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.

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COMMENTARY

Lessons from Walking the Medical Distancing Tightrope

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It took only three months for the novel coronavirus, SARS-CoV-2, to transform the world. Chinese authorities reported an outbreak of viral pneumonia in late December 2019, and the United States reported its first case less than a month later. Since then, the United States has suffered more cases of COVID-19 (novel coronavirus disease) than any other nation, restricted social interactions and business activity, suffered an unprecedented spike in unemployment, and passed a $2 trillion economic stimulus measure.[1] On March 12 California Governor Gavin Newsom banned large gatherings. Within a week, he ordered residents to shelter in place,[2] transforming the state overnight. San Diego schools, childcare centers, and restaurants closed. Essential businesses implemented distancing practices. For example, warehouse shopping giant Costco implemented senior citizen shopping hours, occupancy limits, distanced entry and checkout queues, shopping cart disinfection, and plastic shields at checkout counters and masking to protect employees.

Patient care and education at the University of California, San Diego (UCSD) Health System had to change just as dramatically. Doing so felt like walking a tightrope—a life or death balancing act. Like many academic programs before the pandemic, UCSD's Division of Hospital Medicine emphasized interdisciplinary bedside rounding, focusing on clinical care, quality, patient experience, and teaching. Large teams led by hospitalists and residents circulated through wards, with up to eight team members listening to interviews, or doing exams jointly or serially. These rounds resembled a photo negative of social distancing. Routine rounding structures, previously sources of pride and symbols of excellence, became serious health threats. SARS-CoV-2, capable of spreading from presymptomatic and asymptomatic persons,[3] threatened to injure or kill high-risk hospitalized patients (that is, elderly, or with comorbid illnesses) as well as health care workers (HCWs), making them patients instead of caregivers during our projected surge.

Some risk mitigation occurred as part of our overall pandemic response: We created geographically cohorted COVID teams, staffed by volunteer hospitalists, which meant that trainee physicians did not see COVID positive patients or high-risk patients with pending test results. These teams first operated February 5–24 to handle a small number of noncritically ill evacuees from China and reopened March 12 with our first locally diagnosed case. Medical students were removed from inpatient rotations on March 17. On April 9 UCSD Health implemented universal rapid screening of all admissions, further reducing risk. Throughout the pandemic, rapid implementation of health informatics upgrades facilitated screening, electronic check-in, secure messaging, and telemedicine to support outbreak management from our clinics to our emergency departments and inpatient wards.[4]

To complement these interventions, hospital medicine faculty drafted guidelines for inpatient "medical distancing" to transform our rounding practices and shared a first draft on March 15. We invited suggestions from colleagues, trainees on a quality improvement rotation, and nurse/pharmacy representatives. We included any suggestion we thought might be both helpful and of limited risk. Submitted ideas included ideas brainstormed locally and some discussed on social media, such as positioning IV pumps outside patient rooms. Our goal was to reduce COVID-related morbidity and mortality for both patients and HCWs, and keep our HCWs at work without negatively affecting patient care. Most recommendations are applicable to any inpatient setting. Some are particularly relevant at our two hospitals, where some patients experience discharge delays due to inadequate insurance, and because of patients with comorbidities, such as active malignancies and immunosuppression. Our recommendations fell into four categories: (1) reduce unnecessary doctor visits, (2) reduce support staff visits, (3) distance providers, and (4) improve patient experience (Table 1).

These hospital medicine recommendations were subsequently shared throughout the organization. Our health system has conducted near-daily COVID response conference calls at several levels, including among medical directors, quality leaders, and senior leadership, and our division administration has conducted daily calls as well. These tiered huddles honed our recommendations with prompt feedback and facilitated dissemination of the hospital medicine guidelines to all services in the health system. Dissemination was also accomplished via our health

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Table 1. Medical Distancing Recommendations

