	
99469	Subsequent inpatient neonatal critical care, per day, for the evaluation and management of a critically ill neonate, 28 days of age or younger	Procedure
99471	Initial inpatient pediatric critical care, per day, for the evaluation and management of	Procedure
	a critically ill infant or young child, 29 days through 24 months of age	
99472	Subsequent inpatient pediatric critical care, per day, for the evaluation and	Procedure
	management of a critically ill infant or young child, 29 days through 24 months of age	
99475	Initial inpatient pediatric critical care, per day, for the evaluation and management of	Procedure
00476	a critically ill infant or young child, 2 through 5 years of age	Dungandung
99476	Subsequent inpatient pediatric critical care, per day, for the evaluation and management of a critically ill infant or young child, 2 through 5 years of age	Procedure
99477	Initial hospital care, per day, for the evaluation and management of the neonate, 28	Procedure
	days of age or younger, who requires intensive observation, frequent interventions,	
00470	and other intensive care services	
99478	Subsequent intensive care, per day, for the evaluation and management of the	Procedure
	recovering very low birth weight infant (present body weight less than 1500 grams)	
99479	Subsequent intensive care, per day, for the evaluation and management of the	Procedure
	recovering low birth weight infant (present body weight of 1500-2500 grams)	
99480	Subsequent intensive care, per day, for the evaluation and management of the	Procedure
	recovering infant (present body weight of 2501-5000 grams)	



Code	Description	Code Category
99485	Supervision by a control physician of interfacility transport care of the critically ill or critically injured pediatric patient, 24 months of age or younger, includes two-way communication with transport team before transport, at the referring facility and during the transport, including data interpretation and report; first 30 minutes	Procedure
99486	Supervision by a control physician of interfacility transport care of the critically ill or critically injured pediatric patient, 24 months of age or younger, includes two-way communication with transport team before transport, at the referring facility and during the transport, including data interpretation and report; each additional 30 minutes (List separately in addition to code for primary procedure)	Procedure
G0240	Critical care service delivered by a physician, face to face; during interfacility transport of a critically ill or critically injured patient; first 30-74 minutes of active transport	Procedure
G0390 G0508	Trauma response team associated with hospital critical care service Telehealth consultation, critical care, initial, physicians typically spend 60 minutes communicating with the patient and providers via telehealth	Procedure Procedure
G0509	Telehealth consultation, critical care, subsequent, physicians typically spend 50 minutes communicating with the patient and providers via telehealth	Procedure
Extracorpo	real Membrane Oxygenation (ECMO)	
33946	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS)	Procedure
33947	provided by physician; initiation, veno-venous Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; initiation, veno-arterial	Procedure
33948	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; daily management, each day, veno-venous	Procedure
33949	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; daily management, each day, veno-arterial	Procedure
33951	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; insertion of peripheral (arterial and/or venous) cannula(e), percutaneous, birth through 5 years of age (includes fluoroscopic guidance, when performed)	Procedure
33952	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; insertion of peripheral (arterial and/or venous) cannula(e), percutaneous, 6 years and older (includes fluoroscopic guidance, when performed)	Procedure
33953	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; insertion of peripheral (arterial and/or venous) cannula(e),	Procedure
33954	open. birth through 5 years of age Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; insertion of peripheral (arterial and/or venous) cannula(e),	Procedure
33955	open, 6 years and older Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; insertion of central cannula(e) by sternotomy or thoracotomy, birth through 5 years of age	Procedure



Code	Description	Code Category
33956	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; insertion of central cannula(e) by sternotomy or thoracotomy,	Procedure
33957	6 years and older Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; reposition peripheral (arterial and/or venous) cannula(e), percutaneous, birth through 5 years of age (includes fluoroscopic guidance, when	Procedure
33958	performed) Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; reposition peripheral (arterial and/or venous) cannula(e), percutaneous, 6 years and older (includes fluoroscopic guidance, when performed)	Procedure
33959	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; reposition peripheral (arterial and/or venous) cannula(e), open, birth through 5 years of age (includes fluoroscopic guidance, when performed)	Procedure
33962	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; reposition peripheral (arterial and/or venous) cannula(e), open, 6 years and older (includes fluoroscopic guidance, when performed)	Procedure
33963	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; reposition of central cannula(e) by sternotomy or thoracotomy, birth through 5 years of age (includes fluoroscopic guidance, when performed)	Procedure
33964	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; reposition central cannula(e) by sternotomy or thoracotomy, 6 years and older (includes fluoroscopic guidance, when performed)	Procedure
33965	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; removal of peripheral (arterial and/or venous) cannula(e), percutaneous, birth through 5 years of age	Procedure
33966	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; removal of peripheral (arterial and/or venous) cannula(e), percutaneous. 6 years and older	Procedure
33969	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; removal of peripheral (arterial and/or venous) cannula(e), open, birth through 5 years of age	Procedure
33984	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; removal of peripheral (arterial and/or venous) cannula(e), open, 6 years and older	Procedure
33985	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; removal of central cannula(e) by sternotomy or thoracotomy, birth through 5 years of age	Procedure
33986	Extracorporeal membrane oxygenation (ECMO)/extracorporeal life support (ECLS) provided by physician; removal of central cannula(e) by sternotomy or thoracotomy, 6 years and older	Procedure
33987	Arterial exposure with creation of graft conduit (eg, chimney graft) to facilitate arterial perfusion for ECMO/ECLS (List separately in addition to code for primary procedure)	Procedure



