

Guidelines for Healthcare Facility Management of Perinatal Care of Persons with COVID-19 or Suspected COVID-19

Compiled by: Bryna Sampey, IBCLC

Summary: SARS-COV-2 (novel coronavirus) is spread via droplet transmission. The majority of the active transmission is with sustained contact with a person who is known to have COVID-19. Primary method of transmission is hand-to-face or aerosolized droplets during healthcare procedures. Vertical transmission via blood, placental transmission, vaginal fluid/secretion, or breastmilk has not been documented in available literature. Person-to-person contact is a risk for transmission. Mothers and infants should be supported to stay together and maintain skin-to-skin care, regardless of suspected, probable, or confirmed COVID-19 status, while using infection prevention and control (IPC). [See WHO's interim guidelines, including appropriate IPC, here.](#) Healthcare providers should follow this guidance for best practices in the care of perinatal families. *Upcoming additions to this document will include considerations for home birth, as well as surgical considerations for bloodless surgery and transfusion.*

"It has been confirmed that COVID-19 gravely damages leucocytes, and could lead to multiple organ damage along with the respiratory system (12). In this study, blood assays of the three infant cases were normal, and all the blood cell counts and hemoglobin concentrations fluctuated within the normal reference range. It is worth noting that both Case 2 and Case 3 presented a transient skin rash after birth. Whether this was attributable to the maternal inflammatory toxin effect requires further study. At follow up, the four newborns were healthy and had grown on formula feeding.

This feature reveals that none of the four newborns of the mothers with COVID-19 developed COVID-19 infection. In this study, viral nucleic acid detection using real-time polymerase chain reaction (RT-PCR) remains, is taken as the standard of COVID-19 infection. A recent retrospective analysis in adults showed that the sensitivity of RT-PCR is 71% for COVID-19 infection (13). Therefore, the reliability of diagnostic testing should be further evaluated, especially in children. Another limitation of this report was the small number of cases, and imperfect clinic data. No COVID-19 vertical transmission was detected. Further studies for viral infection in placenta, amniotic fluid, neonatal blood, gastric fluid, and anal swab, and the viral depending receptor on children will be detected in future."

-Chen Y, Peng H, Wang L, Zhao Y, Zeng L, Gao H and Liu Y (2020) Infants Born to Mothers With a New Coronavirus (COVID-19). Front. Pediatr. 8:104. doi: 10.3389/fped.2020.00104

Compiled here are summaries and quotations from a variety of sources to guide recommendations, guidelines, and best practices of healthcare workers managing the care of families giving birth while suspected or confirmed to have COVID-19 exposure or infection.

As an expert in infant feeding and breastfeeding, I have added considerations that have a strong evidentiary basis. These sections (and all sections) are identified as such and cited in parenthesis. It is important to consider that, while infants appear to be (in recent cases) at risk for COVID-19 morbidity, that there is no indication that immediate postpartum separation, nor the subsequent lack of access to colostrum for the first days of life, are protective. It is the aim of this document to provide evidentiary support for maintaining safe infant colocation, with an abundance of evidence-based precaution, up to and including breast- or chest-feeding. In this time, we understand that infant separation ends with baby and parent being discharged together in many cases. It is ideal that parents are instructed and able to practice mask and hand hygiene precautions undertake guidance of limited staff. Further, maintaining infant inpatient in a parent's room will minimize staff exposure to babying will further protect all parties from opportunities for transmission of SARS-COV-2.

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Thank you for doing your part to support families managing birth and postpartum in this time of global pandemic. Your contributions are incredibly important, and it is my greatest hope that can collaborate as a whole to ensure the most evidence-based, thoughtful and effective response to this situation, encoring the best outcomes we can for all involved.

-Bryna Sampey, IBCLC

Healthcare worker precautions in the triage of pregnant patients when admitting to hospital or birthing facility:

“All pregnant women undergoing or recovering from COVID-19 should be provided with counselling and necessary information related to the potential risk of adverse pregnancy outcomes. Women’s choices and rights to sexual and reproductive health care should be respected irrespective of COVID-19 status, including access to contraception and safe abortion to the full extent of the law.

-WHO (14)

Multidisciplinary consultations from obstetric, perinatal, neonatal and intensive care specialists are essential. All recently pregnant women with COVID-19 or who have recovered from COVID-19 should be provided with necessary information and counselling on safe infant feeding and appropriate IPC measures to prevent COVID-19 transmission. At this point, there is no evidence that pregnant women present with increased risk of severe illness or fetal compromise. Pregnant and recently pregnant women who have recovered from COVID-19 should be enabled and encouraged to attend routine antenatal, postpartum or postabortion care as appropriate. Additional care should be provided if there are any complications.”

