A Simple Guide To Understand COVID-19 Disease & its current medical treatments!!

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This guide addresses the following issues related to COVID –19, a viral disease. COVID stands for Coronavirus disease, and 19 stands for the year when it first got detected in China. The first cases of COVID (also called SARS COV-2) occurred in Wuhan, China, in 2019.

1. **What are the signs and symptoms of COVID disease?**
2. **When to get tested for COVID, and what are the available tests?**
3. **When the COVID test is positive, how do doctors assess the severity of COVID disease based on clinical signs and symptoms?**
4. **Who is at a greater risk for getting severe COVID disease?**
5. **What Laboratory and radiological tests do doctors do to assess the severity of COVID disease?**
6. **How long does it take for the COVID patient to become severely ill?**
7. **When does a COVID patient require hospital admission?**
8. **The current home care medical treatment guidelines for COVID patients with mild to moderate illness?**
9. **What are the current medications used to treat hospitalized severely ill COVID patients?**
10. **How do doctors treat hospitalized COVID patients with moderate to severe disease?**
11. **What factors influence the risk of death from COVID disease?**

12. **Can there be persistent health problems after recovery from COVID?**
13. **Which medications have not proved to be beneficial for the prevention or treatment of COVID?**
14. **How to Boost Immunity to protect from and fight COVID infection?**

1.What are the signs and Symptoms Of COVID disease?

The signs and symptoms of COVID disease vary widely amongst individuals and are affected by the severity of the disease as the disease progresses. The reported signs and symptoms are:

- **Fever (present in 80-90% of cases)**
- **Loss of sense of smell and taste (keep in mind that this can also happen with common cold and sinus infection)**
- **Fatigue- general weakness, body aches, and headaches**
- **Loss of appetite**
- **Chills and Shivering**
- **Abdominal pain and diarrhea**
- **Red eyes with excessive tearing**

In almost 10% of cases who are COVID positive, there may be no symptoms at all. The asymptomatic COVID is more common in children and young adults, and they are the biggest culprits in spreading the COVID.

2. When to get tested for COVID & which type of test?

One should get tested for COVID if any of the above signs and symptoms are present. Additionally, one should get tested if one gets exposed to a COVID-positive person (friends, family, big crowded gatherings). There are two kinds of diagnostic tests available, but the search for fast and reliable tests is ongoing.

A. **Diagnostic Tests- These tests tell if you are infected with COVID or not. These tests get done on a sample of secretions collected from deep inside the nose**

or throat. The nose sample is superior. There are two kinds of diagnostic tests:

a). Molecular tests **– These tests check for the virus's genetic material in the collected sample. The molecular tests include:**

- **RT-PCR test (most commonly performed test with high accuracy)**
- **Nucleic acid amplification test (NAAT)**
- **RT-LAMP test (newer rapid test to check for virus genetic material)**

The RT-PCR test takes two days to report results. So other tests were designed for fast results.

b) Antigen tests- These tests look for COVID virus protein fraction – called spike (S) protein. This test also uses nasal secretions and has the advantage of the fastest results with 15-30 minutes. However, it has the disadvantage of false-negative results. So if the doctor suspects COVID by the history of symptoms and antigen test is negative, they will recommend an RT-PCR test to confirm the diagnosis of COVID.

A false-negative result can also happen with the RT-PCR test when the test is done very early following the first 2-3 days of infection. Again if the symptoms suggest disease, the doctor will repeat the RT-PCR test after 2-3 days.

B. ***Antibody test*****- This test does not detect the presence of the COVID virus but checks if the body has developed protection (protective antibodies) against COVID. This test is not necessary but typically done if someone wishes to donate their antibody-rich protective blood plasma to help a severely ill COVID patient. The protective antibodies may take several weeks to develop. The antibody test requires a blood sample which is collected by finger prick or from the vein.**

3. When the COVID test is positive, how do doctors assess the patient for the severity of the disease based on clinical signs & symptoms?

When the COVID test is positive, the immediate next step is to check with the doctor, who will assess the severity of the disease. COVID virus mainly affects the breathing passages and the lungs. The lungs provide vital oxygen supply to the body and eliminate waste gas carbon dioxide from the body. Checking for breathing difficulty and oxygen levels are the front and center in assessing the severity of COVID disease. The disease severity is studied based on signs and symptoms, pulse oximeter readings, breathing rate, heart rate, and overall wellbeing. When necessary, a chest x-ray, CT scan of the chest, and other lab tests.

