Primary Care Networks
CALGARY AND AREA

Alberta Health Services

PEDIATRIC COVID-19 CONSIDERATIONS

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Alberta Children's Hospital
August 24, 2020

Back to school
COVID-19
WEBINAR

Disclosures: Cora Constantinescu

- Pediatric Infectious Disease, Clinical Assistant Professor, University of Calgary
- Merck (not related to this work)
- Pfizer (not related to this work)

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Objectives

At the end of this section of the talk, the participants will be able to …

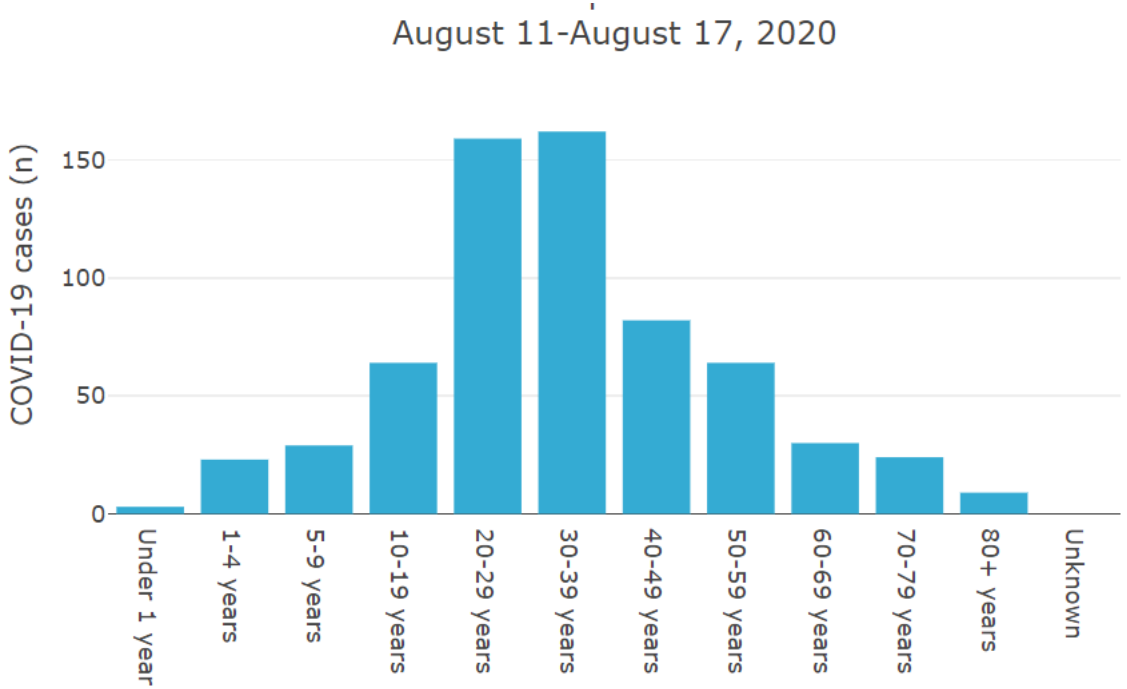
- Compare and contrast epidemiology and clinical presentation of pediatric COVID-19 and adult disease
- Have an understanding of the multisystem inflammation that has been associated with COVID-19 in pediatrics
- Become familiar with Spectrum MD and its application for pediatric COVID-19