Reduce unnecessary doctor visits.
• Target a single physician visit per stable patient per day. Consider rotating the examining provider on teach teams.
• Skip exams needed only for documentation or teaching purposes.
• Consider omitting daily exams in patients who no longer require hospitalization (for example, patients awaiting custodial placement for weeks or months; stable patients with barriers to home infusion).
Reduce support staff visits.
• Reduce unnecessarily frequent vital signs checks.
• Promptly de-escalate monitoring such as alcohol withdrawal scoring, neuro checks, and frequent glucose checks when appropriate.
• Eliminate food service and janitorial visits to isolation rooms unless requested by the nurse.
• Locate IV pumps in halls with longer tubing to reduce room trips.*
• Substitute longer-acting medications if appropriate and if doing so reduces room traffic (for example, enoxaparin for heparin prophylaxis, naproxen for ibuprofen, ceftriaxone for cefazolin, and patient-controlled analgesia for as-needed morphine injections).
• Explore opportunities for self-care in capable patients (inhalers, insulin dosing).†
Distance providers.
• Conduct team rounds six feet apart, or remotely.
• Avoid shared work rooms. Alternatively, distance within work rooms and reserve workstations for single providers.
• Transition meetings to videoconferences or electronic collaboration.
• Use messaging embedded in the electronic medical record system over face-to-face communication.
Improve patient experience.
• Educate patients about the reasons for medical distancing (when told about the reasons for distancing, patients tend to welcome it).
• Confirm their ability to communicate with providers, including by telephone or video chat.

* This step has only been necessary for COVID patients in intensive care.

† In practice, patients self-administer inhalers, but we are not aware that insulin self-management has been used.

system's internal COVID information webpage and e-mail updates to staff (April 4). Our huddle calls also permitted monitoring of adverse events and care delays related to distancing. Our rounding structures were designed to enhance patient care and experience, and we did not expect that drastic changes could be accomplished without consequence. Prior research has shown isolated patients to have longer lengths of stay, higher costs of care, and higher readmission rates.[5] A meta-analysis found that isolation practices led to delays in care, increased noninfectious adverse events such as falls and pressure ulcers, increased depression and anxiety, and decreased patient satisfaction.[6] Thus, we worried our distancing efforts could have unintended consequences, including adverse events and worsened experience.

The effects of our distancing efforts are not fully known. With no control group, we cannot know how much illness and death may have been prevented, and we expect that benefits would be higher at facilities with more COVID activity. We know of only anecdotal adverse effects at this time, but they are still illuminating. Several cases involved no-harm delays, as when consult services declined to perform patient visits even on non-COVID, non-isolated patients, which the primary team deemed clinically necessary for services such as skin biopsy or laryngoscopy. Another consulting service suggested that a homeless patient with diabetic foot ulcer and osteomyelitis could be discharged to street and receive toe amputation in the future when elective surgeries resumed, raising the risk of a higher amputation. In all cases, attending communication prompted the desired consult (the toe amputation was performed the following day).

Two other examples illustrate the value of attending-level physical exams. In one case of misdiagnosis, a stable patient received "medically distanced" hospitalist exams (interview only) for several days. When the trainee physicians performing traditional exams suspected overdiuresis of chronic heart failure, the attending performed a detailed exam and diagnosed significant volume overload. This was subsequently confirmed by inferior vena cava ultrasound and treated with high-dose diuretics. Another patient, released from the ICU to general medicine after respiratory failure, received only trainee physician exams for three days. The patient subsequently suffered respiratory failure requiring urgent intubation; investigation showed no clear evidence of missed treatment opportunities.

A final anecdote illustrates the value of good communication and the anxieties of frontline clinicians, related to both COVID itself and the distribution of risk. According to a story circulated during COVID response huddle calls, a psychiatry consultant asked a nurse to deliver a phone to a patient's bedside for a remote interview, creating the perception of having transferred risk rather than mitigated it. The psychiatrist later clarified that they were following distancing recommendations on a patient with nonemergent symptoms and had only asked nurses to set up communication when their room presence was next required for other reasons (phone access has since been set up in all rooms and the numbers disseminated).

Continuous evaluation of our medical distancing efforts occurs in multiple venues. These events were discussed in our tiered and division-level COVID response huddle calls and/or reported through our computerized adverse event monitoring system. At all levels, physicians and administrators worried that the distancing pendulum had swung too far away from direct patient care. We emphasized two key points in our ongoing division and institutional communication. The first was to remain laser-focused on our "true north" or guiding principle of providing the best patient care possible, emphasizing that all necessary in-person visits and exams should occur. The second was a reminder that with proper precautions, including thorough hand hygiene and masking (currently required at UCSD Health), the risk of HCW/patient transmission in either direction is low. In several illustrative cases, coronavirus patients exposed many dozens of HCWs without infecting any.[7] At UCSD, there have been 739 reported HCW exposures and 3 confirmed infections after exposure to COVID patients (0.4%, all prior to diagnosis). Random screening of more than 3,000 HCWs subsequently detected only 1 active infection. Risk has been further reduced by daily symptom screening of HCWs at all entry points to the hospital, symptom screening of all patients, and the implementation of rapid, universal testing on admission. These measures, however, should reassure providers that necessary clinical care is safe to provide, not that their vigilance is no longer required.

