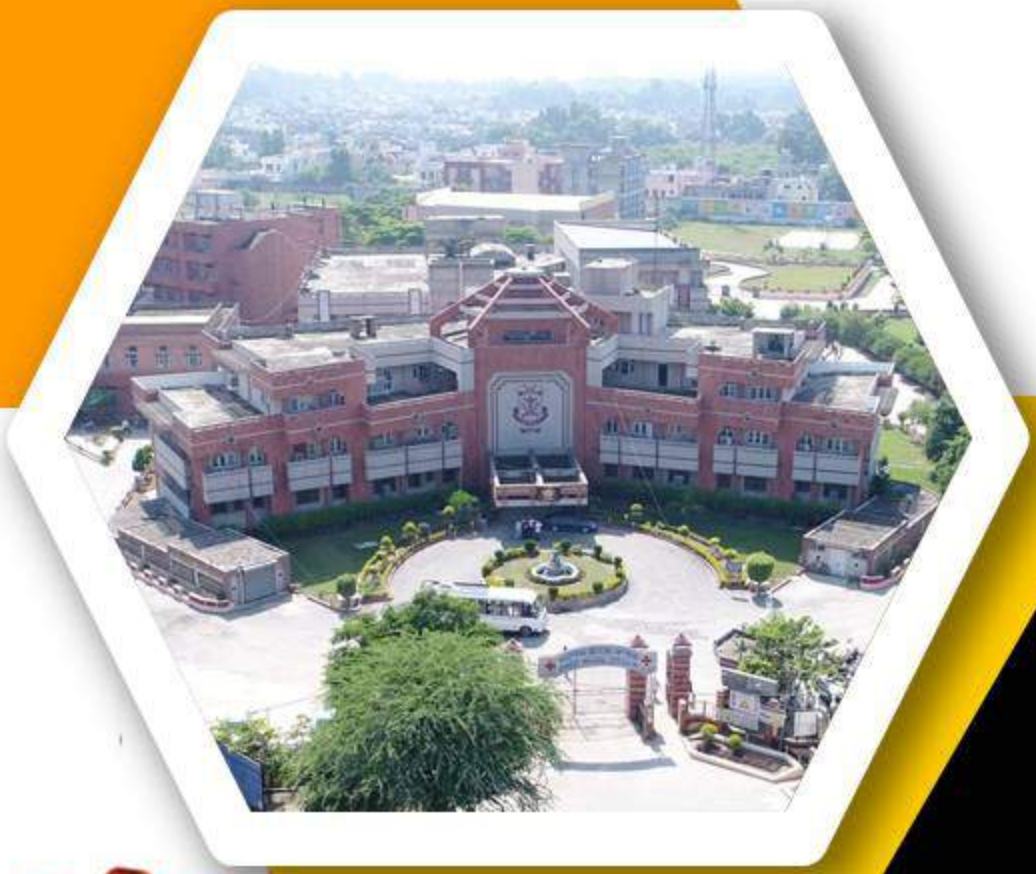
DASMESH INSTITUTE OF RESEARCH & DENTAL SCIENCES, FARIDKOT

COVID -19 PANDEMIC MANUAL & PROTOCOL



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As Covid-19 has altered the life style all over the globe even we as Dental Professionals have to alter our protocols for protection of our patients, to prevent spread of COVID-19 and protect ourself.

"Physical Distancing & Hand Hygiene is The KEY"

PROTOCOLS –COVID 19

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INTRODUCTION

Coronaviruses are a large family of viruses that cause illnesses ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). On December 31, 2019, China alerted WHO to several cases of unusual pneumonia in Wuhan, a port city of 11 million people in the central Hubei province. The virus was unknown. Several of those infected worked at the city's Huanan Seafood Wholesale Market, which was shut down on January 1, 2020. As health experts worked to identify the virus amid growing alarm, the number of infections exceeded 40. On January 7, 2020 officials announced they had identified a new virus, according to the WHO. The novel virus was named 2019-nCoV and the disease was named COVID-19 (co-corona, vi-virus, d-disease, 2019-outbreak year) and was identified as belonging to the coronavirus family, which includes SARS and the common cold. This particular virus, officially known as SARS-CoV-2 was named by International Committee on Taxonomy of Viruses on 11 Feb, 2020. Since the new coronavirus was first reported in Wuhan, China, in December, the infectious respiratory disease COVID-19 has spread rapidly within China and to neighboring countries and beyond.

The first confirmed coronavirus cases outside China occurred on Jan. 20, 2020 in Japan, Thailand and South Korea. On Jan. 21, 2020 the first case in the U.S. was identified in Washington state. Authorities in the United States, Nepal, France, Australia, Malaysia, Singapore, South Korea, Vietnam and Taiwan confirmed cases over the following days. ‘

On January 30, 2020, the World Health Organization (WHO) announced that this outbreak had constituted a Public Health Emergency of International Concern. The World Health Organization (WHO) on March 11 declared COVID-19 a *pandemic*, pointing to the over 118,000 cases of the coronavirus illness in over 110 countries and territories around the world and the sustained risk of further global spread.

Currently known overall mortality rate is estimated to be as high as 3.4%. According to John Hopkins University Coronavirus Resource Center (April 11, 2020) update on COVID-19, there have been more than 17,00,000 reported cases and 1,00,000 deaths worldwide and this number continues to increase. Therefore, measures for prevention, identification and management must be in place for appropriate mitigation of further spread.

TRANSMISSION

Our understanding of the mode of transmission is currently incomplete. Epidemiologic investigation in Wuhan at the beginning of the outbreak identified an initial association with a seafood market where most patients had worked or visited. The seafood market also sold live rabbits, snakes and other animals. The initial concept was that the virus originated from snakes, however later studies proved that it had more similarity with bats. However, as the outbreak progressed, person-to-person transmission through droplets and fomites became the primary mode of transmission.

How does Person-to-person transmission occur?

Droplet transmission

The virus is released in the respiratory secretions when an infected person coughs, sneezes or talks. These droplets can infect others if they make direct contact with the mucous membranes. Infection can also occur by touching an infected surface and followed by eyes, nose or mouth. Droplets typically do not travel more than six feet (about two meters) and do not linger in the air. However, given the current uncertainty regarding transmission mechanisms, airborne precautions are recommended routinely in some countries and in the setting of specific high risk procedures. Patients are thought to be most contagious when they are symptomatic. Some spread might be possible before symptoms appear, but this is not thought to be a common occurrence.

Other possible modes of transmission

It may be possible that a person can get COVID-19 by touching a surface or object that has the virus on it and then touching their own mouth, nose, or possibly their eyes, but this is not thought to be the main way the virus spreads.

One study suggested that the **virus may also be present in feces** and could contaminate places like toilet bowls and bathroom sinks. But the researchers noted the possibility of this being a mode of transmission needs more research.

In February a Chinese **newborn** was diagnosed with the new coronavirus just 30 hours after birth. The baby's mother tested positive before she gave birth. It is unclear how the disease was transmitted - in the womb, or after birth. Recently in London another newborn was tested positive for the coronavirus, marking what appears to be the second such case as the pandemic worsens

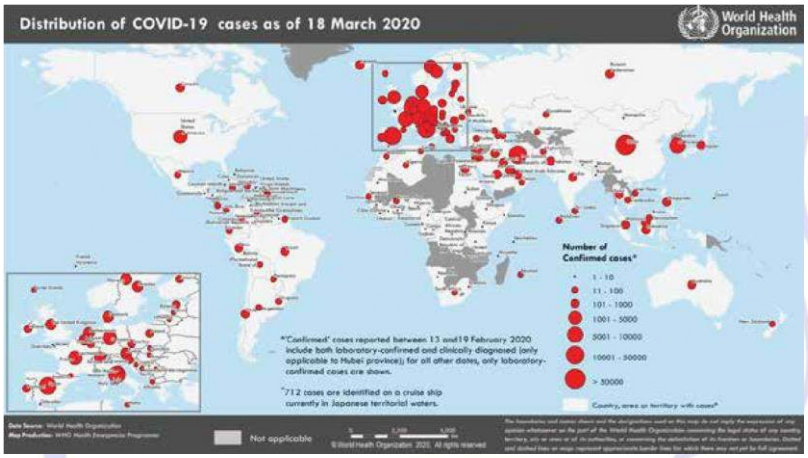
To Summarize

a) Person to person by respiratory droplets.
b) Face to face communication
c) Transmission through direct contact and fomites.
d) COVID-19 can be transmitted directly or indirectly through saliva.
e) Contact with contaminated instruments and or environmental surfaces.
f) Poor respiratory hygiene and etiquettes
g) Inadequate sterilization protocols

EPIDEMIOLOGY

Since the first reports of cases from Wuhan, at the end of 2019, more than 80,000 COVID-19 cases have been reported in China; including all laboratory-confirmed cases as well as clinically diagnosed cases in the Hubei Province. Increasing numbers of cases have also been reported in other countries across all continents except Antarctica. The rate of new cases outside of China has outpaced the rate in China which led world health organization (WHO) to declare COVID-19 as a pandemic.

COVID-19 OUTBREAK (WORLD DATA)



Coronavirus Map: Distribution of COVID-19 cases as of March 18, 2020. Credit: WHO
(Image reproduced with permission from WHO)

Updated till: March 21st 2020

COVID-19 Cases	Deaths	Recovered
2,77,049	11,422	91,986

Courtesy: worldometers.info

CLINICAL FEATURES

Incubation period

The exact incubation period is not known. It is presumed to be between 2 to 14 days after exposure, with most cases occurring within 5 days after exposure

The spectrum of illness severity

Most infections are self-limiting. COVID-19 tends to cause more severe illness in elderly population or in patients with underlying medical problems. As per the report from Chinese center for disease control and prevention that included approximately 44,500 confirmed Infections with an estimation of disease severity

- Mild illness was reported in 81% patients
- Severe illness (Hypoxemia, >50% lung involvement on imaging within 24 to 48 hours) in 14%
- Critical Disease (Respiratory failure, shock, multi-organ dysfunction syndrome) was reported in 5 percent
- Overall case fatality rate was between 2.3 to 5%

Age affected

- Mostly middle aged (>30 years) and elderly.
- Symptomatic infection in children appears to be uncommon, and when it occurs, it is usually mild.

Clinical Presentation

In a study describing 1099 patients with COVID-19 pneumonia in Wuhan, the most common clinical features at the onset of illness were:

•Fever in 88%
•Fatigue in 38%
•Dry cough in 67%
•Myalgias in 14.9%
•Dyspnea in 18.7%

Pneumonia appears to be the most common and severe manifestation of infection. In this group of patients breathing difficulty developed after a median of five days of illness. Acute respiratory distress syndrome developed in 3.4% of patients.

Other symptoms

•Headache
•Sore throat
•Rhinorrhea
•Gastrointestinal symptoms

About 80% of confirmed COVID-19 cases suffer from only mild to moderate disease and nearly 13% have severe disease (dyspnea, respiratory frequency ≥30/minute, blood oxygen saturation≤93%, PaO2/FiO2 ratio <300, and/or lung infiltrates >50% of the lung field within 24-48 hours).

Critical illness (respiratory failure, septic shock, and/or multiple organ dysfunction/failure) is noted in only in less than 6% of cases.

COVID 19 IN PEDIATRIC POPULATION

In this outbreak, compared with adult cases, there are relatively fewer cases of children, milder symptoms and better prognosis. Also, children are less frequently exposed to the main sources of transmission. Most infected children recover one to two weeks after the onset of symptoms, and no deaths had been reported by February 2020. According to the recent report of the China-WHO Joint Mission Expert Group, the current domestic case data show that children under 18 years of age account for 2.4% of all reported cases, and no deaths have been reported.

Probable reasons Why COVID-19 is less affected in children

- The time period of the outbreak, is the winter vacation time of the university, middle school and kindergarten. It is a good time for everyone to stay in their own families, which is equivalent to active home isolation. It is a good time to avoid the collective cluster disease by chance.
- Secondly, humoral and cellular immune development in children is not fully developed. This may be one of the mechanisms that lead to the absence of severe immune responses after viral infection.

