Chapter 1

# Introduction

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With the arrival of New Year 2020, alarming bell in health sector was ringing. On the last day of the year 2019, Coronavirus disease 2019 (COVID-19) was reported to WHO in the form of severe acute respiratory illness outbreak in Wuhan city, Hubei province, China.[1,2] It was notified as global health emergency just after 4 weeks on 30 January 2020 and within six weeks, it was officially a global pandemic on March 11 with declaration from WHO.[3]

SARS-CoV-2 nomenclature given on 11 February 2020 by International Committee on Taxonomy of Viruses, has changed the every aspect of life, health, work, planning and development globally with onset of its effect in the disease termed **COVID-19** (coronavirus disease 2019).[4] The name was chosen to avoid stigmatizing the virus' origins in terms of populations, geography, or animal associations.[5]

Considering the wings of COVID-19 engulfing the globe and a large population affected, aftermaths will be for decades just like scars imprinted by smallpox for the human beings. Whole exercise from a focal point or global perspective targets containment, control and cure of the disease. We are having only containment and control and no cure established till date which is a bitter truth to remember for caution as well as care in COVID-19.

A guideline has been issued by CDC with a recommendation that the general public gathering should not be more than 10 at a place at a time and face coverings with mask should be a routine when working in public places even by asymptomatic individuals to reduce the risk of transmission of COVID-19.[6] The CDC advises that non-pharmaceutical interventions (NPIs) will serve as the most important response strategy in attempting to delay viral spread and to reduce disease impact.[7]

Only preventive tools are with us in COVID-19 crisis and care, so every aspect of containment and breakdown of chain of transmission is probably most definitive target in this pandemic.

The CDC has also provided recommendations for individuals who are at high risk of COVID-19-related complications, including older adults and persons who have serious underlying health conditions (e.g. heart disease, diabetes, lung disease).[8]

## CLINICAL FEATURES

There is always myriad possibility of presentations in COVID-19, which may be either asymptomatic or with mild symptoms in most cases but severe manifestations needing ventilator support with higher possibility of death are also within the spectrum of the disease during an usual incubation period of 2 days to 2 weeks in most cases.[9,10]

Cough and shortness of breath or difficulty in breathing plus at least two of the following symptoms may indicate COVID-19:[11]

- Fever
- Chills
- Repeated shaking with chills
- Muscle pain
- Headache
- Sore throat
- New loss of taste or smell

**Other reported symptoms have included the following:**

- Fatigue
- Sputum production
- Diarrhoea
- Malaise
- Respiratory distress

The most common serious manifestation appears to be pneumonia due to acute lung injury.

## DIAGNOSIS

COVID-19 is considered a possibility in:

1. Patients with respiratory tract symptoms and newly onset fever, or
2. In patients with severe lower respiratory tract symptoms with no clear cause.

Suspicion is increased, if such patients have been in an area with community transmission of SARS-CoV-2 or have been in close contact with an individual with confirmed or suspected COVID-19 in the preceding 14 days.

Microbiologic testing is required for definitive diagnosis. Patients who do not require emergency care are encouraged to contact their healthcare provider over the phone. Patients with suspected COVID-19 who present to a healthcare facility should prompt infection-control measures. They should be evaluated in a private room with the door closed (an airborne infection isolation room is ideal) and asked to wear a surgical mask. All other standard contact and airborne precautions should be observed, and treating healthcare personnel should wear eye protection.[12]

## MANAGEMENT

The antiviral drug Remdesivir gained emergency use authorization (EUA) from the FDA on May 1, 2020, based on preliminary data showing a faster time to recovery of

hospitalized patients with severe disease.[13] Numerous other antiviral agents, immunotherapies, and vaccines continue to be investigated and developed as potential therapies.

In addition, infected patients should receive supportive care to help alleviate symptoms. Vital organ function should be supported in severe cases.[14]

No vaccine is currently available for SARS-CoV-2. Avoidance is the principal method of deterrence.

