



Obstetrical Telehealth and Virtual Care Practices During the COVID-19 Pandemic

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Abstract: The coincidence of a global pandemic with 21st-century telecommunication technology has led to rapid deployment of virtual obstetric care beginning in March of 2020. Pregnancy involves uniquely time-sensitive health care that may be amenable to restructuring into a hybrid of telemedicine and traditional visits to optimize accessibility and outcomes. The coronavirus disease 2019 pandemic has provided an unprecedented natural laboratory to explore how virtual obstetric care programs can be developed, implemented, and maintained, both as a contingency model for the pandemic and potentially for the future. Here, we discuss the role of telehealth and virtual care for pregnancy management in the coronavirus disease 2019 pandemic, as well as anticipated barriers, challenges, and strategies for success for obstetric telemedicine.

Key words: telehealth, telemedicine, COVID-19, SARS-CoV-2, pandemic, health care delivery, prenatal care, virtual care

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The Coronavirus Disease 2019 (COVID-19) Pandemic and Telemedicine

The COVID-19 pandemic has challenged the capacity of the contemporary US health care system with unprecedented critical care volume and infectivity. The structure of care delivery has also been forced to reckon with public health mandates for social distancing and the imperative to balance essential health care service with risk reduction for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) exposure. Like other fundamental social and public health services, hospitals and medical practices have simultaneously confronted a directive to limit the risk of COVID-19 infection and prevent associated morbidity with the need to prevent and address other sources of morbidity with health care services. This requires careful delineation of what constitutes essential health

care as well as a creative reimagining of how those services are delivered. Telemedicine has proven to be an important care modality to maintain outpatient and preventive care during the pandemic while reducing the risk of SARS-CoV-2 infection.^{1,2}

Obstetric care, which is definitionally time-sensitive, faced an urgent need for adaptive remodeling of established care models at the outset of the pandemic. Pregnant patients are typically evaluated in the outpatient setting regularly throughout gestation, at a frequency ranging from monthly to weekly, as well as with at least 1 obstetric ultrasound. At the same time, in the face of a new and dangerous pathogen, there has been especial concern regarding exposure to SARS-CoV-2 during pregnancy with potential implications for maternal and fetal well-being. The need to provide safe, regular obstetric care in the face of the pandemic has driven the rapid adoption of new health care platforms for pregnancy care, primarily through the use of telemedicine. While telehealth technologies have been in existence for decades, the pandemic prompted the utilization of telemedicine specifically to facilitate virtual prenatal visits to reduce the risk of exposure to the pandemic, which is a largely new application of the technology.

Virtual care using telehealth can provide many aspects of pregnancy care that do not require physical contact with a health care provider or facility. In the context of routine pregnancy care, this can include vital sign measurement through home monitors, assessment of pregnancy symptoms and concerns, and anticipatory guidance and counseling. Many other elements of pregnancy care, such as genetics consultations, maternal-fetal medicine (MFM) consultations, and surveillance of specific pregnancy complications such as hypertension and diabetes, can also be provided virtually. These care delivery changes in response to COVID-19

have potential utility beyond the pandemic, including increasing accessibility and feasibility of prenatal care and may serve as an advantageous and enduring paradigm for optimal pregnancy care delivery.

Overview of Prepandemic Obstetric Telehealth

Before the early spring of 2020, telehealth programs in obstetrics were already expanding, primarily to facilitate improved access to care for patients in remote locations without available specialists and subspecialists, to provide more efficient care for uncomplicated pregnancies, and to facilitate more convenient postpartum care for patients with new infants at home.³ A systematic review of the impact of telehealth on obstetric outcomes demonstrated improved rates of breastfeeding and smoking cessation as well as fewer high-risk obstetric office visits without an increase in maternal or neonatal morbidity.⁴ Multiple hybrid prenatal care programs combining self-monitoring tools such as handheld Doppler and blood pressure cuffs, text messaging platforms with the medical team, and video conference appointments have been developed and studied, with data demonstrating preserved obstetric outcomes and increased patient satisfaction.⁵⁻⁷ Postpartum care has also increasingly been remodeled to include telemedicine platforms for improved access given historically low rates of outpatient postpartum follow-up.⁸ Multiple large telemedicine-based MFM programs have been developed over the past 2 decades to address the lack of MFM availability in rural settings.⁹⁻¹¹ Data emerging from these programs have demonstrated comparable outcomes with unique advantages to telemedicine care. For example, data from an observational study of a tele-MFM program based in Pittsburgh comparing telemedicine-based to traditional pregnancy care were signifi-

