

Coronavirus: Novel Coronavirus (COVID-19) Infection Management (Maternal-Newborn) – CE

ALERT

Ask the patient about signs and symptoms of coronavirus disease 2019 (COVID-19) upon arrival to the facility. Obtain this history from a distance of 1.8 m (6 ft) or more if possible.²⁰

Don appropriate personal protective equipment (PPE) based on the patient's signs and symptoms and indications for isolation precautions.

Consider the risks versus the benefits of antenatal steroids after 34 weeks' gestation and for repeated courses of antenatal steroids.²⁰

Consider the risk versus the benefit of administering magnesium sulfate for neuroprotection, preeclampsia, or seizure prophylaxis.²⁰

Organizations should consider restricting or disallowing visitors for a patient who tests positive for COVID-19 or a person under investigation (PUI) to reduce the risk of transmission.²⁰

It is recommended that in a pandemic situation all visitors be banned to reduce the risk of infection transmission.^{3,20}

OVERVIEW

COVID-19 is an infectious disease affecting the respiratory tract, which can progress to severe pneumonia and death. COVID-19 is caused by a new strain of novel coronavirus (SARS-CoV-2). Due to the extent of the infection, COVID-19 was declared a pandemic by the World Health Organization as of March 11, 2020.^{5,8,10,16,17}

Transmission of COVID-19 is spread person to person, although it likely initially emerged from an animal source.⁸ It can be spread by two routes, either directly by respiratory secretions entering the eyes, mouth, nose, or airways after close contact with an infected person (within 2 m [6.5 ft]¹⁶), or indirectly by touching an object, surface, or an infected person that is contaminated with respiratory secretions and then touching the mouth, nose, or eyes.^{16,19} The COVID-19 virus can survive on dry, inanimate surfaces for 48 to 96 hours.¹⁴ It is easily isolated from respiratory secretions, fomites, and feces.¹⁶

Pregnant people have the same risk of contracting the disease as the general population; although, due to the changes in pregnancy to the immune system and its response to viral infections, there is a potential for more severe symptoms.^{2,16,19}

Pregnancy changes that can also increase the risk of more severe symptoms in patients positive for COVID-19 include increased oxygen consumption and decreased lung capacity.¹⁷ There is some evidence that infection with COVID-19 can lead to preterm labor.¹² Vertical transmission to the fetus antenatally is possible, but no strong data exist.¹⁶

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The incubation period of COVID-19 is 3 to 14 days¹⁰ postexposure, with viral shedding up to 20 days. The infected person may spread the infection before onset of symptoms.¹⁰

Common symptoms include:^{8,13}

- Fever
- Cough (either productive or nonproductive)
- Shortness of breath
- Headache
- Myalgia
- Fatigue

Worsening symptoms include:^{8,13}

- Dyspnea
- Pleuritic chest pain

Other symptoms that have been reported include:^{8,13}

- Nausea
- Vomiting
- Diarrhea

If possible, patients with COVID-19 and PUI due to their symptoms should be isolated into a restricted area of the facility. If aerosolizing procedures are anticipated, an airborne infection negative pressure isolation room with at least six air exchanges per hour is best.²⁰ If this is not possible, an isolation room with droplet and contact precautions is recommended.²⁰

There is no evidence of an increased risk of COVID-19 infection with internal fetal monitors, amniotomy, or operative delivery; however, the data are limited. The use of nitrous oxide in labor may increase the risk of aerosolization of bodily fluids and should be avoided, if possible, to decrease the risk of transmitting COVID-19.^{3,20} The routine use of high-flow nasal cannula or face mask oxygen for fetal intolerance of labor should be suspended because it may be an aerosolizing procedure, which could increase the risk of COVID-19 transmission.^{3,20} Oxygen, using the safest, most effective method, should be administered to treat maternal oxygen desaturation.³

