Mississippi Perinatal Quality Collaborative
COVID-19: Maternal and Neonatal Update

March 24, 2020
12PM

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Agenda

- General announcements/housekeeping
- Covid-19 Neonatal Update
- COVID-19 Obstetric Update
- Open Discussion, Q&A
Objectives

• Provide weekly opportunity to review maternal and neonatal guidance regarding COVID, share resources

• Encourage Mississippi providers to share experiences, challenges
• Please be advised that the COVID-19 pandemic is a rapidly evolving situation and this guidance may become out-of-date as new information becomes available.

• Reassess updates frequently from the Centers for Disease Control and Prevention (CDC), professional and local authorities

• Corrections encouraged!
GoToMeeting Platform

• You can mute and unmute yourself. During presentations all will be muted.

• You can chat comments, questions into the chat box for the entire Audience or send private messages

• **PLEASE Enter your Name, credentials (MD/RN, etc), hospital, Peds or OB**

• During Q&A either type question/comment in chat or indicate in the chat ‘hand raised’ if you’d like to be unmuted to ask question or make comment
COVID-19 in US - Where are we now?

- Total US cases: 40,069 as of March 23 at noon
- Number Deaths: 462

- Mississippi
- Total cases: 249
- Death: 1
Updates

- New England Journal of Medicine, SARS-Co V in Children, 3/18/20
- Guidance shared with AAP membership, unofficial
SARS-CoV-2 Infection in Children

Lui, Zhang et. Al, 3/18/20

*Chinese CDC: Less than 1% of 72,314 cases were in children younger than 10 years of age

* This study evaluated children infected with SARS-CoV-2 and treated at the Wuhan Children’s Hospital, the only center assigned by the central government for treating infected children

* Clinical Outcomes monitored up until March 8, 2020

* 171 (12.3%) of the 1391 children tested between Jan. 28-Feb. 26 were confirmed positive for COVID-19

* Median age was 6.7 years, with 18.1% less than 1 year of age.
Clinical Features

* Fever - 41.5%
* Cough and pharyngeal erythema.
  * 15.8% no symptoms of infection or radiologic features of pneumonia.
  * 64% with pneumonia
  * 12 patients had radiologic features of pneumonia but did not have any symptoms of infection.

* 3 patients required intensive care support and invasive mechanical ventilation; all had coexisting conditions

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
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<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>Median (range)</td>
<td>6.7 yr (1 day–15 yr)</td>
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<tr>
<td>Distribution — no. (%)</td>
<td></td>
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<tr>
<td>&lt;1 yr</td>
<td>31 (18.1)</td>
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<tr>
<td>1–5 yr</td>
<td>40 (23.4)</td>
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<tr>
<td>6–10 yr</td>
<td>58 (33.9)</td>
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<tr>
<td>11–15 yr</td>
<td>42 (24.6)</td>
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| Diagnosis — no. (%)                             |       |
| Asymptomatic infection                          | 27 (15.8) |
| Upper respiratory tract infection               | 33 (19.3) |
| **Pneumonia**                                   | 111 (64.9) |

| Exposure or contact information — no. (%)       |       |
| Family cluster                                  | 154 (90.1) |
| **Confirmed family members**                   | 131 (76.6) |
| Suspected family members                        | 23 (13.5) |
| Unidentified source of infection                | 15 (8.8) |
| Contact with other suspected case               | 2 (1.2) |

