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Adaptation of prenatal care and ultrasound

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ABSTRACT

In the spring of 2020, expeditious changes to obstetric care were required in New York as cases of COVID-19 increased and pandemic panic ensued. A reduction of in-person office visits was planned with provider appointments scheduled to coincide with routine maternal blood tests and obstetric ultrasounds. Dating scans were combined with nuchal translucency assessments to reduce outpatient ultrasound visits. Telehealth was quickly adopted for selected prenatal visits and consultations when deemed appropriate. The more sensitive cell-free fetal DNA test was commonly used to screen for aneuploidy in an effort to decrease return visits for diagnostic genetic procedures. Antenatal testing guidelines were modified with a focus on providing evidence-based testing for maternal and fetal conditions. For complex pregnancies, fetal interventions were undertaken earlier to avoid serial surveillance and repeated in-person hospital visits. These rapid adaptations to traditional prenatal care were designed to decrease the risk of coronavirus exposure of patients, staff, and physicians while continuing to provide safe and comprehensive obstetric care.

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Introduction

In March 2020, New York City saw its first case of COVID-19 followed quickly by widespread community transmission of the novel coronavirus. As case volume increased, area hospitals – including those within the NewYork-Presbyterian (NYP) health system – shifted resources to care for patients with COVID-19. Together, NYP's Columbia University Irving Medical Center (CUIMC) and Morgan-Stanley Children's Hospital are an over 1000-bed medical campus which delivers over 4600 pregnant patients annually. Within this obstetric service, CUIMC cares for a significant proportion of high-risk patients with maternal and/or fetal complications and performs over 50,000 ultrasounds annually within its Division of

Maternal Fetal Medicine. As the number of COVID cases in the New York metropolitan area swelled, NYP suspended all elective inpatient and outpatient procedures and canceled non-urgent ambulatory visits effective March 16th. In an effort to both ensure ongoing access for its patients and protect its staff from exposure, the Department of Obstetrics and Gynecology was forced to rapidly adapt its prenatal care model to the markedly altered healthcare landscape of the pandemic. Specifically, not only was there a need to reassess the frequency and timing of prenatal appointments and ultrasounds for both low- and high-risk patients, but also the need to reconsider how and where patients were seen, to adjust screening and diagnostic testing modalities, and to reconsider thresholds at which fetal therapy was offered.

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Prenatal care adaptations

Prior to the onset of the novel coronavirus disease 2019 (COVID-19) pandemic, the majority of prenatal visits for our patient population were performed in-person following standard recommendations for the provision of obstetric care.¹ However, in the setting of this major public health emergency, telehealth was rapidly integrated into prenatal care in order to consolidate in-person prenatal screening, surveillance, and examinations into fewer in-person visits while maintaining access to ongoing antenatal care and subspecialty consultation through virtual visits. The rationale for this change was to minimize patient travel and thus risk for COVID-19 exposure, particularly in a locale such as New York City, where there was a high prevalence of the virus. Other benefits for integration of telehealth include reducing provider exposures and decreased use of personal protective equipment (PPE) in the context of recognized shortages. While we do not have definitive evidence regarding the relative benefits of telehealth, current conditions support that there is substantial benefit to telehealth use during the pandemic and beyond. Increased child-care responsibilities, the need to work remotely, and fear of infection during the COVID-19 pandemic are just some of the reasons telehealth-consolidated prenatal care could have social and economic advantages for pregnant women. It is important to note that telehealth virtual visits do not fully replace in-person encounters during pregnancy and that the prenatal care and ultrasound guidelines presented in our paper are based on expert opinion.

