



# A Critical Review from the Perspective of 2 Years Thereafter of the Effectiveness of Revolutionary Changes in a Gastroenterology Division at a Medical School Teaching Hospital due to the Coronavirus Disease-2019 Pandemic

Gastrointestinal Physician Clinical Practice and Emotional Stresses, Gastrointestinal Graduate Medical Education, Gastrointestinal Professional Societies, and Pandemic Control

Mitchell S. Cappell, MD, PhD

## KEYWORDS

- COVID-19 • Coronavirus • SARS • Pandemic • Gastroenterology fellowship
- Academic gastroenterology • Gastroenterology clinical service

## KEY POINTS

- The effectiveness of the revolutionary changes during the COVID-19 pandemic in an academic gastroenterology division (William Beaumont Hospital at Royal Oak, the primary teaching hospital of Oakland University Medical School) were critically reviewed, from the perspective of two years thereafter, in two special articles. This article focuses on changes in GI physician clinical practice, physician emotional stress, GI graduate medical education, GI professional societies, and pandemic control.

*Continued*

---

Funding: None.

Gastroenterology Service, Department of Medicine, Aleda E. Lutz VA Medical Center at Saginaw, Building 1, Room 3212, 1500 Weiss Street, Saginaw, MI 48602, USA

E-mail address: [mitchell.cappell@va.gov](mailto:mitchell.cappell@va.gov)

Gastroenterol Clin N Am 52 (2023) 235–259

<https://doi.org/10.1016/j.gtc.2022.12.004>

0889-8553/23/Published by Elsevier Inc.

[gastro.theclinics.com](http://gastro.theclinics.com)

*Continued*

- Most of the pandemic-induced revolutionary changes were beneficial, while some were disadvantageous.
- Beneficial changes during severe pandemic included: temporarily pulling GI fellows to supervise exclusively COVID-19 patient wards; endoscopies reduced to perform only emergent/urgent cases; change from “live” to “virtual” lectures and meetings; fellows promoted/graduated on time despite missing minor requirements due to pandemic; GI clinic reduced by 50%; GI fellowship program director contacted GI fellows biweekly to monitor their psychological stress; and ACGME cancelled annual fellowship survey in 2020. These profound, beneficial GI-Divisional changes maximized clinical resources devoted to pandemic and minimized risk of infection transmission.
- Disadvantageous changes: Huge, hospital revenue shortfall during pandemic exacerbated by Hospital’s paying \$84.5 million-fine to government for Stark-Law/anti-kickback violations; hospital employee terminations during pandemic; and reduced GI fellowship support staff. Replacement of long-term academic anesthesiology group by low-cost anesthesiology group and many resignations of GI nurses (after hospital prevented nursing unionization) caused severe personnel shortages causing about 50% reduction in GI endoscopies and severe endoscopy delays. Numerous highly respected, elderly, senior leaders (e.g., chief medical officer, department chairs) terminated without cause.
- Disadvantageous, massive, cost-cutting degraded this academic institution while offering hospital for sale to about 100 hospital suiters, until eventually “selling” hospital to Spectrum Health, without faculty input.

#### Abbreviations

COVID-19	Coronavirus disease 2019
PMC	PubMed Central
US	United States
mRNA	messenger ribonucleic acid
GI	gastrointestinal
GME	Graduate Medical Education
FDA	Food and Drug Administration
ACGME	Accreditation Council for Graduate Medical Education
RRC	Residency Review Committee
ICU	intensive care unit
IRB	Institutional Review Board
VA	Veterans Administration

## INTRODUCTION

The spending by America and Western Europe and to a lesser extent but still importantly other countries and international organizations, especially the World Health Organization, have been enormous encompassing an astronomical total cumulative spending of 4,600,000,000,000.00 dollars just by the US Government (!)<sup>1</sup> alone. Likewise, the basic and clinical research expended by academia, pharma, and organizations including the Centers for Disease Control, National Institutes of Health (NIH), and World Health Organization have, likewise, been enormous encompassing 309,558 (!) published articles listed in PubMed and 434,877 published articles listed in PMC on the pandemic from January 2020 to November 3, 2022.<sup>2</sup> Indeed, I liken this worldwide

response to a cytokine storm that represents an overwhelming immunologic defensive response against an invading virus, such as coronavirus disease-2019 (COVID-19). What have Western societies and the entirety of civilization obtained from their extraordinary investment in the capitol, resources, scientific research, and clinical investigation?

Extraordinary achievements, including in just 2 years combating the pandemic by developing: (1) diagnostic tests; (2) relatively effective vaccines using novel mRNA technologies to both prevent and mitigate infection; (3) improved general therapy to reduce mortality (eg, improved management of respiratory decompensation); (4) reduced contagiousness by instituting effective infection control measures (eg, N95 face masks); and (5) moderately effective therapy to improve infection prognosis (eg, Plaxovid). Other notable achievements include elucidating its infectious pathophysiology, clinical presentation, and natural history. These summative achievements gloss over interim fitful and incremental advancements, typical of scientific progress, which even included some interim mishaps.

None the less, the cumulative progress is remarkable. Just the development of relatively effective vaccines, using novel mRNA technology, has saved an estimated 14,600,000 lives worldwide from January 2020 to December 2021, exclusive of China (which has not been well analyzed in terms of lives saved). This benefit is crudely calculated by dividing US government expenditures per world-wide life saved as \$328,571.43,<sup>3</sup> or by a more precise mathematical model, using different costs and lives saved estimates, of a mean US \$40,800 (range: US \$7400 to \$81,500) per life saved.<sup>4</sup> These cost estimates of \$328,571 or \$40,800 are comparable to that of lives saved from numerous universally accepted medical interventions, such as triaging critically ill patients to intensive care units (ICUs)<sup>37</sup>. Moreover, the cost per life saved is reduced by factoring in the benefits of increasing worker productivity due to the mitigation of workers' COVID-19 infections. I salute these accomplishments by the American government, NIH, American pharma, and academia, in partnership with other Western democracies, international organizations, and institutions.

In the second part of the study, we analyze the nitty-gritty of the advances in the management of the pandemic by focusing on academic and clinical gastroenterology in specific and comprehensive detail. I believe the reported experience in clinical, academic, and professional organizations in gastroenterology by focusing on one tertiary care Hospital and its affiliated medical school can (1) serve as a microcosm of the revolutionary changes to mobilize academia, hospitals, and pharma against this virus to effectively combat it, (2) lay out a road map to combat, I believe, the almost inevitable next pandemic, and (3) use this experience to learn from mistakes done during this pandemic to prepare for the next pandemic.

This work has been divided into two related parts because of its extraordinary length and its covering of two different but related aspects of the Hospital and Medical School responses to the pandemic. For the convenience of the readership and to reduce redundancy from overlapping text in the two parts, the Introduction is much abbreviated in this second part.

## METHODS

I wrote a comprehensive and detailed analysis of the changes brought about by the pandemic in Beaumont Hospital and the Medical School that was published nearly two years ago in *Dig Dis Sci*.<sup>21</sup> The previous work prospectively and continuously collected data from March 2020-May 2021 (mostly March-September 2020) that reported the revolutionary changes in GI at this clinical and academic institution, the

primary teaching hospital of Oakland-University-William-Beaumont-School-of-Medicine since the medical school was founded 12 years ago. The previous work was envisioned as a microcosm of the reorganization throughout academic and clinical GI and was proposed as a representative model for academic GI divisions in America. The current companion works critically analyze the effectiveness of the previously published revolutionary changes of the GI division mostly enacted from March-September 2020, from the perspective of some two years later. The first critical review conveniently precedes this second one.<sup>38</sup> While the changes are mostly effective, some changes are questionably effective, and occasionally changes are ineffective. This work consists of two closely related but different works. To avoid redundancy, the Methods section is not repeated in this related article and the reader is referred to the other related article to view the complete Methods section.

### ***Consequences of Pandemic on Income of Hospital and Gastrointestinal Practitioners***

---

1. Pandemic onset caused American unemployment to soar to 14.8%) and a massive and the gross domestic product to sharply decline by 31.4% (April to June 2020), with temporary business closures due to stay-at-home policies of consumers.<sup>39</sup> In response to this economic contraction, the US Federal Reserve Bank drastically lowered interest rates to stimulate the economy, and the federal government passed four large stimulus packages (early 2020 to early 2021) to help revive the economy and relieve economic pressures on families and businesses impacted by the pandemic.<sup>5</sup> These interventions caused a moderate, gradual economic recovery, reflected by improvements in GDP and decreasing unemployment (July 2020 to May 2021).

*Opinion:* I personally experienced the economic effects of the initial pandemic, by buying a large house at a deeply discounted price because of the absence of buyers at the pandemic onset and I purchased a mortgage at an extremely low fixed-interest rate because of the Federal Reserve Bank's accommodative monetary policy at the pandemic onset. These accommodative Federal Reserve Bank were designed to settle the economy and prevent a sharp economic contraction due to the pandemic.

