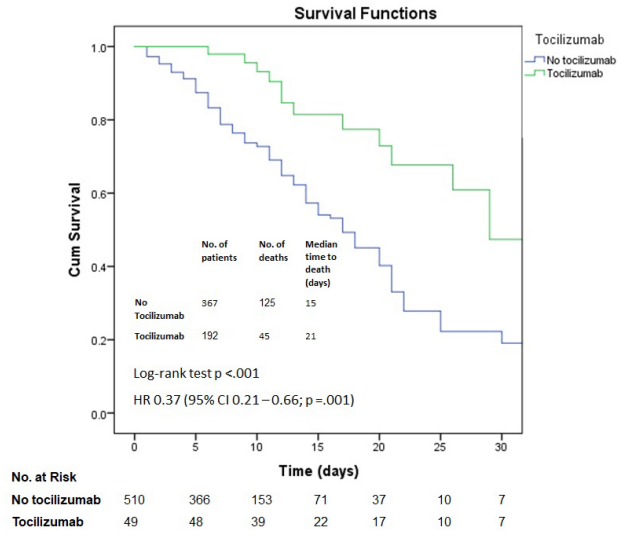
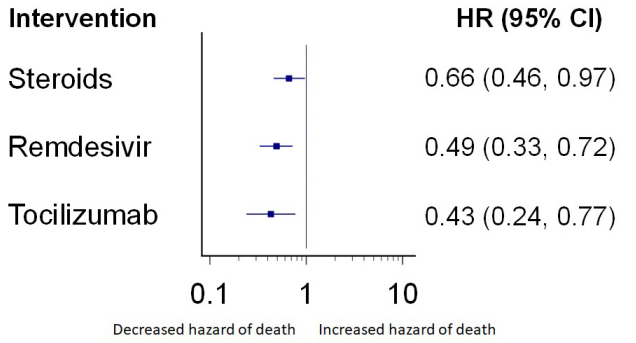
(34.3%) received remdesivir, and 49 (8.8%) received tocilizumab. By the cutoff date for data analysis, 389 (69.6%) patients survived, and 170 (30.4%) had died. The bivariable Cox regression models showed decreased hazard of in-hospital death associated with the administration of steroids (Figure 1), remdesivir (Figure 2), and tocilizumab (Figure 3). This association persisted in the multivariable Cox regression controlling for other predictors (Figure 4). The E value for the multivariable Cox regression point estimates and the lower confidence intervals are shown in Table 1.

Figure 3. Kaplan–Meier survival curves for in-hospital death among patients treated with and without tocilizumab



The hazard ratio was derived from a bivariable Cox regression model. The survival curves were compared with a log-rank test, where a two-sided P value of less than 0.05 was considered statistically significant.

Figure 4. Forest plot on effect estimates and confidence intervals for treatments



The hazard ratios were derived from a multivariable Cox regression model adjusting for age as a continuous variable, qSOFA score, noninvasive positive-pressure ventilation, and invasive mechanical ventilation.

Table 1. Sensitivity analysis of unmeasured confounding using E-values

Intervention	Point estimate (lower CI)	E value	E value for lower CI
Steroids		2.4	1.21
Remdesivir		2.21	1.64
Tocilizumab		2.42	1.54

CI, confidence interval. Point estimate from multivariable Cox regression model. The E value is defined as the minimum strength of association on the risk ratio scale that an unmeasured confounder would need to have with both the exposure and the outcome, conditional on the measured covariates, to explain away a specific exposure-outcome association fully: i.e., a confounder not included in the multivariable Cox regression model associated with remdesivir or tocilizumab use and in-hospital death in patients with severe COVID-19 by a hazard ratio of 1.64-fold or 1.54-fold each, respectively, could explain away the lower confidence limit, but weaker confounding could not.

CI, confidence interval. Point estimate from multivariable Cox regression model. The E value is defined as the minimum strength of association on the risk ratio scale that an unmeasured confounder would need to have with both the exposure and the outcome, conditional on the measured covariates, to explain away a specific exposure-outcome association fully: i.e., a confounder not included in the multivariable Cox regression model associated with remdesivir or tocilizumab use and in-hospital death in patients with severe COVID-19 by a hazard ratio of 1.64-fold or 1.54-fold each, respectively, could explain away the lower confidence limit, but weaker confounding could not.

Conclusion. For patients with severe COVID-19 admitted to our community hospital, the use of steroids, remdesivir, and tocilizumab were significantly associated with a slower progression to in-hospital death while controlling for other predictors included in the models.