- As COVID-19 virus exploits the ACE2 receptors to gain entry inside the cells, under expression, immaturity of ACE2 receptors in children is another hypothesis in this regard.
- Moreover, recurrent exposure to viruses like respiratory syncytial virus in winters can induce more immunoglobulins levels against the new virus infection compare to adults. There is no direct evidence of vertical mother-to-child transmission, but new borns can be infected through close contact.

In recent studies in china, there was no significant gender difference in children and it was suggested that alleges ranged from 1 day to 18 years were prone to infected by the COVID-19. The symptoms of COVID-19 are similar in children and adults. However, children with confirmed COVID-19 have generally presented with mild symptoms and usually recover within 1 to 2 weeks. Reported symptoms in children may include cold-like symptoms, such as fever, dry cough, sore throat, runny nose, and sneezing. Gastrointestinal manifestations including vomiting and diarrhea have also been reported.

In the 13 pediatric patients (13/20, 65%) that had an identified history of close contact with COVID-19 diagnosed family members. Fever (12/20, 60%) and cough (13/20, 65%) were the most common symptoms. Children with underlying medical conditions and special healthcare needs may be at higher risk for severe illness. There is much more to be learned about how the disease impacts children.

For laboratory findings, in the early stage of the disease, the total number of peripheral white blood cells is normal or decreased, the lymphocyte count is reduced, and some children have increased liver enzymes, lactate dehydrogenase (LDH), muscle enzymes, and myoglobin; some critically ill patients have increased troponin, D-dimer and ferritin and the number of peripheral blood lymphocytes have progressively reduced. Like adults, the children with severe and critical illness may be accompanied by elevated levels of inflammatory factors such as interleukin (IL)-6, IL-4, IL-10, and tumor necrosis factor (TNF)-α.

There are no abnormal findings in the early stages of the disease in the children's plain X-rays with COVID-19 thus plain X-rays it is not recommended especially in the early stages and in whom without symptoms or any positive risk factors. Suspected cases should undergo chest CT examination as soon as possible. The most important finding in early stages is a single or multiple limited ground-glass opacity which mostly located under the pleura or near the bronchial blood vessel bundle especially in the lower lobes. Severe period is very rare, manifested by diffuse unilateral or bilateral consolidation of lungs and a mixed presence of ground glass opacities.

Also compared to adults, consolidation with surrounding halo signs is more common in pediatric patients and was suggested as a typical sign in pediatric patients. For now, treatment is supportive; no specific antiviral medications are available for children

DIAGNOSIS

CASE DEFINITION *(As per WHO-China joint commission report)*

1.1 Suspected case

Based on the epidemiologic characteristics observed so far in China, everyone is assumed to be susceptible, although there may be risk factors increasing susceptibility to infection.

- A patient with acute respiratory tract infection (sudden onset of at least one of the following: cough, fever, shortness of breath) AND with no other a etiology that fully explains the clinical presentation AND with a history of travel or residence in a country/area reporting local or community transmission* during the 14 days prior to symptom onset;

OR

- A patient with any acute respiratory illness AND having been in close contact with a confirmed or probable COVID-19 case in the last 14 days prior to onset of symptoms;

- A patient with severe acute respiratory infection (fever and at least one sign/symptom of respiratory disease (e.g., cough, fever, shortness breath)) AND requiring hospitalization (SARI) AND with no other aetiology that fully explains the clinical presentation.

1.2 Probable Case

A suspected case for whom testing for virus causing COVID-19 is inconclusive (according to the test results reported by the laboratory) or for whom testing was positive on a pan-coronavirus assay.

1.3 Confirmed Case

A person with laboratory confirmation of virus causing COVID-19 infection, irrespective of clinical signs and symptoms

1.4 Close Contacts

Close contact of a probable or confirmed case is defined as

- A person living in the same household as a COVID-19 case;
- A person having had direct physical contact with a COVID-19 case (e.g. shaking hands);
- A person having unprotected direct contact with infectious secretions of a COVID-19 case (e.g. being coughed on, touching used paper tissues with a bare hand)
- A person having had face-to-face contact with a COVID-19 case within 2 meters and > 15 minutes.

- A person who was in a closed environment (e.g. classroom, meeting room, hospital waiting room, etc.) with a COVID-19 case for 15 minutes or more and at a distance of less than 2 meters.
- A healthcare worker (HCW) or other person providing direct care for a COVID-19 case, or laboratory workers handling specimens from a COVID-19 case without recommended personal protective equipment (PPE) or with a possible breach of PPE;
- A contact in an aircraft sitting within two seats (in any direction) of the COVID-19 case, travel companions or persons providing care, and crew members serving in the section of the aircraft where the index case was seated (if severity of symptoms or movement of the case indicate more extensive exposure, passengers seated in the entire section or all passengers on the aircraft may be considered close contacts).

LABORATORY FINDINGS

White Blood Cell Count

- White blood cell count can vary. It does not provide accurate information about COVID-19.
- Leukopenia, leukocytosis, and lymphopenia have been reported.
- Lymphopenia is more common, seen in more than 80% of patients
- Mild thrombocytopenia is commonly seen. However thrombocytopenia is considered as a poor prognostic sign.

INFLAMMATORY MARKERS

Serum Procalcitonin

- Serum procalcitonin is often normal at the time of admission; however it increases in patients who require ICU care. In one study high D-Dimer and lymphopenia are associated with poor prognosis.

C - reactive protein (CRP)

- COVID-19 increases CRP. This seems to track with disease severity and prognosis. In patients suffering from with severe respiratory failure with a normal CRP level an alternative diagnosis should always be sought.

Patients who meet the criteria for suspect cases, as discussed above, should undergo testing for SARS-CoV-2 and also respiratory pathogens. Respiratory specimen collection from the upper and in particular lower respiratory tract should be performed under strict airborne infection control precautions. Preferably these samples should be obtained as early as symptom onset, since it yields higher virus concentrations.

RECOMMENDATIONS FOR SAMPLE COLLECTION

- Collection of specimens to test for SARS-CoV-2 from the upper respiratory tract (nasopharyngeal and oropharyngeal swab) is the preferred method for diagnosis
- Induction of sputum collection is not recommended

- Bronchoscopy being an aerosol generating procedure has got the potential to transmit infection to others. In view of this preferably avoid performing it and limit its usage clearing secretions/mucous plugs in intubated patients
- All respiratory specimen collection procedures should be done in negative pressure rooms
- Additional specimens (eg: Blood, stool, urine) can also be collected to rule out alternative/ supportive diagnosis.

CURRENT RECOMMENDED DIAGNOSTIC MODALITY FOR COVID 19

- SARS-CoV-2 RNA is detected by polymerase chain reaction (RT-PCR)
- Results are generally available within a few hours to 2 days
- A single positive test should be confirmed by a second RT-PCR assay targeting a different SARS-CoV-2 gene
- If initial testing is negative but the suspicion for COVID-19 remains, the WHO recommends re-sampling and testing from multiple respiratory tract sites
- For safety reasons, specimens from a patient with suspected or documented COVID-19 should not be submitted for viral culture.
- Samples should also be tested for other viral/bacterial pathogens.

COVID 19- RAPID TESTS

COVID-19 Rapid Test qualitatively detects IgG and IgM antibodies to SARS-CoV-2 in human whole blood, serum and plasma samples. This test applies lateral flow immuno-chromatography and is a tool to assist in the diagnosis of SARS-CoV-2 infections. . The IgM-IgG combined assay has better utility and sensitivity compared with a single IgM or IgG test. It can be used for the rapid screening of SARS-CoV-2 carriers, symptomatic or asymptomatic, in hospitals, clinics, and test laboratories.

Recommendation:

Despite the promise, there is no definitive definitive evidence regarding the utility of rapid kits for testing COVID 19 suspected patients respiratory/serum samples .

Photograph
COVID-19 Rapid Test kit

Corona testing positivity rates- Journal of American Medical Association (JAMA)		
Sl No	Type of specimen	Positive %
1	Bronchoalveolar lavage fluid	93 %
2	Fibrobronchoscope brush biopsy	46 %
3	Sputum	72 %
4	Nasal swabs	63 %
5	Pharyngeal swabs	32 %
6	Feces	29 %
7	Blood	1 %
8	Urine	0 %

Note: Nasal swab will detect only 2/3rd of cases and pharyngeal swabs will detect only 1/3rd of cases and Nasal swab testing is better of two for unadmitted patients

Ref: Detection of SARS-CoV-2 in Different Types of Clinical Specimens
Wenling Wang, Yanli Xu, Ruqin Gao, Roujian Lu, Kai Han, Guizhen Wu, Wenjie Tan
JAMA. 2020 Mar 11 : e203786. Published online 2020 Mar

BRONCHOSCOPY

Benefits

- Helps in obtaining BAL samples in patients who are not able to expectorate sputum for checking bacterial culture/AFB smear/gene Xpert
- Bronchoscope can be used to clear out mucous plugs in ventilated patients.

Risks

- May cause some deterioration in clinical condition, especially in patients who are on high oxygen support
- High risk of transmission of infection to providers.
- Significant utilization of valuable resources at this point (N95 respirators, physicians, respiratory therapists) – Supply of all these resources will be limited during the time of a pandemic.

Recommendations

- Bronchoscopy should not be done only for the purpose of ruling COVID-19. Risk of transmission of infection to others is extremely high through aerosols.
- It can be performed when sputum sample cannot be obtained to rule out alternative diagnosis like (Tuberculosis, bacterial/fungal pneumonias)
- It can be performed to suction out mucous plugs in ventilated patients
- Consideration for use of a disposable bronchoscope if available
- Consider bronchoscopy in patient's place of care to minimize the exposure
- Minimize staff in room during procedure.
- Negative pressure room if available
- All Personal Protective equipment should be used: Face shield/goggles, N95 mask, Contact isolation gown, Gloves
- Standard disinfection protocols should be followed for cleaning your flexible bronchoscopes and video monitors.

RADIOLOGY IN COVID-19 INFECTION

In this section, we are about to describe the imaging features in COVID-19 infection. The information we have available until now, it is based on Chinese registries and publications of recently knowledge.

It is good to know that the American College of Radiology have released recommendations for the use of Chest Radiography and computed Tomography in the last two weeks (March 11st). And the official paper emphasize that knowledge of the infection is rapidly evolving. Also there is the recommendation of the CDC,

supporting the fact that chest radiography or computed tomography are not recommended to diagnose the COVID-19 infection. CDC link. www.cdc.gov

The findings on chest imaging are not specific of the infection, and could overlap with other entities, such as Influenza. There are also recommendations about the performance of the chest radiography, including the fact that it is better to avoid the movement of the patient within the hospital.

Chest Radiography (CXR).

The findings on CXR are not specific, and in the initial phases of the disease the studies could be normal. The most common features include lobar/ multi-lobar / bilateral lung consolidation.

Computed Tomography (CT Chest).

Recent studies have reported the features on CT imaging. Pan et al described the tomographic changes of 21 patients with mild to moderate disease who recovered from the disease, and they described **four stages:**

- **Early stage** (0-4 days after the onset of the symptoms), in which ground glass opacities (GGO) are frequent, with sub-pleural distribution and involving predominantly the lower lobes. Some patients in this stage could have a normal CT.
- **Progressive stage** (5-8 days after the onset of the symptoms), the findings usually evolved to rapidly involvement of the two lungs or multi-lobe distribution with GGO, crazy-paving and consolidation of airspaces.
- **Peak stage** (9-13 days after the onset of the symptoms), the consolidation becomes denser and it was present in almost all of the cases. Other finding was residual parenchymal bands.
- **Absorption stage** (>14 days after the onset of the symptoms), no crazy paving pattern was observed, the GGO could remain.

Shietal also described the CT findings in 81 patients in Wuhan, China. All of the patients had an abnormal CT, and the features include: GGO, smooth and irregular interlobular septal thickening, crazy paving pattern, air bronchogram and irregular pleural thickening. Usually affecting the subpleural regions and the lower lobes.

Lung ultrasound. (USG

The USG findings are also not specific for COVID-19 infection. Little information is available to date on this matter. The findings include: Irregular pleural lines, sub-

pleural areas of consolidation, areas of White lung and thick B lines. It is a tool that could be used at bed side avoiding the need for shifting infected patients to a Radiology suite.

