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Summarized Facts, Managements and Treatment Pattern for COVID -19

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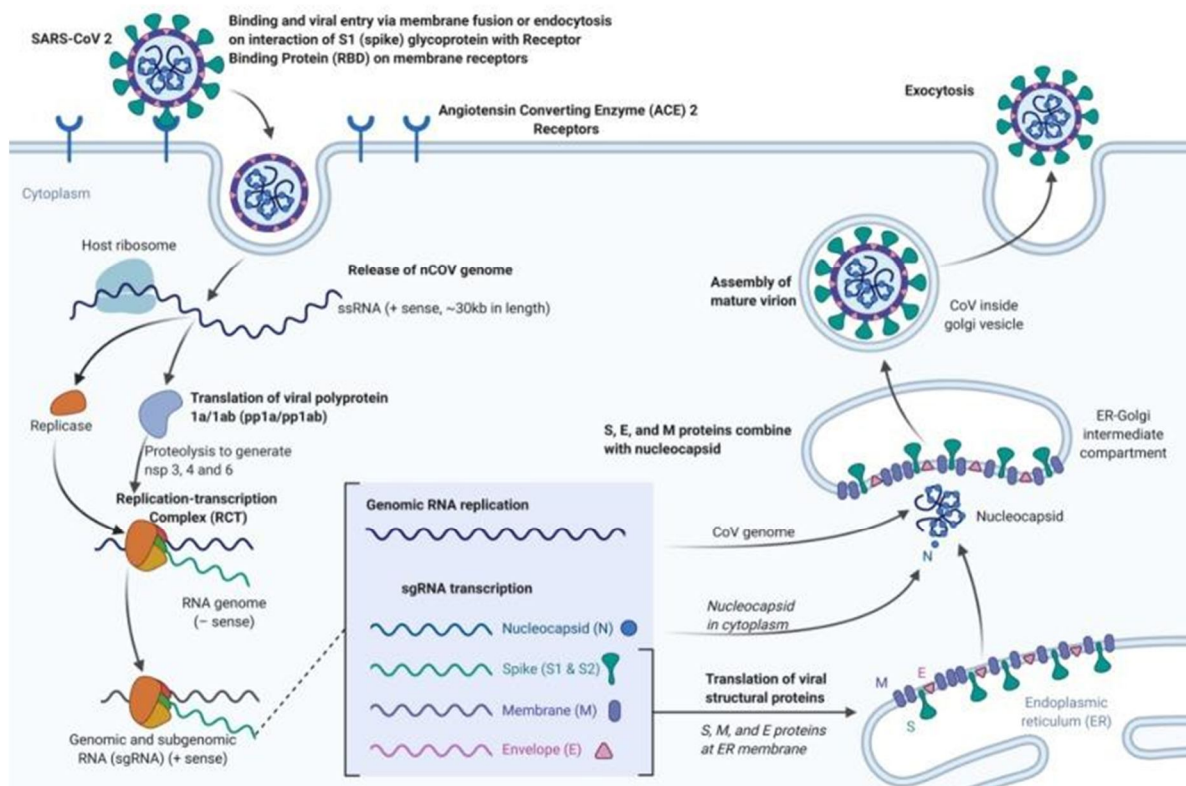
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Abstract: According to the World Health Organization (WHO), viral diseases continue to pose a serious issue to public health. In recent years, several viral epidemics such as the severe acute respiratory syndrome coronavirus (SARS-CoV) in 2002 to 2003, and H1N1 influenza in 2009, have been recorded. But the COVID -19 has done a major impact on society by killing many individuals. To overcome this we have to understand the nature and infection pattern of the virus and also we must be keen about our body's own immune mechanism against a particular infection. With respect to the available data's currently from world health organization and other medical institution the protocol for the corona virus is very clear, In addition to that the Administration of Antiviral dose in Aerosol Route and Followed by Intravenous Administration of O₂ (Oxygen) to prevent the organ damage is advised. Summarized facts, Management & Treatment pattern for COVID -19 will be supporting the protocol of WHO on covid-19