Newborns born to mothers who are COVID-19 positive should be considered PUIs. The CDC recommends separate isolation precautions for the mother and the newborn, coming together only for breastfeeding after the mother takes steps to provide sanitation and a barrier.^{2,7} The World Health Organization recommends that mothers and infants remain in isolation together.^{21,22,23} The organization's practice regarding mother and newborn should be followed. The determination of whether or not to separate a mother with known or suspected COVID-19 from the newborn should be made on a case-by-case basis using shared decision-making between the mother and the health care team and should consider factors such as the mother's

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and newborn's clinical condition and COVID-19 testing results, the mother's desire to breastfeed, and the facility's capacity to accommodate separation.⁵

Mothers infected with COVID-19 may breastfeed their newborn if their illness does not prevent them from caring for their newborn. If unable to breastfeed, the mother can safely express milk to be given to the newborn.⁴ Before breastfeeding or expressing milk, the mother should perform hand hygiene with soap and water or use an alcohol-based hand sanitizer, wear a medical mask, and clean and disinfect any surfaces the mother comes in contact with.^{1,7,9,19,21,23} To date, no evidence of COVID-19 has been found in breastmilk.^{2,7,15} Caution should be used during handling and storage of breastmilk (e.g., sanitizing the outside of the container, double bagging).

EDUCATION

- Provide developmentally and culturally appropriate education based on the desire for knowledge, readiness to learn, and overall neurologic and psychosocial state.
- Explain the purpose of the isolation to the mother and support person and any precautions that the support person should take when entering an isolation room.
- Demonstrate and assist the mother with donning and proper wearing of a mask.
- Inform the mother and support person of the organization's visitation restrictions so that the mother can make arrangements for virtual contact options if applicable.
- Provide the mother and support person information on the signs and symptoms of COVID-19.
- Educate the mother and support person about modes of COVID-19 transmission.
- Explain to the mother and support person about testing for COVID-19 if the mother is a PUI.
- Explain to the mother and support person the methods of infection prevention, including hand hygiene, respiratory hygiene, and cough etiquette⁶ (Box 1).

Box 1 Respiratory Hygiene and Cough Etiquette

Have patients and accompanying individuals:

- Cover the nose and mouth, or both, when coughing or sneezing.
- Use tissues to contain respiratory secretions and dispose in nearest no-touch waste container.
- Perform hand hygiene after contacting respiratory secretions and contaminated objects or materials.
- Contain respiratory secretions with procedure mask for coughing or other symptomatic patients.
- Sit at least 1.8 m (6 ft) away from others if coughing.

(Modified from Siegel, J.D. and others. [2007, updated 2019]. 2007 Guideline for isolation precautions: Preventing transmission of infectious agents in healthcare settings. Retrieved April 30, 2020, from <https://www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines-H.pdf>)

- Demonstrate to the support person how to put on and take off PPE.
- Educate the mother and support person about the possible exposure of individuals in contact with the mother before the diagnosis. Discuss the need for these individuals to be tested.

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- Encourage questions and answer them as they arise.

ASSESSMENT AND PREPARATION

Assessment

1. Perform hand hygiene and don PPE as indicated for needed isolation precautions.

Face masks are an acceptable alternative when the supply chain of respirators or N95 masks cannot meet the demand.²

Available respirators should be prioritized for procedures that generate respiratory aerosols.⁵

2. Introduce yourself to the mother and support person.
3. Verify the correct patient using two identifiers.
4. Assess the mother's vital signs, including oxygen saturation.
5. Assess the mother for signs and symptoms of COVID-19.

Rationale: Some patients may present without a fever. A lack of fever may be noted in the immunosuppressed or in patients taking certain medications (e.g., steroids).⁶

6. Ensure that the mother with COVID-19 or the PUI wears a mask during assessment.¹⁰
7. Assess the mother for signs and symptoms of pneumonia and auscultate the mother's lungs.
8. Notify the infection preventionist or report to the health department a patient with suspected or confirmed COVID-19.