-WHO (14)

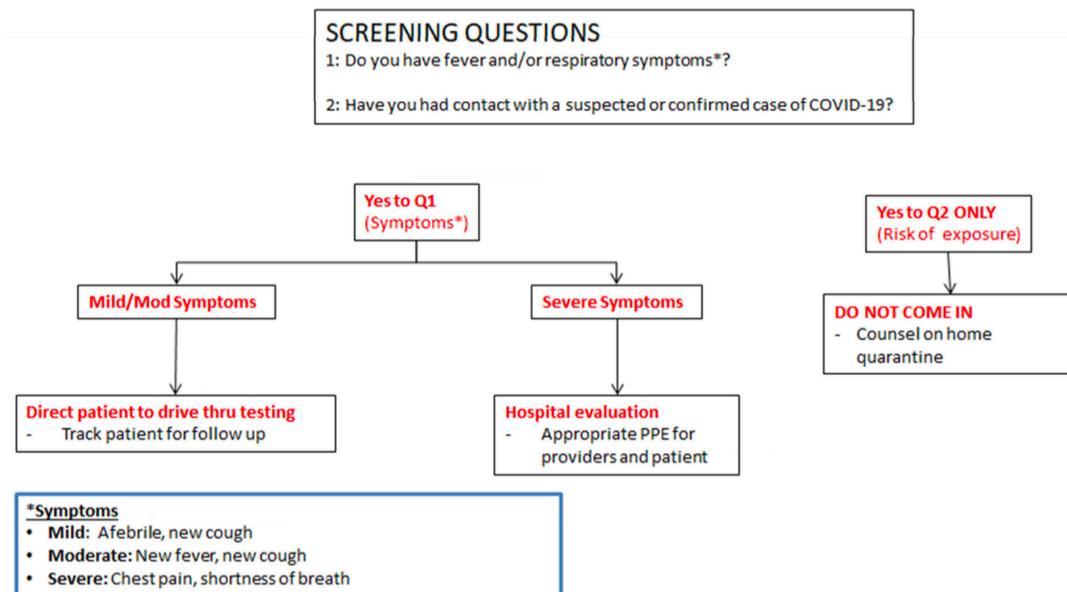
We still do not know if a pregnant woman with COVID-19 can pass the virus that causes COVID-19 to her fetus or baby during pregnancy or delivery. No infants born to mothers with COVID-19 have tested positive for the COVID-19 virus. In these cases, which are a small number, the virus was not found in samples of amniotic fluid or breastmilk.

-CDC (5)

Effective triage to assess the patient risk level for COVID-19 should be established before the patient arrives to the hospital. All pregnant patients should be instructed to call and discuss presence/absence of COVID-19 symptoms, as well as labor signs, when experiencing what they consider to be early labor. Patients with early signs of labor (ESOL) should remain home for as long as possible, unless otherwise instructed by their physician, or the triaging provider.

-AJOG, MFM (29)

PREGNANT PHONE TRIAGE



Recommendations for visitors/continuous labor support in labor:

Given the significant risk of COVID-19 transmission between patient/family/healthcare providers, there should be strict restrictions on visitor policy.

Labor and Delivery:

Visitation should be limited to one support person, in-person. Preference is for support via video, if patient agrees. All in-person support people should be screened as per Section 2. The support person should be easily identifiable by L&D staff; one suggestion would be to provide them with a special colored wrist band that must be worn at all times. Switching of visitors will not be permitted. Given public health emergency, no additional in-person support people should be allowed, including doulas.

-AJOG MFM, (29)

If there is no support person available, a doula or other skilled continuous labor support person can (and should) be considered as research shows skilled labor management reduces the rates of unanticipated cesarean delivery by upwards of 30%. Continuous doula support may also reduce length of labor, reduce instrument delivery, increase spontaneous delivery, increase 5 minute APGAR scores in infants, reduce the use of any analgesia. Continuous labor support may also reduce staffing burden and can help maintain a 1-1 nurse-patient ratio for patients laboring with synthetic oxytocin management.

Partner and/or doula should not be permitted to travel in/out of the facility or laboring patient's room while attending. If they must leave, they should not be readmitted to the facility for any reason (other than their own illness or management of care).

-AUTHOR CONTRIBUTION, (30)

AWHONN's Position on Doulas with Patients During COVID-19 Outbreak:

"AWHONN recognizes that doula services contribute to the woman's preparation for and support during childbirth and supports hospital policies that allow for the presence of a doula during a woman's active labor. AWHONN supports doulas as partners in care and acknowledges their ability to provide physical, emotional, and partner support to women. Each hospital must make decisions that are in the best interests of the health of the hospital team, patients and families. AWHONN nurses are on the frontline of delivering care, and we support those decisions and ask that nurses do all they can to protect themselves in this time of national crisis."