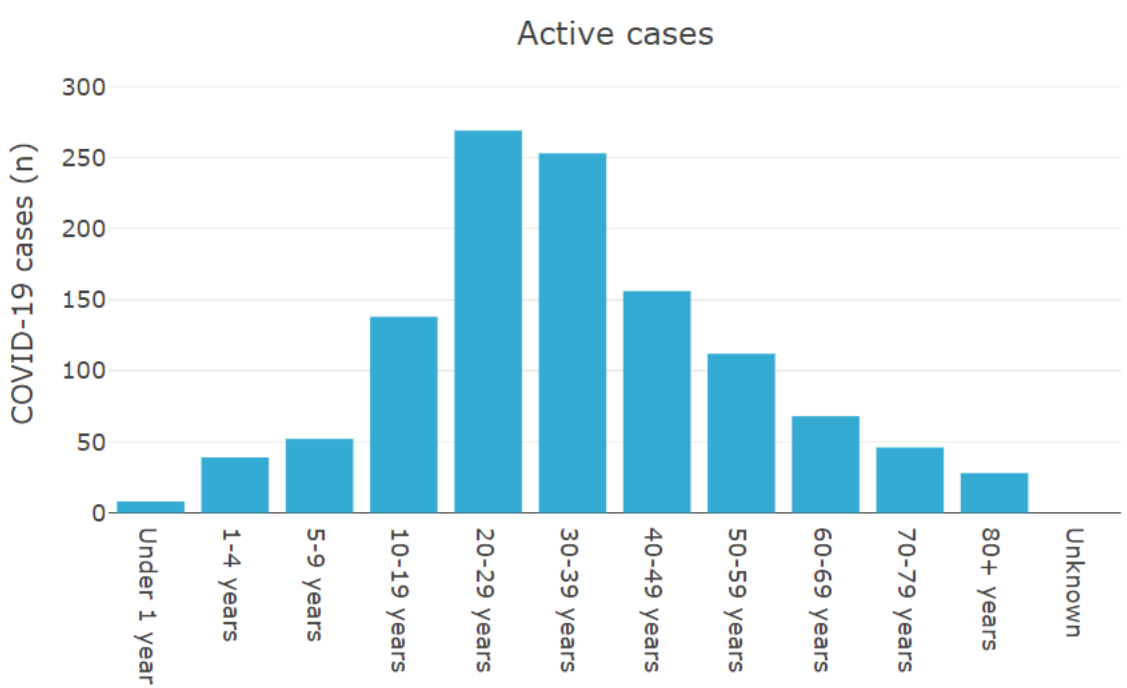
Overview of COVID-19 in children

- Children account for a small percentage of all COVID-19 patients:
  - Estimated worldwide pediatric infection rate is 1-5%
- Overall seems like a mild disease, with very few kids progressing to critical illness and overall better outcomes than adult patients
- Mortality is low
  - In Canada estimated around 0.01
    - UK and US somewhere between 0.15 to 0.2

Epidemiology

Right now in Alberta, 20% of cases are in under 20-year-olds





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Epidemiology

So far, evidence has shown that:

- The majority of children with COVID-19 have a positive household contact
- There is no documented evidence of child-to-adult transmission
    - No documented cases of children bringing an infection into the home, from school or otherwise
- No direct evidence of vertical transmission
- Children have not been shown to be: "super-spreaders"

Inconclusive evidence

- No conclusive evidence that children who are asymptomatic pose a risk to other children or to adults
    - Rates of asymptomatic transmission or transmission with mild symptoms are unknown
- How likely children are to bring this home to their parents

BCCDC Health Professionals Site: http://www.bccdc.ca/Health-Professionals-Site/Documents/COVID-19_Pediatric_clinical_guidance.pdf
AHS Insite: Pediatric guidelines for COVID-19

Clinical presentation in children

- Overall mild disease compared to adult COVID-19
  - Severe illness is significant but far less frequent
- Less than 5% COVID-19 positive kids have hypoxia
- Around 0.6% of kids end up with ARDS or MODS
- Around 1% of COVID-19 kids will need hospitalisation

Cruz and Zeichner. COVID-10 in children: Initial Characterization of the Pediatric Disease. Pediatrics 2020Jun Jun;145(6):e20200834.

Comparisons to adult COVID-19

- The incubation period in children is approximately two days, with a range of 2-10 days (similar to adult disease)
- Clinical worsening in second week of illness
- Similar isolation recommendations
- Children have been found to have high viral loads despite mild symptoms, with prolonged shedding in nasal secretions
  - May shed virus longer than adults

Hoang et al. COVID-19 in 7780 pediatric patients: A systematic review https://doi.org/10.1016/j.eclinm.2020.100433

Dong et al. Epidemiology of COVID-19 among children in China. Pediatrics. 2020;145(6):e20200702

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Clinical presentation in pediatrics

- Fever (50-60%)
- Cough (50-60%)
- Fatigue (18-20%)
- Runny nose
- Chills
- Shortness of breath
- Sore throat
- Loss of sense of smell or taste
- Headache
- Diarrhea
- Loss of appetite
- Nausea and vomiting
- Muscle aches

Hoang et al. COVID-19 in 7780 pediatric patients: Asystematic review . The Lancet. https://doi.org/10.1016/j.eclinm.2020.100433

