Kentucky; [6]Christiana Care Healthcare System, Hockessin, Delaware; [7]West Virginia University School of Medicine, Morgantown, West Virginia; [8]Maine Medical Center Research Institute, scarborough, Maine; [9]Nemours Children's Health System & University of Delaware, Wilmington, Delaware; [10]University of Mississippi Medical Center, JACKSON, Mississippi

Session: P-21. COVID-19 Research

Background. A major challenge to identifying effective treatments for COVID-19 has been the conflicting results offered by small, often underpowered clinical trials. The World Health Organization (WHO) Ordinal Scale (OS) has been used to measure clinical improvement among clinical trial participants and has the benefit of measuring effect across the spectrum of clinical illness. We modified the WHO OS to enable assessment of COVID-19 patient outcomes using electronic health record (EHR) data.

Methods. Employing the National COVID Cohort Collaborative (N3C) database of EHR data from 50 sites in the United States, we assessed patient outcomes, April 1,2020 to March 31, 2021, among those with a SARS-CoV-2 diagnosis, using the following modification of the WHO OS: 1=Outpatient, 3=Hospitalized, 5=Required Oxygen (any), 7=Mechanical Ventilation, 9=Organ Support (pressors; ECMO), 11=Death. OS is defined over 4 weeks beginning at first diagnosis and recalculated each week using the patient's maximum OS value in the corresponding 7-day period. Modified OS distributions were compared across time using a Pearson Chi-Squared test.

Results. The study sample included 1,446,831 patients, 54.7% women, 14.7% Black, 14.6% Hispanic/Latinx. Pearson Chi-Sq P< 0.0001 was obtained comparing the distribution of 2nd Quarter 2020 OS with the distribution of later time points for Week 4.

Table 1. OS at week 1 and 4 by quarter

	2nd Quarter 2020		3rd Quarter 2020		4th Quarter 2020		1st Quarter 2021	
Modified OS	**Week 1 N (%)**	**Week 4 N (%)**	**Week 1 N (%)**	**Week 4 N (%)**	**Week 1 N (%)**	**Week 4 N (%)**	**Week 1 N (%)**	**Week 4 N (%)**
1 Outpatient	179,953 (83.31)	203,869 (94.38)	224,956 (90.72)	241,740 (97.49)	595,935 (90.94)	637,383 (97.27)	291,602 (89.02)	318,033 (97.09)
3 Hospitalized	26,437 (12.24)	5,200 (2.41)	18,369 (7.41)	3,456 (1.39)	45,782 (6.99)	8,561 (1.31)	27,612 (8.43)	4,679 (1.43)
5 Oxygen	2,792 (1.29)	386 (0.18)	1,761 (0.71)	212 (0.09)	6,706 (1.02)	721 (0.11)	4,182 (1.28)	402 (0.12)
7 Mechanical Ventilation	4,032 (1.87)	784 (0.36)	1,878 (0.76)	355 (0.14)	4,109 (0.63)	953 (0.15)	2,428 (0.74)	435 (0.13)
9 Organ Support	265 (0.12)	129 (0.06)	239 (0.1)	51 (0.02)	319 (0.05)	105 (0.02)	286 (0.09)	54 (0.02)
11 Death	2,529 (1.17)	5,640 (2.61)	764 (0.31)	2,153 (0.87)	2,442 (0.37)	7,570 (1.16)	1,453 (0.44)	3,960 (1.21)
Total N	216,008	216,008	247,967	247,967	655,293	655,293	327,563	327,563

The study sample included 1,446,831 patients, 54.7% women, 14.7% Black, 14.6% Hispanic/Latinx. Pearson Chi-Sq P< 0.0001 was obtained comparing the distribution of 2nd Quarter 2020 OS with the distribution of later time points for Week 4.

Conclusion. All Week 4 OS distributions significantly improved from the initial period (April-June 2020) compared with subsequent months, suggesting improved management. Further work is needed to determine which elements of care are driving the improved outcomes. Time series analyses must be included when assessing impact of therapeutic modalities across the COVID pandemic time frame.

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448. COVID-19 Acute Care at Home: A Substitution for Hospitalization in Patients with Mild Symptoms

Joel A. Kammeyer, MD, MPH[1]; Brian Perkins, MD[2]; Sara Seegert, RN, MSN[2]; Dave E. Caris, RN, MPH[2]; Caitlyn M. Hollingshead, MD[1]; Evan D. Brochin, MD[3]; Benjamin H. Russell, n/a[3]; [1]University of Toledo College of Medicine and Life Sciences, Toledo, Ohio; [2]ProMedica-Toledo Hospital, Toledo, Ohio; [3]University of Toledo College of Medicine, Toledo, Ohio

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Background. Constraints on resources require healthcare systems to implement alternative and innovative means for delivering care. The COVID-19 pandemic amplified this issue throughout the world, leading to shortages of ventilators, hospital beds, and healthcare personnel. We report the results of an Acute Care at Home Program (ACHP) response to COVID-19, providing in-home hospital-level care to patients with mild symptoms, preserving in-hospital beds for more serious illness.

Methods. Patients with COVID-19 were selected for ACHP after undergoing risk stratification for severe disease, including oxygen evaluation, time course of illness, and evaluation of comorbidities. Patients admitted to ACH met inpatient criteria, required oxygen supplementation of ≤4 liters, and received insurance approval. Services were provided consistent with best practice of inpatient care, including 24/7 provider availability via TeleMedicine, bedside care provided by paramedics and nurses, respiratory therapy, radiology and laboratory services, pulse oximetry monitoring, and administration of medications. Protocols existed for patient transfer to hospital in the event of clinical deterioration.

