Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company’s public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
moderate disease, with 29% having severe disease and 14% have critical diseases. The overall mortality was 15%. The overall hospital median length of stay (LOS) was 5 days (IQR 3-11). Patients with higher BMI were significantly more likely to require mechanical ventilation and require pressor support (P<0.0001, 95% CI 0.0013 to 0.0021) [Figure 1]. Patients with higher BMI were also significantly more likely to die (P<0.001, OR 1.031, 95% CI 1.03-1.04). This association held true even when analyzed in a multivariable regression model controlled for age and sex (p=0.0131). The hospital length of stay was inversely correlated to the BMI. Bivariate analysis demonstrated that the average length-of-stay could be approximated as 9.1 days -0.03*BMI. Presumably, this is because at higher BMIs there is higher mortality resulting in shorter LOS.

Conclusion: Patients with elevated BMI were significantly more likely to have highest disease severity, higher mortality and shorter length-of-stay in this large national cohort of patients hospitalized for COVID-19.

Results: We included 824 visits with 51% male, a mean age was 67.1 (SD 17.0) and 153 (18.6%) had AMS. There were 152 deaths for an overall mortality rate of 16.1%. Patients with AMS had in-hospital mortality of 38.2% (95% CI 30.4%-46.4%), compared to 11.1% (8.8%-13.7%) for patients without AMS (P<0.0001). After adjusting for potential confounders, visits by patients with AMS during their stay at the ED had 3.1 (95% CI, 2.1-5.9) times the odds of death compared to those without AMS.

Conclusion: Among patients with COVID-19, AMS in the ED was associated with three-fold increase in mortality compared to patients without AMS.

Comorbid Conditions With COVID-19 in Hospitalized Pediatric Patients: A Multi-Center Analysis

Heyming T, Spiegelman L, Marano R, Taraman S, Feaster W, Keskinocak P, Ewerhemuepha L/CHOC Children’s, Orange, California, University of California Irvine California, CHOC Children’s, CHOC Children’s, Georgia Institute of Technology, Atlanta, Georgia, CHOC Children’s

Background: Although the physical morbidity and mortality attributable to SARS-CoV-2 has predominantly affected adults, children remain at risk for serious complications. There has been substantial research regarding comorbid conditions, such as obesity and diabetes, and COVID-19 outcomes in adults, yet much is still unknown in the pediatric population.

Study Objective: This study sought to examine comorbid conditions as risk factors associated with severe outcomes among pediatric COVID-19 patients.

Methods: In this cross-sectional retrospective study we used data mining approaches on the Cerner multicenter dataset to retrieve an extensive list of comorbidities including pre-existing and concurrent conditions in hospitalized patients with SARS-CoV-2 (> 29 days and <21 years, hospitalized 3/1-6/30/20). Complications were defined as death or mechanical ventilator use. A nested mixed effects model was built on the most common comorbid conditions. All variables were assessed using the generalized variance inflation factor. Corresponding two-way statistical interactions with age were considered while controlling for patient demographics and payer type; the final model was selected using backward elimination procedures.

Results: There were 2480 encounters from 2320 patients; 17.1% required a ventilator and 0.85% died (19/21 patients who died required mechanical ventilation). 25.8% of patients were < 2, 16% were 6-11, and 29.6% were 12-18. Male patients comprised 52.1%, and 48.3% were White/Caucasian, 21.8% were Hispanic, and 15.1% were African American/Black. Males were at 36% increased odds of complication (IOC), and Black/African American patients were found to be at 63% IOC. Patients with bacterial pneumonia and severe sepsis had 330% and 314% IOC respectively. Heart failure, 738% IOC, coagulation defect, 722% IOC, and patent ductus arteriosus (PDA), 693% IOC, were among the highest risk factors in this study. Obese patients had 246% IOC. Interestingly, the increased risk of complications in patients with epilepsy and acute kidney failure was age dependent. Patients with epilepsy > 5 years were at higher odds of complication and those odds increased with age, whereas younger patients with acute kidney failure were more at risk. The highest risk factor for complication was found to be ileus. OR=11.9. Of 40 patients with ileus, 3 died and 26 required mechanical ventilation.

