

# Framework for obstetrics and gynecology department change management in response to COVID-19 pandemic: A tertiary center experience

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#### Abstract:

Coronavirus (cov) disease 2019 pandemic caused by severe acute respiratory syndrome cov 2 has imposed significant demands on healthcare systems across the world. These demands were more significant on obstetrics and gynecology (obgyn) patients, who required services that had to continue despite the closure of other services. This paper describes the change management of an obgyn department at a tertiary health-care center. That experience resulted in a complete management shift in the institution and the formation of an infectious disease epidemic plan for respiratory infections. Description of the change management performed, difficulties encountered, and achievements obtained can assist other departments change management when they face similar situations.

#### Keywords:

Change management, coronavirus disease 2019, obstetrics and gynecology

The coronavirus disease 2019 (COVID-19) pandemic caused by severe acute respiratory syndrome coronavirus 2 (COV-2) pandemic has imposed significant demands on healthcare systems around the world. Most hospitals and health-care centers have had to reassign space, personnel and facilities to accommodate the heavy load of sick patients.<sup>[1]</sup> Restructuring the health-care system in this emerging situation would require a strong need for constant collaboration and major readjustments on a daily basis as the disease was new for all with constantly changing information.<sup>[2]</sup> These changes were variable for different specialties where elective cases were postponed or rearranged, workforce was redistributed

and wards were redesigned in response to the demands of COVID-19 patient management.<sup>[3]</sup> Such arrangements were not suitable for obstetrics services as they have different challenges. Obstetrics wards and labor rooms and obstetrics emergency services needed to continue to function for their patients. Furthermore, elective cesarean sections (CS) continued as previously planned despite the COVID-19 pandemic challenges; increasing the risk of disease transmission to healthy controls and health-care workers (HCW).<sup>[3]</sup> The balance between maintaining the needed obstetric care for patient versus safety of HCW and patients was challenging.<sup>[4]</sup> Pregnant patients with COVID-19 are frequently asymptomatic, and the appropriate management for these patients is unclear. Likewise, it is not well known whether

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pregnancy imposes additional risk to the mother or her fetus.<sup>[5]</sup> The lack of reliable data on the management of COVID-19 infection for pregnant patients causes an additional stress for obstetrics HCW.<sup>[6]</sup>

Understanding obstetric management of COVID-19, as well as hospital-level preparedness for its control, was crucial for patient safety.<sup>[7]</sup> Guidance for patient management has come from expert opinions, case series, and systematic reviews of observational studies.<sup>[7,8]</sup> Saudi as well as international perinatal societies have produced fairly consistent guidelines for the management of these patients based on available data.<sup>[9,10]</sup>

Few international obstetrics and gynecology (OBGYN) departments have described their departmental management in response to COVID-19 with variable aims and results. Some have described the management in countries with fewer resources, others described outpatient and inpatient practices and psychosocial challenges, and summary of practice.<sup>[11-13]</sup> There is a scarcity of data on complete experience and change management descriptions that have resulted in successful safe management of obstetrics patients during the COVID-19 pandemic.<sup>[14]</sup>

The Department of OBGYN at King Abdulaziz Medical City (KAMC), Riyadh, Saudi Arabia, is one of the largest OBGYN departments in the region. There are more than 8000 deliveries conducted annually with CS incidence of about 25% that have maternal and fetal outcomes that are comparable to international figures. With the announcement of the pandemic, KAMC was ready with an emergency plan to tackle the pandemic challenges due to the institution's experience with the Middle East respiratory syndrome CoV (MERS-CoV) outbreak where the institute shut down inpatients activities for 2 months during 2015.<sup>[15]</sup> In response to the MERS-CoV outbreak, the institute underwent complete change management that resulted in quick control of the outbreak. Based on that experience, a contingency plan was established at KAMC for any similar future outbreaks or emerging pathogens, a plan that set an example for other institutions.<sup>[16]</sup> The Infectious Disease Epidemic Plan was revised based on the available scientific data, Riyadh's epidemic situation, HCW availability and number of expected COVID-19 cases; aiming for smooth and safe patient flow across the hospital, organized patient admission, space designation and imposed limits on elective admission and surgical cases. The aim is to guarantee enough admission beds, intensive care unit beds, and necessary support facilities while protecting institution HCW and patients and effectively caring for COVID-19 patients.