High risk factors

- Age < 1 year
- Underlying conditions that are potentially higher risk:
  - Immunocompromise
  - Underlying comorbidities:
    - Heart disease
    - Lung disease
    - Neurological disease
    - Diabetes mellitus

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COVID-19 clinical categories

MILD disease

Upper respiratory symptoms (e. g., pharyngeal congestion, sore throat, and fever) or asymptomatic infection

May also include fatigue, myalgia, and gastrointestinal symptoms

MODERATE disease

Clinical and/or radiological signs of pneumonia on chest imaging

Symptoms such as fever, cough, fatigue, headache, and myalgia

No complications and manifestations related to severe disease

SEVERE disease

Mild or moderate clinical features, plus any manifestations that suggest disease progression:

- Worsening tachypnea
- Hypoxemia (oxygen saturation less than 92 % on room air)
- Altered LOC, such as Irritability or lethargy
- Dehydration, GI dysfunction

CRITICAL disease

Rapid disease progression, plus any other conditions showing organ failure:

- Respiratory failure with need for mechanical ventilation
- Decreased LOC, coma, convulsions
- Myocardial injury
- Elevated liver enzymes
- Coagulatiopathy, rhabdomyolysis
- Septic shock

Dong et al. *Pediatrics* April 2020;

Qui et al, *Lancet* Mar 25, 2020

What is multisystem inflammatory syndrome (MIS-C)?

Children and adolescents 0–19 years of age with fever ≥ 3 days AND two of the following:

a) Rash or bilateral non-purulent conjunctivitis or muco-cutaneous inflammation signs (oral, hands or feet)

b) Hypotension or shock

c) Features of myocardial dysfunction, or pericarditis, or valvulitis, or coronary abnormalities (ECHO findings or elevated Troponin/NT-proBNP)

d) Evidence of coagulopathy (abnormal PT, PTT, elevated d-Dimers)
e) Acute gastrointestinal problems (diarrhea, vomiting or abdominal pain)

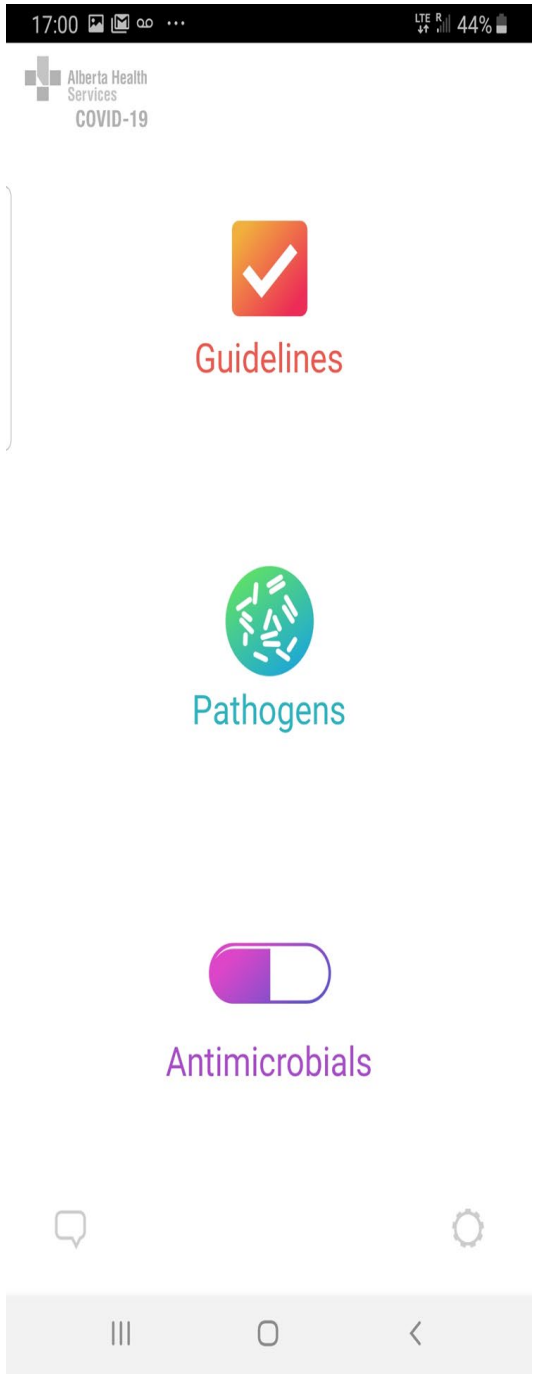
AND Elevated markers of inflammation such as ESR, C-reactive protein or procalcitonin