The prenatal care telehealth outline followed at Columbia University Irving Medical Center (CUIMC) was structured on the idea that in-person visits would occur in conjunction with the necessary testing and ultrasound visits for a low-risk pregnancy. Telehealth formats from prior studies and expert recommendations, including resources from the American College of Obstetricians and Gynecologists (ACOG) and the Society for Maternal-Fetal Medicine (SMFM), were incorporated into our prenatal care regimens.²⁻⁶ It has been our experience that a general telehealth approach for low-risk patients eliminates about one-half of in-person visits.⁷

The following outlines the approach to prenatal care used at CUIMC during the height of the pandemic. If the patient was presumed to be less than 11 weeks' gestation at initiation of care, the first encounter was virtual. During this office visit, the patient was introduced to the practice, a clinical history elicited, and individualized pregnancy counseling given (Table 1). For intake visits occurring during the flu season, patients were informed about influenza vaccination and referred to local pharmacies for vaccine administration. Every prenatal visit, whether by telehealth or in-person, included a review of system (ROS) as well as the appropriate education and counseling pertaining to the particular time-point in pregnancy and specific patient situation.

In uncomplicated pregnancies, the next visit occurred between 11 and 13 weeks and was the first in-person encounter. Maternal vital signs and weight were measured during all in-person visits, with the performance of a physical exam as needed. During this 11-to-13-week office visit, a dating

ultrasound and nuchal translucency assessment, as well as a baseline physical exam and prenatal blood work, were performed. Additionally, genetic screening and testing options were reviewed, and further counseling based on the patient's individual medical, surgical, obstetric and social risk factors was performed.

The next visit occurred by telehealth between 13 and 18 weeks' gestation and was followed by an in-person visit between 18 and 22 weeks, during which the fetal anatomy ultrasound was performed. If the patient was low-risk, the subsequent visit was in-person between 26 and 29 weeks. This encounter included a growth scan and/or follow-up anatomy ultrasound if indicated, as well as third trimester labs, administration of the pertussis (Tdap) vaccine, and Rhogam for unsensitized Rh-negative patients. The subsequent visit between 32 and 34 weeks' gestation was virtual, followed by an in-person visit at 35 to 36 weeks, during which the group B streptococcus (GBS) culture was collected and if indicated by risk or clinical suspicion, another fetal growth scan was performed. Thereafter, visits occurred in-person on a bi-weekly or weekly basis; if stable patients had access to a home blood pressure monitor, some telehealth visits were undertaken during the last month of pregnancy. However, there was a low threshold for scheduling an in-person visit given the increased risk for complications late in the third trimester. At 40 weeks' gestation and beyond, patients were seen in-person and by 41 weeks, underwent twice weekly antenatal testing until delivery. These guidelines were modified for high-risk patients to ensure they received appropriate fetal testing and ultrasound examinations, non-obstetric consultations and indicated maternal testing and imaging, as well as easy access to their obstetric providers whether in-person or via telehealth.⁷

Ancillary services for otherwise low-risk patients were also provided via telehealth, including social work consultations, mental health services, nutrition education, genetic counseling, and obstetric anesthesia consultations. For high-risk patients, neonatology consultations were also performed via telehealth with virtual tours of labor and delivery and the neonatal intensive care unit. Although an in-person physical examination had been routine at the time of the 6-week postpartum visit, telehealth for both vaginal and cesarean deliveries was regularly utilized in the setting of the COVID-19 pandemic. At 1 to 2 weeks postpartum, a virtual visit was scheduled to assess all patients, address postpartum concerns, and check for possible complications. Patients with elevated blood pressures during their delivery hospitalization were asked to obtain a blood pressure cuff for home use from their local pharmacy and were counseled when to seek in-person medical care. During the early postpartum telehealth visit for these patients, blood pressures were reviewed along with screening for symptoms associated with hypertension. For patients delivering by cesarean, the skin incision was assessed using a smartphone or computer with a camera. All patients experiencing abnormal pain, bleeding or with other concerns, were scheduled for an in-person visit. Patients with risk factors for mental health complications were also followed virtually, as long as they clearly understood the precautions for escalation of care. Counseling regarding the patient's obstetric experience

Table 1 – Suggested timeline for routine prenatal care during the COVID-19 pandemic.

