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Consolidation of obstetric services in a public health emergency

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ABSTRACT

Though much of routine healthcare pauses in a public health emergency, childbirth continues uninterrupted. Crises like COVID-19 put incredible strains on healthcare systems and require strategic planning, flexible adaptability, clear communication, and judicious resource allocation. Experiences from obstetric units affected by COVID-19 highlight the importance of developing new teams and workflows to ensure patient and healthcare worker safety. Additionally, adapting a strategy that combines units and staff from different areas and hospitals can allow for synergistic opportunities to provision care appropriately to manage a structure and workforce at maximum capacity.

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Introduction

Though much of routine healthcare pauses in a public health emergency, childbirth continues uninterrupted. Crises like COVID-19 put incredible strains on healthcare systems and require strategic planning, flexible adaptability, clear communication, and judicious resource allocation. Consolidating obstetric services (within a hospital or across a health system) and adapting units to contain COVID-19 (either within an existing labor and delivery unit or building a specialized unit for COVID-19 antepartum, intrapartum, and postpartum patients) should be major considerations for hospital leadership. While this paper discusses the planning and organizing related to the COVID-19 pandemic, it can apply to nearly any large-scale disaster or crisis.

Strategic planning for the consolidation of obstetric services at a hospital or hospital system level in response to COVID-19 should begin as early as possible. Key stakeholders

involved in the comprehensive delivery of obstetrical services should be identified and brought together for assessment of (1) ongoing obstetrical needs of the patient population; (2) hospital resources including availability of physical space, health care workers, and supplies; and (3) projected needs during a surge in COVID-19 admissions. Existing communication infrastructure should be critically evaluated and strengthened to ensure all components of comprehensive obstetrical care have efficient communication methods in place while developing and sustaining a consolidated obstetric service. Due to social distancing recommendations, innovative approaches to effective communication should be explored including expanded use of video conferencing and development of easy access webpages that hold all relevant information. Regularly scheduled teleconference meetings that are frequent, but short, are important tools to ensure reliable and timely communication. These meetings can start daily at first and then be spaced out over time as the teams feel more comfortable and problems are more settled. The

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teams at Yale-New Haven Health (comprised of 5 labor and delivery units), as well as New York Presbyterian (NYP) Columbia University Irving Medical Center (CUIMC) Department of Obstetrics and Gynecology (comprised of 4 labor and delivery units), for example, initiated daily 30-minute meetings at the end of the day, with a structured format to review each site. These spaced out to 3-times per week over time.

“Development of a proposed consolidated obstetric service should center on the resources and needs identified during strategic planning. Further expansion and refinement of the service should be guided by public health and medical recommendations published at the global, national and state levels. The World Health Organization (WHO) serves as a director and coordinator of international health within the United Nations System. In addition to providing COVID-19 related travel advice, situational reports, media resources, research and development, and mythbusters, the WHO provides an updated strategic preparedness and response plan that outlines public health measures to support all countries to prepare for and respond to COVID-19 (Table 1).¹ These recommendations provide a broad platform to initiate obstetric service changes.

Part of the mission of the Centers for Disease Control (CDC) is to increase the health security of the United States by conducting critical scientific research and providing health information that protects our nation against dangerous health threats and responding when these arise. The CDC provides detailed information that guides hospitals when developing an evidence-based strategy to safely care for persons infected with SARS-CoV-2 (Table 2).² Additionally, the CDC supplies specific information for maternity and newborn units while acknowledging each facility should consider their unique space and staffing needs to prevent transmission of SARS-CoV-2. Advice includes appropriate isolation of pregnant patients who have confirmed COVID-19 or are persons under investigation (PUIs); basic and refresher training for all healthcare personnel to include correct adherence to infection prevention practices and personal protective equipment

Table 1 – World Health Organization: Strategic Preparedness and Response Plan for Coronavirus Disease 2019 (COVID-19)^a.