AND No other obvious microbial cause of inflammation, including bacterial sepsis, staphylococcal or streptococcal shock syndromes

WITH OR WITHOUT * Evidence of COVID-19 (RT-PCR, antigen test or serology positive) or likely contact with patients with COVID-19

Treatment options

- Very few studies that have looked at this in pediatrics
- NOT recommended: Hydroxychloroquine or Kaletra
- NOT typically recommended in mild and moderate disease
- Consider for severe disease with risk factors OR critical disease:
  - Remdesivir
  - Dexamethasone
- Treatment of secondary pneumonia as needed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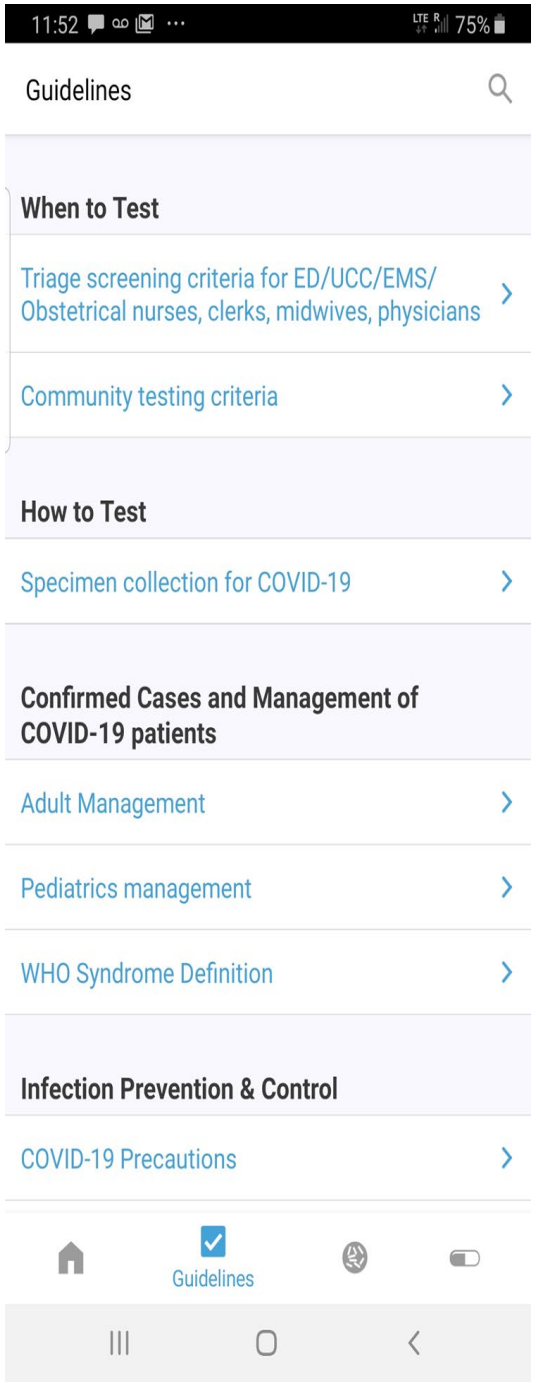
Alberta Health Services
COVID-19
Guidelines
Pathogens