-AWHONN (3)

Recommendations for triage/check in to Labor and Delivery Unit:

Patients should be screened (a second time) upon check in to the labor and delivery unit. An easy-to-follow flow chart is listed below:

-AJOG, MFM (28)

FOR ANY PREGNANT PATIENT CHECKING INTO LABOR AND DELIVERY TRIAGE

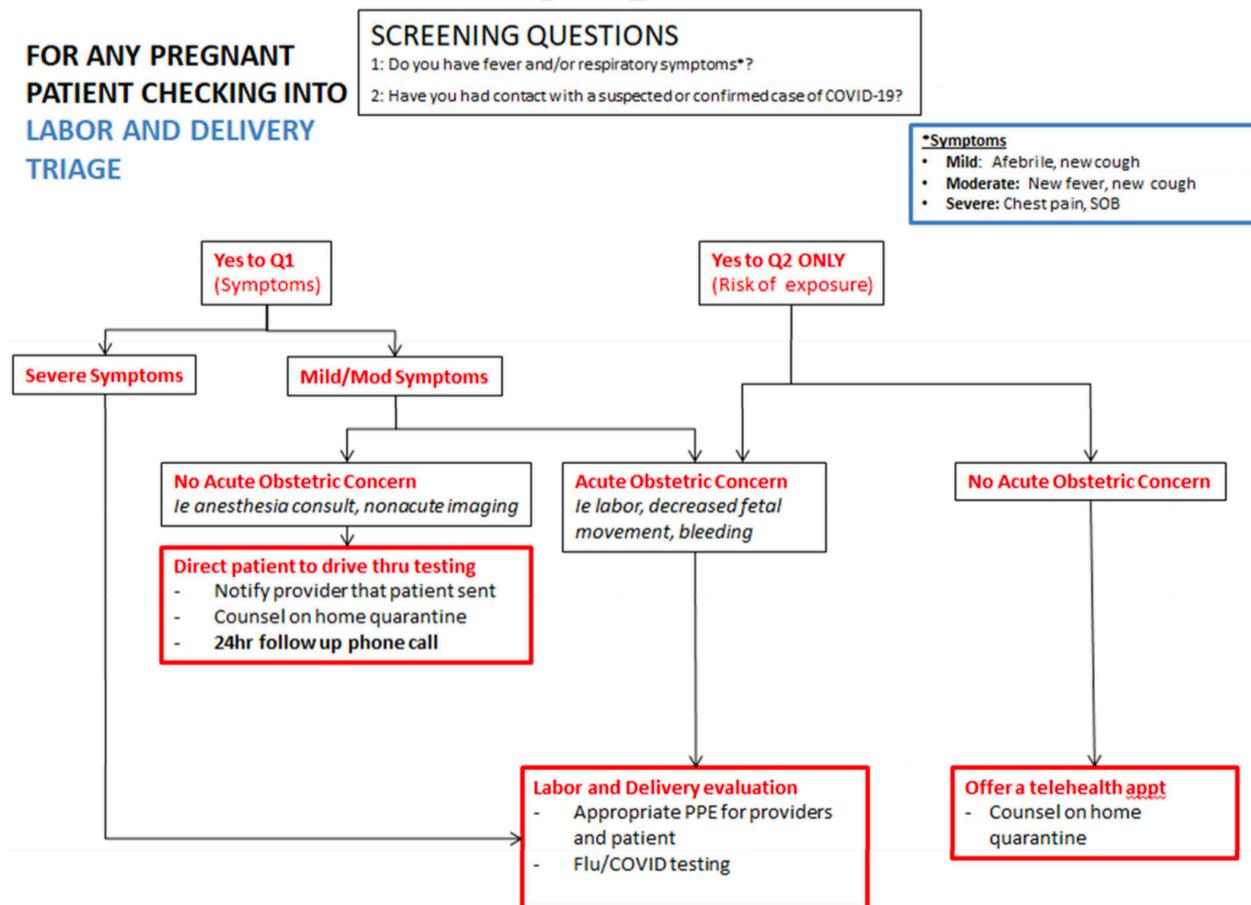


IMAGE SOURCE:
Boelig RC, Manuck T, Oliver EA, Di Mascio D, Saccone G, Bellussi F, Berghella V, Labor and Delivery Guidance for COVID-19, American Journal of Obstetrics & Gynecology MFM (2020), doi: <https://doi.org/10.1016/j.ajogmf.2020.100110>.

Recommendations for mode of birth:

Mode of birth should be individualized based on obstetric indications and the woman's preferences. WHO recommends that caesarean section should ideally only be undertaken when medically justified (https://apps.who.int/iris/bitstream/handle/10665/161442/WHO_RHR_15.02_eng.pdf?sequence=1).

