

One Academic Health System's Early (and Ongoing) Experience Responding to COVID-19: Recommendations From the Initial Epicenter of the Pandemic in the United States

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Abstract

On January 19, 2020, the first case of a patient with coronavirus disease 2019 (COVID-19) in the United States was reported in Washington State. On February 29, 2020, a patient infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) passed away in a hospital in Seattle-King County, the first reported COVID-19-related death in the United States. That same day, a skilled nursing and rehabilitation facility in the county reported that several of its residents tested positive for SARS-CoV-2 and that many staff had symptoms compatible with COVID-19.

The University of Washington Medicine health system (UW Medicine), which is based in Seattle-King County and provides quaternary care for the region, was one of several health care organizations called upon to address this growing crisis. What ensued was a series of swiftly enacted decisions and activities at UW Medicine, in partnership with local, state, and national public health agencies, to respond to the COVID-19 pandemic. Tapping into the multipronged mission areas of academic medicine, UW Medicine worked to support the community,

innovate in science and clinical practice; lead policy and practice guideline development; and adopt changes as the crisis unfolded. In doing so, health system leaders had to balance their commitments to students, residents and fellows, researchers, faculty, staff, and hospital and health center entities, while ensuring that patients continued to receive cutting-edge, high-quality, safe care. In this Invited Commentary, the authors highlight the work and challenges UW Medicine has faced in responding to the global COVID-19 pandemic.

At the end of 2019, the University of Washington Medicine health system (UW Medicine), like many other health systems across the country, started tracking the global movement of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), preparing for its arrival in the United States. Little did we at UW Medicine know that Seattle-King County, where our health system is based, would become an early epicenter of the coronavirus crisis in the United States. After the first patient with coronavirus disease 2019 (COVID-19) in the United States was diagnosed in Washington State on January 19, 2020, local public health jurisdictions partnered with UW Medicine leaders in infection prevention and control to rapidly implement containment strategies including creative models of care, such as

the home assessment team that deploys physician and nurse teams to patients' places of residence, to evaluate and test for SARS-CoV-2.¹

In the weeks that followed, it was not clear how prevalent the virus was in our community. The first priority for our infection prevention and control team and for the larger public health efforts was to limit the movement of patients at high risk of infection (based on travel or contact history) into crowded emergency departments and busy clinics. The first reported death in the United States was of a Washington State patient with SARS-CoV-2 on February 29, 2020; it coincided with reports of COVID-19 cases in several residents and staff at a skilled nursing and rehabilitation facility in Seattle-King County. These events led to rapid mobilization and collaboration among our state, public health, and regional health care systems to support our community through the ensuing pandemic.

About UW Medicine

UW Medicine is an academic health system based in Seattle, Washington, that serves a 5-state region (Washington, Wyoming, Alaska, Montana, and Idaho)

for quaternary care. The health system comprises 7 entities including UW Medical Center (Montlake and Northwest Campuses), Harborview Medical Center, Valley Medical Center, UW School of Medicine, UW Physicians (professional medical group), UW Neighborhood Clinics, and Airlift Northwest. Together, we provide care for 64,000 hospitalized patients, 1.8 million outpatient visits, and 200,000 emergency department visits annually.

Responding to the COVID-19 Crisis—Locally and Globally

While each UW Medicine entity had been meeting, making plans, and practicing their response with drills and exercises, the reality of the public health emergency after the reports on February 29 was unprecedented. Seattle had become the initial epicenter of the outbreak in the United States, and UW Medicine was one of many health care organizations called to immediate action to respond. We immediately activated the emergency operations center at the health system and individual hospital levels. Thus far, this emergency operations center structure has worked well to disseminate clear and consistent information, cascade decisions across all health system entities in an

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organized manner, and escalate concerns from staff and local leadership. In tandem with this internal mobilization, UW Medicine providers and staff worked with public health officials to go to local long-term care facilities (e.g., skilled nursing, rehabilitation, assisted living facilities) to evaluate, test, and transfer patients with COVID-19 to the appropriate acute care hospitals.

Other initial efforts focused on ensuring appropriate training and support for providers and staff around caring for patients with suspected or confirmed COVID-19. We established dozens of patient care protocols, algorithms, and policy and guidance statements, including workflows to see patients in various clinical settings and decision support for testing criteria and telephone triage. We quickly expanded the capacity of our virtual and telemedicine care teams, developing specific protocols for critical care and immunosuppressed and high-risk patients coming to our health care system for complex procedures. These guidelines were written by multiple care partners across UW Medicine, going quickly through the initial draft, revisions, and approval processes and being posted on a central internal UW Medicine website for immediate use. User feedback and subsequent changes are ongoing, and the website is updated in real time as policy and practice recommendations evolve. In keeping with the core mission of our academic health system being a resource for the community hospitals and health facilities in our county and state (and beyond), we also created a public website to facilitate external access to our guidelines and protocols (see the UW Medicine COVID-19 Resource Site at covid-19.uwmedicine.org).

Innovations in Science and Practice

During January and February, the UW Medicine Virology Division developed a Food and Drug Administration–approved polymerase chain reaction test for SARS-CoV-2. Having this test locally available improved our response time; we were able to return test results within 12–24 hours. In collaboration with public health authorities (through state and federal labs), this test also significantly increased our regional capacity to test at-risk populations. In early March, the Virology Division lab was able to process dozens of

specimens per day, which quickly ramped up to more than 2,000 specimens per day with the addition of high-throughput equipment. Within 2 weeks of offering testing services to the state, 85% of the processed specimens came from outside the UW Medicine health system.