2. The initial pandemic surge resulted in >25% of Hospital beds filled with COVID-19 patients, but the overall census became <55% of capacity, reduced from the pre-pandemic baseline census of >90% of hospital bed capacity due to plunging elective admissions for patients with illnesses other than COVID-19 infection. These two effects peaked in May 2020. To accommodate the surge of COVID-19-infected patients, the Hospital nearly ceased performing elective surgery or GI endoscopy; the number of surgeries declined by >90%, and the number of GI endoscopies declined by 96% at its nadir from the pre-pandemic baseline. Indeed, most hospital operating rooms from March to May 2020 were transformed into ICUs to accommodate the explosive growth of patients requiring ICU beds after undergoing endotracheal intubation and mechanical ventilation for COVID-19 pneumonia. The overall decrease in hospital admissions, surgeries, ambulatory procedures, and emergency room visits together with increased hospital expenses incurred from purchasing massive quantities of personal protective equipment (PPE), which rose sixfold in price during the COVID-19 pandemic onset, and increased purchases of mechanical ventilators abruptly caused a 278.4 million dollar deficit for the January to March 2020 quarter, compared with a profit of 129.1 million dollars during the same quarter in 2019.<sup>6</sup> In March and April 2020, the federal government granted the Hospital a COVID-19 stimulus package of 75 million

dollars, to partly compensate the Hospital for this loss. The cumulative deficit in the next several fiscal quarters climbed much higher to many hundred million dollars,<sup>7,8</sup> but the Hospital received altogether four extraordinary bonus payments from the federal government totaling about 500 million dollars via Medicare and Medicaid during the pandemic (March 2020 through early 2021).

*Opinion:* The pandemic's onset greatly affected hospital finances, as occurred in this Hospital.

3. Owing to this large Hospital deficit early in the pandemic, the Hospital on April 21, 2020, terminated 450 hospital employees and temporarily furloughed 2,500 (>7% of the employees, mostly hospital administrative staff, other employees not directly performing patient care, and employees whose clinical departments were temporarily closed due to the pandemic, such as cardiac rehabilitation.<sup>9–11</sup> Additionally, Beaumont Hospital at Wayne, which had been transformed in March 2020 into an exclusively COVID-19 patient hospital, closed indefinitely on April 24, 2020. Other hospitals in the Detroit metropolitan area also furloughed or terminated hospital staff.<sup>12</sup>

*Opinion:* The Hospital selectively terminated senior, older, highly accomplished, and distinguished academicians with outstanding reputations (approximately June 2021 to current), including the highest and most senior Hospital-employed physician who was a well-known and highly regarded academic researcher with an outstanding curriculum vitae. The Hospital abruptly terminated several other highly distinguished and senior clinical leaders without cause. The hospital replaced these highly accomplished leaders with attendings which had much inferior academic credentials and who earned significantly lower salaries.

4. Division permanently terminated one half-time divisional administrative secretary and temporarily furloughed one 0.4 full-time equivalents GI fellowship program manager/coordinator, who represented nearly all the support staff of the Division. The GI endoscopy unit furloughed seven (10% of) GI endoscopy nurses and terminated all but one of the GI endoscopy schedulers. Furloughs went into effect immediately. Furloughed employees lost their salaries for 60 days, but the hospital maintained their medical insurance during the furlough, and these employees were allowed to apply for and receive unemployment insurance during their furloughs. Furloughed employees were rehired by June 30, 2020. Other hospital systems in the greater metropolitan Detroit area, including Detroit Medical Center, Trinity Health Michigan, and the Henry Ford Health System, announced similar employee furloughs or terminations in April 2020 because of similar financial problems.<sup>12</sup>
5. In October 2019, just a few months before the pandemic began, the eight Beaumont Hospitals drastically reduced the number of employed librarians and library technicians. After the pandemic onset, all the remaining librarians/library technicians were furloughed without pay (March to September 1, 2020). During this period the hospital library at Royal Oak remained open to physicians and other health care professionals *sans* librarians. Librarian assistance was subsequently furnished virtually, which proved highly inconvenient and cumbersome for clinicians and researchers due to the lack of live, face-to-face interactions with librarians. The five remaining librarians returned physically to work in the Hospital library approximately in January 2021.

*Opinion:* This cost-cutting measure damaged the educational, clinical, and research missions of the Medical School and Hospital but saved little money due to the small costs of the librarians' salaries compared with the overall Hospital budget.

6. The Hospital administration expended considerable Hospital funds, normally expected to fund patient care, to prevent the unionization of Hospital nurses. This effort successfully blocked their unionization. The Hospital also campaigned hard to successfully block the unionization of house staff. Beginning in December 2020, the Hospital encountered severe difficulties in recruiting new endoscopy nurses to replace the endoscopy nurses who left during the pandemic surge.

*Opinion:* I believe this action against the unionization of nurses caused many GI endoscopy nurses to leave the Hospital which created a large shortfall in the GI endoscopy nursing staff that was required to maintain staffing for the GI endoscopy suite and contributed to long delays in scheduling GI endoscopies.

7. The Hospital administration terminated a longstanding (20-years-long) exclusive contract with a highly regarded academic anesthesiology group (December 31, 2020), and hired another, nonacademic anesthesiology group to save costs (effective January 1, 2021). However, about half of the affiliated anesthesiologists left when the anesthesiology group contract was terminated, which left the Hospital very short staffed with anesthesiologists during the pandemic crisis. Also, about half of the nurse-anesthetists employed by the Hospital left when the previous academic anesthesiology group left.

*Opinion:* This change in the anesthesiology group resulted in a sustained severe shortage of anesthesiologists required to provision anesthesia services for GI endoscopies that compelled frequent cancelations of GI endoscopies (January to April 2021). The anesthesiology group termination contributed to the successful unionization of nurse-anesthetists at the Hospital.

8. The income of GI practitioners in private practice abruptly plummeted due to greatly decreased volume of GI endoscopies (reduced at the nadir to only 4% of the pre-pandemic baseline) performed at the Hospital and decreasing GI office visits (April 2020). For example, my crude, oral survey of five GI colleagues in private practice affiliated with the Hospital revealed that their revenues declined by >80% during the pandemic peak in late April 2020. Similarly, in a poll conducted in April 2020, 97% of dentists reported that their offices were closed, except for dental emergencies, and reported that their monthly income plummeted by  $\geq 95\%$ .<sup>13</sup> GI specialists and dentists may share high risks of contracting COVID-19 infection from examining and working within oral cavities of COVID-19-infected patients during EGD or dental work, respectively, and contrariwise may share high risks of transmitting infection from themselves to their patients via close oral contact. The surge temporarily threatened the economic viability of GIs in private practice or employed by the Hospital as well as undermined GI training, education, and research due to the Hospital's financial crisis. Fortunately, the plunge in GI income slowly and gradually reversed starting July 2020, with a substantial resumption of GI endoscopy from <4% of the baseline rate to approximately 50% of the baseline rate by November 2020. Widespread vaccination of the American population against COVID-19 infection in 2021 is bringing recovery to the general American economy and to the GI market.
9. GI attendings in private practice received a bonus (March to May 2020) from the federal government amounting to several percent of their compensation in 2019 from Medicaid and Medicare, based on their individual 2019 tax returns. This bonus compensated GI physicians for their large losses in clinical income during the pandemic surge (March to May 2020).

10. During the pandemic in 2020, the Hospital network raised the minimum wage of employees to \$15.00/h. This constituted a large raise for the lowest-paid hospital workers (custodial staff) who had previously earned only \$11.00 per hour. The rationale for this raise was to compensate workers who worked under stress during the pandemic. This raise did not affect the salaries of clinical employees in the Division who already earned more than the new minimum wage.

*Opinion:* I believe this salary raise was motivated by market forces: the wages of the lowest-paid Hospital workers were raised due to the limited supply and increased demand for them during the pandemic. Similar raises occurred for the lowest-paid workers in many industries.

11. Hospital residents and fellows, including GI Fellows, successfully petitioned Hospital administration, with unanimous support from the institutional GME Committee administrators, to receive a modest bonus of \$1,000.00 (in June 2020) per physician to compensate them for their extra clinical workload and increased health risks from the pandemic onset (March to May 2020). House staff requested this bonus because medical and GI attendings in private practice received several clinical bonuses from the federal government and the Hospital received several large clinical bonus packages from the federal government because of the pandemic. In November 2020, the Hospital administration granted another \$1,000.00 bonus to all residents and fellows, including GI fellows, to recognize their continuing clinical work due to the on-going pandemic.<sup>14</sup> This time, the Hospital administration also granted a \$1,000.00 clinical bonus to all full-time-employed, medical attendings for their extra work during the pandemic.

*Opinion:* Physicians employed full-time by the Hospital felt justified in receiving this symbolic bonus because they had worked extra hard under the stress of the pandemic and the Hospital had been awarded approximately 500 million dollars in cumulative bonuses by the federal government during the pandemic.

12. The Hospital administration provided all clinical employees one complementary lunch per week for four consecutive weeks in appreciation of their hard clinical work during the pandemic (April to May 2021).

*Opinion:* I believe this gesture was politically motivated because of the low morale of hospital employees due to rumors circulating that the hospital was being offered or sold to other medical institutions. The selling of the hospital became public a few months later and was subsequently consummated. This symbolic hospital gesture did not achieve its aim of improving the morale of hospital-employed physicians.

13. Hospital administration approved voluntary annual hospital contributions amounting to up to six thousand dollars per year per hospital-employed physician to their 401K retirement fund for 2020 and 2021. Most years the Hospital funded this voluntary contribution but in some years the Hospital did not fund this annual contribution due to budgetary shortfalls.

*Opinion:* This contribution in 2020 and 2021 likely reflected that the Hospital administration felt that the physicians deserved this voluntary contribution for their hard work during the pandemic.

### ***Infection Control Measures with Particular Focus on Gastrointestinal Endoscopy***

---

1. Cleaning solutions and cleansing regimens for GI endoscopy equipment between endoscopy cases changed early during the pandemic to provide longer cleaning

sessions with more intensely viricidal chemicals. This change lengthened turnover times between GI endoscopies and thereby diminished by 10% the maximal number of endoscopy cases that could be accommodated per endoscopy room per day (April 2020 to current). As aforementioned, the number of cases per day was much more severely decreased due to shortages of endoscopy nurses and anesthesiologists.