-WHO (11-14)

Emergency delivery and pregnancy termination decisions are challenging and based on many factors such as gestational age, severity of maternal condition, and fetal viability and well-being.

-CDC (5)

Recommendations for scheduled cesarean or induction of labor:

Induction of labor is not recommended to be delayed or rescheduled unless staff or facility is at an unsafe capacity. In this case, divert to overflow facility as necessary. If induction must be postponed, the patient should have a conversation with their health care provider to determine best timing for induction of labor.

All laboratory testing should be done on the day of planned induction or cesarean patients, to reduce visits to healthcare facility by patient.

- Ideally COVID status should be picked up when screening the patient by phone the day prior to admission to avoid travel to the hospital.
- Evaluation to determine if rescheduling in 2-3 days is feasible to allow for results of COVID-19 testing.

- For COVID-19 positive patients with mild or moderate symptoms not requiring immediate care, it is important to recognize that the severity of disease peaks in the second week, so planning delivery prior to that time is optimal.

-AJOG (30)

Recommendations for management of labor (vaginal birth):

First stage of labour should have relatively few limitations, except that the patient should remain confined to their room. Walking, ad lib food and drink, and upright positioning are recommended. Immersion in water can be considered. If no oral intake is permitted, 250ml/hr of dextrose can be considered.

-ACOG (10)

Increased doses of synthetic oxytocin as well as assisted rupture of membranes (AROM) can be considered to hasten labor as indicated. Caution should be noted, though, that synthetic oxytocin has a noted antidiuretic effect, which can contribute to water toxicity, postpartum edema of the breasts (reducing subsequent milk output and delaying milk transition), and a sudden drop in blood pressure followed by increased cardiac output- which can compromise hypovolemic patients (in the case of third stage management, mentioned later). Limited doses should be used to achieve intended effect. Non-medical management should be considered to augment labor if possible.

-AUTHOR CONTRIBUTION (41, 45)

It is recommended to limit or restrict all potentially high-risk transmission or aerosolizing devices or procedures for labor management:

- nasal cannula is not recommended due to frequent adjustment and high risk of transmission to healthcare provider
- Nitrous oxide is not recommended due to the risks of aerosolization
- Peanut ball in the event of regional anesthesia (risk of transmission)
- Continuous catheterization in labor with regional anesthesia is not recommended
- Pushing should not be delayed
- Perineal massage and warm compresses can be considered to avoid 3rd and 4th degree tearing (with appropriate or available IPC/PPE in place)

-AJOG (30)

Third Stage Management:

Placenta should not be permitted to be retained by family for traditional or herbal medicine purposes. Pathology can be helpful to determine infant status, and contribute to the available data regarding COVID-19 infection and delivery. Policies and procedures for placental pathology should remain the same. Placentophagy has not been directly linked to transmission, but it does introduce risk that is not apparently outweighed by benefit.

-AUTHOR CONTRIBUTION (25, 26)

Oral misoprostol can be substituted for management of bleeding, as evidence available shows the oral, vaginal, or rectal administration of misoprostol to be as effective as intramuscular (IM) oxytocin, without the concomitant hypo- and subsequent hypertensive effects, as well as the antidiuretic effects which can negatively impact breast or chestfeeding. Side effects of misoprostol are increased via the oral route, and are pyrexia and shivering. From research: "Misoprostol free acid is rapidly absorbed and is detected in circulation within 2 minutes of oral intake. Peak serum levels are achieved within 12 to 60 minutes and are high in oral as compared to the rectal route. Thus the oral route is potentially advantageous."

If oxytocin cannot be avoided, anticipatory guidance regarding edema and breastfeeding should be prioritized before discharge (see discharge section).

-AUTHOR CONTRIBUTION (41)

Recommendations for management of labor (cesarean delivery):

WHO conducted two studies: a systematic review of available studies that had sought to find the ideal caesarean rate within a given country or population, and a worldwide country-level analysis using the latest available data. Based on this available data, and using internationally accepted methods to assess the evidence with the most appropriate analytical techniques, WHO concludes:

1. Caesarean sections are effective in saving maternal and infant lives, but only when they are required for medically indicated reasons.
2. At population level, caesarean section rates higher than 10% are not associated with reductions in maternal and newborn mortality rates.
3. Caesarean sections can cause significant and sometimes permanent complications, disability or death particularly in settings that lack the facilities and/or capacity to properly conduct safe surgery and treat surgical complications. Caesarean sections should ideally only be undertaken when medically necessary.
4. Every effort should be made to provide caesarean sections to women in need, rather than striving to achieve a specific rate.
5. The effects of caesarean section rates on other outcomes, such as maternal and perinatal morbidity, pediatric outcomes, and psychological or social well-being are still unclear. More research is needed to understand the health effects of caesarean section on immediate and future outcomes.