Keyword: COVID -19, Management & Treatment, protocol for the corona virus, Antiviral dose in Aerosol Route, IVO2 Method

I. INTRODUCTION

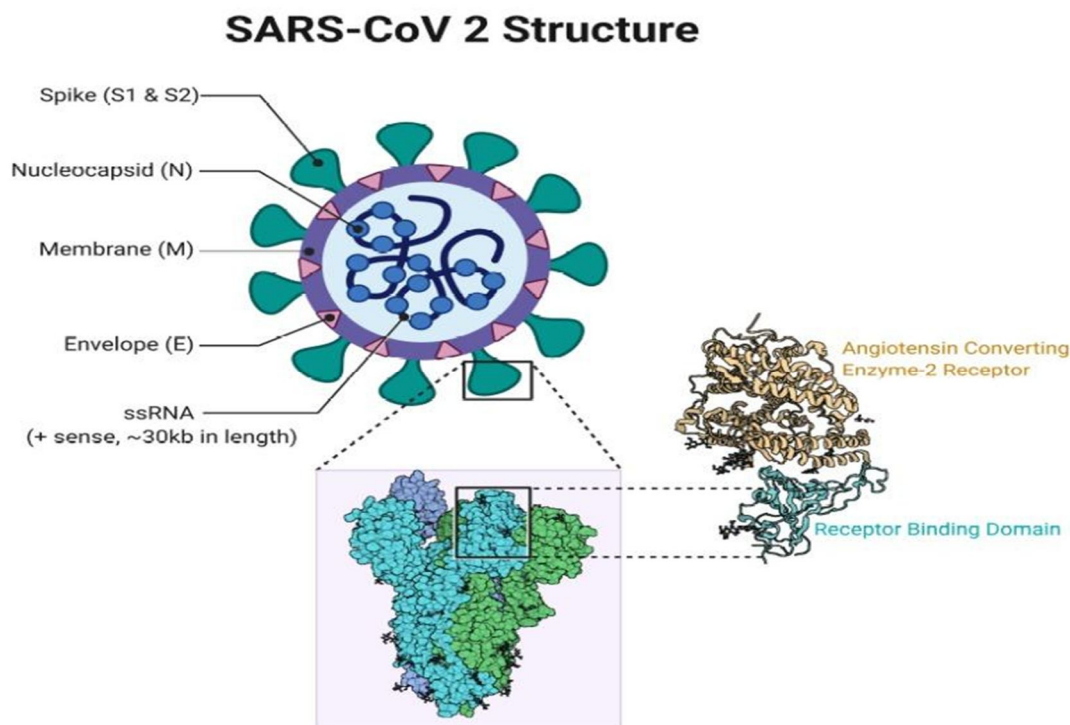
With Respect To World Health Organization (WHO), viral diseases continue to emerge serious issues to public health. These are single-stranded RNA viruses Probably originated from bats then would have spread to animals later on to humans. On March 10, the number of COVID-19 cases has increased more than 20 times and the number of countries affected is increasing day by day as triple the ratio with more than 124,000 cases in 145 countries and over 5,000 deaths,



