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Conversion and optimization of telehealth in obstetric care during the COVID-19 pandemic

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ABSTRACT

When New York City became the international epicenter of the COVID-19 pandemic, telehealth at Columbia University Irving Medical Center was expanded in the inpatient and outpatient settings. The goals of telehealth during the pandemic were to maintain patient access to care while reducing the risk for COVID-19 exposure for patients and staff. Recommendations are made on how telehealth can be implemented and utilized to accomplish these goals. In the outpatient setting, virtual prenatal care visits and consultations can replace most in-person visits. When visitor restrictions are in effect telehealth can be used to engage support persons in the delivery room. Telehealth innovations can be leveraged to greatly improve care for COVID-19 mothers and their infants during the COVID-19 pandemic and beyond.

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Introduction

As the COVID-19 pandemic surged in the Spring of 2020, New York City quickly became the international epicenter. The governor of New York declared a state of emergency on March 7 and subsequently issued a “stay-at-home” order to begin on March 22.¹ Although going outdoors for doctor visits was permitted, obstetric patients traveling to and from their appointments, using public transportation, sitting in crowded waiting rooms, and interacting with healthcare personnel and staff posed an increased risk of exposure. The expansion of telehealth within the department of obstetrics and gynecology at Columbia University Irving Medical Center (CUIMC), and the institution at large, became an immediate priority.

Telehealth is an umbrella term defined by the National Consortium of Telehealth Resource Centers as “a collection of means or methods for enhancing the health care, public

health, and health education delivery and support using telecommunications technologies”.² Telemedicine refers to the traditional clinical assessment and monitoring that are delivered using technology.³ Telehealth is an essential tool that allows for continued care during natural disasters and public health emergencies.⁴ During a pandemic, telemedicine can also mitigate the spread of disease by facilitating “social distancing” and allowing for the assessment and/or follow-up of infected patients in home quarantine.

Background

The practice of telemedicine in antenatal care or “virtual prenatal care” is not new. Mayo Clinic in Minnesota published the results of a randomized trial in 2019, in which 300 low-risk women <13 weeks gestation were randomized to “OB Nest” or usual care.⁵ OB Nest care was made up of 8 in-person

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visits, 6 virtual visits with a trained nurse using handheld fetal Doppler and sphygmomanometer devices at home, and a private online forum where pregnant women could ask questions. Those in the OB Nest group had higher satisfaction scores and less pregnancy-related stress compared to those in usual care. There was no statistical difference in perceived quality of care. Maternal and neonatal outcomes were similar between groups. Pflugeisen et al. in Washington State published a quality improvement initiative in which women had the option to choose traditional or virtual prenatal care.⁶ Those receiving virtual care had 9 in-person visits, 5 video visits, and a 2-week virtual postpartum visit. Handheld fetal Dopplers and sphygmomanometers were also used at home. Women who chose the virtual prenatal care track were twice as likely to be partnered and seven times more likely to have been pregnant before. They did note that a higher percentage of women who participated in virtual care developed preeclampsia when compared to the traditional care group. Another study randomized 88 women to usual care and virtual care through the mobile application Babyscripts®, which enables remote monitoring of weight and blood pressure along with virtual prenatal care.⁷ In this pilot study, there was no difference in patient or provider satisfaction, although it was not powered to detect differences in maternal or neonatal outcomes.

Prior to COVID-19, CUIMC was performing 3–5 prenatal visits and consults via telehealth per month. During March 9–13, 2020, only 8 obstetric-related video visits were performed. After the decision to transition to telehealth was made, the number of video visits increased to 256 in the first week of implementation (March 16–20, 2020). This represented a 3200% increase in one week. During March 23–27, 2020, after the “stay-at-home” order went into effect, we performed 558 video visit. The following week, March 30–April 3, 2020, the number of video visits had increased to 892.

Converting to telehealth

Considerations prior to implementation

Two key elements of our institutional and regional response to COVID-19 catalyzed our department’s ability to rapidly incorporate telehealth into our practice. First, providers were permitted to conduct video visits with out-of-state patients, regardless of whether or not they were licensed in the state where the patient was located at the time of the visit. Initially, this change only applied to established patients; but by the end of March, it was extended to new patients as well. Given CUIMC’s proximity to New Jersey (5 miles) and Connecticut (25 miles), this change was critical, especially for follow-up care with established patients. The second element was the indication that insurers would begin or increase their reimbursement for telehealth in light of the COVID-19 pandemic.^{8,9} Questions of cost and appropriate reimbursement for telehealth services has consistently deterred increased utilization.¹⁰ The impact of shelter-in-place orders in the tri-state area (NY, CT, NJ) and the resulting inability of patients to access in-person care strongly encouraged insurers to recognize the value of this mode of care delivery. Both of these

changes significantly reduced concerns around quickly converting in-person appointments to telehealth rather than canceling or delaying them in the early phase of the pandemic in New York.

