Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Reengineering academic departments of obstetrics and gynecology to operate in a pandemic world and beyond: a joint American Gynecological and Obstetrical Society and Council of University Chairs of Obstetrics and Gynecology statement

Ronald D. Alvarez, MD, MBA; Barbara A. Goff, MD; David Chelmow, MD;
Todd R. Griffin, MD, MBA; Errol R. Norwitz, MD, PhD, MBA; John O. De Lancey, MD

Coronavirus disease 2019 (COVID-19), caused by the virulent severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), first emerged as a human disease in December 2019 in Hubei province, China.¹ It spread rapidly throughout the world and was declared a pandemic by the World Health Organization on March 11, 2020.

Reengineering the Ambulatory Environment

The COVID-19 pandemic raised concerns about the safety of patients and

The Problem: The COVID-19 pandemic significantly disrupted operations in healthcare throughout the United States and will continue to do so for the foreseeable future. Academic departments of obstetrics and gynecology (henceforth referred to as departments) have implemented safety measures and innovations to continue to provide high-quality care for patients with the most immediate need while protecting the health and safety of their workforce. Until an effective vaccine has been developed and distributed, COVID-19 is going to challenge our ability to meet our tripartite mission.

The Solution: The purpose of this American Gynecological and Obstetrical Society (AGOS) and Council of University Chairs of Obstetrics and Gynecology (CUCOG) "Call to Action" paper from the leaders of AGOS and CUCOG is to provide a framework to help department leaders reengineer their operations in the new postpandemic era.

From the Department of Obstetrics and Gynecology, Vanderbilt University Medical Center, Nashville, TN (Dr Alvarez); Department of Obstetrics and Gynecology, University of Washington School of Medicine, Seattle, WA (Dr Goff); Department of Obstetrics and Gynecology, Virginia Commonwealth University School of Medicine, Richmond, VA (Dr Chelmow); Department of Obstetrics and Gynecology, Stony Brook Medicine, Stony Brook, NY (Dr Griffin); Department of Obstetrics and Gynecology, Tufts Medical Center, Boston, MA (Dr Norwitz); and Department of Obstetrics and Gynecology, University of Michigan Medical School, Ann Arbor, MI (Dr De Lancey).

Received May 14, 2020; revised June 9, 2020; accepted June 11, 2020.

The authors report no conflict of interest.

This communication has been published in the middle of the COVID-19 pandemic and is available via expedited publication to assist patients and healthcare providers.

Corresponding author: Ronald D. Alvarez, MD.
ronald.alvarez@vumc.org

0002-9378/\$36.00

© 2020 Elsevier Inc. All rights reserved.

<https://doi.org/10.1016/j.ajog.2020.06.024>

providers in ambulatory settings. In response, departments consolidated ambulatory sites, postponed well-women visits, reevaluated prenatal care in-person visits, rotated clinician and staff coverage, and implemented virtual visits. A range of infection screening, testing, and control measures were imposed. The Centers for Disease Control and Prevention (CDC)—recommended measures included automated calls to patients before their clinic visits to assess for respiratory symptoms and screening at entrance sites for symptoms and fever.² Clinicians and staff in the ambulatory setting followed safety measures such as entrance site screening, physical distancing, hand hygiene, cough etiquette, and the appropriate use of personal protective equipment (PPE). They were advised to monitor their symptoms and stay at home if they developed fever or cough. To address asymptomatic and presymptomatic transmission, the CDC

recommended the routine use of face masks for all patients, clinicians, and staff.³ Large academic health centers, insurers, and regulators, never known for being nimble, learned how to respond rapidly with needed change.

Departments also reengineered outpatient scheduling. There was emerging evidence even before COVID-19 that a prenatal schedule with fewer than the traditional 12 to 14 visits is safe for average-risk pregnant patients.^{4,5} Many departments adopted reduced schedules for average-risk pregnant patients, which is a strategy endorsed by the American College of Obstetricians and Gynecologists.^{6,7} An example is presented in Table 1.