Numerous collaborative efforts to discover and evaluate effectiveness of antivirals, immunotherapies, monoclonal antibodies, and vaccines have rapidly emerged. Guidelines and reviews of pharmacotherapy for COVID-19 have been published.[15,16]

**Numerous clinical guidelines have been issued for COVID-19 as summarized below:**

- *COVID-19 Enforcement Policy for Sterilizers, Disinfectant Devices, and Air Purifiers (FDA, 2020):* 2020 COVID-19 guidance for industry and FDA staff.
- *OSHA Guidance on Preparing the Workplace for COVID-19 (2020):* 2020 guidance on preparing the workplace for coronavirus disease 2019 (COVID-19) by the Occupational Safety and Health Administration (OSHA).
- *COVID-19 Breast Cancer Patient Triage Guidelines (CPBCC):* Guidelines on surgical triage of patients with breast cancer by the COVID-19 Pandemic Breast Cancer Consortium.
- *Procedures in Known/Suspected COVID-19 (ASA, 2020):* 2020 guidelines on performing procedures on patients with known or suspected COVID-19 by the American Society of Anesthesiologists (ASA).
- *COVID-19-Related Airway Management Clinical Practice Guidelines (SIAARTI/EAMS, 2020):* 2020 clinical practice guidelines from the SIAARTI Airway Research Group and the European Airway Management Society on coronavirus disease 2019 (COVID-19)-related airway management.
- *Surviving Sepsis Campaign: Guidelines on the Management of Critically Ill Adults with Coronavirus Disease 2019 (COVID-19):* Panel consisting of 36 experts from 12 countries compiled 54 evidence-based statements for clinicians caring for patients with severe COVID-19 infection.
- *Belgium Task Force on supportive care and antiviral/immunologic treatment of hospitalized patients with suspected or confirmed COVID-19 (2020):* 2020 interim clinical guidance by the Belgium Task Force for supportive care and antiviral/immunologic therapy for adults with suspected or confirmed coronavirus disease 2019 (COVID-19).
- *COVID-19 Ventilation Clinical Practice Guidelines (2020):* COVID-19 ventilation clinical practice guidelines by the European Society of Intensive Care Medicine and the Society of Critical Care Medicine.
- *Guidance on Obstetric COVID-19 (ISUOG, 2020):* Guidance on the management of COVID-19 infection during pregnancy, childbirth, and the neonatal period, from the International Society of Ultrasound in Obstetrics and Gynecology.
- *Control of COVID-19 in Nursing Homes Guidelines (2020):* 2020 guidelines on infection control and prevention of COVID-19 in nursing homes by the Centers for Medicare and Medicaid Services (CMS).

- *FDA Face Mask and Respirator Policy in COVID-19 (2020):* 2020 guidelines on enforcement policy for face masks and respirators by the US Food and Drug Administration (FDA).
- *Rapid COVID-19 Clinical Practice Guidelines (2020):* Rapid COVID-19 clinical practice guidelines by Wuhan University Novel Coronavirus Management and Research Team and China International Exchange and Promotive Association for Medical and Health Care.
- *Guidance on Cardiac Implications of COVID-19 (ACC, 2020):* 2020 guidance by the American College of Cardiology regarding the cardiac implications of COVID-19.
- *COVID-19 Guidance for Ophthalmologists (AAO, 2020):* 2020 COVID-19 guidance for urgent and nonurgent patient care in ophthalmology.
- *Guidance on Containing Spread of COVID-19 (CMS, 2020):* Guidance for hospitals on how to identify at-risk patients, screen for COVID-19, and monitor or restrict health care facility staff, from the Centers for Medicare and Medicaid Services.
- *COVID-19 Sample Collection and Testing: Clinical Practice Guidelines (CDC, 2020):* 2020 clinical practice guidelines from the Centers for Disease Control and Prevention on the collection, handling, and testing of specimens for the diagnosis of coronavirus disease 2019 (COVID-19).
- *Guidelines for Evaluating and Testing Persons Under Investigation for COVID-19 (CDC, 2020):* 2020 clinical practice guidelines on evaluating and testing persons under investigation for coronavirus disease 2019 (COVID-19) by the Centers for Disease Control and Prevention (CDC).