Based on the severity, COVID disease gets graded as:

A. **Asymptomatic**
B. **Mild**
C. **Moderate**
D. **Severe**
E. **Critical**

A. ***Asymptomatic COVID Infection*- The COVID test is positive, but there is no symptoms present, and the patient feels perfectly normal. Most of these cases are young people or children. About 20% of people who are COVID positive are asymptomatic. That is good news, but the bad news is that these asymptomatic patients are silent carriers of the virus and can infect others. So by rules, if someone is COVID positive, they must be self-isolated and quarantined for two weeks to protect others.**

B. ***Mild COVID Infection* - In the mild disease patient may have any of the symptoms outlined above. The oxygenation is not affected. The checklist is as follows:**

- **The temperature less than 38 degrees**
- **The Pulse Oximeter shows oxygen levels at or above 95% at rest and even on moderate exertion (walking briskly for one minute)**

- **No shortness of breath on moderate exertion- Able to walk and carry on a conversation without catching breath**
- **The respiratory rate is less than 22 breaths per minute.**

Patients with mild COVID usually recover within 1-2 weeks unless there is a progression of symptoms such as shortness of breath and drop in oxygen saturation with moderate exercise.

C. ***Moderate COVID Infection*- If the patient starts developing shortness of breath with exertion (brisk walk for one minute), has a faster breathing rate and drops oxygen saturation, they are progressing to moderate disease. The checklist is as follows:**

- **The temperature is higher than 38 degrees centigrade.**
- **Shortness of breath on moderate exercise**
- **Oxygen saturation on moderate exertion (brisk walk for one minute) remains 94%**
- **Resting respiratory rate is less than 24 breaths/ minute**

Moderately severe COVID may take 2-4 weeks to recover. In some cases, it may progress to severe disease if there are coexisting medical diseases (see the coexisting disease list below)

D. ***Severe COVID illness*- Patients with severe COVID have developed pneumonia, and their oxygenation and breathing are affected significantly. The checklist is as follows:**

- **High temperature above 38 degrees**
- **Loss of appetite looks ill**
- **Confusion and lack of interest in the surroundings**
- **Severe shortness of breath, shallow breaths**
- **Patient unable to walk normally**
- **Gets short of breath when talking, unable to speak uninterrupted**
- **Pain in chest and back**
- **Bluish hue to face and lips**

- **Respiratory rate greater than 25 per minute**
- **A pulse oximeter reading less than 94 at rest, dropping down to 90 with slight exertion (one-minute brisk walk)**
- **Faster heart rate greater than 90 per minute and low blood pressure.**

E. Critical COVID disease

These patients are seriously ill, breathing fast and shallow, heart rate quick, blood pressure low, blue lips, oxygen saturation less than 90% at rest. Need Intensive care admission as soon as possible. These patients will require high flow oxygen or ventilator care in an intensive care unit.

4. Who is at a greater risk for more severe COVID disease?

Certain medical conditions increase the risk of severe COVID disease and a greater risk of death. These patients may require hospitalization even if they have mild to moderate disease. These conditions include:

- **Obesity (especially patients with BMI > 40)**
- **Type 2 diabetes.**
- **Chronic lung disease – Smokers bronchitis, Bronchial asthma**
- **Cardiovascular disease, including High Blood Pressure**
- **Advanced Kidney and Liver disease**
- **History of cancer**
- **Weak immune system from medications and diseases – Multiple sclerosis, Rheumatoid arthritis, Inflammatory bowel diseases 9 Crohn's disease and Ulcerative colitis)**
- **Pregnancy**

5. What Laboratory and radiological tests do doctors order to assess the severity of COVID disease?

Based on the severity of the disease, the doctor orders laboratory tests, chest x-ray, and CT scans of the lungs. Patients with mild disease do not require tests. Doctors order several tests for patients with moderate and severe illness and medical conditions that increase the risk. These tests check for the level of inflammation, blood clot formation and tests for heart, kidney, and liver damage. The list of tests include:

- ***White blood cell count with differential to see the number of Neutrophil cells and Lymphocytes and the ratio of these two types of cells*** **– Normally, the Neutrophil/ Lymphocyte ratio (NLR) is three or less. NLR ratio greater than 4 suggests that COVID will progress to a more severe illness and that the above five indicates that the disease will likely move to a critical state with a poor prognosis. NLR of less than 3 suggests there will be a good recovery. The lymphocyte number less than 1000 also indicates severe and critical disease with a poor prognosis. So NLR ratio and Lymphocyte count allow early prediction of disease severity and prognosis (chances of recovery from COVID disease).**
- ***C-Reactive Protein or CRP-*** **It is a marker of inflammation in the body, and a high value of 20-50 mg/L means the likelihood of a more severe disease. Normal CRP levels are 10 mg/ L.**
- ***D-dimer value-*** **A high D-dimer value suggests abnormal blood clot formation in the body. That is a sign of severe COVID disease. A combination of high CRP and high D-dimer values both suggest a more severe disease. The normal range of D-dimer is < 250ng/ml or < 0.4 mcg/ml.**
- ***Platelet count- L*****ow platelet count suggests severe disease.**
- ***Serum Ferritin level-*** **Increase level suggests severe disease.**
- ***Troponin levels-*** **Elevated levels suggest the heart muscle damage**
- ***Liver enzymes-*** **Elevated in severe disease**
- ***Kidney function tests-*****Patient with severe COVID may develop kidney failure requiring dialysis. Kidney function monitoring is essential in hospitalized patients with severe disease.**
- ***Chest X-ray and CT scan of Lungs-*** **Disease affecting 30% of lung tissue suggests moderate disease, and > 50% of lung tissue indicates**

severe disease. For assessing the disease severity on a CT scan, each lung lobe gets assigned a score of 5, and there are five lobes in the lung. If the total score of the five lung lobes affected by the disease is more than 17/25 (more than 50% of lung involved), it suggests severe disease.

6. How long does it take for the COVID patient to become severely ill?

The severe disease in COVID patients usually takes one week to develop. The patients who go on to develop severe disease typically run the following timeline:

- **The time to develop significant lung disease with shortness of breath ranges from 7-12 days. Twenty-five to 30% of patients with considerable shortness of breath usually has a CT scan showing 30-50% (score 15-17/25) lung tissue involvement.**
- **Patients with 30-50% lung disease affected by the disease will require an intensive care unit for high flow oxygen therapy or ventilator care.**
- **Time to Intensive care unit admission from the time illness started ranges from 10-12 days.**
- **Patients who require ventilator care have a high risk of death ranging from 30-70%.**
- **The median range of hospitalization for patients who require ventilator care can be two weeks or much longer**

7. When does a COVID patient require hospital admission?

Patients with mild to moderate disease usually do not require hospital admission unless they have coexisting medical disorders listed above. That has become possible because of the availability of Monoclonal antibody injection. These have helped control the progression to severe disease allowing for an increasing number of patients to have safe care and recovery in the home setting.

Patients with coexisting medical diseases listed above require careful evaluation via laboratory tests to assess the likelihood of a more severe disease progression.

Patients with severe disease require hospital admission. As outlined above, laboratory values that suggest high risk and need for hospital admission are:

- **NLR ratio > 4**
- **Low lymphocyte count**
- **Low platelet count**
- **High D-dimer value**
- **High Ferritin levels, and**
- **Chest CT scan with > 30 % lung involvement.**

Suppose these tests are within normal range and clinical symptoms do not suggest a severe disease. In that case, the patient can be treated at home safely with Monoclonal antibodies injection and general care.

8. The current home care medical guidelines for patients with mild to moderate COVID illness!!

- **Usually, no chest X-ray or chest CT scan of the lungs is required**
- **No other laboratory tests except when a patient has coexisting medical diseases. If tests are abnormal, then hospital admission is required.**
- **Isolation and quarantine to prevent spread to other family members (all the members should have COVID testing done).**
- **Acetaminophen or Paracetamol, as needed, for fever and body aches. Avoid Motrin, Advil, Aleve (Ibuprofen and Naproxen)**
- **Aspirin 75 mg tablet daily for 10-14 days until complete recovery.**
- **Maintain good hydration with plenty of water and natural alkaline herbal teas (with saunf, Iliachi, peppercorn, cinnamon, and cloves)**
- **Eat Home-cooked simple meals made from fresh vegetables, rice or millets, moong dal. Use immune-boosting herbs and spices -**

turmeric, ginger, cumin, saunf , lemon juice, homemade curd, and thin buttermilk.

- **Vitamin D supplements up to 2-5000 units daily and a good multivitamin supplement with minerals.**
- **Keep mobile, legs up when sitting, pillows under the knee when sleeping to prevent blood clots in the legs.**
- **Keep Pulse oximeter and temperature monitor handy. Regularly monitor temperature, oxygen levels, heart rate, and breathing rate every 2-3 hours.**
- **Seek medical help when the breathing rate gets faster than 24/minutes and oxygen saturation falls below 94%**
- **Monoclonal antibodies injection – This treatment has proved extremely useful in controlling disease severity and minimizing expensive hospital care of patients who have mild to moderate COVID disease. National Institute of Health, USA, recommends that patients with mild to moderate illness receive a Monoclonal antibody cocktail to prevent disease progression. The antibody cocktail comprises of following medications:**