Strategic Preparedness and Response Plan for Coronavirus Disease 2019 (COVID-19)

Healthcare facilities should prepare for large increases in the number of suspected cases of COVID-19
 Staff should be familiar with the suspected COVID-19 case definition, and able to deliver the appropriate care pathway
 Patients with, or at risk of, severe illness should be given priority over mild cases
 A high volume of cases will put staff, facilities and supplies under pressure
 Guidance should be made available on how to manage mild cases in self-isolation, when appropriate
 Plans to provide business continuity and provision of other essential healthcare services should be reviewed
 Special considerations and programs should be implemented for vulnerable populations (elderly, patients with chronic diseases, pregnant and lactating women, and children)

^a Adapted from <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/strategies-plans-and-operations>.

Table 2 – Centers for Disease Control: Obstetric Unit Preparedness for Coronavirus Disease 2019 (COVID-19)^a.

Obstetric Unit Preparedness for Coronavirus Disease 2019 (COVID-19)

Prevent the spread of COVID-19 on the Obstetric Unit
 Promptly identify and isolate patients with possible COVID-19 and inform the correct facility staff and public health authorities
 Care for a limited number of patients with confirmed or suspected COVID-19 as part of routine operations
 Potentially care for a larger number of patients in the context of an escalating outbreak while maintaining adequate care for other patients
 Monitor and manage any healthcare personnel that might be exposed to COVID-19
 Communicate effectively within the facility and plan for appropriate external communication related to COVID-19

^a Adopted from <https://www.cdc.gov/coronavirus/2019-ncov/hcp/hcp-hospital-checklist.html>.

(PPE) use and handling; sufficient and appropriate PPE supplies located at all points of care; and processes to protect newborns from risk of COVID-19.

The American College of Obstetricians and Gynecologists (ACOG) and the Society for Maternal Fetal Medicine (SMFM) provide clinical information, patient resources, practice management, and advocacy and health policy recommendations specific to handling SARS-CoV-2 in the obstetric population. This includes guidance from the Committee Opinion regarding Hospital Disaster Preparedness for Obstetricians and Facilities Providing Maternity Care, a document that highlights obstetric population needs (including antepartum, intrapartum, postpartum, and neonatal care) that warrant special consideration during infectious disease outbreaks (Table 3).³ A joint algorithm has been developed by ACOG and SMFM to aid obstetric providers in assessing and managing pregnant women with suspected or confirmed COVID-19.⁴

Knowledge of up to date recommendations from the WHO, CDC, ACOG and SMFM are critical for accurate implementation of consolidated obstetric services. However, successful implementation of a consolidated obstetric service will be the result of a detailed understanding of the hospital or hospital system's resources and needs along with regional or state specific recommendations for infection prevention. During COVID-19, an obstetric service that is transformed to be adaptable, flexible, and able to pivot to the needs of the community will achieve long term success. We provide practical strategies to establish a consolidated obstetric service in response to the COVID-19 pandemic; these strategies, guided by published recommendations and considerations, are based on real-world experience garnered from consolidation of our obstetric services during the pandemic.

Problem statement

To borrow from the Donabedian model of quality improvement, favorable outcomes in an emergency will come from establishing reliable processes and an organized structure. In terms of process, a strong effort at consolidating and organizing obstetric services depends on the establishment of clear core principles

Table 3 – ACOG: Hospital Disaster Preparedness for Obstetricians and Facilities Providing Maternity Care^a.

Obstetric-Specific Considerations and Recommendations for COVID-19 Preparedness

<p>Appoint an obstetrician and pediatrician to codirect COVID-19 planning for maternity services with close involvement of maternity and pediatric nursing</p> <p>Consider regional patterns of obstetric care provision during COVID-19 pandemic</p> <p>Consider obstetric and neonatal needs with high obstetric patient surge</p> <p>Establish policies for visitation and lactation that balance infection prevention with patient and familial desires for involvement in the birth process</p> <p>Foster functional working relationships with local and regional critical care clinicians</p> <p>Have a working algorithm for ethical resource allocation when demand exceeds supply that considers obstetric- and pediatric-specific needs</p> <p>Develop a surge capacity plan, realizing the challenges that pregnancy poses, to control patient volume</p> <p>Consider temporary alterations to usual standards of obstetric care and mechanisms to optimize obstetric services with limited resources</p> <p>Examples:</p> <ul style="list-style-type: none"> - Early hospital discharge after delivery - Telephone and telemedicine triage - Rapid credentialing of health care providers to enable delivery of obstetric care in the event of work force limitations