2. To reduce COVID-19 infections, the Hospital installed new soap dispensers containing viricidal chemicals designed to kill 99.9% of the COVID-19 virus, next to all sinks in hospital bathrooms, lavatory rooms, and kitchens (April 2020 to current).
3. Hospital changed the type of disposable gloves available in the endoscopy suite and other procedure rooms (such as the cardiac catheter laboratory) to thicker gloves to reduce the risk of COVID-19 virus transmission by hand contact to endoscopists or other proceduralists from patients. The Hospital also stocked the endoscopy suite and other interventional suites with disposable face masks and safety goggles to protect the eyes of endoscopists or other proceduralists from being contaminated by fluid spraying into their eyes during procedures.
4. From April to May 2020, hospital physicians were encouraged to change daily into freshly laundered surgical scrubs rather than wear their normal civilian attire within the hospital.

*Opinion:* This represented a radical shift in Hospital policy which previously and explicitly forbade physicians from wearing surgical scrubs outside the operating room, endoscopy suite, cardiac catheter suite, or interventional radiology areas.

5. Soon after the pandemic onset, the hospital endoscopy suite transitioned from flimsy, single-use, disposable surgical gowns to thick, impermeable, plastic gowns for endoscopy personnel that were laundered after each use to reduce transmission of COVID-19 infection at endoscopy. On approximately April 1, 2021, the thick plastic gowns were replaced by cheap, flimsy, single-use, and disposable endoscopy aprons/gowns that did not completely cover the torso of endoscopy personnel during endoscopy, apparently as a cost-saving measure.

*Opinion:* This policy change was not discussed with me or other GI attendings performing GI endoscopy. We were unhappy about this policy change and that it was unfortunately effected without notifying GI attendings in advance.

6. The Hospital had an acute shortage of N95 masks at the pandemic onset requiring health care workers in the endoscopy suite to reuse face masks for an entire day after daily sterilization. This scarcity was partly relieved by substituting the much cheaper K95 masks, made in China, for N95 masks. With time, highly effective N95 face masks became widely available to Hospital physicians (June 2020 to current). In July 2020, all hospital patients and visitors were required to wear face masks to cover their mouths and nose while in the hospital. The Hospital supplied cheap complementary face masks to hospital patients and visitors.

*Opinion:* I believe the K95 masks were almost as effective as N95 masks and were much cheaper. The reuse of face masks after sterilization after one day of use was an abomination that was necessitated by an acute shortage of face masks during the pandemic onset that was later corrected.

7. The Hospital started offering employed house staff, including GI fellows and attendings, and affiliated medical attendings vaccination against COVID-19 infection, using the Pfizer-BioN-Tech vaccine starting on December 13, 2020, soon after emergency approval of the vaccine was obtained from the FDA (Food and Drug



Administration). I and all the GI fellows received our first vaccine dose by December 31, 2020, and our second dose by January 21, 2021. The public started receiving vaccines soon thereafter, with prioritization according to their risk factors, such as age >65 years. Everybody was offered booster shots soon thereafter. After a few months, the public was able to receive vaccines at walk-in clinics without scheduled appointments and with minimal waiting times.<sup>15</sup> Vaccines are now tailored for effectiveness against emerging mutant COVID-19 strains, such as the Omicron variant. Offering universal vaccination of adults for free was a wise governmental decision and public health measure that saved many lives.

*Opinion:* The manufacture and availability of a relatively effective vaccine constitutes a great accomplishment of modern medicine that saved many millions of lives in America and worldwide. Prioritization of vaccination of physicians appears justified because physicians willingly accepted increased risks of contracting COVID-19 infection, by voluntarily treating COVID-19-infected patients.

8. COVID-19 testing became progressively more available, faster, and more accurate (April 2020 to current).

#### ***Changes in Ancillary Hospital Services due to the Pandemic***

---

1. Hospital cafeteria changed to offer disposable plastic utensils (including silverware, plates, and trays) during the pandemic to reduce risks of COVID-19 transmission (April 2020 to current).

*Opinion:* This represented a radical change in Hospital policy because the Hospital had previously instituted using metal utensils and discontinued using disposable plasticware to protect the environment. This reminds me of an old Jewish proverb, “man plans und der Heibishter *lacht*” (Yiddish for “and God laughs”).

2. The Hospital cafeteria erected plastic (Lucite) barriers between cafeteria customers and food servers to reduce risks of COVID-19 virus transmission.
3. Patients were reluctant to present to the Hospital emergency department with diseases or disorders other than COVID-19 infection due to fears of contracting COVID-19 infection while in the Hospital for other reasons (March 2020 to current).

*Opinion:* This phenomenon was suspected of causing higher mortality of diseases unrelated to COVID-19 infection, such as ischemic cardiovascular disease and systemic hypertension during the pandemic due to the failure of patients to present for preventive cardiac care.<sup>16,17</sup>

4. Before the pandemic, the Hospital during normal business hours had one hospital-ity clerk and no security guards manning major hospital entrances (except for the emergency room entrance which always maintained tight security) and had no hospital personnel guarding minor hospital entrances. With the pandemic onset, the Hospital initially closed the main (East) entrance; closed minor, unguarded, entrances; and maintained enhanced security, with two hospitality clerks and four other personnel, mostly previously furloughed rehabilitation technicians, manning major entrances from March to June 2020. All hospital employees, including GI employees, had to sign a form upon entering the hospital daily for work declaring that they were healthy and free of suspected symptoms of COVID-19 infection. From March to July 2020 all patient visitors, whether visiting patients with COVID-19 infection or not, were barred entry to the hospital to reduce infection transmission. Subsequently, hospital clerks dispensed antiviral cleaning solutions to hospital employees and hospital visitors to clean and disinfect their hands upon entering the

Hospital. Enhanced security was gradually reduced starting in August 2020, with security eventually reduced to one or two clerks at all major entrances due to decreasing concern about morbidity and mortality from COVID-19 infection.

*Opinion:* Enhanced security was reasonable to protect Hospital patients and their visitors from contracting COVID-19 infection.

5. The Hospital added a module consisting of 12 slides (March to May 2021) on general medical knowledge about COVID-19 infection that was mandatory for all Hospital-affiliated physicians. The slides included COVID-19 infection symptoms, signs, laboratory abnormalities, epidemiology, diagnostic testing, treatment, and vaccination. This teaching module was presented virtually, by Internet, with slides and brief video presentations, and with post-module multiple choice questions graded automatically by computer by the Internet.

*Opinion:* This mandatory module was brief and appropriate in view of the importance of the pandemic.

### ***Reduction of Gastrointestinal Physician Stress During the Pandemic***

---

1. Medical house staff working at the Hospital contracted COVID-19 Infection at a moderately higher rate than the public experienced in the Detroit area (March to June 2020). House staff generally had asymptomatic or mild infections attributed to the relative youthfulness of house staff. The GI attendings and GI fellows had a similar rate of contracting COVID-19 infection (March to June 2020).
2. GI fellows were highly susceptible to emotional stress from risks of contracting COVID-19 infection from infected patients while working as medical attendings on medical wards exclusively treating COVID-19-infected patients (April-May 2020). Increased stress of health care workers due to the pandemic was documented for general physicians.<sup>18</sup>

*Opinion:* As GI fellowship program director, I individually contacted all GI fellows twice weekly by telephone to discuss their emotional state and perceived workload burden to support their morale and psychological health (April and May 2020). Starting June 1, 2020, my intense engagement with GI fellows as program director reverted to baseline as the work rotations for GI fellows returned to baseline (without their functioning as supervisory medical attendings on exclusively COVID-19 wards). GI fellows, indeed, recommended one change in their workload schedule which I implemented without diminishing the quality of patient care. The original GI fellow schedule for April to May 2020 had one GI fellow on-call covering the GI service and another GI fellow on-call supervising a medical ward for COVID-19-infected patients. At the GI fellows' request, I modified the on-call schedule to have one GI fellow cover both of these on-call services. All the GI fellows were delighted to have one GI fellow working moderately hard covering the two services on-call, rather than having two GI fellows, each working less hard, cover only one on-call service. With gradually decreasing pandemic mortality and severity of infection,<sup>19</sup> GI fellows should experience substantially less psychological stress from the pandemic. .

3. To reduce work-related stress and risks to endoscopy staff during the COVID-19 surge, inpatient endoscopies for elective indications were postponed for at least several weeks to be performed as outpatients after patient discharge. Also, GI fellows performed mildly delayed GI consultations on COVID-19-infected patients due to their overwhelming clinical load. Medical attendings and house staff quickly complained in five cases about these two issues during the first twenty days of the

pandemic (March 2020). This rate of complaints was tenfold more than the baseline rate of about five complaints annually before the pandemic! Moreover, these complaints during the early pandemic were lodged to the Chair of Medicine or GME administrators rather than within the Division (chief of GI or GI fellowship program director), as had usually occurred previously.

*Opinion:* I advised GI fellows and GI attendings to proactively engage medical house staff and attendings when postponing GI endoscopies in patients with COVID-19 infection to prevent such complaints. I advised medical residents and medical attendings about the GI policy of postponing elective GI endoscopies. These two types of complaints rapidly abated; the high rate of complains during the first 20 days of the pandemic reverted to the baseline rate of about five complaints annually, thereafter. This reduction was attributed to less volume of COVID-19 patients as their rate hospitalization decreased and more understanding by medical attendings and house staff of the difficult circumstances encountered by GI fellows due to the pandemic.