cant for similar obstetric outcomes with high patient satisfaction scores and substantial cost savings.¹² Many specific aspects of MFM care have also been readily adapted to telehealth platforms, such as diabetes management using remote review of patient blood glucose logs, with studies demonstrating equivalent or even improved rates of diabetes-specific outcomes including macrosomia and cesarean section.^{13–15} Similar virtual care opportunities exist for remote blood pressure monitoring in patients with hypertensive disorders of pregnancy with the potential to improve access and compliance.^{16,17}

Practicing Teleobstetrics in the COVID-19 Pandemic

ROUTINE PRENATAL CARE

Prenatal care is one of the most utilized preventive health services in the United States, with 98% of the 4 million obstetric patients who deliver annually receiving at least some antenatal care.^{18,19} Routine obstetric care typically involves regular prenatal visits with an obstetric care provider at increasing frequency throughout gestation, resulting in ~13 to 14 visits.²⁰ These appointments usually include assessment of maternal vital signs including blood pressure and weight, fetal

heart rate assessment, measurement of the uterine fundal height, review of patient symptoms and concerns, and anticipatory guidance and planning for delivery. Many of these elements can be conceivably replicated in a virtual context (Table 1). Discussions of pregnancy symptoms and counseling can occur via video conference, and simple home monitoring devices for blood pressure and weight assessment, and even handheld Doppler for fetal heart rate can allow most pregnancy monitoring to take place remotely. This has the benefit of enabling prenatal care to be more feasible and convenient for patients, avoiding commutes to the clinic, waiting room time, and disruption of their workday or other daily activities. During the COVID-19 pandemic, telemedicine prenatal care has also facilitated social distancing and reduced potential exposures for patients and health care providers.

Before the pandemic, obstetricians, researchers, and health policy experts were already considering potential innovations to the traditional model of prenatal care in the United States. For example, a survey study of 300 obstetric patients demonstrated that most felt comfortable using home monitors for weight, blood pressure, and fetal heart tones and that they desired fewer visits than typically recommended but wanted more regular

TABLE 1. Routine Prenatal Care Elements That Can Be Delivered Virtually Versus In-person

Potential for Virtual Care	Obligate In-person Care
Full history	Routine prenatal labs and genetic screening
Vital signs and weight	Physical examination and cervical cancer screening
Fetal heart rate assessment	Vaccination for influenza and TDaP
Pregnancy symptom assessment	Dating, anatomy, and growth ultrasounds
Fundal height measurement	Third trimester laboratory work and diabetes screen
Anticipatory guidance for pregnancy	Rhogam administration
Fetal kick count instructions	GBS screen
Screening for perinatal depression	Assessment of fetal presentation
Breastfeeding education	Cervical examination
Family planning counseling	
Anticipatory guidance for labor and delivery	

GBS indicates Group B Strep.

contact with their providers between visits.²¹ More flexible models of prenatal care targeting specific patient medical and psychosocial needs, rather than adherence to an arbitrary schedule of visits, have also been proposed with the goal of individualizing and optimizing care utilization.¹⁹ Data collected from earlier prenatal care trials with reduced in-person visits have demonstrated similar or improved patient satisfaction and consistent maternal and neonatal outcomes, supporting the safety and acceptability of these changes.^{22,23}