^a Adapted from Hospital disaster preparedness for obstetricians and facilities providing maternity care. Committee Opinion No. 726. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2017;130: e291–7.

from leadership. The challenge in these situations is to manage change and uncertainty and the anxiety around that. For instance, consolidating units brings together new and unfamiliar teams; these workers need a firm platform of principles to work well together under pressure. Further, as demonstrated in the COVID-19 pandemic, uncertainty around the use and availability of PPE created considerable, and understandable, anxiety, about personal safety. What these examples demonstrate is that leadership must be guided by firm principles of transparency, discipline, and availability to resolve issues as they come up. Teams mobilize and perform well when processes are guided under these conditions.

The team providing the literal and figurative structure should not be considered narrowly from the onset of identifying a crisis. Obstetric care spans an entire healthcare institution—ambulatory, emergency department, critical care, perioperative, pediatrics—and contact should be made immediately with these services to support changes on a unit. As demonstrated by COVID-19, for example, many obstetric units partnered with perioperative services for when COVID-19 pregnant patients required cesarean. Efforts to consolidate obstetric units within a hospital or health system should be promptly communicated to these partners, as it will impact their volume or ability to support obstetrics. In particular, facilities, bed management, and infection prevention services should be consulted early to expedite the movement or rearrangement of services.

Evaluation of clinical resources

The most important resource in a hospital is the group of frontline healthcare workers. As the COVID-19 crisis demonstrated, frontline workers can be immensely adaptable and dependable. However, sensitivity to the limits of human physical and psychological capacity is required at the onset of a crisis, especially one predicted to last weeks or months. This should initiate advanced planning and evaluation of the pool of clinicians available to work.

At the onset of the east coast COVID-19 crisis, Yale-New Haven Hospital and NYP CUIMC Department of Obstetrics and Gynecology accounted for all providers (physicians and midwives) trained to provide obstetric care. Anticipating that a surge of infected patients, potential workforce illnesses or absences or increases in volume could overburden our capacity, we worked with our Medical Staff office to facilitate emergency privileges, when necessary, for supervision of labor and birth for providers not currently in active obstetric practice, such as gynecologic oncologists, urogynecologists, gynecologic specialty surgeons and family planning providers. We also worked with our liability insurance carrier (MCIC Vermont, Inc.) to provide temporary emergency obstetric-level insurance for these providers if necessary. We also discussed the potential to give hospital privileges to obstetricians and midwives with privileges at other hospitals in our health system, given that they practice within the same guidelines and procedures, in case there were discrepancies in volume between localities, though execution of this portion of the contingency plan never became necessary.

Consolidating should not just be considered a structural concept. The COVID-19 crisis demonstrated the reality that many healthcare workers could be affected and there could be a huge attrition of clinicians due to infection and illness. While we did not have to resort to this at Yale, we planned for a contingency where a substantial number of obstetricians and midwives would not be able to work. At Yale a majority of deliveries are distributed across 8 community obstetric groups composed of 3–7 covering physicians each. Illnesses of 2–3 providers in any of those practices could have devastating impact on their ability to cover their patients so we discussed creating obstetric ‘supergroups’ to cover inpatient services. All community groups were ready to share duty and patients for the sake of safety. As an example, to cover 450 deliveries a month, we were ready to provide two coverage groups, each staffed by 2 Obstetrician-Gynecologists, 1 Maternal-Fetal Medicine specialist, and 2–3 midwives at a time, supported by our resident cohort.

Initiation of a response

As a pandemic progresses or other public health emergency evolves, sites may be called upon to consider reorganization of resources to free up space to accommodate surge volumes of sick patients within hospitals. A sustained yet flexible response by local and regional health systems is required to care for communities affected by COVID-19. Reorganization

of health systems in the face of a fast-moving pandemic requires numerous deft decisions be made in swift succession. Although the locations where childbirth occurs may change, key stake holders involved with health system reorganization should recognize that obstetrical delivery volume across a region will likely continue at historical levels. When planning the reorganization of obstetrical services, the multidisciplinary leadership team, equipped with up to date guidance published from the WHO, CDC, ACOG and SMFM should have a thorough knowledge of hospital resources and capabilities. It is critical that opportunities to consolidate both physical space and human resources preserve ongoing commitments to high levels of patient safety. The need to reorganize existing health care delivery systems during the COVID-19 pandemic presents an unprecedented opportunity for innovation and novel use of existing technologies. We share multiple examples along with strategies undertaken to accommodate these important requests.