In this study, we described the change management that has occurred at the Department of OBGYN

at KAMC-Riyadh and the implemented change management plan. We believe that the unique experience presented can provide an example for other OBGYN departments that may face similar situations.

## Departmental General Infection Prevention and Control Precautions

All the OBGYN department HCWs did the obligatory infection prevention training and the N95 mask fit testing as required by the infection prevention and control (IPC) department. Alcohol-based hand sanitizers were made available in all clinical areas for the use of HCW and patients. A unified screening tool was used for all patients entering the hospital including the emergency department and outpatient facilities using the acute respiratory infection (ARI) checklist (temperature check and symptoms assessment); the assigned team for ARI checking has agreed upon the appropriate pathway to follow.

Visitors were not allowed in the hospital and accompanying personnel were not allowed at outpatient facilities. All HCW and patients were asked to wear a mask during their presence or stay in the clinical facilities. Distance spacing in all waiting areas was arranged, keeping at least one and half meter distance between attending personnel. All surfaces and medical equipment were cleaned and disinfected regularly.

## Outpatient Clinic

In the obstetric clinics, the goals of prenatal care remain essential for the prevention, detection, and management of pregnancy complications when they arise. Maintaining daily outpatient maternity services for more than 250 patients at the time of the COVID-19 pandemic was a challenge. Practicing IPC precautions to control disease transmission among patients and staff required a modified prenatal care approach.

Entrance to the outpatient clinic building was allowed only if appointment confirmation was available. All antenatal educational classes were suspended, and educational leaflets were handed to the patients instead. The waiting areas were expanded through the utilization of appropriate space on the same floor. One waiting area was assigned for each obstetric consultant's patients to ease contact-tracing if confirmed COVID-19 cases were identified.

While high-risk patients were seen regularly and their follow up plans were individualized, a suggested care model following Saudi Society of Maternofetal Medicine guidelines that combined both telehealth and in-person visits for low-risk patients was followed.<sup>[10]</sup> Confirmed

case of COVID-19, infection management was based on the agreed-on international recommendations.<sup>[9]</sup> Routine appointments for low-risk patients were delayed until after the recommended period of isolation. For COVID-19-positive patients with high-risk pregnancies, management was individualized, and appointments were arranged at the end of the working hours.

Gynecology clinics were run virtually. The consultant and his team had to call all patients with appointments to perform virtual assessment and plan of care. If physical assessment was deemed necessary, physical attendance was arranged. The pharmaceutical department has arranged medications home delivery, drive-through medication pick-up, or personal attendance.

### Obstetric Emergency and Labor and Delivery Units

Previous preparedness plans and patient flow pathways for patients with respiratory infection and MERS-CoV infection were reviewed and updated. The updates aimed to fit with admission plans from the obstetric triage, assessment, and management unit (OTAMU) to the labor room, according to the available national and international best practices.

In the OTAMU, all pregnant patients at more than 20 weeks of gestation who came through the main hospital emergency drive-through were directed to the OTAMU entrance.<sup>[16]</sup> On arrival to the OTAMU, patients were screened using the ARI scoring system, and according to their scores, the managing team followed the approved pathway. The OTAMU was prepared with two high-efficiency particulate air (HEPA) filters and staff took full personal protective equipment (PPE) precautions for patients with suspected or confirmed cases of COVID-19. If admission was required, patients were admitted according to the hospital flow chart pathway for inpatients with suspected or confirmed COVID-19 infection. Admitted patients received a swab test for COVID-19 regardless of their symptoms as per the hospital-wide policy that was initiated in May 2020.

In labor and delivery suite, negative pressure rooms were increased from 2 to 5 rooms to accommodate the increased number of confirmed and suspected cases. HEPA filters were made available if extra negative pressure rooms were needed. PPE was made available in the unit around the clock. Simulations and drills on the management of confirmed COVID-19 cases in labor suite were carried out for all levels of HCW.

Patients with negative ARI screening were assessed and admitted according to the normal pathway. Given that the second stage of labor is an aerosol-producing

stage, the managing teams were instructed to wear full PPE (surgical mask, face shield, head cover, gown, gloves, and boots). The N95 mask was not considered a requirement in such cases. If emergency CS was determined necessary, it was performed in the labor and delivery suite with staff taking the full PPE precautions. The N95 mask was required if general anesthesia was needed or anticipated.