UW Medicine also set up multiple drive-through COVID-19 testing sites to offer an alternative approach to testing patients for SARS-CoV-2. Staff wearing personal protective equipment (PPE) obtain specimens from patients who remain in their cars, allowing for an innovative approach to providing patient-centered care, while preserving PPE and diverting potentially infectious patients from our clinics, urgent care facilities, and emergency departments.

Difficult Decisions in the Throes of the COVID-19 Pandemic

Given the compressed time line to respond to the rising demands of COVID-19, we were faced with several difficult questions that needed immediate answers. For example, one of our early challenges was the conflict between the precaution and PPE guidelines from the World Health Organization (WHO) and those from the Centers for Disease Control and Prevention. UW Medicine worked with the Washington State Department of Health, the Northwest Healthcare Response Network, and the Washington State Hospital Association to lead the change to adopt the WHO guidelines using standard, droplet, and contact precautions (i.e., mask, eye protection, gown, and gloves) for the care of suspected or confirmed cases of COVID-19, while reserving airborne precautions for caring for patients undergoing aerosol-generating procedures (e.g., intubation). This change was based on the biology of SARS-CoV-2 indicating that the virus spread predominantly through large respiratory droplets similar to other respiratory viruses and on our desire to match the appropriate level of PPE with the care provided. This decision was critical to ensuring adequate supplies of N95 respirators for use in the care of critically ill patients or those undergoing aerosol-generating procedures.

Potential shortages of PPE became a reality, as a month's worth of PPE and hand sanitizing gels were dispensed

through our supply chain in just 5 days. We quickly adjusted to better coordinate our supplies, including moving all available PPE from nonclinical spaces (e.g., the School of Medicine research and simulation labs) to the hospitals and clinics. Rapid depletion of PPE forced difficult conversations across the UW Medicine system about the sustainability of current practices and led to PPE conservation strategies, such as limiting the number of individuals entering hospital rooms on rounds, transferring medical students from their clinical rotations, and postponing elective and nonurgent surgeries and procedures if they could be safely delayed without causing patient harm.

Another conflict pertained to balancing our organizational focus on patients and families, with the need to minimize exposures and transmission within our health care facilities. We rolled out a strong visitor restriction policy that was instituted across all UW Medicine clinical sites. This decision was not made lightly, knowing that visitors are an important part of healing and that calming fears and assuring and supporting family members are part of our work. However, our general priority has been to focus on maximizing containment given the active community transmission and severity of COVID-19.

Another difficult decision pertained to how best to balance the clinical care responsibilities and continued educational activities of residents and fellows, given their indispensable role in the care of patients and the limited availability of PPE and other resources to combat the effects of COVID-19. Early on, residents and fellows were excluded from the care of COVID-19 patients. However, as the number of infected patients exponentially increased, residents and fellows were asked to care for these patients in a phased manner, while maintaining the principles of PPE preservation and minimizing the number of provider exposures to patients with suspected or confirmed COVID-19. If our county or state should be asked to provide crisis standards of care,² residents and fellows may be called upon to provide more independent care of patients, with a greater number of trainees under the supervision of a single faculty member. Our health system leaders are already working with regional

and state-wide leaders to determine the appropriate allocation and utilization of scarce resources and clinical services available to our community.

Finally, with regard to medical student education and the role of students on clinical rotations, the University of Washington and the School of Medicine moved all classes online as of March 9. Our first decision regarding medical students on clinical rotations was to prohibit their participation in the care of patients with suspected or confirmed COVID-19. That quickly evolved to include any patient whose care required the use of PPE, including in operating rooms (with one exception made for subintern students who were on a surgical rotation as a key part of their career planning). This very restrictive policy was soon followed by a School of Medicine decision to suspend students' clinical rotations until the end of April, when the policy will be reassessed.

Conclusions

In the face of uncertainty, academic health systems are essential ramparts supporting their communities, innovating in science and clinical practice, leading policy and practice guideline development, and adopting changes quickly to lead others in health care. They must balance their multipronged commitments to their students, residents and fellows, researchers, faculty, staff, and hospital and health center entities, while ensuring that patients continue to receive cutting-edge, high-quality, safe care. Indeed, academic health systems continue to provide necessary complex patient care, such as transplants, complex cancer care, lifesaving surgery, and advanced cardiac care, in the midst of the COVID-19 crisis.

At UW Medicine, we have prioritized sharing timely updates and facts through structured communication channels, including our website, virtual town halls,

and electronic memos. We recognize that the response to COVID-19 will require flexibility and innovation through an iterative learning process, which is the hallmark of academic medicine. We acknowledge that many other academic and nonacademic health systems around the country are also working tirelessly to innovate and develop new modalities to contain, control, and treat COVID-19. Collectively, we have risen to meet this demanding challenge and, congruent with the mission of academic medicine, we believe in the importance of sharing best practices and the rapid dissemination of information across institutions.

We recognize that many organizations have contributed to the evolving standard of care for COVID-19. As we write this Invited Commentary in early April, our recommendations and best practices have already been adopted and further adapted by others. What we have learned in these early days in the fight against this global pandemic is that our academic health systems are strong, and so we innovate, provide high-quality care to those with complex health problems, be a resource to the community, collaborate, and support each other.

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