Gestational Age	Visit Type	Care Provided	
1-10 weeks	Telehealth visit	Introduction to practice/care model Review of systems (ROS), labs, imaging, Rx as needed Individualized pregnancy education and counseling When applicable, discussion of influenza vaccination → referral to local pharmacy for administration	
11-13 weeks	In-person visit	Viability/dating/nuchal translucency scan ROS + physical exam Discussion of aneuploidy screening vs diagnostic testing Intake labs Individualized education and counseling	
13-18 weeks	Telehealth visit or MD/RN call	Lab review	
18-22 weeks	In-person visit	ROS, BP, weight, +/- exam Anatomy scan with cervical length Individualized education and counseling	
26-29 weeks	In-person visit	ROS, BP, weight, +/- exam Growth scan (+ F/U anatomy if not completed) 3 rd trimester labs Pertussis vaccine (TDaP) Rhogam (if indicated) Mid-pregnancy education + individualized education and counseling	
32-34 weeks	In-person visit (multiples only)	ROS, BP, weight, +/- exam Growth scan Late-pregnancy education + individualized education and counseling	<i>May do US-only if patient can home BP monitor</i>
35-36 weeks	In-person visit	ROS, BP, weight, +/- exam Growth scan GBS swab Term-pregnancy education + individualized education and counseling	
37 weeks	In-person visit	Weekly visits with ROS, BP, weight, +/- exam Term-pregnancy education Individualized education and counseling	<i>May be every other week and/or telehealth visit if patient has home BP monitor</i>
38 weeks	In-person visit		
39 weeks	In-person visit		
40 weeks	In-person visit		
41+ weeks	In-person visit	Twice-weekly visit for ROS, BP, weight, +/- exam Antenatal testing	
48-72 hours postpartum	Phone call	Implemented to follow-up with patients after earlier delivery discharge	
1-2 weeks postpartum	Telehealth visit	May be scheduled at the discretion of the provider for depression screen, incision check, BP review, etc.	
6-8 weeks postpartum	Telehealth visit	ROS Lab requisition as needed Individualized education and counseling re: postpartum care, contraception, and future pregnancy	
Prenatal consult (Initial, follow-up, or co-management)	In-person or telehealth visit	To be determined by consulting Maternal Fetal Medicine specialist	
Preconception	Telehealth visit		

*This schedule is presented as a suggested approach to providing outpatient prenatal care; is not meant to be restrictive and providers may schedule additional visits (in-person or telehealth) and / or increase testing at their discretion based on individual scenarios.

and postpartum care including contraception and future pregnancy planning, was also performed virtually with labs and referrals ordered as needed. Telehealth proved to be an ideal modality for achieving the American College of Obstetrician and Gynecologists' goals for ongoing postnatal care over 12 weeks rather than a single encounter in the postpartum period.⁸

Obstetric ultrasound adaptations

During the COVID-19 pandemic, medically-indicated antenatal fetal surveillance and ultrasonography continued to the extent possible, sometimes limited by the willingness of patients to attend an in-person visit. As recommended by

ACOG under normal conditions, elective or non-indicated ultrasounds were not performed.⁹ Obstetric ultrasonography was reserved for routine, recommended studies or to provide medical benefit to patients by aiding to answer relevant clinical questions.¹⁰ In New York City and similar locales where community spread of the contagion was significant, obstetric providers in collaboration with imaging facilities were obliged to balance the risk of potential exposure of patients and staff to the virus against the potential consequences of postponing or canceling a test, taking into consideration site capabilities to provide ultrasound and antenatal testing services.¹¹ In situations where the risk of infection was judged to outweigh the benefit of testing, ultrasounds were rescheduled and antenatal testing delayed until the peak risk of infection diminished.¹²

