Inpatient COVID-19 Update
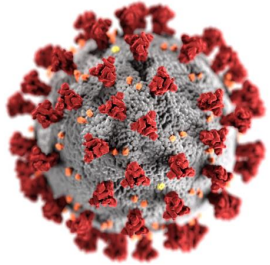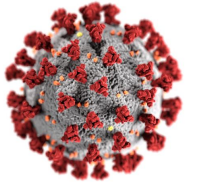
Project ECHO at MAHEC

Rebecca.Bernstein@mahec.net
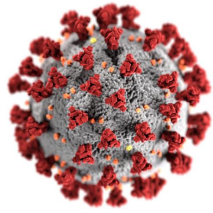
Future Sessions on COVID-19
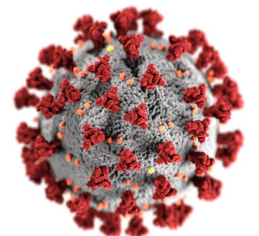## Wednesdays - 12 noon

August 12 – Dr. Ahmed Sesay, Pulmonary

August 26 – Dr. Alisa Alker, Infectious Disease

September 9 – Racial/Ethnic Disparities

September 23 – Diabetes/Chronic Disease

October 7 – TBA

October 21 – TBA
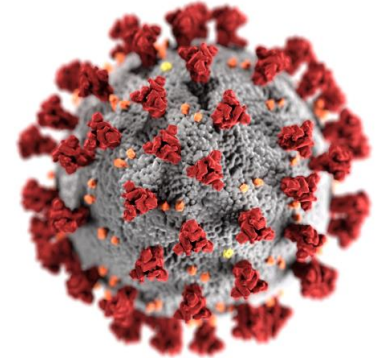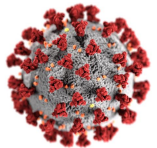
COVID-19 Western North Carolina Dashboard (18 Counties)

Last Update (updated weekly): 7/21/2020

County Map by Case

Cases Per 10,000

03/16 ———————————————— Oct/28

Click to highlight map, unclick to revert map
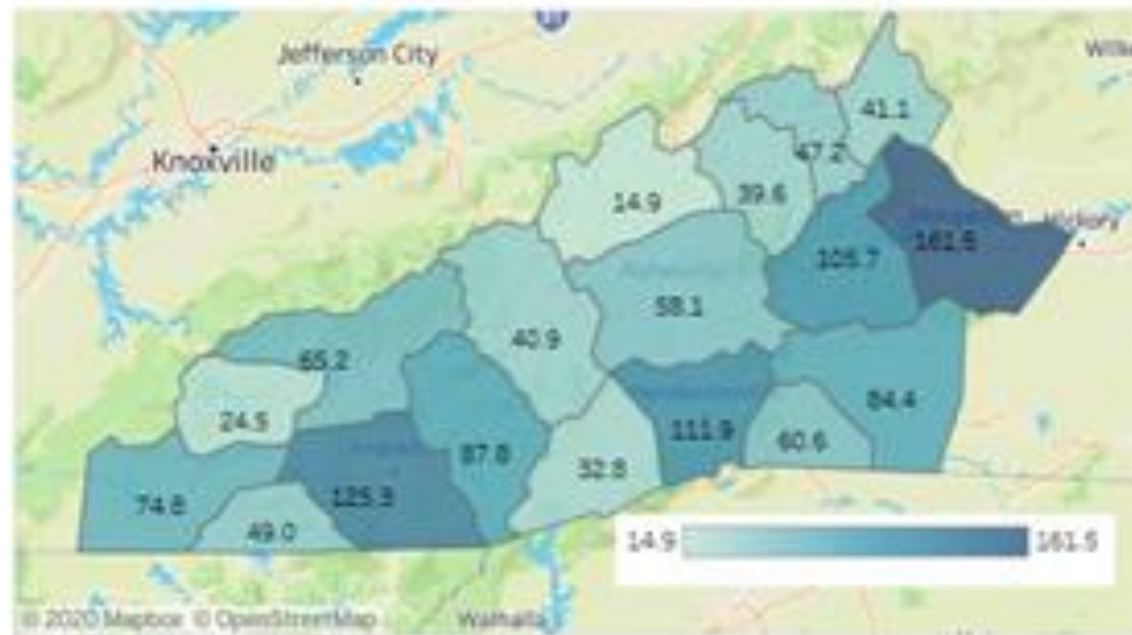
Lab-Confirmed Cases