Suspected and confirmed COVID-19 cases were admitted to the designated isolation negative pressure rooms. A full maternal and fetal assessment was conducted, including assessment of the severity of COVID-19 symptoms and confirmation of the onset and progress of labor, as per the standard care. A multi-disciplinary team approach, including an infectious disease specialist or medical specialist consultation was used.<sup>[17]</sup> Standard Maternofetal care and observation were practiced during labor. If a patient with suspected COVID-19-infection was found to be positive while in labor, both obstetric and neonatology physicians explain to the patient the test result, expected pathway and possible outcomes. Efforts were made to minimize the number of staff members entering the room, and visitors were not allowed. Anesthesia service was consulted in the event an epidural was needed, and neonatology service was alerted for newborn isolation after delivery.<sup>[18]</sup>

Vaginal delivery was the goal, while CS was performed depending on fetal or maternal indications. If CS was indicated, it was done at a designated negative pressure operating room (OR). Full PPE precaution was practiced, and CS was done under spinal or epidural analgesia unless general anesthesia was indicated for the case. A post-CS patient recovered in the OR and was transferred directly to an assigned room in the COVID-19 ward, as per the hospital policy. Elective CS cases were evaluated by the patient's consultant to determine the urgency of the procedure and the safety of delaying the procedure until the infection cleared to minimize risk of infection transmission to other patients, HCW, and the newborn.<sup>[18,19]</sup>

Newborn, whose mother was confirmed positive for COVID-19, was resuscitated in a separate room from the mother and underwent a whole-body bathing with soap and water when stable. The infant was then placed in an isolation.<sup>[20]</sup> The admission process for those infants followed the agreed-upon pathway as shown in Table 1.

Swab testing was required if the infant was born to a mother confirmed positive for COVID-19. HCW were required to take a throat and/or nasopharyngeal swab or tracheal swab if the baby was intubated. First sample was done at 24 h of life and the second sample was obtained after 72 h of life (4<sup>th</sup> day of life) if the first test

**Table 1: Neonatal Resuscitation Team Management of Infants born to Confirmed/Unknown/Pending Coronavirus disease 2019 Mothers in Labor and Deliver**

Mother status	ARI	Nursing precautions	Baby management
Confirmed positive COVID 19		Blue gown	Sick Newborns will be admitted in NICU/ICN Isolation rooms
		N 95 mask	Healthy SCBU profile neonates will be admitted in Unit extension in ICN
		Face shield/goggles Gloves	Transport in Isolette Bed
Noneligible/Pending COVID 19 result	ARI ≥4	Blue gown	Sick Newborns will be admitted to NICU/ICN isolation rooms
		Face shield /goggles	Healthy newborn will be Admitted in Unit extension in ICN
		Surgical mask Gloves	Transport in Isolette Bed
	ARI <4	Yellow gown	Admit in Unit extension
		Face shield /goggles	Transport in Crib
		Surgical mask Gloves	

ARI=Acute respiratory infection, ICN=Intermediate care nursery, NICU=Neonatal intensive care unit, SCBU=Special care baby unit, COVID 19=Coronavirus disease 2019

was negative. Breastfeeding was not allowed in such cases. Infants were allowed to be discharged with their asymptomatic COVID-19 positive mothers. An Arabic Waiver confirming that the mother has agreed to have her baby discharged with her after counseling is usually taken.

### Inpatient Wards

The COVID-19 pandemic presented several challenges in the inpatient area, notably locating an area for admission of suspected and confirmed positive cases and the increasing number of positive obstetric cases in addition to the influx of regular daily cases.

At earlier phases, all confirmed or suspected cases were admitted to dedicated isolation wards under obstetric consultation based on shared care with infectious disease consultants. As the pandemic progressed, bed occupancy by positive cases has increased in medical wards and number of obstetric positive cases has also increased. One of the OBGYN department postpartum wards with 32 beds capacity was converted to an isolation ward for COVID-19-positive obstetrics patients only. All rooms in the assigned postpartum ward were converted into negative pressure rooms. COVID-19-positive OBGYN patients were assessed during the daily rounds. Patients with no concerns were contacted by phone to check on them, answer their queries and give them the plan of care. Physical assessment was done as indicated. This approach decreased unnecessary exposure among staff and preserved the PPE supply. All electively admitted patients were tested for COVID-19 prior to their admission. For emergent and urgent admission, rapid testing was performed, and the patient was considered a suspected/pending case until the result made available.