Although few HCWs have been infected at work, 12 have been infected in the community, demonstrating that HCWs pose a risk of transmission, not just patients. But particularly as a local COVID surge failed to materialize, and our health system resumed offering elective procedures in early May 2020, some staff appear not to appreciate this risk. Monitoring of lounges and cafeterias showed HCWs and environmental services workers gathering unmasked and in close proximity. Clinic-based providers noticed similar contacts in small clinic breakrooms. These concerns were escalated to leadership on huddle calls, prompting reeducation and enhanced signage in gathering areas. The ease of escalation reinforced the value of our tiered huddle system and served as a reminder to remain vigilant: Distancing management is an extended process, not an event.

Medical distancing may be with us for an extended period of time. San Diego has succeeded in "flattening the curve," avoiding the surges in illness that have plagued cities like New York.[8] For example, on April 9 UCSD Health had a total census of 471 patients (56% occupancy) of which only 4.2% had COVID, with 10 patients on the hospital medicine service, 8 on ventilators (5.2% of capacity), and only 3 total deaths to date. Our region's distancing efforts, which have radically changed social interactions and come with a substantial economic cost, have worked. But as a result, we have a population that remains overwhelmingly vulnerable to infection. There is no vaccine in sight, and these facts and modeling suggest that distancing may be required into 2022.[9]

In addition to affecting patient care, distancing has profoundly affected medical education, and the impact will continue for many months. Association of American Medical Colleges (AAMC) guidelines advise that medical students not be involved in patient care unless COVID risks are low and protective equipment and testing are available.[10] With our low COVID activity and rapid testing of all admissions, UCSD third-year students will likely be able to return to clinical clerkships by mid-May, but have still missed key training experiences on the wards. Preclinical physical exam education has been limited to webcam tutorials, with obvious inherent limitations. Cut off from traditional education, creative UCSD students found a way to pitch in and gain some clinical experience as remote scribes of discharge summaries for frontline hospital medicine physicians and spread their idea to students at 10 other centers.[11] At the graduate medical education level, new interns are scheduled to begin service July 1. Both students and new physicians, as well as other new clinicians such as nurses and therapists, will enter a training environment radically different from any their predecessors ever experienced. Personal health risks are far higher. Opportunities for provider-patient connection are significantly reduced. The breadth of training experience will be substantially reduced for some trainees during crucial periods in professional development. And considering the possibility that a whole year of medical students may be delayed, there may be a year with a drastic undersupply of interns followed by a surge, changes that will cause an upheaval in medical training and require creative and flexible programs.[12]

As we contemplate the future of hospital care and training, we continue to monitor our distancing efforts for signs of adverse effects on safety, efficiency, and experience. We have replaced hospital medicine's interdisciplinary bedside rounds with Zoom meetings but have not yet been able to include patients in joint rounds. We will reconsider the intensity of distancing depending on the severity of local COVID activity and the need for personal protective equipment (PPE) preservation. Two efforts to measure the effect of distancing are under way—one looking at patient/provider experience and adverse events, and a second looking at the impact of draconian visitation restrictions (one visitor for childbirth and select special circumstances; maximum of two for end of life). Our division has also implemented a peer support network, although pandemic stress is far higher elsewhere, in locations where providers face higher personal risks and witness numerous patients dying alone, or even pick who lives or dies when scarce ICU beds or ventilators run out.

Meanwhile, we continue to mitigate feelings of isolation among patients by improving videoconferencing into patient rooms. We're also assessing which practices offer last-

ing value. Just as the pandemic has highlighted the importance of "essential workers" in society, we hope it refocuses medical care on patient-oriented service. Repeated exams mandated by insurance requirements instead of physician-determined need have never helped our patients. Requiring in-person visits over videoconferencing for conditions that do not require exams has always wasted time and resources. Improved online teaching materials and conferencing capabilities will significantly benefit trainee physicians long after this disastrous pandemic has ended.

Forced to distance ourselves from colleagues and patients, we are doing our best to limit the harm, and capture long-term benefits from our experience walking the distancing tightrope.

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