The NYP/CUIMC experience

In early April 2020, as the COVID-19 pandemic peaked within the New York metropolitan and surrounding areas, multiple sites within the New York Presbyterian health system identified the need for additional medical-surgical bed capacity to accommodate increasing numbers of non-obstetric adult COVID-19 patients. While field hospitals and other off-site capacity was being created, a potential additional opportunity identified was the conversion of postpartum units in two of our community hospitals, New York Presbyterian Allen Hospital (AH) and New York Presbyterian Lawrence Hospital (LH), to accommodate additional COVID-19 patients. To accomplish this, we looked at our care delivery models and strategized opportunities to continue to provide safe high quality obstetric care with the addition of COVID-19 safety in mind, within our health system. It follows that if no postpartum unit is available that delivery of Obstetric care needs to be carefully considered. In broad strokes, options included continued use of the labor and delivery units for triage along with labor and delivery utilizing existing labor, delivery, recovery (LDR) rooms as labor, delivery, recovery, postpartum (LDRP) rooms or the option of shifting obstetric volume to another location.

The Obstetric service at New York Presbyterian Morgan Stanley Children's Hospital (MSCH) delivers approximately 4600 patients annually with a significant proportion being high risk. AH and LH deliver 2300 and 1300 low risk patients annually, respectively. These three services are closely aligned with many shared patients, transfers between sites when indicated and a common faculty from the department of Obstetrics and Gynecology at Columbia University Irving Medical Center. At LH the approach immediately undertaken was to begin using the LDRs as LDRPs while ensuring that additional medical surgical beds were available to ensure safety with volume surges. The approach taken at AH is described in a bit more detail due to the complexity to provide information for others who may face similar challenges.

Consolidation of all obstetric services from AH to MSCH was planned. Patient notification processes were put into

place and multidisciplinary teams at both sites were informed. To vacate the postpartum unit at AH, immediate planning was undertaken to facilitate safe transfer of inpatient postpartum mother and newborn dyads who were not anticipated to be eligible for discharge in the next 48 h.

Successful management of the additional obstetrical volume at MSCH would require additional space, continued efforts to promote patient discharge with enhanced support when medically and socially appropriate and expansion of multidisciplinary coverage, including obstetrics, anesthesiology, pediatrics, nursing and support services. Multidisciplinary discussions were held and the option of caring for low risk, COVID negative patients scheduled for cesareans in the MSCH pediatric perioperative areas was explored. OR schedules from MSCH and AH were blended into a single schedule, leveled over the day and week and included the additional pediatric operating room. On the transition date, all AH cesareans and inductions of labor were safely completed on MSCH L&D, leveled throughout the day while equipment and supplies were transferred from AH to the MSCH pediatric OR area. One operating room and 2 PACU slots were dedicated to Obstetrics and equipped with fetal monitors, newborn equipment and all necessary supplies.

Multidisciplinary walk throughs and simulations were run to test the new space for preoperative management, cesarean and post-operative recovery. Additional surge space was identified in case the need arose for triage, labor and postpartum care. Modifications were made to the approach to scheduling inductions of labor to include flexible slots throughout the day with a team leader on the unit helping to prioritize patients and bring them in throughout the day when the unit was able to accommodate.

On the day after the transition and 6 days after the need to repurpose the postpartum space was identified, the AH OB service closed. Small team were maintained at AH for Obstetric or Gynecologic emergencies. All scheduled cesareans and inductions were completed on MSCH Labor and Delivery on the day of transition leveled throughout the day. Beginning the next day, we ran one scheduled cesarean in the dedicated pediatric operating room and identified minor opportunities to optimize the process. Thereafter, schedules were reviewed daily by the multidisciplinary leadership team, with attention to medical and surgical history, obstetric and neonatal risk with plans made for surgical schedule pending COVID results. Subsequently a full day operating room schedule was run on weekdays in the pediatric ORs with a dedicated multidisciplinary team staffing cesarean deliveries and their immediate perioperative care with healthy outcomes for moms and newborns. This helped to facilitate safe care for these patients while allowing continued safe operations on our busy labor and delivery, antepartum and postpartum units. Safe infection prevention and control practices were incorporated into all aspects of planning and execution but are beyond the scope of this manuscript (see xxx).