The pandemic prompted rapid translation of these early efforts at prenatal care redesign into wide-scale uptake of more elastic models reliant on virtual care, which has been supported heartily by experts in the field.^{24,25} One group at the University of Michigan published their experience reengineering prenatal care delivery during the pandemic focused on using in-person care exclusively for services that cannot be provided remotely and creating flexible, opt-in programs for pregnancy psychosocial support.²⁶ They developed a “4-1-4” model for the pandemic involving a combination of 4 office visits, 1 ultrasound, and 4 virtual visits in addition to a supplemental online program of group prenatal care with small-group counseling sessions, online chatting, and classes by behavioral health specialists. They rapidly trained obstetric providers in the new care model and enlisted medical students to call patients to review their updated antenatal care schedules and discuss home monitoring options such as blood pressure cuffs and handheld Dopplers, though these were not required. Data collected after the introduction of this model demonstrated a reduction in weekly prenatal visit volume by 16%, a 4-fold increase in virtual visit volume, and a majority of providers and patients who felt that the new model was safe and improved access to care.²⁷ Another group in Tampa, Florida, described its experience rapidly implementing a

blended model of office and virtual visits for routine prenatal care during the pandemic.²⁸ This involved a virtual intake followed by alternating virtual and in-person appointments with 2 virtual postpartum visits and is currently being evaluated with patient and provider surveys. Table 2 depicts comparative hybrid schedules of virtual and in-person care from multiple different pandemic prenatal care programs across the country.

HIGH-RISK PREGNANCY CARE

While geographic constraints in MFM access have already prompted robust telemedicine programs for high-risk maternal and fetal care in underserved areas with high uptake and satisfaction as well as favorable outcomes, telemedicine-based MFM care had not previously been attempted systematically in urban or suburban settings before the pandemic. However, many elements of high-risk pregnancy care lend themselves naturally to a telemedicine model. According to the Society for Maternal-Fetal Medicine (SMFM), the role of MFM specialists in the outpatient setting is to provide preconception counseling for patients with chronic medical conditions or complicated pregnancies in the past; perform prenatal screening diagnosis using genetic screening, ultrasound, and ultrasound-based procedures; provide fetal testing and therapeutics; and manage pregnancies complicated by maternal health problems, fetal anomalies, and pregnancy-specific complications such as preterm birth, pregnancy loss, and placental disorders. Many of the maternally focused care provided by MFM, including risk stratification and counseling, managing chronic conditions such as hypertension and diabetes, and planning for safe deliveries, can occur virtually.²⁹ For MFM care directed at fetal anomalies, which typically requires in-person imaging and procedures, experts have suggested utilizing telemedicine for initial consultations and counseling to

TABLE 2. Comparative Models of Published Teleobstetric Care Schemes in the COVID-19 Pandemic

University of Michigan ²⁶		Columbia University Irving Medical Center ²⁴		University of Illinois at Chicago Medical Center ²⁵		University of South Florida ²⁸	
Virtual	In-person	Virtual	In-person	Virtual	In-person	Virtual	In-person
Intake		Intake		Intake		Intake	
	8 wk		11-13 wk		12 wk	6-10 wk	10-14 wk
16 wk		14-17 wk		In-person visit every 6-8 wk, 12-28 wk with virtual visits in between as necessary		15-19 wk	
	19-20 wk with anatomy scan		18-22 wk with anatomy scan				20-22 wk
24 wk		23-26 wk				23-26 wk	
	28 wk		27-28 wk				27-28 wk
32 wk		29-35 wk		In-person visit every 4 wk, 29-36 wk with virtual visits, 2 wk after every in-person visit		29-34 wk	
	36 wk	37 wk	36 wk				35-36 wk
38 wk		38 wk		In-person visit every 2 wk from 36 wk until delivery with weekly virtual visits in between		37-38 wk	
	39 wk		39 wk				39-40 wk
			40 wk				40-41 wk

COVID-19 indicates coronavirus disease 2019.

