COVID Updates October 2020

SUNY-UHB

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COVID-19 Snapshot: UHB, NYC, NY State

NY State:

- 7 Day positivity rate: 1.2%
- Red zone positivity rate: 4.8%

NYC:

- 7 Day Positivity Rate: 1.2%
- Kings County positivity rate: 1.5%

UHB:

- 7 Day Positivity Rate: 1%
- Current Inpatient: 2

HHS also Extends Disaster Declaration until January 2021

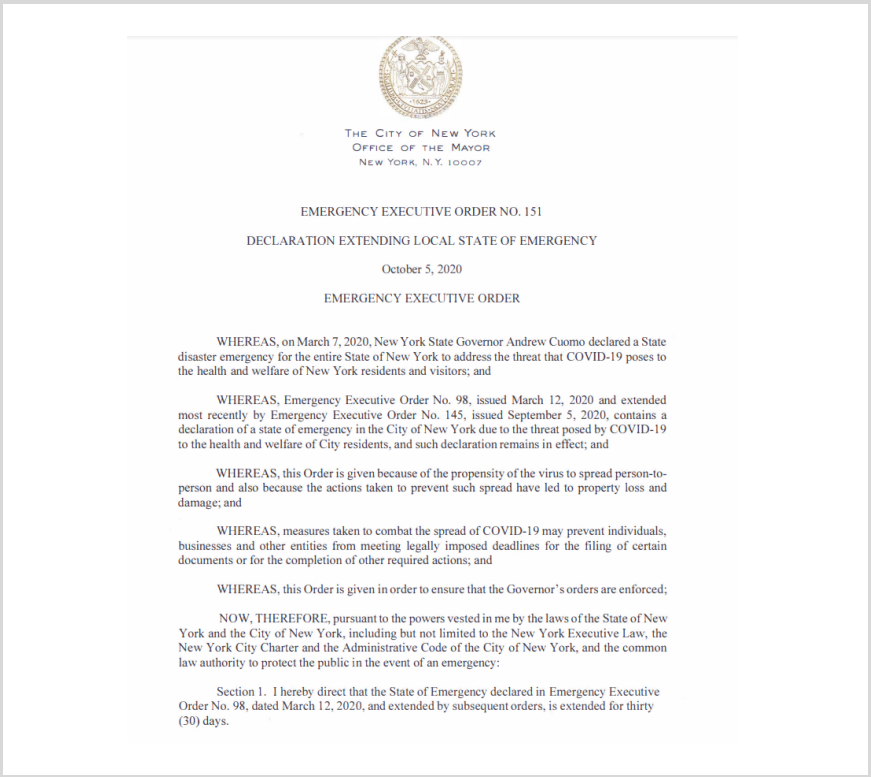
https://www.manatt.com/insights/newsletters/covid-19-update/hhs-renews-the-covid-19-public-health-emergency

https://www.shvs.org/wp-content/uploads/2020/07/COVID-19-Emergency-Flexibility-Timelines-Product-10.05.2020.pdf

NY STATE AND NYC:

STATE OF EMERGENCY EXTENDED 30 DAYS (UNTIL NOVEMBER 3RD)

https://www.governor.ny.gov/news/no-20267-continuing-temporary-suspension-and-modification-laws-relating-disaster-emergency



THE CITY OF NEW YORK
OFFICE OF THE MAYOR
NEW YORK, N.Y. 10007

EMERGENCY EXECUTIVE ORDER NO. 151

DECLARATION EXTENDING LOCAL STATE OF EMERGENCY

October 5, 2020

EMERGENCY EXECUTIVE ORDER

WHEREAS, on March 7, 2020, New York State Governor Andrew Cuomo declared a State disaster emergency for the entire State of New York to address the threat that COVID-19 poses to the health and welfare of New York residents and visitors; and

WHEREAS, Emergency Executive Order No. 98, issued March 12, 2020 and extended most recently by Emergency Executive Order No. 145, issued September 5, 2020, contains a declaration of a state of emergency in the City of New York due to the threat posed by COVID-19 to the health and welfare of City residents, and such declaration remains in effect; and

WHEREAS, this Order is given because of the propensity of the virus to spread person-to-person and also because the actions taken to prevent such spread have led to property loss and damage; and

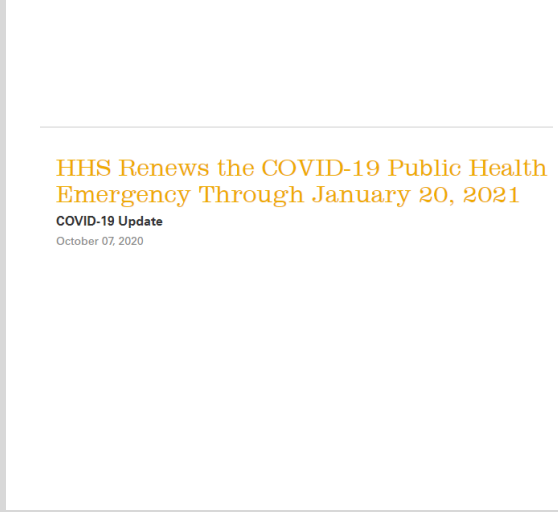
WHEREAS, measures taken to combat the spread of COVID-19 may prevent individuals, businesses and other entities from meeting legally imposed deadlines for the filing of certain documents or for the completion of other required actions; and

WHEREAS, this Order is given in order to ensure that the Governor's orders are enforced;

NOW, THEREFORE, pursuant to the powers vested in me by the laws of the State of New York and the City of New York, including but not limited to the New York Executive Law, the New York City Charter and the Administrative Code of the City of New York, and the common law authority to protect the public in the event of an emergency:

Section 1. I hereby direct that the State of Emergency declared in Emergency Executive Order No. 98, dated March 12, 2020, and extended by subsequent orders, is extended for thirty (30) days.

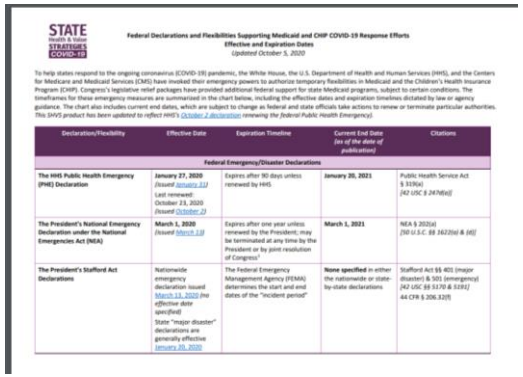
State of New York
Executive Chamber



HHS Renews the COVID-19 Public Health Emergency Through January 20, 2021

COVID-19 Update

October 07, 2020



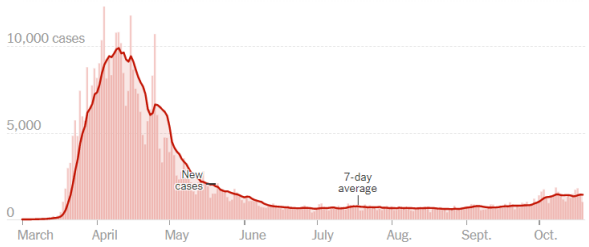
STATE Health & Value STRATEGIES COVID-19

Federal Declarations and Flexibilities Supporting Medicaid and CHIP COVID-19 Response Efforts
Effective and Expiration Dates
Updated October 5, 2020

To help states respond to the ongoing coronavirus (COVID-19) pandemic, the White House, the U.S. Department of Health and Human Services (HHS), and the Centers for Medicare and Medicaid Services (CMS) have invoked their emergency powers to authorize temporary flexibilities in Medicaid and the Children's Health Insurance Program (CHIP). Congress's legislative relief packages have provided additional federal support for state Medicaid programs, subject to certain conditions. The timeframes for these emergency measures are summarized in the chart below, including the effective dates and expiration timelines dictated by law or agency guidance. The chart also includes current end dates, which are subject to change as federal and state officials take actions to renew or terminate particular authorities. *This SHVS product has been updated to reflect HHS's October 2 declaration renewing the federal Public Health Emergency).*

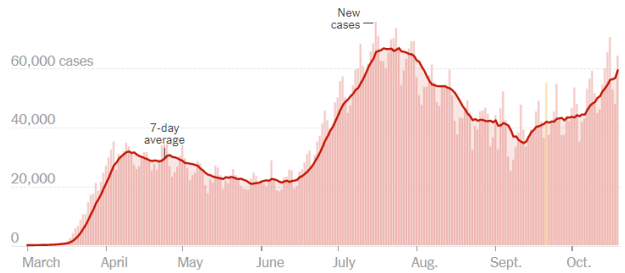
Declaration/Flexibility	Effective Date	Expiration Timeline	Current End Date (as of the date of publication)	Citations
Federal Emergency/Disaster Declarations				
The HHS Public Health Emergency (PHE) Declaration	**January 27, 2020** *(Issued January 31)* Last renewed: October 23, 2020 *(Issued October 2)*	Expires after 90 days unless renewed by HHS	**January 20, 2021**	Public Health Service Act § 319(a) *[42 USC § 247d(a)]*
The President's National Emergency Declaration under the National Emergencies Act (NEA)	**March 1, 2020** *(Issued March 13)*	Expires after one year unless renewed by the President; may be terminated at any time by the President or by joint resolution of Congress[1]	**March 1, 2021**	NEA § 202(a) *[50 U.S.C. §§ 1622(a) & (d)]*
The President's Stafford Act Declarations	Nationwide emergency declaration issued March 13, 2020 *(no effective date specified)* State "major disaster" declarations are generally effective January 20, 2020	The Federal Emergency Management Agency (FEMA) determines the start and end dates of the "incident period"	**None specified** in either the nationwide or state-by-state declarations	Stafford Act §§ 401 (major disaster) & 501 (emergency) *[42 USC §§ 5170 & 5191]* 44 CFR § 206.32(f)

New reported cases by day in New York



Note: The seven-day average is the average of a day and the previous six days of data.

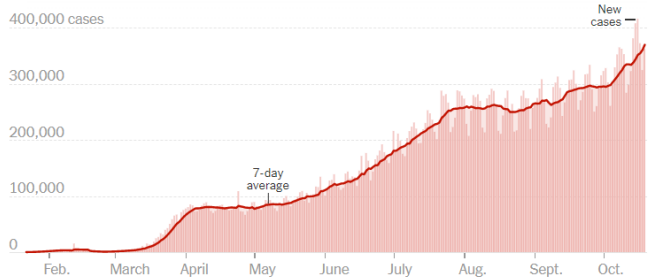
New reported cases by day in the United States



These are days with a data reporting anomaly. Read more here.

Note: The seven-day average is the average of a day and the previous six days of data.

New reported cases by day across the world



Note: The seven-day average is the average of a day and the previous six days of data.

