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Residents' Perspective

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"SARS-Ed": Severe Acute Respiratory Syndrome and the Impact on Medical Education

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In the middle of March 2003, an attending staff physician informed me that the weekly grand rounds topic would be SARS. "Will be... Sorry?" When he repeated the word, I realized he was referring to severe acute respiratory syndrome, the new pneumonia in Asia. I teased him for using the acronym, shortening the name to sound both hip and common.

Seven days later, I was hiking around the hospital grounds, searching for an entrance untouched by yellow police tape. Inside the empty building, I walked through silent halls wearing a mask over my primary means of communication, the smell of the material to become both familiar and redolent.

With the return of influenza season, the re-implementation of isolation procedures has induced a posttraumatic stress disorder-like response amongst those who endured the 2003 SARS epidemic. Much has been written regarding the impact of SARS on public health, health care delivery, and occupational safety.¹⁻⁴ However, very little has been written on the impact of SARS on the educational environment of teaching hospitals. On the basis of our experiences

as residents at the University of Toronto during the SARS epidemic, this article will highlight several areas of residency training that were affected by this disease, as well as articulate the atmosphere it created. Our intent is to prompt further discussion regarding the effect of future infectious epidemics on medical education.

In the emergency department (ED), febrile patients were placed in the back rooms, which were under negative pressure, except for the day when a fellow resident noticed that the paper he tucked under the door whooshed back out at us. I wished the glass was not embedded with wire, decreasing one of the only views I had of my patient. After 10 minutes of tedious dressing procedures, I entered the room looking, sounding, and feeling like an astronaut. I could not see the young man before me—the hood had fogged up. I extended my neck as far as I could to gain visual access to the lower left corner of the plastic window, and I saw by his skin that he was African American. Yet no matter how I turned, I could not see his eyes. "Have you noticed... any yellowing of the whites of your eyes lately?" His voice sounded strong, so I wrote NAD on his chart.

Residents provide the bulk of direct patient contact within teaching hospitals. Thus, they are a population inherently at risk of exposure to communicable disease. This is not a novel issue, because emergency medicine residents are exposed to the potential transmission of tuberculosis, hepatitis, and other infectious diseases.⁵⁻⁹ However, there is security in the established means of preventing transmission of these diseases. During the SARS epidemic, especially in the early stages, there was little confirmed information regarding optimal personal protective equipment. Thus, 108 (43%) of 251 cases of probable SARS in Canada were health care workers,¹⁰ which included residents. As physicians contracted SARS and became ill, the role of patient contact for practitioners-in-training was called into question. Medical students were removed from clinical placements, as were nursing and other student health care providers.¹¹ Emergency medicine and other residents continued working.

When Allison was admitted to the SARS ward, we were shocked. We shouldn't have been. As a fourth-year resident in the emergency medicine program, she was specializing in critical care, so naturally she would have supervised the infamous ICU intubation of a SARS patient (and fellow

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physician). She was quarantined on the SARS ward, taking her own temperature and communicating her physical examination findings by means of a bedside phone to the nurse who guarded her door. She was not intubated, and the in-laws she visited days before becoming symptomatic were not infected.

Emergency medicine is a discipline that lends itself best to one-on-one clinical teaching. As EDs were quarantined and other hospitals became overwhelmed with the influx of redirected patients, the time for faculty to teach around a case was severely restricted. As week dragged into week, the garb of goggles, gowns, gloves, caps, booties, and the hated N-95 masks progressively drained faculty and senior residents of the energy required to engage medical students and residents. As friends became sick and physicians found themselves quarantined from families, morale plummeted, stripping enthusiasm for clinical responsibilities, including bedside teaching. All of these factors contributed to a morale in which the teaching environment was sub-optimal. Given the circumstances, it is difficult to imagine how anyone could maintain a productive teaching environment during a sustained epidemic of more than 4 months.

On the first day of my anesthesia rotation, the anesthetist sent the patient back out of the operating room to get his temperature checked; it had been done, the nurse assured us, but not written in the chart. Nerves were frayed, and the anesthetist next door said, "It's from the high ambient CO₂—put the CO₂ detector in your mask, and you'll see." On the fifth day, another anesthetist insisted on absolute SARS precautions, despite the elective nature of the case. Once I passed the tube through the white target, I attached the tubing and put down the laryngoscope—only to be up-braided by a voice from over my shoulder. "You just contaminated the ventilator, and the tape too!" I looked down at the ring of salmon pink cupped in my tainted hand, impressed that this step had become instinctive already. I changed my gloves, as instructed, and with his eyes on my own, the anesthetist leaned over the lax head of the patient to turn on the ventilator. I hadn't perceived the alarm, having been disrupted from the tenuous sequence of my new induction skills. Later, I found a former priest-turned-anesthetist who had worked for many years in Africa; his view of life afforded him peace of mind in these times, and me the ability to learn airway management.