Clinical Findings by Age

Table S1. Age distribution of infected children and their respective diagnoses

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>All patients (n = 171)</th>
<th>Asymptomatic infection (n=27)</th>
<th>Upper respiratory tract infection (n = 33)</th>
<th>Pneumonia (n =111)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median (IQR)</td>
<td>6.7 (2.0-9.8)</td>
<td>9.6 (7.6-12.6)</td>
<td>3.9 (1.4-8.4)</td>
<td>5.9 (1.2-9.3)</td>
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<tr>
<td>&lt;1</td>
<td>31 (18.1)</td>
<td>0</td>
<td>6 (18.2)</td>
<td>25 (22.5)</td>
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<tr>
<td>1-5</td>
<td>40 (23.4)</td>
<td>1 (3.7)</td>
<td>12 (36.4)</td>
<td>27 (24.3)</td>
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<tr>
<td>6-10</td>
<td>58 (33.9)</td>
<td>14 (51.9)</td>
<td>10 (30.3)</td>
<td>34 (30.6)</td>
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<tr>
<td>11-15</td>
<td>42 (24.6)</td>
<td>12 (44.4)</td>
<td>5 (15.2)</td>
<td>25 (22.5)</td>
</tr>
</tbody>
</table>
Conclusion

In contrast with infected adults, most infected children appear to have a milder clinical course.

Asymptomatic infections were not uncommon.

Determination of the transmission potential of these asymptomatic patients is important for guiding the development of measures to control the ongoing pandemic.

Management of Mother/Baby

* Novel Virus

* Limited information on perinatal transmission and illness in newborns

* It is unlikely that vertical transmission or transmission via breastmilk occurs

* No information on long-term effects
CDC Guidelines for Mother/Baby Contact

It is unknown whether newborns with COVID-19 are at increased risk for severe complications. Transmission after birth via contact with infectious respiratory secretions is a concern.

To reduce the risk of transmission of the virus that causes COVID-19 from the mother to the newborn, facilities should consider temporarily separating (e.g., separate rooms) the mother who has confirmed COVID-19 or is a PUI from her baby until the mother’s transmission-based precautions are discontinued,

Unofficial Guidelines
Newborn Risk

- It remains unclear if SARS-CoV-2 is vertically transmitted from mother to fetus antenatally via maternal viremia and transplacental transfer. Prior published experience with respiratory viruses would suggest this is unlikely.
- Perinatal exposure may be possible at the time of vaginal delivery based on the detection of virus in stool and urine.
- Newborns are at risk of infection from a symptomatic mother’s respiratory secretions after birth, regardless of delivery mode.

All infants

- Mother and infant will be separated immediately at birth.
- A designated, limited set of caregivers will be assigned to the infant.
- Infant should be bathed as soon as is reasonably possible after birth.
- Newborns will be tested for perinatal viral acquisition as follows:
  - Molecular assay testing will be done on 2 consecutive sets of nasopharyngeal, throat, and stool swabs collected at least 24 hours apart.
  - Testing will begin at ~24 hours of age, to avoid detection of transient viral colonization and to facilitate detection of viral replication.
  - Newborn will be designated as uninfected if all 6 tests are negative.

Delivery Room Management

- Initial stabilization/resuscitation of the newborn will take place as per center usual care.
- Newborn resuscitation should not be compromised to facilitate maternal-infant separation.
- If the center has a newborn resuscitation room separate from the mother’s delivery room, this should be utilized.
- Because of the uncertain nature of newborn resuscitation (that is, suctioning and/or tracheal intubation may be required), Airborne Precautions should be used.

Admission

- Infants who are well-appearing at birth and who would otherwise be admitted to the center’s well newborn area should be cared for in a designated area separate from other newborns. Centers should assess their local structures to determine where such infants should receive care.
  - Staff will use Enhanced Droplet Precautions for these infants.
- Infants who require NICU care due to illness or gestational age at birth should be admitted to a single patient isolation room within the NICU.
  - If the infant requires technical CPAP, HFNC as CPAP, or any form of mechanical ventilation, Airborne Precautions must be used, until infection status is determined as outlined above.

1) Infant initially isolated at birth

2) Newborn bathed as soon as reasonable possible after birth.

3) Newborns will be tested by molecular assay testing on 2 consecutive sets of nasopharyngeal, throat, and stool swabs collected 24 hours apart, starting at 24 hours of age.

4) Management in the Delivery Room should include using Airborne Precautions during resuscitation.

5) Infants who are well-appearing at birth and admitted to the Newborn Nursery should be placed under Enhanced Droplet Precautions.