Graphs show data for counties selected in map

⦿ Cases by date reported
◯ Cases by date of specimen collection

Cases by date reported

18 county region
Total cases=7,214
Total deaths=152
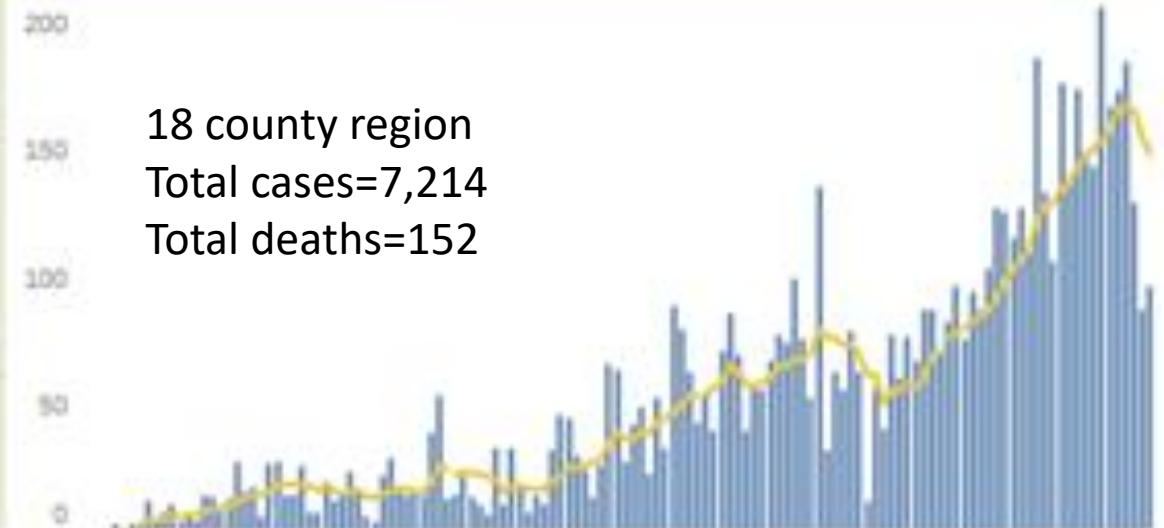
WNC Healthy Impact

Heat map in above is for cases per 10k population
Graph on right shows cases per day (based on report date), the yellow line is a 7 day moving average

Western North Carolina Demographics

Select County:

[(All) ▼]

Select Demographic Metric:

[Cases ▼]

Data can be filtered by county and demographic data. All data will reflect data for that group. Numbers may not equal 100% due to rounding. All data are primary and subject to change.

By Race

Race	Percentage
American Indian Alaskan Native	1.4%
Asian	0.8%
Black or African American	6.3%
Native Hawaiian or Pacific Islander	1.6%
White	89.1%
Other	0.8%

By Age

| Age	Percentage
0-17	12%
18-24	13%
25-49	41%
50-64	18%
65-74	8%
75+	9%

By Ethnicity

Ethnicity	Percentage
Hispanic	36.4%
Non-Hispanic	63.6%

By Gender

Gender	Percentage
Female	52.6%
Male	47.4%
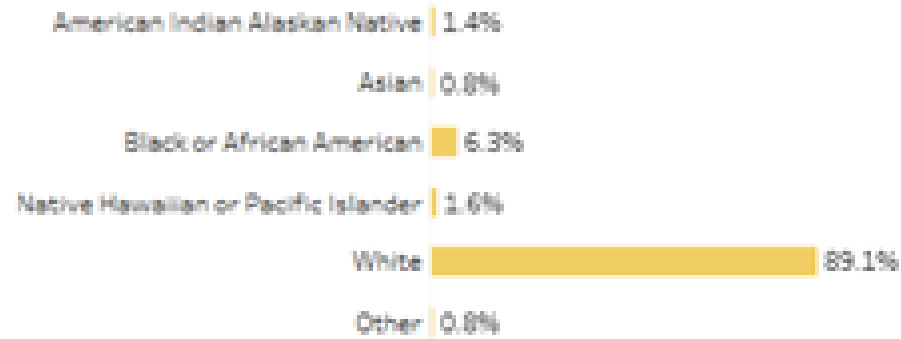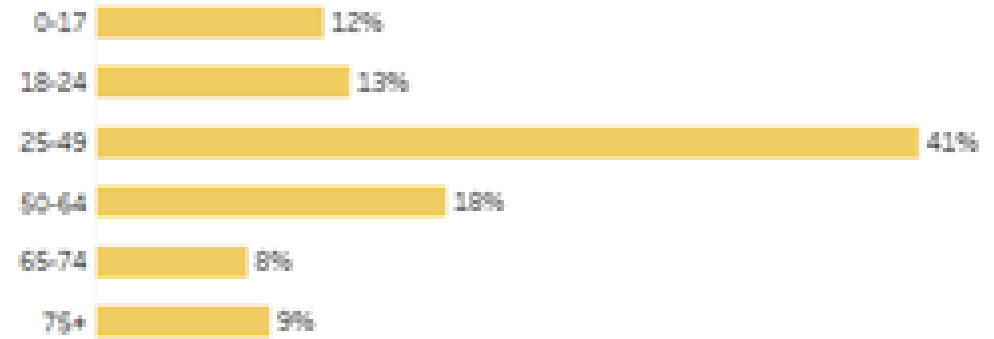
Missing Demographic Data