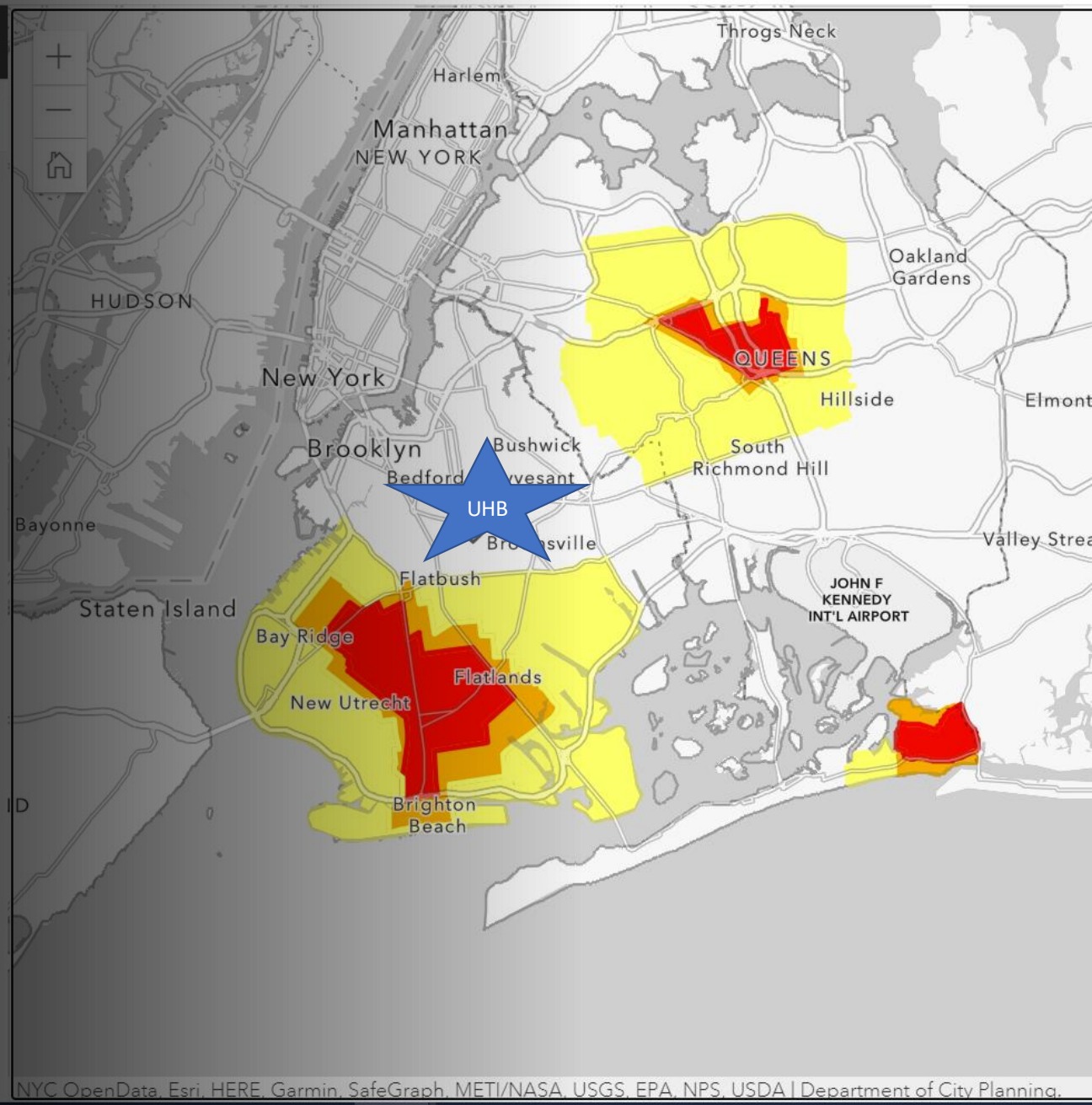

NEW YORK STATE
MAKING PROGRESS HAPPEN
Governor
Andrew M. Cuomo
Type of Activity
RED
ORANGE
YELLOW
Worship
25% capacity
10 people maximum
33% capacity
25 people maximum
50% capacity
Mass Gathering
Prohibited
10 people maximum, indoor and outdoor
25 people maximum, indoors and outdoors
Businesses
Only essential businesses open
Closing high-risk non-essential business (gyms, personal care, etc.)
Open
Dining
Takeout only
Outdoor dining only, 4 person maximum per table
Indoor and outdoor dining, 4 person maximum per table
Schools
CLOSED
Remote-only
Open
Mandatory weekly testing of students and teachers/staff for in-person settings. DOH will set percent by Friday.
WEAR A MASK.
GET TESTED.
SAVE LIVES.

FOCUS ZONE	9/27-10/3 % Positive	10/4-10/10 % Positive	Week to Date (10/11 - 10/15) % Positive	Day Prior (10/14) % Positive	Yesterday (10/15) % Positive
Brooklyn red-zone focus area % positive	6.69%	5.86%	5.47%	4.75%	5.47%
Queens % red-zone focus area % positive	2.97%	3.36%	2.50%	2.15%	2.03%
Rockland % red-zone focus area % positive	12.29%	9.77%	5.08%	8.40%	11.26%
Orange red-zone focus area % positive	24.64%	12.41%	5.90%	7.95%	3.10%
All red-zone focus area % positive	6.91%	6.13%	4.76%	4.84%	4.84%
Statewide % positive with red-zone focus areas included	1.25%	1.18%	1.19%	1.09%	1.25%
Statewide % positive without red-zone focus areas included	1.02%	1.01%	1.08%	0.99%	1.14%

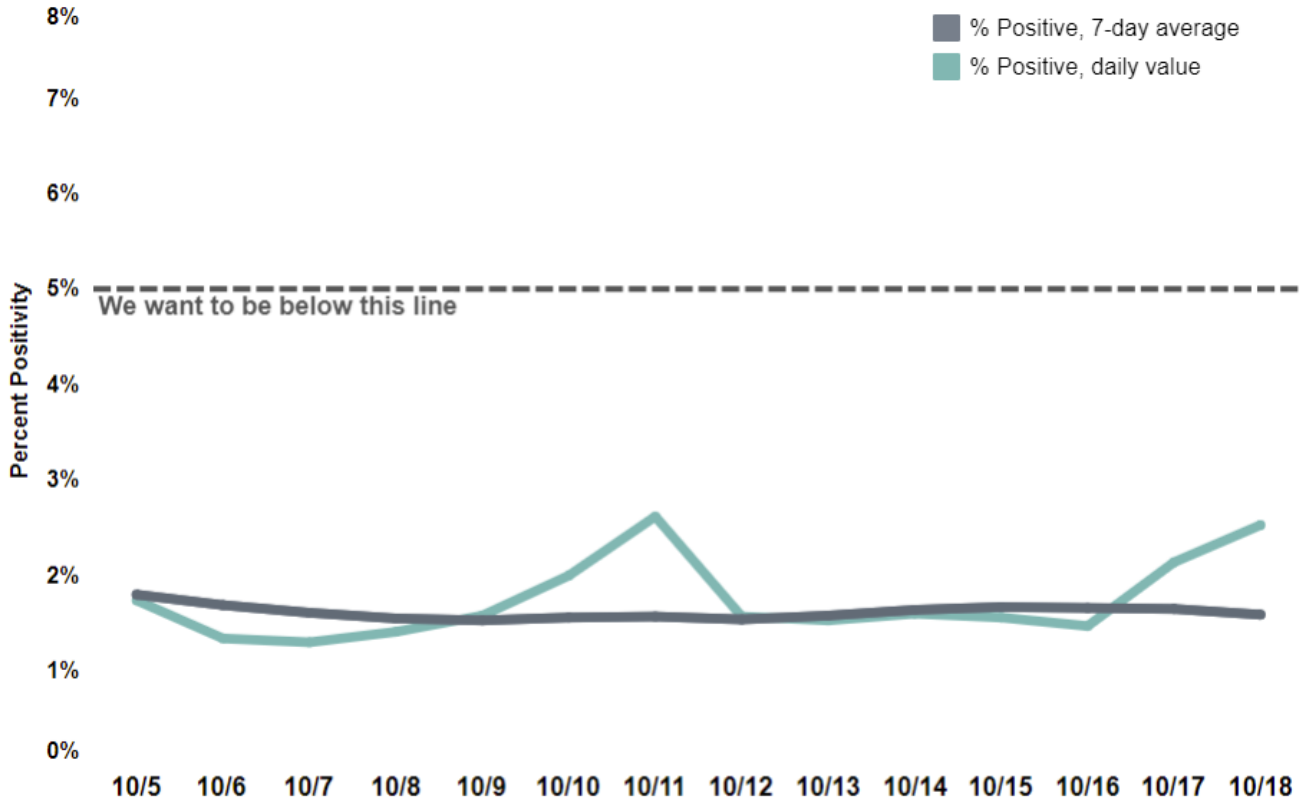
- **Patient Hospitalization** - 918 (+21)
- **Patients Newly Admitted** - 143
- **Hospital Counties** - 42
- **Number ICU** - 200 (+3)
- **Number ICU with Intubation** - 97 (+2)
- **Total Discharges** - 78,117 (+111)
- **Deaths** - 10
- **Total Deaths** - 25, 628

