Practice Guidance- DCU Field Hospital

4/24/2020

Updated: 8/5/2020-Wessolossky

V9 Draft Form

Broach/McManus/Forster/Milsten/Kobayashi/Wessolossky/Poisson-Irani/ Monnier-Serov/Slosar-Cheah/Kobayashi/Reznek/Kotkowski/Eisenstock

Location: DCU Center Exhibit Hall (50,000 square feet)

Mission: Care of COVID19 + patients requiring low acuity inpatient acute care as defined below:

Concept of Operations (abbreviated):

Six Units 36-42 beds in each plus two acute care resuscitation areas with 3 beds each

Each unit can be stood up independently to accommodate growing need for surge space

1 “rapid response” team staffed by RN resource/1 attending provider

BLS/ACLS code response provided by 911 services through WEMS

Admission Criteria:

Lab confirmed COVID+

Resting O2 sat 94% or greater on no more than 4L NC O2

Resting HR less 120

Respiratory Rate <= 20/min

No hemodynamic instability

Included Patients:

Up to two-person level of assist for mobility and ADLs

Patients with some cognitive or behavioral comorbidities requiring safety sitters

Patients requiring some mobility assistance including help getting to the restroom+

Individuals experiencing homelessness from the Worcester area

Exclusion criteria:

Pediatrics

Pregnancy

Major Behavioral health comorbidities (i.e., schizoaffective disorders, aggressive behavioral disorders)

Total care needs

Anticipated need for rapid escalation of care

Disposition:

After treatment, plan to discharge to home or post-acute care treatment facility.

Deployment schedule

Each provider shift is 12 hours

Capabilities as expected upon patient admission:

Lab

Glucose monitoring for point of care

Onsite iStat Chem 8 and VBG/lactate

Send out capability for CBC with diff, LFTs, others as required, ie UA/C+S/Sputum C+S

Radiology

Onsite chest X-ray

EKG

Intermittent Pulse Ox monitoring,

Vital signs every 4 hours

O2 up to 4 L/min

Intravenous access

Administration of inhalers

Limited administration of nebulized medications

Resuscitation Bay

Ability to manage a patient requiring a higher level of care for up to 2 hours while awaiting transport via ALS or CCT to an appropriate patient care location.

On site or easily available ALS and CCT transfer capability for decompensation patient via Worcester EMS and UMass Life Flight ground operations.

Staffing model is flexible based on availability of staff can modified by medical director as needed.

Triage recommendations regarding outside transfer requests and observation period

No period of observation at an outside hospital is required before accepting COVID patients who have <= 1 L oxygen requirement and mild dyspnea.

A period of observation of at least 6 hours without escalating O2 requirements is required before accepting patients who have 2 L O2 requirement and mild dyspnea.

A period of at least 12 hours of observation is recommended for patients requiring oxygen support > 2L or moderate dyspnea at the time of transfer request.

All patients requiring a period of respiratory status observation should be placed in an inpatient or observation admission as clinically appropriate. The period of respiratory status observation should not result in the patient remaining in an ED status.

Who is an appropriate patient for triage to the DCU Field Hospital?

1) A patient with a low burden (<=5) of chronic conditions
2) A patient with a lower (<=4L) oxygen requirement and few signs of respiratory distress
3) A patient free from a significant and active cardiovascular or pulmonary condition
4) A patient observed in an inpatient or emergency environment according to the above guidelines.
5) A patient on low-dose steroids or a patient with HIV with normal CD4 counts is appropriate for triage

Who is not an appropriate triage for the DCU Field Hospital?