Metric	Percentage	Count
Cases by race	29.2%	2,038
Cases by Age	0.0%	1
Cases by ethnicity	32.8%	2,368
Cases by gender	1.4%	101

WNC Healthy Impact

Severity of disease

- Cohort in China: 44,000 patients
  - 81% had mild to moderate disease
  - **14% had severe disease** which was dyspnea, hypoxia, or 50% lung involvement on imaging
  - 5% were critical – resp failure, shock, Multiorgan system dysfunction

CDC.gov/coronavirus

Onset of Symptoms

- Symptom onset: 2-11 days since exposure
- Starts with fever and cough
- Dyspnea: 5-8 days
- ARDs: 8-12 days

- Length of hospitalization: 10-13 days

- 26-32% of all hospitalized patient were admitted to ICU

CDC.gov/coronavirus

ARDS: Acute Respiratory Distress Syndrome

- All patients: 3-17%

- Hospitalized patients: 20-42%

- ICU patients: 67-85%

- ICU mortality ranges: 39-72%

CDC.gov/coronavirus

Case Study

- 40M with DM2, not on insulin p/w SOB, fever, cough, body aches, mild diarrhea x1 week

- Exposed to known COVID+ 1 week prior

- ED vitals: T 103.0, HR 130-140s, Normotensive, O2 sat – 83% on room air, RR 40-50bpm!

- EXAM: Lungs clear!

