***CDI COVID-19 Survival Toolkit: Common Clinical Indicators***

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At the time of this resource’s publication, COVID-19 has spread to all 50 states including the District of Columbia. To date there have been nearing 500 deaths in the United States and the virus is spreading rapidly. As more people are being tested, the incidence of infection is rising at an alarming rate.

While hospitals are now beginning to treat COVID-19 patients, we anticipate the number of cases to rise. For those hospitals that are actively treating COVID-19, they are in the trenches on the front lines and we want to offer our support as they move through this pandemic.

***The CDI review***

The CDI review will be a ***very important piece*** in capturing all the comorbid conditions that can be seen in a hospitalized patient with COVID-19. Symptoms range from mild to ventilated patients to death which means that a variety of clinical scenarios are appearing in our hospitals across the country.

The Centers for Disease Control and Prevention (CDC) has published risk factors that include the elderly patients with comorbid conditions. There have been several studies done in attempt to track the comorbid conditions in those infected with COVID-19 to assist in further identification of high-risk patients. To date, there are many hypotheses based on information coming from these studies. Patients with cardiac disease and diabetes who are on ACE inhibitors are considered high risk for infection of COVID-19 at this time. Evidence-based studies are underway and for now, these comorbidities are included regardless of medications taken. In the near future, however, it is possible that COVID-19 patients on ACE inhibitors may see changes with this medication, so we need to remain aware of these studies if we begin to see ACE inhibitors being discontinued for these patients. In fact, if this data proves accurate, this could be a viable clinical indicator to utilize in query writing.

**Common reported risk factors**

The most common reported symptoms are as follows:

* Fever
* Cough
* Dyspnea/shortness of breath (SOB)
* Myalgia/malaise
* Chest pain
* Headache
* Vomiting
* Smoking, vaping

Incubation period: The incubation period for COVID-19 is thought to be within 14 days following exposure, with most cases occurring approximately four to five days after exposure

**Common comorbid conditions identified in infected patients**

Per recent studies:

* Diabetes
* Cardiac disease, mainly hypertension
* Pre-existing lung disease and any disease that can compromise oxygenation such as sickle cell crisis
* Diseases that involve immunosuppression
	+ Cancer patients, especially those on chemotherapy and/or radiation therapy
* Patients that are on medications that suppress immunity such as steroid usage

**Common documented conditions seen in COVID-19 patients**

Documented diagnoses can vary as much as the symptoms do but certain trends are being noted across the nation. The following are the most common diagnoses associated with COVID-19 infections:

* Pneumonia
* Acute respiratory failure
* Acute respiratory distress syndrome (ARDS)
* Acute exacerbation of chronic obstructive pulmonary disease (COPD)
* Viral sepsis with organ dysfunction ranging from encephalopathy, acute kidney injury, and shock
* Leukopenia
* Procedures for Intubation for mechanical ventilation
* Cardiac injury to infarction (often non-ST elevation myocardial infarction [NSTEMI] Type 2)

***Capturing all comorbid conditions will be of the highest priority in order to effectively capture the acuity level of these patients and to arrive at the correct reimbursement for facilities.***

**CDI quick tips**

*This is not an inclusive list of clinical indicators but is meant to give a quick reference on the common indicators seen in association with diagnoses listed below.*

**Pneumonia:**

* Physical symptoms of leukocytosis cough, fever, increased sputum production, chest pain, and oftentimes low oxygen saturations
* Chest x-ray demonstrating infiltrates, atelectasis, and/or ground glass opacities
* Antibiotics for patients who develop bacterial pneumonia