Telehealth implementation was also accelerated. In March 2020, the Centers for Medicare and Medicaid Services (CMS) introduced interim measures that reduced or eliminated many barriers to the widespread adoption of telehealth.⁸ New rules allowed providers to

TABLE 1**Example of compressed prenatal schedule for low-risk pregnant patients**

Visit type	Gestational age	Modality
New OB	6 wk to term	F2F
Return OB	12–19 wk	TH
Return OB with anatomy scan	20–22 wk	F2F
Return OB	23–27 wk	TH × 1 or 2
Return OB with DMS/RhoGAM/Tdap vaccine	28 wk	F2F
Return OB	29–35 wk	TH × 1 or 2
Return OB with GBS screening	36 wk	F2F
Return OB	37–38 wk	TH
Return OB	39–40 wk	F2F

DMS, diagnostic medical sonography; F2F, face to face; GBS, group B streptococcus; OB, obstetrics; Tdap, tetanus, diphtheria, and pertussis; TH, telehealth.

Alvarez. Reengineering departments of obstetrics and gynecology. *Am J Obstet Gynecol* 2020.

use telehealth for new and established patients from any location and allowed patients to have a telehealth visit at their homes. Licensure accommodations allowed providers to perform telehealth visits across state lines. Reimbursement for telehealth visits was allowed at the same rates as in-office visits. These accommodations were widely adopted by other payors. The number of telehealth visits grew significantly and was well received by both patients and providers.⁹

Until the pandemic resolves, departments will have to monitor COVID-19 infection statistics at their institutions and in their communities, continue many of these safety measures, and assess the health status of their clinicians and staff. They should also continue to implement innovations to maintain reduced clinic visit schedules for average-risk pregnant patients and promote the use of telehealth. The future of telemedicine will depend largely on the long-term policies adopted by CMS and other payors to replace the current emergency regulations, but we must advocate for telemedicine policy changes that improve access to care and reduce the burden for many patients of travel to urban ambulatory settings.

Safety in Labor and Delivery

Throughout this pandemic, maternity services have been uniquely challenged

to maintain a safe environment for patients and healthcare providers. Best practices have been developed and will need to continue for the foreseeable future. Several of these focused on the initial evaluation of patients and support persons presenting to a maternity suite. A staff member in appropriate PPE was stationed at either the hospital or maternity suite entrance to triage patients and their supporters. Patients and supporters were masked and screened for fever and characteristic symptoms.¹⁰ Many departments implemented universal testing on admission regardless of symptoms. One study in a high-prevalence area reported that 13.7% of patients had a positive result for SARS-CoV-2 on admission to labor and delivery (L&D), 88% of whom were asymptomatic.¹¹ To limit exposures, patients were restricted to 1 support person in labor, who was required to remain sequestered in the patient's room.

Additional best practices focused on clinicians and staff, who were instructed to use appropriate PPE, perform frequent handwashing, and practice universal precautions. Full COVID-19 PPE (which included N95 respirator, face shield, gown, and gloves) was used for confirmed cases of COVID-19 and patients under investigation (PUIs).³ In addition, some departments advised the

use of N95 respirators for all deliveries, particularly in the absence of universal testing.¹² Algorithms were developed to coordinate care among clinicians and staff during vaginal or cesarean delivery in patients with COVID-19 and those suspected of having COVID-19. Additional precautions were taken during cesarean delivery when general anesthesia was required, given that intubation is an aerosol-generating procedure (AGP).

For the foreseeable future, departments will need to continue many of these measures to identify patients with COVID-19 and protect clinicians and staff. Universal testing of all patients admitted to L&D with appropriate use of PPE will likely constitute standard operating procedures in the immediate future.