- Na 133, glucose 423, A1c 8.2%

- ABG:
  - 7.48, PCO2: 26, **PO2: 63** on 4L NC and 36% O2.
  - PF ratio was 175, A-a gradient 161
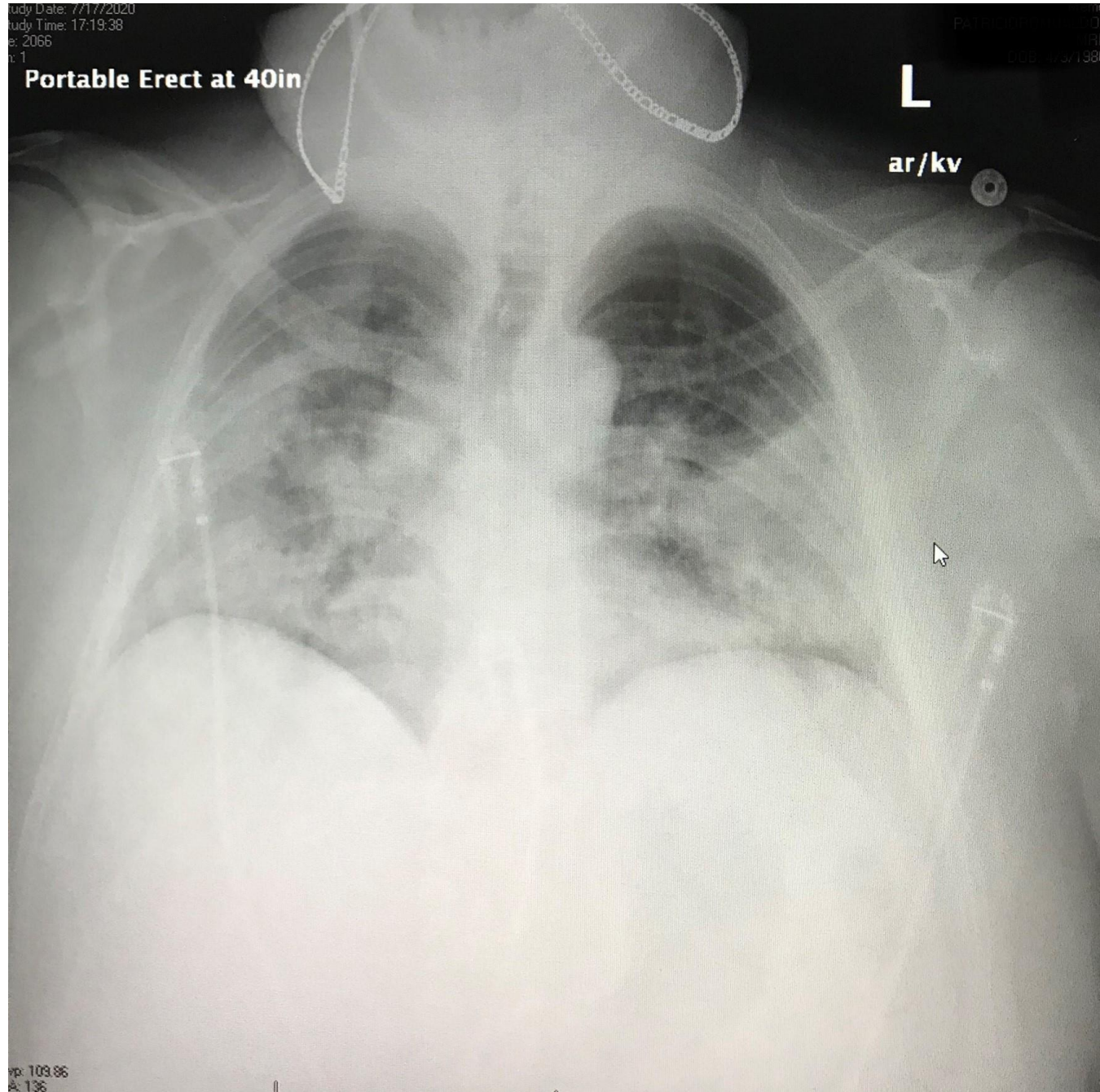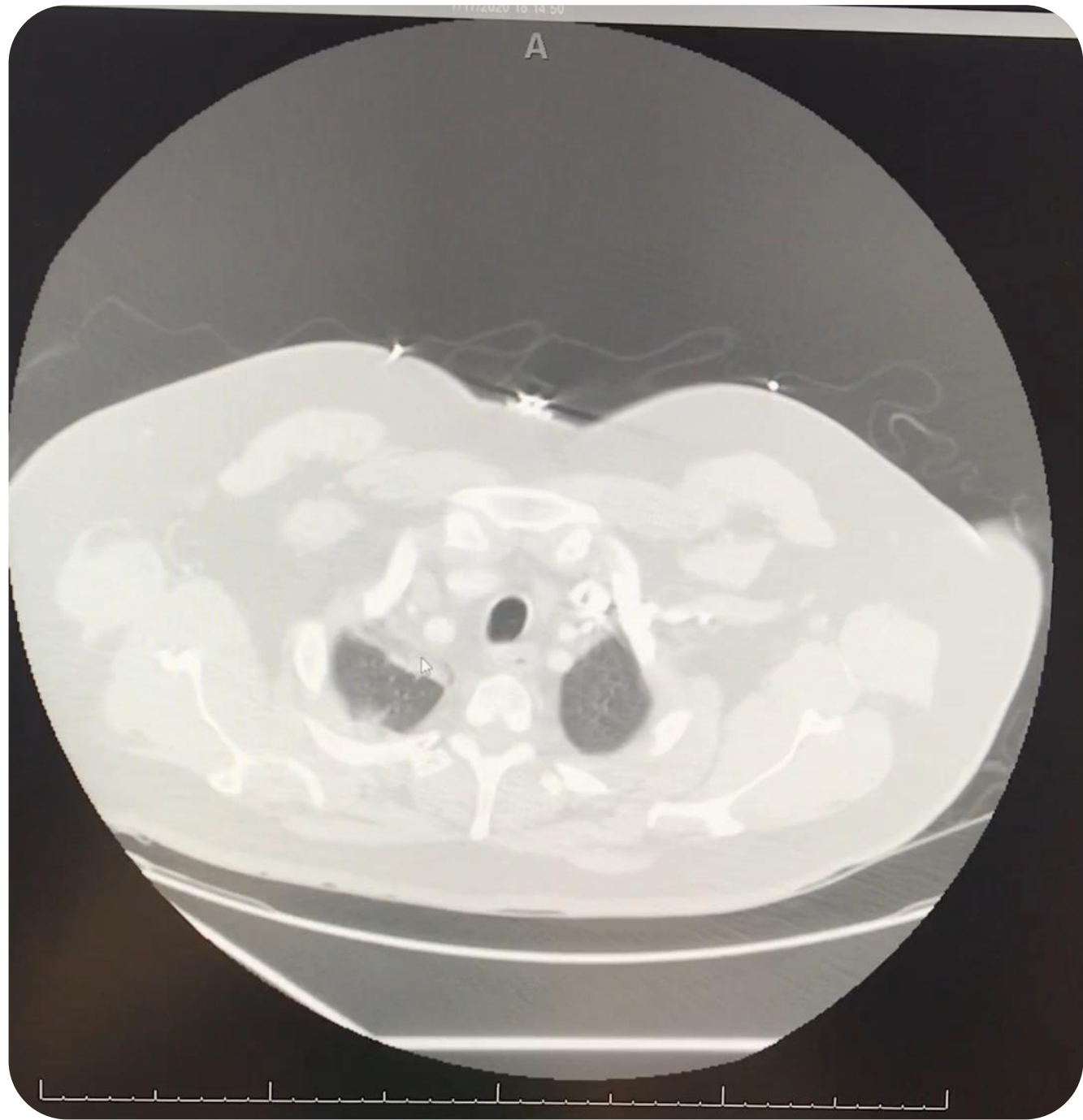
Questions