While details of logistics and operations were reviewed here, there is an additional piece that was equally important to consider. When blending services, the importance of the people, relationships and communication cannot be underestimated and consideration of any opportunities to facilitate smooth interactions is crucial.

The Yale New Haven Hospital (YNHH) experience

Inpatient obstetrical care at Yale New Haven Hospital (YNHH) is provided at two distinct locations. Obstetrical services at the York Street Campus (YSC) supports approximately 4600 deliveries annually. This larger service provides care for a diverse range of patient needs from low risk, low complexity obstetrical care to high risk, high complexity maternal and fetal care that requires multidisciplinary medical and surgical expertise. Maternity services are provided across several units including Labor and Birth (11 delivery rooms, 3 operating rooms), Maternal Special Care Unit (17 rooms, with the ability to flex 5 of these rooms for labor and delivery), Early Labor Lounge (12 triage/post-anesthesia care unit bays), and Postpartum (36 rooms with 3 respite rooms and 1 well newborn procedure room). The Vidone Birth Center at the St. Raphael's campus (SRC), located approximately one mile from YSC, supports approximately 1000 deliveries per year and provides comprehensive obstetrical care for low risk patients. Maternity services are provided on Labor and Birth (6 labor rooms, 2 triage bays, 2 operating rooms, 1 hydrotherapy room) and Postpartum (11 rooms).

During the COVID-19 pandemic, Yale New Haven Hospital determined brisk expansion of floor beds and ICU beds reserved to care for patients infected with SARS-CoV-2 was needed. The expansion required the movement of entire medical and surgical services from one floor to another, from one campus to another. During the reorganization, needs of the two obstetrical services were assessed and the opportunity to consolidate services at one campus was explored. It was understood that consolidation to one campus would require simultaneous expansion of the combined obstetrical unit including an increase in the number of labor rooms, antepartum/postpartum rooms, dedicated OR space, and well newborn rooms. The YNHH neonatal intensive care unit (located at the YSC) serves both the YSC and the SRC campuses so no expansion was required.

Consolidation of the two obstetrical services to the larger YSC campus addressed three critical needs. First, consolidation allowed optimal scheduling of available human resources including the development of contingency plans if multiple staff were infected with SARS-CoV2 and needed to be out of work. Second, consolidation to a single campus ensured the available physical resources were used at or just below capacity most of the time. Third, consolidation provided opportunity to create an obstetrical unit specifically to care for women affected by COVID-19. Given the potential benefits of consolidation, the decision was made to quickly combine the two obstetrical services onto the YSC. The next step was to secure additional space to safely provide all components of obstetrical care.

Creation of the YNHH Obstetric Comprehensive Care Unit (OCCU)

“Mater atrium necessitas”

Cancellation of elective procedures and surgeries allowed redistribution of medical and surgical services throughout

YNHH and permitted accommodation of a substantial number of COVID-19 admissions. The movement of services provided opportunity to locate and secure optimal space for the expansion of obstetrical volume at YSC. Down the corridor from the YSC Labor and Birth Unit, a medicine unit was marked for relocation. The unit consisted of two hallways of patient rooms connected by a central work station and provided ample space for conversion to an obstetrical unit to include three labor and delivery rooms, ten flex rooms that can provide antepartum/postpartum/triage/post anesthesia care, two well newborn nursery rooms with six beds total, and a single neonatal resuscitation room. Additionally, the operating room set up to care for COVID-19 positive women who required obstetrical surgery was located directly below this unit and was easily accessed via patient transport elevator. Factors critical to successful transformation included (1) integration of hospital infection prevention recommendations, (2) upgrade of hardware and software systems (e.g. fetal surveillance systems on central viewing stations, infant security systems, cardiac telemetry), (3) stocking of durable and disposable equipment onto the unit, (4) development of cleaning guidelines congruent with infection prevention recommendations, (5) establishment of workflows with central sterile processing to obtain instrumentation trays. The multidisciplinary leadership team successfully vetted the space and transformation of the space into an obstetrical unit was begun.

