# 151 Analysis of Race and Sex Disparities in the Emergency Department

Schmeitzel JL, Litzenberger S, Stoltzfus J, Melanson S, Stankewicz H/St. Luke's University Hospital, Bethlehem, PA

Study Objectives: Race and sex disparities in health care have been previously documented in the literature. A contributing factor may be "unconscious bias" - the concept that patients may be treated differently due to social stereotypes a provider is unaware they are acting upon. This effect may be more pronounced in busy and stressful environments such as the emergency department. Socioeconomic status and other social determinants of health likely also contribute to disparities in care.

Our study objective was to describe patterns in emergency care surrounding race and sex demographics. Subjective measurements included patient satisfaction surveys rating provider empathy and quality of visit. Objective measurements included admission rates and length of stay (LOS).

Methods: A descriptive secondary analysis of prospective data collected at a tertiary academic level 1 trauma center emergency department was performed from July to August 2018. All comers were included. A non-physician research assistant asked the patient or family member to complete a survey rating physicians on courtesy, listening, concern for comfort, informed on care, treatment of pain, time waiting, and overall visit. Patient demographics, length of stay, and patient disposition were recorded.

Results: 204 patients responded overall. Median satisfaction scores in nearly all categories ranged from 4 (good) to 5 (very good). Median White LOS was 192 minutes vs non-white LOS of 185.5 minutes, Black LOS was 207 minutes. White discharge rate was 47.9% vs 75.6% non-White overall, Black discharge rate was 80%, and Hispanic discharge rate was 74.1%. Male discharge rate was 60.7% vs 58.3% female. Complete Median LOS and % admission rate by race and sex are reported in Table 1.

Conclusion: Patient satisfaction scores were comparable across both race and sex. Median LOS and discharge rate by sex was comparable. LOS for Black demographic patients was 15 minutes longer than White patients and 21.5 minutes longer than non-White patients. This may be meaningful particularly given a high discharge rate of 80% for Black patients. Non-White patients overall had a much higher discharge rate from the emergency department compared to White patients. Possible factors for this large difference include lack of insurance, access to primary care, health literacy, and socioeconomic status. Another concerning possibility is that unconscious bias may result in providers downplaying the severity of patients' symptoms due to racial differences. This study is limited by population demographics specific to this single center. Further investigation is warranted to differentiate the cause of admission rate variance, and how this may impact patient outcomes.

**Table 1.**

| | Length of Stay (median, range) | Disposition (n, %) |
|---|---|---|
| White (n = 121) | 192 (32 - 646) | Discharged: 58 (47.9%) Admit Floor: 61 (50.4%) Admit ICU: 2 (1.7%) |
| Black (n = 25) | 207 (0 - 1053) | Discharged: 20 (80%) Admit Floor: 4 (16%) Admit ICU: 1 (4%) |
| Hispanic (n = 54) | 183 (3 - 582) | Discharged: 40 (74.1%) Admit Floor: 13 (24.1%) Admit ICU: 1 (1.9%) |
| Asian (n = 1) | 88 | Discharged: 1 (100%) |
| Other (n = 2) | 223.5 (174 - 273) | Discharged: 1 (50%) Admit Floor: 1 (50%) |
| Non-White (all) (n = 82) | 185.5 (0 - 1053) | Discharged: 62 (75.6%) Admit Floor: 18 (22%) Admit ICU: 2 (2.4%) |
| Male (n = 89) | 189 (31 - 1053) | Discharged: 54 (60.7%) Admit Floor: 34.8% Admit ICU: 2 (2.2%) Transferred: 2 (2.2%) |
| Female (n = 115) | 193 (0 - 582) | Discharged: 67 (58.3%) Admit Floor: 48 (41.7%) |

# 152 Correlation of Point of Care Lung Ultrasound and CT Scan Findings in Patients with COVID-19

Shokoohi H, Chahardoli M, Sabbaghan Kermani S, Loesche M, Schulwof S, Abdollahzade Manqoutaei S, Tofighi R, Yadegari S, Duggan N/Massachusetts General Hospital, Boston, MA; Iran University of Medical Sciences, Tehran, Islamic Republic of Iran