- How do I stabilize?

- How do I prevent deterioration?

- How do monitor to see that he is getting better?

Admission

- COVID-19 suspected/confirmed and inability to tolerate orals, hypoxia

- Place on isolation

- Initial workup:
  - CBC, CMP, PT/PTT, Troponin, BNP
  - LDH, CRP, Ferritin, CPK
  - Ddimer, ?APL
  - Type and Cross in case they need Convalescent Plasma
  - ABG if hypoxic
  - UA/Urine Culture, blood culture x2, sputum culture

Case Study Labs

	Admission	Day 6	Day 9
LDH (IU/L)	760	526	276
CRP (mg/dL)	19.31	4.40	0.61
Ferritin (ng/mL)	3279	1147	**1232**
D-Dimer (mcgFEU/mL)	2.06	0.88	0.53
Lymphocyte, absolute	1.0	0.5	
Lactic Acid (mmol/L)	2.61	1.86	

Respiratory

- Nasal cannula → HFNC (Optiflo, Vapotherm)
  - Target SpO2 92-96%
  - Avoid NPPV unless other indication

- Incentive spirometry

- ROX Index for intubation after HFNC = $\dfrac{SpO_2/FiO_2\%}{Resp\ rate}$

- Proning

https://www.mdcalc.com/rox-index-intubation-hfnc

Proning

Supine   Prone
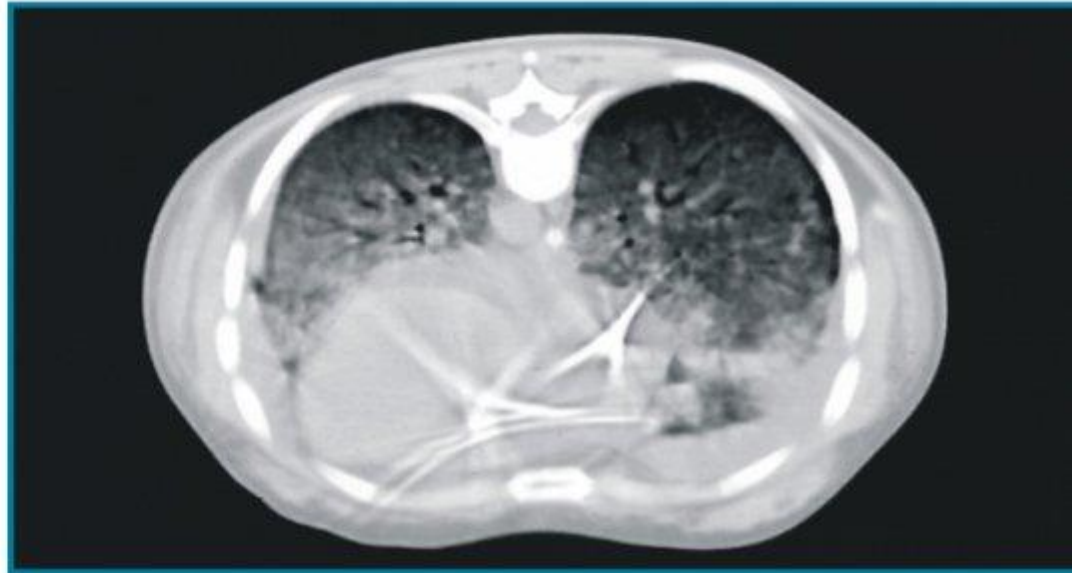
Other Tenants of Therapy

- IVF: Keep dry vs. buffered/balanced crystalloids
- Anti-pyretic: Avoid NSAIDs to avoid renal damage
- Antibiotics?
- VTE prophylaxis
- Steroids
- Antivirals
- Convalescent Plasma

Antibiotics?

Acute Bacterial Co-Infection in COVID-19
A Rapid Living Review and Meta-analysis

28 Studies included