Antimicrobials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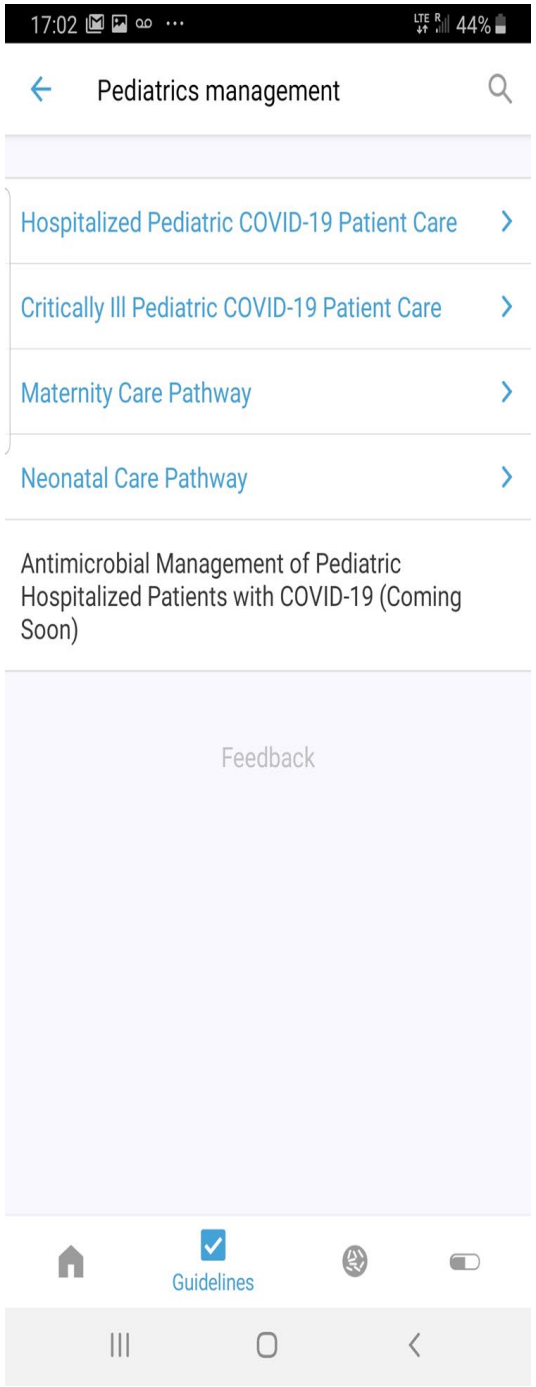
Guidelines
When to Test
Triage screening criteria for ED/UCC/EMS/ Obstetrical nurses, clerks, midwives, physicians
Community testing criteria
How to Test
Specimen collection for COVID-19
Confirmed Cases and Management of COVID-19 patients
Adult Management
Pediatrics management
WHO Syndrome Definition
Infection Prevention & Control
COVID-19 Precautions
Guidelines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Pediatrics management
Hospitalized Pediatric COVID-19 Patient Care
Critically Ill Pediatric COVID-19 Patient Care
Maternity Care Pathway
Neonatal Care Pathway
Antimicrobial Management of Pediatric Hospitalized Patients with COVID-19 (Coming Soon)
Feedback
Guidelines