***CDI tips:***

* Many COVID-19 patients are demonstrating leukopenia instead of leukocytosis so the CDI professional may not see leukocytosis as in the normal pneumonia setting of a non-immunocompromised patient.
* The CDI professional should remember that not all imaging captures pneumonia at the onset. It is prudent to allow for 48 hours for signs to show up on imaging.
* Watch for CT chest to be done in the absence of clinical findings on chest x-ray.
* Remember if the patient has “lobar pneumonia” the documentation should state “lobar pneumonia” with the laterality and lobe identified.
* Steroids are not recommended at this time in those that have COVID-19 and should be avoided outside of asthma and other inflammatory diseases and continuation or implementation will be based on the provider’s discretion.
* Monitor for complications such as pleural effusions, empyema, and acute respiratory failure/ARDS.
* *Coding Clinic*, third quarter 2018, p. 37: Lobar pneumonia can only be coded when the provider specifically documents lobar pneumonia and a causal organism is not identified. ***Please refer to the Coding Clinic for the complete Coding Clinic instruction.***
* Ensure that the provider documents the etiology if known or to identify the “suspected” etiology. Providers may need to be reminded that if they use an “uncertain term” such as “suspected” that the attending will also need to document the suspected diagnosis in the discharge summary.

***CDI critical thinking tip:***

* This can get tricky if the pneumonia is due to COVID-19 as this is a viral infection. It is possible for patients to contract bacterial infections superimposed on viral infections especially when hospitalized in this situation. Be mindful of microbiology testing and confirm that tests are not contaminated. If bacterial pneumonia is documented that antibiotics are not de-escalated as they would be in a contaminated specimen or a viral infection only.

**Acute respiratory failure:**

* Arterial blood gas (ABG) of P02 of 60 or less and/or C02 of 50 or higher
* PF ratio of 300 or less
* Signs of respiratory distress such as:
	+ SOB
	+ Dyspnea on exertion (DOE)
	+ Cannot complete sentences
	+ Tripod positioning
	+ Anxiety
* Fi02 levels: Oxygenation from liters per minute on nasal cannula to ventilation

**CDI tips:**

* Oxygen saturations below 91 are indicative of respiratory failure and should be further explored by identifying other clinical indicators for the query process if not documented.
* The lowest oxygen saturation with the corresponding oxygenation should be used to calculate PF ratios.
* Trend oxygen saturations and FI02 levels to ensure that nursing notes or respiratory therapy notes are not conflicting the patient status.
	+ If there is conflicting documentation amongst ANY specialty, a query would be advised.

**ARDS:**

* Abrupt onset
* Hypoxia with severe shortness of breath/low oxygen saturations and labored breathing
* ***Bilateral infiltrates*** on imaging, atelectasis and/or ground glass opacities
* Mechanical ventilation
* ECMO
* Hypotension can be seen with these patients \* monitor for signs of shock
* Altered mental status (AMS)/metabolic encephalopathy/lethargy

***CDI tips:***

* Complications often include shock, pneumothorax, and possibly scarring or the development of pulmonary fibrosis.
* Assessments typically include oxygen saturation levels, modes of ventilation including PEEP and ABG/VBGs.
* Patients with ARDS are considered high risk patients that often develop several comorbid conditions as a result of ARDS.
* Sepsis and pneumonia are common causes of ARDS.
* All devices that are involved in adverse events including ventilators fall under mandatory reporting guidelines.
* Patients with ARDS typically have a longer inpatient stay, require more intensive treatment and monitoring and are susceptible to hospital acquired infections.
* Documentation should be CLEAR and CONSISTENT with ALL documentation including nursing and respiratory therapy. Clarify through the query process for any conflicting documentation as this will need to be part of the medical record for payer audits.
* Acute respiratory failure is considered inherent to ARDS and will generate an Excludes1 note meaning that the CDIS should not code both.
* Other terms used to describe ARDS are: Acute lung injury (ALI), increased permeability pulmonary edema, and non-cardiac pulmonary edema.