Due to the low occupancy of gynecology beds during the COVID-19 pandemic, the gynecology ward with 25 beds

capacity was utilized for both obstetric and postpartum patients alongside early pregnancy-related admissions. Early discharge within 6–18 h for stable and uncomplicated cases following vaginal delivery was activated and a home health-care team arranged to visit the patient after discharge. A special flow was arranged for positive cases who needed induction and dedicated negative pressure isolation rooms in the antenatal ward adjacent to the labor and delivery suite were assigned to them.

### Home Health Care for Postpartum Patients

There is no international standard definition for early postpartum discharge because the average length of stay for vaginal delivery varies between countries.<sup>[21]</sup> Therefore, the hospitalization period for vaginal delivery in KAMC-Riyadh was brought down from 18 to 24 h to between 6 and 18 h.

Internationally, health-care centers have advocated for shorter postpartum stays for reasons such as containing costs, de-medicalizing childbirth, and promoting family-centered bonding<sup>[22]</sup> for KAMC, the driving force for promoting shorter postpartum hospital stays was to mitigate the risk of hospital-acquired infection for mother and baby and to ensure bed availability when the pandemic escalates.

A complete remodeling of the discharge process was implemented to hasten the turnover of beds, which inadvertently helped to contain resources and services. Expedited discharge planning was rolled out by the physician soon after delivery at the labor ward for cases that meet the criteria for home health-care visits: Uncomplicated vaginal delivery with negative COVID-19 test. Patients were informed of the early discharge plan.

At the time of writing this paper, the home health-care team has seen approximately 350 patients since it

started in early June 2020. All early discharge patients were visited within 24–48 h, with the aim of maximizing maternal health. Postpartum units were prepared by having a written protocol, well-trained personnel and specific checklists to complement and guide home visits. Patients have verbalized commitment in providing care for them self and their infant. Subsequently, no increase in emergency room visits or readmissions were observed a result of the early discharges. This observation will be confirmed by conducting a satisfaction survey and post pandemic audit on the readmission rate for postpartum patients during the pandemic period.

As systematic and well-planned protocol with a structured home visit has proven to reduce maternal and neonatal mortality and morbidity in developed countries, it would be ideal to continue this program after the pandemic.<sup>[23,24]</sup>

### Obstetrics and Gynecology Ultrasound Unit

Routine and specialized obstetric ultrasound scans (USS) are an important part of prenatal care that needs to be maintained despite the ongoing COVID-19 pandemic.<sup>[25]</sup> The OBGYN USS unit at KAMC usually runs approximately 1700 antenatal scans per month, with two distinctive working areas: One is in the outpatient clinic and the other is in the inpatient area. With the onset of the COVID-19 pandemic, modifications to the obstetric USS service to minimize risk of exposure for both patients and HCW without jeopardizing Maternofetal outcomes were implemented.

The USS room and machine cleaning techniques were emphasized with the ICP department, using appropriate and special sanitation. Sanitation was done every day at the beginning and end of the day and in between patients. All ultrasound appointments were arranged and booked by phone or mobile phone messages. Obstetric USS appointments were arranged on the same day as the patients' clinic visits to reduce risk of exposure. All gynecology USS orders were reviewed for their urgency, patients were contacted, and USS request was rescheduled where possible.

As the risk of infection is high during USS due to the impossibility of keeping a protective distance,<sup>[25]</sup> sonographers were instructed to minimally adequate scanning time. Likewise, personnel in attendance were limited. Low-risk obstetric USS requests were limited to fetus dating and viability scans at 11–13 weeks of gestation and anomaly second trimester scans at 18–23 weeks. Physicians were advised to reduce the frequency of obstetric USS requests for high-risk patients to the minimum required.

For patients with confirmed COVID-19 infection, USS requests were reviewed and rescheduled for after the clearance of the infection where possible. An experienced sonographer was assigned to perform the scan and was instructed to practice PPE procedure and deeply clean the machine and scanning room after the USS. Where possible, pregnant COVID-19 positive women who were not hospitalized had their USS appointment scheduled for the end of working hours to minimize exposure to other attending patients and staff. For inpatients and Emergency Department USS requests, a portable scan. Was performed at the patient's room to prevent contamination to the ultrasound unit and to minimize exposure to other health workers.<sup>[26]</sup>

