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My Thoughts/My Surgical Practice

Surgeons, plague, and leadership: A historical mantle to carry forward



Sweeping throughout Europe in 1348, the bubonic plague killed an estimated one-third of the population, demolished the agrarian economy, and reconfigured the international political infrastructure for the next several centuries. Guy de Chauliac, known by historians as the “father of western surgery,” practiced amidst the Black Death. Trained in both medicine and surgery in an era when the specialties were in conflict, Guy strove to unite the two fields by providing surgery with a theoretical foundation that elevated it from its association with handicrafts.¹ By 1348, he had achieved significant professional success, exemplified by his position as physician to the Papal Court. Present for the onset of the bubonic plague and the calamitous effects it had on society, he remained to minister to his patients, including Pope Clement VI. Guy eventually contracted the disease, surviving only through “god’s will.” He published extensively on this experience, recording the clinical and cultural consequences of the plague. Through his writings, this surgeon emerged as the contemporary authority on the condition, shaping scientific understanding of bubonic plague and medical responses to it for decades.

Guy epitomizes surgeons who have investigated novel infectious diseases and contributed significant knowledge to their causation, prevention, and treatment. Peter Lowe, a founder of the College of Physicians and Surgeons in Glasgow, drafted the definitive treatise on the plague in Scotland, dying just prior to its completion.² The Great Pox, also known as syphilis, ravaged the European population from the late 15th century onwards. Desperate to clarify its etiology, John Hunter, the father of scientific surgery, injected the purulent discharge from an infected patient’s penis into his own member in an effort to understand the process of transmission and attempt to discriminate it from concomitant gonorrheal infection.³ In another example, when scurvy decimated the crews of sailing ships, James Lind, a British naval surgeon in the end of the 18th century, demonstrated the importance of citrus fruits for preventing and curing the disease. Not only did he resolve a clinical issue, but Lind also pioneered novel research methodology, conducting one of the first examples of a randomized controlled clinical trial.⁴

Cholera raged in Europe and North America throughout the 19th century. It was surgeon John Snow who concluded that it spread through the water supply. By removing the handle from the Broad Street water pump in London, he assisted in developing the modern discipline of epidemiology.⁵ In the United States, typhoid tore through military camps hastily erected to house soldiers in the Spanish American War. US Army Surgeon Walter Reed, collaborating with Victor Vaughn and Edward Shakespeare, determined the unsanitary conditions that promulgated the disease. Reed later

left for Cuba to address the yellow fever epidemic decimating American soldiers. Building on the research of Carlos Finlay, Reed and his team performed a series of controlled experiments to examine various possibilities of transmission. In conducting these tests, he utilized one of the first examples of written informed consents (in English and Spanish), advancing medical ethics along with epidemiology. By 1900, he had concluded that a mosquito transferred the disease, enabling successful public health measures to protect against this lethal virus.⁶

Now once again, a pandemic is enveloping the globe. Although not yet as devastating as the Black Death that confronted Guy de Chauliac, COVID-19 has nevertheless sickened millions and killed over two hundred thousand people worldwide at the time of this writing. We surgeons can learn from our predecessors who lived through earlier epidemics and emulate their example of not just caring for patients but also leading campaigns to understand and manage the disease. National organizations have commendably stepped forward. The American College of Surgeons as well as other surgical societies have provided leadership and guidance regarding the practice of emergency surgery as well as delineating how to manage clinical workflow under present conditions. As an example, the College has launched a program coordinating the distribution of volunteer surgeons to areas of need. Surgery journals are publishing articles to inform the community of the signs and symptoms of the disease, including appropriate management strategies for sickened patients and guidelines regarding elective practice.^{7,8} Active registries are accruing, both nationally and internationally, to examine the impact of surgery in COVID-19 confirmed patients. These studies will most certainly yield important insights into surgical and medical outcomes in affected cohorts (e.g. the UK National Institute for Health Research Global Health Research Institute: [ClinicalTrials.gov](https://clinicaltrials.gov/ct2/show/study/NCT04323644) NCT04323644). Moreover, intensivists including trauma and critical care surgeons are at the forefront of translational studies to understand the biology of the disease, improving both therapeutics and prevention.

What more can we surgeons contribute, particularly in this era of hyper-specialization? How can we move beyond surgery-based projects and expand to the levels of engagement that Guy, Lind, Snow, and Reed exemplified? While Hunter’s example of self-inoculation ought not be replicated, the opportunities that the COVID-19 pandemic presents must be seized to think more broadly and creatively. Immunology-focused transplant labs could pivot towards vaccine research, while those conducting virology or pharmaceutical experiments must redouble their efforts towards identifying and testing novel drug therapies. Similarly, teams examining health disparities should harness this opportunity to

implement innovative initiatives to provide remote care to rural and underserved communities and to redress deep-seated inequities of health care delivery at an international scale, refocusing on the social determinants of health.⁹

Historically, surgeons have led global efforts against pandemics, thus addressing some of humanity's most devastating health challenges. COVID-19 demands we redirect our efforts to follow in this proud tradition.

Declaration of competing InterestCOI

None of the three authors have any conflicts of interest to declare. This material has not published or posted previously.

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