6) Infants in the NICU requiring HFNC, CPAP, or mechanical ventilation will be placed on Airborne Precautions.
Breastfeeding
- Mother may express breast milk (after appropriate hand hygiene) and this milk may be fed to the infant by designated caregivers
- Breast pumps and components should be thoroughly cleaned in between pumping sessions using standard policies (clean pump with antiseptic wipes; clean pump attachments with hot soapy water)

Visitation
- No visitation will be allowed until the newborn’s infection status is determined
  - Exception: the non-maternal parent (or designated equivalent) may visit the infant and participate in care if they are asymptomatic, even if they are being monitored for infection due to exposure to the mother. This person will use Enhanced Droplet Precautions during visits.
- If the newborn is uninfected but requires prolonged hospital care for any reason, the mother will not be allowed to visit the infant until she meets the CDC recommendations for suspending precautions:
  - Resolution of fever, without use of antipyretic medication
  - Improvement in illness signs and symptoms
  - Negative results of molecular assay for COVID-19 from at least two consecutive sets of paired nasopharyngeal and throat swabs specimens collected ≥24 hours apart (total of four negative specimens - two nasopharyngeal and two throat).

Discharge
- Considerations when infant is medically appropriate for discharge
  - Infants determined to be infected, but with no symptoms of COVID-19, may be discharged home with appropriate precautions and plans for outpatient follow-up on a case-by-case basis.
  - Infants whose infection status has determined to be negative will be optimally discharged home when otherwise medically appropriate, to a designated healthy caregiver who is not under observation for COVID-19 risk. If such a caregiver is not available, manage on a case-by-case basis.

1) Encourages expressed breast milk use
2) No visitors other than the non-maternal parent. They must use Enhanced Droplet Precautions
3) Mom can not visit baby until she meets the CDC recommendations for suspending precautions
4) Infant determined to be infected, but without symptoms of COVID-19, may be discharged home with appropriate precautions and plan for F/U
5) Infants whose infection status is negative or unknown at time of discharge can be discharged home to a healthy caregiver who is not under observation for COVID-19 risk
Mississippi Neonatology Facebook Group

Created to share best practices in neonatal care among caregivers across the state
Any Questions

Questions are guaranteed in life; Answers aren’t.
Obstetric Updates/Team Sharing
SMFM Ultrasound Guidance

• Released March 23rd:
• The Society for Maternal-Fetal Medicine COVID-19 Ultrasound Practice Suggestions

• General Guidelines: sonographer safety, sanitizing practices, visitor policies
• Staffing suggestions
• Ultrasound scheduling: 12 week initial/NT, spacing, limiting echo

• https://s3.amazonaws.com/cdn.smfm.org/media/2271/ultra.pdf
PRIORITY: Pregnancy CoRonavIrus Outcomes RegIsTrY

Pregnant with known or suspected Coronavirus (COVID-19)?

What is the purpose of this study?

The goal of the study is to better understand how pregnant women are affected by COVID-19 including what their symptoms are, how long they last, and how COVID-19 may impact their pregnancy and/or delivery.

Who can join?

✅ You may be able to join if...
  - Pregnant or have been pregnant within the last 6 weeks
  - Diagnosed with COVID-19, or being evaluated for COVID-19 since January 1, 2020

❌ You can’t join if...
  - Less than 18 years of age

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[https://priority.ucsf.edu/priority%20pregnancy-coronavirus-outcomes-registry](https://priority.ucsf.edu/priority%20pregnancy-coronavirus-outcomes-registry)
Welcome to the UW Medicine COVID-19 Public Site. The clinical and administrative teams throughout our system (Harborview Medical Center, UW Medical Center-Montlake, UW Medical Center-Northwest, Valley Medical Center, UW Neighborhood Clinics and Airlift Northwest) and partners Seattle Children’s Care Alliance have developed policies and protocols in response to the outbreak in Western Washington. Most of these documents have been written since Monday, February 24th 2020 and are undergoing frequent revisions as the COVID-19 situation evolves. When using the documents, we caution you to be mindful of the date the document was produced and to check that against current knowledge and evolving clinical standards.