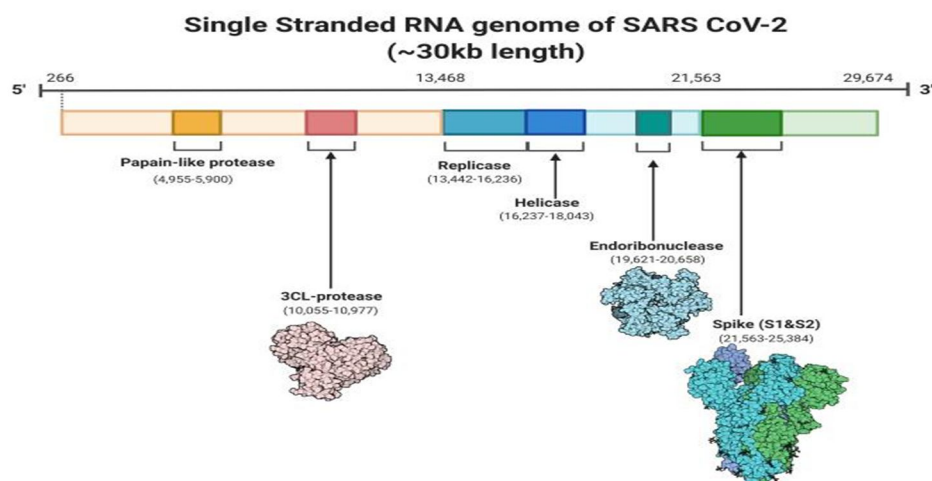
II. STRUCTURE

Corona virus is a positive-stranded RNA virus with a crown shaped body structure under electron microscope. The subfamily Orthocoronavirinae of the Coronaviridae family (order Nidovirales) classified into four genera of CoVs: [2] In general, estimates suggest that 4% of the population are healthy carriers of a CoV and that these viruses are responsible for about 6% to 12% of acute respiratory infections.[3]

- A. They cause common colds and in some cases they can cause self-limiting upper respiratory infections. In immune compromised subjects and the elderly, lower respiratory tract infections may occur.



Thus the coronavirus, belongs to the category of Beta Group (Cov). It has round and often pleomorphic style, and a measuring about a diameter of approximately 60–140 nm.



III. TRANSMISSION

The transmission of the corona virus has been identified in many individuals that it could be transmitted from one person to another person i.e. . The mode of transformation is through humans. As per the statistics it is very clear that isolation of individuals affected with corona virus is the better way to stop the spreading of virus .

Same as other respiratory tract infections the transmission of the corona virus is believed to be happen from the droplets that spread during sneezing and coughing by the affected individual .Majorly as first level of the transmission of corona virus is limited with closed circle to the affected individual like family members , caretakers, doctors, nurses and other people who have a regular contact with the affected individual .

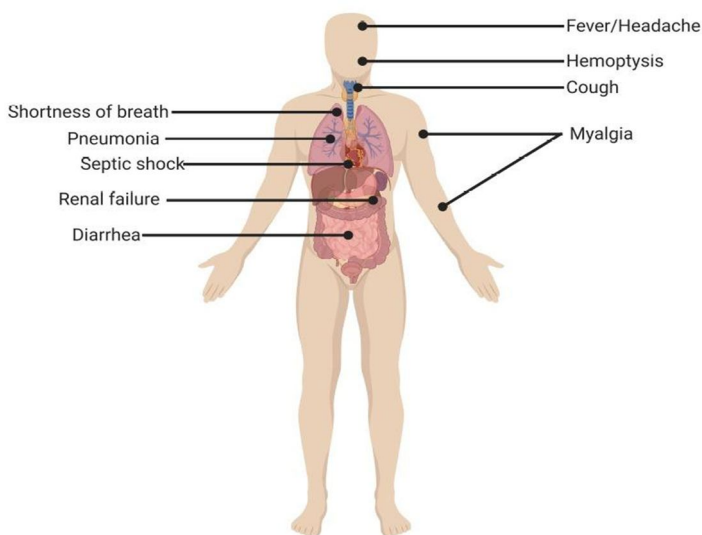
IV. PROGNOSIS OF COVID

The Clinical analysis of Corona virus ranges from paucisymptomatic type to various conditions that are characterized by respiratory dysfunctions or even to failure which requires mechanical ventilation and in some worsen cases requires intensive care .

The severity of the disease can be divided as per the clinical manifestations:

- 1) *Mild Stage Disease:* Pneumonia may or may not occur and in some cases mild pneumonia can be accompanied with raise in temperature ; this condition is noted in more than 90% of the individuals.

Clinical presentation of patients with CoVID-19



- 2) *Risky Stage Disease:* Shortness of breathing (dyspnea), respiratory rate may be greater than or equal to 30 times per minute, saturation point of oxygen in the blood (SpO2) may be ranging from lesser than or equal to 90%, and level of fraction of inspired oxygen, is identified to be greater than 300.