Prior to COVID-19, general imaging recommendations for a low-risk pregnancy at our institution included a first trimester dating ultrasound to evaluate pregnancy location, viability, plurality and in the setting of multiples, chorionicity and amnionity. This was followed by a nuchal translucency scan between 11 and 13 weeks with an assessment of gross fetal anatomy, and a second trimester anatomy scan to assess cardiac activity, fetal size, basic fetal anatomy and well-being, cervical length as well as placental appearance and location.^{13,14} For patients at increased risk for congenital heart disease, both early and second trimester fetal echocardiography were available at our institution prior to the pandemic. In the absence of maternal comorbidities or a concerning obstetrical history, patients at CUIMC would typically undergo a fetal growth ultrasound early in the third trimester, with a reassessment of placental location in those previously diagnosed with placenta previa or a low-lying placenta. When required due to recognized risk, repeat growth scans were performed every 3 to 4 weeks until delivery. Before COVID-19, antenatal testing for known maternal conditions such as advanced age, obesity, pregestational diabetes, medication-controlled gestational diabetes or chronic hypertension, was initiated at 32 to 34 weeks; for fetal conditions with increased risk of death, testing would be initiated at the time of diagnosis and/or at the time of fetal viability.

During the COVID-19 pandemic, modifications to our approach to obstetric ultrasound and antenatal testing were required in an effort to reduce the risk of exposure for patients with a fallout benefit of decreased exposure for providers, ultrasonographers, and staff. This also resulted in important conservation of PPE which was in very short supply early in the pandemic. While the timing of the first trimester nuchal scan and second trimester anatomy ultrasound remained unchanged, first trimester anatomy ultrasounds and early fetal echocardiograms were deferred unless a major structural anomaly was suspected on the nuchal translucency ultrasound. In uncomplicated pregnancies, dating was confirmed at the time of the nuchal scan rather than performing an additional dating scan earlier in the first trimester.¹⁵ During the pandemic, the first obstetric ultrasound was the nuchal scan at 11 to 13 weeks' gestation; however, in cases of threatened miscarriage or suspected ectopic

pregnancy, prompt ultrasounds were obtained earlier in gestation. Second trimester fetal echocardiograms were still performed for significant maternal and fetal risk factors for congenital heart disease but every effort was made to consolidate this study into a single appointment with the patient's anatomy ultrasound ideally at 20 to 22 weeks. While referral for this specialized and time-intensive imaging of the fetal heart was generally maintained, fetal echocardiography was deferred if the sole indication was in-vitro fertilization or sub-optimal cardiac views on the second trimester anatomy scan with low suspicion of congenital heart disease.¹³ Serial growth scans were spaced out as judged to be clinically reasonable, usually occurring around 28 and 35 weeks' gestation.

One of the most significant changes to obstetric care during the pandemic involved adjustments to our antenatal testing guidelines (Table 2). For low-risk patients, the initiation of antenatal testing became largely dependent on the outcome of the 28-week growth ultrasound. In cases in which the fetus demonstrated normal growth, most antenatal testing for conditions such as advanced maternal age, obesity, and chronic hypertension was started at 36 weeks' gestation and performed weekly until delivery. Antenatal testing for pregestational diabetes or medication-controlled gestational diabetes typically started at 34 weeks irrespective of normal fetal growth, with twice weekly testing for the former and weekly testing for the latter. Additional adjustments to antenatal surveillance via ultrasound and non-stress testing were made for specific maternal and fetal conditions in an effort to balance risks (Table 2). Patients were informed of our recommendations regarding modifications to fetal testing, accompanied by a risks-versus-benefits discussion on presenting to the ultrasound unit in the setting of a global pandemic. As recommended by ACOG, this counseling was documented in the medical record.¹²