A significant start-up cost is required to practice telemedicine, which can, for some practices, be the main barrier to implementation.¹⁰ The primary expenses are the platform being used and the equipment required to perform visits. Increased internet speed, information technology support, and staff training also require additional investments. If financially feasible, choosing a telehealth platform that integrates with your EMR will reduce concerns about adopting telemedicine practices and add considerable convenience for providers. At CUIMC, our current platform is Epic™, a widely-used electronic medical record system. Visits are conducted through Haiku (smartphone application) or Canto (tablet application). Patients participate in these visits exclusively through MyChart, a smartphone application.

Understandably, there are also safety considerations regarding telemedicine. During a pandemic, pregnant women can easily feel abandoned by their providers when their prenatal care has been unexpectedly and drastically modified. It is important to convey to patients that if there are any concerns that are not addressed remotely, they can and should be seen for an in-person visit. Appropriate protocols for escalation should be put in place to respond to patient concerns that needs to be addressed in person. While telehealth capabilities limit the patient’s in-person visits to the office, it is important to remember and remind staff that the office is still available for acute issues that cannot be addressed remotely, such as decreased fetal movement or elevated blood pressure with concern for preeclampsia.

Provider considerations

Providers who have never conducted a telemedicine visit may be understandably nervous to make the transition. Although the technology has been available for several years, its adoption has been slow. Some barriers include lack of knowledge about technology, a resistance to change, and the perception that telehealth results in impersonal care.¹⁰

In order for an institution to rapidly convert to a telehealth model, all providers, including outpatient advanced practice providers, residents, and fellows, should be encouraged to complete the training needed to conduct a video visit. The speed at which we engaged providers in telemedicine was accelerated, admittedly, by the need to continue to provide prenatal care while minimizing person-to-person contact in the midst of a pandemic. But even without an emergency, widespread participation can be facilitated by having an experienced provider personally champion telehealth, addressing individual concerns, facilitating required training, and being available to assist during initial video visits.

After securing buy-in from providers, a recommended schedule of both in-person and virtual prenatal care visits should be developed to aid providers in modifying their prenatal visit schedule. This schedule should include considerations for high risk pregnancies, such as multiple gestations. Our group published a recommended schedule for prenatal care visits based on expert opinion and highlights

Table 1 – Sample prenatal care regimen incorporating telehealth.

GA	Visit type	Counseling and education	Associated evaluation
Intake	Virtual	<ul style="list-style-type: none"> • Clinical history taken • Counseling on nutrition, weight gain, risk factors based on environment and comorbidities • Genetic screening/testing options • Orientation to practice • Prenatal vitamins prescription 	
11–13 wk	In-person	<ul style="list-style-type: none"> • Blood pressure cuff teaching • If applicable, genetic counselor appointment and screening/testing 	<ul style="list-style-type: none"> • Physical exam • Prenatal laboratories • Dating ultrasound (\pmnuchal translucency)
14–17 wk	Virtual	<ul style="list-style-type: none"> • Review of systems including mental health symptoms and intimate partner violence screening • Prenatal laboratory and genetic screening review 	<ul style="list-style-type: none"> • Home blood pressure and weight
18–22 wk	In-person	<ul style="list-style-type: none"> • Review of systems 	<ul style="list-style-type: none"> • Vital signs including weight • Urine evaluation • Anatomy ultrasound
23–26 wk	Virtual	<ul style="list-style-type: none"> • Review of systems • Counseling on gestational diabetes screening and Tdap vaccine 	<ul style="list-style-type: none"> • Home blood pressure and weight
27–28 wk	In-person	<ul style="list-style-type: none"> • Review of systems • Kick-count counseling 	<ul style="list-style-type: none"> • Vital signs including weight • Doppler heart tones • Urine evaluation • Diabetes screening • 3rd trimester laboratory work • Tdap vaccine • Fundal height evaluation \pm growth ultrasound • RhoGAM, if indicated
29–35 wk	2 or 3 virtual visits	<ul style="list-style-type: none"> • Review of systems • Delivery counseling (TOLAC, if applicable) • Breastfeeding education • Preterm labor and preeclampsia precautions • Counseling on COVID-19 labor and delivery specific protocol, anticipatory guidance, postpartum care • Car seat, pediatrician education • Family planning counseling 	<ul style="list-style-type: none"> • Home blood pressure and weight
36 wk	In-person	<ul style="list-style-type: none"> • Labor precautions • ECV planning if applicable. • Planning for timing of delivery, induction (both indicated and elective), and late-term and post-dates testing, if indicated 	<ul style="list-style-type: none"> • Vital signs including weight • Urine evaluation • Fundal height \pm growth ultrasound • Doppler heart tones • GBS screening
Care from 36 wk on can modified to weekly in-person visits, based on risk; otherwise for weeks without in-person visit, virtual visit should be scheduled			
37–38 wk	2 virtual	<ul style="list-style-type: none"> • Labor precautions 	<ul style="list-style-type: none"> • Home blood pressure and weight
39 wk	In-person	<ul style="list-style-type: none"> • Labor precautions 	<ul style="list-style-type: none"> • Vital signs including weight • Urine evaluation • Fundal height \pm growth ultrasound • Doppler heart tones
40 wk	In-person	<ul style="list-style-type: none"> • Labor precautions 	<ul style="list-style-type: none"> • Vital signs including weight • Urine evaluation • Doppler heart tones • Fetal testing if indicated • Fundal height evaluation

