# Montefiore COVID19 Update

Montefiore Infectious Diseases and Epidemiology Team

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# Agenda

- Brief world COVID update
- Montefiore specific updates
  - PPE/Inpatient flow update
  - COVID Hotline workflow and update
  - Testing update
- Therapeutics
- Clinical trials

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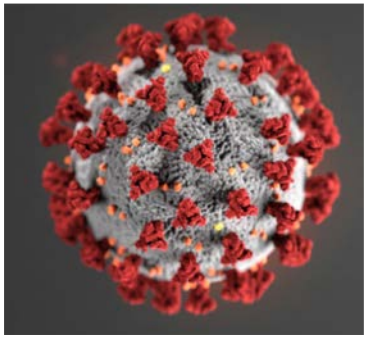
# What is COVID-19?



- Coronaviruses are a large family of viruses including several that cause the common cold
- A novel coronavirus infection (COVID-19) was first reported December 31, 2019 in Wuhan, Hubei Province, China
- Initial cases were linked to an animal market but subsequent cases occurred through human-to-human spread in China
- **COVID-19 disease** is caused by the **SARS-CoV-2 virus**, which is similar but distinct from SARS and MERS, which are other types of coronavirus infections that have caused outbreaks in the past.
- China and multiple other countries are experiencing widespread sustained local spread (South Korea, Italy, Iran, Japan)
- Since December, >100,000 COVID-19 cases have been reported
- There have been confirmed cases in more than 100 countries
- In the US, 36 states have reported >600 cases, including New York State

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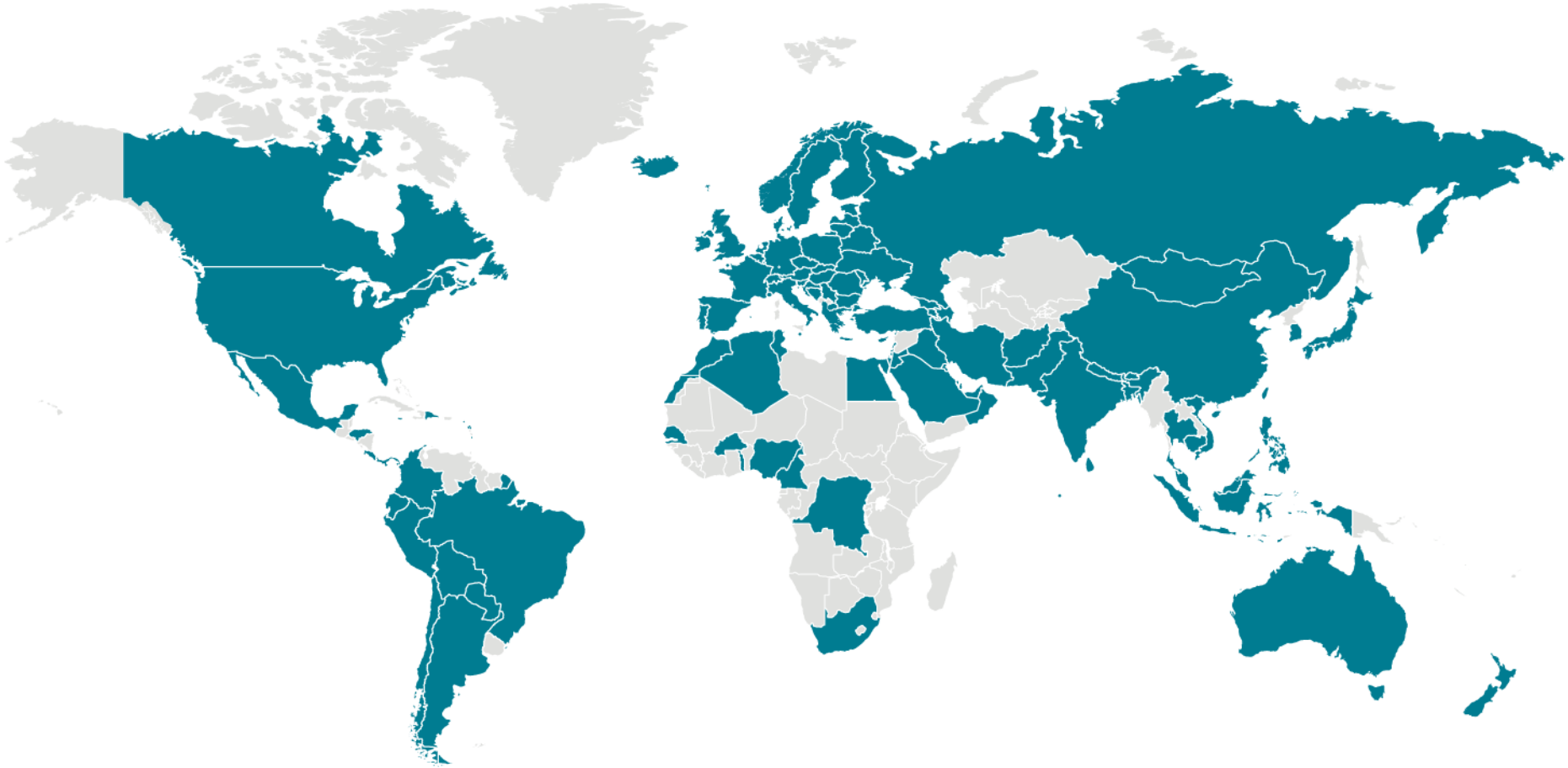
Source: CDC