***CDI critical thinking tips:***

* Clarification may be needed based on the documentation as the above alternate terms used to diagnose ARDS will not accurately capture the acuity level of the patient.
* ARDS can be acquired due to ventilation. The CDI professional should ensure that the documentation clinically supports the etiology documented to avoid the billing of incorrect diagnosis or incorrect payer audit determinations based on ambiguous documentation. (The documentation of the etiology should be documented on every ARDS case regardless of the etiology).
* If the patient recovers quickly from ARDS, proceed with caution and verify that ARDS is not ruled out. Quick recoveries are highly unlikely especially in the scenario involving COVID-19 having various respiratory symptoms. In ARDS, the alveolar actually burst making gas exchange very difficult and a speedy recovery in a TRUE ARDS patient would be a red flag in an audit scenario.

**Acute exacerbation of COPD:**

* SOB
* DOE
* Cannot complete sentences
* Tripod positioning
* Anxiety
* An increase in baseline C02 levels (if baseline is known)
* If on chronic home oxygenation for chronic respiratory failure, these patients will need a higher liter per minute of oxygen while in the exacerbated state
* Monitor for a decrease in home dosage of steroids in COVID-19 infected patients

***CDI tip***:

* CDI professionals should pay close attention to the liters per minute (LPM) the patient is discharged on. There are times when the patient’s lung disease worsens and the patient will go home on increased oxygenation levels which means that “acute” respiratory failure will be difficult to hold up in an payer audit and will likely be downgraded to chronic respiratory failure.

**Viral sepsis:**

* Same criteria as bacterial sepsis—utilize the criteria of your facility’s preference.
* Monitor for clinical indicators of end organ dysfunctions due to sepsis
	+ The most common end organ dysfunctions linked with sepsis: Acute kidney injury, shock, encephalopathy but not excluding disseminated intravascular coagulation (DIC), non-diabetic hyperglycemia, liver dysfunction, etc.
* Fever is reported as being on the higher end with COVID-19.
* Positive COVID-19 culture via microbiology; nasal swab or blood culture.

***CDI tips:***

* Remember sepsis sequencing rules stating to code the systemic infection first followed by the infectious organism.
* COVID-19 test results will be an important clinical indicator to ensure appropriate documentation exists for payment purposes since Sepsis is one of the most frequently denied diagnosis.
* Procalcitonin could be negative since it is widely sensitive to bacteria and not viruses
	+ Procalcitonin synthesis pathways vary in different inflammatory states. When systemic inflammation is caused by bacterial infection, procalcitonin synthesis is induced in nearly all tissues and released into the blood. In contrast, procalcitonin synthesis is not induced in most viral infections *(****Procalcitonin use in lower respiratory tract infections Procalcitonin use in lower respiratory tract infections****Reference**Article: Up to Date, Procalcitonin use in lower respiratory infections by Dr Rhee and Dr Mansour, December 9, 2019)*

**Encephalopathy:**

* AMS with negative head imaging
* Treatment is the underlying cause
* As the treatment for the underlying cause, the patient’s mental status should be returning to or towards their baseline

***CDI tips:***

* Patients with dementia or any deviation for alert and oriented x four should have a documented baseline so the CDI professional can track the improvement once treatment is initiated in order to clinically validate the diagnosis.
* If the patient is NOT moving back towards their mental status baseline, either the incorrect underlying cause/treatment is being employed OR the patient does not have encephalopathy and further investigation would be needed.
* ACUTE Encephalopathy is ALWAYS reversible once the underlying cause is correctly identified and treated.

**Shock:**

* SBP of < 90 or a MAP of 65 or less
* Serum lactate of > 3 for septic shock (Sepsis 2 criteria)
* The use of vasopressor therapy and/or IVF bolus therapy
* Identification and correction of underlying etiology

***CDI tips:***

* Please do not query for introduction of the diagnosis of shock with only one blood pressure (BP) that meets criteria. One low BP does not indicate shock. Trend the BPs along with the medications, i.e. IVF therapy and/or vasopressors to see evidence of true shock.
* Refractory hypotension is key. The patient can receive an IVF bolus with improvement of bp only to find that the BP drops again shortly thereafter. Again, TREND the blood pressures to support the diagnosis.