Since the outbreak began, our colleagues, locally and nationally, have been reaching out to us for assistance as they start to see cases. We hope that by sharing our work, we can assist your teams and facilitate a move more quickly and to spend more time responding and less time typing. This is a “rough” draft of what we hope will be much more to come. Our vision is to continue to add the many more protocols and flow diagrams we have ranging from the Airlift Northwest team to our exposure protocol. We hope to add a discussion board and maybe even the ability for others to upload their documents (ex. from the LTCF community).

Please feel free to contact us with questions and recommendations at covid19@uw.edu.

• https://covid-19.uwmedicine.org/Pages/default.aspx
The University of Mississippi Medical Center

• Recommendations for preparation and management of COVID-19

Dr. Rachel Morris- Maternal Fetal Medicine, UMMC
Acknowledgments: Dr. Sarah Arajii, MFM Fellow, UMMC
Resources/References

• SMFM Webinar: “COVID-19 in Pregnancy: Preparing your Obstetrical Units.”
• [https://www.smfm.org/covid19](https://www.smfm.org/covid19)


• ISUOG webinar on How to prepare your unit for coronavirus.
COVID-19 Preparedness

• Encourage every hospital to have a plan
• Meet frequently
• Call for questions/help/planning
• More resources to come

• [https://umc.edu/CoronaVirus/Mississippi-Health-Care-Professionals/Clinical-Resources/Clinical-Resources.html](https://umc.edu/CoronaVirus/Mississippi-Health-Care-Professionals/Clinical-Resources/Clinical-Resources.html)
UMMC OB COVID-19
Admission Guidelines
Outpatient Assessment and Management for Pregnant Women With Suspected or Confirmed Novel Coronavirus (COVID-19)

Assess Patient’s Symptoms
Symptoms typically include fever ≥38°C (100.4°F) or one or more of the following:
- Cough
- Difficulty breathing or shortness of breath
- Gastrointestinal symptoms

Yes → Conduct Illness Severity Assessment

- Does she have difficulty breathing or shortness of breath?
- Does she have difficulty completing a sentence without gasping for air or needing to stop to catch breath frequently when walking across the room?
- Does patient cough more than 1 teaspoon of blood?
- Does she have new pain or pressure in the chest other than pain with coughing?
- Is she unable to keep liquids down?
- Does she show signs of dehydration such as dizziness when standing?
- Is she less responsive than normal or does she become confused when talking to her?

No Positive Answers → Routine Prenatal Care

Any Positive Answers → Elevated Risk
Recommend she immediately seek care in an emergency department or equivalent unit that treats pregnant women. When possible, send patient to a setting where she can be isolated.
Notifying the facility that you are referring a PUI is recommended to minimize the chance of spreading infection to other patients and/or healthcare workers at the facility.
Adhere to local infection control practices including personal protective equipment.
Assess Clinical and Social Risks

- Comorbidities (Hypertension, diabetes, asthma, HIV, chronic heart disease, chronic liver disease, chronic lung disease, chronic kidney disease, blood dyscrasia, and people on immunosuppressive medications)
- Obstetric issues (e.g., preterm labor)
- Inability to care for self or arrange follow-up if necessary

No Positive Answers

Low Risk
- Refer patient for symptomatic care at home including hydration and rest
- Monitor for development of any symptoms above and re-start algorithm if new symptoms present
- Routine obstetric precautions

Any Positive Answers

Moderate Risk
See patient as soon as possible in an ambulatory setting with resources to determine severity of illness.

When possible, send patient to a setting where she can be isolated. Clinical assessment for respiratory compromise includes physical examination and tests such as pulse oximetry, chest X-ray, or ABG as clinically indicated.
Pregnant women (with abdominal shielding) should not be excluded from chest CT if clinically recommended.

If no respiratory compromise or complications and able to follow-up with care

Admit patient for further evaluation and treatment.
Review hospital or health system guidance on isolation, negative pressure and other infection control measures to minimize patient and provider exposure

If yes to respiratory compromise or complications

Abbreviations: ABG, arterial blood gases; CDC, Centers for Disease Control and Prevention; HIV, human immunodeficiency virus.