Pulmonary function tests (PFT)

Sources of cross infection in pulmonary function lab can occur due to close contact, direct contact and through aerosolized particles. Among these Droplets/aerosolized particles is the most common mode of transmission of infection. Numerous factors play a role in the virulence of an organism: source & strain of pathogen, route of infectivity, particle size, room temperature and infective dose of pathogen.

Recommendations:

- All kinds of pulmonary function tests should be avoided among patients with a strong suspicion of upper or lower Respiratory tract infection.
- In COVID 19 endemic zones it would be wise to avoid PFTs for a major proportion of patient to avoid spread of infection and usage of PFT should be limited for time being for only pre-operative fitness assessment.
- All patients who are enrolled to perform a PFT should be segregated, since this helps in preventing the spread of infection. Performing a chest x-ray prior to PFT would help to rule out Respiratory infections to certain extent.
- Contact in waiting room with potentially infectious patients should be inimized. Surgical facemasks, tissues, and waste container, alcohol-based sanitizers should be made easily available for infectious patients.
- All connections between the patient and the PFT machine (tubing's & valves) should be cleaned and disinfected before re-use.
- Disposable items in PFT lab like mouth pieces can be a reservoir of microorganisms and hence should be disposed carefully.
- Usage of personal protective equipment's helps in reducing the risk of cross contamination.

GUIDELINES FOR PRACTICING DENTISTRY POST COVID-19

Consider all patient as COVID -19 positive

Tele consultation

Telehealth refers to a broad variety of technologies and tactics to deliver virtual medical, health, and education services. Telehealth is not a specific service, but a collection of means to enhance care and education delivery. Teledentistry refers to the use of telehealth systems and methodologies in dentistry. Teledentistry can include patient care delivery using, but not limited to, the following modalities:

- Live video (synchronous): Live, two-way interaction between a person (patient, caregiver, or provider) and a provider using audiovisual telecommunications technology.
- Store-and-forward (asynchronous): Transmission of recorded health information (for example, radiographs, photographs, video, digital impressions and photomicrographs of patients) through a secure electronic communications system to a practitioner, who uses the information to evaluate a patient's condition or render a service outside of a real-time or live interaction
- Mobile health (mHealth): Health care and public health practice and education supported by mobile communication devices such as cell phones, tablet computers, and personal digital assistants (PDA).

During this pandemic our goal as dental care providers is to use telecommunication technology to triage patients and conduct problem-focused evaluations to limit office visits to urgent or emergency care. This can facilitate providing advice and performing triage. It can also facilitate planning for in-person interactions should they become necessary.

Entry Point

All patients and their attendance must wear mask before entering the main gate o the college and sanitize their hand with (70% Isopropyl Alcohol) properly. They are advised to follow all instructions written at the reception area.

Types of Signage's

1. Post a sign at the entrance of ALL departments which instructs patients having symptoms of a respiratory infection (e.g., dry cough, sore throat, fever, fatigue, sneezing, or shortness of breath) to please inform the doctor at FIRST interaction. The same thing applies if they have had any of these symptoms in the last 48 hours

2. Provide supplies for respiratory hygiene and cough etiquette, including alcohol-based hand rub with 60-95% alcohol, tissues, and no-touch receptacles for disposal, at entrances, waiting rooms, and patient check-ins

Reception Area

Patient following the instructions/guidelines shall fill Declaration form (Table 1) and consent Form(Table 2) and registration is done.

1. Every Patient presenting to the hospital OPD be handed over the Self-Declaration & Screening Form and Informed Consent
2. The self-declaration & screening form and consent form has to be filled up and signed by the Patient/Attendant and directed to the doctor with the Self Declaration details.
3. The form will be filled and attached in the patient file.
4. Patient is asked to perform hand hygiene followed by sanitization with alcohol based hand sanitizer. Patient is instructed to put hands in pockets or fold hands together, AVOID unnecessary touching
5. Prevent patients from bringing companions to their appointment, except for instances where the patient requires assistance (e.g., pediatric patients, people with special needs, elderly patients, etc.). If companions are allowed for patients receiving treatment, they should also be screened for signs and symptoms of COVID-19 during patient check-in and should not be allowed entry into the facility if signs and symptoms are present (e.g., fever, cough, shortness of breath, sore throat). Companions should not be allowed in the dental office if perceived to be at a high risk of contracting COVID-19 (e.g., having a pre-existing medically compromised condition). Any person accompanying a patient should be prohibited in the dental operatory
6. Dental professional should be able to identify the patient with suspected CoVID-19 infection and should not treat the patient in the dental clinic, but immediately quarantine the patient & report to the infection control department as soon as possible
7. Reception staff does not require personal protection equipment (PPE).
8. Remove magazines, reading materials, toys and other objects that may be touched by others and which are not easily disinfected
9. Rearrange waiting area to have at least six or more feet distance around each patient and inform the patient beforehand to maintain the social distancing
10. Clean and disinfect public areas frequently, including waiting rooms, door handles, chairs, and bathrooms

Payment guidelines.

a) Digital maximum
b) Non-contact methods, Rupay, UPI, NEFT, GOOGLE PAY, etc.
c) Keep currency handling to bare minimum

Triaging

1. Establishing triage station as Oral Medicine & Radiology department to screen patients before they enter dental clinics. Establishing precheck triages to measure and record the temperature of every staff and patient as a routine procedure. Precheck staff should ask patients questions about the health status and history of contact or travel.
2. In the course of history taking, the following factors are of important relevance: stage of disease spread in the geographical location; history of exposure to potentially infected persons or places; any symptoms of respiratory illness. Patients can be segregated into distinct risk categories based on the responses to these questions
3. Take temperature readings for the screening and as part of the routine assessment of patients before performing dental procedures. A contact-free forehead thermometer is strongly recommended for the screening
4. If the patient has been to epidemic regions/hot spot within the past 14 days, quarantine for at least 14 days is suggested.
5. Every patient is asked to perform hand hygiene followed by sanitization with alcohol based hand sanitizer

TABLE - 1

SELF DECLARATION FORM / ਸਵੈ ਘੋਸ਼ਣਾ

DASMESH INSTITUTE OF RESEARCH & DENTAL SCIENCES, FARIDKOT & DASMESH HOSPITAL, FARIDKOT

- ਕੋਈ ਨੱਕ ਤਾਂ ਨਹੀਂ ਵਗਦਾ ਹੈ।

  ਹਾਂ ਜਾਂ ਨਾਂ

- ਕੋਈ ਬੁਖਾਰ ਤਾਂ ਨਹੀਂ ਹੈ।

  ਹਾਂ ਜਾਂ ਨਾਂ

- ਕੋਈ ਗਲੇ ਦੀ ਦਿੱਕਤ ਜਾਂ ਦਰਦ ਤਾਂ ਨਹੀਂ ਹੈ।

  ਹਾਂ ਜਾਂ ਨਾਂ

- ਕੋਈ ਖਾਂਸੀ ਤਾਂ ਨਹੀਂ ਹੈ।

  ਹਾਂ ਜਾਂ ਨਾਂ

- ਕੋਈ ਸਾਹ ਚੜਨ ਦੀ ਤਕਲੀਫ ਤਾਂ ਨਹੀਂ ਹੈ।

  ਹਾਂ ਜਾਂ ਨਾਂ

- ਲੈਟਰੀਨਾਂ ਦੀ ਦਿੱਕਤ ਤਾਂ ਨਹੀਂ ਹੈ।

  ਹਾਂ ਜਾਂ ਨਾਂ

- ਕੋਈ ਵੀ ਤੁਹਾਡੇ ਘਰ ਵਿਦੇਸ਼ ਤੋਂ ਤਾਂ ਨਹੀਂ ਆਇਆ ਹੈ।

  ਹਾਂ ਜਾਂ ਨਾਂ

- ਕਿਸੇ ਕਰੋਨਾ ਪਾਜੀਟਿਵ ਵਿਅਕਤੀ ਦੇ ਸਬੰਧ ਵਿੱਚ ਤਾਂ ਨਹੀਂ ਹੈ।

  ਹਾਂ ਜਾਂ ਨਾਂ

SCREENING AND SELF DECLARATION FORM

(To be completed by Patient/ Attendant)

Full Name: …… Age…… Gender:……
Contact Number: …… Address……
Regn. No. (If Applicable)……

S.NO.	Particulars		
1	**Do you have symptoms of Respiratory Illness?**		
	Cough Fever Sore Throat Breathlessness Running Nose		
	Others……Please Specify		
2.	**T ravel History in last 14 days: By Road /Rail/Seaways/Air** **Domestic International**		
	Specify Countries and Cities visited by you in last 14 days:		
	Date of Arrival in City (If Applicable):		
	Any contact with any international traveller in last 14 days Yes No **Country:** …… **Date of contact** …….. **:**…… …		
3.	**Any history of Contact with a laboratory confirmed COVID -19 cases in last 14 days**. (If Applicable) Details of Contact: Date of Contact……Name of contact:…… Contact No.:……		
4.	Are you a Healthcare Provider		Yes No
5.	**Family member accompanying**	**Relationship**	**Contact Number**
6.	**Hospital staff who attended to the patient:**	**Designation & ID**	**Contact Number**

During the lockdown in the wake of the current Corona companion, I have come to the hospital by myself for an Emergency Treatment. If I am an asymptomatic carrier or an undiagnosed patient with COVID19, I suspect it may endanger doctors and hospital staff; It is my responsibility to take appropriate precautions and to follow the Protocols prescribed by them.
I also know that I may get an infection from the hospital or from a doctor, and I will take every precaution to prevent this from happening, but I will Not at all hold doctors and hospital staff accountable if such infection occurs to me or my accompanying persons.

Signature of Patient/Attendant …….. Relationship……
Date and time: ……

(Note: This form is to be filled in duplicate:
For **ALL patients** visiting hospital One copy to be handed over to patient, and second copy to be attached in patient file

Any of Above History and Symptoms Present	Advise
No	**Can Proceed for the needful treatment**
Yes	**To seek Medical Advice and report when asymptomatic and have clearance from Medical Authorities .**

……	……	……..	……..
Sign of Staff	**Name of Staff**	**Date**	**Time**

Table No. 2

DASMESH INSTITUTE OF RESEARCH & DENTAL SCIENCES, FARIDKOT

INFORMED CONSENT FOR DURING PANDEMIC OF COVID 19

This consent form should be signed by the patient at the time of treatment/ procedures or surgery during the pandemic phase of COVID 19.

Patient Details:

Name :	Registration No.:
Age :	Gender :
Address :	Phone No :

Patient Consent:

1. I agree that I am aware and have been informed by the hospital about the outbreak of COVID-19/Coronavirus, which may involve the following complications and risks, including but not limited to:-
   - ❖ Symptoms of infection can be mild to severe respiratory illness with fever, cough, and difficulty breathing.
   - ❖ In some cases, these symptoms may be so severe that may require an referral/ admission to ICU

   I will be shifted to other medical hospital/ tertiary care hospital, if need arise
2. I agree and understand that I may be exposed to the above-mentioned risks during and after treatment in the hospital and that I will not hold the hospital liable for any such risks, outcomes and complications. Further, I may also be an asymptomatic carrier of the infection, which manifests clinically during/ after the treatment.
3. I have been informed and am opting for treatment / surgery / investigation in the midst of community outbreak of COVID19 pandemic.
4. I have been explained about the precautions being taken by the hospital to prevent transmission of infection in patients and staff.
5. I understand and acknowledge that although all precautions as prescribed by the Government of India have been duly implemented by the hospital, as the disease is new and its kinetics, symptoms and treatment are still being studied, no assurances or guarantees can be offered regarding disease transmission to myself or clinical outcome in case of disease transmission to me.
6. I understand and agree to strictly abide by all the instructions/ guidelines laid down by the hospital, in order to help curb the spread of Covid -19/Coronavirus.

I certify that I have received complete information & fully understood the above consent statement, that all of my questions have been answered to my satisfaction, that all blanks requiring completion were filled in, prior to the time of my signature, and that this consent is given with stable mind,freely,voluntarily and without reservation.