# COVID19 Cases



**Declared PANDEMIC by WHO 3/11/20**

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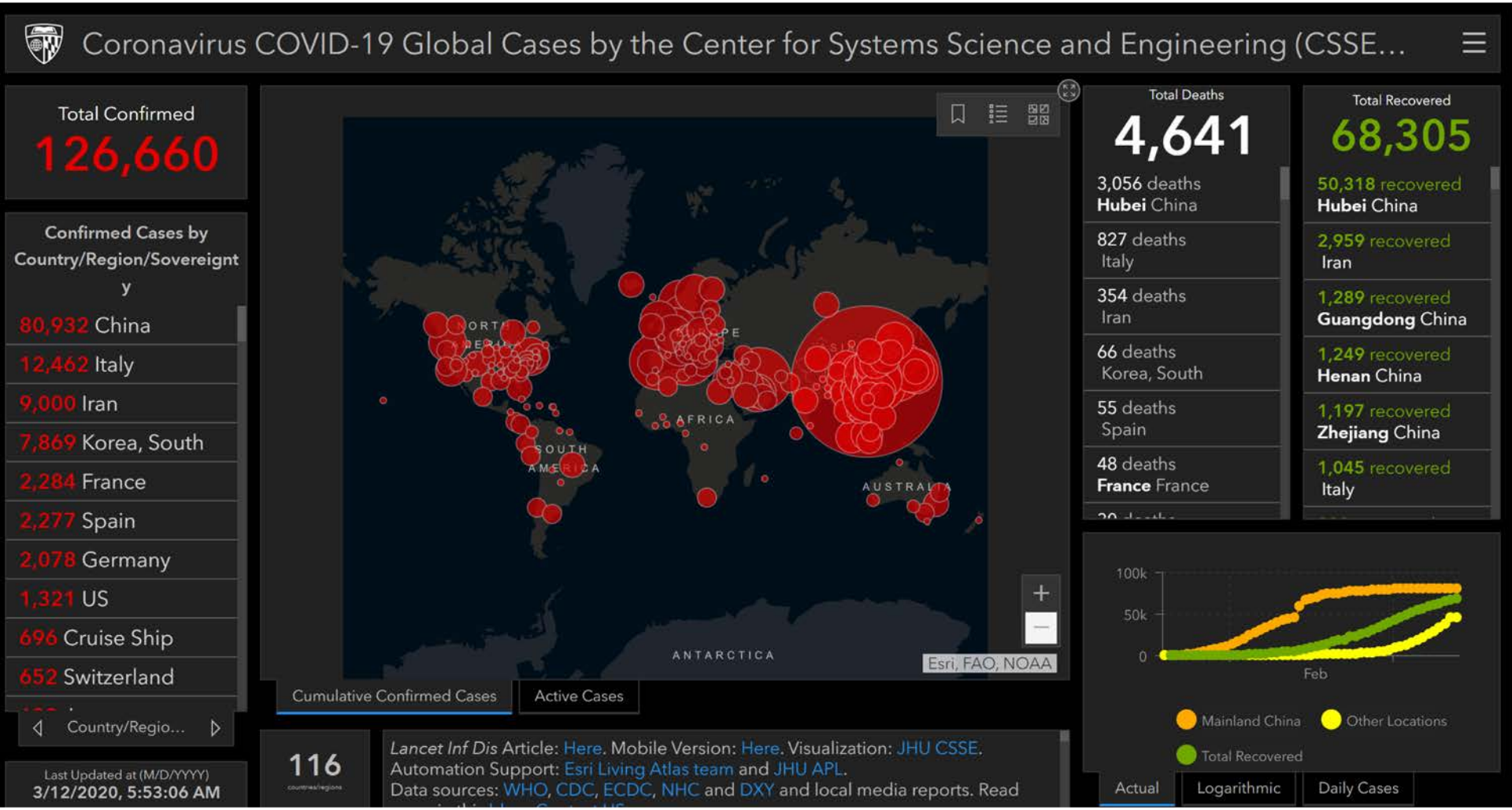
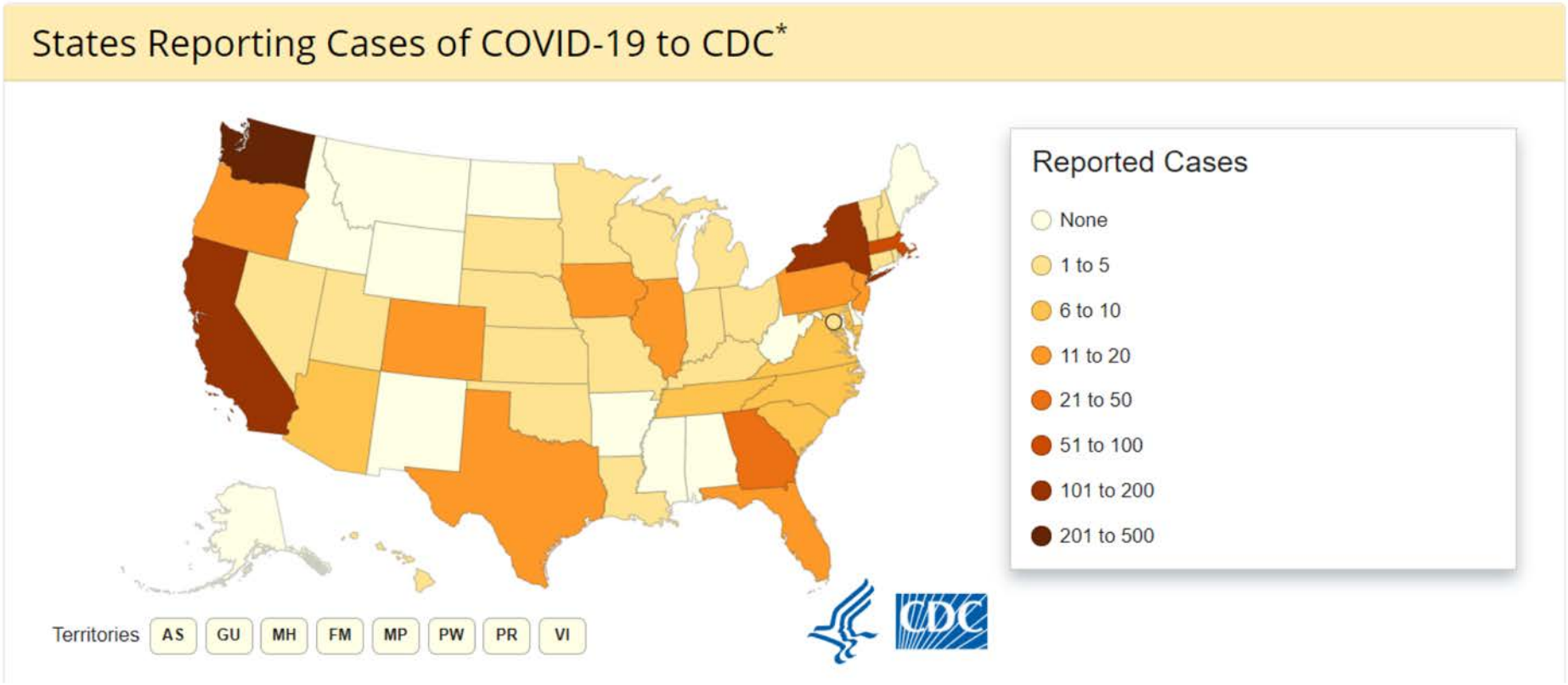


# COVID19 Cases

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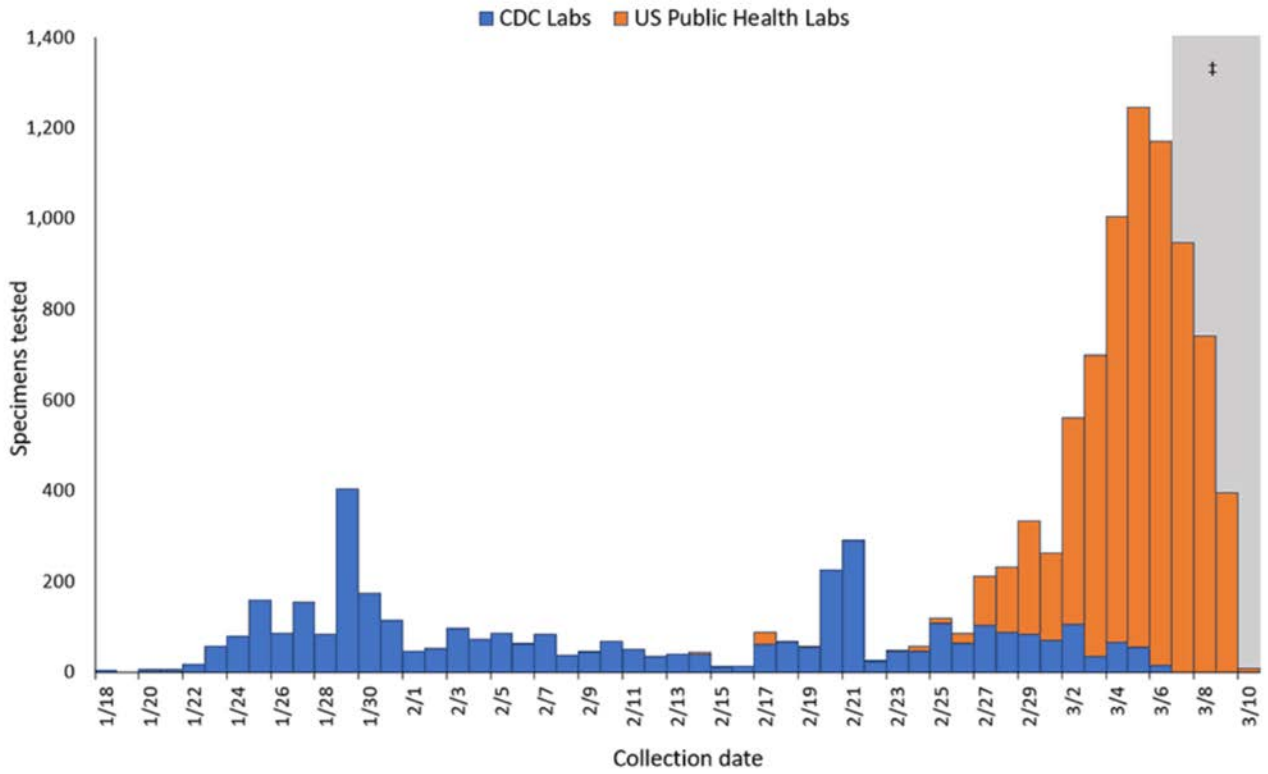
# COVID-US CDC