### ***Evaluation of Gastrointestinal Fellows***

---

1. Supervisory GI attendings evaluate GI fellows monthly using a somewhat lengthy, comprehensive, computerized questionnaire involving seven medical competencies plus an overall performance evaluation. During the pandemic surge, I, as GI fellowship program director, replaced these time-consuming monthly GI attending evaluation forms with a highly abbreviated form asking only two questions requiring only yes or no answers and that took only a moment for a GI attending to complete per evaluation described under heading 2 below. I then contacted key faculty by telephone if they had problems about individual GI fellows. Monthly attending evaluation forms reverted to the traditional, somewhat lengthy, monthly evaluation forms starting June 1, 2020.

*Opinion:* No GI supervisory attendings completed the standard detailed monthly GI fellow evaluation forms on time during the pandemic surge (0 forms completed out of 18 submitted to me by the GI attendings from March to May 2020) because the GI attendings were overwhelmed by their clinical work during the pandemic surge. After I retroactively revised the evaluation forms for March to May 2020 in June 2020, the GI attendings promptly completed and submitted the greatly abbreviated evaluation forms.

2. Normally the six key GI faculty met quarterly face-to-face to review the clinical and academic progress of the six GI fellows, but the April 2020 quarterly meeting was canceled and replaced by only two brief questions sent by email by me as program director to all the 6 key faculty (requiring only yes or no answers). The questions asked whether individual fellows had (1) experienced significant problems, and (2) had satisfactorily progressed toward promotion/graduation during the prior quarter. I then contacted key faculty by telephone if they had problems about individual GI fellows. Regularly scheduled face-to-face quarterly GI key faculty meetings resumed in June 2020, with about half of the GI faculty committee members present virtually and about half present physically at the meeting.

*Opinion:* I instituted the abbreviated and simplified quarterly key faculty evaluations (April 2020) as an emergency measure during the height of the pandemic surge.

3. Annual Accreditation Council for Graduate Medical Education (ACGME) and National Board of Medical Examiners annual evaluations of all six GI fellows maintained fully and on time without delays despite pandemic (June 2020). The

required evaluation forms were maintained complete and without abbreviation despite the pandemic to fully evaluate the GI fellows.

*Opinion:* I wholeheartedly agree with the decision to have these forms completed on time and in full to not delay promotions or graduations of GI fellows and not delay graduating GI fellows from eligibility to sit for the GI board examination, and to have such critical decisions about GI fellow graduations or promotions rendered on a complete and unabbreviated evaluation. Similar actions were designed to prevent medical students' graduation from being delayed for one year due to the pandemic (see Discussion).

4. The GI Division traditionally celebrates a graduation party to honor graduating GI fellows and their spouses (or significant others) attended by GI physician assistants, secretaries, program coordinator/manager, fellowship program director, Chief of GI, and voluntary and full-time GI attendings. From 2006 to 2019 the graduation party was always held at a local restaurant and the party costs were paid by a philanthropic grant donated to the Division. In June 2020, the graduation party was held virtually rather than physically. To simulate the traditional party experience, each graduating fellow ordered two fully catered takeout dinners which were delivered to their home from a local restaurant of their choice and were paid for by the Division. The party was held remotely with partygoers connected by telephone conference call. GI fellows, including the graduating GI fellows, key GI faculty, and the Program Director spoke at the virtual party via telephone conference calls. The day after the virtual party, the two graduating GI fellows received their diplomas and graduation gifts in person from the GI faculty. The annual GI graduation party (June 2021) was held physically at a local restaurant. Aside from the GI divisional party, the Hospital traditionally celebrated a hospital-wide graduation party and awards ceremony every June for all graduating house staff in all divisions and departments. This celebration was canceled in June 2020 because of the pandemic.

*Opinion:* Although everyone appreciated the virtual GI graduation party in 2020, especially the graduating GI fellows, it lacked the camaraderie, spontaneity, and emotional satisfaction of a "live" graduation party. Nevertheless, it was the best that could be accomplished under the pandemic circumstances.

5. For the last 15 years before the pandemic, the Division had celebrated a holiday party around the Christmas and New Year holidays at a local restaurant, with the party funded by the Division. In December 2020 the annual party did not formally occur because of the pandemic, but it was replaced by a small informal and unofficial gathering of some faculty and GI fellows to celebrate the Holidays (December 2020).
6. The medical school traditionally celebrated the following ceremonies or parties annually: a white coat party for medical students entering the clinical wards, a party on match day when fourth-year medical students are notified of their matches with residency programs, and a graduation convocation and party in which graduating medical students receive their diplomas and in which deserving medical students and faculty receive awards. All these celebrations were changed from physical to virtual in 2020 and 2021.

*Opinion:* All these ceremonies felt much less celebratory as virtual rather than live and face-to-face ceremonies but were the best that could be accomplished under the circumstances of the pandemic.

**Graduate Medical Education, Gastrointestinal Research, and Gastrointestinal and Hepatology Professional Societies**

---

1. During the pandemic surge (April to June 2020), committee meetings of Hospital GME administrators with program directors and representative house officers were changed from monthly to weekly to quickly adapt to the rapidly changing needs of residency and fellowship trainees and their patients due to the pandemic surge and were changed from face-to-face to virtual meetings to reduce pandemic exposure.

*Opinion:* This increased frequency of committee meetings was necessitated by the rapidly changing circumstances of patient care due to the pandemic.

2. The Hospital, in collaboration with the Medical School, traditionally held an education week annually in May to recognize house officers who present posters or brief podium talks based on their clinical research projects conducted during the prior academic year, to disseminate their research, and to compete for monetary prizes based on the clinical importance and quality of their research presentations. The education week also featured a nationally known visiting professor who presented several lectures on academic medicine, which were endowed by a philanthropic grant. Annual education week meetings were always held publicly, live, and face-to-face in conference rooms or assembly halls before the pandemic. The annual education week was extremely limited in May 2020 due to the pandemic, with only a few research posters, presented virtually via the Internet, to reduce pandemic exposure. Monetary prizes were not awarded in 2020 and podium talks and lectures by a visiting professor were canceled in 2020. The education week was, however, reinstated fully in May 2021, including awarding prizes for the best research papers authored by residents and fellows. Research abstracts or talks were presented only virtually with no podium or other physical research talks, but the lectures by an invited visiting professor were fully reinstated and presented live and physically in an auditorium and also streamed live virtually by the Internet.

*Opinion:* It was good to see some recovery of the educational week activities as the pandemic crisis eased in 2021.

3. The Hospital in collaboration with the Medical School publishes annually a comprehensive compilation of scholarly activities, including publications (original articles, reviews, and case reports) published in peer-reviewed journals, articles in books, abstracts presented orally or as posters at national or international professional meetings, and invited talks or presentations at academic hospitals during the prior academic year for all residents, fellows, clinical attendings, and research faculty in all Divisions and Departments at all Beaumont Network Hospitals. The annual compilation of scholarly achievements for the academic year of 2019 was extremely delayed (until December 2020) and this compilation was only published virtually, without publication as a physical book, as had occurred in previous years. Publication of the annual 2020 scholarly achievements was published soon after the normally expected date (June 2021) with minor delays because of the declining pandemic impact and was disseminated virtually and was also not physically published.
4. The American Gastroenterology Association normally holds an annual in-service examination for GI fellows that evaluates their cognitive skills in GI and hepatology via a 3-h-long examination using multiple choice questions in the fields of hepatology, esophagus, stomach, small bowel, colon, hepatobiliary tree, pancreas, and GI

endoscopy. The grades of individual GI fellows are compared with that of their peers, stratified according to fellowship year of training. Normally a proctor is physically present in the room to proctor test-takers taking the test by computer. This annual examination provides GI fellows a valuable service by indicating how they compare with their peers in each individual subject to identify topics in which they are comparatively weak and may want to study further for the Board examination. The annual examination was not postponed but was changed from physical proctoring to remote proctoring of the computerized examinations due to the pandemic (March 2020 and March 2021). It was held virtually by computer by Internet, as in previous years, without any changes required because of the pandemic except for the remote proctoring.

5. The major annual GI national/international professional conventions in 2020 were all scheduled as physical events in specific cities, including Digestive Disease Week sponsored by the American Gastroenterology Association and American Society for Gastrointestinal Endoscopy scheduled for May 2020 in Chicago, Illinois; American College of Gastroenterology scheduled for October 2020 in Memphis, Tennessee; and American Association for the Study of Liver Diseases scheduled for November 2020 in Boston, Massachusetts. These conventions traditionally were massive affairs, sometimes exceeding 10,000 participants and involving hundreds of commercial exhibitors. These conventions were, however, all changed to virtual meetings conducted via the Internet in 2020 to reduce transmission of COVID-19 infection in crowded convention halls.

*Opinion:* The change to virtual meetings saved conventioners time and money by avoiding the costs of round-trip flights to the host city and local lodging. The author, however, feels significant loss from the absence of physical meetings due to the loss of professional camaraderie and interactions between speakers, researchers, exhibitors, and physicians. In 2021, the Digestive Week Convention was also held entirely virtually, rather than as a physical meeting.<sup>20</sup>

6. Program managers, including the GI fellowship program manager, were furloughed (March to May 2020), and then instructed to work virtually from home (June 2020 to June 2021) to decrease their exposure to COVID-19 infection from the pandemic, and instructed to perform their duties by telephone or Internet.

*Opinion:* This policy change mildly decreased the program manager's efficiency but its effect was mitigated by program managers still coming to the hospital physically to occasionally attend critical meetings.

