SARS-CoV-2 UCMC Supplement

https://drive.google.com/file/d/11Rh9o5AWc57fR50rNkA2Ly1eRDwF1haa/view?usp=sharing


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 Katiyln 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:**
- UMC 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
- UMC 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, trop5, 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](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.

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