improve accessibility and reduce pandemic-related exposures.³⁰

An MFM practice at Columbia University Irving Medical Center, one of the first medical centers to confront COVID-19 on its early front lines in New York City, published recommendations early on in the pandemic to guide implementation of high-risk pregnancy care via telemedicine.³¹ They classified high-risk pregnancy conditions into categories and focused on key management points for each condition, including: hypertensive disorders of pregnancy, diabetes, cardiovascular disease, neurological disease, and history of preterm birth or other poor obstetrical history. They then delineated which elements of care should continue in-person, such as cervical length screening and antenatal testing, as well as in-person visits in the third trimester for patients with hypertension and cardiac disease, and which could be accomplished virtually such as diabetes management, nutrition counseling, and some subspecialty consul-

tations. In addition, they provided guidance for management of fetal complications, genetic counseling, obstetric anesthesia consultations, mental health services, and postpartum care. These included virtual genetics and anesthesia consultations, psychotherapy, and routine postpartum visits. They also recommended consolidating routine office visits with ultrasound and antenatal testing appointments as much as possible to reduce contact points with the health care system. This is a potential strategy that can continue as a standard of care for high-risk pregnancy management outside of the pandemic that can reduce the burden of pregnancy-related visits required for complicated pregnancies and improve patient satisfaction and adherence.

Another group at the University of North Carolina at Chapel Hill described its workflow for transitioning genetics consults to telemedicine during the pandemic.³² They were able to quickly enable their genetic counselors to work from home and

engage both in scheduled video visits for patients with established genetic-related pregnancy concerns as well as unscheduled virtual visits for patients with newly diagnosed fetal anomalies in the ultrasound unit. Their program was able to leverage scaled-down in-person resources for ultrasound and prenatal diagnostic procedures while optimizing safe and effective patient care for genetic counseling and psychosocial support after a difficult diagnosis, which is an expertise of genetic counselors. Though further data is required to understand patient satisfaction and inform potential long-term postpandemic implementation, this model effectively enabled the continuation of this important obstetric care service despite the pandemic.

Though patients with complicated pregnancies may be apprehensive about transitioning to a telemedicine model, research has demonstrated that a majority of patients actually prefer a hybrid of telemedicine and in-person MFM visits during pregnancy.³³ This same study demonstrated a significant decrease in no-show appointments, patient-canceled appointments, and patient same-day cancellations with the implementation of telehealth. This suggests that telemedicine may have the ability to provide more accessible MFM care both during and outside of the pandemic in ways that are acceptable even to high-risk patients.

COVID-19 CARE IN PREGNANCY

A novel challenge of the COVID-19 pandemic has been to create health care capacity for triage, evaluation, and management of potential and confirmed SARS-CoV-2 infection in ambulatory settings. During the pandemic, hospitals quickly became overwhelmed by patients presenting with acute respiratory symptoms of COVID-19, utilizing unprecedented inpatient resources.³⁴ However, the vast majority of infections (~80%) are mild-moderate, both in general and in pregnancy specifically.^{35,36} It, there-

fore, became necessary to develop systems for diagnosing COVID-19 in patients with nonsevere presentations and to manage symptoms for these patients away from teeming hospitals and outside of traditional clinic settings to conserve resources and reduce exposure risks for health care workers and other patients.

Multiple obstetric groups have published their experience developing virtual COVID-19 clinics for pregnant patients and COVID-19 telehealth surveillance programs. Given the uncertainty surrounding additional pregnancy-related risks of SARS-CoV-2 and concerns for potential increased severity of disease in pregnancy, it was especially important to facilitate timely, regular mechanisms for monitoring symptoms of patients with confirmed cases of COVID-19 in pregnancy. One MFM Division at Beth Israel Deaconess Medical Center in Boston, MA, described the feasibility and outcomes following the introduction of a multidisciplinary telemedicine model for obstetric patients with suspected or confirmed COVID-19.³⁷ Patients were assessed with regular phone calls by nurses to evaluate respiratory symptoms including shortness of breath, cough, chest pain, and hemoptysis, as well as hydration and mental status. Patients with concerning symptoms were triaged for emergency evaluation. Of 135 enrolled patients in the program over a 1-month period from March to April of 2020, 86% were managed exclusively via telemedicine with an average of one phone call per day and did not require in-person evaluation. Another program, at Columbia University Irving Medical Center in New York City, utilized an existing framework for multidisciplinary high-risk obstetric care to enroll patients with suspected or confirmed SARS-CoV-2 infection in a virtual care model for mild-moderate COVID-19.^{38,39} Patients were scheduled for an initial virtual visit within 24 hours and subsequent follow-up visits at 24-hour,