3448 COVID-19 Patients

December 2019 to March 2020

3.5% Co-Infection
On presentation

15.5% Secondary Infection
After presentation

71.3% Antibiotic Prescribing

Langford BJ, So M, Raybardhan S, Leung V, Westwood D, MacFadden DR, Soucy JPR, Daneman N. Clinical Microbiology and Infection. 2020.

TARRN
www.tarrn.org/covid

VTE Prophylaxis

Mission Hospital Venous Thromboembolism (VTE) Prophylaxis and Treatment for COVID-19 Positive or PUI Patients

MISSION HOSPITAL

COVID-19 Positive or PUI Inpatients

Call Out: If a PUI patient tests negative, follow facility standard of practice for ruling out VTE

!Attention! Optimize medications and dosing frequency to minimize nurse and patient interaction

Labs on admission: D-dimer, PT, aPTT, fibrinogen, CBC with differential
Inpatient Labs every 2-3 days: D-dimer, fibrinogen

- All COVID-19 positive and Patients Under Investigation (PUI) patients should receive VTE prophylaxis or treatment anticoagulation
- All severely ill COVID-19 positive and PUI patients are considered high risk for VTE until proven otherwise
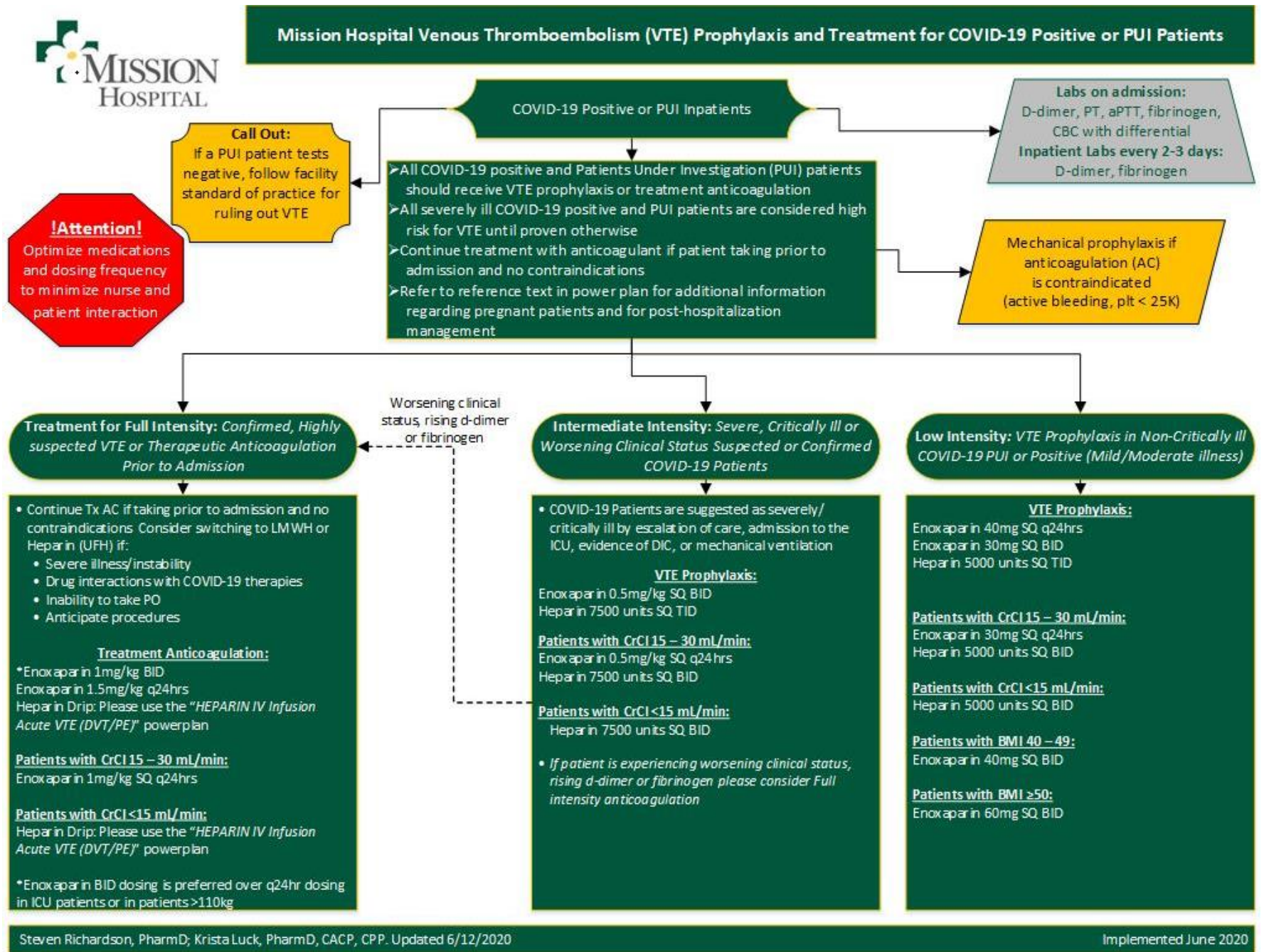- Continue treatment with anticoagulant if patient taking prior to admission and no contraindications
- Refer to reference text in power plan for additional information regarding pregnant patients and for post-hospitalization management