The question is often posed as to how the system continued, when it was overwhelmed to begin with, because ED crowding was already a daily reality.¹²⁻¹⁵ Some experts suspect that the cancellation of elective cases and a decline in walk-ins led to an overall decrease in the

number of patients seen in Toronto EDs during the SARS epidemic.¹⁶ If this was the case, it would offset some of the crowding precipitated by the closure of other EDs in the city. However, this was likely site-dependent, because we suspect that hospitals closer to those with ED closures bore the brunt of redirected patients, whereas more distant centers experienced less impact. Subsequently, medical students and residents at the former sites enjoyed less teaching time than those at the latter hospitals.

We signed in and out every day, lining up to have our temperatures taken. We offered our ears to a probe like fingers to an ink pad. The job changed significantly under the influence of SARS, and I'm not sure I could have stayed if SARS had.

New clinical rotations were delayed in an attempt to diminish intersite contamination when residents changed locales.¹¹ In the end, many rotations were abbreviated or omitted entirely. In an effort to prevent the spread of disease beyond Toronto, out-of-city electives were either not permitted (medical students) or required a quarantine period (residents). The restricted mobility impinged on specialized clinical electives and even mandated a delay in the national residency match.¹⁷

When SARS arrived in Toronto, I was playing neurosurgeon, and the daily shipments of head-injured patients from around the province decreased dramatically, reducing my neurosurgical exposure to the acutely operable or unstable. Some patients would make it part way, before mounting a fever en route, only to be sent back to the referring hospital to await the shifting of their brains.

Learning was also affected in the nonclinical setting. Grand rounds, workshops, seminars, and simulations were either cancelled or greatly diminished in scope. The reduction stemmed from 2 predominant factors. The first was that, to limit cross-contamination between hospital sites, mixing of residents and faculty from a university program with 6 teaching centers was severely retarded. Thus, for a period spanning nearly one third of the academic year, the normal course of educational activities was altered.

I woke up one morning and coughed. Just once. I didn't feel very energetic, and I wondered if I should board the subway to go to work. Having already missed significant training because of the restrictions, I didn't want to miss any more of the rotation. I focused on my breathing in the quiet subway car; during those months in Toronto, all heads would turn on a single cough. When I left the subway, I felt short of breath, and I wondered if I would be the case that brought Toronto to its knees. But on stepping into the fresh air, I realized I had just ascended 30 stairs,

and I recalled the previous late night, hence my lack of energy.

The other factor impinging on nonclinical education involved new administrative roles of emergency medicine faculty. At a municipal and provincial level, numerous emergency medicine faculty were providing leadership and administrative support in detailing and containing the epidemic. With these additional time-sensitive, unanticipated roles, previous faculty commitments to education were impaired.

When I started my ICU rotation in August, one of my patients had "SARS" written on the board under "Diagnosis." "Yeah, but he doesn't have the disease any longer," intoned the ICU fellow. Yet some nurses gowned up, while others did not. I wanted to gown, but I did not want to publicly dress up in my fear. So I avoided the patient for the first week, until I saw that others who cared for him remained healthy.

At an informal level, there were attempts to limit resident exposure to potential SARS patients. The attending staff often facilitated resident learning by seeing the rule-out SARS cases; the resident would see a patient in the time it took the staff physician to gown. In this way, resident exposure to a variety of clinical cases was somewhat maintained.

When the sanctions were finally lifted, I was amazed at our tolerance and endurance. When I put on an N-95 mask now, I smell SARS, but the association is merely of a time of uncertainty, and even a modicum of security, now that we survived it.

Rarely does a month pass without the Toronto media heralding the next plague. Even the most optimistic physician recognizes the high probability of recurrence of infectious epidemics. There are lessons to be learned from the Toronto experience; so far, the emphasis on such lessons relates to the more pressing issues of disease surveillance and containment. Yet, the education of future physicians in the midst of an epidemic is not an issue that we can afford to dismiss. The balance between the educational necessity of direct patient contact and exposure of practitioners-in-training to lethal diseases without established transmission mechanisms will have to be evaluated. From the loss of formal educational sessions to the time required to treat patients in isolation to the disenchantment of altered job descriptions, these factors need to be acknowledged in order to conceive of potential means of mitigation. As emergency physicians, we have the capacity to weather (nearly) any transient storm. Regardless of whether the storms become more frequent or protracted, it would be wise to consider and address the

impact of infectious epidemics on the education of future practitioners of emergency medicine before the next storm arrives.

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