Conclusions: Risk factors for complications of SARS-CoV-2 infection encompass a variety of conditions including obesity, epilepsy, PDA, bacterial pneumonia, sepsis, acute kidney failure, and ileus. Further studies are needed to explore these associations which may help elucidate why certain children suffer increased complications as well as inform treatment decisions.

External Validation of the Quick COVID-19 Severity Index: A Prognostic Tool for Early Clinical Decompensation

Ngi K, Maher PP, Leibnier E, Loo G, Legomne E/Icahn School of Medicine at Mount Sinai, New York, New York, Icahn School of Medicine at Mount Sinai, New York, New York, Icahn School of Medicine at Mount Sinai, New York, New York, Icahn School of Medicine at Mount Sinai, New York, New York, Icahn School of Medicine at Mount Sinai, New York, New York

Study Objective: To externally validate a risk-stratification tool—the Quick COVID-19 Severity Index (qCSI)—developed by Haimovich et al. to predict 24-hour respiratory decompensation in admitted patients with COVID-19.
Methods: This was a retrospective observational cohort study of COVID-19 patients admitted from the emergency department between Feb 29, 2020 to Feb 1, 2021. The health care system is composed of a mix of 2 community and 4 academics EDs in a major metropolitan area. Patient demographics, vital signs, laboratory results were extracted from our institutional COVID-19 Data Warehouse. Following the convention of qCSI variables, respiratory rate (breaths/min), pulse oximetry (%), and oxygen flow rate (L/min) were used to calculate points between 0 to 12, with higher points associated with highly likely of respiratory decompensation within 24 hours.

Results: 35,696 COVID-19 patients were admitted via the emergency department during the study period. The mean qCSI was 1.73 (SD 1.82) for non-ICU admissions (n=34,667). The mean qCSI was 2.83 (SD 2.55) for ICU admission (n=1,049). As of the time of submission, ED treat and release patients, as well as decompensation results are pending.

Conclusions: In this validation study of qCSI using a large system cohort of COVID-19 patients, qCSI appears to correlate strongly with clinical triage for admission decision to regular floor vs. ICU level care. Further analysis is needed to identify 24-hour respiratory decompensation after regular floor admission.

16 Temporal Associations Between Decreasing Emergency Department and Increasing Emergency Telehealth Volumes During the COVID-19 Pandemic: A Time-Series Analysis From Two Academic Medical Centers

Reno E, Eutermoser M, Li B, Davis CD, Shy BD/University of Colorado

Study Objectives: During the initial periods of rising COVID-19 cases and critically ill patients in 2020, overall ED volumes fell substantially. Our goal was to compare the contrasting increase in emergency telehealth volume with the decreasing ED volumes to identify staffing strategies that can be used in future epidemics.

Methods: We performed interrupted time series analyses to compare the associations of COVID-19 surges on daily ED and telehealth volumes at Denver Health Medical Center (DHMC) in Denver, Colorado, and the University of Colorado Hospital (UCH) in Aurora, Colorado. Consecutive adults from January 1, 2019, though December 31, 2020 were included, with time periods corresponding to baseline volumes (January 1, 2019 to March 24, 2020), and first (March 25, 2020 to June 15, 2020), second (June 16, 2020 to September 12, 2020), and third (September 13, 2020 to December 31, 2020) COVID-19 surges according to Colorado epidemiological data. We performed pairwise comparisons between baseline versus each COVID-19 surge for ED and telehealth daily volumes, using linear regression to account for secularity and non-parametric statistics to compare median values.

Results: DHMC ED daily volumes differed between baseline (median, 346 [interquartile range {IQR}, 325-367]) and first (219 [196-237]; p<.0001), second (281 [264-298]; p<.0001), and third (284 [260-301]; p<.0001) COVID-19 surges. DHMC telehealth median daily volumes also differed between baseline (181 [156-199]), and first (257 [231-285]; p<.0001), second (227 [202-256]; p<.0001), and third (241 [208-274]; p<.0001) COVID-19 surges. Similarly, UCH ED median daily volumes differed between baseline (276 [257-292]), and first (207 [188-223]; p<.0001), second (243 [227-255]; p<.0001), and third (245 [225-264]; p<.0001) COVID-19 surges. Lastly, UCH telehealth median daily volumes also differed between baseline (9 [6-15]), and first (97 [65-141]; p<.0001), second (60 [51-69]; p<.0001), and third (74 [62-89]; p<.0001) COVID-19 surges (Figure).