Code	Description	Code Category
33988	Insertion of left heart vent by thoracic incision (eg, sternotomy, thoracotomy) for	Procedure
	ECMO/ECLS , , , , , , , , , , , , , , , , , , ,	
33989	Removal of left heart vent by thoracic incision (eg, sternotomy, thoracotomy) for	Procedure
	ECMO/ECLS	
36822	Insertion of cannula(s) for prolonged extracorporeal circulation for cardiopulmonary	Procedure
	insufficiency (ECMO) (separate procedure)	
5A15223	Extracorporeal Membrane Oxygenation, Continuous	Procedure
5A1522F	Extracorporeal Oxygenation, Membrane, Central	Procedure
5A1522G	Extracorporeal Oxygenation, Membrane, Peripheral Veno-arterial	Procedure
5A1522H	Extracorporeal Oxygenation, Membrane, Peripheral Veno-venous	Procedure
5A15A2F	Extracorporeal Oxygenation, Membrane, Central, Intraoperative	Procedure
5A15A2G	Extracorporeal Oxygenation, Membrane, Peripheral Veno-arterial, Intraoperative	Procedure
5A15A2H	Extracorporeal Oxygenation, Membrane, Peripheral Veno-venous, Intraoperative	Procedure
Renal Repla	acement Therapy Diagnosis Codes	
N17.0	ACUTE RENAL FAILURE WITH TUBULAR NECROSIS	Diagnosis
N17.1	ACUTE KIDNEY FAILURE W/ ACUTE CORTICAL NECROSIS	Diagnosis
N17.2	ACUTE KIDNEY FAILURE WITH MEDULLARY NECROSIS	Diagnosis
N17.8	OTHER ACUTE KIDNEY FAILURE	Diagnosis
N17.9	ACUTE KIDNEY FAILURE UNSPECIFIED	Diagnosis
Z99.2	DEPENDENCE ON RENAL DIALYSIS	Diagnosis
	acement Therapy Procedure Codes	
4052F	Hemodialysis via functioning arteriovenous (AV) fistula (ESRD)	Procedure
4053F	Hemodialysis via functioning arteriovenous (AV) graft (ESRD)	Procedure
4054F	Hemodialysis via catheter (ESRD)	Procedure
90935	Hemodialysis procedure with single evaluation by a physician or other qualified health	Procedure
00037	care professional	
90937	Hemodialysis procedure requiring repeated evaluation(s) with or without substantial	Procedure
90941	revision of dialysis prescription Hemodialysis, For Acute Renal Failure And Or Intoxication,	Procedure
90941	Hemodialysis, For Acute Renal Failure And Or Intoxication,	Procedure
90942	Hemodialysis, For Acute Renal Failure And Or Intoxication,	Procedure
90943	Hemodialysis, For Acute Renal Failure And Or Intoxication,	Procedure
90944	Dialysis procedure other than hemodialysis (eg, peritoneal dialysis, hemofiltration, or	Procedure
30343		riocedure
	other continuous renal replacement therapies), with single evaluation by a physician	
90947	or other qualified health care professional Dialysis procedure other than hemodialysis (eg, peritoneal dialysis, hemofiltration, or	Procedure
30347	other continuous renal replacement therapies) requiring repeated evaluations by a	riocedure
	physician or other qualified health care professional, with or without substantial	
90976	revision of dialysis prescription	Procedure
90976	Peritoneal Dialysis For End-stage Renal Disease (esrd), Peritoneal Dialysis For End-stage Renal Disease (esrd),	Procedure
90977	Peritoneal Dialysis For End-stage Renal Disease (esrd), Peritoneal Dialysis For End-stage Renal Disease (esrd),	Procedure
90978	Peritoneal Dialysis For End-stage Renal Disease (esrd), Peritoneal Dialysis For End-stage Renal Disease (esrd),	Procedure
90979	Peritoneal Dialysis For End-stage Renal Disease (esrd), Peritoneal Dialysis For End-stage Renal Disease (esrd),	Procedure
90982	, , ,	Procedure
90983	Peritoneal Dialysis For End-stage Renal Disease (esrd), Peritoneal Dialysis For End-stage Renal Disease (esrd),	Procedure
JUJ04	rentoneal Dialysis For Litu-stage Relial Disease (estu),	FIOCEGUIE



Code	Description	Code Category
90985	Peritoneal Dialysis For End-stage Renal Disease (esrd),	Procedure
90996	Continuous Arteriovenous Hemofiltration (cavh) (per Day)	Procedure
90999	Unlisted dialysis procedure, inpatient or outpatient	Procedure
G0491	Dialysis procedure at a Medicare certified ESRD facility for acute kidney injury without ESRD	Procedure
G0492	Dialysis procedure with single evaluation by a physician or other qualified health care professional for acute kidney injury without ESRD	Procedure
G8075	ESRD patient with documented dialysis dose of URR greater than or equal to 65% (or Kt/ V greater than or equal to 1.2)	Procedure
G8076	ESRD patient with documented dialysis dose of URR less than 65% (or Kt/V less than 1.2)	Procedure
G8714	Hemodialysis treatment performed exactly 3 times per week > 90 days	Procedure
G8715	Hemodialysis treatment performed less than 3 times per week or greater than 3 times per week	Procedure
G8727	Patient receiving hemodialysis, peritoneal dialysis or kidney transplantation	Procedure



T-2), Current rnational Tenth lequest

Code Type

ICD-10-CM

ICD-10-PCS

CPT-4

CPT-2

ICD-10-PCS

ICD-10-PCS

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ICD-10-PCS

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