Number of specimens tested for the virus that causes COVID-19 by CDC labs (N=3,791) and U.S. public health laboratories* (N=7,288) by date of specimen collection†




*Reporting public health laboratories are 46 state public health labs (AK, AL, AR, AZ, CA, CO, CT, DE, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MO, MS, MT, NC, ND, NE, NH, NJ, NM, NV, NY, OH, OK, OR, PA, RI, SC, TN, TX, VT, WA, WI and WY), New York City, USAF, and 5 California Counties.

As of 3/12/2020

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# New York COVID19 Cases

as of March 11, 2020

**Data last updated 4:00pm March 11, 2020**

| | Positive Cases |
|---|---|
| Westchester County | 121 |
| Nassau County | 28 |
| Suffolk County | 6 |
| Rockland County | 6 |
| Saratoga County | 2 |
| Ulster County | 1 |
| **New York State (Outside of NYC)** | **164** |
| New York City | 52 |
| **Total Positive Cases (Statewide)** | **216** |

NYC DOH Novel Coronavirus Hotline: 1-888-364-3065

Source: NYC DOH

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# How is it Spread?

- What we know is largely based on what is known about similar coronaviruses
- Transmission is Person to Person
  - Persons within 6 feet of each other
  - Respiratory droplets – produces when person coughs or sneezes (large droplets)
  - Also isolated from stool and blood
- Transmission via fomites – touching surface with SARS-CoV-2 on it, then touching mouth or eyes
- Incubation period 1-14 days (median 5-6, max up to 24 days)
- Quarantine is 14 days from last exposure based on other coronaviruses.
- Community spread, not linked to travel

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# Managing spread

- **Containment** – has not been completely successful
- **Mitigating** strategies
  - Social distancing
  - Isolating ill persons
  - School closures
  - Telecommuniting as much as possible

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# What are the symptoms of COVID-19?

- From mild to severe and death – more severe in elderly and pts with comorbidities
- Onset 2-14 days after exposure – based on experience with MERS-CoV
- What does this look like clinically?:
  - Fever; Dry Cough; Fatigue and myalgias; Shortness of breath
- Labs: Lymphopenia, prolonged PTT, elevated LDH and LFTs
- Imaging: CXR – bilateral patchy infiltrates, CT chest – ground glass infiltrates

Del Rio, C. & Malani, P. N. COVID-19-New Insights on a Rapidly Changing Epidemic. *JAMA* (2020)

# COVID19 Summary

- Symptoms: fever, cough, shortness of breath, muscle aches (flu-like symptoms)
  - Some people have sore throat or upset stomach
- Incubation Period: 2-14 days
- Transmission: Human-to-human spread likely via coughing, sneezing, and direct contact with respiratory secretions
- Severity: 80% of people do not require hospitalization
- Diagnosis: NY State lab and NYC lab, Labcorp, Quest
  Treatment: Supportive (oxygen, fluids, etc.)
- Prevention: No vaccine. Hand hygiene, transmission-based precautions, social distancing strategies

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Source: Centers for Disease Control and Prevention, World Health Organization

# COVID-19 Infection Control

- Source Control: Masking the patient has protection and is recommended
- Isolation:
    - Droplet+Contact+Standard (including eye protection) for other contact and care
    - Airborne+Contact+Standard (including eye protection) for aerosol generating procedures (performed (BiPAP, CPAP, nebulizer, intubation/extubation, or open airway suctioning) and for intubated patients
- Environmental Cleaning: normal terminal cleaning (2 hr rest if possible)
- Transport: Patient should wear surgical mask

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Source: Centers for Disease Control and Prevention, World Health Organization

# COVID-19 prevention

- Hand Hygiene
- Hand Hygiene
- Hand Hygiene
- Avoid touching eyes, nose, mouth
- Stay home if you are sick
- Cover your cough and sneeze
- Clean and disinfect high touch surfaces
- Facemask for people with symptoms of COVID to protect others

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# Regulatory Updates

- CDC update re PPE use for COVID
- WHO rec for PPE REUSE
- Expanded travel ban

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# CDC Revised Recommendations 3/10/20

## Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings

### Summary of Changes to the Guidance:

- Updated PPE recommendations for the care of patients with known or suspected COVID-19:
  - Based on local and regional situational analysis of PPE supplies, facemasks are an acceptable alternative when the supply chain of respirators cannot meet the demand. During this time, available respirators should be prioritized for procedures that are likely to generate respiratory aerosols, which would pose the highest exposure risk to HCP.
    - Facemasks protect the wearer from splashes and sprays.
    - Respirators, which filter inspired air, offer respiratory protection.
  - When the supply chain is restored, facilities with a respiratory protection program should return to use of respirators for patients with known or suspected COVID-19. Facilities that do not currently have a respiratory protection program, but care for patients infected with pathogens for which a respirator is recommended, should implement a respiratory protection program.
  - Eye protection, gown, and gloves continue to be recommended.
    - If there are shortages of gowns, they should be prioritized for aerosol-generating procedures, care activities where splashes and sprays are anticipated, and high-contact patient care activities that provide opportunities for transfer of pathogens to the hands and clothing of HCP.
- Included are considerations for designating entire units within the facility, with dedicated HCP, to care for known or suspected COVID-19 patients and options for extended use of respirators, facemasks, and eye protection on such units. Updated recommendations regarding need for an airborne infection isolation room (AIIR).
  - Patients with known or suspected COVID-19 should be cared for in a single-person room with the door closed. Airborne Infection Isolation Rooms (AIIRs) (See definition of AIIR in appendix) should be reserved for patients undergoing aerosol-generating procedures (See Aerosol-Generating Procedures Section)
- Updated information in the background is based on currently available information about COVID-19 and the current situation in the United States, which includes reports of cases of community transmission, infections identified in healthcare personnel (HCP), and shortages of facemasks, N95 filtering facepiece respirators (FFRs) (commonly known as N95 respirators), and gowns.
  - Increased emphasis on early identification and implementation of source control (i.e., putting a face mask on patients presenting with symptoms of respiratory infection).