7. The ACGME and RRC normally comprehensively annually survey by Internet all six GI fellows at the Hospital with 30 questions about the academic and clinical quality of the fellowship program and annually survey all six key GI faculty at the Hospital with 30 similar questions to indicate the clinical and teaching quality of the program. Both surveys are detailed and relatively time-consuming. These surveys are normally mandatory. The ACGME and RRC emailed the annual surveys to GI fellows and to key GI faculty (March 2020) with a response due by April 2020. However, the ACGME abruptly canceled both surveys due to the pandemic (April 2020) and subsequently reinstated the surveys on a voluntary basis in May to June 2020. The ACGME emailed the annual surveys for 2021 (March 2021) to both the GI fellows and key GI attendings. These surveys were completed electronically and returned by email by the key faculty and GI fellows (April 2021) despite the ongoing pandemic. The resulting survey evaluations were sent to program directors, together with extensive descriptive statistics comparing institutional performance

of the GI fellows with nationwide performance parameters in late April 2021. Descriptive evaluation statistics were sent anonymously, without revealing individual evaluators.

*Opinion:* The GI fellow and GI attending surveys were filled, compiled, analyzed, and sent to program directors in 2021 because all these actions were performed virtually by Internet.

8. The ACGME and RRC periodically perform physical site visits of accredited residency and fellowship programs, with the physical site visit interval set according to program performance during the prior site visit. Site visits are prolonged affairs requiring one or two RRC surveyors to carefully survey the Hospital fellowship and residency programs. For example, two site visitors spent one week at the Hospital surveying the Department of Medicine at the last Hospital site visit. During a site visit, surveyors meet program directors, division chiefs, program managers, hospital administrators, medical residents, fellows, and the designated hospital GME official. Surveyors audit all divisions and departments to ascertain that all mandated paperwork from fellowship and residency program directors and program managers are complete, accurate, and up-to-date. Surveyors report their findings on quality of residency and fellowship programs to the relevant RRC committee based upon the surveyors' findings and the committee decides whether to grant programs continuing accreditation; sets the time interval for continuing accreditation; decides whether to impose citations or warnings that must be addressed by the institution, residency, or fellowship programs in a timely manner; and determines whether to place a program on probation or suspension. The ACGME cancelled all physical site visits for residency and fellowship programs during the pandemic surge (March to July 2020) and then resumed site visits (starting August 2020), while changing the site visit format from physical to virtual. Paperwork previously submitted during physical site visits were now submitted by Internet. For example, the Critical Care and Pulmonary Medicine training program at the Hospital had a virtual rather than physical site visit scheduled in October 2021. The ACGME initially planned a physical site visit for the Internal Medicine and the GI fellowship program at the Hospital in 2020 but canceled this physical site visit due to the pandemic and deferred this visit until at least 2022 or possibly later, because the pandemic delayed the entire ACGME work schedule.

*Opinion:* Physical site visits involve large expenditures by the RRC for surveyors to visit a hospital typically for about one week, incurring costs of airline flights, local lodging, and food expenses. Although virtual visits do not engender such expenses, virtual visits, do not provide the camaraderie and intimate conversations available at physical meetings that potentially provide informal informative discussions about the visited sites.

9. Significantly reduced GI research electives for GI fellows at the Hospital due to the pandemic (March to June 2020). The pandemic may lead to less resident and fellow research electives and less time dedicated to clinical research because of a greater clinical load. However, research on COVID-19 infection has blossomed. This is indicated by the more than 300,000 articles published in peer reviewed medical journals until November 2022 on this subject.<sup>2</sup> The pandemic provides physicians a once-in-a-lifetime opportunity to perform exciting, cutting-edge, research on COVID-19 that can potentially save lives. I encourage young medical researchers to consider focusing their research on COVID-19 infection.

*Opinion:* Catastrophes, including war, economic depression, famine, plague, and other natural disasters are the traditional enemies of medical research because of less financial resources available to devote to medical research. Despite my heavy clinical obligations during the pandemic, I took my own advice and devoted my research exclusively on GI manifestations of COVID-19 from the pandemic onset, starting with my first publishing an article on diarrhea with COVID-19 infection in April 2020<sup>22</sup> and I have so far published 10 articles in peer-reviewed journals on this subject and am currently editing this book on this subject.<sup>21,23–25</sup> Also, in my experience, decisions on acceptance of medical research papers submitted for publication normally take about two months or longer after submission for peer review, but I had a case report on a COVID-19-infected patient with diarrhea accepted within one week of submission and published virtually one week thereafter in a leading clinical GI journal.<sup>22</sup> I believe accelerated peer-review and publication in medical journals of papers on the pandemic<sup>26</sup> is justified by the overwhelming clinical need to disseminate new medical findings on the pandemic to save patient lives.

## DISCUSSION

This work shows that the pandemic severely affected the American businesses climate and consumer behavior. The economy abruptly contracted at the pandemic onset by >30% in the first fiscal quarter of 2020. House sales plummeted at the pandemic onset due to home buyers unwillingness to expend large funds to purchase homes in the face of economic uncertainty engendered by the pandemic.

The Hospital, located at a pandemic epicenter in suburban Royal Oak near Detroit, was severely affected by the pandemic. During the pandemic surge, twenty-five percent of inpatients had COVID-19 infection. Hospital costs rose rapidly due to purchases of mechanical ventilators required to treat respiratory decompensation from COVID-19 pneumonia. Most operating rooms were converted to ICU beds to accommodate patients suffering from respiratory decompensation from COVID-19 pneumonia. As more patients were admitted with COVID-19 infection, revenue decreased from other admissions because much fewer patients than normal underwent elective ambulatory procedures or were admitted to short stay wards for procedures. Hospital occupancy plunged to approximately 55% of capacity from >90% of capacity before the pandemic. Moreover, the Hospital tended to lose money on patients admitted with respiratory decompensation from COVID-19 pneumonia due to their requirements for intense medical resources, such as ICU beds and mechanical ventilators, whereas patients did not come for elective short stays, minor surgeries, and ambulatory procedures, such as GI endoscopy, which all tended to be highly lucrative for the Hospital due to low resource utilization and relatively high insurance reimbursements. For example, the rate of GI endoscopy plummeted drastically to 4% of baseline during the initial pandemic onslaught. The Hospital faced several fiscal quarters of budgetary shortfalls.

This problem was exacerbated and compounded by Hospital mistakes. First and foremost, the Hospital paid a huge penalty to settle a long-standing claim, stemming from 2006–2012, against it by the Department of Justice for alleged Hospital violations of the Stark (antikickback) Law in paying eight cardiologists undeserved compensation (alleged kickbacks) for referring their private patients to the Hospital. This 84.5-million-dollar settlement was consummated at an exceedingly inopportune time for the Hospital just before the pandemic onset. This settlement also badly damaged the Hospital's reputation which decreased the willingness of patients to entrust their own or their families healthcare to the Hospital and lowered the morale of full-time



Hospital-employed and voluntarily affiliated physicians. Second, to cut costs, the Hospital terminated a 20-years-long exclusive contract with a highly respected anesthesiology group in favor of a low-cost anesthesiology group. This proved to be a disaster because the low-cost anesthesiology group could not provide an adequate number of anesthesiologists to staff the endoscopy suite rooms. About half of the endoscopy suite rooms were left idle due to the shortage of anesthesiologists. This caused the Hospital to absorb very significant unrealized (or lost opportunities) for revenues. Many already scheduled GI endoscopies (January-April 2021) were cancelled after the patient and the endoscopy attending came for the scheduled endoscopy because anesthesiologists were unavailable. Third, the nurse-anesthetists voted overwhelmingly, during the anesthesiology controversy, to unionize adding more expenses to run endoscopy rooms. Fourth, the Hospital won a pyrrhic victory against unionization of nurses because many nurses left the Hospital after being frustrated and demoralized by the failed unionization drive. The hospital had spent about two million dollars waging a campaign to discourage nurse unionization.<sup>40</sup> I wonder out loud whether such payments are permissible to a nonprofit institution or would have to be accounted by a for-profit branch of the institution (I do not know whether the appropriate accounting occurred or not). This loss of endoscopy nurses further exacerbated the shortage of professionals staffing the GI endoscopy unit and precipitated other fierce Hospital cost-cutting measures that caused other mistakes. Fifth, the Medical School (approximately half owned by the Hospital) furloughed 20% of its IT staff just when they would need them the most to implement virtual technology (for virtual medical school lectures and virtual meetings) because of the pandemic. This lack of IT support predictably resulted in six medical school lecture cancellations without warning for the GI and renal courses (or about 12% of the total clinical lectures in these two courses) because of computer gaffes made by clinical educators recording their lectures without IT guidance or supervision. One hundred and twenty-five medical students, who had paid an estimated \$15,000 in tuition money (at about \$125.00 per student per lecture x 125 students), were punished by coming to attend these lectures which were abruptly cancelled without warning. Seventh, the Hospital selectively abruptly terminated senior, older, highly accomplished, and distinguished academicians with outstanding reputations (approximately June 2021-on), including the Chief Medical Officer, the highest and most senior Hospital-employed physician who was a well-known and highly regarded academic researcher with an outstanding curriculum vitae,<sup>41</sup> and abruptly terminated several highly distinguished, and older Departmental Chairs without cause. The Chief Hospital Quality officer left to accept a position at another hospital. The Hospital replaced these highly accomplished leaders with physicians with much inferior academic credentials but who were paid much lower salaries. Eighth, the Hospital severely cut back librarian staff to cut costs. This saved negligible money due to the low salaries of the librarians compared to the overall Hospital budget, but negatively impacted the educational, clinical, and research missions of the Hospital as the primary teaching hospital of a medical school.