Preparation

1. Place the mother in a single person room with the door closed.

Reserve negative pressure isolation rooms for patients undergoing aerosol-generating procedures.

2. Choose isolation precautions that are appropriate for the mother's signs and symptoms or diagnosis.

- a. Contact precautions: Standard precautions plus gloves and gown
- b. Droplet precautions: Standard precautions plus a mask and eye protection

Use contact and droplet precautions for most encounters with a newborn born to a mother with COVID-19.¹⁵

Personal eyeglasses are not adequate protection for the eyes.¹⁵

- c. Airborne precautions: Standard precautions plus an N95 respirator or powered air-purifying respirator (PAPR) and eye protection

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Use contact, droplet, and airborne precautions when the mother requires bag-mask ventilation, intubation, tracheal suctioning, nasal cannula oxygen at a flow greater than 2 L/min/kg, continuous positive airway pressure, and positive pressure ventilation of any type, given the potential for these supports to generate aerosols.¹⁵

3. Provide proper PPE access and signage as needed.
4. Limit trips in and out of the room; gather all equipment and supplies needed before entering the room. If the mother is a PUI and COVID-19 testing is to be done, include a test kit.
5. Dedicate medical equipment (e.g., stethoscope, blood pressure cuff, thermometer, oxygen saturation monitor) to be used only by the mother.

PROCEDURE

1. Perform hand hygiene and don gloves and appropriate PPE based on the patient's signs and symptoms and indications for isolation precautions.
2. Verify the correct patient using two identifiers.
3. Explain the procedure to the mother and support person and ensure that the mother agrees to treatment.
4. Ensure that the mother has had the opportunity to discuss health problems, course of treatment, or other important topics while in the isolation room.
5. Remind the mother to cover the mouth when coughing, if not wearing a mask, or to wear a mask if leaving the room for any reason ([Box 1](#)).
6. Provide designated care to the mother while maintaining precautions.
 - a. Keep hands away from own face.
 - b. Limit touching surfaces in the room.
 - c. Remove gloves when torn or heavily contaminated, perform hand hygiene, and don clean gloves.
7. Collect any ordered specimens, such as COVID-19 testing for a PUI, per the instructions on the COVID-19 test kit.
8. In the presence of the patient, label the specimen(s) per the organization's practice.¹¹
9. Place the labeled specimen(s) in a biohazard bag.
10. At the door, have another health care team member hold a biohazard bag into which the specimen(s) is placed.

Rationale: This prevents contamination of the outside of the biohazard bag.

11. Ensure that the specimen(s) is transported to the laboratory.

General Considerations

1. Consider the risk versus the benefit of administering magnesium sulfate for neuroprotection or preeclampsia and seizure prophylaxis.

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Rationale: Magnesium sulfate can contribute to the mother's respiratory depression.²⁰

2. Restrict or disallow visitors for a mother who tests positive for COVID-19 or is a PUI to reduce the risk of transmission.²⁰

It is recommended that in a pandemic situation all visitors be banned to reduce the risk of infection transmission.^{3,20}

If visitors are allowed, the organization may consider limiting visitors to one essential support person and having that person be the same individual throughout the mother's stay.⁵

Ensure that any permitted visitor is screened for symptoms of acute respiratory illness and not allowed entry if fever or respiratory symptoms are present.⁵

3. Ensure that a laboring mother with COVID-19 or a PUI is not allowed to leave the isolation room.

4. Ensure that a pregnant and breastfeeding patient is a priority in screening algorithms for COVID-19.^{5,20}

Rationale: Clinical guidance is driven by the results of a COVID-19 diagnosis.²⁰

5. Follow the organization's practice for obtaining and transporting specimen collection for patients positive for COVID-19 and PUI (e.g., fern specimens).