The risk of surgery to the providers performing the procedure must be taken into account. See the following collection of evidence-based recommendations and guidelines (AJOG):

Surgical considerations:

- Use of personal protective equipment is recommended by the Centers for Disease Control for every operative procedure performed on a patient with confirmed COVID-19 infection or a patient where there is suspicion for infection.
- N95 respirators or respirators that offer a higher level of protection should be used when performing or present for an aerosol-generating procedure (e.g. OR patient intubation) in COVID-19 or suspected infected patient.
- Disposable respirators and face-masks should be removed and discarded appropriately in accordance with local policy.
- Perform hand hygiene after discarding the respirator or face-mask.

Intubation Risks

Aerosolization and droplet transmission of the COVID-19 virus are important hazards for surgical personnel. Aerosolization and droplet transmission hazard increases with procedures such as endotracheal intubation, tracheostomy, gastrointestinal endoscopy and during the evacuation of pneumoperitoneum and aspiration of body fluids during laparoscopic procedures. Surgeons and personnel not needed for intubation should remain outside the operating room until anesthesia induction and intubation are completed for patients with or suspected of having COVID-19 infection.

Negative pressure operating rooms and/or anterooms when available are recommended.

A review article that presented data on the use and effectiveness of negative pressure operating rooms is referenced here: Chow TT, Yang XY. Ventilation performance in operating theaters against airborne infection: review of research activities and practical guidance. Journal of Hospital Infection. 2004;56(2):85-92.

A recent study in the New England Journal of Medicine shows how long COVID-19 might remain infectious on different surfaces (e.g. cardboard 1 day, plastic 3-4 days).

Appropriate PPEs need to be used per local policy - this article provides a useful discussion of overarching management in the OR of a COVID-19 infected patient, and also the intra-operative protocol used in Singapore.

Specific Operative Risk Issues

- Have minimum number of personnel in the operating room, including during intubation, as well as throughout. No visitors or observers.
- Use smoke evacuator when electrocautery is used.

After Operation/Recovery

If transport of a patient with or suspected to have COVID-19 infection to an outside recovery area or intensive care unit is necessary, handoff to a minimum number of transport personnel who are waiting outside the operating room should be considered. Personnel should wear personal protective equipment as recommended by the CDC. Personal protective equipment should not be the same as worn during the procedure. Recommendations for surgeon protection before and after separating from a patient with or suspected of having COVID-19 infection vary from institution to institution. We reached out to surgeons at four academic medical centers to obtain their perspectives on behavior following separation from the patient. Selections from these perspectives are presented here:

- Remove clothes worn from home and keep in garment bag.
- Wear scrub clothes after arrival at hospital
- After separating from the patient remove scrub clothes; consider showering before changing into a clean scrub suit or home clothes
- Wash hands frequently and maintain safe social distancing

-FACS (8)

Special considerations:

Preterm Delivery:

Typically, antenatal corticosteroids are administered the case of preterm labor from 23-34 weeks gestation. However, given the risks of corticosteroid use documented with COVID-19 infection, risk vs. benefit should be carefully weighed by healthcare team.

NICU admission:

Precaution should be taken to isolate any suspected cases of COVID-19 in NICU admitted infants. According to reports from Wuhan, China, infants are susceptible to the virus, though all evidence shows symptoms are mild-to-moderate with none requiring ventilation. *There have been no reported infant deaths solely linked to COVID-19 without additional comorbidities such as prematurity or physiological complications. Fewer than 6% of all coronavirus cases have been children and infants, worldwide.*

-WHO (15)

Guidelines for the immediate postpartum:

Delayed cord clamping should be avoided for all deliveries at this time, unless baby can be ensured in person follow up and treatment for at least the first week of life. If baby is anticipating a two week quarantine, delayed cord clamping is not indicated. Immediate skin on skin contact may be performed, IF parent is provided a mask and hand hygiene. Immediate breastfeeding may occur and should not be interrupted. Kangaroo care can be practiced in premature, early term, and full term neonates.

Delayed cord clamping is associated with higher hemoglobin levels, ensuring good iron and nutrition stores for the first six months of life. However, there is an associated increased risk of jaundice which requires careful monitoring and follow up care. Bilirubin levels peak on average at day 5 of life, and should be monitored to prevent neonatal lethargy and associated dehydration due to insufficient milk intake. Extreme risk is kernicterus, which is why in-person follow up is advised, to manage phototherapy intervention as indicated. For families in quarantine, a portable phototherapy blanket can be an option, and this decision should be made between family and care provider.