Abbreviations: COVID-19, novel coronavirus disease 2019; ECV, external cephalic version; GA, gestational age; GBS, Group B streptococcus; TOLAC, trial of labor after cesarean.

opportunities to consolidate in-person examinations, ultrasounds, procedures, and laboratory tests.¹¹ (Table 1).

Finally, telehealth etiquette should be reviewed with practitioners. Providers should wear professional attire, sit in front of a non-distracting background, eliminate office noise, and properly position the camera.¹² Eye contact should be made with the camera and not the patient during the visit. These small, added measures will help with the success of the visit.

Staff considerations

The first points of contact when scheduling a telehealth visit are the medical secretaries and scheduling staff. This is where optimizing the experience for patients begins. Clear, written instructions should be given to the patient in their primary language. Ideally, a mock virtual visit should be

conducted to identify any technical problems prior to the actual visit. The scheduling staff should orient patients to what will happen during a video visit. For example, the concept of a “virtual waiting room” should be introduced as the patient may be waiting for their provider to finish with another patient prior to connecting. As with in-person visits, virtual visits do not always start at the time they are scheduled.

Patient considerations

This profound shift in medical care can present patients with a new paradigm. Certain populations may not have a device with video capabilities (e.g., a smartphone, tablet, or computer) for economic or cultural reasons (e.g., the Hasidic population in New York City), in which case a telephone visit can

be conducted. Several patients can find downloading the necessary phone applications confusing since multiple steps are required to verify the patient's account. Volunteers can be leveraged to serve as patient "concierges" to provide technical support to the patients, releasing front desk staff from this task. Telehealth etiquette should also be reviewed with patients. Patients should schedule their visit during a time when they can be alone in a quiet room, and not multi-tasking (e.g., actively working, driving a car, or walking), as this creates distractions for both parties and can cause safety and connectivity issues.

Equipment requirements for virtual prenatal care

In order to perform virtual visits, key equipment items are needed. Providers require a computer, smartphone, or tablet with video capabilities along with internet service. Patients can use a computer or smartphone. If either party uses a smartphone, access to reliable WiFi greatly improves the experience. The patient may need to purchase specific equipment. During a virtual prenatal care visit, patients can – with the assistance of a provider – use a tape measure to document fundal heights and can check fetal heart tones after 16 weeks gestation. Blood pressures and serial weights can also be obtained using equipment that is easily available at local pharmacies or online. Some of these items can also be acquired through durable medical equipment suppliers if utilizing health insurance.

Outpatient uses for obstetric telehealth

Routine as well as high risk prenatal care can be provided safely through telehealth.¹¹ Prenatal care visits that do not require laboratory testing, ultrasounds, vaccinations, or physical examinations can generally be conducted via telemedicine. Postpartum evaluations like blood pressure monitoring, cesarean scar exams, depression screening, and even the 6-week postpartum visit can be conducted through telemedicine. And if a need arises for a physical exam, the patient can be scheduled for an in-person visit. In addition, non-obstetric consultations with subspecialties such as endocrinology, cardiology, neurology, and anesthesiology can be performed. Mental health visits and genetic counseling can also easily be done through telehealth.

Inpatient uses for telehealth

As the number of COVID-19 positive patients increased in the community and it became evident that community spread of the disease was largely responsible for the increase in cases, hospitals around the country began revising visitation policies. As revisions in visitation policies progressively reduced the number of support persons per patient to one person and then, dramatically and temporarily, to no in-person visitors, a solution was needed to improve the patient experience. Obstetrics is a family-centered discipline, and the expansion of outpatient telehealth served as a nexus for adapting this technology to the inpatient setting. Initially, the goal was to re-integrate family members who under usual circumstances would be able to be present in the delivery room. By

liberalizing guidelines for the use of smartphones during delivery, hospitals were able to grant access to support persons so that they could participate in the birth experience via video call.