Implementation of hospital infection prevention recommendations included the initial development of two enclosed negative pressure hallways, in an attempt at creating a negative pressure environment on the unit. Later information demonstrated that this negative pressure environment was probably not required for this setting and created unnecessary secondary effects and it was then uninstalled. However, to provide a level of safety—both physical and psychological—for patients and caregivers, portable HEPA filter air systems were placed into rooms of patients with COVID-19. These portable air filter systems are capable of filtering 1000 cubic feet of air per minute and provide filtration much like that of an N95 respirator.

Transformation of the unit took approximately two weeks. Completion of the unit was anticipated to occur prior to the predicted mid-April 2020 surge in COVID-19 volume at YNHH. The number of maternity patients affected by COVID-19 was difficult to predict, so the build adjusted for this unpredictability by making the entire unit able to care for COVID-19 patients, but with care delivered in two separate wings. Each wing could safely toggle between serving COVID-19 positive and negative populations depending on the census.

During the transformation, preparations were begun to move the SRC obstetrical unit to the YSC. The move required several detailed communications (1) among all SRC obstetrical staff and providers, (2) between SRC obstetrical providers and the patients they serve, (3) between SRC and YSC obstetrical services, and (4) between YNHH leadership and YSC/SRC medical leadership responsible for potential hospital entry points of obstetrical patients (e.g. Emergency Department). Communications among all SRC obstetrical staff and providers prepared them for work at the YSC. This included orientation to the physical space, adaptation to local work flows, and development of new communication methods.

Scripted and impromptu communication regarding the move from SRC to YSC was presented to patients who were anticipating childbirth at the SRC. The obstetrical services between the two campuses discussed staff assignments, patient work flows, and integration onto the new unit. Importantly, hospital leadership worked with medical directors from YSC and SRC obstetrical services and YSC and SRC emergency departments along with emergency transport services to develop guidelines for the safe care or transfer of an obstetrical patient who may present to SRC requesting emergency obstetrical services after the SRC labor floor was closed.

The new obstetrical unit, named the Obstetric Comprehensive Care Unit or OCCU, was opened April 8, 2020. Opening of the OCCU allowed for safe transfer of the Vidone Birth Center from SRC to the YSC. The transfer was successfully completed over 48 h, with new Vidone Birth Center patients admitted to YSC and previously delivered patients allowed to recover and be discharged home from SRC.

COVID-19 screening and testing of all patients admitted for childbirth at YNHH was initiated on April 2, 2020. SARS-CoV-2 testing via polymerase chain reaction (PCR) was performed onsite with the availability of rapid testing. Development of this program allowed for the successful triage of patients to the OCCU when they were admitted for childbirth and appropriate use of personal protective equipment (PPE). Patients testing positive for SARS-CoV-2 were admitted to the OCCU for ongoing obstetrical care. Patients with scheduled cesareans had testing performed at the time of the preoperative visit the day prior to surgery.

Several adaptations were made to provide safe care to women admitted to the OCCU. A stocked PPE station was created. Features that made this station highly functional included placement of a large mirror for assistance with donning and doffing of PPE when a trained “dofficer” was not immediately available. Video consoles were used to provide a type of patient-provider communication that did not require bedside patient care. The support of a patient during labor can require long periods of time spent at the bedside, so hands free communication speakers were placed in patient rooms, so nursing and obstetrical providers had a hands-free option to call out for supplies needed, request assistance, or provide updates in a patient’s labor course. Simulations were performed to prepare staff and providers for responding to various obstetrical emergencies in the newly created unit. Prepared simulations included (1) practicing the transfer of a patient to the COVID-ready operating room, (2) management of shoulder dystocia, and (3) response to an obstetric hemorrhage.