Safety During Gynecologic Surgery

In April 2020, CMS recommended that all nonemergent elective medical services be delayed to preserve PPE and reduce exposure to patients and staff.¹³ Many states in the United States followed suit. Professional organizations provided guidance regarding which elective cases could be safely delayed.¹⁴ For patients with COVID-19 who required gynecologic surgery, enhanced PPE with an N95 respirator was advised, and surgeons were instructed to remain outside the operating room during AGPs such as intubation and extubation.¹⁵

As the COVID-19 surge recedes, regions around the United States are beginning to relax their restrictions, and initial guidance is emerging on how to safely resume surgical operations and address the backlog of cases.^{16–18} Scoring systems have been developed that account for patient- and disease-specific factors and for prioritization of cases.^{19,20} Departments will need to adopt or develop and follow guidelines while carefully monitoring PPE use. They should also be prepared to make adjustments should further COVID-19 surges develop.¹⁵

For the foreseeable future, departments should ensure that all gynecologic surgical patients are tested for

SARS-CoV-2 24 to 72 hours before scheduled surgery and screened again for fever and symptoms on the day of surgery. In some ways, this is reminiscent of the day when all patients being admitted to a hospital were tested for other infectious diseases such as tuberculosis or syphilis. Universal preoperative testing enhances safety for asymptomatic and presymptomatic patients who can have devastating consequences with anesthesia, reduces the risk of exposure to operating personnel, and preserves PPE.^{21,22} Patients with COVID-19 should have surgery delayed, if possible, for 14 days following CDC and institutional guidelines.

Maintaining the Culture of Learning

Medical education has been profoundly affected by COVID-19, particularly for students on clinical rotations. In March 2020, the Association of American Medical Colleges recommended that medical students not be involved in direct patient care to ensure learner safety and minimize use of PPE.²³ Most medical schools in the United States implemented these recommendations, suspending all clinical clerkships and other patient-facing educational experiences. Departments provided virtual live or recorded didactic sessions. Whether and to what extent the lack of direct patient care has affected students' knowledge base and skills in women's health is yet to be determined. The application process for medical students interested in obstetrics and gynecology residency training may be adversely affected. Students may have done fewer clinical rotations, may have been unable to complete away acting-internship rotations, may have had less time with reference letter writers, and may be affected by ongoing travel restrictions limiting in-person interviews. We must be vigilant and counter this trend if it emerges, considering ways to advocate for medical students considering our specialty.

Guidelines from the Accreditation Council for Graduate Medical Education emphasized the importance of resident and fellow safety, supervision, and work

hour requirements, while recognizing the need for residents to continue to care for patients in their specialty and allowed for redeployment to other services when necessary.²⁴ Many departments suspended normal rotations and deployed residents and fellows primarily to cover obstetrical services and urgent gynecologic cases. They also provided training in the proper use of PPE and the management of patients with COVID-19 or PUIs.

Departments implemented a number of innovations in education. Remote learning was widely implemented. The long-standing aspiration of a national residency curriculum took a significant step forward with the establishment of the National Remote Obstetrics and Gynecology Didactic Program.²⁵ The American Board of Obstetrics and Gynecology also made a number of changes to its certification processes for both specialist and subspecialist candidates.²⁶

In the short term, departments will need to provide instruction to all learners on how to manage patients with COVID-19 while protecting themselves. Strategies, such as focused assignments and mini-blocks, will have to be developed to make up for lost clinical rotations, especially when it comes to surgical experience. Residents and fellows will need training in telemedicine, because this is likely to become a more substantial means of healthcare delivery. Virtual conferences are also likely to continue as a major educational modality, and every effort should be made to implement a virtual national educational curriculum.

Departments should develop a strategy to address upcoming residency and fellowship interviews. In response to ongoing travel restrictions, Female Pelvic Medicine and Reconstructive Surgery Fellowship programs conducted their interviews remotely this year, which was thought to be highly successful. Virtual interviewing may alleviate many problems with the existing application process. The Association of Professors of Gynecology and Obstetrics and Council on Resident Education in Obstetrics

and Gynecology have provided recommendations to promote remote interviewing this year, and a coalition of education-based organizations have recommended virtual interviews for the 2021 resident match.^{27,28}

Sustaining and Optimizing Opportunities for Research

Departments had to suspend many ongoing clinical and basic research activities to comply with social distancing recommendations. This significantly affected the scholarship and productivity of faculty members, and many academic centers have made timeline adjustments for faculty members on tenure track. In instances where accrual to clinical trials was able to continue, provisions were made to obtain consent verbally (a positive step). Department research meetings were conducted virtually, and many national scientific and professional organizations cancelled their in-person meetings or replaced them with webinars to share new scientific findings. It is likely that virtual exchanges of information will continue in some form. The pandemic also drove the need for research on COVID-19 infection in women's health. The Pregnancy Coronavirus Outcomes Registry (Priority) study, a nationwide study of pregnant patients with COVID-19, is an example of that effort.