### *In vitro* Fertilization and Reproductive Endocrinology Unit

As the number of COVID-19 cases increased, all ongoing procedures were completed for patients with good response to *in vitro* fertilization (IVF) medications, and patients were given the choice between fresh embryo transfer and freezing all embryos. The initiation of new treatment cycles was suspended following international guidelines.<sup>[27]</sup> There was an exception for male oncology patients who were to undergo chemotherapy treatment. In those cases, sperm freezing was done with instruction to collect semen samples at home to avoid using the collection room in the hospital. Strict compliance with protective measures during the procedure was followed. Female oncology patients were treated with Gonadotropin-releasing hormone Analog as a fertility preservation method to avoid frequent clinic visits.<sup>[28]</sup> Patients booked in IVF clinics were called and reassured through a weekly virtual clinic and provided with access to care for urgent situations. Waiting lists were created for all clinics so that patients could be rescheduled after the COVID-19 situation is resolved to ensure that patients are not lost in the system.

### Residency Training

In our center, we are running a 5-year OBGYN program with more than 40 residents at different levels, from junior to senior level. In concordance with postgraduate academic affairs, steps were taken for the continuity of the program to provide maximum benefits for residents while ensuring a safe environment for both resident and patient.

Acceptance of rotating residents and offsite training rotation were suspended. All our academic activities were converted to real-time online activity and arrangement of virtual objective structured clinical evaluation has been done for senior graduating residents. Residents were involved in running the virtual gynecology clinic under the consultant supervision.

**Table 2: Summary of main challenges faced during coronavirus disease 2019 pandemic and actions taken**

Main challenges faced	Main actions executed
Limited waiting area at outpatient clinic which made it difficult in the contact-tracing if confirmed COVID-19 cases were identified	The waiting areas were expanded through the utilization of appropriate space on the same floor. One waiting area was assigned for each obstetric consultant's patients to ease the contact-tracing
Being in a red zone area (due to increased numbers of confirmed COVID-19 cases)	Admitted patients received a swab test for COVID-19 regardless of their symptoms as per the hospital-wide policy that was initiated in May 2020
Majority of confirmed COVID-19 obstetric cases were asymptomatic with concern of infection transmission while waiting for the screening result	Rapid COVID-19 test was done for all emergency obstetric admissions
As the designated OR for confirmed COVID-19 cases was assigned in main OR, there was a concern about the delay in performing stat Caesarian section cases	It was agreed to reallocate the stat Caesarian section cases in dedicated Labor and delivery operating room
The dilemma of infection transmission risk and isolating the newborn who was handled by his mother before the confirmation of COVID-19 status received	The newborn was admitted in a dedicated area in intermediate care nursery till the negative result of the screening is confirmed.
Increased number of confirmed COVID-19 obstetric cases	Conversion of one of the post-partum wards to an isolation ward to accommodate the load
Decreased bed capacity for non COVID cases as a result of dedicating one post-partum ward to COVID-19 cases	Early discharge within 6 to 18 hours for stable and uncomplicated cases following vaginal delivery was activated and a home healthcare team arranged to visit the patient after discharge

COVID 19=Coronavirus disease 2019

As the scheduled surgical gynecological procedures were placed on hold and training rotations in sub-specialties such as IVF, urogynecology, and gyn-oncology were on hold too, residents were mainly doing the cesarian section procedures and emergency gynecological surgeries.

Those residents in their final year who still need to complete their essential rotations will have their graduations delayed until they finish their outstanding rotations.

This pandemic raised the need to come up with innovative virtual surgical skills training methods, which can be used as an alternative to hand-on training for residents during such situations.<sup>[29]</sup>

### Post Pandemic Suggested Audits

Although positive results were observed in response to the quick and dynamic changes implemented [Table 2], there will be a need to audit the outcomes of pregnant ladies who were managed and delivered during the pandemic which may reflect on the efficiency and impact of the implemented changes. Conducting patient satisfaction survey regarding the changes done at the outpatient set up including the virtual clinic implementation is another area to be looked at searching for opportunities for improvement.

### Conclusion

Change management of a dynamic department during the time of the COVID-19 pandemic has been challenging and has brought with it major threats. Timely preparedness plans, teamwork and resource sharing

with adequate, safe, and wise prioritization have resulted in favorable outcomes and smooth implementation of quickly changed policies and guidelines. The outcomes of these changes are observed to be favorable.

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### Conflicts of interest

There are no conflicts of interest.

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