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553. Outcomes in Patients Positive for Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Infection After Treatment with Monoclonal Antibody Therapy (MAT) in the Outpatient Setting

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Session: P-24. COVID-19 Treatment

Background. Monoclonal antibody therapy (MAT) was granted Emergency Use Authorization (EUA) by the U.S. Food and Drug Administration for treatment of mild to moderate coronavirus disease 2019 (COVID-19) in adults with positive SARS-CoV-2 viral testing and at high risk for progression to severe COVID-19 with up to 10 days of symptoms. This study assessed the impact of MAT on COVID-19-related ER visits, admissions, and mortality for patients diagnosed with COVID-19.

Methods. This was a single-center, retrospective study at The Ohio State University Wexner Medical Center to compare COVID-19-related ER visits, admissions, and mortality at 30 days after receiving MAT in the outpatient setting with either bamlanivimab or casirivimab-imdevimab in adult patients diagnosed with SARS-CoV-2 between November 16, 2020 and February 2, 2021. Outcomes in patients who received MAT were compared to those of a control group of patients diagnosed with COVID-19 in the outpatient setting from May 16, 2020 through November 15, 2020 who would have qualified for MAT through EUA criteria had it been available. Statistical analysis used logistic regression analysis with backward selection to determine the odds ratios (OR) and the 95% confidence interval to evaluate the relationship between patient clinical characteristics and outcomes.

Results. This study cohort included 1,944 patients, including 943 who received MAT and 1,001 in the control group. The MAT group included 658 who received bamlanivimab and 285 who received casirivimab-imdevimab. Patients who received MAT compared to the control group had a lower rate of COVID-19 related ER visits (3.3% vs 7.4%, p = < 0.0001) and hospital admissions (4.0% vs 7.8%, p = < 0.0001). No statistically significant difference was seen in mortality between the MAT group (0.5%) and control group (1.1%, p = 0.17). After accounting for potential confounders, the difference between the monoclonal antibody and control groups remained significant for ER visits and hospital admissions as reflected in the table.

Logistic Regression for COVID-19 Related ER Visit and Hospital Admission for Patients with COVID-19			
	OR	95% Confidence Interval	p-value
ER Visit			
Monoclonal Antibody Therapy	0.49	0.31 – 0.76	0.001
Malignancy	2.15	1.26 – 3.68	0.005
Asthma	1.90	1.11 – 3.27	0.02
African-American	1.71	1.12 – 2.61	0.01
Age (per ten years)	0.085	0.75 – 0.98	0.02
Hospital Admission			
Monoclonal Antibody Therapy	0.37	0.24 – 0.56	< 0.001
Age (per ten years)	1.32	1.16 – 1.52	< 0.001
Chronic Kidney Disease	3.16	1.85 – 5.39	< 0.001
Chronic Obstructive Pulmonary Disease	3.07	1.63 – 5.77	0.001

Conclusion. Patients who received MAT for COVID-19 in the outpatient setting had a lower rate of COVID-19-related 30 day ER visits and hospitalizations compared to those who did not receive MAT, adjusting for potential confounders.

Disclosures. **Mohammad Mahdee Sobhanie, M.D.**, **Regeneron** (Scientific Research Study Investigator)**Regeneron** (Scientific Research Study Investigator, Was a sub-investigator for Regeneron 2066 and 2069) **Carlos Malvestutto, M.D.**, **Lilly** (Scientific Research Study Investigator)**Regeneron Inc.** (Scientific Research Study Investigator)**ViiV Healthcare** (Advisor or Review Panel member)

554. Clinical Impact of Monoclonal Antibody Therapy with SARS-CoV-2 Infection

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Session: P-24. COVID-19 Treatment

Background. The novel coronavirus SARS-CoV2 is the causative agent for COVID-19 responsible for the ongoing global pandemic. The spike protein on its surface binds to the angiotensin-converting enzyme 2 receptor helps to enter human cells. Neutralizing antibodies to this protein can be protective and helpful in alleviating

symptoms. Monoclonal antibodies (mAb) have been utilized in the U.S. under an emergency use authorization by the FDA, including bamlanivimab (BAM) and casirivimab-imdevimab (CAR/IMD). We report our experience of using COVID mAb.

Methods. We conducted a retrospective chart review of patients that received CAR/IMD or BAM between December 1st, 2020, and May 15th, 2021. Medical records were reviewed to determine demographic and clinical information as well as tolerability and effectiveness of mAb.