On the basis of the above statements, I hereby authorize Dr. …… and those he may designate as associates or assistants to provide necessary treatment, surgical operation and/ or diagnostic/ therapeutic procedure as required.

Patient/ Substitute Decision Maker	**Witness**	**Interpreter**
Name:-	Name:-	Name:-
Relationship:-	Relationship:-	Translation given in:-
Signature:-	Signature:-	Signature:-
Date:-	Date:-	Date:-
Time:-	Time:-	Time:-

PERSONAL PROTECTIVE EQUIPMENTS (PPE)

WHAT SHOULD INCLUDE IDEAL POST PROTECTIVE EQUIPMENT (PPE)?

Personal protective equipment must be used while dialyzing COVID-19 positive patients. These include:

- Shoe covers
- Gown
- Surgical cap or hood
- Goggles or eye shields
- Mask: Ideally all masks should be N95 respirators with filters. However, as the life of such masks is approximately 6-8 hours and they can be uncomfortable over a long term and are also in short supply, they should be prioritized for aerosol generating procedures, namely intubation, open suction and bronchoscopy. Surgical triple layer masks and cloth masks can be used as alternatives for all other procedures.
- Surgical gloves.

The correct method of donning and doffing personal protective equipment's (PPE) can be viewed on YouTube at https://youtu.be/NrKo2vWJ8m8. However, it is always better to give hands on training of donning and doffing to staff who is going to handle suspected or positive patients.

PPE for at-risk health facilities

Airborne precautions for aerosolized generating procedures:

Gloves

Gloves nitrile, powder-free, non-sterile. (eg. minimum 230mm total length. Various sizes ranging from small, medium , large

Mask (healthcare worker)

Medical mask, good breathability, internal and external faces should be clearly identified

Face Shield

Made of clear plastic and provides good visibility to both the wearer and the patient, Adjustable band to attach firmly around the head and fit snuggly against the forehead, Fog resistant (preferable), Completely cover the sides and length of the face, May be re-usable (made of robust material which can be cleaned and disinfected) or disposable.

Particulate respirator, grade N95 or higher

N95 or FFP2 respirator or higher Good breathability with design that does not collapse against the mouth (e.g. duckbill, cup-shaped)

Figure: Mask vs. Respirator

N95 vs. FFP3 & FFP2

The most commonly discussed respirator type is N95. This is an American standard managed by NIOSH – part of the Center for Disease Control (CDC). Europe uses a "filtering face piece" score (FFP). This comes from EN standard 149:2001 – drafted and maintained by CEN (European Committee for Standardization).

Figure: Different types of Respirators commonly used

Respirator standard	Filter capacity(removes x% of all particles that are 0.3 microns in diameter or larger
FFP1	80 %
FFP2	94 %
N95	95 %
FFP3	99.95 %
N100	99.97 %

Table 1: Filter capacity of different types of Respirators

Are N95/N100 actually better than FFP2/FFP3?

Whilst the specifications for the NIOSH (N95/N100) are marginally higher than FFP, that doesn't mean the respirators are any better. **Can Surgical Masks Filter the Corona virus?**

Whilst FFP2/FFP3 or N95/N100 are the gold standard as far as face protection goes, **what about surgical masks,** do they provide any protection?

Surgical masks are **primarily** designed to protect vulnerable patients from medical professionals. Stopping the wearer from spreading their germs when coughing/sneezing/speaking. So they're designed to protect patients, **not** to protect the wearer. There isn't currently research available on the efficacy of surgical masks (or even respirators), for protecting wearers against the corona virus.

RECOMMENDATIONS FOR USAGE OF SURGICAL TRIPLE LAYER MASK/ RESPIRATORS

1. Asymptomatic individuals wearing masks of any type is not recommended
2. Wearing masks when they are not indicated results in unnecessary cost and a procurement burden especially during the time of an epidemic/pandemic
3. People with respiratory symptoms or who are taking care of COVID-19 patients at home should receive triple layer surgical masks.
4. Respirators(N95, FFP2 or equivalent standard) should be reserved for aerosol generating procedures (Tracheal intubation, non-invasive ventilation, tracheostomy, bronchoscopy and cardio pulmonary resuscitation) along with other personal protective equipments (PPE)
5. Health care workers who are involved in direct care of COVID -19 patients should use three layered surgical mask/ Respirator (only if available in sufficient quantity) and other PPE (eye protection, gloves and gowns/fluid resistant aprons)
6. Medical and Nursing staff involved in Intensive care unit should use Respirators(N95/FFP2 or an equivalent)
7. During the present pandemic situation respirators (e.g., N95, FFP2 or equivalent standard) can be used for an extended time, especially while caring for multiple patients who have the same diagnosis without removing it. Evidence shows that respirators maintain their protection when it is been used for extended periods.
8. Always prioritize the use of N95 respirators for those personnel at the highest risk of contracting infections.
9. Most often an N95 mask can be used for up to 8hours on a continuous or intermittent basis and ideally it needs to be removed after that.
10. Avoid touching the inside of the respirator. If inadvertent contact is made with the inside of the respirator, perform hand hygiene.

Scrubs, tops

Tunic/tops, woven, scrubs, reusable or single use, short sleeved (tunic/tops), worn underneath the coveralls or gown.

Scrubs, pants

Trouser/pants, woven, scrubs, reusable or single use, short sleeved (tunic/tops), worn underneath the coveralls or gown.

Apron, heavy duty

Straight apron with bib, Fabric: 100% polyester with PVC coating, or 100% PVC, or 100% rubber, or other fluid resistant coated material, Waterproof, Sewn strap for neck and back fastening. Minimum basis weight: 300g/m2covering size: 70-90 cm (width) X 120-150cm

(height) Reusable (provided appropriate arrangements for decontamination are in place)

Gown

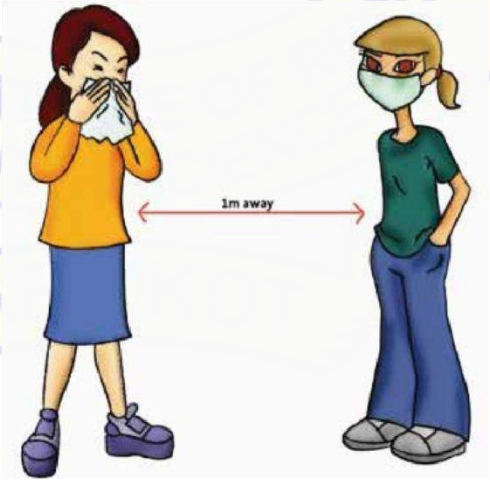
Single use, disposable, length mid-calf.

Shoe cover, hood

Goggles, protective

Good seal with the skin of the face, Flexible PVC frame to easily fit with all face contours with even pressure, Enclose eyes and the surrounding areas, Accommodate wearers with prescription glasses, Clear plastic lens with fog and scratch resistant treatments, Adjustable band to secure firmly so as not to become loose during clinical activity, Indirect venting to avoid fogging, May be re-usable (provided appropriate arrangements for decontamination are in place) or disposable.

WHAT CAN YOU DO TO REDUCE RISK? SOCIAL DISTANCING



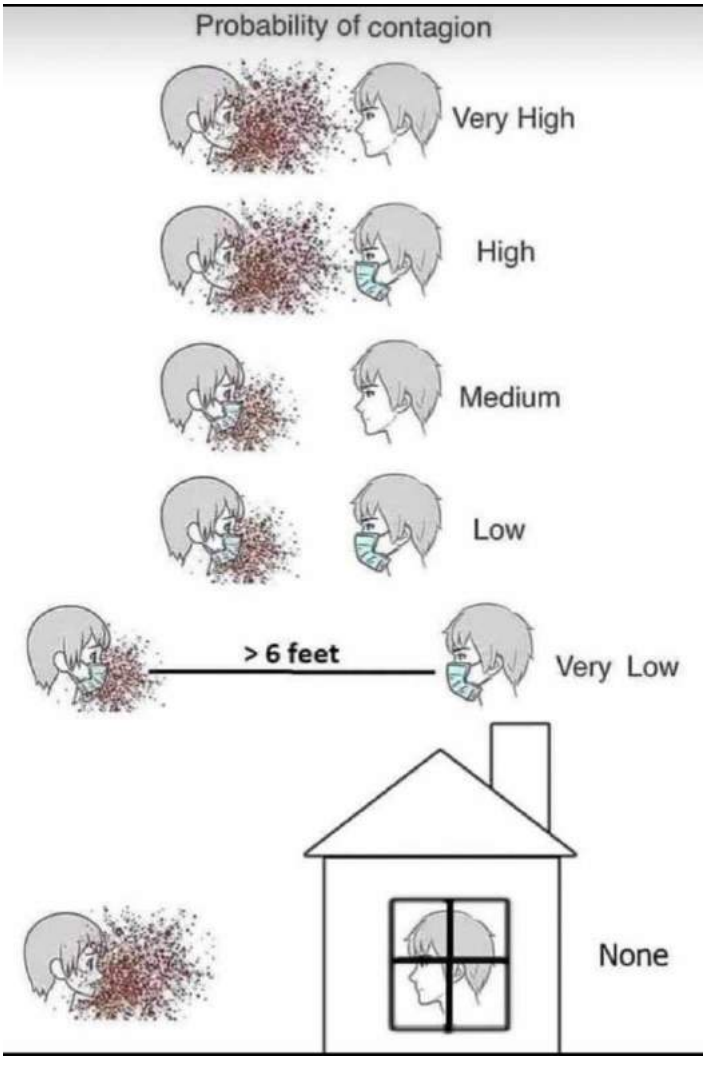
Novel coronavirus are spread by people who have the virus coming in to contact with people who are not infected. The more you come in to contact with infected people, the more likely you are to catch the infection. Social distancing is infection control action that can be taken by public health officials to stop or slow down the spread of a highly contagious disease.

In addition to social distancing measures taken by governments, we can ourselves choose to reduce physical exposure to potentially sick people, for example:

- Exploring the option to work from home if your job allows for it.
- Avoiding large public gatherings such as sporting events. Or situations where you may come into contact with crowds of people, for example in busy shopping malls.
- Interacting with people over the phone/video calls, instead of in person.

These types of steps may be an impediment to normal life. However the intention is that these will be a short term measure (not forever!).

A risk with a pandemic is that the initial spread is so quick that it overwhelms the health services. A key aim for any country should be to avoid that, and social distancing can help.



Recommended Sequences for Donning PPE

1. **Donning of PPE** will be done in the presence of a trained observer in a clearly demarcated donning area.