  A. ***A Mixture of Casirivimab plus Imdevimab (available in a pack with 1200 mg of each drug)*-- Regeneron company in the USA was the first company to manufacture this compound (REGN-COV2 Antibody Cocktail). CIPLA and Roche pharmaceutical companies are Indian distributors. The cost is Rs one lakh, 20,000 per pack; it is suitable for two patients. The antibody cocktail requires administration under the doctor's guidance as an allergic reaction may require immediate treatment.**
  The injection is given intravenously diluted in a 200 ml saline bag over 30-60 mins. It can also be given as a subcutaneous injection under the skin (a much easy and safe way if expert medical help is not available to provide intravenous infusion). The patient should be monitored closely for one hour after the injection for any unwanted allergic reaction (hives, fast heart rate, difficulty breathing, etc.).

B. ***Sotrovimab (not available in India)***

Note; Dexamethasone (Decadron) or other corticosteroid drugs such as Prednisone, Hydrocortisone, and not given to patients who get home care for mild to moderate illness.

9. What are the current medications used to treat hospitalized severely ill COVID patients?

Based on a doctor's evaluation, COVID patients can receive one or more of the following kinds of medications:

A. ***Antiinflammatory drugs*** **– These medications reduce the inflammation caused by the virus in the body- The drugs in this category are steroids such as Dexamethasone or Prednisone, or Hydrocortisone. These medications need judicious dosing and for not more than ten days. Excess steroid drugs reduce the body's Immunity to severe bacterial and fungal infections such as Mucomycosis (an epidemic amongst COVID survivors in India). Ideally, Dexamethasone should be given as 6 mg oral or intravenous dose daily for ten days. Diabetic patients are more prone to fungal and bacterial infections with dexamethasone and steroids because the blood sugars become very high with these drugs. Uncontrolled high blood sugars increase the risk of life-threatening and disfiguring fungal infections such as Mucormycosis.**

B. ***Antiviral drugs (Remedesivir and Monoclonal Antibodies)*****-- Remedesivir reduces the viral multiplication in the body. It is given only to hospitalized patients with severe illnesses. It may reduce the duration of hospitalization, but its benefits on the cure are not clear cut. Monoclonal antibodies, on the other hand, bind to the virus and prevent it from attaching to the body cells. These drugs have proved very effective, and when given early, these drugs will prevent COVID from progressing to a severe illness. Monoclonal antibodies currently are the state-of-the-art treatment for managing COVID immediately.**

C. ***Drugs to block excessive immune reaction in the body (Tocilizumab, Rituximab)*****- Severe COVID disease causes exaggerated immune response with release of damaging agents in the body called**

Cytokines. The condition is called the "*Cytokine storm,"* which causes life-threatening multi-organ damage. The lab tests show high levels of cytokine marker Interleukin- 6 . Cytokine storm is also associated with blood clots in the body, blocking the blood flow to essential organs such as lungs, heart, kidneys, brain, etc.

Tocilizumab (Actemra) is a drug used commonly for Rheumatoid arthritis. It is distributed in India by drug companies Roche and Dupont. Increasing demand for Tocilizumab for COVID patients has created inflated drug prices on the black market in India. It benefits only the severely ill patients unable to maintain Oxygen levels above 94% on high flow oxygen and at risk of Cytokine storm and blood clots.

It can be given intravenously or by subcutaneous injection under the skin. The dose is 4-8 mg/kg (maximum amount 800 mg given in two divided doses 12 hours apart). It is available as a vial of 400mg/20ml.

D. ***Drugs to stop blood clots in the body (blood thinners)*- The blood tests which suggests a high risk of blood clots are: NLR > 3, lymphocyte count less than 1000, high Interleukin -6 level, CRP levels > 10mg/L, high D-dimer levels, and presence of fibrin degradation products.**

All patients hospitalized with severe disease are given blood thinners within 24 hours of admission, which reduces the risk of organ damage from blood clots. The blood thinners used in COVID are:

- **Low dose 75 mg aspirin tablet one daily- Early on, when the disease is diagnosed with a positive COVID test, aspirin 75 mg daily should be started until complete recovery from symptoms by 10-14 days**
- **Heparin, a more potent blood thinner, is given within 24 hours of hospital admission**

***E. Human Convalescent Plasma*- The patients who have recovered from COVID develop protective antibodies in their blood which is a natural response to any infection. The number of antibodies formed and the time frame these are created varies widely amongst individuals. At present, there is no solid medical evidence that human Convalescent Plasma is effective in severe COVID cases.**