Triage

1. Avoid transporting specimens across the unit when using ferning and microscopy evaluation for rupture of membranes. Use alternative methods for ruling out rupture of membranes such as pooling, nitrazine, and commercially available tests.²⁰

Transporting the specimen across the unit increases the risk of exposure and should be avoided.

Antepartum

1. Consider the risks versus the benefits of antenatal steroids after 34 weeks' gestation and for repeated courses of antenatal steroids.

Rationale: Prolonged exposure to high-dose steroids has been found to worsen general population outcomes in patients with SARS-CoV-2.²⁰

2. Monitor the mother for signs and symptoms of preterm labor.

There is some evidence that infection with COVID-19 can lead to preterm labor.¹²

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Intrapartum

1. Implement continuous fetal monitoring for a mother in labor.¹⁶
2. Refrain from the routine use of high-flow nasal cannula or face mask oxygen for fetal distress.

The use of a high-flow nasal cannula or face mask oxygen may be an aerosolizing procedure, which could increase the risk of COVID-19 transmission.^{3,20}

3. Administer oxygen as needed for maternal oxygen desaturation.³
4. Don an N95 mask, if available, when the mother is pushing.²⁰

An N95 mask should be worn if available due to the length of patient contact, and because of repeated and prolonged exhalations, there is an increased risk of exposure to aerosolized bodily fluids in the second stage of labor.²⁰

5. Limit the use of nitrous oxide in labor due to the potential for aerosolization of bodily fluids.

The use of nitrous oxide should be discussed on individual labor and delivery units and avoided, if possible, to decrease the risk of transmitting COVID-19.^{3,20}

6. Ensure that responding health care team members use airborne, droplet, and contact precautions-level PPE when a newborn resuscitation or stabilization is needed at delivery.

Rationale: Newborn aerosols may be generated along with maternal aerosols during intubation, airway suctioning, and initiating positive pressure ventilation.

Cesarean Birth

1. Avoid the practice of having open surgical equipment in operating rooms, as is sometimes done on labor and delivery units for possible emergency cesarean birth.

This practice can increase the risk of COVID-19 transmission.²⁰

2. Facilitate the use of a negative pressure operating room, if possible, for a patient with SARS-CoV-2 or a PUI. If this is not possible, with proper PPE and transportation guidelines, a cesarean birth can still be performed in a positive flow operating room safely.²⁰

Postpartum and Breastfeeding

1. Consider a newborn born to a mother who is COVID-19 positive as a PUI. These newborns should be separated from other healthy infants.^{5,15}
2. Place the mother and newborn in isolation, per the organization's practice, using one of these methods:
 - a. The mother and newborn each have a separate isolation room, coming together only for breastfeeding.^{2,7}
 - b. The mother and newborn are isolated together.^{21,22,23}

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If separate rooms are not used, other methods to reduce the risk of transmission include the use of engineering controls like physical barriers (e.g., a curtain between the mother and newborn) and keeping the newborn 1.8 m (6 ft) or further away from the mother unless breastfeeding.⁵

3. Bathe the newborn as soon as possible after birth.

Rationale: Bathing the newborn as soon as possible after birth removes any virus potentially present on skin surfaces and decreases the risk of transmission.¹⁵

4. If another healthy family member or health care team member is present to provide care such as diapering, bathing, and feeding for the newborn, ensure that this person wears appropriate PPE. For a healthy family member, appropriate PPE includes a gown, gloves, face mask, and eye protection.⁵

5. Assist the mother with breastfeeding, as needed, after delivery.

6. Before breastfeeding or expressing milk, ensure that the mother performs hand hygiene with soap and water or uses an alcohol-based hand sanitizer and wears a mask. Disinfect any surfaces with which the mother comes into contact.^{1,9,19,21,23}

7. If the mother is unable to breastfeed, assist with expressing breastmilk and ensure that the breast pump and all of its parts are cleaned.

Ensure that the breast pump is dedicated to the mother in isolation and left in the room.