The government invested heavily in providing the Hospital four bonus payments totaling approximately 500 million dollars in 2020-2021 but even these payments could not create a financially healthy environment for the Hospital. Consequently, the Hospital offered itself as a suitor to one hundred hospital systems in proposed buyouts, mergers, or acquisitions.<sup>45</sup> During this time the Hospital announced two planned mergers or acquisitions, one by Advocate Aurora Health,<sup>42</sup> and another by Summa Health,<sup>43</sup> only to see both deals fail. Finally, the Hospital was either bought by or merged with Spectrum Health during the pandemic.<sup>44</sup>

The Hospital made several token gestures to employed physicians during the pandemic such as complementary lunches for four days; small \$1,000 bonus payments to house staff or full-time attendings; and paying the annual voluntary employer matching contributions to employee retirement funds for 2019 and 2020. However, these gestures failed to achieve their objective of improving the morale of dispirited hospital-employed and voluntary physicians who were seeing the Hospital being offered to other medical institutions without their involvement.

The Hospital made an abrupt about face decision on several “pet” Hospital projects because of the pandemic. The Hospital stopped using metal non-disposable silverware (originally instituted to help the environment) and returned to using disposable plastic silverware to decrease pandemic exposure; and the Hospital reversed itself to permit physicians to wear surgical scrubs anywhere in the Hospital to decrease clothing contamination from its prior policy that strictly forbade physicians from wearing surgical scrubs outside operating room-like settings. This change reminds me of an old Jewish proverb, “man plans *und der Heibishter lacht*” (Yiddish for “and God laughs”).

The Hospital and Medical School often used an opaque decision process without involving hospital-employed or voluntary physicians in the decisions. For example, endoscopy suite gowns were changed to substantially thinner and cheaper gowns during the pandemic (2021) without consulting or informing GI attendings. The academic anesthesiology group was terminated and replaced by a low-cost anesthesiology group during the pandemic without consulting GI attendings. The medical school course structure was substantially changed due to the pandemic without consulting the course codirectors and the course codirectors were only informed of these changes on short notice.

I created several minor innovations to ameliorate problems created by the pandemic. One, I called GI fellows weekly during the height of the raging pandemic to check on their psychological stresses while they worked as medical attendings on exclusively COVID-19 wards (April & May 2020). Two, I advised medical residents and medical attendings about the GI policy of postponing elective GI endoscopies on patients with active COVID-19 infection. This announcement greatly decreased the number of complaints by house staff and medical attendings about postponing GI endoscopies in such patients. Three, in response to GI attendings not completing the standard monthly GI fellow evaluations at the height of the pandemic, I greatly shortened the monthly evaluation forms. Four, I greatly abbreviated and simplified the quarterly key GI faculty evaluation (April 2020) as an emergency measure during the pandemic surge.

I wholeheartedly agree with the important medical school decision to graduate medical students on time in June 2020 and in June 2021 despite their missing small parts of the medical school curriculum<sup>33</sup> to avoid delaying medical school graduation for one year due to the pandemic.<sup>34</sup> To quote the show business motto, “the show must go on”!

This comprehensive work shows the pervasiveness of the changes at how one extremely large, academic, GI division, in an academic tertiary care hospital that is the primary teaching hospital of a medical school. The Hospital reorganized when facing massive clinical needs caused by a pandemic explosively spreading from zero patients to >one-fourth of all hospital patients within one month, for a total onslaught of >13,000 distinct infected patients treated over one year. This work shows the revolutionary (profound and abrupt) changes in both institutions engendered by the pandemic. The suddenness of the crisis in Detroit is partly due to its being a local pandemic epicenter, like New York City, and the Hospital serving as a tertiary referral

center for COVID-19-infected patients. This Hospital is an unusual academic hospital in that most attendings are voluntary and in private practice, with 36 GI attendings in private practice (recently reduced to 29 voluntary GI attendings after several GI attendings voluntarily left the Hospital) and only three (recently reduced to two) hospital-employed GI attendings. This composition of GI attendings resembles that of Baylor Medical Center, in Houston, Texas, a large academic hospital with a similar attending composition. GI practitioners in private practice had to agree to Hospital practice changes made during the pandemic. This involved complicated negotiations between the GI division and GI attendings, such as assigning voluntary GI attendings for GI endoscopies on staff (ward) patients with COVID-19 infection.

Traditional “live” lectures were replaced by virtual lectures. The medical school first used “canned” lectures of audiovisual tapes which had been filmed “live” during the previous academic year. This policy had advantages in that it could be implemented quickly and without costs but faced mild drawbacks including (1) not incorporating into preexisting audiovisual tapes curriculum changes recommended during the ensuing year; (2) several lecturers dropped from the lecture roster due to weak teaching ability were perform still delivering “canned” lectures; and (3) questions asked during prior year lectures could not be easily edited out of “canned” lectures. Medical school administrators minimized these drawbacks by authorizing a new set of taped audiovisual “virtual” lectures, presented by the newly scheduled lecturers.

Beyond the change from physical to virtual lectures, the medical school and Hospital changed numerous other educational and clinical activities from physical to virtual, which included: GI divisional conferences, annual education week lectures, committee meetings, GI fellowship applicant interviews, program manager communications with program directors, and divisional parties or graduation ceremonies.

Virtual activities lack spontaneity, camaraderie, and personal interactions between speakers and live audiences due to computerized communications. How can I compare watching a sports event on television to the excitement and intensity of watching the same event “live” and in person at a stadium?<sup>21</sup> I felt emotionally detached when delivering virtual lectures by videoconference to medical residents in June 2020 because of no visual feedback from my virtual audience while I lectured. Lecturers presenting virtually cannot gauge audience reactions since they are not physically in the same room. Other lecturers have expressed similar feelings. Likewise, audience may experience decreased attentiveness and less satisfaction during virtual lectures (“in a virtual lecture, the lights go out and the minds tune out”). Virtual parties and ceremonies lack the comradery and feelings experienced in physical parties. Videoconferencing created a need for more information technologists and upgrading computer equipment for videoconferencing. IT personnel should be readily available to help clinicians or educators set-up videoconferences because clinicians or educators typically lack sophistication in computer technology as forementioned. During the early change to videoconferencing from physical meetings, few hospital computers had cameras or software for transmitting videoconferences. My ancient hospital computer installed about ten years before the pandemic had to be upgraded to a new computer provisioned with a video camera and microphone to enable videoconferencing during the pandemic. Some conferences early during the pandemic, before the computer upgrades were accomplished, had to be conducted by conference calls via cell phones. Virtual instead of physical activities will likely become the standard in many situations due to lower costs and elimination of travel time, but the benefits of physical activities must be considered in the equation. Virtual meetings are not all-or-none and can include physical attendance for participants who can easily attend physical meetings and virtual attendance only for far away participants. A two-tiered

system may emerge: virtual for low-priority activities and low-priority participants (e.g., liaison participants), and physical for high-priority activities and high-priority participants (e.g., team leaders). For example, GI clinic visits may be physical for sick patients and virtual for relatively stable patients. Physical visits have the advantage of physical examination which can be important in patient evaluation. Before the pandemic, GI clinic televisits were not performed and not billed because Medicare and Medicaid only instituted reimbursement for televisits during the pandemic.<sup>36</sup> The closest activity resembling televisits before the pandemic was telephone calls from physicians to patients or vice versa, for which I did not bill for until the ruling allowing such billing during the early pandemic. Simulators have been developed to train GI fellows in GI endoscopy but are still in their infancy.

The Hospital strongly recommended changing in-hospital GI consults of COVID-19-infected patients from physical to virtual to decrease transmitting infection to physicians during the pandemic from March 2020 to current. Patients without COVID-19 infection were mostly seen through traditional physical visits. This change received the imprimatur of the Centers for Medicare and Medicaid Services which approved insurance reimbursement for virtual patient visits in April 2020.<sup>36</sup>

The author salutes the American Healthcare system for investing heavily in developing relatively effective vaccines using novel mRNA technology against the coronavirus and offering the vaccines for free to the general adult population. This saved many millions of lives. The manufacture and availability of a relatively effective vaccine constitutes a landmark accomplishment of modern medicine.

I remember and will never forget my first forceful confrontation with the explosive pandemic surge upon entering the hospital observation unit in the windowless cavernous halls in the hospital basement at high noon, circa March 13, 2020.<sup>21</sup> I reconnoitered with three fellow soldiers, a medical attending in the medical observation unit, a physician's assistant assigned to working with me, and an EKG technician. The lurking insidious enemy was present but invisible and could shoot to kill from any perch if we just got too close – less than six feet away.<sup>21</sup> We palpated the risks in manning the trenches, just like in the Great World War (also known as the War to End all Wars).

