SARS-CoV-2 UCMC Supplement

https://drive.google.com/file/d/11Rh9o5AWc57fR50rNkA2Ly1eRDwF1haa/view?usp=sharing
https://www.idsociety.org/practice-guideline/covid-19-guideline-treatment-and-management
https://www.newyorker.com/news/q-and-a/how-governments-respond-to-pandemics-like-the-coronavirus

https://acphospitalist.org/weekly/archives/2020/04/08/1.htm?utm_campaign=FY19-20_NEWS_HOSPITALIST_DOMESTIC_040820_EML&utm_medium=email&utm_source=Eloqua

A supplement to well-curated education resources already available:
Frontline Covid Guide
SCCM COVID19 Guidelines
Brigham & Women's Critical Care Protocols
Our World in Data, COVID-19
Illinois data from IDPH
UCMC AgileMD COVID-19 Pathways
UCMC Resource Numbers
Sherer and Landon clinician summary ppt
Management of Critically Ill Adults With COVID-19
UCMC town hall: Part 1: Dr. Shu-Yuan Xiao; Part 2: Dr. Emily Landon; 4/10/20

UCMC PULM CRIT Educational Videos

- Acute Hypoxemic Respiratory Failure due to COVID-19
- Basics of Mechanical Ventilation
- Contemporary Ventilator Management for ARDS
- ARDS management outside the ventilator
- Analgesia and Sedation for Mechanically Ventilated Patients
- Liberation from Mechanical Ventilation

COVID Literature and Learning

- team staffed by Maggie Collison, a 2nd year ID fellow, clinical biomedical librarians Katilyn Van Campen and Debra Werner, medical student volunteers, Dr. Arora
- covidlearning@uchospitals.edu for contact
- journal articles w/ summaries
- Q&A

COVID-19

The virus:

- betacoronavirus RNA virus w/ spike (S) proteins that bind ACE2 receptor (found in lung, SI, vascular endothelium, olfactory n.)

- proposed three-stage classification system (Siddiqi H. K. et al.) describes an initial viral response phase, followed by a hyperinflammatory phase (may explain utility of immunomodulators later)
- COVID-19 possibly resembles secondary HLH (unremitting fever, cytopenias, ↑ ferritin, ARDS in 50%), a hyperinflammatory syndrome characterised by a fulminant and fatal hypercytokinemia w/ multiorgan failure commonly caused by viral infections, which could justify immunosuppression w/ Anikinra (IL-1 blockade) or tocilizumab (IL-6 R blockade) w/ high HScore or inflammatory markers (Mehta P. et al.)

Epidemiology, transmission:

- UCMC rates
- 1-5% close contacts developed COVID-19, driven by family clusters (Wu Z. CROI 2020)
- incubation 2-7 (median 4) days (Guan W. et al.), 1-14 (5-6) (del Rio C. et al. 2020)
- incubation period range from 1 to 14 days with a median of 5 to 6 days
- viral shedding can occur 24-48 hr before Sx onset, highest early in disease (Wu Z. CROI 2020); median viral shedding 20 days (up to 37 days) (Zhou F. Z. et al.)
- recommendations for mask use vary country-to-country; CDC about to recommend cloth masks in community to prevent transmission from *wearer*
- UCMC universal cloth masks must be worn at all times on campus, but when entering airborne, droplet, or precautions, use appropriate mask as indicated
- those with ILI Sx **may not** come to work; page CROC, page 9990 or call 773-702-6819, arrange drive-through COVID testing (appointment required 773-702-2800), if busy, test in PCG (773-702-0240)
- furlough mitigation: +COVID-19 exposure can work **IF** asymptomatic
- if sent home, stay for 14 days or 72 hours after Sx **resolve**, whichever is longer
- a good explanation of surface transmission: leave packages outside for a few hours; don't touch face while shopping, wash them as soon as you're home; put away groceries, and then wash your hands again; if you need to use something immediately, wipe the package with disinfectant; wash fruits and vegetables as you normally would
- study of SARS-CoV-2 surface stability (exponential decay) (Doremalen N et al.):
    - plastic and steel: detectable up to 72 hours (titer greatly reduced)
    - copper/cardboard: no viable SARS-CoV-2 measured after 4/24 hr
    - $T_{1/2}$ aerosols: 1.1-1.2 hr
- how to keep your family safe (for HCW)