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# Montefiore Readiness

Identify

Isolate

Inform

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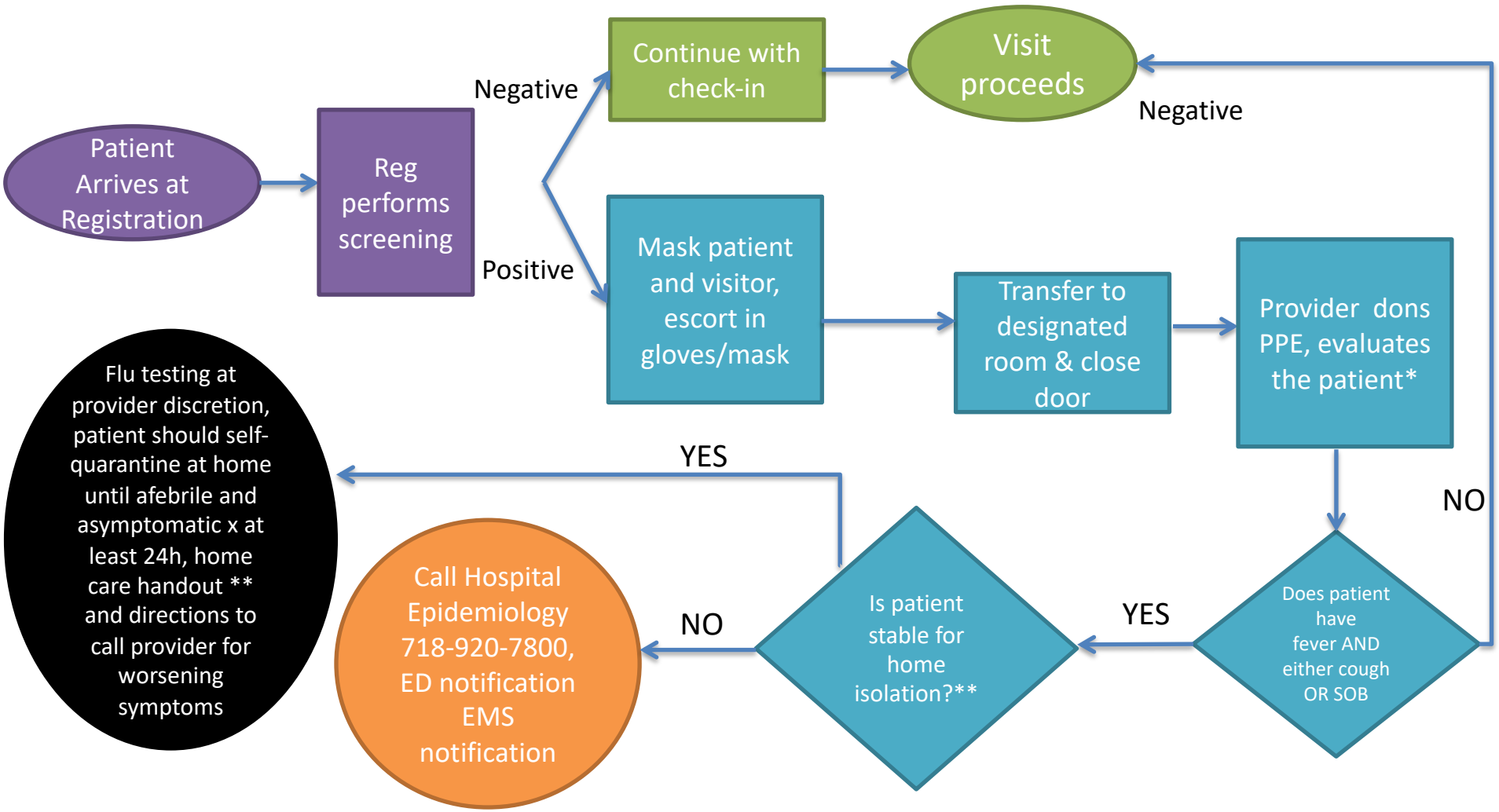
# Ambulatory MHS COVID-19 Algorithm




*Ambulatory PPE is surgical mask, +/- eye protection, gown, gloves

**Consider if patient lives in congregate setting/shelter when determining appropriateness for home care. https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-home-care.html includes guidance and patient instructions.

# MHS Adult ED/Inpatient COVID-19 Screening Algorithm

Rev 9Mar20

**Affected Areas/Higher Index of Suspicion if Travel to:**

- China
- South Korea
- Japan
- Iran
- Italy

**Signs and Symptoms**

Subjective or measured fever ≥38.0°C (100.4°F)

**OR**

Cough or shortness of breath

NO → **STOP** Green tag, standard precaution no testing

YES

**Mask the patient** and ask about Travel and Exposure

**Travel or Exposure**

- Patient has **traveled to China or an affected area** (see pink box) within the last **14 days**

**OR**

- Patient has had **contact** with a **KNOWN** patient infected with COVID-19 in the last **14 days**

YES → **STOP** Issue Orange tag mask patient, Isolate, Inform

NO → ill-appearing?

YES → **STOP** Issue Blue Tag, Mask patient, start droplet and contact, begin Respiratory Illness Pathway

NO → Take vitals → Hypotension, Tachypnea or Hypoxia present?

YES → **STOP** Issue Blue Tag, Mask patient, start droplet and contact, begin Respiratory Illness Pathway

NO → Return to Green tag, standard precaution no testing

Suspicious Respiratory Illness after Workup?

YES → **STOP** Issue Orange tag mask patient, Isolate, Inform

NO → Return to Green tag, standard precaution no testing

**Hospital Epidemiology:**
718-920-7800

**Provider access lines:**
-NYC DOH 866-692-3641
-Westchester County DOH: 914-813-5000
-Rockland County DOH M-F 8am-5pm: 845-364-2997
-Rockland County DOH after hours/weekend: 845-364-8600
-Orange County DOH: 845-291-2330
-Dutchess County DOH: 845-486-3400
-Ulster County DOH: 845-340-3090

**Personal Protective Equipment (PPE) for Orange and Blue Pathway:**

*Contact/Droplet/Standard with Eye Protection recommended in private room with door closed*

- Surgical mask
- Contact isolation gown
- Gloves
- N95/face shield (if available) for intubated patients or aerosol-generating event (nebulizer, BiPAP, CPAP, open airway suctioning, intubation/extubation etc.) in a negative pressure room

# Respiratory Illness Pathway

**STOP**
**Screening and issue Blue tag and mask, droplet & contact**

- **Isolation**: Droplet and Contact and Standard with Eye Protection
  - Mask patient
  - Post droplet and contact isolation signs and enter isolation orders
  - Cohort if possible
  - Consider N95 fluid shield for any aerosol-generating procedure, if available (intubated patient, BiPAP, CPAP, nebulizer, intubation/extubation, or open airway suctioning)
- **Infectious Workup**
  - Influenza/RSV PCR; if negative then Respiratory Pathogen Panel
  - Blood culture
  - Respiratory culture
  - S. Pneumoniae and Legionella urine antigens
- **Imaging**
  - CXR
  - If CXR indeterminate, consider pulmonary ultrasound (if needed for more information per Pulmonary)
  - CT if needed for other diagnoses (e.g. PE) or for further workup
- **Laboratory Testing**
  - CBC
  - PT
  - LDH

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# Inpatient workflow

- Decision has already been made to admit this patient
- This means that patient has **severe enough respiratory illness (Influenza like illness ILI) to require inpatient care.**
- Patient destination will depend on their clinical status – this is actually **same** for all **ILI** (Influenza, etc) regardless of the virus causing respiratory distress or viral pneumonia.
- Management and PPE will, therefore, be SAME regardless of whether patient is confirmed COVID or suspected COVID – will be based on **CLINICAL STATUS**

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# Inpatient flow and PPE

**Aerosol Generating procedures:**

- Upper airway testing (RPP, COVID swabbing)
- Bipap
- CPAP
- HFNC
- Nebulizer Tx
- Bag-Mask ventilation
- Bronchoscopy
- Active Intubation
- Intubated patient