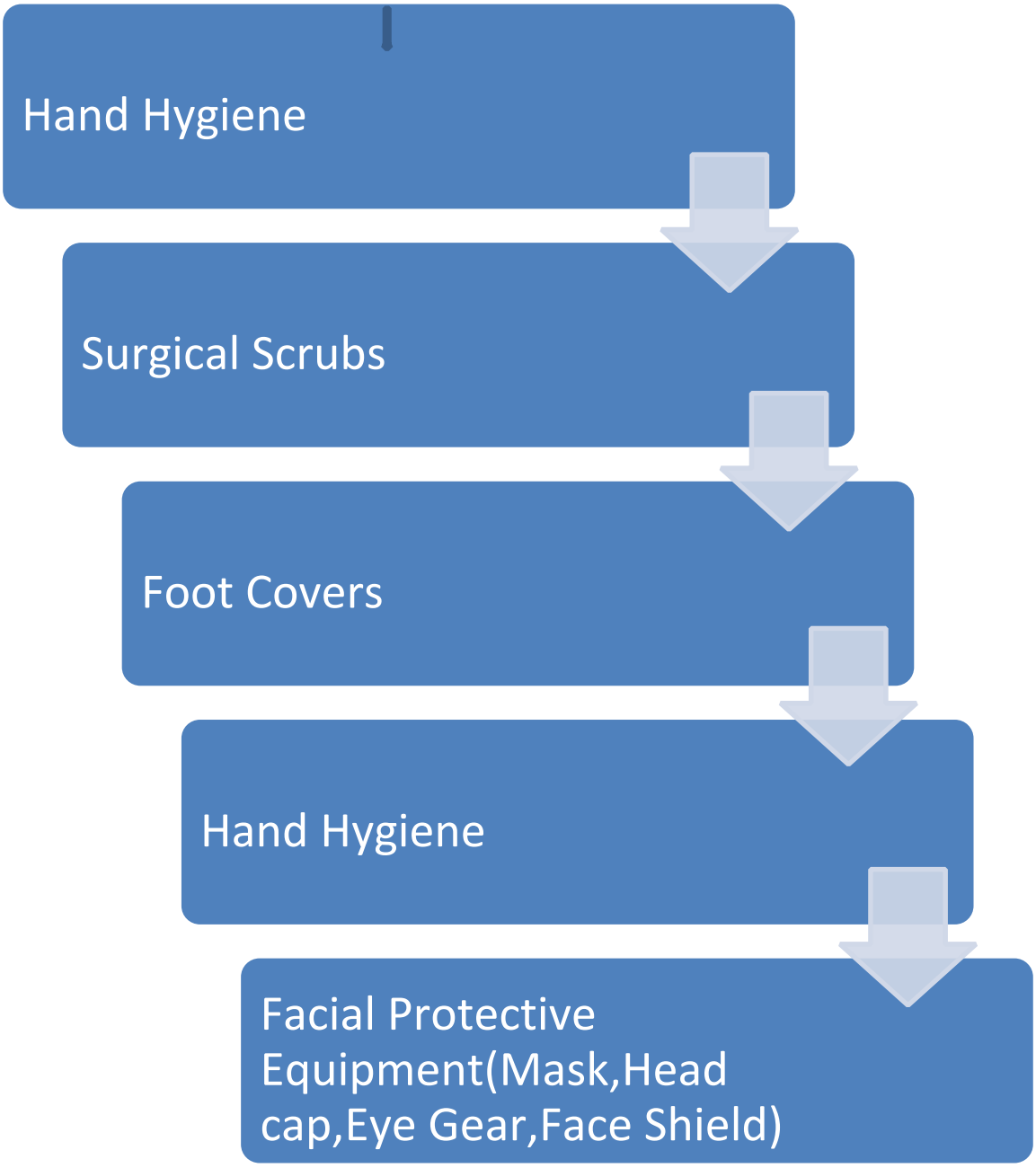
2. The staff will be **properly hydrated and use the toilet prior** to donning.

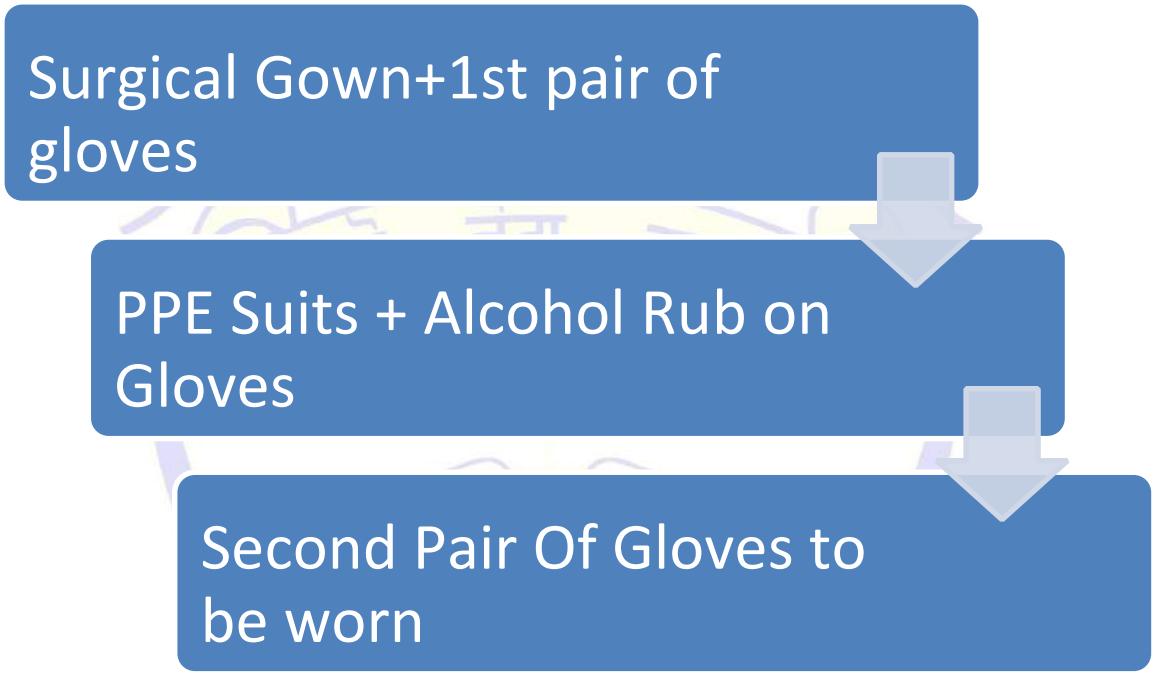
3. **Remove Personal Clothing and Items:** Change into surgical scrubs (or disposable garments) and dedicated washable (plastic or rubber) footwear. No personal items (e.g., jewellery including rings, watches, cell phones, pens) should be brought into the patient room. Long hair should be tied back. Eye glasses should be secured with a tie.

4. **Inspect PPE before Donning:** Visually inspect the PPE ensemble to be worn to ensure that it is in serviceable condition, all required PPE and supplies are available, and the sizes selected are correct for the healthcare worker.
5. **Put on Boot Covers (if required):** If a coverall without integrated socks is worn, the upper band of the boot cover will be worn UNDER the pants leg of the coverall to prevent pooling of liquids between the coverall pants leg and upper band of boot cover. This step can be omitted if wearing a coverall with integrated socks.
6. **Perform hand hygiene** with alcohol rub for 20 seconds
7. **Put on Inner Gloves:** Put on first pair of gloves.
8. **Put on Gown or Coverall:** Ensure gown or coverall is large enough to allow unrestricted freedom of movement. Ensure cuffs of inner gloves are tucked under the sleeve of the gown or coverall.
9. **Put on Outer Gloves:** Put on second pair of gloves (with extended cuffs). Ensure the cuffs are pulled over the sleeves of the gown or coverall.
10. **Put on N95 mask**
11. In case a separate hood is provided with the gown then it should be worn after wearing the mask
12. **Put on goggles**
13. **Verify:** After completing the donning process, the trained observer should verify the integrity of the ensemble. The healthcare worker should be able to extend the arms, bend at the waist, and go through a range of motion sufficient for patient care delivery while all remaining correctly covered. A mirror in the room can be useful for the healthcare worker while donning PPE.

No exposed clothing, skin or hair of the healthcare worker should be visible at the conclusion of the donning process.

Sequence of Donning PPE





WEARING AND REMOVING PERSONAL PROTECTIVE EQUIPMENT (PPE)

Before entering the isolation room or area:

- Collect all necessary items.
- Ensure to perform hand hygiene with an alcohol-based hand rub or soap and water;
- Use PPE in the order that ensures adequate placement of PPE items and prevents self-contamination and self-inoculation while using and taking off PPE.

- Figure 1 illustrates an example of the order in which to done PPE.

Recommended Sequences for Doffing PPE

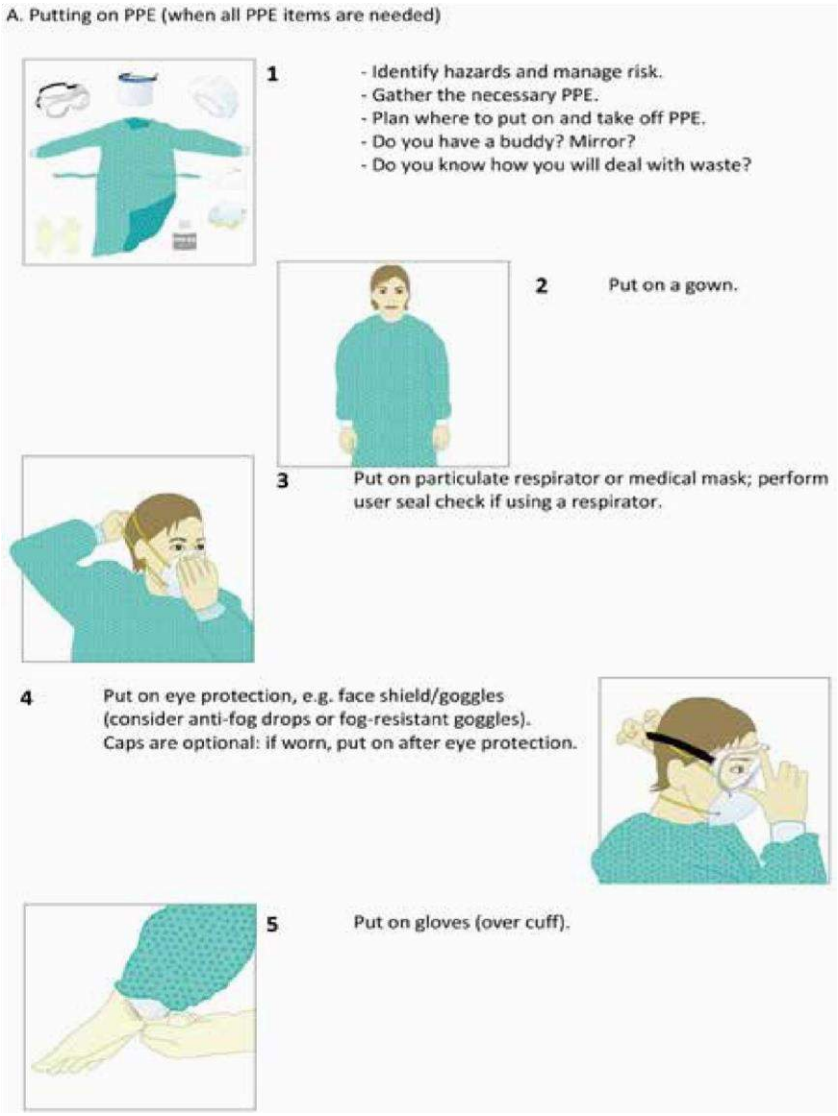
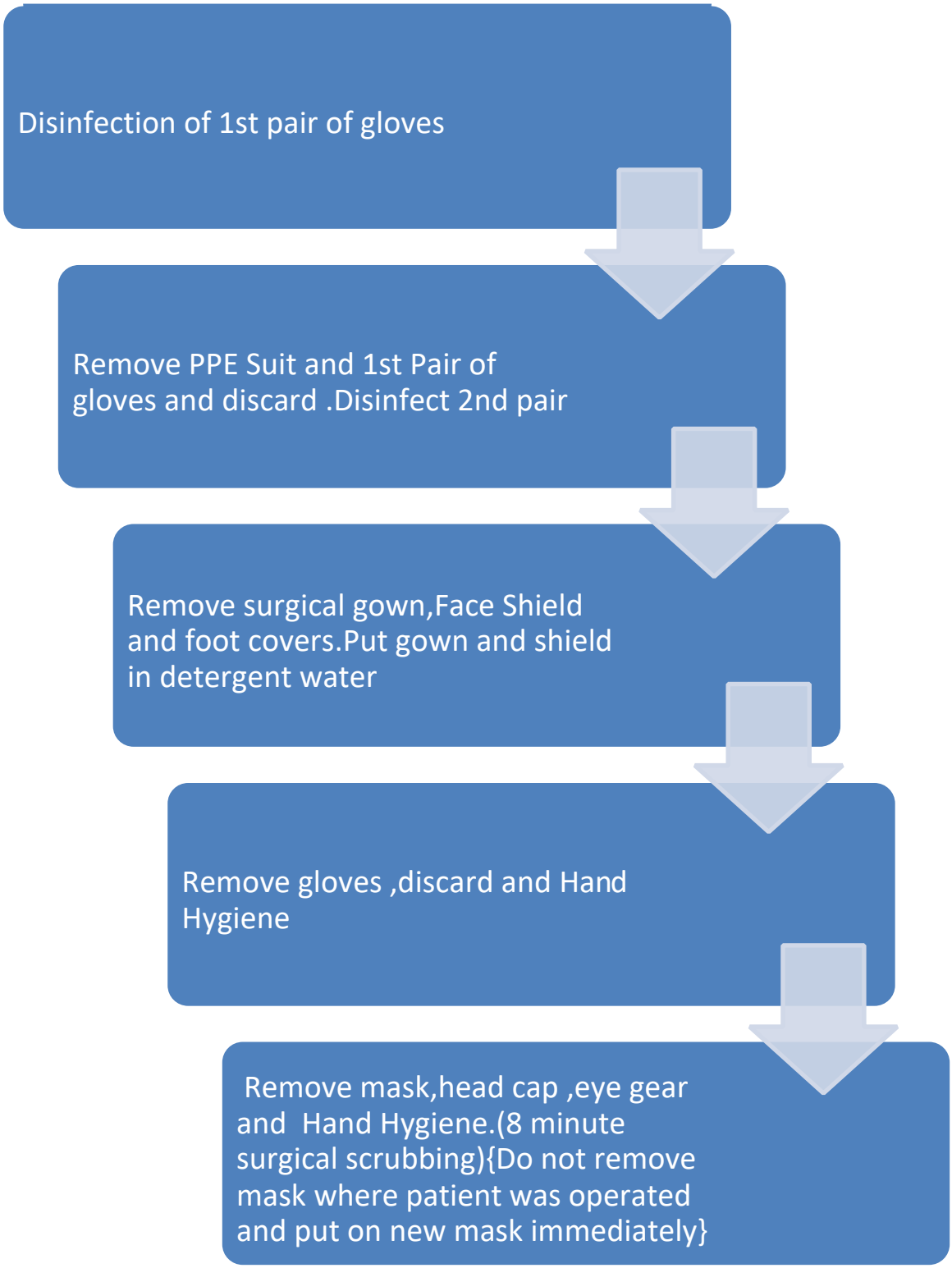