V. SYSTEMATIC SYMPTOMS OF COVID-19

The patients affected with corona virus has developed certain symptoms ,

- A. Individuals initially develop increased body temperature .
- B. Some individuals are prone to develop dry cough .
- C. In Teenagers the shortness of breathing and respiratory symptoms appears bit later when compared to others
- D. Some individuals experiencing increased inflammatory lung injury, may be noted with sudden fall of the oxygen saturation below 93 percent .
- E. Shortness of breathing occurs common in all affected individual due to the above said inflammation

VI. AWARENESS & PATIENT EDUCATION

Patients and families should receive instruction to:

- A. Avoid close contact with the affected individuals and always stay 1m in distance from all.
- B. Wash your hands always after visiting any patient or when returning home.
- C. Individuals with symptoms of any airway infections are advised to close their nose and mouth during sneezing, coughing and while speaking with anyone.
- D. Self responsibility and personal wellbeing and social distancing is advised to get out of this situation.

VII. MANAGEMENT OF COVID

While considering the treatment and management of the corona virus there is no protocol or treatment or antiviral dose for the infection occurring by the virus is recommended. Majorly there is no preventive vaccine is also developed against the corona virus. At present affected patients are provided with oxygen therapy treatment intervention. In some case suffering from respiratory failure needs Mechanical.

A. Intubation and Protective Mechanical Ventilation

The procedure should be executed by an expert. Some individuals require rapid sequence intubation (RSI). Along with that oxygenation (100% O₂ for 5-10 minutes) before the procedure should be performed via the continuous positive airway pressure method.

B. Other Therapies

Antibiotics administration to the patient should be avoided since it's a viral infection, even though there is no specific antiviral injections and protocol against the corona virus, there are many clinical studies that have been conducted with several combinations proposed by various organisations such as lopinavir, chloroquine. And in some places some interferon's such as Alpha-interferon is administered in patient by the inhalation process.

C. Important Changes

In COVID-19 cases as already discussed the patient mortality occurs majorly due to lack of oxygen (O₂ %) level in the body, which further results in multiple organ dysfunction and other severe complications as stated above. This situation is now addressed by various ventilation process and by administering various drugs in a trial basis as per reports these methods are useful in some cases but actually it hurts the affected individual in addition to that of infection. On other hand already our body's own natural immune system has started showing a strong Immune response once again it also affecting the linings of the pulmonary organ so we have to follow the alternative route to avoid other long term effects.