Departments will need to reboot their research activities shortly after resuming "normal" clinical operations in a phased pattern based on institution-specific criteria. Individual research programs should be mapped to the timeline based on factors such as essential vs nonessential research, strategic importance, staffing, resource requirements (physical space and equipment), contractual obligations, attendant risks, and cost and return on investment. Separate time horizons may be needed for clinical and basic or translational research programs. Laboratory and clinical investigators will need to follow many safety measures used in the clinical setting and those specific for the

TABLE 2

Effect of COVID-19 on future healthcare delivery in the departments of obstetrics and gynecology

Reason	Implication	Effect on future obstetrics and gynecology healthcare delivery
SARS-CoV-2 is endemic in the population.	<ul style="list-style-type: none"> Efforts in the United States to contain the infection have failed; the strategy has shifted to disease prevention and mitigation. Most infections are acquired in the community. Many obstetrics and gynecology services have to be provided in person and not virtually, such as prenatal care for high-risk patients, delivery, and urgent surgery. 	<ul style="list-style-type: none"> Screening patients based on a history of travel or personal exposure is of limited value and should not be relied upon. Screening based on symptoms or fever is critical and will need to continue for both patients and support personnel, ideally before arrival at a healthcare center or hospital. Patients scheduled for hospital admission require routine testing. This test result represents a single point in time. We do not know whether or when retesting is indicated. Telehealth capabilities should be expanded where possible (such as select prenatal visits for low-risk patients) to avoid unnecessary exposure to patients and providers.
The virus is spread almost exclusively through droplet exposure.	<ul style="list-style-type: none"> Social distancing and PPE are effective in protecting both patients and providers. 	<ul style="list-style-type: none"> Social distancing will need to continue in both inpatient and ambulatory settings. Routine use of COVID PPE will need to continue, similar to the implementation of "universal precautions" after the HIV/AIDS epidemic.
AGPs pose particularly high risk.	<ul style="list-style-type: none"> Enhanced PPE is effective in protecting patients and providers in the setting of AGPs. Confusion remains about which procedures are AGPs. AGPs in obstetrics and gynecology include intubation, nasopharyngeal sampling, and nebulizer treatments; whether the second state of labor is an AGP remains unclear. 	<ul style="list-style-type: none"> Enhanced PPE will be required for AGPs in the inpatient and ambulatory settings. A reliable supply of enhanced PPE (N95 respirators, PAPRs) will need to be kept immediately available. ORs will need more extensive cleaning, which may affect turnover times. Improved coordination will be necessary between L&D and main operating theaters in the event of emergency cesarean delivery.
About 85% of cases are asymptomatic or presymptomatic.	<ul style="list-style-type: none"> Every patient and every provider should be considered as potentially positive for SARS-CoV-2. 	<ul style="list-style-type: none"> Routine use of PPE will need to continue. Facility enhancements (eg, Plexiglass screens) are required. Patient density will need to be decreased by altering schedules for outpatient visits and admissions and decreasing wait times (improving on-time visits, having patients wait in their cars until called). The number of support personnel accompanying patients to outpatient visits and scheduled inpatient admissions will need to be minimized.
Clinical education experience will be affected.	<ul style="list-style-type: none"> Medical students will have less in-person clinical opportunities. Risk of resident and fellows having diminished clinical experiences Educational venues will need to be redesigned to improve physical distancing. 	<ul style="list-style-type: none"> PPE supply may limit opportunities for obstetrics and gynecology clerks to participate in procedures and deliveries. Previous cessation of student clinical rotations will affect length of future obstetrics and gynecology rotations, with possible effect on future residency choice. Pandemic surge and cancellation of elective surgery decreased graduating resident and fellow experience. Second surge may require residents and fellows to be deployed. Subsequent cancellation of elective procedures may continue to affect surgical and clinical experience. Use of surgical simulation will become more important for trainees to maintain their skills. Virtual teaching will need to be further implemented at all levels for students, residents and fellows, faculty, and community. Videoconferencing capabilities will need expansion to replace in-person learning for students or residents and professional meetings.