Healthcare providers should immediately notify their local or state health department in the event of a PUI for COVID-19 and should contact and consult with their local and/or state health department for recommendations on testing PUIs for COVID-19.
OB COVID-19 Admission Guidelines

• After screening with ACOG/SMFM algorithm, patient is low risk and discharged home.
  • Counsel on hydration, isolation, monitoring of symptoms and routine obstetric precautions.

• No obstetric complaints + COVID-19 PUI or positive: to non-OB floor based on acuity of patient’s illness
  • (e.g. Med/Surg bed vs ICU).

• If obstetrical complaints and COVID PUI/COVID + :
  • Stabilize and assess in a isolation/negative pressure room (if available) in OB emergency room. If obstetric complaint(s) resolve after stabilization (either with or without delivery), transfer to non-OB floors when able, if they don’t resolve admit to L&D (negative pressure/isolation).
Which COVID Patients Should Be Transferred?

- Usual maternal/neonatal indications with consideration of resources

- Covid symptoms alone, COVID + testing with mild symptoms are NOT an indication for transfer to higher level of care

- Transfer indicated for concern for maternal respiratory compromise/decompensation and higher level of care (ICU) needed
Corticosteroids for fetal lung maturity- To give or to hold?

- Decisions about the use of corticosteroids for fetal lung maturity should be made in consultation with critical care physicians, neonatology (dependent on availability of surfactant) and maternal-fetal medicine consultants.

- As a rule, late preterm corticosteroids for fetal lung maturity should be withheld in the COVID-19 positive/PUI parturient.

- Corticosteroid use must be individualized case by case and should be reserved for the extreme preterm pregnancies (<28W) ONLY if maternal status permits its use.
Tocolysis < 34 weeks in COVID+

- Magnesium sulfate per usual ACOG guidelines.
- Procardia per usual ACOG guidelines.
How to manage on COVID PUI or COVID-19 + patient on L&D?

• Elective 39+ deliveries: Should be phoned the night before their scheduled admission to screen for acuity of symptoms consistent prior to admission. Consider resources/

• Intended/anticipated vaginal deliveries: Keep in a negative pressure room for antepartum, labor/delivery, and postpartum care. Maintain guidelines for negative pressure room and PPE for all healthcare providers.

• Plan and minimize who will be in the room to care for the COVID-19 patient. Log all staff who go in and out of the room during each shift.
How to manage on COVID PUI or COVID-19 + patient on L&D?

• Consider making COVID-19 kits with all equipment including drugs for labor analgesia and cesarean delivery that would minimize traffic and contaminating drug dispensing machines.
  • Examples may include uterotonics, tocolytics, analgesics, IV fluids, foley catheter.

• Supplemental oxygen in labor:
  • May use nasal cannula under a surgical mask.
  • Avoid face mask and non-rebreather.
    • Concern for aerosolization of infectious particles.
How do we manage on COVID PUI or COVID-19 + patient on L&D?

- Second stage of labor may confer droplet spread and transmission to others in the setting of pushing with increased heavy/fast breathing efforts.
- No data that vaginal delivery is an aerosolizing event.
- Appropriate PPE, including N95 masks, is required for all healthcare providers with the prolonged exposure during the time of pushing.
  - Patient wearing mask during pushing is sub-optimal.
- Viral particles present in feces, vaginal secretions.
How do we manage COVID PUI or COVID-19 + patient on L&D?

- Although there is no data currently to suggest vertical transmission, consider avoiding Skin to skin should be avoided as well.
- Infant to pediatric attendant immediately following delivery for assessment.
- Notify NICU prior to delivery of confirmed COVID/PUI so they can make accommodations for infant.
- Procedures for patients (including vaginal deliveries and cesarean sections) should be performed and attended by experienced providers/surgeons, anesthesiologists, and nurses.
- For patients with confirmed COVID or PUI, minimize the number of personnel present.
Tubals... Elective?

- At the time of cesarean delivery may be performed, especially for high risk patients.