1) In general, patients with evidence of ongoing respiratory distress are not appropriate for triage to the DCU field hospital.
2) Similarly, patients with evidence of delirium or significant psychiatric comorbidity.
3) Patients with active cardiovascular conditions, such as atrial fibrillation with rapid ventricular response, acutely decompensated heart failure, or acute myocardial infarction are not appropriate.
4) Pregnant patients and breastfeeding patients are not appropriate for triage.
5) Patients with prior organ transplant or undergoing chemotherapy.
6) Patients who weight > 450lbs

Anticipated common comorbidities

1) Diabetes Mellitus
2) Hypertension
3) Coronary artery disease/prior myocardial infarction
4) Chronic kidney disease I-III
5) Congestive heart failure
6) Ischemic stroke

7) Chronic pulmonary disease (COPD/emphysema)
8) Reactive airway disease/asthma
9) Tobacco smoking
10) Malignancy (solid tumor or CLL)
11) Osteoporosis
12) Dyslipidemia
13) Peripheral arterial disease
14) Atrial fibrillation
15) Depression
16) Anxiety
17) Visual impairment
18) Hearing impairment
19) Osteoarthritis
20) AIDS

COVID Clinical Characteristics

Common Clinical Manifestations

Fever, fatigue, shortness of breath, and dry coughing are considered the main clinical manifestations. Other symptoms that have been associated with COVID-19 include loss of smell, anorexia, headache, myalgias, nausea, abdominal discomfort +/- diarrhea.

Clinical Classifications

Mild cases only present with low-grade fever, flu-like symptoms, mild fatigue and so on without or with minimal evidence of pneumonia on CXR. Dyspnea is mild (chest tightness, dyspnea on exertion), O2 Sats are >95% on room air.

Moderate to Severe Disease/Lower Respiratory Tract infection: Persistent fever or fever > 39C, moderate-severe dyspnea or dyspnea on exertion, tachypnea and increased work of breathing, hypoxia (SpO2<90% on room air), rales, lymphopenia, elevated LDH, elevated d-dimer (>1 mcg/mL), elevated PT, elevated inflammatory markers (C-reactive protein, ferritin), elevated troponin, elevated IL-6 (> 40 pg/mL); infiltrates on initial CXR.

In **severe cases**, dyspnea and/or hypoxemia usually occurs one week after disease onset **and can rapidly progress to acute respiratory distress syndrome**, septic shock, metabolic acidosis, coagulopathy, and multi-organ system failure. Patients with severe or critical illness may have a moderate to low fever, or no fever at all.

Risk Factors for adverse outcomes

Age > 65, patients living in a long-term care facility, immunosuppressed state (prolonged use of steroids or other immunosuppressants, transplant, AIDS), smoking, BMI > 40, end-stage kidney disease, poorly-controlled diabetes mellitus, chronic lung disease, end-stage liver disease, cardiovascular disease (11% mortality rate in this group), hypertension, and pregnant patients.

Laboratory Abnormalities

In the early stages, a normal or decreased total white blood cell count and a decreased lymphocyte count can be found. In addition, liver function test abnormalities, elevated LDH and myoglobin, as well as an elevated level of troponin can be seen in some critically ill patients. In most cases, the laboratory tests show a high C-reactive protein level and erythrocyte sedimentation rate, but a normal procalcitonin. In severely ill patients, D-dimer and the peripheral blood lymphocyte counts can decrease. In addition, elevated values of inflammatory factors are accompanied with in severe and critical patients.

Diagnostic Workup

1) **Pulse Oximetry**: Oxygen saturation should be monitored continuously. This is a key predictor of change in status.
2) **CBC with differential** is a send-out but can be helpful for prognostication and management.
3) **Comprehensive metabolic panel** (send out): CRP, LDH, CPK, troponin, BNP or NT-proBNP, ferritin, D-dimer, fibrinogen, pregnancy test (as warranted): helpful for prognostication and supportive management. For severe cases, consider IL-6 level
4) **Chest X-ray:** useful in many cases for prognostication and management. Bilateral, rounded or geographic areas of ground glass opacities are associated with less severe and recovering pneumonia, whereas consolidations in the periphery are seen in more severe cases.
5) **Electrocardiogram (ECG)**: helpful to evaluate chest pain, diagnose underlying heart disease, evaluate for arrhythmias, monitor QT in response to therapies
6) **Microbiology**: Sputum for bacterial culture; MRSA PCR; Legionella urinary antigen if clinically indicated; HIV – 1 & 2 antibody if not already documented; If febrile, send 2 sets of blood cultures prior to antibiotics.

Management Recommendations

First, an evaluation and documentation of goals of care within 48 hours of admission/transfer is recommended.