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Home | Guidelines | Pathogens | Antim

Management

Hospitalized Pediatric COVID-19 Patient Care

Home | Guidelines | Pathogens | Ant

Multisystem Inflammatory Syndrome in Children (M

General Information

- Key Messages
- COVID-19 Pneumonia in Children
- COVID-19 and MIS-C

MIS-C

Case Definition

Differential Diagnosis

Clinical Algorithm

Home | Guidelines | Pathogens | Anti

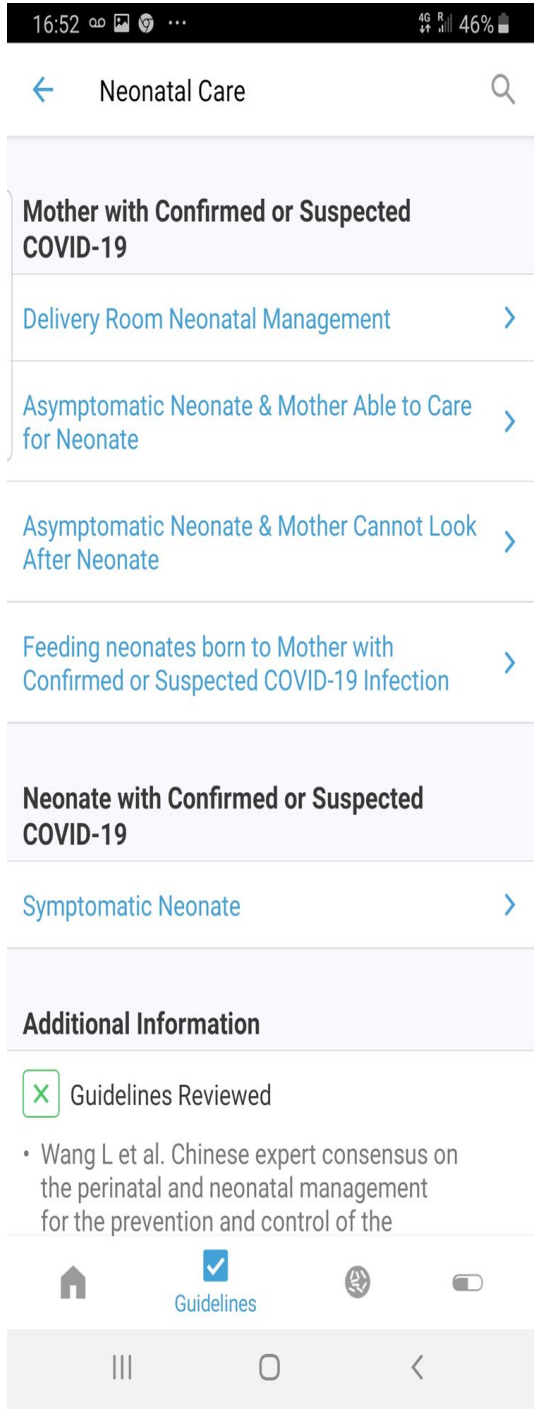
Clinical Algorithm

Clinical Presentation

Fever x 3 days +/- clinical features of multisystem inflammatory syndrome

Initial Actions

- Obtain MIS-C blood work
- Obtain standard swabs, serologies and cultures
- COVID-19 NP swab, store serum for COVID serology
- Watch for signs of cardiovascular shock:
  - Hypotension
  - Tachycardia
  - Adverse response to fluid resuscitation
- Consider differential diagnoses and exclude other causes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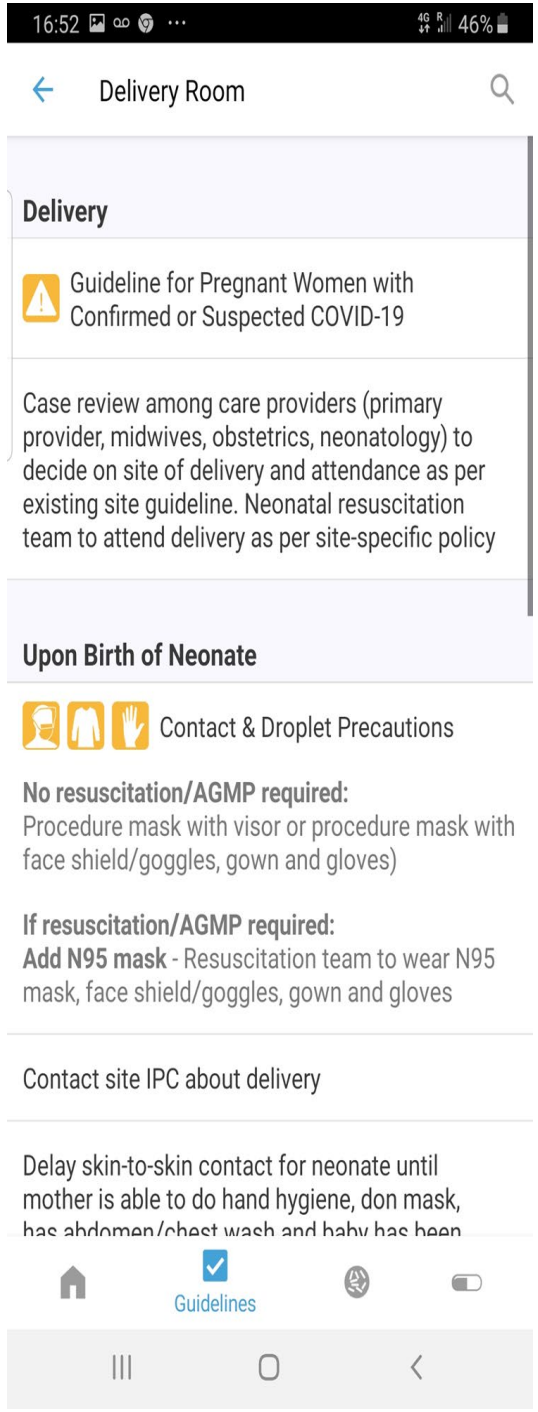
Neonatal Care
Mother with Confirmed or Suspected COVID-19
Delivery Room Neonatal Management
Asymptomatic Neonate & Mother Able to Care for Neonate
Asymptomatic Neonate & Mother Cannot Look After Neonate
Feeding neonates born to Mother with Confirmed or Suspected COVID-19 Infection
Neonate with Confirmed or Suspected COVID-19
Symptomatic Neonate
Additional Information
Guidelines Reviewed
• Wang L et al. Chinese expert consensus on the perinatal and neonatal management for the prevention and control of the
Guidelines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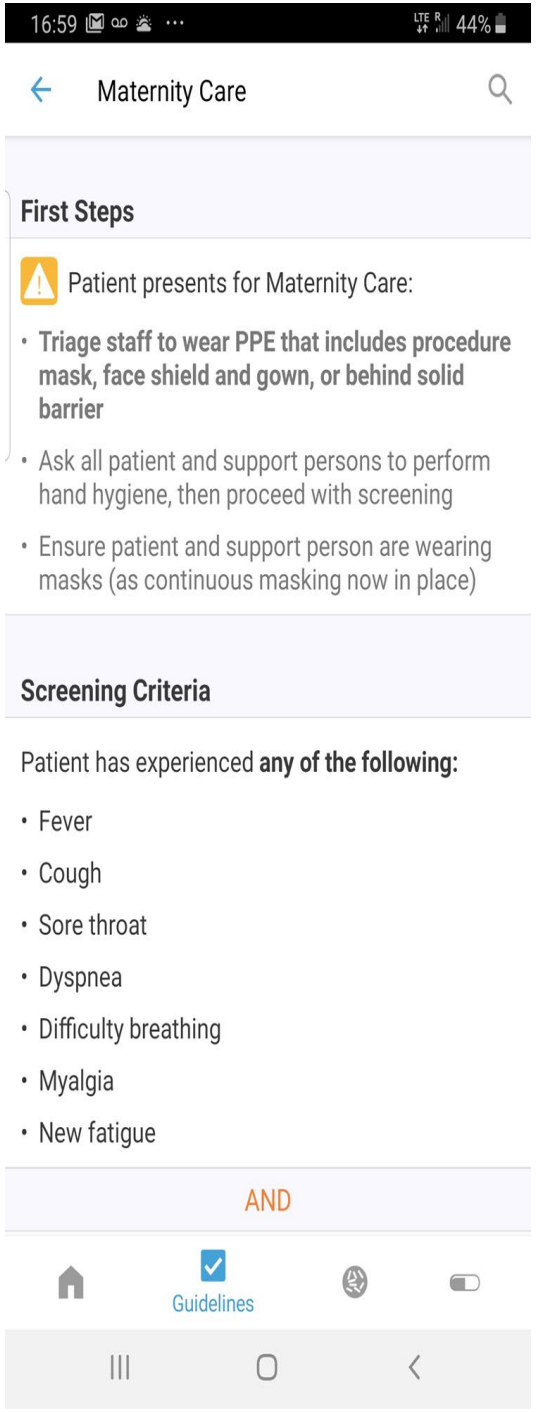
Delivery Room
Delivery
Guideline for Pregnant Women with Confirmed or Suspected COVID-19