***Figure 1**: Steps of putting personal protective equipment's*

1. Provision for **hand hygiene, gloves, disposable tissues and 1 bin for biomedical waste disposal should be present in the doffing area.** Additional place just outside the doffing area for removal of mask**, will again have provision for hand hygiene, gloves, disposable tissues and 1 bin for biomedical waste disposal.**
2. **Trained Observer:** The doffing process will be supervised by the trained observer, who reads aloud each step of the procedure and confirms visually that the PPE has been removed properly. Before doffing PPE, the trained observer must remind healthcare workers to avoid actions that may put them at risk, such as touching their face.
3. **Inspect:** Inspect the PPE to assess for visible contamination, cuts, or tears before starting to remove. If any PPE is visibly contaminated, then it is disinfected.
4. **Disinfect Outer Gloves:** Disinfect outer-gloved hands with alcohol rub for 20seconds
5. **Remove Outer Gloves:** Remove and discard outer gloves, taking care not to contaminate inner gloves during removal process.
6. **Remove goggles:** By bending slightly forward, hold the back of the goggles, remove forward and out wards and drop it in the yellow biomedical waste bin.
8. **Remove Gown (with separate hood) or Coverall:** Remove and discard.
   a. Gown with separate hood: Remove the hood carefully by bending forward and pulling away with one hand on top of the hood. Pull gown away from body, rolling inside out and touching only the inside of the gown.
   b. To remove coverall, tilt head back to reach zipper or fasteners. Unzip or unfasten coverall completely before rolling down and turning inside out. Avoid contact of scrubs with outer surface of coverall during removal, touching only the inside of the coverall.
9. **Inspect and Disinfect Inner Gloves:** Inspect the inner gloves' outer surfaces for visible contamination, cuts, or tears. If an inner glove is visibly soiled, then disinfect the glove, remove the inner gloves, perform hand hygiene with alcohol based hand rub on bare hands, and don a new pair of gloves. If no visible contamination is identified on the inner gloves, then disinfect the inner-gloved hands
10. **Disinfect Inner Gloves** by performing hand hygiene with alcohol rub for 20 seconds
11. **Remove Boot Covers:** Sitting on a clean surface (e.g., second clean chair or clean side of a bench) pull off boot covers, taking care not to contaminate scrubs pants legs.
12. **Disinfect Inner Gloves:** Perform hand hygiene with alcohol rub for 20 seconds 13. **Remove inner gloves** and perform hand hygiene with alcohol rub for 20 seconds.
14. Leave the doffing area go to the place dedicated for mask removal.
15. **Remove N95 Mask:** Remove the N95 Mask by tilting the head slightly forward, grasping first the bottom tie or elastic strap, then the top tie or elastic strap, and remove without touching the front of the N95 Mask. Discard N95 Mask.
16. **Perform hand hygiene** with alcohol rub for 20 seconds.
17. **Disinfect Washable Shoes:** wipe down every external surface of the washable shoes.
18. **Perform Hand Hygiene:** with alcohol rub for 20 seconds
19. **Additional gloves** can be **worn at any point of doffing**, to reduce contamination of hands.
20. **Inspect:** Both the trained observer and the healthcare worker perform a final inspection of healthcare worker for contamination of the surgical scrubs or disposable garments. If contamination is identified, the garments should be carefully removed and the wearer should shower immediately.

Scrubs: Healthcare worker can leave PPE removal area wearing dedicated washable footwear and surgical scrubs or disposable garments, proceeding directly to showering area where these are removed

Sequence of Doffing PPE



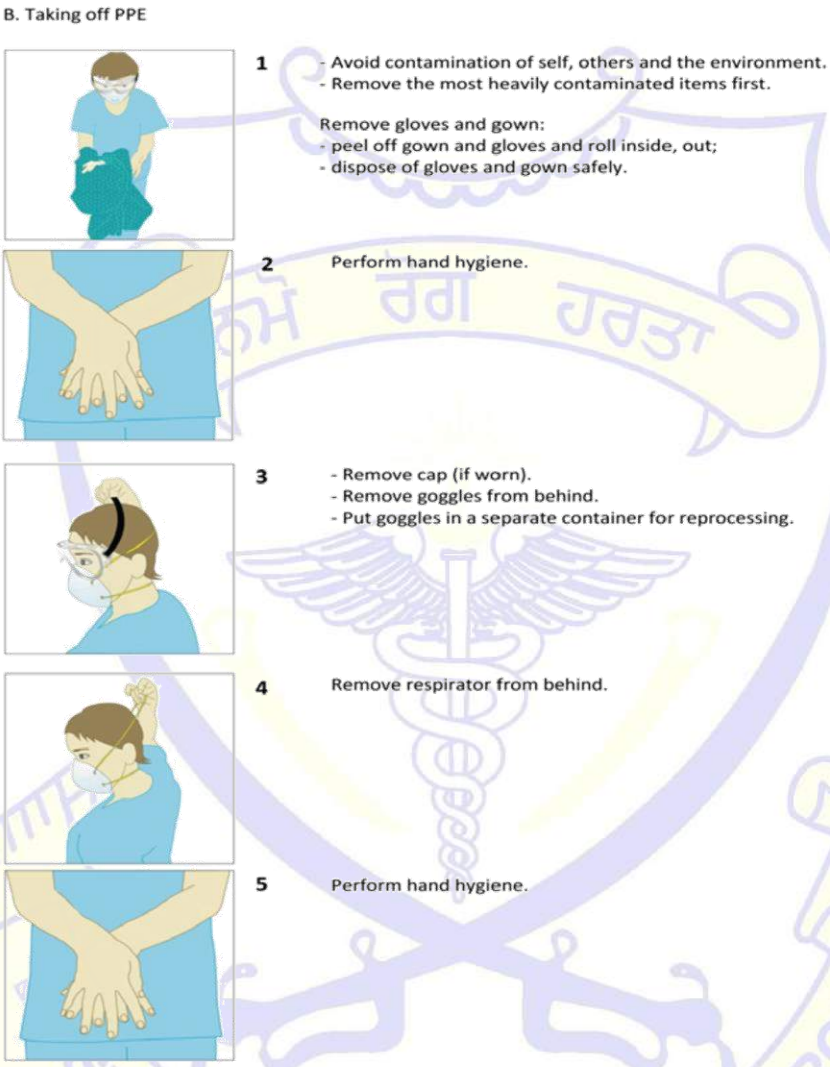


Figure 2: *Steps of removing personal protective equipment's*

PATIENT PRECAUTION BEFORE STARTING DENTAL TREATMENT ON THE CHAIR

i) Ask patient to rinse the mouth with 1% hydrogen peroxide or 0.2% povidine iodine mouthwash for 1 minute
ii) Reduce aerosol production by using rubber dam for all procedures.
iii) 4 handed dentistry with high vacuum suction
iv) Anti-retraction hand pieces may provide additional protection against cross contamination
v) Autoclave hand piece for every patient (recommended to keep 5-6 spare hand pieces autoclaved)
vi) Use of hepa filters
vii) Use of extra Oral Suctioning devices

AFTER DENTAL CARE

i) In between patients – cleaning and sanitizing surfaces and changing PPE as given above
ii) Postoperative instructions for patients- it is recommended that NSAIDS in combination with acetaminophen can still be used for management of pulpal and periapical related dental pain and intraoral swelling (https://www.sciencealert.com/who-recommendsto-avoid-taking-ibuprofenfor-covid-19-symptoms)
iii) Dental health care providers (DHCP's) should change from scrubs to personal clothing before returning home. Upon arriving home, DHCP's should take off shoes remove and wash clothing (separately from other household residents) and immediately shower

DENTAL EMERGENCIES

Potentially life threatening and require urgent and immediate treatment to stop ongoing tissue bleeding, alleviate severe pain or infection and includes

i) Uncontrolled bleeding
ii) Severe uncontrolled pain
iii) Cellulitis or a diffuse soft tissue bacterial swelling
iv) Infection with intra oral or extra oral swelling that potentially compromises the airway
v) Trauma involving the face or the facial bones.
vi) Severe trismus
vii) Persistent non healing ulcers

URGENT DENTAL CARE

- Severe dental pain from pulpal inflammation
- Peri coronitis or third molar pain
- Dry socket
- Abscess or localised pain and swelling

- Tooth fracture
- Dental trauma with avulsion/ luxation
- Final crown and bridge cementation if the temporary has been lost or broken
- Restorations causing severe pain
- Suture removal
- Orthodontic wire or appliances piercing or impinging on the oral mucosa and causing ulcers
- Biopsy of abnormal tissue.

Who should avoid practice in dental offices

a. Dentists and paramedical staff above the age of 65 years with the underlying conditions
   i. Diabetes Mellitus
   ii. Chronic Liver Disease
   iii. Heart and Kidney Disease
   iv. Chronic lung conditions like Asthma, COPD, etc.
   v. Cancer
   vi. Pregnant women
   vii. Seropositive status cases.
b. Any Dentist or the Allied staff with a travel history in the last 28 days
c. Anyone suffering from cough/ cold/ fever

Patients that should be avoided for treatment

a) All symptomatic individuals who have undertaken international travel in the last 28 days
b) All hospitalized cases in the last 28 days
c) All individuals who come from a hotspot areas must be tested first
d) All healthcare workers in hospitals who are symptomatic
e) Patients with active fever, cough, cold, malaise, diarrhea etc.
f) History of direct contact with CoVID +VE cases.