PPE:

- donning, doffing, requirements for COVID-19 units
- for fit testing, call x2-6757
- remember that droplets gather on the outside of PPE, and removing PPE is a very high risk time for exposure; avoid pulling it under your chin
- be mindful of phone, which can become contaminated throughout the day
- universal cloth masks aim to prevent spread among hospital employees (re-use)
- protective goggles can be reused (clean w/ purple or orange wipes if soiled/removed)

- masks/N95s: extended use (wear for multiple patients, discard if taken off or soiled) (practice supported by Ong, SWX et al.)
- undifferentiated URI/ILI/PUI/COVID-19+: negative-pressure, eye shields, surgical masks, gowns, gloves
- N95 required for for aerosol-generating procedures: CPR, trach, conscious sedation, NC > 5 L, NRB (not NP swabs)
- which N95 to use as of 4/14/20 *(only use teal mask if it's the only mask that fits)*
- COVID-19-specific N100s/respirators are for reusability (i.e. PPE preservation) and not for what's actually required for care of COVID-19 patients on PUIs
- if supplies are necessary: page 2900 (reflex COVID-19 resource pager)

Fatality rate:

- case fatality rate (CFR) estimated 3.8% by WHO, though estimated 1.1% per Diamond Princess Cruise Ship (Russell, T. W. et al.)
- CFR increases with advanced age and comorbidities (Onder, G. et al.)
- cardiac injury a/w higher mortality (51.2% vs 4.5%) when controlled for comorbidities (HTN, CAD, HF, CVD, DM, COPD, renal failure, cancer, ARDS, which were all higher) (Shi S et al.)
- D-dimer levels independent RF (i.e. consider anticoagulation) (Zhou F. Z. et al.)

Signs, symptoms:

- as above
- ILI screening: fever, cough, sore throat, body aches, D, rhinorrhea, sinus tenderness
- dyspnea duration 13 days in survivors (Zhou F. Z. et al.)
- 18% infected people on the Diamond Princess Cruise Ship were "asymptomatic" (Mizumoto, K. et al.); presymptomatic spread 24-72 hr before Sx? (Wei W. et al.)

Labs:

- baseline labs: TG, CK, D-dimer, ferritin, fibrinogen, LDH, trops, RVP, MRSA swab, UPT, HBV, HCV, HIV, CXR, ECG (QTc prolongation HCQ, Kaletra)
- baseline & daily labs: CMP, CBC/d, PTT/INR, CRP
- if critically-ill: IL-6, G6PD
- general lab findings: lymphopenia, ↑ LDH, ↑ AST/ALT
- **severe disease predictors**: COPD, asthma, CKD, DM, HTN, immunosuppression, HIV (regardless of CD4), CRP > 100 mg/L, D-dimer ≥ 0.5 mg/L, LDH > 250 U/L, elevated trop, ferritin > 300 ug/L, ALC < 0.8, high fever, age 60+
- lymphocyte count lowest on day 7 after illness onset, improved in survivors; severe lymphopenia continued until death in non-survivors (Zhou F. Z. et al.)

Imaging:

- common radiographic findings: b/l lung involvement (79%), peripheral distribution (54%), diffuse distribution (44%), GGO (65%), w/o septal thickening (65%); no tree-in-bud, masses, cavitation, calcifications (Shi H et al.)
- CXR insensitive in mild or early ifn (Wong H. Y. F. et al.)