**Pt with ILI and Respiratory symptoms**

**Stable**
(non-invasive respiratory support)

**Blue** – pending testing;
**Orange** (stable COVID)

**Floor admission**
NC O2 or RA support only

Stable – d/c home

**Contact+Droplet**; Surgical mask with shield, gown and gloves

**Floor admission**
Req Aerosolizing procedures*

**Contact+Droplet**
**N95 mask*** use during aerosol generating procedures

**DOOR SIGN**:
**STOP**: CHECK IF AEROSOL GENERATING PROCEDURE* IS IN PROGRESS! If **YES=N95**

**Unstable**
(respiratory failure or impending respiratory failure

**Orange** (confirmed COVID or pending)

**ICU or Critical Care** level admission

Airborne+Contact; N95, Face shield, gown and gloves

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# EPIC Updates

- COVID19 Isolation orders indications
  - Contact + Droplet
  - Contact + Airborne
- Respiratory Pathogen Orderset (COVID19)

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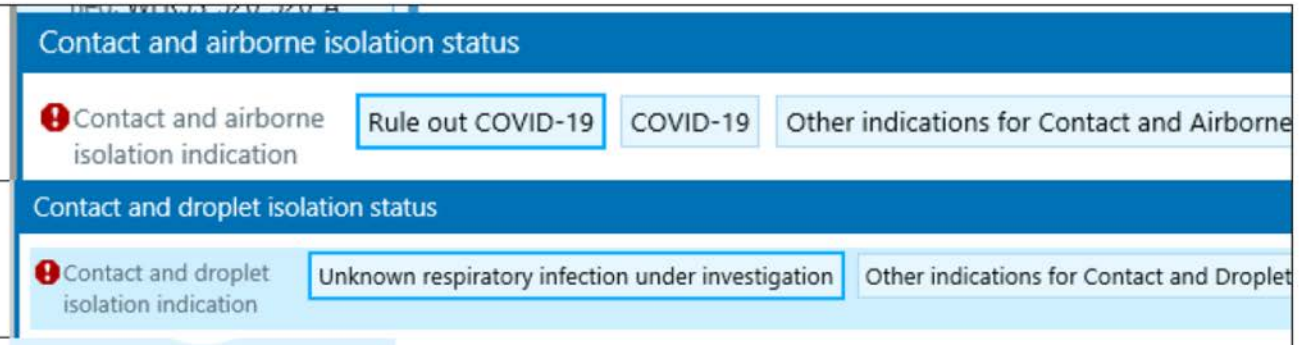
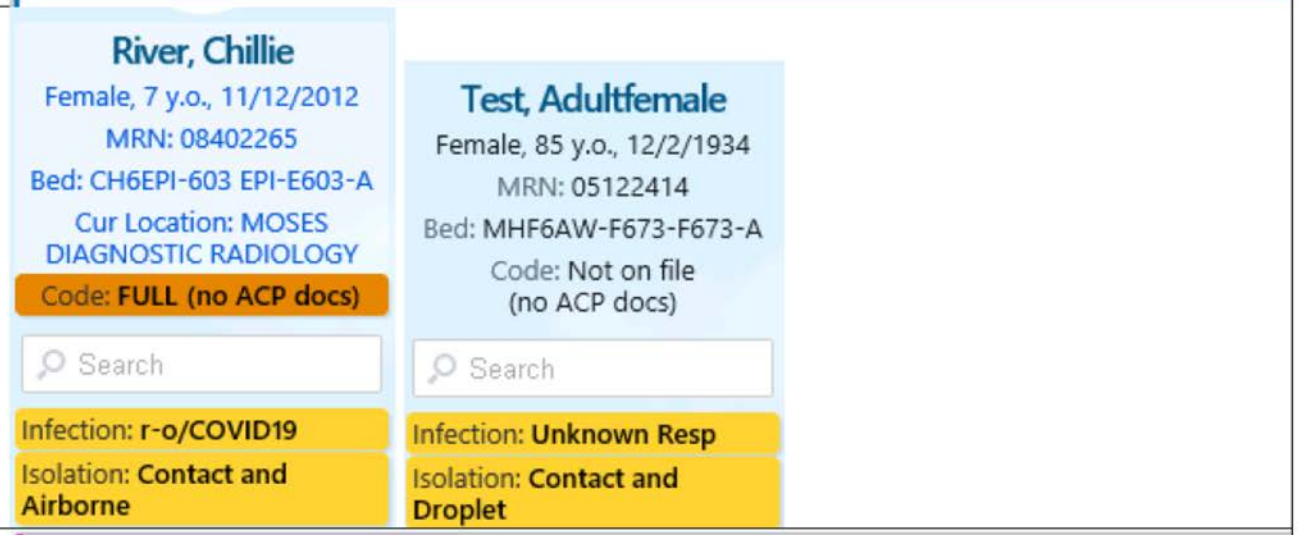
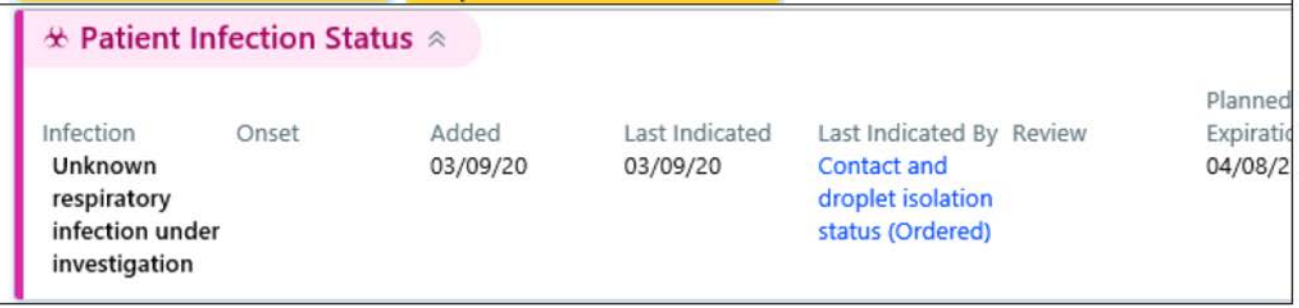
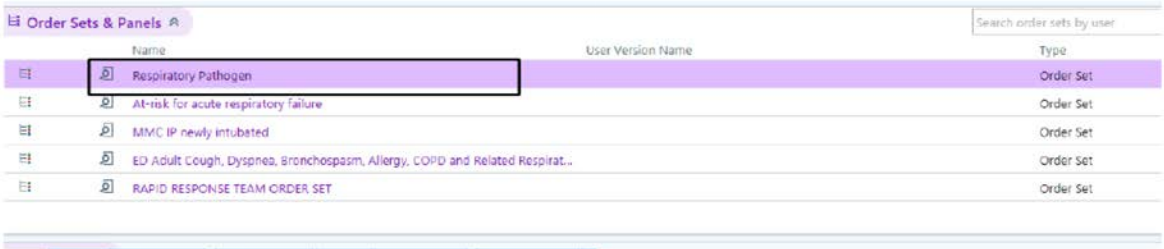
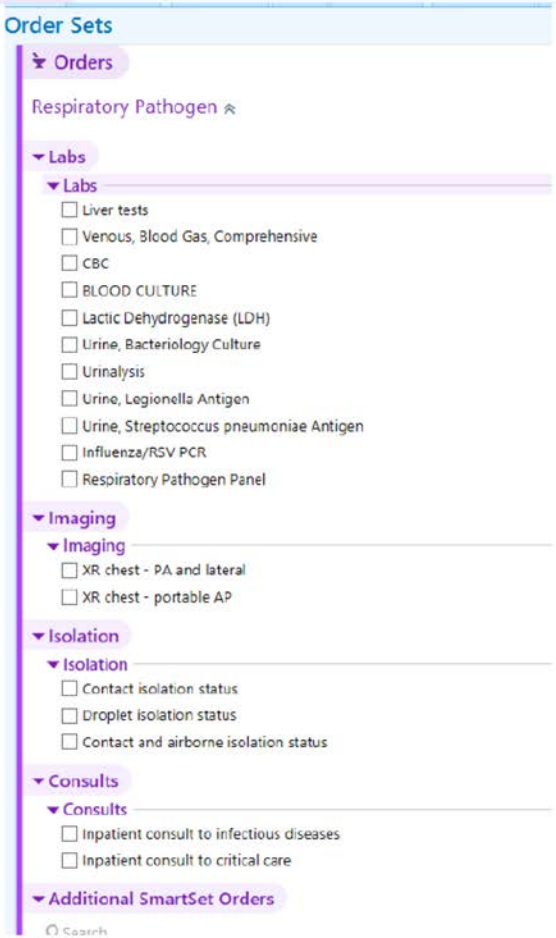
| | |
|---|---|
| Indications |  |
| Storyboard |  |
| Storyboard Report |  |