Conclusions: ED volumes decreased and remained depressed through all 3 COVID-19 surges in Colorado, and in response, COVID-19 was associated with an unprecedented increase for emergency telehealth and virtual services. Patients adopted telehealth as an alternative to seek care while trying to stay protected from infection. Shifting providers in this manner, from physical ED to acute-care telehealth shifts, may allow EDs to meet dynamically changing patient volumes during future pandemics.

15 Long-Term Follow-Up of Emergency Department Patients Discharged With Moderate Hypoxia and COVID-Like Illness in New York City During Height of the COVID-19 Pandemic

Daniels B, Tanyoue R, Jacobowitz A, Bhandari M, Steel P, Sharma R/Weill Cornell Medicine, New York, New York, Weill Cornell Medicine, Weill Cornell Medicine, Weill Cornell Medicine, Weill Cornell Medicine, Weill Cornell Medicine

Study Objective: During the height of the COVID-19 pandemic in New York City (NYC), emergency departments (EDs) faced unprecedented numbers of patients seeking care for COVID-19-like illness (CLI). Testing for COVID-19 was not widespread, the most appropriate management and disposition of patients with respiratory disease was unknown and ED, ward and ICU beds were becoming scarce. We have reported previously on short-term (7-day) outcomes using a clinical pathway for discharging CLI patients with mild to moderate hypoxia based on exertional oxygen saturation (eSpO2) after one minute of walking in place. Eligible CLI patients with an eSpO2 of at least 90% were discharged with a pulse oximeter, oxygen concentrator if needed, and remote follow-up. We report long-term outcomes for CLI patients discharged using this pathway.

Methods: Between 07/2020 and 09/2020, follow-up phone calls were attempted for CLI patients with mild to moderate hypoxia discharged between 03/2020 and 05/2020 during the height of the COVID-19 pandemic at two NYC EDs. Patients were contacted by phone using a standardized script. Information on subsequent COVID testing, health care and outcomes was collected. Demographic and clinical data was obtained from the electronic health record (EHR). If patients could not be contacted after three attempts, review of the EHR for evidence of life (EOL) such as COVID testing, health care and outcomes was collected. Data was obtained from the electronic health record (EHR). If patients could not be contacted by phone, patients were considered lost to follow-up. We report long-term outcomes for CLI patients discharged using this pathway.

Results: 492 patients discharged with moderate CLI were included. The mean age was 51 [range: 17-92], 62% were male and 61% were discharged from the community ED site. The average duration of CLI symptoms was 7.1 days with non-specific influenza-like symptoms being the most common (80%) and few patients having a primary respiratory complaint (13%). The mean triage SpO2 was 95% [IQR, 93-97] and discharge eSpO2 was 94% [92-96]. A chest x-ray was performed in 350 patients; 70% had findings consistent with viral pneumonia. A pulse oximeter and/or oxygen concentrator was documented as given to 73% and 18%, respectively. We contacted 357/492 (69%) by phone and EOL was available for an additional 141 (28%) patients; 3% were considered LTF. The mean follow-up time was 85 days [95% CI: 81-89]. 228 patients reported COVID testing; 179 (80%) tested positive. At the time of follow-up, nine patients (1.8%, 95% CI: 0.9 -3.4) were deceased. 17% [14-21] had a subsequent ED visit, 11% [9-14] were admitted with 16 and 8 patients requiring ICU level care and intubation respectively.

Conclusions: Long-term follow-up of CLI patients discharged with mild to moderate hypoxia demonstrates low subsequent admission and mortality rates. This clinical pathway relying on exertional oxygen saturation after a one-minute walk test offers a simple method for identifying patients suitable for discharge with remote monitoring during pandemic conditions in resource-limited settings.