VIII. ACTION OF COVID-19 ON PULMONARY ORGAN

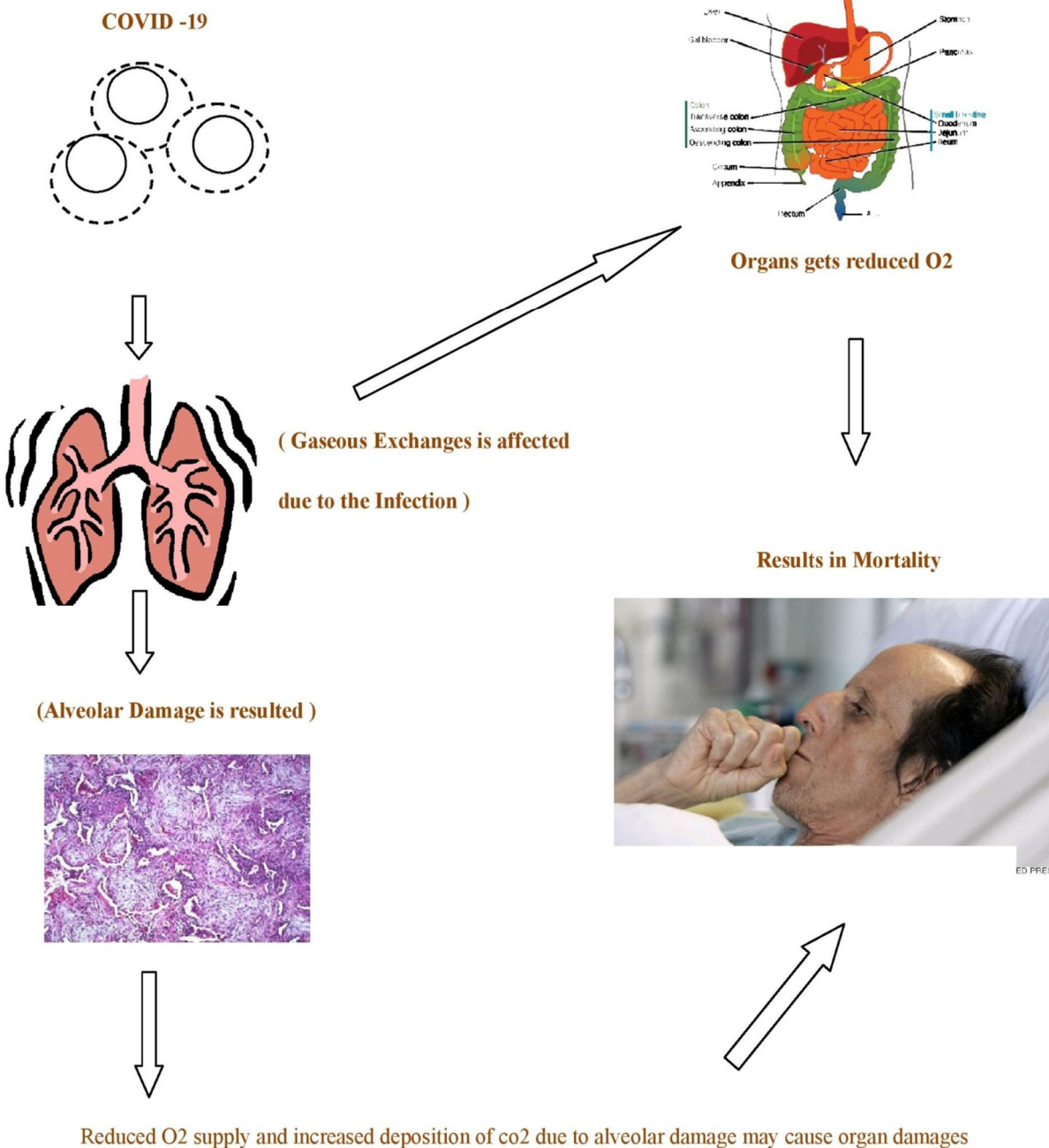
The corona virus affects the humans through affecting the respiratory tract initially and then it affects the whole respiratory system through a process called "Cytokine storm". In short cytokine storm refers to overreaction of our body's own immune system, through small proteins released by different types of cells in the body called cytokines hence the increased production of the cytokine is called a cytokine **storm**. These proteins in turn provide a message to the human immune mechanism to reach the site of infection and they promote the immune Mechanism to respond against the virus, this immune mechanism in turns Promotes inflammation.

Sometimes the human body produces large quantities of cytokines, which cause huge pressure to our immune system and force it to send more immune cells to the site of infection leading to hyper inflammation. The COVID-19 spreads all over the pulmonary organ until it reaches the lower respiratory tract, where the tiny air sacs called Alveoli are located. Because of this cytokine storm, the immune system begins to destroy the alveoli. This can lead to thickening of the lining of lungs than normal. The hyper-Inflammation triggered by the cytokine storm forces the immune cells to destroy healthy cells in the lining of our lungs and making the lungs more vulnerable to bacterial infection. Once lungs becomes less functional by the excessive immune response other organs gets deprived of oxygen. Thus the patient is suffering with suffocation from oxygen.

The Haemoglobin present in the blood are the oxygen carriers normal haemoglobin content in blood is 15 g%. Since oxygen carrying capacity of haemoglobin is 1.34 ml/g, blood with 15 g% of haemoglobin should carry 20.1 mL% of oxygen, i.e. 20.1 mL of oxygen in 100 mL of blood. But, blood with 15 g% of haemoglobin carries only 20 mL% of oxygen, i.e. 20 mL of oxygen is

carried by 100 mL of blood. Oxygen carrying capacity of blood is only 20 mL% because the haemoglobin is not fully saturated with oxygen. Due large dosage of the antiviral doses and other therapeutic drugs may result in destruction of Hb present in the blood and leading to the reduction of oxygen carried to other vital organs and also resulting in failure of gaseous exchange and failure of other processes carried between the vital parts and blood leading to damages .

