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EDITORIAL

COVID-19 and academic neurosurgery

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On January 23, 2020, the Mass General Brigham Health System sent a first systemwide email broadcast to employees concerning the SARS-CoV-2 virus outbreak in China, and the impact of the associated disease syndrome commonly known as COVID-19. A week later the first case of COVID-19 was noted in the Commonwealth of Massachusetts. Little did we know that less than 2 months later, a worldwide pandemic would drastically alter the work of academic departments of neurosurgery across the US. As the world "shelters in place," we are physically distanced from our colleagues, trainees, and care teams and new realities have set in for large academic departments and health systems. Indeed, life is different. What have we learned and how have we responded?

Academic departments of neurosurgery across our country are hubs of innovation aiming to foster the next generation of neurosurgeons, discoverers, and leaders in our field. Our two departments of neurosurgery comprise approximately 120 clinical faculty, residents, and advanced practice providers (APPs) who provide neurosurgical care at Harvard's two largest teaching hospitals, Massachusetts General Hospital and Brigham and Women's Hospital. Our strategy has been to unleash the creativity of our teams to tackle the myriad problems posed by COVID-19. Led by an overarching Mass General Brigham incident command center, each hospital and department has coordinated and communicated to address the challenge.

Recognizing the potential tsunami of COVID-19 cases to come, within a hectic 10-day period in March, we did the following: 1) ceased all physical meetings in the hospital; 2) virtualized all nonessential outpatient visits; 3) stopped performing elective neurosurgery; 4) authorized and implemented remote work for clinical, resident, and support staff; 5) restricted all visitors from our facilities; 6) required every employee on site to wear face mask protection and to attest daily as to symptom-free status; 7) shuttered our wet bench research laboratories; 8) converted a sizable portion of our neurosurgical beds to isolation rooms for COVID-19 patients; 9) redeployed faculty, residents, and APPs on a voluntary basis to COVID-19–related support activities; 10) developed an emergency cross-privileging strategy between our hospitals; 11) developed new triage, workflow, and personal protective equipment (PPE) policies for neurosurgical cases involving the nasopharynx and air sinuses, and other urgent procedures; and 12) created new virtual educational programs for residents and faculty. Even now, in the steep part of the COVID-19 incidence curve, we are mobilizing more physical space, including converting our regular floors to intensive care units and mobilizing more provider staff to join COVID-19 care teams as necessary.

All of this work has been done by empowered teams, for it is in teamwork that academic departments have the greatest potential to shine. Of course, for teamwork to exist, the team has to be viable, safe, and protected. On March 15, Dr. Peter Slavin, president of Massachusetts General Hospital, spoke on the television program *Meet the Press* and called for a "war-like stance" regarding COVID-19, with a specific ask for a "Manhattan project" to supply PPE and dramatically increased testing for COVID-19 to support healthcare providers in the US and worldwide. COVID-19 has revealed areas of weakness in our healthcare system, particularly with our "just in time" supply chain, that should be rectified in the future. Responding to this call, our health system has formed the Mass General Brigham Center for COVID Innovation, a think tank and incubator to drive practical solutions to the pandemic, including the all-important problems of PPE, ventilators, diagnostics, and therapeutics (see covidinnovation.partners.org).

Physical distancing of our teams, a major COVID-19 mitigation strategy, has significantly altered our usual ways of caring for patients and our education programs. We have adapted with increased virtual interactions in both education and clinical care. One bright spot has been the creation of a daily videoconference "lunchtime lec-

ture" where we have assigned every member of the department (faculty, residents, APPs) to present on a neurosurgical topic. Our medical students, currently unable to pursue their typical clerkship roles, join in. Our daily videoconference is a combination of journal club, operative video teaching, and team briefing, and has become the new way for us to gather and remain connected in common purpose. Even as we have changed the way we teach during the pandemic, our goal is to remain fully committed to the education of the upcoming generation. On the care front, COVID-19–related physical distancing has also likely advanced the cause of telemedicine by many years, propelled by increased patient acceptance of the virtual visit, more facile technology, and reimbursement for such interactions. This trend portends favorably for increased access by underserved communities to specialized neurosurgical care. There should be no retreat from this advance when the COVID-19 crisis is over.

We note our firsthand experience of the importance of network and regional "systemness" in tackling a fast-moving healthcare threat; no single facility, department, or group of providers in any specialty should be left underresourced and outgunned. Observing the looming shortage of N95 masks in our region, Mass General Brigham is deploying a new sterilization capability to allow for reuse of 80,000 N95 masks per day, to be redistributed to all area hospitals regardless of network affiliation. Boston hospitals and local government are also collaborating to stand up a 1000-bed temporary hospital at the Boston Convention Center (the exact location where this year's AANS meeting was to be held). We encourage diverse healthcare systems in proximate geographic regions, now and after COVID-19, to plan and work together as we reboot our clinical, research, and teaching enterprises. Academic departments of neurosurgery can be leaders in building these alliances.

There is a motivation we share, articulated by the founding surgeon of Massachusetts General Hospital and first Harvard Medical School dean, Dr. John Collins Warren, when he noted, "When in distress, every man becomes our neighbor." Neurosurgeons are what Steve Jobs described as "thinker-doers." We feel fortunate to be able to contribute our "thinking" and "doing" talents and energy to the challenge of COVID-19 alongside dedicated doctors, nurses, and allied caregivers across our country. Working together, we can solve this problem.

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