- CT ↑ sensitivity for early parenchymal lung disease, progression, eval for alternative Dx
- per Radiology, Chest, imaging not indicated for COVID-19 w/ mild clinical features, but ↑ risk for disease progression (e.g., comorbidities) or worsening respiratory status is indication (Rubin G. D. et al.)
- reimaging can be useful to evaluate for secondary cardiopulmonary abnormalities (PE, secondary bacterial PNA, ADHF 2/2 COVID-19 myocardial injury)

Testing:

- UCMC: IP, certain ED patients, symptomatic UCM/BSD employees, and high-risk symptomatic OP via teletriage (x2-2800 or free MyChart ILI e-visit via patient portal)
- 50+ w/ ILI, 18+ w/ ILI and comorbidity (chronic lung disease, CVD, CKD, cancer, blood disorder, DM, endocrine/metabolic disorder, neurologic disorder, liver disease, pregnancy (32+ weeks gestation), HIV/AIDS, immunosuppression), HCW w/ ILI, high risk pediatric pts w/ ILI (see ambulatory pathway), pre-procedure, pre-op, ESRD, first responders, active labor,
- rapid (< 3 hr) test: ER pts adm w/ ILI, ER pts d/c to communal living environments and dialysis units, pts adm for solid oral transplantation or symptomatic pts in labor
- curbside testing: appointment only 10a-2p all days excluding Sunday
- http://hdx.org/covid summarizes CDC and public health recs for who should be tested

Rule out:

- probably 1 negative test if alternate Dx, but 2 negatives 48 hours apart if no alternate Dx
- **do not** discontinue precautions if 1 negative test; need clearance from COVID-19 team
- clearing PUIs: 30104

Treatment:

- ventilation
- HCW safety strategies: CTX → cefdinir, MRSA screen to limit vanc use
- remdesivir (ribonucleoside inhibitor) compassionate use in effect at UCMC
    - AE: N, V, ↑ ALT, avoid if CrCl < 50 mL/min
- hydroxychloroquine 400 mg q12h d1, 200 mg q12h d2-5 + lopinavir/ritonavir (Kaletra) 400 mg q12h d1-5 if not qualified for remdesivir study
- in 199-patient RCT, lopinavir–ritonavir did not affect time to clinical improvement, mortality, detectable viral RNA (stopped early in 13.8% 2/2 AE) (Cao B. et al.)
- 4/6 non-peer-reviewed summary of shaky HCQ data:
    - RCT suggests improvement in fever and CT (Chen Z. et al.)
    - reanalysis of initial study assumptions questions claims (Hulme O. J. et al.)
    - no improvement in 11 patients in France w/ HCQ/azithro (Molina M. M. et al.)
    - QTc prolongation (d3-4) > 40 ms in 30%, > 500 mL in 11%, correlates w/ development of renal failure (not baseline QTc) w/ HCQ/azithro (Chorin E. et al.)
    - bad interaction of (OH)CQ w/ metformin in *mice* (Rajeshkumar N. V. et al.)
- Tocilizumab (IL-6 inhibitor)

    - indications: rapidly worsening blood gas, radiographic worsening, crackles, SpO2 ≤ 94% on RA, > 6 L HFNC and/or CRP > 100, ferritin > 300 ug/L w/ doubling, ferritin > 600 ug/L and LDH > 250, D-dimer >1 mg/L
- convalescent plasma 200-500 mL (4-5 mL/kg x 2)
- less useful: steroids, BS antivirals (ribavirin), IFN-α, IFN-β
- suggest against routine glucocorticoids for respiratory failure w/o ARDS, but suggest for glucocorticoids w/ ARDS (weak for LQE) (Poston, J. T. et al. 2020)

Inpatient

HCW re-assignment:

- pregnancy, cancer, immunocompromised, age 70+

Management:

- for all non-intubated patients: AVOID nebs (use MDI w/ spacer)
- for codes, DO NOT use a bag valve mask (compression-only CPR, NRB)
- no changes to ACEI/ARBs per ACC
- limit CPT (acapella, manual), incentive spirometry when able
- if req. > 6 L NC, > 44% FiO2 for SpO2 > 91%, intubate
- initial vent settings: 10/450/5/100
- helmet ventilation: intranet video, tip sheet, other information
    - compared to BiPAP in unblinded single-center RCT for ARDS: ↓ intubation, ↓ mortality (Patel B. et al.)
    - goal during COVID-19: obviate need for intubation
    - indications: SpO2 < 92%, RR > 30, 6 L NC and/or transitioning to NRB, Hx or high probability of OSA
    - order CPAP, write helmet NIV in comments, use mepilex/duoderm/hand towel
    - secure with arm straps
    - per flow x FiO2 table, start 100% FiO2, PEEP 8 cm H2O
        - ensure PEEP/FiO2 documented in EMR, talk w/ RT closely, RNs sign out
        - don't let helmet/attachments get thrown away
    - if no improvement after 2 hours, intubate

Rounding:

- Computer pre-round only, no examination, consider calling patients
- Attending rounds: 6 feet between all providers
    - attending-only patient: attending documents exam
    - all others: round intern + senior (6 feet between providers) or phone round, only attending and either intern or resident enter room on rounds (same designations on subsequent days)
    - Gens: interns round separately with faculty (phone or in person)
    - call days: resident and the intern examine new patients

COVID transfers:

- place order and page: floor 30039 (COV Unit Hospitalist), ICU 30036 (COV Unit Resident 1), charge RN 53966
- intubate early: PUIs > 5 L NC, > 40% FiO2
- no HFNC or BiPAP (incl. OHS/OSA, but keep on pulse ox)
- when cleared by ID, they will enter a note, & bed access will begin moving pt. to Mitchell

Dr. Cart:

- Dr. Cart coverage, AgileMD pathway
- limit people in room to < 8 (1-2 airway providers [anesthesia, RT], 1 leader, 1 assistant, 2-3 rotating chest compressors, 1 critical care RN for meds, 1 RN recorder)
- patient may be PUI given aerosolizing procedure: ID recommends against N95 (i.e. carry for the day), face shield, gowns, gloves for asymptomatic individuals, but extended use of N95 recommended
    - masks in 4418 (put back if you don't use it)
- if primary team is present and comfortable, encourage primary team to run
- if coding and not intubated, **DO NOT** use a bag-valve mask (even with a filter); place on NRB (not a simple oxymask) while you start chest compressions
- anesthesia will not intubate w/ compressions ongoing; they will try to intubate during a pulse and rhythm check (can be extended)
- as always, minimize interruptions to compressions (high quality CPR saves lives)
- once intubated, hook up to the ventilator (even during the code)
    - vent settings: PC (AC) for 6 mL/kg IBW vs. 10/450/5/100; trigger "off" to prevent auto-triggering w/ compressions (possibly prevent hyperventilation, air trapping), RR 10, secure ETT
- if bag valve mask is needed, it can be used, but only with a filter
- COVID units respond to their own Dr. Carts (will not be paged overhead)
- ethical considerations from COVID-19 Ethics Resource Group

ED:

- floor stable patients can go to floor (**ALL** with mask on) without seeing admitting team
- either ED places holding orders and remains FCP (w/ 2nd page for SO when bed available) or evaluate patient in ED (wear surgical mask and eye shield at all times)
- bring PPE from upstairs if you go down to evaluate
- ambulance bay (negative pressure) is overflow
- unstable ILI patients: SPED
- COVID-19 positivity ≠ admission indication (exceptions: NH residents, unable to separate from others safely)
- since rapid test: if 1st COVID-19 test is still in process, ask if they are able to hold onto the patient until the test results (or for ICU, if they need specific ICU assistance)

- labs: if positive in ED, ED will page COVID-19 triage, add on for tests/inflammatory markers (see COVID-19 orderset, AgileMD), and place ED skeleton holding orders (full admit orders per admitting team)

Transfusion recommendations:

- minimize waste using EBM guidelines summarized here
- donations are possible by appointment (773-702-6247)

M2B:

- 7a – 5p (Mon – Fri)
- Regular hours resumed 4/4

Sign out:

- over phone whenever possible
- add “COVID-19 status”: not tested, pending, negative (@date@), POSITIVE (@date@)

Housing, dispo:

- social Work COVID-19-Homeless Liaison p30066
- McCormick Place Alternate Care Facility (MPACF): accepting those w/ minimal medical support and still in need or isolation
    - req: COVID-19+, 18+, SpO2 > 91% on 2 L, independent in ADLs, VSS 24h
    - send w/ 10 days of meds (M2B), home equipment (CM)

Interpreters:

- 133 from any hospital phone, 844-594-6452 from any mobile phone

Consults:

- Ophtho: intubated and sedated pts need lacrilube ointment q4 hr to both eyes to prevent exposure keratopathy / corneal ulcers; coronavirus can cause conjunctivitis, which is self-limiting and does not require treatment other than lubrication
- Wound care/derm: be sure to take pictures of the wounds / rashes and put them in the chart; consultant will review and determine if visit is necessary
- EEGs must be authorized by epilepsy attending if COVID-19 positive or pending (preferably postponed until PCR results if pending)

End-of-life visitation:

- Non-symptomatic immediate family members (up to two at a time) can visit dying or recently deceased COVID-19 pts

Outpatient

- 4th floor DCAM COVID-19 and ILI clinic: subspecialists and ambo clinicians to eval COVID-19 or ILI patients; COVID+PUIclinic@uchospitals.edu or 773-683-9324
- no ILI patients should be seen in Urgent Care
- tip Sheets for virtual visits: non-COVID, COVID
- use "Ambulatory Virtual Visits-Routine Follow up" smartset
- COVID-19 testing telehealth algorithm (or use AgileMD algorithms for ambo, telehealth)

PCG:

- evaluating ANY patient for the first time: call room or cell to screen for ILI Sx (F, cough, sore throat, body aches, D, rhinorrhea, sinus tenderness)
    - if uncertain: eyeshield and surgical mask
    - if c/f ILI: eyeshield, mask, gown, and gloves; ILI Eval Express Lane (in smartsets)
    - ILI/COVID-19: one attending and one resident; resident Hx, attending swab (NEVER BOTH GO IN TO SEE SAME ILI/PUI PATIENT)
- MP clinic schedule
- Telehealth (or MyChart e-visit if willing)
    - pgy1 CALL preceptor on the schedule once during the half day; pgy2/3 send EPIC phone messages to preceptor on the schedule for review
    - open encounter from schedule → copy forward note: remove exam and past HPI, add dotphrase about COVID-19 and call, do note → "Ambulatory Virtual Visit" Express Lane, Sign → problem list, meds, etc. →
- email Danny each session with the number of adults and kids you saw as telehealth

BMED teletherapy:

community partners. send referrals by email. include name, phone number, reason for referral, cc: nlaiteer@medicine.bsd.uchicago.edu.

Cathedral Counseling	jwall@cathedralcounseling.org
Claret Center	cruzi@claret.org
Friend Health	epalos@bsd.uchicago.edu; lamarillo@bsd.uchicago.edu
In Home Counseling	info@inhomecounselingservices.com
Ingalls *teletherapy coming soon*	jbosley@ingalls.org; adahleh@ingalls.org
Nurture Therapy	hello@nurture-therapy.com

formerly Jamie Kreiter & Associates	

Pharmacy:

- 4/8/20 pharmacy hours information around Hyde Park
- pharm7 (mail pharmacy) tip sheet