48-hour, or 72-hour intervals based on symptom severity (such as the presence of shortness of breath or fever $> 101^{\circ}\text{F}$). Of 69 patients in the initial pilot program in March of 2020, 88.4% were able to be managed as virtual outpatients with a mean of 3.5 visits ($\text{SD} = 2.6$) per patient. At the Hospital of the University of Pennsylvania in Philadelphia, PA, a remote surveillance program for patients with confirmed or suspected SARS-CoV-2-monitored patients with twice-daily text messages to evaluate symptoms. Patients indicating worsening dyspnea or other concerning symptoms were contacted directly via telephone by an MFM physician and triaged for continued monitoring at home versus acute evaluation. Of 160 patients enrolled over a 6-month period, 81% responded to at least 1 of the text message prompts per day, and 61.3% were managed without requiring direct provider outreach. Of 4 total patients referred to the emergency department after the escalation of remote monitoring, 50% required inpatient admission for hypoxia.⁴⁰

SUBSTANCE USE TREATMENT IN PREGNANCY

Pregnant patients with a history of substance use disorder require close outpatient surveillance, typically involving psychotherapy, social support, and opioid agonist therapy. The pandemic threatened many of these services and opened the opportunity for a swift transition to telemedicine models to maintain continuity. However, patients with substance use disorder may be socioeconomically vulnerable and more likely to face barriers to successful telemedicine care including access to reliable technology and to safe and secure locations for virtual visits. They may also have unique concerns about the privacy and confidentiality of telemedicine visits. At the same time, telemedicine has the potential to improve access for vulnerable patients by obviating trans-

portation costs and reducing time away from work or childcare. One small study of 13 patients from the Ohio State University College of Medicine demonstrated that transitioning from in-person to virtual care during the pandemic resulted in decreased attendance at therapy sessions and more uptitration of medication-assisted treatment regimens due to cravings.⁴¹ The authors posited that telemedicine care may not be able to fully replicate the social system generated by in-person addiction treatment and that other pandemic-related socioeconomic changes such as food and job insecurity may have disproportionately impacted this population. At the same time, prior research has suggested that physical access to buprenorphine providers and opioid treatment programs that accept pregnant patients may be limited, especially given the increased prevalence of opioid use disorder in pregnancy,⁴² and telemedicine may serve as both a pandemic era and potentially long-term solution to provide this essential service.

ROUTINE POSTPARTUM CARE

Postpartum care is faced with distinct challenges, as a significant majority of postpartum patients are balancing their own health care needs with care for a newborn baby. Many pregnancy complications can arise only in the postpartum setting—such as hypertensive disorders of pregnancy, perinatal depression, infection, and hemorrhage—and comprehensive postpartum care must potentially address surveillance for these issues, monitoring of chronic diseases that may be impacted by pregnancy, reproductive preventive health care such as contraception and vaccination, nonreproductive preventive care including diabetes screening and lifestyle counseling, and anticipatory guidance for new motherhood as well as lactation support.⁴³ However, all of these elements can be potentially incorporated into a telemedicine-based care model.

Telemedicine platforms for prenatal care that have been developed and implemented during the pandemic have been extended to the postpartum period and may serve as infrastructure for more accessible and functional postpartum care in the future.^{21,27} This may extend to nonmedical postpartum care and support as well. Lactation programs in New York and North Carolina have reported on their experience transitioning traditional breastfeeding support resources and services into a telehealth model during the pandemic and found success in terms of access and patient satisfaction with an innovative, virtual platform for lactation care.^{44,45}