10. How do Doctors treat hospitalized COVID patients with moderate to Severe disease?

All hospitalized patients are given blood thinners (heparin) within 24 hours of admission. From the point of view of treatment options, hospitalized patients fall into four categories:

a). High-risk patients with Coexisting diseases not needing oxygen – **These patients are in hospital primarily for monitoring if the condition becomes progressive. These patients receive supportive therapy but no dexamethasone or Remdesivir.**

b). Patients who require low flow oxygen with a nasal cannula to maintain pulse oximeter -oxygen reading at or above 94%-- **These patients get treated with the following drug options:**

- **Monoclonal antibody cocktail (Casirimivab plus Imdevimab)-As outlined above.**
- **Dexamethasone plus Remdesivir, or**
- **Dexamethasone only, if Remdesivir is not available**

***c) Patients who require high flow oxygen to maintain their oxygen readings at 94% on pulse oximeter*- These patients get treated with:**

- **Dexamethasone 6mg oral or intravenously for a maximum of 10 days**
- **Dexamethasone plus Remdesivir**
- **If the patient's oxygen demand is rising fast and saturation remains below 94% despite high flow oxygen, all three drugs-Tocilizumab plus Dexamethasone plus Remdesivir.**

Note; Do not give Tocilizumab to patients who have the following conditions, which can increase the risk of bacterial, viral, and fungal infections:

- Patients who are already taking medications to suppress the immune system– Rheumatoid arthritis, Inflammatory bowel disease (ulcerative colitis, Crohn's disease), and Multiple sclerosis patients.

-Patients whose liver enzymes are elevated five times the average value

-Patients with a platelet count below 50,000

-Patients with low white cell count

d). Critically ill patients who require ventilator and intensive unit care-
All the medications described above and close monitoring for organ failure. These patients typically remain hospitalized for a long time and are at high risk of death. Kidney failure is most common, requiring kidney dialysis.

11. What factors increase the risk of death from COVID?

Two significant factors that increase the risk of death from COVID are age above 65 years and underlying medical conditions.

A. **Age factor- Amongst 44,000 COVID cases in China, the death rate was highest over 65 years, especially over 80 years. Age-related death rates being:**
    - **Age > 80 years------ 14.8%**
    - **Age 70 -79 years---- 8%**
    - **Age 60-69 yrs--------- 3.6%**
    - **Age 50-69 yrs---------- 1%**
    - **Less than 40 Yrs--------0.2 %**
B. **Coexisting medical diseases- Disease versus death rate was as follows:**
    - **Cardiovascular disease-10.5%**
    - **Diabetes- 7.3%**

- **Respiratory disease-6%**
- **High blood pressure-6%**
- **Cancer- 6%**

12. Can there be persistent health problems after recovery from COVID disease?

Currently, there is limited information on this subject, but it is common knowledge that many patients suffer from persistent health problems following recovery from COVID. These ongoing health problems are called "Long COVID" Most patients who suffer from long COVID are those who had severe disease with prolonged hospitalization. However, less commonly, patients who had mild disease also report Long COVID problems. Long COVID symptoms may include:

- **The feeling of fatigue, weakness, low energy**
- **Blurred vision**
- **Joint pains and muscle aches.**
- **Numbness in limbs**
- **Anxiety, depression, and decreased memory**

Medical science is investigating the long COVID, and there is not much information on the cause and treatment yet.

13. What drugs have not proved beneficial in the prevention and treatment of COVID?

a). Hydroxychloroquine (Plaquenil)- **This drug is used to treat malaria. Scientific research has shown that it does not help in the prevention or treatment of COVID.**

b). *Oseltamivir (Tamiflu)-* This medication prevents flu virus infection from getting worse. It has not proved helpful in preventing or treating COVID.

c*). Ivermectin*—This medication is used to treat parasitic infections. It is being used widely in Asia to prevent COVID, but research has not yet proved its efficacy in preventing or treating COVID.

13. How to Boost Immunity to protect from and fight the COVID?

The capacity of the body to protect and fight against bacterial, viral, and fungal infections depends on the strength of the Immune system. The COVID pandemic has given the word Immunity universal recognition. Immune Health remains intimately connected to overall body health- Physical, Mental, and Social Health. In April 1948, World Health Organization defined Health as:

"Health is not a mere absence of disease but the wholeness of Body, Mind and Social wellbeing."

To ensure Holistic Health, one needs natural holistic food and a lifestyle in harmony with nature.

To review the subject of Boosting Immunity via holistic Health and a balanced lifestyle, check the video on this subject on my website:

www.foodlifestylebalance.com

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