Alvarez et al. Reengineering departments of obstetrics and gynecology. Am J Obstet Gynecol 2020.

(continued)

TABLE 2

Effect of COVID-19 on future healthcare delivery in the departments of obstetrics and gynecology (continued)

Reason	Implication	Effect on future obstetrics and gynecology healthcare delivery
Clinical research programs were placed on hold.	<ul style="list-style-type: none"> Every member of the research team should be considered as potentially positive for SARS-CoV-2. 	<ul style="list-style-type: none"> Clinical research programs need to be redesigned to limit PPE use and interpersonal interactions (eg, limiting clinical research to those studies with potential benefit, enhanced use of remote or virtual study subject consent). Laboratory-based research will require stricter safety and screening measures. Standard procedures need to be put in place for safe handling of research biospecimens potentially infected with SARS-CoV-2.
Herd immunity is a long way off.	<ul style="list-style-type: none"> Cannot rely on herd immunity to solve this pandemic in the next few years 	<ul style="list-style-type: none"> The more effective we are in containing the pandemic, the longer it will take to reach the 70% SARS-CoV-2—positive rate in the population required for herd immunity (SARS-CoV-2—positive rates are currently <20% even in high-risk obstetrics and gynecology populations).
An effective vaccine is a long way off.	<ul style="list-style-type: none"> Do not rely on a vaccine to solve this pandemic in the next few years. It is not clear whether antibodies are protective against reinfection. 	<ul style="list-style-type: none"> An effective vaccine is likely a viable long-term solution but remains distant. Once developed, an extensive implementation phase will be required.
A second surge is a real possibility.	<ul style="list-style-type: none"> As we incorporate routine and non-emergent visits and surgeries back into our practice, we need to be vigilant about a second surge. Early data from South America suggest that COVID-19 may be seasonal; hence, we need to prepare now for a possible surge in winter. 	<ul style="list-style-type: none"> COVID-19 is not going away anytime soon; collaboration with public health epidemiologists and continued tracking of rates of infection, hospitalization, or deaths is necessary for the next few years. A need to be prepared to back off reactivation (“pump the brakes”) if a significant uptick in infections is detected

AGP, aerosol-generating procedure; COVID-19, coronavirus disease 2019; L&D, labor and delivery; OR, operating room; PAPR, powered air-purifying respirator; PPE, personal protective equipment; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

Alvarez et al. Reengineering departments of obstetrics and gynecology. *Am J Obstet Gynecol* 2020.

research environment (staggered work hours, smaller research teams, virtual laboratory meetings, and limiting travel to scientific meetings). Laboratories will have to abide by more stringent ABSA International guidelines when using human tissues potentially infected with SARS-CoV-2.²⁹ Advocating for and securing additional funding for COVID-19 research specific to women's health should be a priority.

Conclusion

The COVID-19 pandemic will have an enduring effect on the departments of obstetrics and gynecology around the country and has led many to reengineer patient care, education, research, and administrative activities (Table 2). They must embrace flexibility to meet and enhance their tripartite mission in the post-COVID-19 era and future

pandemics. The healthcare ecosystem will be changed by this experience, and academic departments should lead the way in developing new transformative strategies for implementing forward-looking changes to improve women's health.