Results. 463 patients with mild to moderate symptoms of SARS-CoV2 received mAb: 355(176 Men) BAM, 108(53 Men) CAR/IMD. The median BMI was 31 (17.4 to 62.5), 85% Caucasian, 4% Asian, 3% African American, 4% Hispanic, 4% others. The average duration of symptoms was 3.4 days and included cough (74%), malaise (71%), Headache (28%), dyspnea (28%), rhinorrhea (25%), fever (20%), diarrhea (18%), and anosmia (14%). Risk factors included hypertension (65%), diabetes mellitus (32%), coronary artery disease (22%), asthma (16%), COPD (9%), CHF (9%), CKD (8%), active malignancy (6%), and immunocompromised state (7%). Those who received BAM were older (p=0.000) and have underlying dementia and congestive heart failure (p=0.025 and 0.034, respectively). 27 patients (2 CAR/IMG, 25 BAM) got admitted to the hospital due to worsening of their respiratory status and were treated for COVID-19. 4 patients in the BAM group and 0 in the CAR/IMD group died. 2 patients developed a mild allergic reaction to CAR/IMD, no other side effects were reported in both groups. 37 patients (19 CAR/IMD, 18 BAM) received mRNA COVID vaccine prior. Overall mortality rate was 0.8%. There was no significant difference between BAM and CAR/IMR in terms of hospitalization (p= 0.104) or mortality (p=0.268).

Conclusion. Treatment with BAM versus CAR/IMR was well tolerated and resulted in similar outcomes in terms of hospitalization or mortality.

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555. Utilization of Remdesivir for COVID-19 in the National Veterans Affairs Healthcare System

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Session: P-24. COVID-19 Treatment

Background. As remdesivir (GS-5734) has become a leading treatment for COVID-19, we sought to assess remdesivir utilization patterns, including utilization of concomitant and supportive therapies, and heterogeneity in treatment approaches.

Methods. Our retrospective cohort study included hospitalized Veterans with positive COVID-19 PCR tests treated with remdesivir, from 03/2020 through 4/2021. Using exposure mapping of barcode medication administration records and medication dispensings, we assessed other medications received by each patient on each day of remdesivir treatment. Heterogeneity was defined as patterns of treatment (drug & duration) not shared by any other patient.

Results. Our study included 13,665 patients with COVID-19 receiving remdesivir. The median time to remdesivir initiation from either positive test or hospital admission was 1 day (interquartile range [IQR] 0-4 and 0-1, respectively). The median duration of remdesivir treatment was 5 days (IQR 4-5 days). Median length of hospital stay was 7 days (IQR 4-13). Inpatient mortality was 13.9% and an additional 6.2% of patients died within 90 days of discharge. The most common concomitant and supportive therapies were anticoagulants/antiplatelets (94.8%; enoxaparin 72.6%, heparin 18.4%, apixaban 10.8%, clopidogrel 6.3%), corticosteroids (90.8%; dexamethasone 87.3%, prednisone 2.9%, methylprednisolone 5.5%), statins (55.8%; atorvastatin 38.2%, simvastatin 7.1%, rosuvastatin 6.0%), antibiotics (41.9%; azithromycin 25.6%, ceftriaxone 13.2%, doxycycline 6.0%, vancomycin 4.9%), angiotensin receptor blockers (11.9%) and angiotensin-converting enzyme inhibitors (20.4%), melatonin (29.7%), and aspirin (35.6%). Concomitant utilization of Janus kinase inhibitors (0.5%), interleukin-6 inhibitors (2.4%), and hydroxychloroquine (0.5%) was low. Heterogeneity in concomitant and supportive therapies during remdesivir treatment was 84.6% (68.3% when assessed as drug class/category).

Conclusion. Among hospitalized patients with COVID-19 in the national VA Healthcare system receiving remdesivir, remdesivir was initiated early in the admission and substantial heterogeneity was observed in concomitant and supportive therapies during remdesivir treatment.

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556. Ruxolitinib for the Management of Severe Pneumonia Caused by SARS-CoV-2. Exploring the Combination with dexamethasone

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Session: P-24. COVID-19 Treatment

Background. Mexico is one of the top five countries with a higher mortality rate of hospitalized patients of 30.1%. Since COVID-19 has been associated with immune dysregulation and hyper inflammation, JAK-12 inhibitors have been tested to reduce IL6 production. Studies have shown improvements when using ruxolitinib (rxb) in severely hospitalized patients with COVID-19. These have included patients in combination with corticosteroids such as dexamethasone (dxm). This work aims to test the response of hospitalized patients with severe or critical COVID-19 treated with rxb with or without dxm.

Methods. An experimental, open, prospective study in a single third-level hospital in Mexico was performed. The primary outcome was favorable clinical response defined as withdrawal or decline of supplementary oxygen. Secondary outcomes such as mean hospital stay, improvement in systemic inflammatory response parameters, and mortality were also evaluated. Statistical differences for baseline and final measure and the use and not use of dxm were estimated. The study included adults with SARS-CoV-2 infection confirmed with polymerase chain reaction, radiological pneumonia, and oxygen saturation less than 90%. Rxb was administered 5mg/12hrs/15days, IV dxm 6mg/day/10days.