-AUTHOR CONTRIBUTION (21, 22)

Skin on skin contact has been shown to be beneficial in neonatal recovery from birth, including respiration, blood glucose levels (BGL), and immune system function. However, the risks cannot be ruled out. If the parent chooses skin on skin contact for themselves and their infant, informed consent should occur about the risks of transmission to infant.

Should a parent decline skin on skin, or physician and patient together decide it is unsafe, baby may be placed skin on skin with partner who is 6 feet from delivering parent. Routine postpartum procedures may be performed.

-AUTHOR CONTRIBUTION (19, 34), CDC (5)

Guidelines for management of newborn care in the immediate postpartum:

All babies should receive the following:

- thermal protection (e.g. promoting skin-to-skin contact between parent and infant);
- hygienic umbilical cord and skin care;
- early and exclusive breastfeeding;
- assessment for signs of serious health problems or need of additional care (e.g. those that are low-birth-weight, sick or have an HIV-infected parent)
- preventive treatment (e.g. routine immunization, vitamin k, and ocular prophylaxis)

Infant-Parent colocation on a 24-hour basis enhances opportunities for bonding and for optimal breastfeeding initiation. Whenever possible, parents and infants are to remain together during the hospital stay. To avoid unnecessary separation, infant assessments in the immediate postpartum time period and thereafter are ideally performed in the birthing parent's room. Evidence suggests that mothers/parents get the same amount and quality of sleep whether infants room-in or are sent back to the nursery at night.

Relatively few cases have been reported of infants confirmed with COVID-19 and they experienced mild illness. No vertical transmission has been documented. Amniotic fluid from six mothers positive for COVID-19 and cord blood and throat swabs from their neonates who were delivered by caesarean section all tested negative for SARS-CoV-2 by RT-PCR. Breastmilk samples from the mothers after the first lactation were also all negative for SARS-CoV-2. In general, acute infectious diseases, undiagnosed fever, and common postpartum infections in the mother are not a contraindication to breastfeeding, if such diseases can be readily controlled and treated. Infants should not be breastfed in the case of untreated active tuberculosis, or herpes simplex when there are breast lesions. In the case of maternal human immunodeficiency virus the World Health Organization recommends that “national authorities in each country decide which infant feeding practice, i.e. breastfeeding with an antiretroviral intervention to reduce transmission or avoidance of all breastfeeding, should be promoted and supported by their Maternal and Child Health services.”

-WHO (14)

Parents can potentially offer immunity or passive protection to their infants via placental transfer. In a recent study: "Among 6 mothers with confirmed COVID-19, SARS-CoV-19 was not detected in the serum or throat swab by RT-PCR in any of their newborns. However, virus-specific antibodies were detected in neonatal blood sera samples. The IgG concentrations were elevated in 5 infants. IgG is passively transferred across the placenta from mother to fetus beginning at the end of the second trimester and reaches high levels at the time of birth.⁵ However, IgM, which was detected in 2 infants, is not usually transferred from mother to fetus because of its larger macromolecular structure. In a study⁶ of mothers with SARS, the placentas of 2 women who were convalescing from SARS-CoV infection in the third trimester of pregnancy had abnormal weights and pathology. Whether the placentas of women in this study were damaged and abnormal is unknown. Alternatively, IgM could have been produced by the infant if the virus crossed the placenta."

-AUTHOR CONTRIBUTION (8, 25)

Infectious peripartum varicella may require separation of the mother and newborn, limiting direct breastfeeding, but expressed milk can be used.

-ACOG (10)

Recommendations for breastfeeding initiation and management in the immediate postpartum

Breastfeeding protects against death and morbidity also in the post-neonatal period and throughout infancy and childhood. The protective effect is particularly strong against infectious diseases that are prevented through both direct transfer of antibodies and other anti-infective factors and long-lasting transfer of immunological competence and memory. See WHO Essential newborn care and breastfeeding (<https://apps.who.int/iris/bitstream/handle/10665/107481/e79227.pdf>). Therefore, standard infant feeding guidelines should be followed with appropriate precautions for IPC.

Infants born to mothers with suspected, probable or confirmed COVID-19 infection, should be fed according to standard infant feeding guidelines, while applying necessary precautions for IPC.

Breastfeeding protects infants and young children, particularly against infectious disease.¹ When a person is lactating and becomes ill with a virus, they develop antibodies to fight the illness. Those antibodies are then conveyed to the infant through breastmilk, helping to protect the infant from illnesses to which the parent has been exposed.²

“Considering the benefits of breastfeeding and the insignificant role of breastmilk in the transmission of other respiratory viruses, the mother can continue breastfeeding, while applying all the necessary precautions.”³

Now more than ever, families need lactation support to navigate infant feeding questions and challenges. According to the World Health Organization, “Breastfeeding counselling, basic psychosocial support and practical feeding support should be provided to all pregnant women and mothers with infants and young children, whether they or their infants and young children have suspected or confirmed COVID-19.”