DENTAL PROCEDURES WHICH CAN BE PERFORMED WITH MINIMAL AEROSOL/NO AEROSOL PRODUCTION

TREATMENT PROCEDURES	SCOPE	ADVISORY
Management of Carious lesions not involving pulp	1. Selective caries removal 2. SDF application 3. SMART	Using sharp excavators, slow speed drill and GIC/RMGIC restoration To arrest carious lesions in geriatric and pediatric patients SDF application to arrest lesion followed by GIC restoration
Minimally invasive pulp therapy	1. Partial pulpotomies 2. Full pulpotomies 3. Root canal treatment	Traumatic exposures, Iatrogenic exposures. Irreversible pulpitis, Traumatic and Iatrogenic exposures. Necrotic pulp; Periapical lesion. $CaOH_2$ dressing; Delay obturation.
Post endodontic restorations	1. Monoblocking 2. SS Crown 3. Preformed esthetic crown	Bonded composite restoration with cuspal coverage For badly destroyed molars Long term esthetic provisional restorations
Bonded restorations for replacement of missing anterior teeth	1. Maryland bridge 2. Fibre reinforced composite bridge 3. Lithium disilicate bonded bridge	Metal wings, ceramic pontic Lab fabricated or chairside fabrication using restorative composite resin Lab fabricated for highly esthetic restorations
Prosthodontics	1. Impressions 2. Removable dentures 3. Management of existing FPDs	Chemical disinfection of impressions and wax rims Partial and Complete dentures, Essix appliances/Flippers. Cementation or bonding of restorations following usual protocol

Esthetic dentistry	1. Direct composite veneers 2. Diastema closure 3. Class 4 build ups 4. Multiple teeth composite resin build ups(FMR)	Free hand or using indices made from wax ups Free hand with palatal index Free hand with palatal index Transparent silicone index and injection moulding technique
Periodontics	1. Scaling 2. Periodontal surgery	Only hand instrumentation Following conventional protocols
Radiology	1. Panaromic xrays 2. IOPA 3. CBCT	Preferable 3 layers of disposable barriers Selected cases
Oral Surgery	1. Exodontia 2. Abscess drainage 3. Disimpactions	Sectioning with micromotor drills; fine tipped elevators Following conventional protocols Bone drilling to be avoided. Chisel/Mallet technique. Refer to specialist
Implant Dentistry	1. Implant placement surgery 2. Immediate placements 3. Crestal sinus lifts 4. Ridge expansion 5. Ridge augmentation	Slow speed drilling protocol without saline for soft bone. Dense bone cases to be avoided Atraumatic technique followed by slow speed osteotomy dills. Using concave ossteotomes Bone expansion screws, convex ossteotomes Following conventional protocols. No harvesting autogeneous bone.
Orthodontics	1. Changing wires and ligatures 2. Bonding orthodontic attachments 3. Interproximal Reduction 4. Debonding 5. Placement of microimplants	Extreme caution to prevent laceration Wash etchant with water in syringe and gently use chip blower to dry Use IPR strips Delay debonding Avoid irrigation, use moist gauze to maintain field of vision

THE PATIENT TREATMENT AREA

i) Should be cleansed after every session using disposable cloth or clean microfibre materials even if the area appears uncontaminated.

ii) Areas and items of equipment local to the dental chair that need to be cleansed between each patient with 1% sodium hypochloride or 70% alcohol these include: local work surfaces; dental chairs; curing lamps; inspection lights and handles; hand controls including replacement of covers; trolleys/delivery units; spittoons; aspirators; X-ray units.

iii) Areas and items of equipment that need to be cleansed after each session include: taps; drainage points; splashbacks; sinks. In addition, cupboard doors, other exposed surfaces (such as dental inspection light fittings) and floor surfaces, and bathrooms, including those distant from the dental chair, should be cleaned daily with wet mopping containing a disinfectant . Spittoons and aspirating units need to be washed through at the end of a session according to manufacturers' instructions.

iv) Items of furniture that need to be cleansed at weekly intervals include:
window blinds; accessible ventilation fittings; other accessible surfaces such as shelving, radiators and shelves in cupboards.

Disposable single-use covers are available for many of the devices mentioned above, including inspection light handles and headrests.

v) For infection control reasons, in clinical areas, covers should be provided over computer keyboards

vi) Intra-oral radiology film and devices used in digital radiology imaging are potential sources of cross-infection. Accordingly, where reusable devices are used, they should be decontaminated in accordance with the manufacturer's instructions. For intra-oral holders, this will require the use of steam sterilization following washing and disinfection.

vii) For blood spillages, care should be taken to observe a protocol that ensures protection against infection. The use of hypochlorite at 1000 ppm available chlorine is recommended. Hypochlorite should be made up either freshly using hypochlorite-generating tablets or at least weekly in clean containers. Contact times should be reasonably prolonged (not less than five minutes). A higher available chlorine concentration of 10,000 ppm is useful, particularly for blood contamination. The process should be initiated quickly and care should be taken to avoid corrosive damage to metal fittings etc. The use of alcohol within the same decontamination process is not advised. The use of these is encouraged but should not be taken as a substitute for regular cleaning. Covers should be removed and surfaces should be cleaned after each patient contact.

viii) Keep the Air-conditioning vent facing upwards, use of air purifiers with HEPA filters is recommended

ix) If the dental chairs are not six feet apart, then 2 patients should not be treated at the same time

DO NOT TOUCH ANY PAPER, FILE, XRAY,DVD WITHOUT GLOVES.

NO USE OF CELL PHONES BY DOCTORS IN OPD.

1 single computer to be arranged in OPD which has to be disinfected daily and not to be operated without PPE for radiograph viewing. No use of laptops in OPD.

Any extra fomite bearing articles like books, watches, bags not allowed in OPD.

Emergency Treatment:-

1. Management of facial fractures as per AOCMF guidelines.
2. Management of Soft tissue injury of Face (Suturing as and when required).
3. Management of any swelling compressing over airway of patient
4. Space infection Patients with Collection
5. Patient with features of septicemia.
6. TMJ dislocation

Essential Elective Treatment:-

1.Treatment of tender tooth

2. Osteomyllitis

Non-Essential Elective Treatment:-

1. TMJ surgery
2. Orthognathic surgery
3. Cleft surgery
4. Dental Implant Procedures
5. Asymptomatic third molars
6. Pathology
7. Any other elective surgery

Protocols for Emergency Surgical Procedures (Minor)

Minor procedures include-

1.Tooth extraction

2. IMF release(Only IMF wire to be removed)
3. Suturing of extraoral lacerated wound

These procedure to be undertaken under 3 layer ppe that is scrubs, gown, PPE suit and all facial protective aids in Exodontia Department.

All instruments to be arranged in tray before doning of ppe with loaded LA syringes.

Doffing of PPE to be done into dustbins and drums placed in minor surgical area and all ppe to be immersed immediately in detergent and hypochlorite solution by operator himself. Surgical gowns not to be touched till next day.

1 assistant (auxillary/intern) should be there at a safe distance from operator to provide hand hygiene measures when required.

PROTOCOL FOR EMERGENCY TREATMENT TO BE PROVIDED (OPERATION THEATRE PROTOCOLS)

Procedures-

- Airway Management

Intubation should be performed by the most experienced member of the team. This is not the time for multiple attempts, and letting everyone have a turn. Paralysis should be considered to limit coughing. Limit the amount of mask/bag ventilation prior to intubation, and avoid jet ventilation, suctioning as much as is absolutely necessary to mitigate aerosolization. Intubation is preferred over placement of LMA.

For a surgical case, the OR team should be outside the door for 20 minutes following intubation before entering the OR. After this 20-minute delay, the team should enter with appropriate PPE (N95 or PAPR). The reason for this is after an aerosol generating procedure (AGP), the virus could be present. Based on the OR air exchange per hour, 99% of pathogens should be clear in 14 minutes, and 99.9% by 21 min. All unnecessary personnel should be outside the room for extubation and an oxygen mask should be placed over the face after the tube is removed to mitigate aerosolization with coughing.

Tracheostomy in COVID-19 patients is performed for similar indications to non-COVID patients. Mortality in patients intubated for COVID-19 associated respiratory failure is greater than 50% and duration can be 3 - 6 weeks. The decision for percutaneous or open approach for the procedure is at the discretion of the surgeon. In general, in the hands of an experienced provider, an open approach may lead to less potential aerosolization, and therefore less risk. The patient should be paralyzed, preoxygenated, ventilation held before the trachea is incised to minimize aerosolization. Suctioning should be limited as much as possible, to avoid aerosolization. Bipolar cautery is preferred over monopolar. Advance the tube distally prior to incising the trachea, to avoid creating a hole in the ETT balloon. Closed suctioning systems are preferred for tracheostomy care.

- Management of Hard tissue trauma.

CMF Trauma

Procedures should be performed by an experienced surgeon, with a minimal number of assistants possible. In general, closed procedures, if internal fixation is not required for stability of the reduction are favored. Specific recommendations follow based on the anatomical region.

Lower face/mandible fractures:

1. Consider closed reduction with self-drilling MMF screws
2. Scalpel over monopolar cautery for mucosal incisions

3. Bipolar cautery for hemostasis on lowest power setting
4. Self-drilling screws for monocortical screw fixation
5. When drilling is required, limit or eliminate irrigation
6. If drilling is required, consider a battery powered low speed drill
7. If a fracture requires ORIF, consider placement of MMF screws intra-orally, then place a bio-occlusive dressing over the mouth, and use a trans cutaneous approach rather than an extended intraoral approach
8. If osteotomy is required, consider osteotome instead of power saw

Midface fractures

1. Consider closed reduction alone if fracture is stable following reduction
2. Consider using Carroll-Girard screw for reduction, and avoid intra-oral incision, if two-point fixation (rim and ZF) is sufficient for stabilization
3. Scalpel over monopolar cautery for mucosal incisions
4. Avoid repeated suctioning/irrigation
5. Bipolar cautery for hemostasis on lowest power setting
6. Self-drilling screws preferred
7. If osteotomy is required, consider osteotome instead of power saw or high-speed drill

Upper face fractures/frontal sinus procedures.

1. Consider delay of non-functional frontal bone/sinus fractures
2. Endoscopic endonasal procedure, and the associated instrumentation (power micro debriders) carry a very high risk of aerosol generation and should be avoided if possible
3. When performing a frontal sinus obliteration or cranialization consider performing the mucosal stripping manually, and not using a burr or power equipment
4. Avoid repeated suctioning/irrigation
5. Bipolar cautery for hemostasis on lowest power setting
6. Self-drilling screws preferred
7. If osteotomy is required, consider osteotome instead of power saw

- **Advisement Concerning Dental Procedures (adapted from AAOMS 3/17/2020)**

1. Emergency and urgent care should be provided in an environment appropriate to the patient's condition, and with appropriate PPE. Recall that any procedure involving the oral cavity is considered high risk.
2. Asymptomatic patients requesting removal of disease-free teeth with no risk of impairment of the patient's condition or pending treatment should defer treatment to a later date.
3. Asymptomatic patients, patients under investigation, (PUI), and patients tested positive for COVID-19, who have acute oral and maxillofacial infections, active oral and maxillofacial disease, should be treated in facilities where all appropriate

PPE, including N-95 masks, are available.

4. Patients with conditions in which a delay in surgical treatment could result in impairment of their condition or impairment of pending treatment (e.g., impairment of the restoration of diseased tooth when another tooth that is indicated for removal prevents access to the diseased tooth) should be treated in a timely manner if possible.

This is an evolving and constantly changing situation, and these recommendations are based on the best available information at this time. Please remember, these are recommendations and not mandates and ultimately the decision of the treatment of patients still rests with the individual practitioner.

Our primary goal is to provide safe and effective treatments for our patients, while minimizing the risk to the practitioner as much as possible.

- Management of extensive soft tissue trauma
- Incision and Drainage of Space Infection

To be performed with minimal individuals in OT.**NO Observers.**

All PPE to be removed in OT itself.

Casualty Protocol

- All the residents to follow strict personal hygiene and hand hygiene while visits to casualty.
- Mandatory N95 mask and carry eye gear, face shields in vehicle boot space.
- Maintain strict social distancing.
- Take Covid-19 history of patient orally.
- All active management cases to be packed with hemostatic agents and pressure pack to achieve hemostasis, kept in casualty for observation and definitive management in department with PPE
- Intervene only if Arterial Bleed is suspected or Poor general condition of patient.
- Contact Unit Incharge or Lecturer if any patient requires admission but do not intervene without complete PPE unless Fatal condition is there.
- If drilling is required, consider a battery powered low speed drill.
- It a fracture requires ORIF, consider placement of MMF screws intra-orally, then place a bio-occlusive dressing over the mouth, and use a transcutaneous approach rather than an extended intra oral approach.
- If osteotomy is required, consider osteotome instead of power saw

HCQ prophylaxis and Regular Screening of Departmental Staff

HCQ Prophylactic dosing for all doctors as per guidelines of MOHFW India i.e 400 mg BD loading Dose and 400 mg OD once a week with meal. ***Doctors can refrain from taking prophylaxis as per their personal choice.**

All the departmental staff to undergo thermal screening once daily. To be done by resident using infrared thermal device.