Results. The final sample was 108 adults with complete information and informed consent. Sixty-two patients (57%) received only rxb. There were no differences between groups for any parameter at the beginning of treatment, and all patients were receiving supplemental oxygen. After 28-day follow-up, 70% reduce supplemental oxygen requirement (74% rxb and 71% rxb+dxm; p=0.628), 18% remained, and 2% increases support (1% with rxb, and 5% rxb+dxm; p< 0.001); 87% of patients were discharged (89% rxb and 85% rxb+dxm; p=0.603). In both groups, there was a significant reduction of CRP, LDH, and Ferritin on day 15. The mortality rate was 9% (no difference in groups; p=0.453), and a higher proportion died for *Pseudomonas aeruginosa* superinfection in the rxb+dxm group (p< 0.001).

Differences for support oxygen at baseline and discharge

		Baseline					
		Invasive		Noninvasive		Low-flow oxygen	
		Rxb + Dxm (n=1)	Rxb alone (n=2)	Rxb + Dxm (n=10)	Rxb alone (n=20)	Rxb + Dxm (n=35)	Rxb alone (n=40)
	Death	1 (100%)	1 (50%)	2 (20%)	4 (20%)	1 (3%)	1 (2.5%)
Discharged	Invasive	0	1 (50%)	2 (20%)	0	0	1 (2.5%)
	Noninvasive	0	0	0	0	0	0
	Low-flow oxygen	0	0	3 (30%)	7 (35%)	10 (29%)	8 (20%)
	Ambient air	0	0	3 (30%)	9 (45%)	24 (68%)	30 (75%)
	Total improve	0	0	6	16	24	30

Rxb= ruxolitinib; dxm= dexamethasone

Final health outcomes of patients with severe or critical COVID-19 in a third-level hospital in Mexico

Outcomes	All (n=108)	Rxb alone (n=62)	Rxb + Dxm (n=46)	P-value
28-day mortality	10 (9%)	6 (10%)	4 (9%)	0.453
Cause				
Multiple organ failure by critical covid 19	4 (40%)	2 (33%)	2 (50%)	
Superinfection due to pneumonia associated with mechanical ventilation due to Pseudomonas aeruginosa	4 (40%)	2 (33%)	2 (50%)	<0.001
Superinfection due to pneumonia associated with mechanical ventilation	2 (20%)	2 (33%)	0	
Median time to being discharged, days [IQR]	12 [9, 16]	12 [9, 15]	12 [9, 16]	0.167
Discharged from hospital within 28 days	94 (87%)	55 (89%)	39 (85%)	0.603
Invasive mechanical ventilation*	1 (1%)	1 (2%)	0	0.425
Successful cessation of oxygen aid	76 (70%)	46 (74%)	30 (65%)	0.628

*as proportion of all alive patients in their last observation. Rxb= ruxolitinib; dxm= dexamethasone.

Conclusion. The use of rxb could be considered as a treatment helping clinical improvement in hospitalized patients with severe COVID-19. Combination with dxm apparently did not add clinical benefits. It should be further evaluated.

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557. Trends in Remdesivir Treatment Over the Course of the COVID-19 Pandemic

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Session: P-24. COVID-19 Treatment

Background. Remdesivir is approved for use in the United States for treatment of COVID-19 requiring hospitalization. Real-world data on trends in remdesivir use may elucidate its benefits and place in therapy.

Methods. Hospitalized Veterans with a positive SARS-CoV-2 polymerase chain reaction (PCR) test that were treated with remdesivir at a Veterans Affairs Medical Center from May 2020 to April 2021 were included. Monthly trends in remdesivir treatment, as well as patient characteristics and clinical outcomes among patients treated with remdesivir, were assessed with joinpoint regression to calculate average monthly percent change and corresponding 95% confidence intervals (CI).

Results. A total of 30,333 Veterans were hospitalized with a positive PCR test over the study period, and 13,639 were treated with remdesivir (45%). Throughout the study period, the proportion of Veterans treated with remdesivir increased significantly (4.5% per month, 95% CI 0.5%-8.6%) and median time to remdesivir initiation decreased significantly (12% per month, 95% CI -15.8% to -8.0%). Though demographic characteristics of Veterans treated with remdesivir remained stable, including age, race, and obesity, improvement in clinical outcomes were observed, including median length of hospital stay which decreased by 6.5% per month (95% CI -9.1% to -3.8%), intensive care admissions which decreased by 4.6% per month (95% CI -6.3% to -2.8%) and inpatient mortality which decreased by 6.3% per month (95% CI -9.4% to -3.1%). By April 2021, most patients initiated remdesivir on the day of admission, and the inpatient mortality rate decreased to 7.9% from 19.2% in May 2020.

Conclusion. Over the course of the COVID-19 pandemic, utilization of remdesivir increased while initiation of remdesivir occurred earlier in the hospital admission, with concurrent reductions in length of hospital stay, intensive care admissions, and inpatient mortality.