Study Objectives: Chest CT scan (CT) is often considered the gold-standard imaging modality to evaluate pulmonary pathology, and thus is used to assess patients with COVID-19. While CT offers higher resolution images, Point-of-care ultrasound (POCUS) has the advantages of being rapid, low cost, low radiation exposure, and offers the ability for monitoring real-time disease progression. As such, POCUS has also been used to assess patients with COVID-19, and characteristic POCUS findings of COVID-19 are described. In the present study, we compare chest CT to lung ultrasound findings in patients with COVID-19 and examine consistency in pathological findings between the two imaging modalities.

Methods: 125 patients presenting to an urban emergency department in Tehran, Iran with symptoms concerning for COVID-19 were prospectively enrolled. Participants underwent lung POCUS following a 12-zone protocol assessing each zone for pleural line irregularities, alveolar interstitial syndrome (eg, B-lines), and presence of consolidations including subpleural consolidations (SCs). Patients also received chest CT read by a radiologist evaluating for ground glass opacity, crazy paving patterns, or consolidations. For POCUS and CT, each zone was scored using a 4-point measure, then aggregated total lung involvement scores were calculated for each patient and imaging modality. Descriptive statistics were performed to asses consistently between POCUS and CT findings.

Results: POCUS findings overall corresponded well with abnormalities seen on CT, without a significant difference in lung involvement scores between the modalities. On CT, COVID-19 patients showed greater incidence of crazy paving in the AI, PS, PI, AX, PLAPS, CS, and CI distributions (p adj= .00293, 0, .000600, .000533, .00272, .0004) and effusion in CI (p adj= .0216), and on POCUS patients had increased B-lines in the AS, AX, and PLAPS distributions (p adj= .0086, .0012, .0024 respectively), increased pleural thickening in all lung regions (AS, AI, PS, PI, AX, PLAPS; p adj= .0182, .0014, .0375, .0328, .0003, 0), and SCs in AS, AX, and PLAPS (p adj= .0312, .0398, .0324). Both CT and POCUS demonstrated more right-sided findings as a whole, though sidedness of findings was not statistically significant. Both CT and POCUS demonstrated differences in finding densities between lung regions (for CT- ARDS: p adj= 1.00e+ 0; consolidation: p adj= 1.04e- 1; Crazy Paving: p adj= 1.92e-16; effusion: p adj= 8 4.94e- 8; GGO: p adj= 8.73e- 2; interstitial: p ajd= 68e- 6; POCUS- atelectasis: p adj= 1.92e- 7; B-lines: p adj= 6.77e -7; consolidation: p adj= 0.00119; effusion: p adj= 7.20e- 9; pleural thickening: p adj= 7.20e -9; SCs: p adj= 4.39e -5) with the highest concentration of positive findings in the PLAPS region on both modalities.



Number of Positive Findings per Region
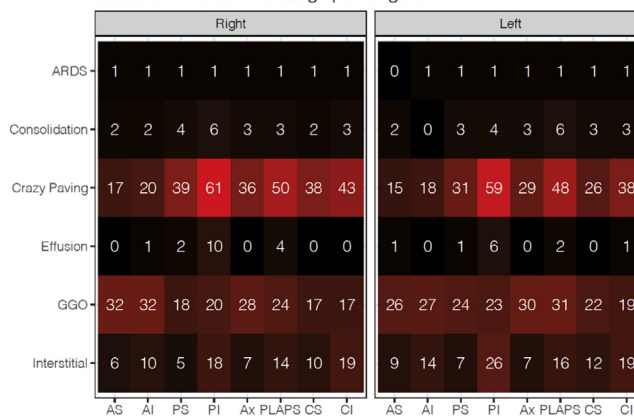
Conclusion: Given comparable findings in the presence and distribution of abnormalities between POCUS and chest CT, POCUS may be a viable alternative to chest CT for diagnosis and risk stratification in patients with suspected COVID-19.

