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Letter to the Editor

Uptake of treatment practice standards during a pandemic in an academic medical system

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To the Editor—The first case of community spread of severe acute respiratory coronavirus virus 2 (SARS-CoV-2) in the United States was reported in Washington state in late January 2020.[1] During the early stage of the pandemic, therapeutics were emerging at a rapid pace, often without peer review, and evidenced-based national guidelines were not yet available. To develop and disseminate guidance for safe and consistent care using data available at the time, the University of Washington (UW) Medicine clinicians convened a practice guidelines committee, comprising faculty from infectious diseases, pulmonary/critical care, cardiology, hematology, internal medicine and pharmacy.[2] We utilized World Health Organization *Guidance for Managing Ethical Issues in Infectious Disease Outbreaks,* which provides a framework for ethical use of unproven interventions during pandemics, to guide our recommendations in the absence of rigorous evidence from clinical trials.[3] The first internal guideline was published on March 17, 2020, and updates were made every 1–2 weeks thereafter. After publication of the Infectious Diseases Society of America (IDSA) guidelines on April 11, 2020, and the National Institutes of Health (NIH) guidelines on May 12, 2020,[4,5] we coordinated with national guidelines, but we continued to provide guidance on implementation of therapeutics and integrated care pathways into the electronic medical record to facilitate the ordering and monitoring of these therapies. We also incorporated ongoing clinical trials as they became available within our system in the internal guidelines as a resource for clinicians to help identify potential candidates for study enrollment. We sought to review the impact of our local guidelines on prescribing patterns for COVID-19 therapeutics at our health system.

The UW Medicine system comprises 3 hospitals and >300 clinics across the Puget Sound region. As part of a quality improvement initiative, pharmacy records from the UW Medicine hospitals (Harborview, University of Washington Medical Center, Montlake and Northwest campuses) were queried regarding the use of hydroxychloroquine (HCQ), tocilizumab, lopinavir-ritonavir, interferon, ivermectin, dexamethasone (6 mg), and remdesivir from March 1 to October 15, 2020. Records of patients who received HCQ were also reviewed for azithromycin use. The clinical indication was obtained from provider notes and categorized into COVID-19 versus non–COVID-19 indications. Surveillance testing for SARS-CoV-2 was performed for all patients upon admission starting April 13, 2020. The number of asymptomatic and symptomatic patients with COVID-19 were obtained from hospital census data for review.

We reviewed 1,006 pharmacy records of patients receiving the interventions. Overall, 333 patients were prescribed HCQ, 156 were prescribed tocilizumab, 110 were prescribed dexamethasone (6 mg), 71 were prescribed remdesivir, 73 were prescribed ivermectin, and 4 were prescribed interferon for various indications. We examined the timeline of the recommendations in local guidelines with drug utilization (Fig. 1). In March and April, 71% of HCQ use and 62% of tocilizumab use were attributed to COVID-19, respectively. Azithromycin plus HCQ was prescribed for 8 patients. Consistent with the guidelines, no patients were prescribed ivermectin, interferon, or lopinavir-ritonavir for COVID-19. When internal guidelines recommended against HCQ and tocilizumab except in the context of clinical trials on April 22 and June 25, respectively, no patients were prescribed these agents for a COVID-19 indication thereafter.

After the US Food and Drug Administration (FDA) issued emergency use authorization for remdesivir based on preliminary data from the Adaptive COVID-19 treatment trial (ACTT-1) on May 1, 2020, this antiviral was incorporated into practice.[6,7] Due to the scarcity of remdesivir early in the pandemic, a clinical allocation team consisting of pulmonary/critical care, infectious diseases, pharmacy, ethics, and medical leadership drafted clinical criteria for remdesivir to ensure appropriate use and equitable distribution. Providers submitted a request for remdesivir with deidentified data via Research Electronic Data Capture (REDCap),[8] and a clinical decision was made by the allocation team within 24 hours of the request. Among the 318 patients admitted with COVID-19 between May 1 and October 15, 2020, 71 patients (22%) received remdesivir with the approval of the clinical allocation team. The median duration was 5 days for remdesivir (range, 1–10 days). Dexamethasone was first recommended on June 23, 2020, after the preprint release of the RECOVERY trial.[9] Among the 225 patients admitted with COVID-19 between July and October 2020, 98 patients (44%) received dexamethasone.