Unique challenges arose when patients exposed to COVID-19, with active disease, or recently recovered from the illness required prenatal ultrasound or antenatal testing. Early in the pandemic, PPE was scarce and COVID-19 testing was unavailable. While prenatal visits could be completed via telehealth during this time, in-person visits were required for ultrasound and non-stress testing. Given minimal information on the natural history of pregnancy affected by COVID-19, we adopted an approach similar to that for patients with influenza. With significant maternal exposure or any COVID-19 symptoms, obstetric ultrasound and antenatal testing were postponed, preferably for 14 days, at which time the appointment was rescheduled if the patient was asymptomatic. Despite the paucity of data on the virus' impact on fetal growth and development, a detailed mid-trimester anatomy ultrasound was performed between 18 and 23 weeks in patients who had experienced COVID-19 in the first trimester.^{12,13,16} For patients infected in the second and early third trimester, fetal growth scans with amniotic fluid assessments were completed every 4 weeks in an effort to detect intrauterine growth restriction as well as any late-recognized fetal abnormalities.^{12,13,16} As in any crisis, all obstetric emergencies were attended to in an expedited fashion regardless of COVID-19 status and in agreement with current local guidelines.

Table 2 – Indications for antenatal surveillance.

Condition	Initiate Testing (GA in weeks)	Frequency of Testing
Abruption	At diagnosis	Weekly
Advanced maternal age \geq 40 years	36 wk if 28 wk growth normal	Weekly
Amniocentesis \geq 24 weeks	Post-procedure	NST once
Antiphospholipid syndrome	36 wk if 28 wk growth normal	Weekly
Chronic hypertension	36 wk if 28 wk growth normal	Weekly
Chronic renal disease	36 wk if 28 wk growth normal	Weekly
Cholestasis	At diagnosis	Weekly; twice weekly if bile acids $>$ 40
Maternal cyanotic heart disease	36 wk if 28 wk growth normal	Weekly
Decreased fetal movement	At diagnosis	Once
Diabetes mellitus (type 1 or 2)	34 wk (earlier if poor control or end-organ damage)	Twice weekly
Gestational diabetes (medication-requiring or with poor control)	34 wk	Weekly
Gestational diabetes (on diet and good control)	40 wk	Weekly
Gestational hypertension	At diagnosis	Weekly
Hyperthyroidism (poor control)	–	None
Hemoglobinopathies (SS, SC, S-thal)	–	None
Fetal growth restriction (EFW $<$ 10th or AC $<$ 5th)	At diagnosis	Weekly; twice weekly if abnormal Dopplers
Isoimmunization	At diagnosis	Weekly MCA Dopplers or per MFM
Known or suspected major fetal anomaly	34–36 wk	Weekly
Multiple gestations		
Dichorionic twins	36 wk	Weekly
Trichorionic triplets	32 wk	Weekly
Uncomplicated monochorionic multiples	$>$ 16 wk	Every 2 weeks 16–32 wk; weekly $>$ 32 wk
Complicated monochorionic multiples	$>$ 16 wk	Per MFM
Monoamniotic multiples	When intervention desired	Per MFM
Obesity with BMI \geq 40	36 wk	Weekly
Oligohydramnios defined as MVP $<$ 2 cm	At diagnosis	Twice weekly
Polyhydramnios	At diagnosis	Weekly
Post EDC pregnancy	41 wk	Twice weekly
Preeclampsia	At diagnosis	Twice weekly
Prior intrauterine fetal demise (unexplained)	34 wk (earlier if prior loss $<$ 34 wk)	Weekly
Systemic lupus erythematosus (active disease)	36 wk if 28 wk growth normal	Weekly
Thrombophilia with poor OB history	36 wk if 28 wk growth normal	Weekly

Adaptations to diagnostic procedures and fetal therapy

There were two major modifications to our approach to diagnostic and therapeutic procedures during the pandemic; first all genetic counseling sessions were transitioned from in-person office visits to telehealth and secondly, for suspected or confirmed cases of COVID-19, procedures were delayed for 14 days and only performed once patients were asymptomatic with appropriate PPE for providers and masks for patients. Virtual visits for genetic counseling were well-accepted by patients, counselors, and providers; for patients deciding against a diagnostic procedure, telehealth allowed them to avoid additional COVID-19 exposure and our ultrasound units were able to conserve precious PPE.