Case review among care providers (primary provider, midwives, obstetrics, neonatology) to decide on site of delivery and attendance as per existing site guideline. Neonatal resuscitation team to attend delivery as per site-specific policy
Upon Birth of Neonate
Contact & Droplet Precautions
No resuscitation/AGMP required:
Procedure mask with visor or procedure mask with face shield/goggles, gown and gloves)
If resuscitation/AGMP required:
Add N95 mask - Resuscitation team to wear N95 mask, face shield/goggles, gown and gloves
Contact site IPC about delivery
Delay skin-to-skin contact for neonate until mother is able to do hand hygiene, don mask,
Guidelines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Maternity Care
First Steps
Patient presents for Maternity Care:
• Triage staff to wear PPE that includes procedure mask, face shield and gown, or behind solid barrier
• Ask all patient and support persons to perform hand hygiene, then proceed with screening
• Ensure patient and support person are wearing masks (as continuous masking now in place)
Screening Criteria
Patient has experienced any of the following:
• Fever
• Cough
• Sore throat
• Dyspnea
• Difficulty breathing
• Myalgia
• New fatigue
AND
Guidelines

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Summary

- Whereas pediatric COVID-19 has a milder presentation, significant burden of disease in children
- Implications exist for epidemiology of pediatric COVID-19
  - Whereas children are mostly primary contacts, this may change with schools reopening
- MIS-C should be considered in kids with fever for more than 3 days and associated symptoms
- Please use Spectrum MD!