Antimicrobial therapy for COVID-19
Second, mild illness requires supportive management (i.e., fluid resuscitation, monitoring of electrolytes). At UMass Medical Center, all medications for treatment of COVID-19 will require approval by either antibiotic stewardship (pager 4963) or an Infectious Diseases physician. We do not initially anticipate having access to Favipiravir, Remdesivir, or hydroxychloroquine.

Suspected Secondary Bacterial Pneumonia in COVID-19 Positive Patient
Patients with COVID-19 pneumonia may have persistent fever for an extended period and secondary bacterial pneumonia is uncommon early in the course. New leukocytosis or a rising neutrophil count and a falling lymphocyte count (higher neutrophil-to-lymphocyte ratio) could be used to predict severity as well as an indication for starting empiric antibiotics. Antibiotics should be initiated when there is concern for a secondary bacterial infection.

Treatment of these pneumonia should be based upon a patients' risk factors for pseudomonas and MRSA. Recommendations on empiric therapy for treatment of pneumonia are available through the UMMC hub. Sputum cultures, tracheal aspirates and MRSA PCRs should be utilized to guide and de-escalate therapy.

Other Management Considerations

1. **Intravenous Fluids only as needed**- aggressive fluid resuscitation should be avoided as it may precipitate respiratory decompensation.
2. **Corticosteroids-**
    a. Observational studies from SARS and MERS report delayed viral clearance, increased rates of complications, and no survival benefit. The use of corticosteroids in patients with COVID-19 pneumonia also remains highly controversial. The use of corticosteroids, early in the disease course, has been associated with prolonged viral shedding and heightened risk of secondary bacterial infections.
    b. However, based on the results of the RECOVERY trial, consider dexamethasone 6 mg PO or IV once daily for up to 10 days (or until discharge if sooner) for confirmed SARS-COV2 patients with pneumonia who require supplemental oxygen or mechanical ventilation. Treatment may begin as early as the onset of the oxygen requirement but should not begin any later than 13 days from the onset of Acute Respiratory Distress Syndrome.
    c. At this time, for standard asthma/COPD exacerbations, would recommend usual care with prednisone or equivalent steroids. Dexamethasone is discouraged in this scenario, especially considering the limited benefit earlier in the course of therapy.
3. **Do not disrupt or adjust treatment with ACE-inhibitor or ARB therapy** in the treatment of COVID-19, unless needed for the management of other problems (e.g. hypotension).
4. **Patients who are already on a statin should remain on this medication**. If a patient is not yet on a statin, but has an accepted indication to start a statin, can consider initiating statin therapy
5. **NSAID therapy should be treated no differently than any other condition** (e.g use with caution with respect to acute kidney injury).
6. Treatment with azithromycin, baloxavir, oseltamivir, protease inhibitors (e.g lopinavir/ritonavir), nitric oxide, ribavirin, interferon Beta -1b, immunoglobulin **IS NOT RECOMMENDED**.

Mild disease

Case definition	Treatment options	Notes
• hospitalized patient with a room air O2 sat >94% and no pneumonia on CXR/CT • Stable vital signs	• Supportive care • Conservative Fluid Management (keep the patient's even or consider diuresis). Lasix for diuresis (monitor K+). Consider intermittent spironolactone for K+ sparing. • Regular daily medications • Drugs to not use: Steroids	

Moderate disease

Case definition	Treatment options	Notes

• hospitalized patient with a room air O2 sat <94%
• -OR-
• Pneumonia on CXR
• Stable vital signs
  ○ HR<120
  ○ RR<20
  ○ SBP b/w 110-180
	• Supportive care
	• Regular daily medications
	• Supplemental Oxygen as needed to keep O2 SAT>94%
	• Conservative Fluid Management (keep the patient's even or consider diuresis). Lasix for diuresis (monitor K+). Consider intermittent spironolactone for K+ sparing.
	• Consider secondary bacterial pneumonia treatment if suspected
		• Check EKG prior to starting HQ. QT prolongation can occur.
		• See separate page for HQ side effects & issues.