The myriad of changes including the consolidation of our obstetric services, creation of the OCCU, and integration of COVID-19 infection prevention measures were presented and opened for discussion in two separate hospital-sponsored, hour-long “town hall” meetings. These town hall meetings were advertised in several areas including YNHH and Yale Medicine websites, email messages to pregnant patients via the electronic medical record, emails to community Ob/Gyn offices, and social media (Facebook and Twitter).^{5, 6} The town hall meetings used a video conferencing platform, were live-streamed on social media and were archived for later access by viewers. Each meeting consisted of a moderator and several panelists including representation from obstetrical

leadership, pediatric leadership, nurse midwifery, and nursing. The general format of the meeting was approximately 15 min of presentation with slides, followed by approximately 45 min of a moderated open forum to answer participant questions. The town hall style meetings provided opportunity to connect with participants and provide nuanced information regarding the new changes to the obstetrical service and provide reassurance that many components of obstetrical care would remain unchanged.

The importance of these town hall meetings in supporting the consolidation of services should not be underestimated. For instance, time at each YNHH town hall meeting was reserved to discuss how the move of one service (SRC/Vidone) to another campus would impact patients. For an SRC/Vidone provider to discuss what would change and what would not change was vital to reassuring affected patients that they were receiving trustworthy and transparent communications.

Consolidation challenges

Consolidation of obstetric services provided several challenges. One of the most critical challenges noted by both institutions was been the integration of two obstetrical services in the era of “social distancing” and the ubiquitous use of PPE that conceals the face. During nonCOVID-19 times, integration of two services would be enriched with social mixers, in person obstetric simulations, and formal educational sessions peppered with ample opportunity for impromptu conversations as two services integrated. We continue to develop ways to safely work around the personal interaction restrictions COVID-19 requires as we learn to integrate our services while protecting our healthcare workers physical safety and emotional wellbeing. One idea of how to help do this came from the guidance of the psychiatry department with the creation and support of a weekly, one-hour “decompression huddle” held on the labor floor with a phone call in number. All persons working in any part of the obstetric service are welcome to participate. Conversations are open, do not have an agenda and participants can contribute to the discussion as they desire. The decompression huddles provide an important forum to identify stressors, common problems, and brainstorm new ways of doing things and managing during the COVID-19. Other strategies included the developing a physician/nurse team leader dyad with standard work to facilitate seamless function of the large team. Additional creative solutions included use of brightly colored name/role stickers worn on caps to help identify team members and the use of a team board with photo magnets to clarify who is in house at any given time and the role they are currently playing within the increasingly complex team.

Conclusions

The Merriam-Webster dictionary defines emergency as (1) an unforeseen combination of circumstances or the resulting state that calls for immediate action and (2) an urgent need for assistance or relief.⁷ In late winter 2020, although the impending COVID-19 pandemic felt more like a distant

tsunami rolling in our direction rather than the active storm of viral transmission that was likely already occurring within our communities, the United States was in an emergency. A timely response of the obstetrical services to the COVID-19 pandemic required well-organized cooperation between existing administrative, clinical, and educational system in order to develop a sustainable strategy. Reliance on these existing systems during an emergency cannot be overemphasized. Whether one is fine-tuning the management of an established obstetrical service or rebuilding one from the ground up, it is important to keep in mind that the structure and function of these systems including effective communication within and between these systems proves to be a critical, rate-limiting component of a hospital's ability to pivot and respond to any unforeseen circumstance that requires immediate action. Cooperation and sharing of gained knowledge between hospitals and health systems will further benefit our ability to respond to COVID-19.

REFERENCES

1. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/strategies-plans-and-operations> (Accessed 6 May 2020)
2. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/inpatient-obstetric-healthcare-guidance.html> (Accessed 6 May 2020)
3. Hospital disaster preparedness for obstetricians and facilities providing maternity care. Committee Opinion No. 726. American College of Obstetricians and Gynecologists. *Obstet Gynecol.* 2017;130:e291–e297.
4. <https://www.acog.org/-/media/project/acog/acogorg/files/pdfs/clinical-guidance/practice-advisory/covid-19-algorithm.pdf> (Accessed 9 May 2020)
5. <https://player.vimeo.com/video/411235101> (Accessed 15 May 2020)
6. <https://player.vimeo.com/video/416183867> (Accessed 15 May 2020)
7. <https://www.merriam-webster.com/dictionary/emergency> (Accessed 15 May 2020)