Mechanical prophylaxis if anticoagulation (AC) is contraindicated (active bleeding, plt < 25K)

Worsening clinical status, rising d-dimer or fibrinogen

Treatment for Full Intensity: *Confirmed, Highly suspected VTE or Therapeutic Anticoagulation Prior to Admission*

- Continue Tx AC if taking prior to admission and no contraindications. Consider switching to LMWH or Heparin (UFH) if:
  - Severe illness/instability
  - Drug interactions with COVID-19 therapies
  - Inability to take PO
  - Anticipate procedures

Treatment Anticoagulation:
*Enoxaparin 1mg/kg BID
Enoxaparin 1.5mg/kg q24hrs
Heparin Drip: Please use the "HEPARIN IV Infusion Acute VTE (DVT/PE)" powerplan

Patients with CrCl 15 – 30 mL/min:
Enoxaparin 1mg/kg SQ q24hrs

Patients with CrCl <15 mL/min:
Heparin Drip: Please use the "HEPARIN IV Infusion Acute VTE (DVT/PE)" powerplan

*Enoxaparin BID dosing is preferred over q24hr dosing in ICU patients or in patients >110kg

Intermediate Intensity: *Severe, Critically Ill or Worsening Clinical Status Suspected or Confirmed COVID-19 Patients*

- COVID-19 Patients are suggested as severely/critically ill by escalation of care, admission to the ICU, evidence of DIC, or mechanical ventilation

VTE Prophylaxis:
Enoxaparin 0.5mg/kg SQ BID
Heparin 7500 units SQ TID

Patients with CrCl 15 – 30 mL/min:
Enoxaparin 0.5mg/kg SQ q24hrs
Heparin 7500 units SQ BID

Patients with CrCl <15 mL/min:
Heparin 7500 units SQ BID

- *If patient is experiencing worsening clinical status, rising d-dimer or fibrinogen please consider Full intensity anticoagulation*

Low Intensity: *VTE Prophylaxis in Non-Critically Ill COVID-19 PUI or Positive (Mild/Moderate illness)*

VTE Prophylaxis:
Enoxaparin 40mg SQ q24hrs
Enoxaparin 30mg SQ BID
Heparin 5000 units SQ TID

Patients with CrCl 15 – 30 mL/min:
Enoxaparin 30mg SQ q24hrs
Heparin 5000 units SQ BID

Patients with CrCl <15 mL/min:
Heparin 5000 units SQ BID

Patients with BMI 40 – 49:
Enoxaparin 40mg SQ BID

Patients with BMI ≥50:
Enoxaparin 60mg SQ BID

Steven Richardson, PharmD; Krista Luck, PharmD, CACP, CPP. Updated 6/12/2020

Implemented June 2020

Steroids

- RECOVERY Trial: **Significant reduction in the incidence of death** for those on supplemental O2 or mechanical ventilation at the time of randomization. It seems to have a more robust effect in the Mech Ventilation arm.