Table 2 Pneumonia Treatment Recommendations

Adults without risk factors for MRSA and P. aeruginosa.	Ceftriaxone 1-2 gm IV q24h *PLUS* *EITHER* Azithromycin 500 mg IV/PO q24h X 3 days *OR* Doxycycline 100 mg PO twice daily x 5 days
Adults with Risk Factors for MRSA and/or *P. aeruginosa* or mechanically ventilated patients – obtain respiratory culture	Vancomycin IV 15 mg/kg every 8-12 hours [Δ] *PLUS* Piperacillin/tazobactam 4.5 gm every 8 hours prolonged infusion[Δ] *OR* Cefepime 2 g every 8 hours prolonged infusion [Δ] *PLUS* *EITHER* Azithromycin 500 mg IV/PO q24h X 3 days *OR* Doxycycline 100 mg PO twice daily x 5 days

Predictors of Decline that Should Prompt Consideration of Transfer to a Higher Level of Care

In general, patients with severe cases of COVID should not be managed at the DCU center. Patients with moderate cases of COVID are at risk for decline. The following baseline characteristics, clinical and laboratory features may be helpful to consider when making triaging decisions (i.e., whether to transfer to the University Campus). In general, we recommend a baseline assessment and at least daily reassessment of decompensation risk. Physical exam and history remain of paramount importance, but laboratory and imaging are available and should be used.

Baseline risk

Patients with pre-existing lung disease (i.e., COPD – 6-fold higher risk for severe disease) and cardiovascular disease are at particularly high risk for decompensation. Age and presence of

comorbidities should be strongly considered when deciding whether a patient should be transferred out of the DCU.

Clinical factors
Patients with COVID are susceptible to rapid (over a 12-hour period) decompensation. Clinicians should be aware that worsening hypoxia, dyspnea, and tachypnea remain the most powerful clinical predictors of decompensation from COVID.

The following respiratory findings and tests should be considered strongly as markers that a patient requires transfer:

- Increase in O2 requirement by 2L over a 24 hour period
- 4L Supplemental Oxygen unable to maintain O2 SAT>94%
- Self-reported moderate or severe dyspnea
- RR>20
- New or worsening infiltrates on chest XRAY

The following hemodynamic findings should be considered strongly as markers that a patient requires transfer

- HR>120 BPM
- SBP<100 mmHg

Biomarkers

Baseline levels of IL-6, CRP, LDH, d-dimer, and ferritin relate to the severity of COVID-19. Decrease in IL-6 may be related to treatment effectiveness, whereas increases in IL-6 levels may indicate disease exacerbation. Decreasing lymphocyte count and increasing D-dimer, LDH and ferritin over the first three days after admission relate to increased risk for death. Biomarkers are send-out at the DCU and thus healthcare providers may consider use at baseline for prognostication.

Consult services

Teleconsults will be available to DCU providers in the following areas:

1) Cardiology: Call the “LOVE” pager (5683) 24/7. It will access a cardiology fellow who can provide initial triaging recommendations. Additional tele-visits can be arranged through this mechanism
2) Pulmonary: Call the on-call university pulmonary fellow 24/7. It will access a pulmonary fellow who can provide initial triaging recommendations.

Discharge Criteria

Patients should be evaluated on the day of discharge and meet the following diagnostic criteria.

A) Hemodynamically stable
B) Stable O2sat > 92% (if requiring supplemental O2, should be stable or decreasing O2 requirement)

C) For discharge to post-acute care facility for COVID patients (Beaumont), please refer to Criteria for Transition of COVID Positive Patient to Skilled Nursing Facility

Other discharge considerations

A) Please provide discharge instructions using the dotphrase .COVIDAVS in EMR.
B) Patients with COVID-19 pneumonia may have worsening respiratory status up to 7-10 days after the initial presenting symptoms. Thus, a close post-discharge follow-up must be performed for those patients being discharged home.

Key Resources

See COVID-19 Website on the Hub – Information for Health Care Professionals

Reference Documents

UMMC Clinical Practice Guideline: Empiric Evaluation and Management of COVID-19 in Adults. April 2, 2020

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