New York State COVID-19 Zone Update 10/16/20

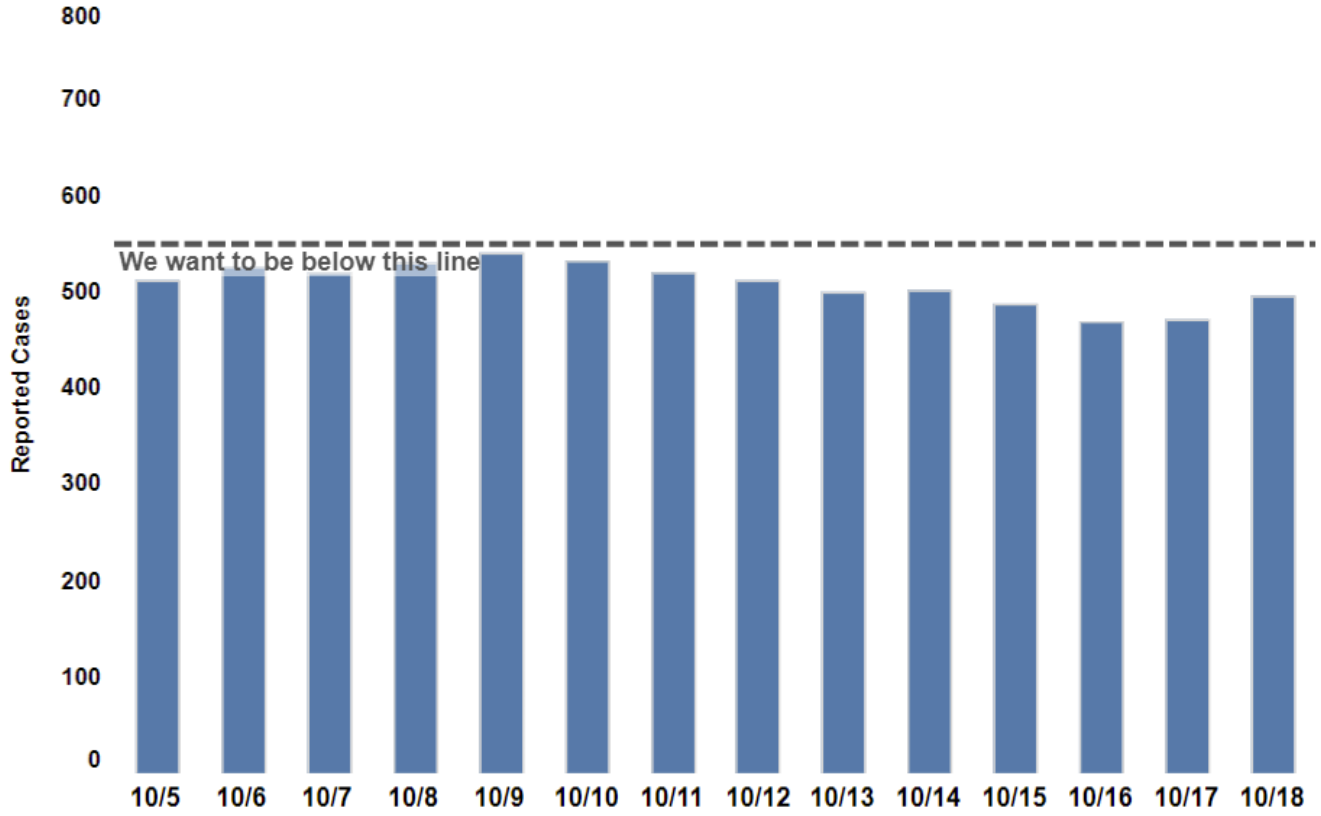
NYC COVID Hot Spots in Relation to UHB



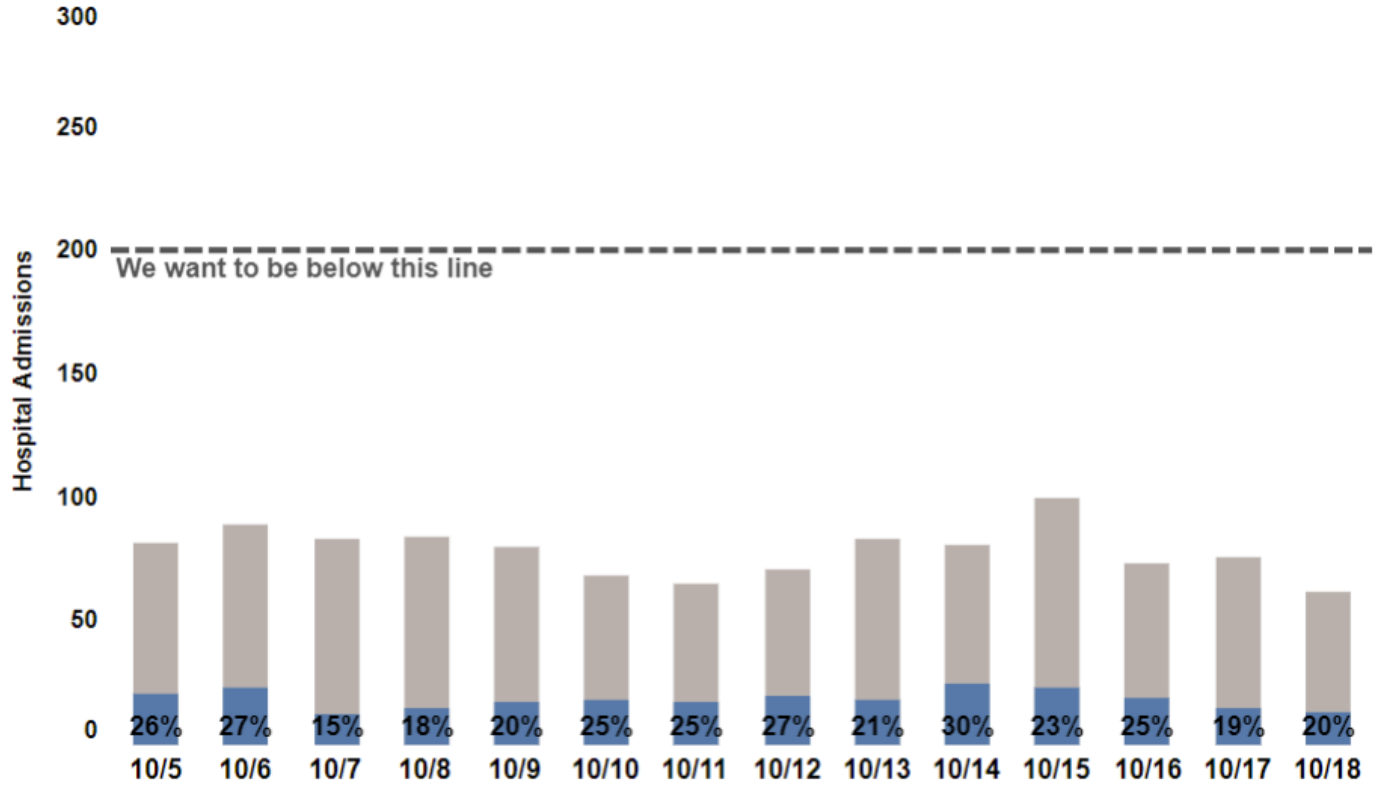
Percent of NYC residents who test positive



Daily reported cases of COVID-19, seven-day average



Daily number of people admitted to NYC hospitals for COVID-19-like illness, percent COVID-19 positive



Brooklyn COVID-19 HERDS Data 10/11 View Snapshot					
Acute Care Hospitals	**Hospitalized CoVID-19**	**CoVID-19 - ICU**	**CoVID-19 - Intubated**	**Available: Staffed**	**Available: ICU**
Maimonides Medical Center (53)	**62 (35)**	**11**	**11**	**166**	**28**
Mount Sinai Brooklyn (93)	**18 (10)**	**3**	**0**	**58**	**3**
New York Community Hospital (92)	5	2	0	39	5
NYC H+H - Bellevue (02)	9	3	1	75	9
NYC H+H - Coney Island (42)	10 **(3)**	2	0	75	8
NYC H+H - Kings County (48)	**2**	**0**	**0**	**101**	**12**
NYC H+H - Woodhull (45)	2	0	0	104	21
NYP - Brooklyn Methodist Hospital (54)	**16 (9)**	**2**	**1**	**95**	**11**
NYU Langone - Brooklyn (51)	**14 (9)**	**4**	**2**	**102**	**21**
One Brooklyn - Brookdale Hospital (41)	4	0	0	34	6
One Brooklyn - Interfaith M.C. (55)	0	0	0	70	1
One Brooklyn - Kingsbrook (47)	1	0	0	48	3
SUNY Downstate Medical Center (44)	**3**	**1**	**0**	**175**	**18**
The Brooklyn Hospital Center (95)	3	0	0	75	18
Wyckoff Heights Medical Center (58)	1	0	0	46	10
Summary (10-7-2020)	**150 (78)**	**28**	**15**	**1263**	**174**

UHB Updates

Up-dates in house

- **COVID Tests:**
  - WE ARE VERY LOW ON RAPID COVID TESTS --> STAT Stickered tests for ED Admitted Patients & Emergency Surgical Patients
  - **YOU MUST ANSWER 7 Questions with each order**
- **FLU Fair in SODEXO this month**
  - Outpatient started a flu vaccine clinic for flu shots
- **EHS extends COVID –19 testing**
  - Tue-Fri from 8-10am
- **Inpatient Plan** for COVID-19 Surge: Unit for PUI
- **Staff COVID surveillance**: Plan under development
- **Well Screening**: For temperature screening at entrances

Reported data is from midnight to midnight as required by AHA	4/4	5/1	6/1	7/1	8/1	9/1	10/1	10/2	10/3	10/4	10/5	10/6	10/7	10/8	10/9	10/10	10/11	10/12
a. New Diagnostic COVID-19 Test Ordered/Received	81	33	43	107	19	68	78	77	35	30	103	107	74	73	92	28	21	30
umulative Diagnostic COVID-19 Tests Ordered/Received	81	902	1941	3248	5044	6961	8902	8979	9014	9044	9147	9254	9328	9401	9493	9521	9542	9572
c. New COVID-19 Tests Resulted	81	33	43	107	19	68	78	77	35	30	103	107	74	66	92	28	21	30
d. Cumulative Specimens Rejected*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
e. Cumulative COVID-19 Tests Performed	81	902	1941	3248	5044	6961	8902	8979	9014	9044	9147	9254	9328	9394	9486	9514	9535	9565
f. New Positive COVID-19 Tests	60	6	6	7	0	1	1	5	0	1	4	3	1	1	0	1	0	0
g. Cumulative Positive COVID-19 Tests	60	491	649	712	734	757	779	784	784	785	789	792	793	794	794	795	795	795
h.New Negative COVID-19 Tests	21	27	37	100	19	67	77	72	35	29	99	104	73	65	92	27	21	30
i. Cumulative Negative COVID-19 Tests	21	411	1292	2527	4301	6195	8114	8186	8221	8250	8349	8453	8526	8591	8683	8710	8731	8761
Percent Positive among Newly Resulted COVID-19 Tests	74.1%	18.2%	14.0%	6.5%	0.0%	1.5%	1.3%	6.5%	0.0%	3.3%	3.9%	2.8%	1.4%	1.5%	0.0%	3.6%	0.0%	0.0%
ılative Percent Positive among Resulted COVID-19 Tests	74.1%	54.4%	33.4%	21.9%	14.6%	10.9%	8.8%	8.7%	8.7%	8.7%	8.6%	8.6%	8.5%	8.5%	8.4%	8.4%	8.3%	8.3%
l1. Employee Positive Tests, NEW		2	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
l2. Student Positive Tests, NEW		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
m1. Employee Positive Tests, CUMULATIVE		90	100	106	108	109	109	109	109	109	110	110	110	110	110	110	110	110
m2. Student Positive Tests, CUMULATIVE		0	0	0	1	2	2	2	2	2	2	2	2	2	2	2	2	2
of new SARS-CoV-2 IgG antibody tests sent to NYSDOH		61																
nber of SARS-CoV-2 IgG antibody tests sent to NYSDOH		1135																
ew SARS-CoV-2 IgG antibody tests performed in house			14	22	1	3	20	22	0	0	20	19	15	11	12	1	0	1
r of SARS-CoV-2 IgG antibody tests performed in house			417	1126	1875	2462	2975	2997	2997	2997	3017	3036	3051	3062	3074	3075	3075	3076
r. New Positive SARS-CoV-2 IgG antibody Tests			6	7	0	1	6	5	0	0	4	2	3	4	4	0	0	1
ng SARS-CoV-2 IgG antibody tests performed in house			148	372	574	736	859	864	864	864	868	870	873	877	881	881	881	882
new SARS-CoV-2 IgG antibody tests performed in house			43%	32%	0%	33%	30%	23%	#DIV/0!	######	20%	11%	20%	36%	33%	0%	#####	100%
ng SARS-CoV-2 IgG antibody tests performed in house			36%	33%	31%	30%	29%	29%	29%	29%	29%	29%	29%	29%	29%	29%	29%	29%
* *rejects are only for incorrect samples, not duplicates*	4/4	5/1	6/1	7/1	8/1	9/1	10/1	10/2	10/3	10/4	10/5	10/6	10/7	10/8	10/9	10/10	10/11	10/12
						22												

In-house Testing data

UHB Health Care Workers/Employees returning to New York from the quarantined states must:

a) Quarantine for 14 days in NYC **OR**

b) Have a Negative COVID test (within 24 hours after return to New York State)

PRIOR to returning to WORK

Staff must plan accordingly, give themselves enough time to get tested.