Results. Our initial cohort included 62 patients enrolled October 1, 2020 – May 31, 2021. Of these, 57 patients were discharged successfully from ACHP. Patients presented with initial oxygen requirements of 0-4 liters. Average length-of-stay in ACHP was 5.4 days. Five patients required hospitalization after enrollment in ACHP; one subsequently expired, two were discharged home, one returned to ACHP after inpatient hospitalization, and one remains hospitalized. One additional patient that was successfully discharged home from ACHP was later readmitted and expired in a subsequent hospitalization. The patients that expired had significant immunocompromising conditions that may have contributed to their outcomes.

Conclusion. ACHP can provide care equivalent to hospitalization for select COVID-19 patients. Immunocompromised hosts with COVID-19 may represent a subset of patients in which in-house hospitalization must be carefully considered, even with mild oxygen requirements. Health systems should consider ACHP as a substitution for hospitalization for COVID-19 patients with mild symptoms.

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449. Performance of the Brighton Case Definition for Multisystem Inflammatory Syndrome in Children (MIS-C) Among a Large Single Center Cohort

Jessica Nguyen, MD[1]; Isabella Osuna, BS[2]; Eyal Muscal, MD[1]; Kristen Sexson, MD PhD MPH[1]; Marietta DeGuzman, MD[1]; Flor M. Munoz, MD[3]; Tiphanie Vogel, MD PhD[1]; [1]Baylor COM, Houston, Texas; [2]Rice University, Houston, Texas; [3]Baylor College of Medicine, Houston, Texas

Session: P-21. COVID-19 Research

Background. Multisystem Inflammatory Syndrome in Children (MIS-C) is a rare, life-threatening, hyperinflammatory condition presumed to follow SARS-CoV-2 infection. Whether MIS-C can also follow SARS-CoV-2 vaccination is not clear, making MIS-C an adverse event of special interest following immunization. Monitoring for post-vaccine MIS-C is complicated by the clinical overlap of MIS-C with numerous other inflammatory conditions including Kawasaki Disease, toxic shock syndrome, and viral myocarditis. A case definition for MIS-C was recently created with the Brighton Collaboration (BC). We aimed to determine the performance of the BC MIS-C case definition among a large, single-center MIS-C cohort.

Methods. Retrospective review was performed for the first 100 MIS-C cases at our institution (May 2020-February 2021). All cases met the Centers for Disease Control and Prevention (CDC) case definition. Data on age, presentation, laboratory results and cardiac studies were collected and used to determine cases that fulfilled the BC case definition for MIS-C (see figure).

Case Definition: Definite Case

Reference: *Vaccine* 2021 39(22):3037-3049

Results. Of 100 children (age < 21 years) diagnosed with MIS-C using the CDC case definition, 93 patients also fulfilled the BC definition. All 100 patients had elevated laboratory markers of inflammation and positive SARS-CoV-2 antibodies. However, 1 patient was excluded for significant respiratory symptoms (pulmonary hemorrhage), 5 were excluded due to only 1 clinical feature, and an additional patient was excluded for having none of the measures of disease activity. Among the 93 patients fulfilling the revised case definition, 88 (95%) met criteria for a definite case. Five of the 93 patients (5%) were considered probable cases, 1 reported only 1 day of fever and 4 had only 1 measure of disease activity.

Conclusion. The original case definitions for MIS-C were created rapidly following the first emerging reports of this hyperinflammatory state. Knowledge of the varied clinical presentations of this disorder has grown substantially. Modification of the case definition to include features truly representative of MIS-C will allow for more precise diagnosis in the face of conditions which mimic MIS-C, and for accurate and reliable monitoring for adverse events following immunization.

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450. Type I Interferon Autoantibodies Are Detected in Those with Critical COVID-19, Including a Young Female Patient

Debra Yee, B.S.[1]; Marana Tso, B.S.[1]; Elana Shaw, B.S.[2]; Lindsey B. Rosen, Ph.D.[2]; Emily Samuels, B.S.[1]; Paul Bastard, Ph.D.[3]; Jean-Laurent Casanova, M.D., Ph.D.[3]; Steven M. Holland, MD[4]; Helen C. Su, MD, PhD[5]; Stephanie A. Richard, PhD[6]; Katrin Mende, PhD[7]; Tahaniyat Lalani, MBBS[8]; David A. Lindholm, MD[9]; David A. Lindholm, MD[9]; Mark P. Simons, Ph.D., MSPH[1]; David Tribble, M.D., DrPH[1]; Allison Malloy, MD[10]; Eric Laing, PhD[1]; Brian Agan, MD[11]; Simon Pollett, MBBS[1]; Timothy Burgess, MD, MPH[12]; Andrew L. Snow, Ph.D.[1]; [1]Uniformed Services University of the Health Sciences, Bethesda, Maryland; [2]National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health, Bethesda, Maryland; [3]The Rockefeller University, New York, New York; [4]Laboratory of Clinical Immunology and Microbiology, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland; [5]Immune Deficiency Genetics Section, Laboratory of Clinical Immunology and Microbiology, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland; [6]IDCRP, Rockville, Maryland; [71]Infectious Disease Clinical Research Program, Department of Preventive Medicine and Biostatistics, Uniformed Services University of the Health Sciences and Brooke Army Medical Center, JBSA