8. If the mother is expressing breastmilk, collect a specimen of breast milk.

9. In the presence of the patient, label the breastmilk per the organization's practice.¹¹

10. Place the breastmilk in a biohazard bag.

11. At the door, have another health care team member hold a biohazard bag into which the breastmilk is placed.

Rationale: This prevents contamination of the outside of the biohazard bag.

12. Ensure that the breastmilk is transported to the appropriate refrigerator.

13. Discard linen, trash, and disposable items.

a. Use single bags that are sturdy and impervious to moisture to contain soiled articles. Double bag heavily soiled linen or heavy, wet trash if necessary.

b. Tie the bags securely at the top with a knot.

14. Remove all reusable pieces of equipment and thoroughly disinfect reusable equipment brought into the room. Ensure that equipment is disinfected with an organization-approved disinfectant when it is removed from the room and before it is used on another patient.

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Rationale: Disinfecting equipment after use decreases the risk of infection transmission. Using equipment that is dedicated for use only with the patient on isolation precautions further minimizes this risk.¹⁸

15. Remove PPE and perform hand hygiene.
16. Exit the isolation room and close the door.
17. If using a negative-pressure room, enter the anteroom, close the door to the isolation room, remove PPE, exit the anteroom, and close the door to the anteroom.

The door to the isolation room and the anteroom should never be open at the same time.

18. Document the procedure in the patient's record.

MONITORING AND CARE

1. Assess the mother's laboratory test results, if tests were ordered, including the COVID-19 test if the mother is a PUI.
2. Ensure that the mother with COVID-19 or the PUI wears a mask during assessment and when transported out of the isolation room.¹⁰
3. Assess, treat, and reassess pain.
4. Discontinue isolation precautions, per the organization's practice, when:
 - a. COVID-19 is ruled out.
 - b. The mother is no longer contagious.
5. Answer questions and assist the mother as needed during the antepartum, intrapartum, and postpartum period.
6. Monitor the mother for depression related to isolation.

Rationale: During a pandemic with restricted visiting and possibly having to give birth without a support person, depression can be severe.

7. Resupply the room as needed. Have another health care team member hand in new supplies, if needed.

Rationale: Limiting trips in and out of the room reduces the exposure of the health care team members to airborne pathogens.

EXPECTED OUTCOMES

- Respirator mask fits properly.
- Health care team members are free from airborne-transmitted infectious illness.
- Mother spontaneously engages in discussions with health care team members and support person.
- Mother asks for information about disease transmission.

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- Mother explains purpose of isolation and cooperates with precautions.
- Mother able to care for newborn if illness allows.
- Mother able to breastfeed newborn if illness allows.
- Mother asks questions about newborn care and breastfeeding if illness allows.

UNEXPECTED OUTCOMES

- Respiratory mask is not donned properly.
- Health care team members contract COVID-19.
- Mother does not cooperate with precautions.
- Mother is unable to care for newborn.
- Mother is unable to breastfeed.
- Mother does not ask questions about newborn care and breastfeeding.

DOCUMENTATION

- Education
- Procedures performed
- Mother's response to social isolation
- Depression screening
- Mother's response to newborn care and breastfeeding
- Evidence or suspected breach of isolation precautions
- Unexpected outcomes and related interventions

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Elsevier Skills Levels of Evidence

- Level I - Systematic review of all relevant randomized controlled trials
- Level II - At least one well-designed randomized controlled trial
- Level III - Well-designed controlled trials without randomization
- Level IV - Well-designed case-controlled or cohort studies
- Level V - Descriptive or qualitative studies

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- Level VI - Single descriptive or qualitative study
- Level VII - Authority opinion or expert committee reports

SUPPLIES

- PPE (gowns, gloves, surgical mask or N95, face shield, eye protection)
- Fetal monitor
- Thermometer
- Blood pressure monitor
- Oxygen saturation monitor
- Oxygen administration supplies
- COVID-19 test kit, if applicable
- Dedicated breast pump, if applicable

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