If you miss work because you did not plan the state mandate says you use your PTO days!

- NYS Travel Form must be filled out if you are travel back from restricted state, by any means of transportation) or $2,000 fine and may also be subject to charges.
- https://forms.ny.gov/s3/Welcome-to-New-York-State-Traveler-Health-Form -

UHB-Personal Protective Equipment

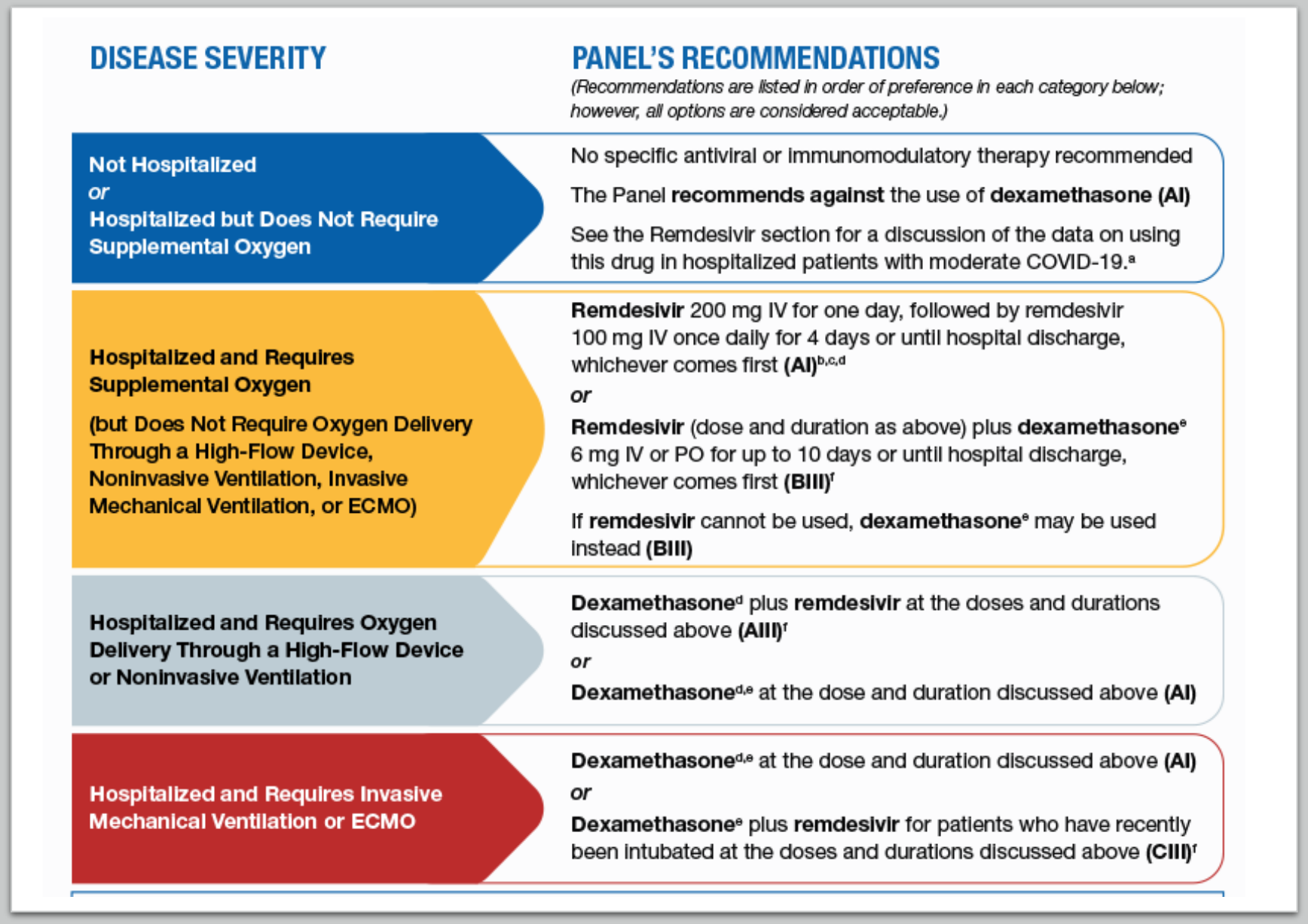
- Masks with valves are NOT PERMITTED to be worn by anyone in the facility
- Booties or caps/bonnets MAY NOT BE WORN as part of PPE garb outside of OR/procedural areas[1]
- Staff with facial hair or who are unable to wear an N95 respirator, will be issued a PAPR mask, per hospital policy
- Hand washing practices should be rigorously adhered to before and after every clinical encounter

UHB HEALTH CARE PERSONNEL IN CLINICAL AREAS (Inpatient or Outpatient)		
Not engaged in direct patient care activities (i.e. passing through units, meeting with colleagues, charting or reviewing EMR, making phone calls etc.)		• Ear loop mask
DIRECT PATIENT CONTACT WITH PATIENTS NOT SUSPECTED OF COVID-19[1]		• Ear loop mask + Eye protection (i.e., face shield or goggles)
ALL AEROSOL-GENERATING PROCEDURES (i.e., intubation, nebulizer tx, tracheal suctioning, obtaining nasopharyngeal specimens) use Transmission-Based Precautions. No exceptions.		• N95 + Eye Protection + Gown + Gloves
DIRECT PATIENT CONTACT[1 and 1a] WITH COVID-19+/PUI (Persons Under Investigation)	Engaged in hands-on activity or activity that requires sustained close proximity (≤ 6' for ≥ 10 minutes) with COVID-19 + patients / PUIs AND potential for exposure to body fluids/secretions[3]	• N95 + Eye Protection + Gown + Gloves
ED/NS24/NS33/Stepdowns[2]	All times Direct COVID-19 +/PUI care	• N95 + Eye Protection • N95 or equivalent + Eye Protection+ Gown+ Gloves
OTHER SERVICES		
Environmental Services	In patient rooms with COVID-19+ or PUIs ENHANCED PRECAUTIONS	• Ear loop mask + Eye Protection + Gown
Vendors/Contractors	In patient rooms with COVID-19+/PUI	• Ear loop mask + Eye Protection + Gloves
ALL PERSONNEL		
Simulated Clinical Activities	With other personnel in close proximity (≤ 6' for ≥ 10 minutes) whose status is unknown	• Ear loop mask + Eye Protection + Gloves
OFFICES/CORRIDORS/CONGREGATE SETTINGS	With interactions with other employees or public, all parties must wear a mask at all times	• Ear loop mask
NON-UHB PERSONNEL		
All Activities	All times, in all public and congregate spaces	• Ear loop mask

COVID NIH Treatment Updates

https://files.covid19treatmentguidelines.nih.gov/guidelines/covid19treatmentguidelines.pdf

COVID NIH Treatment Updates



DISEASE SEVERITY	PANEL'S RECOMMENDATIONS *(Recommendations are listed in order of preference in each category below; however, all options are considered acceptable.)*
Not Hospitalized *or* **Hospitalized but Does Not Require Supplemental Oxygen**	No specific antiviral or immunomodulatory therapy recommended The Panel **recommends against** the use of **dexamethasone (AI)** See the Remdesivir section for a discussion of the data on using this drug in hospitalized patients with moderate COVID-19.[a]
Hospitalized and Requires Supplemental Oxygen **(but Does Not Require Oxygen Delivery Through a High-Flow Device, Noninvasive Ventilation, Invasive Mechanical Ventilation, or ECMO)**	**Remdesivir** 200 mg IV for one day, followed by remdesivir 100 mg IV once daily for 4 days or until hospital discharge, whichever comes first **(AI)**[b,c,d] *or* **Remdesivir** (dose and duration as above) plus **dexamethasone**[e] 6 mg IV or PO for up to 10 days or until hospital discharge, whichever comes first **(BIII)**[f] If **remdesivir** cannot be used, **dexamethasone**[e] may be used instead **(BIII)**
Hospitalized and Requires Oxygen Delivery Through a High-Flow Device or Noninvasive Ventilation	**Dexamethasone**[d] plus **remdesivir** at the doses and durations discussed above **(AIII)**[f] *or* **Dexamethasone**[d,e] at the dose and duration discussed above **(AI)**
Hospitalized and Requires Invasive Mechanical Ventilation or ECMO	**Dexamethasone**[d,e] at the dose and duration discussed above **(AI)** *or* **Dexamethasone**[e] plus **remdesivir** for patients who have recently been intubated at the doses and durations discussed above **(CIII)**[f]

Not Hospitalized *or* **Hospitalized but Does Not Require Supplemental Oxygen**	No specific antiviral or immunomodulatory therapy recommended The Panel **recommends against** the use of **dexamethasone (AI)** See the Remdesivir section for a discussion of the data on using this drug in hospitalized patients with moderate COVID-19.[a]

*Moderate Disease: Clinical or radiographic evidence of lower respiratory tract infection and a saturation of oxygen (SpO_2) ≥94% on room air at sea level.

**Trials: Adaptive COVID-19 Treatment Trial (ACTT-1), Randomised Evaluation of COVID-19 Therapy (RECOVERY) trial

Hospitalized and Requires Supplemental Oxygen

(but Does Not Require Oxygen Delivery Through a High-Flow Device, Noninvasive Ventilation, Invasive Mechanical Ventilation, or ECMO)

Remdesivir 200 mg IV for one day, followed by remdesivir 100 mg IV once daily for 4 days or until hospital discharge, whichever comes first **(AI)**[b,c,d]

or

Remdesivir (dose and duration as above) plus **dexamethasone**[e] 6 mg IV or PO for up to 10 days or until hospital discharge, whichever comes first **(BIII)**[f]

If **remdesivir** cannot be used, **dexamethasone**[e] may be used instead **(BIII)**

Hospitalized and Requires Oxygen Delivery Through a High-Flow Device or Noninvasive Ventilation	**Dexamethasone**[d] plus **remdesivir** at the doses and durations discussed above **(AIII)**[f] *or* **Dexamethasone**[d,e] at the dose and duration discussed above (

Hospitalized and Requires Invasive Mechanical Ventilation or ECMO

Dexamethasone[d,e] at the dose and duration discussed above **(AI)**

or

Dexamethasone[e] plus **remdesivir** for patients who have recently been intubated at the doses and durations discussed above **(CIII)**[f]

COVID NIH Treatment Updates

- **NOT Recommended**:
  - Convalescent Plasma
  - Chloroquine/Hydroxychloroquine
  - Interleukin Inhibitors
  - Ivermectin
  - Vaccine (at this time)
  - Pre/Post-Exposure Prophylaxis (ie with Hydroxychloroquine)
  - Antivirals (Lopinavir/ritonavir)
  - Azithromycin
  - Interferons

Covid Treatment: Presented by Dr. Sinert

Should the following treatments be started in the ED? Based on the evidence!