Among the four of us, only the physician's assistant working with me was wearing a facemask. We were as edgy as the untried soldier in the Red Badge of Courage. We lacked effective tools, guidance, and marching orders. The EKG technician complained that she had already entered dozens of patient rooms that day to perform EKGs without facemask protection. The medical attending worried out loud about his risks in seeing new patients with unknown COVID-19 status. The physician's assistant advised me to get a facemask forthwith. I hunted for twenty minutes until I found the only remaining N95 facemask, after searching six supply rooms. I then saw my consults several of whom proved later to have COVID-19 infection and one of whom I reported as the first mortality in which severe dehydration and electrolyte abnormalities from COVID-19-associated-diarrhea largely contributed to the patient's death.<sup>22</sup>

There is true grit in a grunt just following orders on such fateful days. Physicians and nurses deserve immense credit for heroically managing the pandemic crisis professionally, by willingly risking their health and even their lives as part of their job to treat COVID-19-infected patients without receiving extra compensation. These healthcare workers received extraordinary public support and praise as expressed by emails posted by charitable organizations, grateful patients, and ordinary citizens; by posters cropping up on Hospital grounds stating "Beaumont healthcare workers are our heroes"; and by at least one giant billboard erected just 1 block from the Hospital

stating, “THANK YOU! Health Care Heroes-Beaumont.” On Friday April 17, 2020, a procession of >100 police cars, fire trucks, and ambulances, with several hundred participants in their vehicles drove around Beaumont Hospital, Royal Oak, to honor healthcare professionals working at the Hospital who risked their lives by treating patients with COVID-19 infection.<sup>21</sup>

This work has limitations. First, this work was written by one investigator. The investigator, however, claims expertise from a long history in hospital administration and medical school education as described in the Methods section. This study was prospectively compiled permitting a comprehensive review and analysis. Moreover, the author actively participated in parts of the reorganization which helps explain the comprehensiveness of this review and analysis. Single authorship might potentially introduce observer bias, but the author focused on objective data. The author did not withhold reporting on intitutional errors because such error analysis may be instructive to prevent error recurrence in the (predictable) next pandemic. Second, this author might be criticized for reporting nonclinical details outside the GI division, Hospital, or Medical School in a clinical GI journal. However, actions outside the GI division contributed greatly to the hospital atmosphere and work environment of GI attendings and GI fellows, and to the clinical experiences of hospitalized patients.<sup>21</sup> This report included all changes that I felt affected my clinical practice, my work as an employee, and my emotional state, as well as affecting other divisional employees, medical students, or patients. For example, enhanced hospital security might be considered irrelevant to academic GI departmental reorganization, but is relevant to increasing anxiety of GI faculty, house staff, and their patients. Many important details external to the division are previously unreported. Third, this paper may be criticized for lengthiness, but an unprecedented, reorganization of the GI Division, Hospital, Medical School and affiliated institutions by a historic pandemic merits comprehensive reporting. The length of these two papers reflects their thorough research and comprehensive reporting.

I conclude, by taking my own advice and devoting my research exclusively to GI manifestations of COVID-19 infection from the pandemic onset. My five previous articles on GI manifestations of COVID-19 and my current five articles on this subject in this monograph and the monograph itself, which I edited, are fruits of my exclusive focus on this subject. This work greatly supplements previously published data on the pandemic impact on the clinical and academic missions of GI divisions.<sup>27–32</sup> My current and previous work<sup>21</sup> on the reorganization is distinguished by its depth and comprehensiveness, including new, previously unreported data concerning the reorganization of a medical school and academic hospital, some of which might never have been otherwise reported.

## ACKNOWLEDGMENTS

Dr M.S. Cappell initiated this article and wrote the entire manuscript. The Hospital Institutional Review Board (IRB) approved the previously published study on April 14, 2020.<sup>21</sup> The current work does not require IRB approval because it is solely a review article with no report of original patient data and only provides expert opinion based only on previously published data. Dr M.S. Cappell is employed as a gastroenterologist at the Aleda E. Lutz VA Hospital in Saginaw, Michigan. The Veteran’s Administration Hospital in Saginaw and the federal government of the United States have no position or opinion on this publication. Dr. Cappell dedicates these two related special critical review articles to Dr. Anthony Fauci, the Head of Infectious Diseases at the National Institutes of Health, who has served selflessly in this capacity or other positions

as a public servant at the National Institutes of Health over a long career, and who despite this dedicated service was the subject of vitriol because of advocating vaccination for the pandemic that has been proven to save millions of lives throughout the world.

On the occasion of the retirement of Dr. Anthony Fauci from the National Institutes of Health, Dr. Cappell dedicates this issue to Dr. Fauci for his distinguished, life-long governmental service especially for his role in championing vaccine development for COVID-19 infection in the face of vitriolic, political, and ad hominem attacks.

### CONFLICT OF INTEREST

The author declares no conflict of interest. Dr M.S. Cappell, as a member of the United States Food and Drug Administration (FDA) Advisory Committee for Gastrointestinal Drugs, 2013 to 2018,<sup>35</sup> affirms that this paper does not discuss any proprietary, confidential, pharmaceutical data submitted to the FDA and reviewed by Dr M.S. Cappell. Dr M.S. Cappell was >4 years ago a member of the speaker's bureau for AstraZeneca and Daiichi Sankyo, co-marketers of Movantik. Dr M.S. Cappell had one-time consultancies for Mallinckrodt and Shire >3 years ago. This work does not discuss any drug manufactured or marketed by AstraZeneca, Daiichi Sankyo, Shire, or Mallinckrodt.

### DISCLAIMER

M. S. Cappell is employed as a gastroenterologist at the Aleda E. Lutz Veterans Administration Hospital in Saginaw, MI and by the United States Government. These institutions do not have an opinion on the views expressed by Dr. Cappell herein.

### REFERENCES

1. Federal response to COVID-19. This is how much was spent so far in response to COVID. Available at: <https://www.usaspending.gov/disaster/covid-19?publicLaw=all>. Accessed November 3, 2022.
2. NCBI SARS-CoV-2 resources. National Institute of Health, Library of Medicine, National Center for Biotechnology Information. SARS-CoV-2 Data. Available at: <https://www.ncbi.nlm.nih.gov/sars-cov-2/>. Accessed November 2, 2022.
3. Watson OJ, Barnsley G, Toor J, et al. Global impact of the first year of COVID-19 vaccination: a mathematical modelling study. *Lancet Infect Dis* 2022;22(9): 1293–302.
4. Savinkina A, Bilinski A, Fitzpatrick M, et al. Estimating deaths averted and cost per life saved by scaling up mRNA COVID-19 vaccination in low-income and lower-middle-income countries in the COVID-19 Omicron variant era: a modelling study. *BMJ Open* 2022;12(9):e061752.
5. Udalova, Victoria. Pandemic impact on mortality and economy varies across age groups and geographies. United States Census, March 8, 2021. Available at: [www.census.gov/library/stories/2021/03/initial-impact-covid-19-on-united-states-economy-more-widespread-than-on-mortality.html](http://www.census.gov/library/stories/2021/03/initial-impact-covid-19-on-united-states-economy-more-widespread-than-on-mortality.html). Accessed May 4, 2021.
6. Greene J. Beaumont drops \$146.7 million loss, attributed to pandemic, reduction in elective surgeries. *Crain's Detroit Business*. Available at: [www.crainsdetroit.com/health-care/beamont-drops-1467-million-loss-attributed-pandemic-reduction-elective-surgeries](http://www.crainsdetroit.com/health-care/beamont-drops-1467-million-loss-attributed-pandemic-reduction-elective-surgeries).
7. Beaumont News Releases. COVID-19 pandemic affects Beaumont Health's year-end 2020 financial results. Available at: [www.beaumont.org/healthwellness/](http://www.beaumont.org/healthwellness/)

[pressreleases/covid-19-pandemic-affects-beaumont-healths-year-end2020-financial-results.](#)

8. Walsh D. Beaumont reports loss of nearly \$100 million during first half of 2022. Crain's Detroit Business. Available at: [www.crainsdetroit.com/health-care/beamont-reports-loss-nearly-100-million-during-first-half-2022](http://www.crainsdetroit.com/health-care/beamont-reports-loss-nearly-100-million-during-first-half-2022).
9. Anonymous. Beaumont Health temporarily laying off 2,475 employees, permanently eliminating 450 jobs. Fox 2, Detroit. Available at: [www.fox2detroit.com/news/beamont-health-temporarily-laying-off-2475-employees-permanently-eliminating-450jobs](http://www.fox2detroit.com/news/beamont-health-temporarily-laying-off-2475-employees-permanently-eliminating-450jobs). Accessed April 22, 2020.
10. Livengood C. Beaumont lays off 2,475 employees, eliminates 450 jobs as major revenue streams dry up. Crain's Detroit Business News 2020. Available at: [www.crainsdetroit.com/health-care/beamont-la-2475-employees-eliminate-450-jobscut-executive-pay](http://www.crainsdetroit.com/health-care/beamont-la-2475-employees-eliminate-450-jobscut-executive-pay). Accessed April 23, 2020.
11. Cavitt M. Beaumont lays off 2,475 employees, eliminates 450 jobs as major revenue streams dry up. Available at: [www.theoaklandpress.com/news/beamont-lays-off-2-475-employees-eliminates-450-jobs-as-major-revenue-streams-dry-up/article\\_b5a5c8d2-83d0-11ea-a90e-efa0ffcac378.html](http://www.theoaklandpress.com/news/beamont-lays-off-2-475-employees-eliminates-450-jobs-as-major-revenue-streams-dry-up/article_b5a5c8d2-83d0-11ea-a90e-efa0ffcac378.html). Oakland Press April 21, 2020. Accessed April 22, 2020.
12. LeBlanc B. Henry Ford Health to furlough 2,800 employees amid COVID-19 losses. Detroit News. April 22, 2020. Available at: <https://www.detroitnews.com/story/news/local/michigan/2020/04/22/henry-ford-health-furlough-2800-employees-amid-pandemic-losses/3008570001/>. Accessed April 23, 2020.
13. Carey M. Second week of HPI polling shows dentists' response to COVID-19: Four in five dentists closed their practices except for emergencies. ADA (American Dental Association News). Available at: <https://www.ada.org/en/publications/ada-news/2020-archive/april/second-week-of-hpi-polling-shows-dentists-response-tocovid-19>. Accessed April 25, 2020.
14. Kovanis, George. Trying to retain health care workers in times of COVID-19, Beaumont gives \$1,000 bonus. Detroit Free Press November 12, 2020. Available at: [www.freep.com/story/news/local/michigan/2020/11/12/coronavirus-covid-19-beaumonthealth-employee-bonus/6266431002/](http://www.freep.com/story/news/local/michigan/2020/11/12/coronavirus-covid-19-beaumonthealth-employee-bonus/6266431002/). Accessed April 27, 2021.
15. Beaumont Health offering walk-in COVID-19 vaccine clinic Thursday in Southfield. WWJ Newsradio 950. Local news. April 21, 2021. Available at: [www.audacy.com/wwjnewsradio/news/local/beamont-opens-walk-in-vaccine-clinic-thursday-in-southfield](http://www.audacy.com/wwjnewsradio/news/local/beamont-opens-walk-in-vaccine-clinic-thursday-in-southfield). Accessed May 4, 2021.
16. Napoli N. COVID-19 pandemic indirectly disrupted heart disease care. 2021. Available at: [www.acc.org/aboutacc/press-releases/2021/01/11/16/40/covid-19-pandemic-indirectly-disrupted-heart-disease-care](http://www.acc.org/aboutacc/press-releases/2021/01/11/16/40/covid-19-pandemic-indirectly-disrupted-heart-disease-care). Accessed May 4, 2021.
17. Banerjee A, Chen S, Pasa L, et al. Excess deaths in people with cardiovascular diseases during the COVID-19 pandemic. Eur J Prev Cardiol 2021;zwaa155. <https://doi.org/10.1093/eurjpc/zwaa155>. Available at:.
18. Jalandra RN, Shahul AS, Asfahan S, et al. Emotional distress among health professionals involved in care of inpatients with COVID-19: a survey based cross-sectional study. Adv Respir Med 2022. <https://doi.org/10.5603/ARM.a2022.0026>. published online ahead of print, 2022 Feb 24.
19. Centers for Disease Control and Prevention. COVID-19 Data Review: Update on COVID-19-Related Mortality. 2022. Available at: <https://www.cdc.gov/coronavirus/2019-ncov/science/data-review/index.html>. Accessed: December 12, 2022.
20. Available at: [www.hpnonline.com/events/event/21202555/digestive-disease-week-ddw-virtual](http://www.hpnonline.com/events/event/21202555/digestive-disease-week-ddw-virtual). Accessed April 27, 2021.