- However, due to limitations with OR space, PPE, and staffing, postpartum tubals after vaginal deliveries should be considered elective surgery and should not be performed at this time.

- Recommend LARC as an alternative for patients who are unable to receive sterilization procedure at the time of their admission.
OB anesthesia

• Universal PPE (i.e. N95 mask) for all providers performing or involved in induction of GETA (i.e anyone in the room).

• Consider consults with anesthesia early for high risk parturients.

• Intubation is a high-risk aerosolizing event.

• Epidural to reduce the need for general anesthesia in the event of emergency cesarean for COVID+!!
  • Based on limited data, >75% of deliveries are emergent in the setting of COVID-19.

• Avoid emergent cesarean:
  • Proactive communication between OB team, anesthesia and nursing.
  • Active management of non reassuring FHT.
  • Consideration for cesarean delivery with maternal deterioration.
COVID-19- Do we have a treatment?

• The backbone of the treatment strategy for COVID19 is good quality supportive care as in any viral pneumonia.

• There is no current evidence from RCTs to recommend any specific anti-COVID-19 treatment for patients with suspected or confirmed COVID-19 infection.

• Treatment in pregnant patients should not be any different than the non-pregnant patient.

• Consult ICU and/or Maternal fetal medicine for management related questions.

• The use of any of these drugs remains purely investigational. Reproductive toxicology is our source for information on the use of these medications in pregnancy. [https://reprotox.org/]
Questions?
Open Discussion

• Any covid + pregnant patients managed?
• Lessons learned?challenges faced?
• Staffing concerns?
Addressing MS Blood Shortage

• BLOOD SHORTAGE

• EMERGENCY CONSIDERATIONS FOR MINIMIZING BLOOD PRODUCT UTILIZATION: PREVENTION AND TREATMENT PEARLS
Antepartum

- **Aggressively identify and treat anemia.**

- All prenatal OB providers must review their clinic patients and check anemia status.
  
  **(28W CBC goal):** maintain Hb >10.5 mg/dL.

- If Hgb < 10.5 mg/dL, obtain Iron Panel (Fe, TIBC, Ferritin).

- If IDA anemia confirmed, get a process in place for IV Iron transfusion. Consider hematology.
  
  Venofer 200-300 mg IV weekly for 4-6 total treatments.

- If not IDA, consider Vit B12 and Folic Acid levels (esp if MCV >100).
- Does the patient need an electrophoresis?
  - Call MFM and/or Hematology for help
Labor and Delivery

- Identify the patients highest risk of obstetric post partum hemorrhage (PPH).
- Early anesthesia consultation.
- Notify the blood bank early about high risk cases.
  - Determine availability of other blood products (FFP/Cryoprecipitate)
- Use uterotonics judiciously however, keep in mind that these drugs are also in shortage nationwide.
  - Consider using Cervidil for IOL instead of cytotec.
Labor and Delivery

• Review specific techniques that are available (e.g. Cell salvage, Fibrin/Thrombin glues, Everestt, Bakri balloon tamponade, B-Lynch sutures, O’ Leary sutures, Hypogastric artery ligation reserved for Gyn Oncology or Vascular surgery).

• TXA (1 gram IV, may repeat for a total of two doses)

• Interventional Radiology consultation for uterine artery embolization

• Have a plan.

• Call for help!!! *(Gynecologic oncology, Vascular and/or Trauma surgery)*

• Be decisive.
Postpartum

• Maintain volume with crystalloids and blood substitutes (Albumin).

• Oral Ferrous sulfate TID, folic acid.

• Consideration for Methylergonovine (Methergine 200 mcg PO q4 for 24 hours) if significant ongoing bleeding.

• IV Iron prior to discharge.
Operative tools for PPH

B-Lynch suture placement
https://www.youtube.com/watch?v=LHpS3TXlWMs

Bakri balloon placement:
https://www.youtube.com/watch?v=n1McwrLZ2_I

O’Leary stitch placement:
https://www.youtube.com/watch?v=Vt5BvuRgXvY