## 153 Do Hydroxychloroquine, Disease-Modifying Antirheumatic Agents or Steroids, Serve to Prevent COVID-19 Infection?

Keyes D, Haidous A, Lake C, Stipek K, McHugh L/St Joseph Mercy Health System, Ann Arbor, MI; University of Michigan-Dearborn, Dearborn, MI; St Mary Mercy Hospital, Livonia, MI

Study Objectives: Emergency physicians and other specialists are in critical need of medicinal agents to prevent SARS-COVID-2 (COVID-19) infection. International attention has been given to hydroxychloroquine (HCQ), in particular, and other antirheumatologic agents for this purpose. Several very commonly used medications work to block the cascade of chemotactic influences and macrophage activation, but definitive prevention of ARDS is inconclusive. Agents proposed include TNF blocking agents, leukotriene antagonists and steroids. It may be possible to block infection, pneumonia and ARDS with prior use of these agents. The objective of this study is to compare attack rates of COVID-19 among patients who were already taking common rheumatologic agents prior to the COVID epidemic in the study region and those not taking these agents.

Methods: A retrospective cohort design Data was used across multiple hospitals in MI. 990 patients with lupus (SLE) or rheumatoid arthritis (RA) and a COVID-19 test (whether negative or positive) were included. Agents chosen for analysis included HCQ, infliximab, adalimumab, montelukast and steroids. Unadjusted differences between treatment groups with chi-square or Fisher Exact tests were used. Use of all agents other than HCQ and montelukast were combined as one group for comparative analysis. Adjusted treatment effects were estimated using logistic regression. Predictive covariates for the latter included demographics and Charlson comorbidities. Influenza testing was also evaluated.

Results: After dropping N = 30 patients with no data on pre-COVID prescriptions, a sample size of N = 960 patients with an existing diagnosis of rheumatoid arthritis (RA) or systemic lupus erythematosus (SLE) were analyzed. Of these patients, N = 214 patients had an active HCQ prescription at admission and N = 82 patients had a positive COVID-19 test result. None of the unadjusted or adjusted outcomes were statistically different between the "pretreatment" groups (on-agent or off-agent) for HCQ for other rheumatological agents tested as a group, or for steroids.

Conclusion: In a retrospective observational study, there was no evidence of benefit for the prophylactic use of hydroxychloroquine, several representative rheumatologic agents or steroids for the prevention of infection with COVID-19.

## 154 Virtual Telemedicine Training for Emergency Medicine Residents during the COVID-19 Pandemic

McNally K, Elahi N, Slome M, Ganti L, Lebowitz D, Macintosh T/UCF, Orlando, FL

Study Objectives: With the dawn of the COVID-19 pandemic and the need for enhanced social distancing measures, telemedicine has become an integral part of emergency medicine. Medical schools have started to integrate telemedicine training into their curricula, but there are few reports of telemedicine training in GME programs. The primary objective of this study was to examine current emergency medicine resident knowledge of telemedicine, expose residents to standardized telemedicine patients virtually, and analyze the effectiveness of telemedicine training on completing a successful encounter.

Methods: Seventeen emergency medicine residents first underwent a virtual standardized telemedicine encounter using the Zoom™ application without prior training in telemedicine. Standardized patients were queried on resident success during this untrained encounter using a survey with aspects of a successful encounter. The following session with sixteen of those 17 residents, involved a lecture by a telemedicine physician with years of experience on the fundamentals of a successful encounter, as well as pre-reading materials on the topic. After this intervention, sixteen residents underwent a repeat virtual encounter, with standardized patients responding to the same questions as the pre-training. Residents also underwent a post-survey on their experiences.

Results: Standardized patients evaluated 17 emergency residents before telemedicine training, and 16 of those 17 residents after telemedicine training with a

13-question survey focused on aspects of a successful telemedicine interview. Statistically significant differences were noted on aspects of the encounter related to telemedicine when analyzing pre- and post-training data and using a Z test for proportions: obtaining informed consent (0% vs. 61%, p = 0.00012), asking about privacy in the patient's environment (6% vs. 87%, p <0.00001), verifying name and/or date of birth (29% vs. 94%, p =0.00014). Aspects of the encounter that did not have statistically significant results on pre- and post-test surveys included: resident introducing themselves (94% vs. 100%, p =.31732), asking focused questions about medical condition (100% vs. 100% p = 1), closing the encounter by explaining care plan (94% vs. 94%, p = 1). Fourteen residents responded to a post-training survey with 92.8% of respondents stating that they "strongly agree" that the telemedicine training was helpful to their education. Only 28.6% of respondents stated that they "strongly agree" that they understood how to do a virtual physical exam.