- Dexamethasone/hydrocortisone – Yes, for oxygen requiring patients, evidence supports 6 mgs daily
- Proning – Yes, for intubated and non-intubated oxygen requiring patients
- Remdesivir – Yes, evidence shows that there is benefit to starting drug early, decreases number of ICU days; Request to the admin on both sides of the street to help with approval for use in ED
- Convalescent plasma – No!
- Anticoagulation – No! Don't treat the D-dimer number, only if there is proven thrombosis
- Hydroxychloroquine – No!
- Azithromycin – No!

Differentiating flu from covid? UHB has a new respiratory viral panel (RVP 2.1) that includes both influenza and Sars-CoV-2; Kings county is pending a single test for both

Should we be empirically treating pneumonia in these patients? We should be treating for CAP or HCAP as appropriate, for admitted patients

Surveillance of healthcare workers?

- How often should we be testing healthcare workers? Kings county has policy for monthly testing of employees but is not enforced; no policy at UHB
- Question of how many of us infected eachother or our patients and how many of us are asymptomatic carriers?
- We need to be responsible and wear appropriate PPE and maintain social distancing
-

COVID NIH Guideline Summary

The following slides are a summary of the 200 page NIH Treatment Guidelines

Common laboratory findings of COVID-19 include leukopenia and lymphopenia. Other laboratory abnormalities have included elevated levels of aminotransferase, C-reactive protein, D-dimer, ferritin, and lactate dehydrogenase.

While COVID-19 is primarily a pulmonary disease, emerging data suggest that it also leads to cardiac,[21,22] dermatologic,[23] hematological,[24] hepatic,[25] neurological,[26,27] renal,[28,29] and other complications. Thromboembolic events also occur in patients with COVID-19, with the highest risk in critically ill patients.[30] The long-term sequelae of COVID-19 survivors are currently unknown.

Recently, SARS-CoV-2 has been associated with a potentially severe inflammatory syndrome in children (multisystem inflammatory syndrome in children or MIS-C).[31,32] Please see Special Considerations in Children for more information.

Low: WBC, Plt
Elevated: CRP, Dimer, Ferritin, LDH

Routes of SARS-CoV-2 Transmission

Transmission of SARS-CoV-2 occurs primarily through respiratory secretions, and, to a lesser extent, contact with contaminated surfaces. Most transmissions are thought to occur through droplets; covering coughs and sneezes and maintaining a distance of six feet from others can reduce the risk of transmission. When consistent distancing is not possible, face coverings may further reduce the spread of droplets from infectious individuals to others. Frequent handwashing is also effective in reducing acquisition.[33] The onset and duration of viral shedding and the period of infectiousness are not completely defined. Viral RNA may be detected in upper respiratory specimens from asymptomatic or pre-symptomatic individuals with SARS-CoV-2.[34] An increasing number of studies have described cases where asymptomatic individuals have transmitted SARS-CoV-2.[35-37] The extent to which this occurs remains unknown, but this type of transmission may be contributing to a substantial amount of community transmission.

Primarily Droplet Transmission
Also: Contact, Aerosols

Clinical Presentation

The estimated incubation period for COVID-19 is up to 14 days from the time of exposure, with a median incubation period of 4 to 5 days.[6,17,18] The spectrum of illness can range from asymptomatic infection to severe pneumonia with acute respiratory distress syndrome (ARDS) and death. Among 72,314 persons with COVID-19 in China, 81% of cases were reported to be mild (defined in this study as no pneumonia or mild pneumonia), 14% were severe (defined as dyspnea, respiratory frequency ≥30 breaths/min, SpO_2 ≤93%, PaO_2/FiO_2 <300 mmHg, and/or lung infiltrates >50% within 24 to 48 hours), and 5% were critical (defined as respiratory failure, septic shock, and/or multiple organ dysfunction or failure).[19] In a report on more than 370,000 confirmed COVID-19 cases with reported symptoms in the United States, 70% of patients experienced fever, cough, or shortness of breath, 36% had muscle aches, and 34% reported headaches.[5] Other reported symptoms have included, but are not limited to, diarrhea, dizziness, rhinorrhea, anosmia, dysgeusia, sore throat, abdominal pain, anorexia, and vomiting.

The abnormalities seen in chest X-rays vary, but bilateral multi-focal opacities are the most common. The abnormalities seen in computed tomography (CT) of the chest also vary, but the most common are bilateral peripheral ground-glass opacities, with areas of consolidation developing later in the clinical course.[20] Imaging may be normal early in infection and can be abnormal in the absence of symptoms.[20]

Incubation: 14 days
Onset to Dyspnea: 1 week
Onset to ARDS: 8-12 days

Clinical Presentation of People with SARS-CoV-2 Infection

Last Updated: October 9, 2020

Patients with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection can experience a range of clinical manifestations, from no symptoms to critical illness. This section of the Guidelines discusses the clinical presentations of patients according to illness severity.

In general, adults with SARS-CoV-2 infection can be grouped into the following severity of illness categories. However, the criteria for each category may overlap or vary across clinical guidelines and clinical trials, and a patient's clinical status may change over time.

- *Asymptomatic or Presymptomatic Infection:* Individuals who test positive for SARS-CoV-2 using a virologic test (i.e., a nucleic acid amplification test or an antigen test), but who have no symptoms that are consistent with COVID-19.
- *Mild Illness:* Individuals who have any of the various signs and symptoms of COVID-19 (e.g., fever, cough, sore throat, malaise, headache, muscle pain, nausea, vomiting, diarrhea, loss of taste and smell) but who do not have shortness of breath, dyspnea, or abnormal chest imaging.
- *Moderate Illness:* Individuals who show evidence of lower respiratory disease during clinical assessment or imaging and who have saturation of oxygen (SpO_2) ≥94% on room air at sea level.
- *Severe Illness:* Individuals who have SpO_2 <94% on room air at sea level, a ratio of arterial partial pressure of oxygen to fraction of inspired oxygen (PaO_2/FiO_2) <300 mmHg, respiratory frequency >30 breaths per minute, or lung infiltrates >50%.
- *Critical Illness:* Individuals who have respiratory failure, septic shock, and/or multiple organ dysfunction.

Patients with certain underlying comorbidities are at a higher risk of progression to severe COVID-19. Some of these comorbidities include being 65 years or older; having cardiovascular disease, chronic lung disease, diabetes, cancer, obesity, or chronic kidney disease; and being a recipient of immunosuppressive therapy.[1] Health care providers should monitor such patients closely until clinical recovery is achieved.

The optimal pulmonary imaging technique has not yet been defined for people with symptomatic SARS-CoV-2 infection who present to care. Initial evaluation for these patients may include chest X-ray, ultrasound, or, if indicated, computerized tomography. An electrocardiogram should be performed if indicated. Laboratory testing includes a complete blood count with differential and a metabolic profile, including liver and renal function tests. While not part of standard care, measuring the levels of inflammatory markers such as C-reactive protein (CRP), D-dimer, and ferritin may have prognostic value.[2-4]

The definitions for the severity of illness categories listed above also apply to pregnant patients. However, the threshold for certain interventions may be different for pregnant patients and nonpregnant patients. For example, oxygen supplementation is recommended for pregnant patients when SpO_2 falls below 95% on room air at sea level, to accommodate physiologic changes in oxygen demand during pregnancy and to assure adequate oxygen delivery to the fetus.[5] If laboratory parameters are used for monitoring and interventions, clinicians should be aware that normal physiologic changes during pregnancy can alter several laboratory values. In general, leukocyte cell count increases throughout gestation and delivery and peaks during the immediate postpartum period. This is mainly due to neutrophilia.[6] D-dimer and CRP levels also increase during pregnancy and are often higher in pregnant patients than in nonpregnant patients.[7] Detailed information on treating COVID-19 in pregnant

Asymptomatic: Test +

Mild: URI/Viral syndrome WITHOUT dyspnea/abnormal CXR

Moderate: Clinically/Radiographic lower respiratory infection, O2 >94%

Severe: O2 <94%, RR >30, lung infiltrate >50%

Critical: Respiratory failure, shock, multi organ dysfunction

Persistent Symptoms or Illnesses After Recovery from Acute COVID-19

There have been an increasing number of reports of patients who experience persistent symptoms after recovering from acute COVID-19. At this time, there is limited information on the prevalence, duration, underlying causes, and effective management strategies for these lingering signs and symptoms.[12] Some of the symptoms overlap with the post-intensive care syndrome that has been described in patients without COVID-19, but prolonged symptoms and disabilities after COVID-19 have also been reported in patients with milder illness, including outpatients.[13,14]

Some of the persistent symptoms that have been reported include fatigue, joint pain, chest pain, palpitations, shortness of breath, and worsened quality of life.[15,16] One study from China found that pulmonary function was still impaired 1 month after hospital discharge.[17] A study from the United Kingdom reported that among 100 hospitalized patients (32 received care in the ICU and 68 received care in hospital wards only), 72% of the ICU patients and 60% of the ward patients experienced fatigue and breathlessness at 4 to 8 weeks after hospital discharge. The authors of the study suggest that post-hospital rehabilitation may be necessary for some of these patients.[15]

Neurologic and psychiatric symptoms have also been reported among patients who have recovered from acute COVID-19. High rates of anxiety and depression have been reported in some patients using self-report scales for psychiatric distress.[16,18] Younger patients have been reported to experience more psychiatric symptoms than patients aged >60 years.[15,16]

Patients may continue to experience headaches, vision changes, hearing loss, loss of taste or smell, impaired mobility, numbness in extremities, tremors, myalgia, memory loss, cognitive impairment, and mood changes for up to 3 months after diagnosis of COVID-19.[19,20] More research is needed to better understand the pathophysiology and clinical course of these post-infection sequelae and to identify management strategies for patients.

Dyspnea/Fatigue: can last 1-2 months

Anxiety/Depression: More frequent in age <60 yo

HEENT Residual Symptoms (HA, taste, smell, etc.): can last months

Infection Control

Last Updated: October 9, 2020

Health care workers should follow the infection control policies and procedures issued by their health care institutions.

Recommendation

- For health care workers who are performing aerosol-generating procedures on patients with COVID-19, the COVID-19 Treatment Guidelines Panel (the Panel) recommends using an N95 respirator (or equivalent or higher-level respirator) rather than surgical masks, in addition to other personal protective equipment (PPE) (i.e., gloves, gown, and eye protection such as a face shield or safety goggles) **(AIII)**.
  - Aerosol-generating procedures include endotracheal intubation and extubation, sputum induction, bronchoscopy, mini-bronchoalveolar lavage, open suctioning of airways, manual ventilation, unintentional or intentional ventilator disconnections, noninvasive positive pressure ventilation (NIPPV) (e.g., bilevel positive airway pressure [BiPAP], continuous positive airway pressure [CPAP]), cardiopulmonary resuscitation, and, potentially, nebulizer administration and high-flow oxygen delivery. Caution regarding aerosol generation is appropriate in situations such as tracheostomy and proning, where ventilator disconnections are likely to occur.