## ED & Inpatient Providers: Respiratory Pathogen Order Set (COVID-19) (available 3-11-2020 1pm)

- An order set has been created for respiratory pathogen testing including COVID-19.

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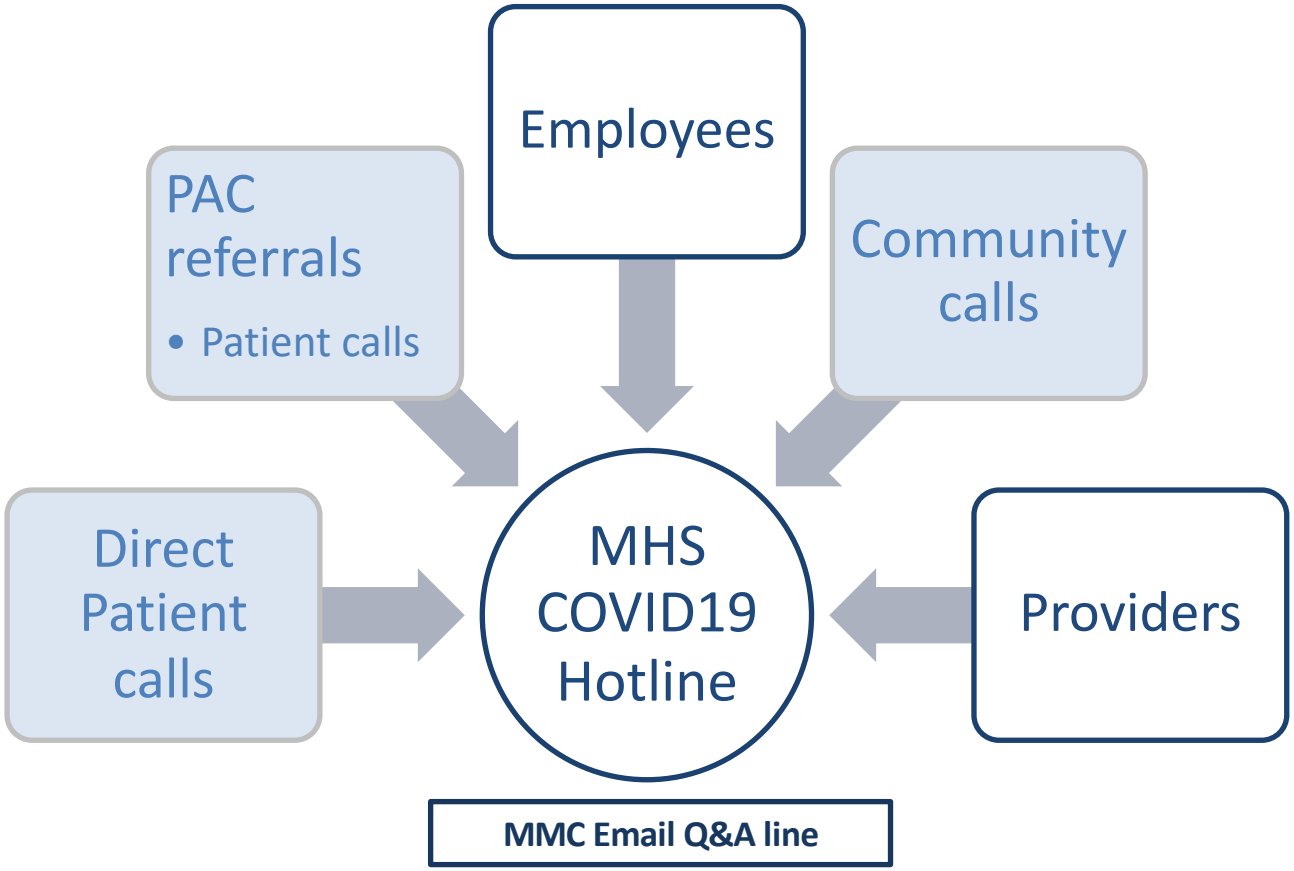
# INTERNAL MMC HOTLINE



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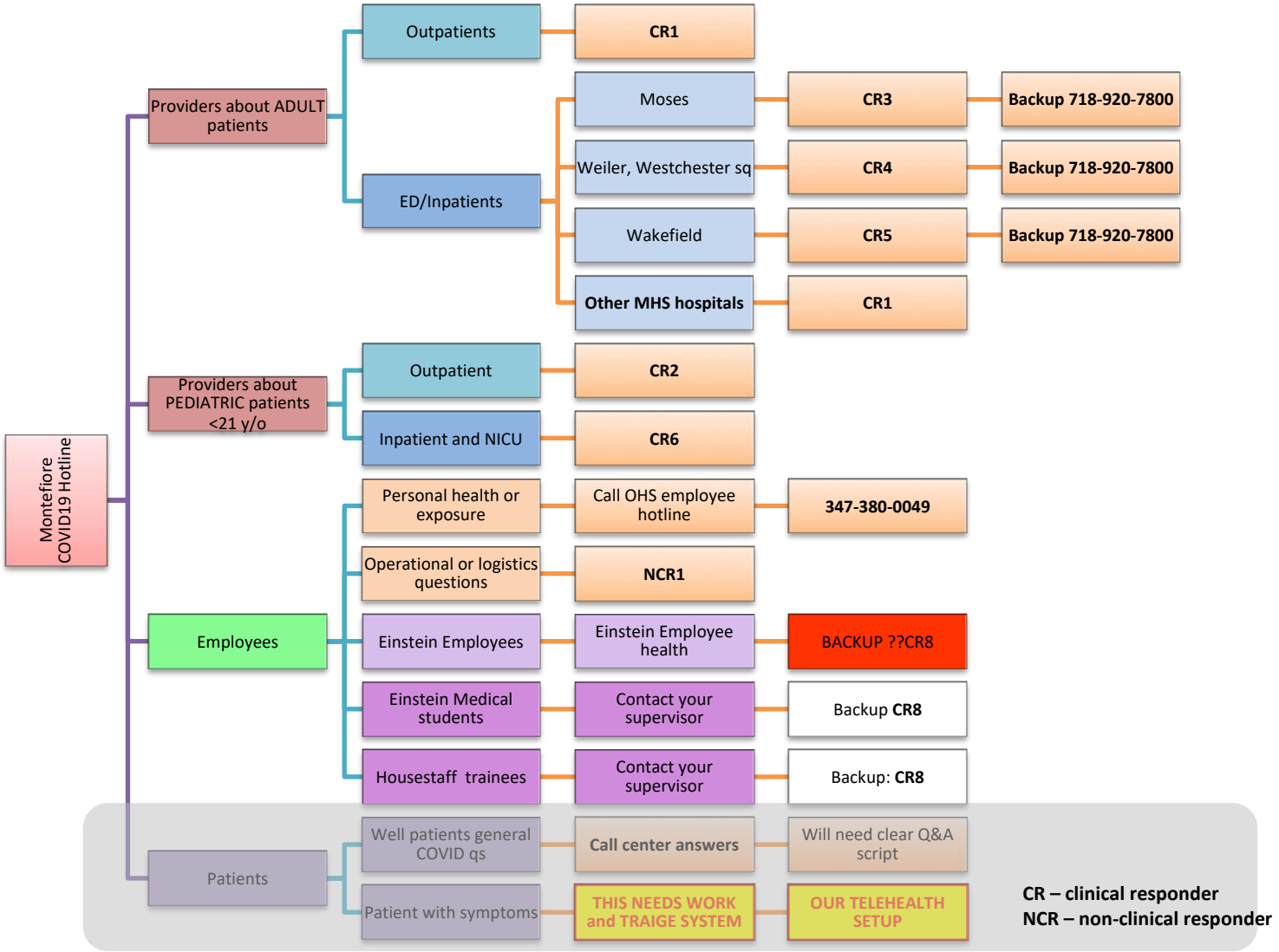
**OPEN 3/10/20**