GLOSSARY OF TERMS

AGOS: American Gynecological and Obstetrical Society

AGP: Aerosolizing generating procedure

CMS: Centers for Medicare and Medicaid Services

CDC: Centers for Disease Control and Prevention

CUCOG: Council of University Chairs of Obstetrics and Gynecology

PPE: personal protective equipment

REFERENCES

1. World Health Organization. Rolling updates on coronavirus disease (COVID-19). Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen>. Accessed May 11, 2020.
2. CDC. Coronavirus Disease 2019 (COVID-19). Healthcare Facility Guidance. Available at: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-hcf.html>. Accessed July 8, 2020.
3. Centers for Disease Control and Prevention. Interim infection prevention and control recommendations for patients with suspected or confirmed coronavirus disease 2019 (COVID-19) in healthcare settings. Available at: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html>. Accessed May 11, 2020.
4. Oschner Health. Oschner Health introduces new prenatal digital medicine program for the Gulf South. Available at: <https://news.ochsner.org/news-releases/ochsner-health-system-introduces-new-prenatal-digital-medicine-program-for>. Accessed May 11, 2020.
5. Butler Tobah YS, LeBlanc A, Branda ME, et al. Randomized comparison of a reduced-visit

prenatal care model enhanced with remote monitoring. *Am J Obstet Gynecol* 2019;221:638e.1–8.

6. American College of Obstetricians and Gynecologists. COVID-19 FAQs for obstetrician-gynecologists, obstetrics. Available at: <https://www.acog.org/clinical-information/physician-faqs/covid-19-faqs-for-ob-gyns-obstetrics>. Accessed May 11, 2020.

7. American College of Obstetricians and Gynecologists. Examples of alternate or reduced prenatal care schedules. Available at: <https://www.acog.org/clinical-information/physician-faqs/-/media/287cefdb936e4cda99a683d3cd56dca1.ashx>. Accessed May 11, 2020.

8. AMA. CARES Act: AMA COVID-19 pandemic telehealth fact sheet. Available at: <https://www.ama-assn.org/delivering-care/public-health/cares-act-ama-covid-19-pandemic-telehealth-fact-sheet>. Accessed May 11, 2020.

9. Wosik J, Fudim M, Cameron B, et al. Telehealth transformation: COVID-19 and the rise of virtual care. *J Am Med Inform Assoc* 2020;27:957–62.

10. Centers for Disease Control and Prevention. Standard operating procedure (SOP) for triage of suspected COVID-19 patients in non-US healthcare settings: early identification and prevention of transmission during triage. Available at: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/non-us-settings/sop-triage-prevent-transmission.html>. Accessed May 11, 2020.

11. Sutton D, Fuchs K, D'Alton M, Goffman D. Universal screening for SARS-CoV-2 in women admitted for delivery. *N Engl J Med* 2020;382:2163–4.

12. Jamieson DJ, Steinberg JP, Martinello RA, Perl TM, Rasmussen SA. Obstetricians on the coronavirus disease 2019 (COVID-19) front lines and the confusing world of personal protective equipment. *Obstet Gynecol* 2020;135:1257–63.

13. CMS. Non-emergent, elective medical services, and treatment recommendations. Available at: <https://www.cms.gov/files/document/cms-non-emergent-elective-medical-recommendations.pdf>. Accessed May 11, 2020.

14. Society of Gynecologic Oncology. Surgical consideration for gynecologic oncologists during the COVID-19 pandemic. Available at: <https://www.sgo.org/clinical-practice/management/covid-19-resources-for-health-care-practitioners/surgical-considerations-for-gynecologic-oncologists-during-the-covid-19-pandemic/>. Accessed May 11, 2020.

15. Brindle ME, Gawande A. Managing COVID-19 in surgical systems. *Ann Surg* 2020 [Epub ahead of print].

16. American College of Surgeons. Local resumption of elective surgery guidance. Available at: <https://www.facs.org/covid-19/clinical-guidance/resuming-elective-surgery>. Accessed May 11, 2020.

17. American College of Surgeons. Joint statement: road map for resuming elective surgery after COVID-19 pandemic. Available at: <https://www.facs.org/covid-19/clinical-guidance/roadmap-elective-surgery>. Accessed May 11, 2020.