In hospitals where visitation limitations were most restrictive and support persons were not permitted to attend deliveries, the implementation of virtual visitation became critical. It became evident that facilities cannot depend solely on patients' personal devices if the goal is equitable access for all patients. Ideally, institutions should secure a supply of wireless tablets, which can be distributed to patients in all areas of the obstetric service, including triage, labor and delivery, antepartum, and postpartum. Generic identifications can be created for wireless tablets for limited use for social networking platforms. This is particularly advantageous as it broadens the capability of the technology to include patients who otherwise would not have access to compatible personal devices.

As the numbers of patients with confirmed COVID-19 infection increases, and the numbers of asymptomatic patients with infection similarly increases, expanding the use of video technology serves a dual purpose as staff are protected from exposure to the infection and personal protective equipment can be preserved when shortages occur. Video technology offers the opportunity to interview and surveil patients without having to be directly exposed with every encounter. Software platforms such as Webex™ and the American Well Clinical Module™ can be installed onto wireless devices and wired computer carts to facilitate inpatient telemedicine. The accessibility and ease of use of these applications encourages rapid adoption and integration into provider workflow. For example, a stationary wireless tablet in a Labor and Delivery triage room can be utilized by staff to communicate with patients via video chat to ascertain the history and begin an initial assessment. Integrating technology into the workflow allows providers to limit in-person patient encounters and thereby reduce risks associated with repeated exposure. An equally important feature of some of the specific clinical software applications is their capacity for two-way communication, which enables patient-initiated contact with the provider using the auto-call feature. This prevents efforts toward protective isolation from leading to patients becoming socially alienated within hospitals. As patients with suspected or confirmed COVID-19 infection are admitted, access to hardware with remote monitoring capabilities becomes increasingly useful. For instance, downward facing cameras with audio capability can be used in isolation rooms for direct observation of patients and vitals. As the capabilities of telemedicine flourish, special attention should be placed on developing systems which are designed to integrate remotely monitored data with the electronic medical record (EMR) to support clinical decision making by aggregating the data into a form that is actionable.

Once patients are delivered and transferred to the postpartum area, the utility of a wireless device for social connection remains germane to continued care. Some women with COVID-19 infection will be able to care for their infant(s) but others will be separated from their infant(s) due to the severity of illness, the infant(s) admission to the neonatal intensive care unit (NICU), which restricts visitation for mothers with

COVID-19 infection, or for patients who chose voluntary separation from the infant in an effort to reduce the risk of spreading the infection to the newborn. Patients in each of these scenarios are motivated to establish a connection with their newborn(s). Video technology is an ideal modality for establishing a bond between the infant and mother when separation is deemed necessary. Staff can utilize wireless devices with one-way audio to schedule virtual visitation to the NICU for parents and extended family without disrupting exams and procedures that may be occurring concurrently for other infants. Using these devices helps to normalize complicated hospitalizations as patients feel connected to support persons who cannot visit the hospital. Well infants born to mothers with COVID-19 who are isolated in the nursery apart from the general population can also be monitored remotely via a camera associated with a mounted computer. Medical staff in the nursery can observe these infants regularly, and newborn assessments can be clustered.

As the prevalence of the disease increases, and more staff move to remote working environments, teleconsultation lends itself to adoption by social workers, case coordinators, and mental health providers who are essential members of the care team but do not require in-person encounters to provide care. In some cases, inpatient telemedicine can facilitate more efficient consultation with services that are primarily offsite or less available after hours. Telephonic consultation can be utilized when visual monitors are not available, but the added component of video communication enhances a provider's assessment of the patient and likely accelerates relationship building. The scope of inpatient telemedicine is vast and has rapidly advanced given the necessity for physical distancing during the COVID-19 pandemic.

Conclusion

Obstetric care can be organized to consolidate in-person visits and maintain appropriate surveillance while conducting other appointments virtually, thus reducing the risk of infection during a pandemic of a highly contagious virus. There may be additional benefits of telehealth-consolidated obstetric care for women who, during a pandemic, may be working remotely, have assumed childcare responsibilities, or both. Telehealth can also be used in the inpatient setting when additional precautions and restrictions are in place and to

monitor COVID-19 positive mothers and their newborns. We believe the vast majority of practices and hospitals can convert to telehealth. The data show that patient satisfaction is high given the added convenience.¹³ And there are promising long-term benefits, including accessibility for patients and the opportunity for providers to expand their practice.

Disclosure statement

None

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