-UNICEF (20), ILCA (16), ABM (1, 2)

Recent evidence has shown breastfeeding exclusively for three months helps contribute to a relative risk reduction of 0.77 (CI 95%) for allergies and 0.66 (CI 95%) for asthma, barring genetic history. This is of particular importance to confer a protective effect as SARS-COV-2 is likely to return in future seasons. Allergic & asthmatic children would be at higher risk for complications of a respiratory illness, and this protection is essential.

-AUTHOR CONTRIBUTION (27)

Breastfeeding or chestfeeding people with more severe cases can continue breastfeeding.

If severe illness prevents direct breastfeeding:

- the parent should be supported to safely provide their expressed milk to the infant while continuing appropriate infection prevention and control (IPC) measures.⁶
- If the lactating parent is too unwell to express milk, find resources for the delivery of human milk in [WHO's clinical interim guidance here](#).

-WHO (14)

Breast milk provides protection against many illnesses. There are rare exceptions when breastfeeding or feeding expressed breast milk is not recommended. CDC has no specific guidance for breastfeeding during infection with similar viruses like SARS-CoV or Middle Eastern Respiratory Syndrome (MERS-CoV).

Outside of the immediate postpartum setting, CDC recommends that a mother with flu continue breastfeeding or feeding expressed breast milk to her infant while taking precautions to avoid spreading the virus to her infant.

-CDC (5)

Initiation of Breastfeeding

Breastfeeding should be initiated within 1 hour of birth. Exclusive breastfeeding should continue for 6 months with timely introduction of adequate, safe and properly fed complementary foods at age 6 months, while continuing breastfeeding up to 2 years of age or beyond. Because there is a dose-response effect, in that earlier initiation of breastfeeding results in greater benefits, mothers who are not able to initiate breastfeeding during the first hour after delivery should still be supported to breastfeed as soon as they are able.

Parents who received oxytocin during or after delivery should be guided to apply frequent alternating heat and cold compresses to the breasts to mitigate the swelling/edema caused by the antidiuretic properties of oxytocin. If the infant is separated, and pumping is initiated to preserve milk supply, hand expression should be prioritized until edema has resolved.

-AUTHOR CONTRIBUTION (35, 37, 38, 41, 43)

Breast milk provides protection against many illnesses. There are rare exceptions when breastfeeding or feeding expressed breast milk is not recommended. CDC has no specific guidance

for breastfeeding during infection with similar viruses like SARS-CoV or Middle Eastern Respiratory Syndrome (MERS-CoV).

-CDC (4)

Whether and how to start or continue breastfeeding should be determined by the mother in coordination with her family and healthcare providers. A mother with confirmed COVID-19 or who is a symptomatic PUI should take all possible precautions to avoid spreading the virus to her infant, including washing her hands before touching the infant and wearing a face mask, if possible, while feeding at the breast.

-CDC (5), WHO (14)

Immediate Postpartum Expression of Breastmilk:

This may be relevant to mothers that deliver by caesarean section, after an anesthetic, or those who have medical instability that precludes initiation of breastfeeding within the first hour after birth. This recommendation is consistent with the Global strategy for infant and young child feeding (<https://apps.who.int/iris/bitstream/handle/10665/42590/9241562218.pdf>), as endorsed by the Fifty-fifth World Health Assembly, in resolution WHA54.2 in 2002, to promote optimal feeding for all infants and young children.

-WHO (14)

If expressing breast milk with a manual or electric breast pump, the mother should wash her hands before touching any pump or bottle parts and follow recommendations for proper pump cleaning after each use. If possible, consider having someone who is well feed the expressed breast milk to the infant.

-CDC (5)

Before breast/chestfeeding or expressing milk, the lactating parent should practice chest/breast hygiene as well- washing the breast/chest with soap and water, and drying thoroughly.

-AUTHOR CONTRIBUTION (5,7,9)

For extra germ removal, sanitize pump parts at least once daily. Sanitizing is especially important if your baby is less than 3 months old, was born prematurely, or has a weakened immune system due to illness or medical treatment (such as chemotherapy for cancer). Daily sanitizing of pump parts may not be necessary for older, healthy babies, if the parts are cleaned carefully after each use. Sanitize all items (even the bottle brush and wash basin!) by using one of the following options.

Note: If you use a dishwasher with hot water and a heating drying cycle (or sanitizing setting) to clean infant feeding items, a separate sanitizing step is not necessary.