ACTION OF COVID-19



IX. EMERGENCY STEP SHOULD BE TAKEN

- A. Initially the patient's Oxygen level should be monitored and the patient should be ventilated properly with a minimal adorable amount of oxygen taken by the patient to become slightly normal.
- B. Amount of Antiviral Dose should be in average controlled form. Excess of administration results in Hb damage .
- C. Since the lining of the lungs is more affected the Gaseous Exchange could not happen in normal rate so to confer the patient stability the patient should be provided with IVO2 (Oxygen - Intravenous Route) (21) So, that the patient will get enough oxygen supply and may have Increased chances to survive.
- D. Since the O2 provided intravenously the lungs will not be under continuous pressure to do increased gaseous exchange and it will automatically show better response to the virus infection.
- E. Now considering the infection , Due to IVO2 Method on the other side we prefer the Olfactory Route ,i.e. In Aerosol form , Any drug administered should be majorly through this route . Any antiviral dose that is administered on Aerosol method works better with lung Infection .
- F. The Aerosol Route will support the Immune system to respond against the viral infection and the minimal ventilation provided by the ventilator will prevent the lungs to be in normal state.
- G. Minimal level of Anti Inflammatory dose are also advised in some cases

X. CONCLUSION

The patient will be free from viral infection slowly and these above methods of IVO2 administration and Aerosol Route of drug Administration will help the patient to be in conscious state and help to reduce the mortality rate in this emergency condition .