Rationale

During the severe acute respiratory syndrome (SARS) epidemic, aerosol-generating procedures increased the risk of infection among health care workers.[1,2] N95 respirators block 95% to 99% of aerosol particles; however, medical staff must be fit-tested for the type used.[3] Surgical masks block large particles, droplets, and sprays, but are less effective in blocking small particles (<5 μm) and aerosols.[4]

Recommendation

- The Panel recommends minimizing the use of aerosol-generating procedures on intensive care unit patients with COVID-19 and carrying out any necessary aerosol-generating procedures in a negative-pressure room, also known as an airborne infection isolation room (AIIR), when available **(AIII)**.
  - The Panel recognizes that aerosol-generating procedures are necessary to perform in some patients, and that such procedures can be carried out with a high degree of safety if infection control guidelines are followed.

Rationale

AIIRs lower the risk of cross-contamination among rooms and lower the risk of infection for staff and patients outside the room when aerosol-generating procedures are performed. AIIRs were effective in preventing virus spread during the SARS epidemic.[2] If an AIIR is not available, a high-efficiency particulate air (HEPA) filter should be used, especially for patients on high-flow nasal cannula or noninvasive ventilation. HEPA filters reduce virus transmission in simulations.[5]

Recommendations

- For health care workers who are providing usual care for non-ventilated patients with COVID-19, the Panel recommends using an N95 respirator (or equivalent or higher-level respirator) or a surgical mask, in addition to other PPE (i.e., gloves, gown, and eye protection such as a face shield

Wear N95 or equivalent when managing COVID + patients during aerosolizing procedures

Wear N95/equivalent OR Surgical Mask when managing COVID + patients during usual care

Always wear glove/gown/eye protection

Last Updated: October 9, 2020

Summary Recommendations

Infection Control:

- For health care workers who are performing aerosol-generating procedures on patients with COVID-19, the COVID-19 Treatment Guidelines Panel (the Panel) recommends using an N95 respirator (or equivalent or higher-level respirator) rather than surgical masks, in addition to other personal protective equipment (i.e., gloves, gown, and eye protection such as a face shield or safety goggles) **(AIII)**.
- The Panel recommends that endotracheal intubation in patients with COVID-19 be performed by health care providers with extensive airway management experience, if possible **(AIII)**.
- The Panel recommends that intubation be performed using video laryngoscopy, if possible **(CIII)**.

Hemodynamic Support:

- The Panel recommends norepinephrine as the first-choice vasopressor **(AII)**.
- For adults with COVID-19 and refractory septic shock who are not receiving corticosteroids to treat their COVID-19, the Panel recommends using low-dose corticosteroid therapy ("shock-reversal") over no corticosteroid therapy **(BII)**.

Ventilatory Support:

- For adults with COVID-19 and acute hypoxemic respiratory failure despite conventional oxygen therapy, the Panel recommends high-flow nasal cannula (HFNC) oxygen over noninvasive positive pressure ventilation (NIPPV) **(BI)**.
- In the absence of an indication for endotracheal intubation, the Panel recommends a closely monitored trial of NIPPV for adults with COVID-19 and acute hypoxemic respiratory failure for whom HFNC is not available **(BIII)**.
- For adults with COVID-19 who are receiving supplemental oxygen, the Panel recommends close monitoring for worsening respiratory status and that intubation, if it becomes necessary, be performed by an experienced practitioner in a controlled setting **(AII)**.
- For patients with persistent hypoxemia despite increasing supplemental oxygen requirements in whom endotracheal intubation is not otherwise indicated, the Panel recommends considering a trial of awake prone positioning to improve oxygenation **(CIII)**.
- The Panel **recommends against** using awake prone positioning as a rescue therapy for refractory hypoxemia to avoid intubation in patients who otherwise require intubation and mechanical ventilation **(AIII)**.
- For mechanically ventilated adults with COVID-19 and acute respiratory distress syndrome (ARDS), the Panel recommends using low tidal volume (VT) ventilation (VT 4–8 mL/kg of predicted body weight) over higher tidal volumes (VT >8 mL/kg) **(AI)**.
- For mechanically ventilated adults with COVID-19 and refractory hypoxemia despite optimized ventilation, the Panel recommends prone ventilation for 12 to 16 hours per day over no prone ventilation **(BII)**.
- For mechanically ventilated adults with COVID-19, severe ARDS, and hypoxemia despite optimized ventilation and other rescue strategies, the Panel recommends using an inhaled pulmonary vasodilator as a rescue therapy; if no rapid improvement in oxygenation is observed, the treatment should be tapered off **(CIII)**.
- There are insufficient data to recommend either for or against the routine use of extracorporeal membrane oxygenation (ECMO) for patients with COVID-19 and refractory hypoxemia.

Hemodynamics

Last Updated: October 9, 2020

Most of the hemodynamic recommendations below are similar to those previously published in the *Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016*. Ultimately, patients with COVID-19 who require fluid resuscitation or hemodynamic management of shock should be treated and managed identically to patients with septic shock.[1]

COVID-19 patients who require fluid resuscitation or hemodynamic management of shock should be treated and managed for septic shock in accordance with other published guidelines, with the following exceptions.

Recommendation

- For adults with COVID-19 and shock, the COVID-19 Treatment Guidelines Panel (the Panel) recommends using dynamic parameters, skin temperature, capillary refilling time, and/or lactate levels over static parameters to assess fluid responsiveness **(BII)**.

Rationale

No direct evidence addresses the optimal resuscitation strategy for patients with COVID-19 and shock. In a systematic review and meta-analysis of 13 non-COVID-19 randomized clinical trials (n = 1,652),[2] dynamic assessment to guide fluid therapy reduced mortality (risk ratio 0.59; 95% CI, 0.42–0.83), intensive care unit (ICU) length of stay (weighted mean difference -1.16 days; 95% CI, -1.97 to -0.36), and duration of mechanical ventilation (weighted mean difference -2.98 hours; 95% CI, -5.08 to -0.89). Dynamic parameters used in these trials included stroke volume variation (SVV), pulse pressure variation (PPV), and stroke volume change with passive leg raise or fluid challenge. Passive leg raising, followed by PPV and SVV, appears to predict fluid responsiveness with the highest accuracy.[3] The static parameters included components of early goal-directed therapy (e.g., central venous pressure, mean arterial pressure).

Resuscitation of non-COVID-19 patients with shock based on serum lactate levels has been summarized in a systematic review and meta-analysis of seven randomized clinical trials (n = 1,301). Compared with central venous oxygen saturation-guided therapy, early lactate clearance-directed therapy was associated with a reduction in mortality (relative ratio 0.68; 95% CI, 0.56–0.82), shorter length of ICU stay (mean difference -1.64 days; 95% CI, -3.23 to -0.05), and shorter duration of mechanical ventilation (mean difference -10.22 hours; 95% CI, -15.94 to -4.50).[4]

Recommendation

- For the acute resuscitation of adults with COVID-19 and shock, the Panel recommends using buffered/balanced crystalloids over unbalanced crystalloids **(BII)**.

Rationale

A pragmatic randomized trial that compared balanced and unbalanced crystalloids in 15,802 critically ill adults found that the rate of the composite outcome of death, new renal-replacement therapy, or persistent renal dysfunction was lower in the balanced crystalloids group (OR 0.90; 95% CI, 0.82–0.99; $P = 0.04$).[5] A secondary analysis compared outcomes in a subset of patients with sepsis (n = 1,641). Among the sepsis patients in the balanced crystalloids group, there were fewer deaths (aOR 0.74; 95% CI, 0.59–0.93; $P=0.01$), as well as fewer days requiring vasopressors and renal replacement therapy.[6]

Treatment for shock similar to **Surviving Sepsis Campaign**

Recommend **Balanced Crystalloids** OVER unbalanced

A subsequent meta-analysis of 21 randomized controlled trials (n = 20,213) that included the pragmatic trial cited above compared balanced crystalloids to 0.9% saline for resuscitation of critically ill adults and children and reported nonsignificant differences in hospital mortality (OR 0.91; 95% CI, 0.83–1.01) and acute kidney injury (OR 0.92; 95% CI, 0.84–1.00).[7]

Recommendation

- For the acute resuscitation of adults with COVID-19 and shock, the Panel **recommends against** the initial use of albumin for resuscitation **(BI)**.

Rationale

A meta-analysis of 20 non-COVID-19 randomized controlled trials (n = 13,047) that compared the use of albumin or fresh-frozen plasma to crystalloids in critically ill patients found no difference in all-cause mortality,[8] whereas a meta-analysis of 17 non-COVID-19 randomized controlled trials (n = 1,977) that compared the use of albumin to crystalloids specifically in patients with sepsis observed a reduction in mortality (OR 0.82; 95% CI, 0.67–1.0; $P = 0.047$).[9] Given the higher cost of albumin and the lack of a definitive clinical benefit, the Panel **recommends against** the routine use of albumin for initial acute resuscitation of patients with COVID-19 and shock.

Additional Recommendations Based on General Principles of Critical Care

- The Panel **recommends against** using hydroxyethyl starches for intravascular volume replacement in patients with sepsis or septic shock **(AI)**.
- The Panel recommends norepinephrine as the first-choice vasopressor **(AII)**. The Panel recommends adding either vasopressin (up to 0.03 units/minute) **(BII)** or epinephrine **(CII)** to norepinephrine to raise mean arterial pressure to target or adding vasopressin (up to 0.03 units/minute) **(CII)** to decrease norepinephrine dosage.
- When norepinephrine is available, the Panel **recommends against** using dopamine for patients with COVID-19 and shock **(AI)**.
- The Panel **recommends against** using low-dose dopamine for renal protection **(BII)**.
- The Panel recommends using dobutamine in patients who show evidence of cardiac dysfunction and persistent hypoperfusion despite adequate fluid loading and the use of vasopressor agents **(BII)**.
- The Panel recommends that all patients who require vasopressors have an arterial catheter placed as soon as practical, if resources are available **(BIII)**.
- For adults with COVID-19 and refractory septic shock who are not receiving corticosteroids to treat their COVID-19, the Panel recommends using low-dose corticosteroid therapy ("shock-reversal") over no corticosteroid therapy **(BII)**.
- A typical corticosteroid regimen in septic shock is intravenous hydrocortisone 200 mg per day administered either as an infusion or in intermittent doses. The duration of hydrocortisone therapy is usually a clinical decision.
- Patients who are receiving corticosteroids for COVID-19 are receiving sufficient replacement therapy such that they do not require additional hydrocortisone.

References

1. Rhodes A, Evans LE, Alhazzani W, et al. Surviving Sepsis Campaign: international guidelines for management of sepsis and septic shock: 2016. *Crit Care Med*. 2017;45(3):486-552. Available at: https://www.

Recommended for Shock:
Norepinephrine
Steroids

Do NOT Recommend
Albumin for resuscitation
Dopamine as first agent or for renal protection

Empiric Broad-Spectrum Antimicrobial Therapy

Recommendations

- In patients with COVID-19 and severe or critical illness, there are insufficient data to recommend empiric broad-spectrum antimicrobial therapy in the absence of another indication.
- If antimicrobials are initiated, the Panel recommends that their use should be reassessed daily in order to minimize the adverse consequences of unnecessary antimicrobial therapy **(AIII)**.

Rationale

There are no reliable estimates of the incidence or prevalence of copathogens with severe acute respiratory syndrome coronavirus 2 at this time.