18. Society of Gynecologic Surgeons. Joint statement on re-introduction of hospital and office-based procedures in the COVID-19 climate for the practicing urogynecologist and gynecologist. Available at: <https://igcs.org/wp-content/uploads/2020/05/Joint-Statement-Reintroduction-of-Hospital-and-Office-Procedures-in-the-COVID-19-Climate-for-Practicing-Urogynecologist-and-Gynecologist.pdf>. Accessed May 11, 2020.

19. American College of Surgeons. COVID-19 guidelines for triage of gynecology patients. Available at: <https://www.facs.org/covid-19/clinical-guidance/elective-case/gynecology>. Accessed May 11, 2020.

20. Society of Gynecologic Oncology. Gynecologic oncology considerations during the COVID-19 pandemic. Available at: <https://www.sgo.org/clinical-practice/management/covid-19-resources-for-health-care-practitioners/gyn-onc-considerations-during-covid-19/>. Accessed May 11, 2020.

21. Yang S, Zhang Y, Cai J, Wang Z. Clinical characteristics of COVID-19 after gynecologic oncology surgery in three women: a retrospective review of medical records. *Oncologist* 2020;25:e982–5.

22. Lei S, Jiang F, Su W, et al. Clinical characteristics and outcomes of patients undergoing surgeries during the incubation period of COVID-19 infection. *EClinicalMedicine* 2020;21:100331.

23. Association of American Medical Colleges. Guidance on medical students' participation in direct patient contact activities. Available at: <https://www.aamc.org/system/files/2020-04/meded-April-14-Guidance-on-Medical-Students-Participation-in-Direct-Patient-Contact-Activities.pdf>. Accessed May 11, 2020.

24. Accreditation Council for Graduate Medical Education. ACGME resident/fellow education and training considerations related to coronavirus (COVID-19). Available at: <https://www.acgme.org/Newsroom/Newsroom-Details/ArticleID/10085/ACGME-Resident-Fellow-Education-and-Training-Considerations-related-to-Coronavirus-COVID-19>. Accessed May 11, 2020.

25. University of California, San Francisco. National remote OBGYN resident didactics. Available at: <https://obgyn.ucsf.edu/residency-program/national-curriculum>. Accessed May 11, 2020.

26. American Board of Obstetrics and Gynecology. COVID-19 updates. Available at: <https://www.abog.org/covid-19-updates>. Accessed May 11, 2020.

27. Association of Professors of Gynecology and Obstetrics. APGO and CREOG residency application response to COVID-19. Available at: <https://www.apgo.org/covid19-residency-app-process/>. Accessed May 11, 2020.

28. Coalition for Physician Accountability's Work Group on Medical Students in the Class of 2021 Moving Across Institutions for Post Graduate Training. Final report and recommendations for medical education institutions of LCME-accredited, U.S. osteopathic, and non-U.S. medical school applicants. Available at: https://www.aamc.org/system/files/2020-05/covid19_Final_Recommendations_Executive%20Summary_Final_05112020.pdf. Accessed May 11, 2020.

29. The Association for Biosafety and Biosecurity. Considerations for handling potential SARS-CoV-2 samples. Available at: <https://absa.org/wp-content/uploads/2020/03/ABSA2020-Covid-19-dr3.pdf>. Accessed May 11, 2020.

ABSTRACT

Reengineering academic departments of obstetrics and gynecology to operate in a pandemic world and beyond: a joint American Gynecological and Obstetrical Society and Council of University Chairs of Obstetrics and Gynecology statement

The coronavirus disease 2019 pandemic has significantly disrupted operations in academic departments of obstetrics and gynecology throughout the United States and will continue to affect them in the foreseeable future. It has also created an environment conducive to innovation and the accelerated implementation of new ideas. These departments will need to adapt their operations to accommodate coronavirus disease 2019 and to continue to meet their tripartite mission of clinical excellence, medical education, and women's health research. This "Call to Action" paper from the leaders of American

Gynecological and Obstetrical Society and Council of University Chairs of Obstetrics and Gynecology provides a framework to help the leaders of departments of obstetrics and gynecology reimagine and reengineer their operations in light of the current coronavirus disease 2019 crisis and future pandemics.

Key words: COVID-19, Re-engineering, Departments of Obstetrics and Gynecology