REFERENCES

- [1] Perlman S, Netland J. Coronaviruses post-SARS: update on replication and pathogenesis. *Nat. Rev. Microbiol.* 2009 Jun;7(6):439-50. [[PMC free article](#)] [[PubMed](#)]
- [2] Chan JF, To KK, Tse H, Jin DY, Yuen KY. Interspecies transmission and emergence of novel viruses: lessons from bats and birds. *Trends Microbiol.* 2013 Oct;21(10):544-55. [[PubMed](#)]
- [3] Chen Y, Liu Q, Guo D. Emerging coronaviruses: Genome structure, replication, and pathogenesis. *J. Med. Virol.*, 2020 Apr;92(4):418-423. [[PubMed](#)]
- [4] Chan JF, Kok KH, Zhu Z, Chu H, To KK, Yuan S, Yuen KY. Genomic characterization of the 2019 novel human-pathogenic coronavirus isolated from a patient with atypical pneumonia after visiting Wuhan. *Emerg Microbes Infect.* 2020;9(1):221-236. [[PMC free article](#)] [[PubMed](#)]
- [5] Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, Ren R, Leung KSM, Lau EHY, Wong JY, Xing X, Xiang N, Wu Y, Li C, Chen Q, Li D, Liu T, Zhao J, Li M, Tu W, Chen C, Jin L, Yang R, Wang Q, Zhou S, Wang R, Liu H, Luo Y, Liu Y, Shao G, Li H, Tao Z, Yang Y, Deng Z, Liu B, Ma Z, Zhang Y, Shi G, Lam TTY, Wu JTK, Gao GF, Cowling BJ, Yang B, Leung GM, Novel Coronavirus-Infected Pneumonia. *N. Engl. J. Med.* 2020 Jan 29; [[PubMed](#)]
- [6] Bauch CT, Lloyd-Smith JO, Coffee MP, Galvani AP. Dynamically modeling SARS and other newly emerging respiratory illnesses: past, present, and future. *Epidemiology.* 2005 Nov;16(6):791-801. [[PubMed](#)]
- [7] Lei J, Kusov Y, Hilgenfeld R. Nsp3 of coronaviruses: Structures and functions of a large multi-domain protein. *Antiviral Res.* 2018 Jan;149:58-74. [[PubMed](#)]
- [8] Song W, Gui M, Wang X, Xiang Y. Cryo-EM structure of the SARS coronavirus spike glycoprotein in complex with its host cell receptor ACE2. *PLoS Pathog.* 2018 Aug;14(8):e1007236. [[PMC free article](#)] [[PubMed](#)]
- [9] Angeletti S, Benvenuto D, Bianchi M, Giovanetti M, Pascarella S, Ciccozzi M. COVID-2019: The role of the nsp2 and nsp3 in its pathogenesis. *J. Med. Virol.* 2020 Feb 21; [[PubMed](#)]
- [10] Tian S, Hu W, Niu L, Liu H, Xu H, Xiao SY. Pulmonary Pathology of Early-Phase 2019 Novel Coronavirus (COVID-19) Pneumonia in Two Patients With Lung Cancer. *J Thorac Oncol.* 2020 Feb 28; [[PubMed](#)]
- [11] Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, Zhang L, Fan G, Xu J, Gu X, Cheng Z, Yu T, Xia J, Wei Y, Wu W, Xie X, Yin W, Li H, Liu M, Xiao Y, Gao H, Guo L, Xie J, Wang G, Jiang R, Gao Z, Jin Q, Wang J, Cao B. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet.* 2020 Feb 15;395(10223):497-506. [[PubMed](#)]
- [12] Wu Z, McGoogan JM. Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention. *JAMA.* 2020 Feb 24; [[PubMed](#)]
- [13] Kogan A, Segel MJ, Ram E, Raanani E, Peled-Potashnik Y, Levin S, Sternik L. Acute Respiratory Distress Syndrome following Cardiac Surgery: Comparison of the American-European Consensus Conference Definition versus the Berlin Definition. *Respiration.* 2019;97(6):518-524. [[PubMed](#)]
- [14] Singer M, Deutschman CS, Seymour CW, Shankar-Hari M, Annane D, Bauer M, Bellomo R, Bernard GR, Chiche JD, Coopersmith CM, Hotchkiss RS, Levy MM, Marshall JC, Martin GS, Opal SM, Rubenfeld GD, van der Poll T, Vincent JL, Angus DC. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). *JAMA.* 2016 Feb 23;315(8):801-10. [[PMC free article](#)] [[PubMed](#)]
- [15] Seymour CW, Kennedy JN, Wang S, Chang CH, Elliott CF, Xu Z, Berry S, Clermont G, Cooper G, Gomez H, Huang DT, Kellum JA, Mi Q, Opal SM, Talisa V, van der Poll T, Visweswaran S, Vodovotz Y, Weiss JC, Yealy DM, Yende S, Angus DC. Derivation, Validation, and Potential Treatment Implications of Novel Clinical Phenotypes for Sepsis. *JAMA.* 2019 May 28;321(20):2003-2017. [[PMC free article](#)] [[PubMed](#)]
- [16] Matics TJ, Sanchez-Pinto LN. Adaptation and Validation of a Pediatric Sequential Organ Failure Assessment Score and Evaluation of the Sepsis-3 Definitions in Critically Ill Children. *JAMA Pediatr.* 2017 Oct 02;171(10):e172352. [[PMC free article](#)] [[PubMed](#)]



- [17] Hui DS, Chow BK, Lo T, Tsang OTY, Ko FW, Ng SS, Gin T, Chan MTV. Exhaled air dispersion during high-flow nasal cannula therapy *versus* CPAP via different masks. Eur. Respir. J. 2019 Apr;53(4) [[PubMed](#)]
- [18] Marco Cascella¹; Michael Rajnik²; Arturo Cuomo³; Scott C. Dulebohn; Raffaella Di Napoli⁴. Features, Evaluation and Treatment Coronavirus (COVID-19) March 20, 2020.
- [19] [Debs RJ](#)¹, [Montgomery AB](#), [Brunette EN](#), [DeBruin M](#), [Shanley JD](#). Aerosol administration of antiviral agents to treat lung infection due to murine cytomegalovirus . 1988 Feb;157(2):327-31.
- [20] Christian Nordqvist Intravenous Oxygen Injection For Patients Who Cannot Breathe. [Medicalnewstoday.-articles-247295](#) .Jul 2012



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