Steroids

- Montefiore Medical Center
  - Early use of Glucocorticoids was not associated with mortality or MV
  - CRP >20mg/dL: (odds ratio, 0.23; 95% CI, 0.08-0.70)
  - CRP <10mg/dL: (OR, 2.64; 95% CI, 1.39-5.03)

J. Hosp. Med. 2020 August;15(8):489-493

Remdesivir

- <u>NIH</u>: "**remdesivir be prioritized for use in hospitalized patients with COVID-19 who require supplemental oxygen but who are not** on high-flow oxygen, noninvasive ventilation, mechanical ventilation, or ECM...**uncertainty regarding whether starting remdesivir confers clinical benefit in these groups**"

- <u>IDSA</u>: "Remdesivir appears to demonstrate the **most benefit** in those with **severe COVID-19 on supplemental oxygen rather than** in patients on mechanical ventilation or extracorporeal mechanical oxygenation (ECMO)."

Adaptive Covid-19 Treatment Trial (ACTT-1), NEJM 2020

Convalescent Plasma

Inclusion Criteria
- Age at least 18 years
- Laboratory confirmed diagnosis of infection with SARS-CoV-2
- Admitted to an acute care facility for the treatment of COVID-19 complications
- Severe or life threatening COVID-19, or judged by the treating provider to be at high risk of progression to severe or life-threatening disease
- Informed consent provided by the patient or healthcare proxy

Severe COVID-19 is defined by one or more of the following:
- Dyspnea
- Respiratory frequency ≥ 30/min
- Blood oxygen saturation ≤ 93%
- $PaO2 : FiO2$ ratio < 300
- Lung infiltrates increased 50% within 24 to 48 hours

Life-threatening COVID-19 is defined as one or more of the following:
- Respiratory failure (requiring mechanical ventilation)
- Septic shock
- Multiple organ dysfunction or failure

COVID19PLASMA@HCAhealthcare.com
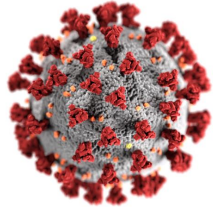
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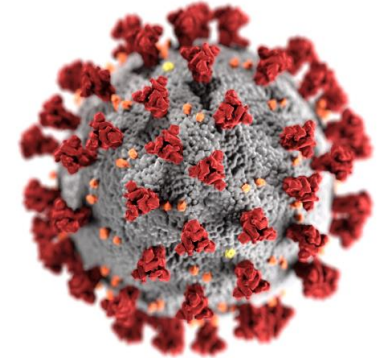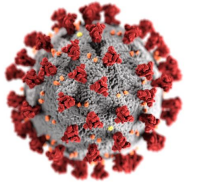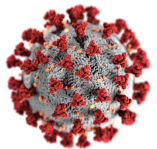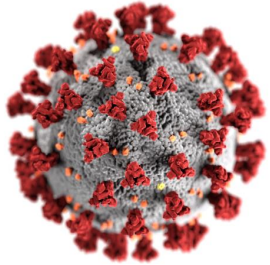
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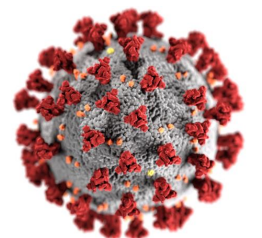
Resources

- Society of Hospital Medicine
  - https://www.hospitalmedicine.org/clinical-topics/coronavirus-disease-2019-covid-19-resources-for-hospitalists/critical-care/
- NIH
  - https://www.covid19treatmentguidelines.nih.gov/whats-new/
- Standford Surge Handbook
  - https://www.notion.so/Welcome-d2ed89001a5748789ed90b91aff8e14b
- Montefiore Medical Center
  - http://einstein.yu.edu/departments/medicine/new/covid-19-resources/