Implementing Obstetric Telehealth in the COVID-19 Pandemic

EVIDENCE-BASED GUIDELINES AND PROCEDURES

Though the pandemic prompted rapid development and adoption of teleobstetric care, it is essential for any telemedicine program—whether long-planned or a contingency—to incorporate clear guidelines to delineate care that is appropriate for a virtual context. In obstetrics, there are several key points to consider. Acute care for patients with new obstetric or nonobstetric symptoms is likely amenable to a telehealth-based triage system, which is not fundamentally different from traditional care models where patients call the office or an on-call provider to discuss new symptoms. As always, patients with concerning symptoms should be advised to present for full, in-person evaluation to the appropriate setting, whereas patients with stable or likely benign symptoms can be expectantly managed at home. The advantage of a formal telemedicine infrastructure, in this case, is that a structured telehealth-based follow-up plan can be

easily enacted that may involve electronic communication or a designated virtual follow-up appointment.

For routine obstetric care, certain elements such as ultrasound or antenatal testing cannot be provided in a virtual context and require in-person visits. There are no established consensus guidelines on the requisite number of in-person versus remote visits. In fact, the American College of Obstetricians and Gynecologists (ACOG) recommends that this be decided at the local level.⁴⁶ A group at the University of Michigan is addressing this with the recent publication of the Michigan Plan for Appropriate Tailored Health Care in Pregnancy (MiPATH), a constellation of expert recommendations for more flexible prenatal care for patients with average risk.⁴⁷ This includes a scheme for prenatal care service delivery that cannot be provided remotely at 4 designated in-person appointments, as well as guidelines for telemedicine utilization and medical and social risk assessment to inform individualized prenatal care plans.

Newer devices for home pregnancy monitoring—both direct-to-consumer products and technologies to use in partnership with obstetric providers—are being developed currently and may offer an opportunity for virtual antenatal testing in the future.^{48,49} There is also no consensus currently on the use of home monitoring devices, such as sphygmomanometers for blood pressure and handheld Dopplers for evaluating fetal heart rate, though survey studies have suggested that these devices may increase both patient and provider comfort with virtual care.^{21,27} Home monitoring devices introduce concerns for potential erroneous measurement and false alarms, which have been demonstrated with home blood pressure cuffs in the past.⁵⁰ This may, in turn, precipitate overutilization of acute care, especially if fetal heart tones could not be appreciated by the patient. To ensure best practices and promote high-value care, it will be essential to generate evidence-based guidelines for vir-

tual/traditional care balance in pregnancy and to inform the use of home monitors. This will likely involve clinical trials of specific devices to assess consistency and accuracy as well as pragmatic trials to ensure that the risks of home monitoring do not outweigh the benefits. Real-time application of these programs must then involve careful monitor calibration and patient education and training.⁵⁰

STAKEHOLDER INPUT

It is also important to consider patient and provider perspectives, in aggregate and individually. Overall, data supports patient and provider satisfaction with telemedicine care, but these studies have largely focused on rural populations and the pandemic period.^{12,27} Considerations for potential long-term telemedicine adoption in urban and suburban areas could be different, and it may be prudent to consider flexible care options where patients can choose the model that works best, and providers can offer individualized recommendations for optimal modalities of care. In fact, prior research supports a hybrid of in-person and virtual obstetric care to optimize patient satisfaction, and this may provide the greatest utility from a provider standpoint as well.²¹

Uptake and scalability of telemedicine programs have historically been determined by insurance coverage. During the pandemic, the Centers for Medicare and Medicaid Services expanded coverage for virtual health care services on an emergency basis through the 1135 Waiver and the Coronavirus Preparedness and Response Supplemental Appropriations Act.⁵¹ Previously, government-funded insurance would only reimburse for telemedicine services in designated rural areas and from specific facilities (not based out of a patient's home). Telemedicine coverage by commercial insurers has been highly variable, though many expanded their coverage schemes to include telehealth services specifically during the

pandemic.^{52,53} Now that the infrastructure of telemedicine obstetric care has been established, standardized insurance reimbursement must remain in place in order for this to continue, and the extent of coverage will likely be a key factor in determining the scope and solvency of postpandemic obstetric telemedicine.