**Leukopenia:**

* White blood cell count (WBC) less than 4,000
* Monitor documentation for the presence of cancer with chemotherapy or radiation therapy or other immunosuppressive disease history

**Cardiac injury to myocardial infarction:**

* Elevated troponin based on the 99th percentile
* Evidence of cardiac ischemia— refer to the Fourth Universal Definitions
* Documentation of evidence of the underlying etiology when NSTEMI Type 2 is diagnosed

***CDI tips:***

* Trend troponins. The standard is three troponin levels are drawn six hours apart.
* This remains a very controversial diagnosis with hospitalist and cardiology often contradicting each other. The CDI professional should query as needed for clarification.

**Treatment for COVID-19 admissions**

* Treatment for COVID-19 has been supportive only
* Treatment for all comorbid conditions have not changed
* Investigational drugs are currently under study trials:
	+ **Remdesivir:** Antiviral under current clinical trials
	+ Per the National Institutes of Health, Remdesivir “was previously tested in humans with Ebola virus disease and has [shown promise in animal models for treating Middle East respiratory syndrome (MERS)](https://www.niaid.nih.gov/news-events/remdesivir-prevents-mers-coronavirus-disease-monkeys) and severe acute respiratory syndrome (SARS), which are caused by other coronaviruses”
	+ Oxypurinol is being investigated as treatment for acute kidney and lung injury accompanying COVID-19 infection
* There are many more drugs being developed at this time, but none have been through the needed clinical trials and are pending.

**Clinical outcomes**

A study published on February 24,2020 in *The Lancet: Respiratory Medicine* called, “[Clinical Course and Outcomes of Critically Ill Patients with SARS-CoV-2 pneumonia in Wuhan, China](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600%2820%2930079-5/fulltext)” says (emphasis added), ***“The primary outcome was 28-day mortality after ICU admission***. Secondary outcomes included incidence of SARS-CoV-2-related acute respiratory distress syndrome (ARDS) and the proportion of patients requiring mechanical ventilation,” shock, acute kidney injury, cardiac injury, and pneumonia, which has the highest incidence of all of the comorbid conditions identified.

For patients that expire, mortality measures will apply which means that the CDI professional should capture ALL comorbid conditions regardless of severity of illness/risk of mortality (if facility guidelines support that process.) There may be some leniency on mortality scoring for patients with COVID-19 by CMS due to the current pandemic but nothing of that nature has been released to date.

**Miscellaneous reminders**

* Remember to follow cultures and antibiotic de-escalation as these are important clues to a diagnosis possibly being ruled out. With sepsis, if you lose the source of infection, the diagnosis of sepsis is at an even higher risk for denial.
* Monitor for malnourishment in prolonged hospitalizations and/or in patients with multiple comorbid conditions.
* Remember that each patient should be approached as being unique in their presentation and don’t forget to look at the patient’s assessment and not just the numbers that often define important clinical indicators. Do you see any discrepancies? If so, there are holes and/or missing information in the record and clarification may be needed.
* Some of the diagnoses above may put the patient into fluid overload. Any pre-existing conditions such as chronic renal failure of any stage and/or heart failure could become exacerbated with high volume fluid resuscitation. Be mindful of this as you are reviewing the record and watch for clinical indicators of exacerbation of both diseases.
* Our providers are likely to be overwhelmed. Patience is needed as they are in the trenches. Speak to your management staff on alternative ways of communicating for both physician education and queries if onsite staff have been moved to the remote position.
* If a CDI professional has worked onsite and is now forced to work remote, my biggest piece of advice is to monitor your metric standards to ensure that there is not a downward trend once working remote. Be proactive in this situation as working remote from home is not for everyone and with this situation, there are few alternatives without exposure.
* Lastly, remember to BREATHE! The CDI professional is an important position to all facilities, but your facility will need you now more than ever as admissions begin to rise. This too shall pass just like all the other viruses that came before COVID-19. Remind yourself of that often.

**References:**

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