HOTLINE PHONE LINE is **914-457-4136**




**Email line – COVID19@Montefiore.org**

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# Update in laboratory testing for CoVID-19 (real-time PCR)

Phasing out testing at public health labs due to enormous hurdles (remains a back-up option if needed)

**Inpatient setting:** Critically ill patients, then inpatients will be prioritized

- In-house testing capabilities have gone live this week at central lab (Moses)
  - **Tests will need to be approved by our ID/EPI team due to limited kits per day (9 patients, 2 specimens/patient, 1 OP, 1 NP)**
  - We need to keep track of all tests and results to report to DOH
  - Turn-around-time <24 hours
  - Capacity may slowly ramp up over coming weeks
  - EPIC order being created

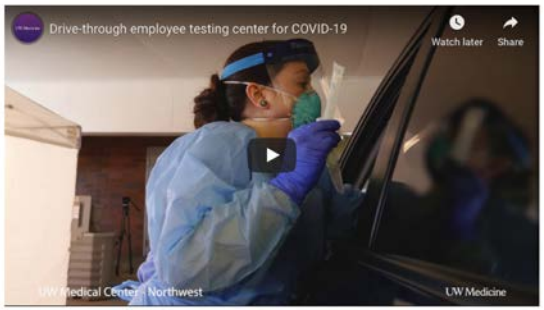
**Outpatient setting**: Symptomatic patients prioritized (not just exposed)

- Symptomatic OHS specimens, urgent care, ED (not admitted), and ambulatory practice patients
- Working on pathway for send out testing (Labcore and Quest)
- Expected role out: 1-2 weeks

By Traci Klein

Mayo Clinic offers pre-screened patients drive-through specimen collection for COVID-19 testing

March 11, 2020

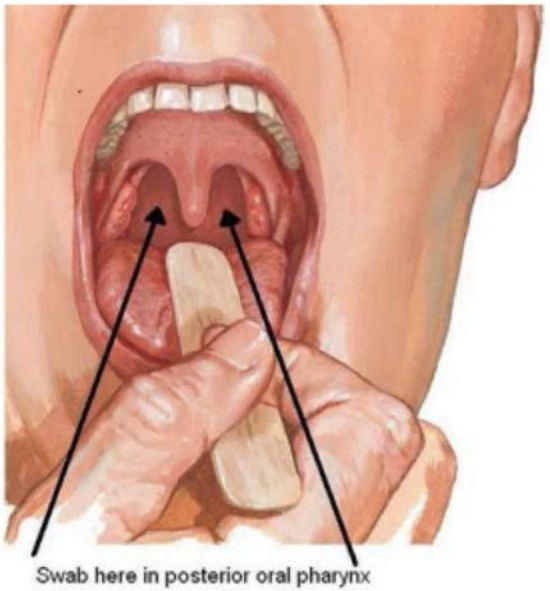


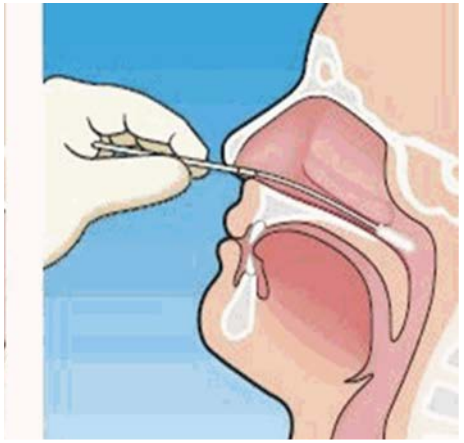

# Testing of Exposed, Symptomatic Employees

- Ideally, an outdoor, open space outside of one of the practice sites for “drive up testing”
- Employees can be tested through their car windows by a trained associate in full PPE
- Process takes about 5-10 minutes
- Orders can be placed in EPIC by OHS

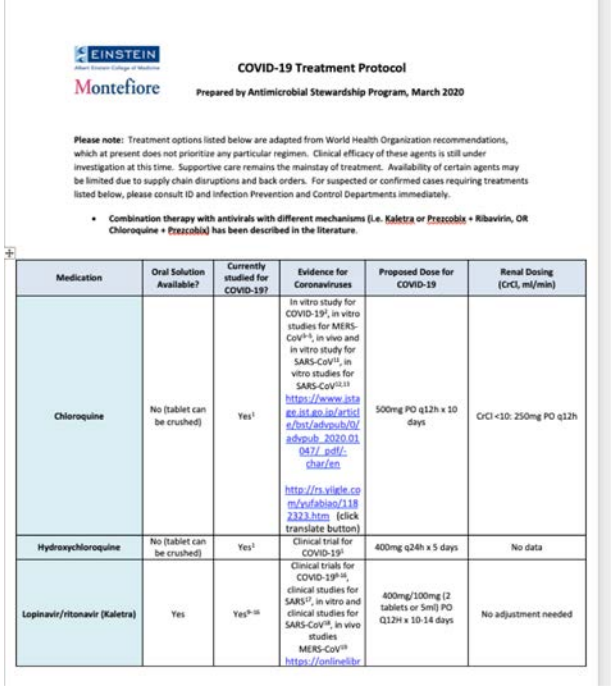
| Patient Symptoms | Epidemiologic Risk | Patient Status | Testing Process |
|---|---|---|---|
| Fever, cough, SOB, +/- hypoxia | **High risk for COVID-19**<br>• Recent travel to a CDC level 2/3 alert country<br>• Exposure to confirmed COVID-19 case | • **1st priority – critically ill, respiratory failure, intubated, ECMO, etc.**<br>• 2nd priority - inpatient ward, not intubated, stable hemodynamics | • **Notify ID/EPI for approval**<br>• Place EPIC order (once live)<br>• Appropriately label specimen for lab safety protocol<br>• In-house testing will be performed |
| Fever, cough, +/- SOB, +/- hypoxia | No recent travel or exposure to confirmed case but **patient ill without alternative diagnosis** (other respiratory work up neg) | • In-house test if criteria met **(discussed with ID hotline person on case-by-case basis),** otherwise send out to private lab | • **Notify ID/EPI for approval**<br>• Place EPIC order (once live)<br>• Appropriately label specimen for lab safety protocol<br>• Testing either in house or send out |
| Symptomatic outpatients (urgent care, OHS, planned discharge from ED) | • Furlough due to known exposure<br>• Exposure to confirmed COVID-19case in community | • Send out test (Labcore or Quest) | • Place EPIC order (once live); done by OHS for employees<br>• Appropriately label specimen for lab safety protocol<br>• Testing sent out |