Given its superior screening performance characteristics, cell-free fetal DNA testing was more commonly offered at the first in-person 11-to-13-week prenatal visit regardless of the patient's a priori risk. For patients requiring diagnostic testing due to positive aneuploidy screening, prior obstetric history, or early ultrasound findings, there was a preference for

amniocentesis given the theoretical lower risk of vertical transmission of the Severe Acute Respiratory Syndrome – Corona Virus 2 (SARS-CoV-2) if the placenta is not traversed.¹⁷ However, to date there have been no documented cases of vertical transmission of SARS-CoV-2 with amniocentesis or chorionic villus sampling (CVS) so CVS was performed in time-sensitive situations so patients would have the opportunity to access early pregnancy termination services if needed. This was clinically important as dilatation and evacuation (D&E) procedures were considered to be “non-urgent” during the pandemic and not widely available in New York.

Fetal therapy was also affected by local and state rules imposed during the COVID-19 crisis. For hospital-based procedures, a pre-procedure polymerase chain reaction (PCR) nasopharyngeal swab for SARS-CoV-2 was required a day in advance so that mandatory measures could be taken for infected individuals and appropriate PPE could be made available to staff and physicians. Patients who tested positive for SARS-CoV-2 were counseled about the theoretical risk of vertical transmission and if feasible, the procedure was delayed for 14 days. Furthermore, “elective” procedures were prohibited during the height of the pandemic. Consequently, fetal

Table 3 – Approach to diagnostic and therapeutic procedures during COVID-19 pandemic.

Procedure	Benefit to fetus/mother	Theoretical risk of vertical transmission	Resource Utilization	Recommendation
Chorionic villus sampling	High	Moderate	Minimal	Offer to asymptomatic or screen negative patient; delay or offer amniocentesis in symptomatic or screen positive patient
Amniocentesis	High	Low	Minimal	Offer to asymptomatic or screen negative patient; if feasible, delay in symptomatic or screen positive patient
Fetal blood transfusion	High	Moderate	Moderate	Offer to asymptomatic or screen negative patient; use appropriate PPE for symptomatic or screen positive patient
Fetal cardiac procedures	Uncertain	Moderate	Moderate	Consider not offering
Thoraco-amniotic shunting	High	Moderate/High	Moderate	Offer to screen negative patient, adjust for symptomatic or screen positive patient if delay not feasible
Vesico-amniotic shunting	Low	Moderate/High	Moderate	Consider not offering
Fetal cystoscopy	Uncertain	Moderate/High	Moderate	Consider not offering
Laser for twin-twin-transfusion syndrome	High	Low	Moderate	Offer to screen negative patient, adjust for symptomatic or screen positive patient if delay not feasible
Selective feticide in monochorionic twins	Variable	Low	Moderate	Offer to asymptomatic patient, adjust for others
Tracheal occlusion for congenital diaphragmatic hernia	Uncertain	Low	Moderate	Consider not offering
Spina bifida closure	High	High	High	Only offer if sufficient local resources are available

Adapted from Deprest J, Van Ranst M, Lannoo L, et al. SARS-CoV2 (COVID-19) infection: is fetal surgery in times of natural disasters reasonable? *Prenatal Diagnosis* 2020 Apr 11;10.1002/pd.5702; doi: 10.1002/pd.5702.

therapeutic interventions were limited to urgent and potentially life-saving procedures such as fetoscopic laser therapy for twin-twin transfusion syndrome, radiofrequency ablation for selective reduction in complicated monochorionic twin gestations, and fetal transfusion for suspected anemia. For these complex pregnancies, fetal interventions were undertaken early to avoid serial surveillance and repeated in-person hospital visits. Interventions of limited or unproven benefit and/or that may require lengthy or recurrent patient-staff interactions such as drainage or shunting procedures, were not performed during the pandemic. Procedures for other fetal conditions were considered on a case-by-case basis, usually with multidisciplinary input via video or telephone conference. In general, non-critical fetal conditions were not offered in utero treatment; our fetoscopic closure program for spina bifida and fetal interventional cardiology program were suspended with a return to standard surgical approaches after birth. For other fetal therapeutic

interventions, our approach was similar to that subsequently published by others (Table 3).^{18,19}