1. Clean first: Pump parts, bottle brushes, and wash basins should be sanitized only after they have been cleaned.
2. Sanitize: Sanitize the pump kit, bottle brushes, and wash basins using one of the following options. Check manufacturer's instructions about whether items may be steamed or boiled.
 - A. Steam: Use a microwave or plug-in steam system according to the manufacturer's directions.
 - B. Boil: Place disassembled items that are safe to boil into a pot and cover with water. Put the pot over heat and bring to a boil. Boil for 5 minutes. Remove items with clean tongs. Allow to air-dry thoroughly. Place sanitized pump parts, wash basin, and bottle brush on a clean, unused dish towel or paper towel in an area protected from dirt and dust. Do not use a dish towel to rub or pat items dry because doing so may transfer germs to the items.

-CDC (5)

Guidelines for discharge of postpartum patients:

Delivered patients should be notified that in order to limit the risk of infection to themselves, staff, and other patients, they will be discharged in an expedited and safe fashion.

- All vaginal deliveries should have a goal of discharge on postpartum day 1, or even same day if possible for selected women.
- All cesarean deliveries should have a goal of discharge on postoperative day 2, with consideration of postpartum day 1 discharge if meeting milestones.
- Discuss anticipated maternal discharge with pediatrics/neonatology to determine timing of infant discharge.
- Home care with supplies for blood pressure follow up will be critical to expediting discharge of patients with a hypertensive disorder.

-AJOG MFM (29)

Guidelines for management of breastfeeding in the later postpartum period (after discharge):

Breastfeeding or chestfeeding people at home with mild symptoms of a suspected COVID-19 infection are currently advised by WHO to wear a mask and perform hand hygiene before and after having close contact with the baby, in addition to other guidelines provided here.

Families who have been exposed should self-quarantine for a period of two weeks. Telehealth management of newborn and postpartum care can, and should, continue. Families should be given clear guidance on discharge for breastfeeding management, including:

- Latching and positioning of infant
- Milk supply support
- Hand expression and/or pumping
- Hygiene and milk storage guidelines
- Protective precautions for parent and infant, including mask (if indicated), and hand/chest hygiene before and after feeding.
- When to call in case of health or breast/chestfeeding concerns such as: insufficient milk supply, infant jaundice, lethargy, inability to latch, low/no stooling or urine, or other standard facility concerns in newborn care after discharge.

Families should be seen by a lactation consultant to address breast and/or bottle feeding, including expression of breastmilk or the proper mixing and feeding of infant formula. All families should be discharged with a comprehensive feeding plan in place.

-AUTHOR CONTRIBUTION (29-31)

Before discharge, patients recovering from cesarean birth should be instructed to use photo upload option for Telehealth systems, enabling monitoring of wound healing. Families should be discharged with all needed supplies for postpartum monitoring and management at home. This includes but is not limited to:

- Thermometer (with axillary temperature-taking instructions)
- Blood pressure cuff (automatic), or prescription for same
- Hand expression guidance or electric breast pump, or prescription for same
- Infant care essentials (varying dependent on facility and patient needs)
- Postpartum wound care or perineal/vaginal care and supplies

Enough supplies should be given to parent for 2 weeks or length of recommended quarantine.

-AUTHOR CONTRIBUTION (1,5,7,9, 33, 34, 36)

Additionally, patients should meet the following criteria for discharge:

In consultation with state or local health department staff, a healthcare professional should assess whether the residential setting is appropriate for home care. Considerations for care at home include whether:

- The patient is stable enough to receive care at home.
- Appropriate caregivers are available at home.
- There is a separate bedroom where the patient can recover without sharing immediate space with others.
- Resources for access to food and other necessities are available.

- The patient and other household members have access to appropriate, recommended personal protective equipment (at a minimum, gloves and facemask) and are capable of adhering to precautions recommended as part of home care or isolation (e.g., respiratory hygiene and cough etiquette, hand hygiene);
 - There are household members who may be at increased risk of complications from COVID-19 infection (e.g., people >65 years old, young children, pregnant women, people who are immunocompromised or who have chronic heart, lung, or kidney conditions).
- AJOG (29), AWHONN (3)

Family advisories for newborn care management in the home:

Families should be advised to seek prompt medical care if necessary (danger signs include feeding problems, or if the newborn has reduced activity, difficult breathing, a fever, fits or convulsions, or feels cold); register the birth; bring the baby for timely vaccination according to national schedules. Some newborns require additional attention and care during hospitalization and at home to minimize their health risks.

-AUTHOR CONTRIBUTION (23)

Family advisories for quarantine in the early postpartum period:

Families should be instructed to maintain quarantine for as long as their healthcare provider recommends (current CDC recommendation is 2 weeks at minimum).

-CDC (5)

Links & References:

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