# 2 specimens, 1 OP, 1 NP

# Treatment Protocol – Yes, we have one



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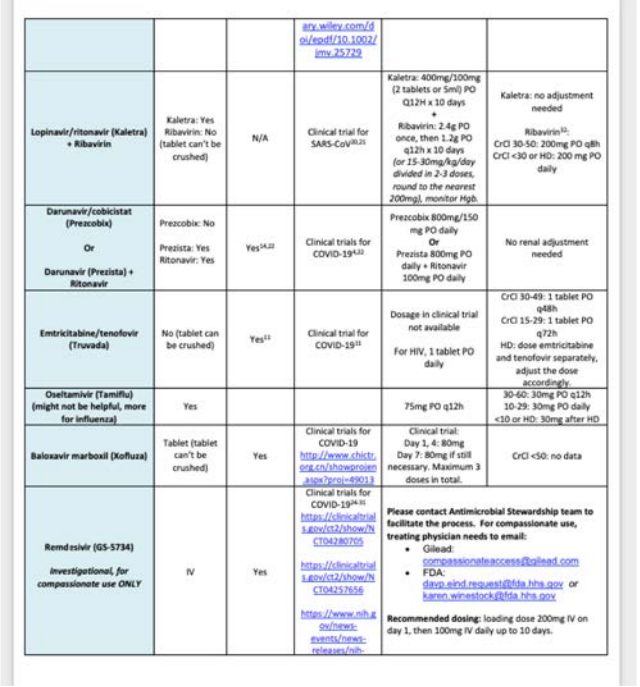
**COVID-19 Treatment Protocol**

**Prepared by Antimicrobial Stewardship Program, March 2020**

**Please note:** Treatment options listed below are adapted from World Health Organization recommendations, which at present does not prioritize any particular regimen. Clinical efficacy of these agents is still under investigation at this time. Supportive care remains the mainstay of treatment. Availability of certain agents may be limited due to supply chain disruptions and back orders. For suspected or confirmed cases requiring treatments listed below, please consult ID and Infection Prevention and Control Departments immediately.

- **Combination therapy with antivirals with different mechanisms (i.e. Kaletra or Prezcobix + Ribavirin, OR Chloroquine + Prezcobix) has been described in the literature.**

| Medication | Oral Solution Available? | Currently studied for COVID-19? | Evidence for Coronaviruses | Proposed Dose for COVID-19 | Renal Dosing (CrCl, ml/min) |
|---|---|---|---|---|---|
| **Chloroquine** | No (tablet can be crushed) | Yes[1] | In vitro study for COVID-19[2], in vitro studies for MERS-CoV[3-7], in vivo and in vitro study for SARS-CoV[11], in vitro studies for SARS-CoV[12,13] https://www.jstage.jst.go.jp/article/bst/advpub/0/advpub_2020.01047/_pdf/-char/en http://rs.yiigle.com/yufabiao/1182323.htm (click translate button) | 500mg PO q12h x 10 days | CrCl <10: 250mg PO q12h |
| **Hydroxychloroquine** | No (tablet can be crushed) | Yes[1] | Clinical trial for COVID-19[1] | 400mg q24h x 5 days | No data |
| **Lopinavir/ritonavir (Kaletra)** | Yes | Yes[9-16] | Clinical trials for COVID-19[9-16], clinical studies for SARS[17], in vitro and clinical studies for SARS-CoV[18], in vivo studies MERS-CoV[19] https://onlinelibr | 400mg/100mg (2 tablets or 5ml) PO Q12H x 10-14 days | No adjustment needed |



| | | | | | |
|---|---|---|---|---|---|
| | | | ary.wiley.com/doi/epdf/10.1002/jmv.25729 | | |
| **Lopinavir/ritonavir (Kaletra) + Ribavirin** | Kaletra: Yes<br>Ribavirin: No<br>(tablet can't be crushed) | N/A | Clinical trial for SARS-CoV[20,21] | Kaletra: 400mg/100mg (2 tablets or 5ml) PO Q12H x 10 days<br>+<br>Ribavirin: 2.4g PO once, then 1.2g PO q12h x 10 days<br>*(or 15-30mg/kg/day divided in 2-3 doses, round to the nearest 200mg), monitor Hgb.* | Kaletra: no adjustment needed<br><br>Ribavirin[22]:<br>CrCl 30-50: 200mg PO q8h<br>CrCl <30 or HD: 200 mg PO daily |
| **Darunavir/cobicistat (Prezcobix)**<br><br>**Or**<br><br>**Darunavir (Prezista) + Ritonavir** | Prezcobix: No<br><br>Prezista: Yes<br>Ritonavir: Yes | Yes[14,22] | Clinical trials for COVID-19[14,22] | Prezcobix 800mg/150 mg PO *daily*<br>**Or**<br>Prezista 800mg PO daily + Ritonavir 100mg PO daily | No renal adjustment needed |
| **Emtricitabine/tenofovir (Truvada)** | No (tablet can be crushed) | Yes[11] | Clinical trial for COVID-19[11] | Dosage in clinical trial not available<br><br>For HIV, 1 tablet PO daily | CrCl 30-49: 1 tablet PO q48h<br>CrCl 15-29: 1 tablet PO q72h<br>HD: dose emtricitabine and tenofovir separately, adjust the dose accordingly. |
| **Oseltamivir (Tamiflu) (might not be helpful, more for influenza)** | Yes | | | 75mg PO q12h | 30-60: 30mg PO q12h<br>10-29: 30mg PO daily<br><10 or HD: 30mg after HD |
| **Baloxavir marboxil (Xofluza)** | Tablet (tablet can't be crushed) | Yes | Clinical trials for COVID-19<br>http://www.chictr.org.cn/showprojen.aspx?proj=49013 | Clinical trial:<br>Day 1, 4: 80mg<br>Day 7: 80mg if still necessary. Maximum 3 doses in total. | CrCl <50: no data |
| **Remdesivir (GS-5734)**<br><br>***Investigational, for compassionate use ONLY*** | IV | Yes | Clinical trials for COVID-19[24-31]<br>https://clinicaltrials.gov/ct2/show/NCT04280705<br><br>https://clinicaltrials.gov/ct2/show/NCT04257656<br><br>https://www.nih.gov/news-events/news-releases/nih- | **Please contact Antimicrobial Stewardship team to facilitate the process. For compassionate use, treating physician needs to email:**<br>• Gilead: compassionateaccess@gilead.com<br>• FDA: davp.eind.request@fda.hhs.gov or karen.winestock@fda.hhs.gov<br><br>**Recommended dosing:** loading dose 200mg IV on day 1, then 100mg IV daily up to 10 days. | |

# Remdesivir compassionate use for critical illness https://rdvcu.gilead.com/