Conclusion: Overall, emergency medicine residents had significant improvement on aspects of an encounter with a standardized patient that were unique to telemedicine after undergoing training from an expert in the field. Residents scored well both before and after training on aspects of the encounter not pertaining specifically to telemedicine, suggesting good clinical overlap between virtual and in-person environments. Residents uniformly felt the training was helpful to their education. Participants did feel less confident with the ability to do a virtual physical exam, which could possibly be ameliorated with more practice in this environment. Many EM residencies are undergoing virtual didactics and because of this, similar training could easily be utilized across the country. This training could prove to be essential in the future because of the global health crisis of the COVID-19 pandemic.

## 155 Using Point-of-Care Ultrasound to Predict Clinical Outcomes in Patients With COVID-19

Shokoohi H, Chahardoli M, Loesche MA, Sabbaghan Kermani S, Schulwolf S, Abdollahzade Manqoutaei S, Tofighi R, Yadegari S, Duggan N/Massachusetts General Hospital, Boston, MA; Iran University of Medical Sciences, Tehran, Islamic Republic of Iran

Study Objectives: Point-of-care ultrasound (POCUS) may be used as a valuable tool for risk stratification of patients with COVID-19 as its characteristic POCUS findings have recently been described. In the present study, we aim to define the prognostic value of cardiopulmonary POCUS in patients with COVID-19. Here, we correlate POCUS findings with patient-centered outcomes such as need for intubation, intensive care unit (ICU) admission, and mortality.

Methods: 125 patients presenting to an urban ED in Tehran, Iran with symptoms concerning for COVID-19 were prospectively enrolled between March 8 and April 4, 2020. Participants underwent pulmonary POCUS following a 12-zone PLUS-Co protocol, and cardiac POCUS using a standardized 4-view protocol. ED physicians performed scans and provided real-time scan interpretations, images were reassessed by a second, blinded reviewer for quality control and inter-rater reliability. For pulmonary POCUS, each lung zone was individually assessed for pleural line irregularities, alveolar interstitial syndrome (eg, B-lines), and subpleural consolidations (SCs), then scored using a 4-point measure. Zone scores were aggregated to generate a cumulative lung involvement score per patient. Cardiac POCUS was assessed for ejection fraction, right ventricular function, pericardial effusion and inferior vena cava collapsibility. Clinical course and outcome variables were collected via retrospective chart review. Descriptive statistics were performed to evaluate the distribution and frequency of positive POCUS findings and their correlation with patient outcomes including ICU admission, mechanical ventilation, inpatient length of stay, and mortality.

Results: COVID-19-positive patients demonstrated higher bilateral lung involvement scores than COVID-19-negative patients overall (p<.001, $r^2$= .667), with significantly increased B-lines (p adj= .000000804), pulmonary consolidations (p adj= .0304), pleural thickening (p adj= .000000742), and SCs (p adj= .000000500). Increased B-lines were most pronounced in the AS, AX, and PLAPS distributions (p adj= .0086, .0012, .0024 respectively), whereas pleural thickening was noted in all lung regions (AS, AI, PS, PI, AX, PLAPS; p adj= .0182, .0014, .0375, .0328, .0003, 0), and subpleural consolidation were most prominent in AS, AX, and PLAPS (p adj= .0312, .0398, .0324). In performing regression analysis no single positive POCUS finding was significantly correlated with patient outcomes inducing mortality, and need for intubation, nor was lung involvement score as a whole.

Conclusion: In patients with COVID-19, regionalized POCUS findings and aggregate lung involvement scores were not predictive of patient outcomes including mortality. Despite this, cardiopulmonary POCUS may still provide valuable diagnostic and risk stratification data in patients with suspected COVID-19.