Conclusions

As the early epicenter of the pandemic in the United States, hospitals in New York had to make rapid changes in order to care for both COVID-19 positive and healthy individuals. This was particularly true for institutions with obstetrical services since pregnant women needed ongoing prenatal care with specified surveillance. At CUIMC, the introduction of telehealth into prenatal care and modifications made to the timing and frequency of obstetric ultrasounds and antenatal testing allowed us to provide safe and comprehensive care for our patients. Even for complex pregnancies requiring diagnostic genetic procedures and fetal therapeutic interventions, adaptations were possible to decrease exposure risk to

Table 4 – Key COVID-19 guidelines for prenatal care and ultrasound.

Organization	Publication
ACOG	COVID-19 FAQs for Obstetricians-Gynecologists, American College of Obstetricians and Gynecologists (ACOG); https://www.acog.org/en/clinical-information/physician-faqs/COVID19-FAQs-for-Ob-Gyns-Gynecology
AIUM	Guidelines for cleaning and preparing external- and internal-use ultrasound transducers and equipment between patients as well as safe handling and use of ultrasound coupling gel. Updated resource includes a section specifically on COVID-19. American Institute of Ultrasound in Medicine (AIUM); https://www.aium.org/officialStatements/57 Patient and ultrasound provider protection quick guide, American Institute of Ultrasound in Medicine (AIUM); https://aium.s3.amazonaws.com/covid19/Covid19_Quick_Guide_PUPP.pdf
IFMSS	Deprest J, Choolani M, Chervenak F, et al. Fetal diagnosis and therapy during the COVID-19 pandemic. Guidance on behalf of the International Fetal Medicine & Surgery Society (IFMSS). <i>Fetal Diagnosis and Therapy</i> ; doi: 10.1159/000,508,254
ISUOG	International Society of Ultrasound in Obstetrics and Gynecology (ISUOG) Safety Committee Position Statement: safe performance of obstetric and gynecological scans and equipment cleaning in the context of COVID-19; https://www.isuog.org/resource/isuog-safety-committee-position-statement-safe-performance-of-obstetric-and-gynecological-scans-and-equipment-cleaning-in-the-context-of-covid-19.html
NAFTNet	Bahtiyar MO, Baschat A, Deprest J, et al. Fetal interventions in the setting of COVID-19 pandemic: statement from the North American Fetal Therapy Network (NAFTNet). <i>Am J Obstet Gynecol</i> ; doi: https://doi.org/10.1016/j.ajog.2020.04.025
SCoR, RCM, RCOG, BMUS	Society & College of Radiographers (SCoR), Royal College of Midwives (RCM), Royal College of Obstetricians and Gynaecologists (RCOG), British Medical Ultrasound Society (BMUS). Obstetric ultrasound examinations during the COVID-19 pandemic; https://www.sor.org/sites/default/files/document-versions/obstetric_ultrasound_examinations_dug_the_covid-19_pandemic_1.pdf
SMFM SOGC	COVID-19 Resources from the Society for Maternal-Fetal Medicine (SMFM); https://www.smfm.org/covid19 Elwood C, Boucoiran I, VanSchalkwyk J, Money D, Yudin M, Poliquin V, on behalf of the Infectious Disease Community of the Society of Obstetricians and Gynaecologists of Canada (SOGC). Updated SOGC Committee Opinion – COVID-19 in Pregnancy https://www.sogc.org/en/content/featured-news/Updated-SOGC-Committee-Opinion_COVID-19-in-Pregnancy.aspx

patients, staff, and providers. The team at CUIMC was forced to make these changes to obstetric care at time when there were limited recommendations available for guidance; our experience and opinions have contributed to the development of many regional, national, and international guidelines now published by various societies and organizations (Table 4). Ultimately, lessons learned during the COVID-19 pandemic may result in permanent changes to the provision of prenatal care in the United States and hopefully, and most importantly, help us when we face another global health crisis in the future.

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