Patient resources

- COVID-ready communication skills from Seattle, VitalTalk
- meals on wheels referral for high-risk individuals (60+ w/o social support, i.e. bought and delivered): (312) 744-4016, press 0'
- OWID informational video, UChicago informational video
- Chicago stay at home order
- CDC: what do do if you are sick, prevention, those at higher risk, FAQ, getting your home ready, disinfecting your home, talking with children about COVID-19, pregnant and breastfeeding women (UCMC employee information re: pregnancy)
- Vox: flattening the curve (benefits of stay at home)
- NYT: yes it's safe to take a walk, zoo webcams, what I learned when my husband got sick with coronavirus
- WP: what it's like to be infected with coronavirus, how to keep your cool with kids when everyone is cooped up together, daily online live classical concerts, can we get past this? yes!
- WSJ: older adults and coronavirus stress
- Atlantic: how might life get back to normal
- COVID-19 for cancer patients (audio)
- safely bringing groceries and take-out into your home
- Medium: how social actions can help
- WHO: coping with stress during the COVID-19 outbreak
- Billboard: daily online concerts

Lectures and learning

Medicine lectures

- Morning Report: https://ucmedicinegroup.zoom.us/j/425613025
- PGY2/3 Ambo Lecture Tues: https://ucmedicinegroup.zoom.us/j/249145671
- PGY2/3 Ambo Lecture Fri: https://ucmedicinegroup.zoom.us/j/869665710
- PGY1 Ambo Lecture Thurs: https://ucmedicinegroup.zoom.us/j/428033289
- Grand Rounds: https://ucmedicinegroup.zoom.us/j/364242914
- General Medicine MDR: https://uchicagomedicine.zoom.us/j/385604139
- Cardiology MDR: https://uchicagomedicine.zoom.us/j/722472321
- Hematology/Oncology MDR: https://uchicagomedicine.zoom.us/j/428523061
- Hospitalist COVID-19 case conference (Mon. 5-6 pm): https://uchicagomedicine.zoom.us/j/340453895

- 2 pm Critical Care Lectures: https://ucmedicinegroup.zoom.us/j/895835368

Pediatrics lectures

- Morning Report: https://ucmedicinegroup.zoom.us/j/174518203
- Noon Conference: https://ucmedicinegroup.zoom.us/j/915191631

Other learning resources:

- Stanford Medical Statistics Certificate
- Writing in the Sciences

Coping and wellness

- wellness resources and strategies for residents ppt
- BSD resources, including daily/weekly zoom sessions
- Perspectives, the Employee Assistance Program
- peer support line: clinical psychologists, chaplains, SW, psychiatrists; all anonymous and confidential available 12-9pm: 800-660-5684
- psychological support hotline 12-9pm for HCW: 800-683-5704

From City of Chicago:

- mental health, childcare, transportation, housing

Food and drink:

- free Starbucks 3/25-5/3
- farmer's fridge: 25% discount "HEALTHY" (CCD 7th Floor near staff break room, 8E public elevator vestibule, Sky Lounge, Comer 3rd Floor Skywalk, DCAM Lobby)

Donations:

- Nicer cloth masks (very cute ones donated by Julia Nath)
- Washable bags (thanks Rebeca Ortiz)
- Goggles/glasses (thanks Rebeca, Alan)
- Thermometers (thanks GME)
- Small toiletries (shampoo/conditioner/soap, etc for call rooms; thanks Cindy)
- Washable Bags (thanks Rebeca) - in chiefs room

Childcare:

- UChicago
- city of Chicago

Housing:

- form

- Joe Goldenberg also has an Airbnb connection

Free apps and online resources:

- Headspace Meditation app is FREE for anyone with an NPI number
- Ten Percent Happier is free for healthcare providers for six months
- Downdog yoga is offering free membership to healthcare providers through September
- Glaad is circulating a petition to lift the ban on gay/bisexual/MSM from donating blood
- Calm offers free meditations and sleep stories
- Marlynn Wei, MD is a psychiatrist and yoga instructor offering free guided meditations
- Planet fitness free live-streamed at-home workouts daily at 7 pm
- Peloton free 90-day trial to its workout app (no bike needed)

Helping from home

Infection control help:

- Includes: contact tracing, IDPH case reports, counting positive results, setting up new cohort rules, notifying EMS
- 2 people/6-hour shift (7a-1p, 1p-7p)
- if interested, email Josh

Pandemic recovery program:

- champions for 30-min training in disaster recovery modules
- the list