21. Cappell MS. Local COVID-19 epicenter in Detroit metropolitan area causing profound and pervasive reorganization of clinical, educational, research, and financial programs of a large academic gastroenterology division with a GI fellowship and primary medical school affiliation. *Dig Dis Sci* 2021;66(11):3635–58.
22. Cappell MS. Moderately severe diarrhea and impaired renal function with COVID-19 infection. *Am J Gastroenterol* 2020;115:947–8.
23. Cappell MS. Novel modifications for a virtual interview visit to simulate the traditional, live, site visit for GI fellowship applicants for an academic GI fellowship program due to the COVID-19 pandemic. *Dig Dis Sci* 2021;66:1370–1.
24. Gill I, Shaheen AA, Edhi AI, et al. Novel case report: A previously reported, but pathophysiologically unexplained, association between collagenous colitis and protein-losing enteropathy may be explained by an undetected link with collagenous duodenitis. *Dig Dis Sci* 2021;4:1–8.
25. Cappell MS. Problems for gastrointestinal patients with diarrheal disorders: Limited access to public bathrooms because previously open public bathrooms have closed due to COVID-19 pandemic and inadequate number of bathrooms in some endoscopy suites. *Am J Gastroenterol* 2021;116:1355–6.
26. Tingley K. Coronavirus Is forcing medical research to speed up. *New York Times Magazine*. April 21, 2020. Available at: <https://www.nytimes.com/2020/04/21/magazine/coronavirus-scientific-journals-research.html>. Accessed April 25, 2020.
27. Papaefthymiou A, Koffas A, Kountouras J, et al. The impact of COVID-19 pandemic on gastrointestinal diseases: a single-center cross-sectional study in central Greece. *Ann Gastroenterol* 2021;34:323–30.
28. Koo CS, Siah KTH, Koh CJ. Endoscopy training in COVID-19: Challenges and hope for a better age. *J Gastroenterol Hepatol* 2021. <https://doi.org/10.1111/jgh.15524>.
29. Li J, Li C, Wang X, et al. Considerations and perspectives on digestive diseases during the COVID-19 pandemic: a narrative review. *Ann Palliat Med* 2021;10:4858–67.
30. Tepper DL, Burger AP, Weissman MA. Hands down, COVID-19 will change medical practice. *Am J Manag Care* 2020;26:e274–5.
31. Crespo J, Fernández Carrillo C, Iruzubieta P, et al. Massive impact of corona virus disease 2019 pandemic on gastroenterology and hepatology departments and doctors in Spain. *J Gastroenterol Hepatol* 2020;36:1627–33.
32. Gross SA, Robbins DH, Greenwald DA, et al. Preparation in the Big Apple: New York City, A new epicenter of the COVID-19 pandemic. *Am J Gastroenterol* 2020 Jun;115:801–4.
33. Coronavirus outbreak forces OUWB medical students to embrace 'new normal' in learning. Oakland University William Beaumont School of Medicine, Mar 24, 2020. Available at: <https://oakland.edu/medicine/news/auto-list-news/2020/Coronavirus-outbreak-forces-OUWB-medical-students-to>. Accessed December 8, 2022.
34. Oakland University William Beaumont School of Medicine. Getting across the finish line: How OUWB keeps next-gen physicians on track during pandemic. Friday, May 01, 2020. Available at: [oakland.edu/medicine/news/auto-list-news/2020/Getting-acrossthe-finish-line-How-OUWB-keeps-next-gen-physicians-on-trackduring-pandemic](https://oakland.edu/medicine/news/auto-list-news/2020/Getting-acrossthe-finish-line-How-OUWB-keeps-next-gen-physicians-on-trackduring-pandemic). Accessed May 4, 2021.
35. Ambulatory Surgery Centers: Gastroenterologist Dr. Mitchell Cappell appointed to FDA GI Advisory Committee, Becker's Hospital Review. Thursday, September 20th, 2012. Available at: <https://www.beckershospitalreview.com/asc/gastroenterologist-dr-mitchell-cappell-appointed-to-fda-gi-advisory-committee.html>. Accessed December 8, 2022.



36. Centers for Medicare & Medicaid Services. President Trump expands telehealth benefits for Medicare beneficiaries during COVID-19 outbreak. CMS.gov. Mar 17, 2020. Available at: <https://www.cms.gov/newsroom/press-releases/president-trump-expands-telehealth-benefits-medicare-beneficiaries-during-covid-19-outbreak>. Accessed April 14, 2020.
37. Edbrooke DL, Minelli C, Mills GH, et al. Implications of ICU triage decisions on patient mortality: a cost-effectiveness analysis. *Crit Care* 2011;15(1):R56. <https://doi.org/10.1186/cc10029>.
38. Cappell MS. A critical review two-years thereafter of the effectiveness of the revolutionary changes in a gastroenterology division at a medical school teaching hospital in response to the initial COVID-19 pandemic: Medical school, medical residency and GI fellowship education; clinical practice of GI attendings, and GI endoscopy
39. Amadeo K., How COVID-19 has affected the US economy. *The Balance*, Available at: <https://www.thebalance.com/how-covid-19-has-affected-the-useconomy-5092445> Accessed April 30, 2021.
40. Starkman E. Starkman: Beaumont Nurse Anesthetists At Royal Oak, Troy And Grosse Pointe Vote Overwhelmingly To Unionize. *Deadline Detroit*. March 29, 2021. Available at [https://deadlinedetroit.com/articles/27683/starkman\\_beaumont\\_nurse\\_anesthetists\\_at\\_royal\\_oak\\_troy\\_and\\_grosse\\_pointe\\_vote\\_overwhelmingly\\_to\\_unionize](https://deadlinedetroit.com/articles/27683/starkman_beaumont_nurse_anesthetists_at_royal_oak_troy_and_grosse_pointe_vote_overwhelmingly_to_unionize).
41. Starkman E. Starkman: Bloodbath At Beaumont – COO Carolyn Wilson And Top Doctor Ousted; Chief Quality Officer Resigns *Deadline Detroit* July 22, 2021. Available at [https://renaissance.deadlinedetroit.com/articles/28438/starkman\\_bloodbath\\_at\\_beaumont\\_coo\\_carolyn\\_wilson\\_and\\_top\\_doctor\\_ousted\\_chief\\_quality\\_officer\\_resigns](https://renaissance.deadlinedetroit.com/articles/28438/starkman_bloodbath_at_beaumont_coo_carolyn_wilson_and_top_doctor_ousted_chief_quality_officer_resigns). Accessed December 25, 2022
42. Beaumont. Advocate Aurora Health, Beaumont Health Exploring Partnership. June 17, 2020. Available at <https://www.beaumont.org/health-wellness/press-releases/advocate-aurora-health-beaumont-health-exploring-partnership>. Accessed December 25, 2022.
43. Greene J. Beaumont makes deal to acquire Ohio's Summa Health. *Modern Healthcare*. July 9, 2019. Available at <https://www.modernhealthcare.com/mergers-acquisitions/beaumont-makes-deal-acquire-ohios-summa-health>. Accessed December 25, 2022.
44. Reindl JC. Newly merged Beaumont-Spectrum health system rebrands as Corewell Health. *Detroit Free Press*. October 11, 2022. Available at <https://news.yahoo.com/newly-merged-beaumont-spectrum-health-153656641.html>. Accessed December 25, 2022.
45. Starkman E. Starkman: Beaumont's Woes Prove CEO Tina Freese Decker Unfit To Run Michigan's Biggest Hospital System. August 19, 2022. Available at [https://www.deadlinedetroit.com/articles/31125/starkman\\_beaumont\\_s\\_woes\\_prove\\_ceo\\_tina\\_freese\\_decker\\_unfit\\_to\\_run\\_michigan\\_s\\_biggest\\_hospital\\_system](https://www.deadlinedetroit.com/articles/31125/starkman_beaumont_s_woes_prove_ceo_tina_freese_decker_unfit_to_run_michigan_s_biggest_hospital_system)