Some experts routinely administer broad-spectrum antibiotics as empiric therapy for bacterial pneumonia to all patients with COVID-19 and moderate or severe hypoxemia. Other experts administer antibiotics only for specific situations, such as the presence of a lobar infiltrate on a chest X-ray, leukocytosis, an elevated serum lactate level, microbiologic data, or shock.

Gram stain, culture, or other testing of respiratory specimens is often not available due to concerns about aerosolization of the virus during diagnostic procedures or when processing specimens.

There are no clinical trials that have evaluated the use of empiric antimicrobial agents in patients with COVID-19 or other severe coronavirus infections

Antiviral Drugs That Are Under Evaluation for the Treatment of COVID-19

Last Updated: October 9, 2020

Summary Recommendations

There are no Food and Drug Administration-approved drugs for the treatment of COVID-19. In this section, the COVID-19 Treatment Guidelines Panel (the Panel) provides recommendations for using antiviral drugs to treat COVID-19 based on the available data. **As in the management of any disease, treatment decisions ultimately reside with the patient and their health care provider.**

For more information on the antiviral agents that are currently being evaluated for the treatment of COVID-19, see Table 2.

Remdesivir

The Remdesivir section of the Guidelines will be updated soon. See Therapeutic Management of Patients with COVID-19 for recommendations on using remdesivir with or without corticosteroids.

Recommendation for Prioritizing Limited Supplies of Remdesivir

- Because remdesivir supplies are limited, the Panel recommends prioritizing **remdesivir** for use in hospitalized patients with COVID-19 who require supplemental oxygen but who do not require oxygen delivery through a high-flow device, noninvasive ventilation, invasive mechanical ventilation, or extracorporeal membrane oxygenation (ECMO) **(BI)**.

Recommendation for Patients With Mild or Moderate COVID-19

- There are insufficient data for the Panel to recommend either for or against the use of **remdesivir** in patients with mild or moderate COVID-19.

Recommendations for Patients with COVID-19 Who Require Supplemental Oxygen

For Patients Who Do Not Require Oxygen Delivery Through a High-Flow Device, Noninvasive Ventilation, Invasive Mechanical Ventilation, or ECMO

- The Panel recommends using **remdesivir** for 5 days or until hospital discharge, whichever comes first **(AI)**.
- If a patient who is on supplemental oxygen while receiving remdesivir progresses to requiring delivery of oxygen through a high-flow device, noninvasive ventilation, invasive mechanical ventilation, or ECMO, the course of remdesivir should be completed.

For Patients Who Require Oxygen Delivery Through a High-Flow Device, Noninvasive Ventilation, Invasive Mechanical Ventilation, or ECMO

- Because there is uncertainty regarding whether starting remdesivir confers clinical benefit in these groups of patients, the Panel cannot make a recommendation either for or against starting remdesivir.

Duration of Therapy for Patients Who Have Not Shown Clinical Improvement After 5 Days of Therapy

- There are insufficient data on the optimal duration of **remdesivir** therapy for patients with COVID-19 who have not shown clinical improvement after 5 days of therapy. In this group, some experts extend the total remdesivir treatment duration to up to 10 days **(CIII)**.

Chloroquine or Hydroxychloroquine With or Without Azithromycin

- The Panel **recommends against** the use of **chloroquine** or **hydroxychloroquine** with or without **azithromycin** for the treatment of COVID-19 in hospitalized patients **(AI)**.
- In nonhospitalized patients, the Panel **recommends against** the use of **chloroquine** or **hydroxychloroquine** with or without **azithromycin** for the treatment of COVID-19, except in a clinical trial **(AI)**.
- The Panel **recommends against** the use of **high-dose chloroquine** (600 mg twice daily for 10 days) for the treatment of COVID-19 **(AI)**.

Lopinavir/Ritonavir and Other HIV Protease Inhibitors

- The Panel **recommends against** using **lopinavir/ritonavir (AI)** or **other HIV protease inhibitors (AIII)** to treat COVID-19, except in a clinical trial.

Recommend Remdesivir for:
Hospitalized + Require Oxygen (NOT THROUGH high flow/ventilation)

Do NOT Recommend
Hydroxychloroquine with or without Azithromycin
HIV Protease Inhibitors

Chloroquine or Hydroxychloroquine With or Without Azithromycin

Last Updated: October 9, 2020

Chloroquine is an antimalarial drug that was developed in 1934. Hydroxychloroquine, an analogue of chloroquine, was developed in 1946. Hydroxychloroquine is used to treat autoimmune diseases, such as systemic lupus erythematosus (SLE) and rheumatoid arthritis, in addition to malaria. In general, hydroxychloroquine has fewer and less severe toxicities (including less propensity to prolong the QTc interval) and fewer drug-drug interactions than chloroquine.

Both chloroquine and hydroxychloroquine increase the endosomal pH, inhibiting fusion of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the host cell membranes.[1] Chloroquine inhibits glycosylation of the cellular angiotensin-converting enzyme 2 receptor, which may interfere with binding of severe acute respiratory syndrome-associated coronavirus (SARS-CoV) to the cell receptor.[2] In vitro studies have suggested that both chloroquine and hydroxychloroquine may block the transport of SARS-CoV-2 from early endosomes to endolysosomes, possibly preventing the release of the viral genome.[3] Both chloroquine and hydroxychloroquine also have immunomodulatory effects. It has been hypothesized that these effects are other potential mechanisms of action for the treatment of COVID-19 However, despite demonstrating antiviral activity in some in vitro systems, hydroxychloroquine with or without azithromycin did not reduce upper or lower respiratory tract viral loads or demonstrate clinical efficacy in a rhesus macaque model.[4]

Chloroquine and hydroxychloroquine, with or without azithromycin, have been studied in multiple clinical trials for the treatment of COVID-19. The recommendations below are based on an assessment of the collective evidence from these studies.

Recommendations

- The COVID-19 Treatment Guidelines Panel (the Panel) **recommends against** the use of **chloroquine** or **hydroxychloroquine** with or without **azithromycin** for the treatment of COVID-19 in hospitalized patients **(AI)**.
- In nonhospitalized patients, the Panel **recommends against** the use of **chloroquine** or **hydroxychloroquine** with or without **azithromycin** for the treatment of COVID-19, except in a clinical trial **(AI)**.
- The Panel **recommends against** the use of **high-dose chloroquine** (600 mg twice daily for 10 days) for the treatment of COVID-19 **(AI)**.

Rationale

The safety and efficacy of chloroquine and hydroxychloroquine with or without azithromycin have been evaluated in randomized clinical trials, observational studies, and single-arm studies. Please see Chloroquine or Hydroxychloroquine With or Without Azithromycin: Selected Clinical Data for more information.

In a large randomized controlled trial of hospitalized patients in the United Kingdom, hydroxychloroquine did not decrease 28-day mortality when compared to the usual standard of care. Participants who were randomized to receive hydroxychloroquine had a longer median hospital stay than those who received the standard of care. In addition, among patients who were not on invasive mechanical ventilation at the time of randomization, those who received hydroxychloroquine were

Do NOT Recommend

Hydroxychloroquine with or without Azithromycin

Immunomodulators Under Evaluation for the Treatment of COVID-19

Last Updated: August 27, 2020

Summary Recommendations

Dexamethasone

- On the basis of the preliminary report from the Randomised Evaluation of COVID-19 Therapy (RECOVERY) trial, the COVID-19 Treatment Guidelines Panel (the Panel) recommends using **dexamethasone** 6 mg per day for up to 10 days or until hospital discharge, whichever comes first, for the treatment of COVID-19 in hospitalized patients who are mechanically ventilated **(AI)** and in hospitalized patients who require supplemental oxygen but who are not mechanically ventilated **(BI)**.
- The Panel **recommends against** using **dexamethasone** for the treatment of COVID-19 in patients who do not require supplemental oxygen **(AI)**.
- If dexamethasone is not available, the Panel recommends using alternative glucocorticoids such as **prednisone**, **methylprednisolone**, or **hydrocortisone** (see Additional Considerations in the Corticosteroids section for dosing recommendations) **(AIII)**.

Other Immunomodulators

There are insufficient data for the Panel to recommend either for or against the use of the following immunomodulators for the treatment of COVID-19:

- Interleukin (IL)-1 inhibitors (e.g., **anakinra**)
- **Interferon beta** for the treatment of early (i.e., <7 days from symptom onset) mild and moderate COVID-19.

The Panel **recommends against** the use of the following immunomodulators for the treatment of COVID-19, except in a clinical trial:

- Anti-IL-6 receptor monoclonal antibodies (e.g., **sarilumab**, **tocilizumab**) or anti-IL-6 monoclonal antibody (**siltuximab**) **(BI)**.
- **Interferons (alfa or beta)** for the treatment of severely or critically ill patients with COVID-19 **(AIII)**.
- Bruton's tyrosine kinase inhibitors (e.g., **acalabrutinib**, **ibrutinib**, **zanubrutinib**) and Janus kinase inhibitors (e.g., **baricitinib**, **ruxolitinib**, **tofacitinib**) **(AIII)**.

Rating of Recommendations: A = Strong; B = Moderate; C = Optional

Rating of Evidence: I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies; III = Expert opinion

Recommend Dexamethasone (6 mg daily) for:
Hospitalized + Require Oxygen or Ventilation
*can substitute other glucocorticoids if needed

Do NOT Recommend Dexamethasone for:
Patients who DO NOT require oxygen or ventilation

Do NOT Recommend :
Other Immunomodulators

Antithrombotic Therapy in Patients with COVID-19

Last Updated: May 12, 2020

Summary Recommendations

Laboratory Testing:

- In non-hospitalized patients with COVID-19, there are currently no data to support the measurement of coagulation markers (e.g., D-dimers, prothrombin time, platelet count, fibrinogen) **(AIII)**.
- In hospitalized patients with COVID-19, hematologic and coagulation parameters are commonly measured, although there are currently insufficient data to recommend for or against using this data to guide management decisions **(BIII)**.

Chronic Anticoagulant and Antiplatelet Therapy:

- Patients who are receiving anticoagulant or antiplatelet therapies for underlying conditions should continue these medications if they receive a diagnosis of COVID-19 **(AIII)**.

Venous Thromboembolism Prophylaxis and Screening:

- For non-hospitalized patients with COVID-19, anticoagulants and antiplatelet therapy should not be initiated for prevention of venous thromboembolism (VTE) or arterial thrombosis unless there are other indications **(AIII)**.
- Hospitalized adults with COVID-19 should receive VTE prophylaxis per the standard of care for other hospitalized adults **(AIII)**. A diagnosis of COVID-19 should not influence a pediatrician's recommendations about VTE prophylaxis in hospitalized children **(BIII)**. Anticoagulant or antiplatelet therapy should not be used to prevent arterial thrombosis outside of the usual standard of care for patients without COVID-19 **(AIII)**.
- Reported incidence of VTE in hospitalized patients with COVID-19 varies. There are currently insufficient data to recommend for or against the use of thrombolytics or increasing anticoagulant doses for VTE prophylaxis in hospitalized COVID-19 patients outside the setting of a clinical trial **(BIII)**.
- Hospitalized patients with COVID-19 should not routinely be discharged on VTE prophylaxis **(AIII)**. Using Food and Drug Administration-approved regimens, extended VTE prophylaxis can be considered in patients who are at low risk for bleeding and high risk for VTE as per protocols for patients without COVID-19 (see text for details on defining at-risk patients) **(BI)**.
- There are currently insufficient data to recommend for or against routine deep vein thrombosis screening in COVID-19 patients without signs or symptoms of VTE, regardless of the status of their coagulation markers **(BIII)**.
- For hospitalized COVID-19 patients, the possibility of thromboembolic disease should be evaluated in the event of rapid deterioration of pulmonary, cardiac, or neurological function, or of sudden, localized loss of peripheral perfusion **(AIII)**.