In the face of a pandemic with rapidly evolving data, internal guidelines had a significant impact on the prescribing patterns of the wide range of empiric COVID-19 therapeutics because the validity of these agents was still being evaluated and national consensus guidelines were not yet available. Successful

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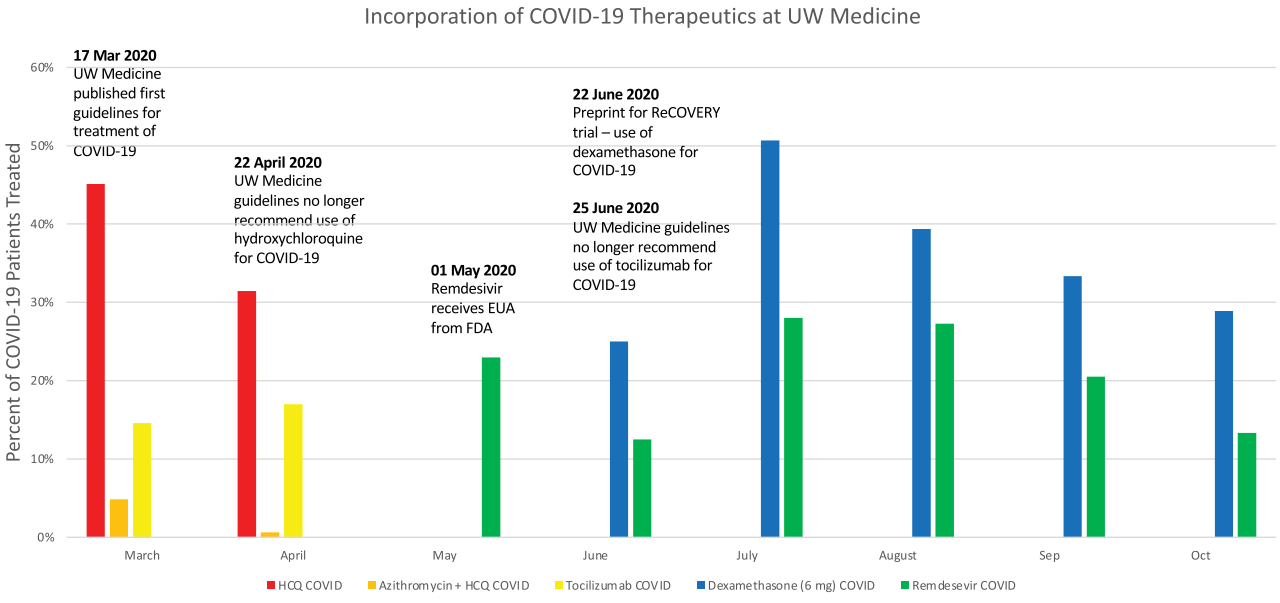

Number of COVID patients	March: 144	April: 159	May: 61	June: 32	July: 75	August: 66	September: 39	October: 45

Fig. 1. Timeline of implementation of COVID-19 therapeutics and prescribing patterns at UW Medicine.

implementation of local guidelines is attributed to a small number of dedicated COVID-19 providers, daily huddles with providers, teaching conferences, and incorporation of care-plan pathway into the electronic medical record. We acknowledge that the lower volume of COVID-19 cases in our region provided a more conducive environment for a meticulous and thoughtful process for guidelines development and implementation. These data exemplify the need for local champions to synthesize available evidence with scientific rigor and implement national guidelines. The limitations of this study include the lack of direct attribution of the internal guidelines to prescribing patterns, but the distribution of medication utilization over time suggests that providers integrated local guidance to inform treatment decisions.

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