These guidelines are being formulated on war footage evolving rapidly and this list will be swelling more and more as the time will pass in the hope of some good news on COVID-19 war front. But there are certain facts helping always to control the disease. If transmission is prevented or minimized that is probably the only definitive armamentarium available with us to fight the disease. We cannot give definitive treatment but only supportive treatment available for different organ systems and high mortality in high viraemia cases with acute lung injury.

**The most common ways in which COVID-19 can spread are:**

- Coughing and sneezing without covering your mouth as this can spread the droplets containing the virus in the air.
- Coming into contact with a person who is already carrying the virus.
- Coming into contact with any object which contains the virus and then touching your nose or mouth.

The primary mode of transmission is through respiratory droplets generated when an infected person coughs, sneezes, or talks. Droplets that settle on the eyes, nose, or mouth of a person in close proximity lead to the transmission of infection. Transmission can also occur by touching the face with contaminated hands. Respiratory droplets do not remain suspended in the air for long; hence, a distance of six feet away from an infected person may be considered safe.

**First and foremost golden rule** in survival during war with COVID-19 is to maintain a distance of 6 feet to avoid direct droplet exposure as safe distance of six feet may be

barrier to control the disease. Almost 80% of droplets generated fall within 1.5 feet but a distance of 6 feet reduces risk as 99.9% droplets are contained in this range.

**Second golden rule** in survival against COVID-19 is sanitization of hands with washing and hygiene maintenance. Contact with contaminated surfaces (fomites) and subsequent transfer to the face by touch may also be an important mode of transmission which is broken down with this second tool. Contaminated metal, glass, or plastic surfaces that may remain infective for several days should not be touched at all, but frequent handwashing and hygiene maintenance with sanitizer helps a lot and cuts this mode of transmission by contaminated surfaces.

**Third golden rule** is safety mask application to minimize risk. It can be of great advantage in breaking the chain of transmission as one may not get protected completely from getting infection but biggest gain is wearing mask limits the capacity to transmit the infected droplets to the others, due to barrier role of the mask. Airborne transmission, distinct from droplet infection, is characterized by viruses that drift through the air. It is still not clear, if airborne transmission occurs or not but considering the other respiratory infections transmitted by air, this mode cannot be ruled out completely. This should be taken care by safety masks application including surgical masks and N-95 masks.

These three golden rules of safe distance with separation by 6 feet, sanitization of hands by hygiene maintenance with frequent washing and safety mask over face covering nose and mouth prevent the danger and reduce the risk of getting infected or transmitting to others.

**Fourth golden rule** is screening which will save others from being hit by the virus. If there are any alarming clinical manifestations in the form of cough, fever, dyspnoea, loss of taste or smell, sore throat, headache, body ache, immediate attention with screening to detect earliest infection, quarantine, isolate and prevent further infection transmission in the society. Thermal scanners are effective in mass screening to detect raised body temperature with detection and work-up in suspicious cases. So, golden rule of screening will prevent further transmission from the source, if detected in time the infected cases.

**Fifth golden rule** is safety culture development for long-term benefit to the society and mankind not only to fight COVID-19 but any similar large-scale pandemic hitting in future. Cultural changes are most difficult, take time but set the value and long-term benefits are more to stand high at the time of crisis. Parts of cultural values and changes are like wearing masks, making masks at the local level, care of self and others, handwashing habits, physical distancing, and earlier identification of the ill and subsequent treatment, care, and support. Exercises, physical activity, healthy dietary habits and self-restrain are parts of culture which pay in long term in output. These are long-term goals to be set as part of cultural shift in the society.

**In summary, *five golden rules* for every warrior in war against COVID-19:**

1. Safe distance with six feet separation.
2. Sanitization of hands, washing and hygiene maintenance.
3. Safety mask covering face including nose and mouth.
4. Screening suspects with symptoms, signs and use of scanner.
5. Set cultural development for values and safety.

This five-point follow-up for survival in COVID-19 era sets the gear and momentum to do definite work at different levels with exploration of all aspects of the disease in terms of every aspect in the developmental and clinical history of the disease.

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