Treatment:

- Patients with COVID-19 who experience an incident thromboembolic event or who are highly suspected to have thromboembolic disease at a time when imaging is not possible should be managed with therapeutic doses of anticoagulant therapy as per the standard of care for patients without COVID-19 **(AIII)**.
- Patients with COVID-19 who require extracorporeal membrane oxygenation or continuous renal replacement therapy or who have thrombosis of catheters or extracorporeal filters should be treated with antithrombotic therapy per the standard institutional protocols for those without COVID-19 **(AIII)**.

Do NOT Recommend:
Empiric full dose anticoagulation

Monitoring Coagulation Markers in Patients with COVID-19:

- Non-hospitalized patients with COVID-19 should not routinely be tested for measures of coagulopathy, such as D-dimer level, prothrombin time, fibrinogen level, and platelet count **(AIII)**. Although abnormalities of these markers have been associated with worse outcomes, there is a lack of prospective data demonstrating that they can be used for risk stratification in those who are asymptomatic or those with mild SARS-CoV-2 infection.
- Hematologic and coagulation parameters are commonly measured in hospitalized patients with COVID-19. Nevertheless, there are currently insufficient data to recommend for or against using such data to guide management decisions **(BIII)**.

COVID in UHB Going Forward

Phase	General Description	Inpatient COVID + Census Metric
1	Full COVID Response High NYC Case/Capita, Mortality Rates	>50% Census COVID +
2	Partial COVID Response Decreasing NYC case/capita x 14 days Goal to maintain ability to EASILY re-enter Phase 1	10-50% Census COVID +
3	Low COVID Response Consistently low NYC case/capita	<10% Census COVID +
4	Minimal COVID Response Minimal NYC case/capita; High NYC Immunity	<1% Census COVID +

Phase 1:Full COVID Response, High NYC Case/Capita, Mortality Rates

Metrics to Monitor, Triggers to Enter Phase (ANY 2 of the BELOW)	**Operational Services** ➢ **Overflow Areas**	**Redeployment/ Increase Staffing**	**Decreased COVID Transmission**	**Activities to Prepare for Phase 2**

• ED Volume 24 Hours Above Capacity (>200)
• Inpatient Census Above Capacity (>230)
• >50% COVID cases inpatient
• > 15 New COVID Cases daily
• >25% COVID tests are positive (inpt and outpt)
	• MICU
	  • CCU, CTICU, PIRR, PICU
	• Internal Medicine/ Family Medicine
	  • All NS
	• Pediatrics/PICU
	• Surgical Services (Tier 3 with approval)
	• ED
	  • Suite A, Tents
	• Modified Primary Care
	• EHS
		• Faculty
		(other services as needed)
		• Resident/Fellow
		(other services as needed)
		• Students
		(NO clinical services)
		• RN/Tech etc.
		• Recruited staff (volunteer, retired, agency staff, locum staff, MRC)
			• Work From Home if possible
			• Telemedicine
			• Social Distancing
			• Masks Policy Enforced for Staff and Visitors
			• Increase PPE allocated to units/departments
			• Increase Environmental Services
			• No Visitors
			• Decrease entrance access to facility
			• Screening at entrances
			• Cafeteria Carry-out only
			• No large gatherings
			• Tele-conferences
				• Develop process for opening up closed services while maintaining Social Distancing
				  • Increase Hours of operation
				  • Clinic appointment times
				  • Direct to Room triage
				  • Visitor Policies
				  • Telemedicine
				• Start making appointments for anticipated open dates

Phase 2: Partial COVID Response, Decreasing NYC case/capita x 14 days, Goal to maintain ability to EASILY re-enter Phase 1

Metrics to Monitor, Triggers to Enter Phase (ANY 2 of the BELOW)	**Operational Services= Phase 1 PLUS:**	**Redeployment/ Staffing**	**Decreased COVID Transmission**	**Activities to Prepare for Phase 3**
• ED Volume 24 Hours Above baseline (140-150) • Inpatient Census Above Baseline (>180) • 20-50% COVID cases inpatient • 2-4 New COVID Cases daily • 5-25% COVID tests are postitive (inpt and outpt)	• Specialty Inpatient Services • Full Primary Care • Specialty Clinics as determined safe/feasible • Tier 2a, 2b Surgical Services	• Faculty/Resident/Fellow (minimal, as needed) • Students (clinical services as per SUNY central) • Maintain easily expandable staff rations, pool	• Telemedicine • Social Distancing • Masks Policy Enforced for Staff and Visitors • Increase Environmental Services • Adjust Visitor Policy • Screening at entrances • Clinic appointment times • Direct to Room triage	• Develop process for opening up closed services while maintaining Social Distancing • Start making appointments for anticipated open dates for closed services

Phase 3: Low COVID Response, Consistently low NYC case/capita

Metrics to Monitor, Triggers to Enter Phase (ANY 2 of the BELOW)	Operational Services= Phase 1-2 PLUS:	Redeployment/ Staffing	Decreased COVID Transmission	Activities to Prepare for Phase 4
• ED Volume 24 Hours Below baseline (140) • Inpatient Census Below Baseline (170) • <20% COVID cases inpatient • Minimal New COVID Cases daily • <5% COVID tests are positive (inpt and outpt)	• Specialty Inpatient Services • All Clinics • Tier 1a, 1b Surgical Services	• Faculty/Resident/Fellow Database updated monthly, but not deployed	• Telemedicine • Social Distancing • Updated Mask Policy • PPE allocated as needed • Maintain Environmental Services • Adjust Visitor Policy • Consider Screening at entrances • Clinic appointment times • Direct to Room triage	• Develop process for opening up closed services while maintaining Social Distancing • Start making appointments for anticipated open dates for closed services

Phase 4: No COVID Response, Vaccine developed, Minimal NYC case/capita; High NYC Immunity

Metrics to Monitor, Triggers to Enter Phase	Operational Services PLUS:	Redeployment/ Staffing	Decreased COVID Transmission	Activities to Prepare for re-entering Phase 1-3
• ED Volume 24 Hours Below baseline (140) • Inpatient Census Below Baseline (180) • Minimal COVID cases inpatient • Minimal New COVID Cases daily • Minimal % COVID tests are positive (inpt and outpt)	• Normal Operations • Process to safely close services as needed	• Process to re-activate redeployment database	• Baseline infection control procedures • Process to restart Social Distancing	• Monitoring Triggers

COVID NIH Guideline Summary

On your own reading

Antiviral Therapy

Because severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) replication leads to many of the clinical manifestations of COVID-19, antiviral therapies are being investigated for the treatment of COVID-19. These drugs inhibit viral entry (via the angiotensin-converting enzyme 2 [ACE2] receptor and transmembrane serine protease 2 [TMPRSS2]), viral membrane fusion and endocytosis, or the activity of the SARS-CoV-2 3-chymotrypsin-like protease (3CLpro) and the RNA-dependent RNA polymerase.[1] Because viral replication may be particularly active early in the course of COVID-19, antiviral therapy may have the greatest impact before the illness progresses into the hyperinflammatory state that can characterize the later stages of disease, including critical illness.[2] For this reason, it is necessary to understand the role of antivirals in treating mild, moderate, severe, and critical illness in order to optimize treatment for people with COVID-19.

The following sections describe the underlying rationale for using different antiviral medications, provide the Panel's recommendations for using these medications to treat COVID-19, and summarize the existing clinical trial data. Additional antiviral therapies will be added to this section of the Guidelines as new evidence emerges.

References

1.Sanders JM, Monogue ML, Jodlowski TZ, Cutrell JB. Pharmacologic treatments for coronavirus disease 2019 (COVID-19): a review. *JAMA*. 2020;323(18):1824-1836. Available at: https://www.ncbi.nlm.nih.gov/pubmed/32282022.

2.Siddiqi HK, Mehra MR. COVID-19 illness in native and immunosuppressed states: a clinical-therapeutic staging proposal. *J Heart Lung Transplant*. 2020;39(5):405-407. Available at: https://www.ncbi.nlm.nih.gov/pubmed/32362390.

Immune-Based Therapy Under Evaluation for Treatment of COVID-19

Last Updated: July 17, 2020

Given the hyperactive inflammatory effects of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), agents that modulate the immune response are being explored as adjunctive treatments for the management of moderate to critical COVID-19.[1] These agents include human blood-derived products and immunomodulatory therapies.

Some human blood-derived products are obtained from individuals who have recovered from SARS-CoV-2 infection (e.g., convalescent plasma, immunoglobulin products).[2,3] These heterogenous products are postulated to have either direct antiviral properties, such as with convalescent plasma, and/or immunomodulatory effects like those noted with mesenchymal stem cells.[4] Additionally, neutralizing monoclonal antibodies directed against SARS-CoV-2 have been developed and are under investigation in clinical trials.[5]

Other agents in this group include therapeutics currently approved for the treatment of other immune and/or inflammatory syndromes. These agents include corticosteroids (e.g., glucocorticoids),[6] which as a class possess a broad array of mechanisms to abrogate systemic inflammation, and more targeted anti-inflammatory treatments such as interleukin inhibitors,[7,8] interferons,[9] kinase inhibitors,[10] and others.

In the following sections of the COVID-19 Treatment Guidelines, different blood-derived products and immunomodulators under investigation for the management of COVID-19 are discussed. Items discussed include the proposed rationale for use of these therapies, the clinical safety and efficacy data to date, and the COVID-19 Treatment Guidelines Panel's recommendations for their use.

Adjunctive Therapy

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In addition to the antiviral medications and the immune-based therapies for the treatment of COVID-19 that are discussed elsewhere in the COVID-19 Treatment Guidelines, adjunctive therapies are frequently used in patients with COVID-19 to prevent and/or treat the infection or its complications. Some of these agents are being studied in clinical trials.

Infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is associated with a prothrombotic state and an increased incidence of thromboembolic disease. Antithrombotic Therapy in Patients with COVID-19 reviews the existing data and provides recommendations for the care of individuals who were receiving antithrombotic agents before they acquired SARS-CoV-2 and those who need these therapies to prevent or treat thromboembolic events during course of the infection.

Some clinicians advocate for the use of vitamin and mineral supplements to treat respiratory viral infections. Multiple ongoing studies are evaluating the use of vitamin and mineral supplements for both the treatment and prevention of SARS-CoV-2 infection.

The following sections describe the underlying rationale for the use of adjunctive therapies and summarize the existing clinical trial data. Additional adjunctive therapies will be added as new evidence emerges.

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