EQUITY AND JUSTICE

While telemedicine has the ability to reduce health care disparities, there is also a concern that it can exacerbate inequity based on access to suitable technology and comfort with virtual care.⁵⁴ The COVID-19 pandemic has underscored socioeconomic and public health inequity by race and ethnicity, with higher rates of infection, hospitalization, and mortality among minority groups.^{55,56} The pandemic may have disproportionately disrupted housing security and insurance coverage for specific patient groups, which could disturb access to telemedicine-based care. It is essential to ensure equitable provision of telemedicine during the pandemic and beyond. Emerging data from telemedicine obstetric care in urban, low-income areas have demonstrated no clinically significant differences in patient satisfaction scores on standardized assessments.^{57,58} There may also be a disparity in the types of practice settings that have had the opportunity to implement telemedicine programs during the pandemic. Since telemedicine infrastructure requires significant financial, technological, and workforce investment to institute and maintain, this may not be feasible for smaller or underresourced practices. It is important to ensure that pandemic standards for virtual care are viable and sustainable in all practice settings to ensure equity and justice in patient care and COVID-19 risk reduction.

STRATEGIES FOR SUSTAINABLE TELEMEDICINE IMPLEMENTATION IN OBSTETRICS

As the pandemic continues to plague the US health care system, it is important to

consider policies for sustainable telehealth programs for the duration of the pandemic and potentially as enduring care models. This requires communication with payers to understand the breakdown of telemedicine coverage by specialty and service, as well as any geographic constraints.⁵⁹ In addition, the value of teletriage systems has been newly highlighted by COVID-19 and is a service that may benefit from expansion both during the pandemic and going forward to improve the utilization of traditional acute and emergency care services. To be maintained, this must be incorporated into existing hospital and emergency service care schemes as well as reimbursement structures.

Technical barriers to obstetric telemedicine success can occur at the patient, provider, and health system level.⁶⁰ To address patient-level challenges, it is important to create formal mechanisms of outreach and support for patients who may be less familiar with telecommunication technologies or have financial, cognitive, or linguistic barriers to access so that telemedicine can be feasible for as many patients as possible. There may be benefit to flexible models that can involve audio or video communication depending on access to high-speed internet as well as the ability to incorporate an interpreter. Providers should be trained on how to use the telemedicine platforms as well as appropriate documentation and billing practices, and staff should be familiar with the mechanisms for scheduling, referrals, and facilitation of laboratory and pharmacy services. Patients and providers must be duly informed about Health Insurance Portability and Accountability Act (HIPAA) protocols when using telemedicine and any patient concerns about privacy should be addressed in advance. There must also be adequate information technology support to help troubleshoot both hardware and software at the health care system level, as well as ready integration between the telemedicine platform and the electronic medical record.

Successful telemedicine programs for obstetric care should optimize convenience and ease for patients as well as universal access. There should be formal mechanisms for telemedicine program evaluation and outcome surveillance to ensure the quality of care and best practices. Before the pandemic, one such framework was already designed, entitled the Model for Assessment of Telemedicine Applications (MAST), which focuses on eight components: the health problem of interest; safety; clinical effectiveness; cost-effectiveness; patient perspectives; and sociocultural, legal, and ethical attributes.⁶¹ Models like this should be employed continuously to promote a culture of high-value care in telemedicine.

Conclusions

The implications of the COVID-19 pandemic for the health care system and for society at large are far-reaching and likely to be long-lasting, with many downstream consequences that have not even been forecast. One potential positive sequela of the pandemic, however, has been the rapid catalyzation of telemedicine services which have known benefits for obstetric care and may improve access without compromising quality or outcomes. These programs have been swiftly developed and implemented for routine prenatal and postpartum care as well as MFM services, COVID-19 care, and opioid addiction treatment, and the procedures and findings of several large academic programs have been described here. Longer term outcomes and studies evaluating ideal virtual and office-based hybrid models are necessary to inform evidence-based care delivery practices in the future, both during the pandemic and thereafter. It is also essential to ensure that telemedicine models are sustainable for large and small practices alike, embedded into health insurance reimbursement structures, and accessible equitably to all patients.

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