GUIDELINES FOR DOCTORS

Change into Hospital Scrubs on arrival.

All Doctors involved in patient related activity to wear all protective equipment's.

PPE for examination-N95 mask, head cap, face shield, head cap, eye gear, double gloves and foot cover from HIV kit

PPE for Procedures- N95 mask, head cap, face shield, head cap, eye gear, double gloves, PPE suits

No resident will get laptops, books, wrist watches, mobile chargers to department.

OPD pens to be kept in opd

Cell phones to be kept inside during patient activity.

Minimal fomite bearing articles to be brought.

Avoid college bags, laptop bags, waist belts.

All doctors to disinfect their keys, pens, cell phones, spectacles on arrival and before leaving the department.

All Doctors to inform HOD in case they have any Symptoms or positive case contact.

GUIDELINES FOR AUXILIARY STAFF

PPE for Reception Staff-N95 mask, Eye gear, head cap, Full sleeves apron

PPE for Attendants and Cleaning Staff- N95 mask, head cap, head cap, eye gear, double gloves and foot cover from HIV kit

PPE for Nursing Staff while assisting- N95 mask, head cap, face shield, head cap, eye gear, double gloves, Hazmat suits

All auxillary staff to also practice stringent hand hygiene and avoid fomite bearing articles and disinfection of cell phones, spectacles etc.

Guidelines for Patient

Alcohol rub to be given to all patients on entry to department

Mask mandatory for all patients

Patients to be seated on dental chair covered with new plastic bed sheet and head cap to be placed while procedures.

All disinfection/sterilization Procedure to be done under observation of Residents/nursing staff.

Sodium hypochlorite to be diluted as per instructions and sprayed using spray bottles.

OPD area, dental chairs, locks, door handles of all OPD departments being used and minor OT which is used as doning area to be sprayed twice with sodium hypochlorite+detergent solution.

Mandatory fumigation and fogging of exodontia clinic and minor surgical area if any procedure conducted.

OPD fumigation daily.

Fogging of OPD and Exodontia clinic Twice daily
Morning-12 pm
Evening-4 pm
Instruments-All instruments to be immersed in hypochlorite + detergent by operator himself and sodium hypochlorite sprayed on tray and to be autoclaved on next day by attendant wearing PPE.

Surgical Gowns-After 24 hours of being immersed in detergent water gowns to be washed and autoclaved.

Face Shields, eye gear-After 24 hours in detergent water to be cleaned with sodium hypochlorite, alcohol rub and soap.

Biomedical waste-Disposed in dustbin with hypochlorite and removed from bin only after 24 hours

ENVIRONMENTAL INFECTION CONTROL

Environmental cleaning is the part of standard precautions to control infection in all areas of health care facility. The following equipment's are needed for maintaining cleanliness in health care facilities:

- Three buckets of different colors
- Two extra buckets
- Two floor mopping clothes
- Detergent
- Phenyl
- 5% sodium hypochlorite solution
- Alcohol (isopropyl 70% or ethyl alcohol 70%)

Personal preventive equipments wear by person during cleaning and disinfection of health care facilities:

- Wear disposable gloves after that wear heavy duty gloves
- Triple layer mask/Medical mask
- Gown
- Heavy duty shoes
- Face shield

Cleaning agents and solutions for disinfection

The solutions for cleaning the floor and surfaces should be prepared fresh every time. The recommended time period for leaving agents on surface is 10 minutes.

The preparation of solutions methods of use:

Sr. no.	Name of cleaning agent	Use
1.	• Bucket one -10L water + 50 gm surf • Bucket two – Plain tap water • Bucket three- 10L water + 100 ml phenyl	• Use solution with surf for first mopping of floor • Clean floor with plain water of second bucket • Third mopping of floor should be done with third bucket solution

2.	Bucket four and five - 9L water + 1L Sodium hypo chlorite = 0.5 % solution	• To do final mopping of floor with 0.5 • % sodium hypochlorite solution To clean three bucket mopping trolley and mopping cloth with 0.5% sodium hypochlorite solution
3.	1% Sodium hypochlorite	To clean the frequently touched surfaces e.g. tables etc.
4.	Alcohol rub	To clean surfaces where bleach use is not possible e.g. metals

Guidelines for cleaning:

- Seal the area where confirmed cases have visited before cleaning procedures.
- During cleaning of sealed area and isolation area the cleaning staff should wear recommended personal protective equipments.
- Clean floor with freshly prepared recommended solutions
- The curtains, fabrics and linen should be washed under hot water cycle with routine detergent or disinfectant in hot water at 70^0C for 25 minutes.
- All the surfaces should be cleaned every 3-4 hours.
- The toilets and bathrooms should be cleaned with 1% hypochlorite solutions.
- The cleaning staff should immediately do the hand hygiene before and after removing the Personal Protective Equipments.

Setting	Target personnel or patients	Activity	Type of PPE or procedure
Health care facilities			
Inpatient facilities			
Patient room	Health care workers	Providing direct care to COVID-19 patients	Medical mask Gown Gloves Eye protection (goggles or face shield)
		Aerosol-generating procedures performed on COVID-19 patients	Respirator N95 or FFP2 standard, or equivalent. Gown Gloves Eye protection Apron
	Cleaners	Entering the room of COVID-19 patients	Medical mask Gown Heavy-duty gloves Eye protection (if risk of splash from organic material or chemicals) Boots or closed work shoes
	Visitors	Entering the room of a COVID- 19 patient	Medical mask Gown Gloves
Other areas of patient transit (e.g. wards, corridors).	All staff, including health care workers	Any activity that does not involve contact with COVID-19 patients	No PPE required
Triage	Health care workers	Preliminary screening not involving direct contact	Maintain spatial distance of at least 2 metres. No PPE required
	Patients with respiratory symptoms	Any	Maintain spatial distance of at least 2 metres. Provide medical mask if tolerated by patient.
	Patients without respiratory symptoms	Any	No PPE required
Laboratory	Lab technician	Manipulation of respiratory samples	Medical mask Gown Gloves Eye protection (if risk of splash)
Administrative areas	All staff, including health care workers.	Administrative tasks that do not involve contact with COVID-19 patients.	No PPE required
Outpatient facilities			
Consultation room	Health care workers	Physical examination of	Medical mask

		patient with respiratory symptoms	Gown Gloves Eye protection
	Health care workers	Physical examination of patients without respiratory symptoms	PPE according to standard precautions and risk assessment.
	Patients with respiratory symptoms	Any	Provide medical mask if tolerated.
	Patients with respiratory symptoms	Any	No PPE required
	Cleaners	After and between consultations with patients with respiratory symptoms.	Medical mask Gown Heavy-duty gloves Eye protection (if the risk of splash from organic material or chemicals). Boots or closed work shoes
Waiting room	Patients with respiratory symptoms	Any	Provide medical mask if tolerated. Immediately move the patient to an isolation room or separate area away from others; if this is not feasible, ensure the spatial distance of at least 1 meter from other patients.
	Patients without respiratory symptoms	Any	No PPE required
Administrative areas	All staff, including health care workers	Administrative tasks	No PPE required
Triage	Health care workers	Preliminary screening not involving direct contact	Maintain a spatial distance of at least 2 meters. No PPE required
	Patients with respiratory symptoms	Any	Maintain a spatial distance of at least 2 meters. Provide medical mask if tolerated by the patient.
	Patients without respiratory symptoms	Any	No PPE required

POINTS TO REMEMBER WHILE USING PPE

- PPEs are not alternative to basic preventive public health measures such as hand hygiene, respiratory etiquettes which must be followed at all times
- Always (if possible) maintain a distance of at least 2 meters from contacts/suspect/ confirmed COVID- 19 cases.
- Always follow the laid down protocol for disposing off PPEs

CLEANING OF FURNITURE AND ENVIRONMENT

Area/Items	Item/Equipment	Process	Method/ Procedure
Clinical Area			
General clinical areas	Dust mops Mop (No broom will be used for sweeping)	Sweeping Cleaning Daily mopping	• Sweep with the dust mop or damp mop to remove surface dust. Sweep under the furniture and remove dust from corners. Gathered dust must be removed using a hearth brush and shovel. • The sweep tool should be cleaned or replaced after use.
Floors (clinical areas) – daily mopping	Detergent/ sanitizer–hot water, sodium hypochlorite(1%) Three buckets (one with plain water and one with detergent solution; one bucket for sodium hypochlorite (1%)	Sweeping Cleaning Daily mopping	• Prepare cleaning solution using detergent with warm water • Use the three-bucket technique for mopping the floor, one bucket with plain water and one with the detergent solution. • First mop the area with the warm water and detergent solution. • After mopping clean the mop in plain water and squeeze it. • Repeat this procedure for the remaining area. • Mop area again using sodium hypochlorite 1% after drying the area. • In between mopping if solution or water is dirty change it frequently. Mop the floor starting at the far corner of the room and work towards the door. • Clean articles between cleaning. **Note: Mopping should be done twice a day**
Ceiling and Walls	Sweeping tool Duster Bowl/ small bucket of soap solution Plain ater	Damp dusting	• Damp dusting with a long handled tool f or the walls and ceiling done with very little moisture, just enough to collect the dust. • Damp dusting should be done in straight lines that overlap one another. • Change the mop head/cover when soiled.
	Care of mop	Hot water Detergent sodium hypochlorite 1%	Clean with hot water and detergent solution, disinfect it with sodium hypochlorite and keep for drying upside down.
Doors and door knobs	Damp cloth or Sponge squeeze mop Detergent	Thorough washing	The doors are to be washed with a brush, using detergent and water once a week (on one defined day); gently apply cloth to soiled area, taking care not to remove paint, then wipe with warm water to remove excess cleaning agent. Door knobs and other frequently touched surfaces should be cleaned daily.

All clinical areas/ Laboratories/ Wherever spill care is required	Sodium hypochlorite (1%) Rag piece Absorbent paper Unsterile gloves Spill care kit Mop Hot water	Blood and body fluid spill care	• Wear non-sterile gloves. • For large spills, cover with absorbent paper/ rag piece • If any broken glass and sharps, using a pair of forceps and gloves, carefully retrieve. • Use a large amount of folded absorbent paper to collect small glass splinters. □ Place the broken items into the puncture proof sharps container. □ Cover the spill with sodium hypochlorite (1%) for 10–20 minutes contact time. □ Clean up spill and discard into infectious waste bin, and mop area with soap and hot water. □ Clean the mop and mop area with 1% sodium hypochlorite. □ Wash mop with detergent and hot water and allow it to dry.
Stethoscope	Alcohol-based rub/Spirit swab	Cleaning	□ Should be cleaned with detergent and water. □ Should be wiped with alcohol based rub/spirit swab before each patient contact.
BP cuffs and covers	Detergent Hot water	Washing	□ Cuffs should be wiped with alcohol based disinfectant and regular laundering is recommended for the cover.
Thermometer	Detergent and water Alcohol rub Individual thermometer holder	Cleaning	• Should be stored dry in individual holder. Clean with detergent and tepid water and wipe with alcohol rub in between patient use. □ Store in individual holder inverted. □ Preferably one thermometer for each patient.
Refrigerators	Detergent and water Absorbent paper or clean cloth	Cleaning (weekly)	• Empty the fridge and store things appropriately. • Defrost, decontaminate and clean with detergent. □ Dry it properly and replace the things. □ Weekly cleaning is recommended.
Monitor		Cleaning	□ Spray with Bacillon

INITIAL MANAGEMENT OF COVID INFECTED PATIENT

COVID 19 INFECTED PATIENTS

At the moment, the therapeutic strategies to deal with the infection are only supportive, and prevention aimed at reducing transmission in the community is our best weapon. Aggressive isolation measures in China have led to a progressive reduction of cases in the last few days. In Italy, in geographic regions of the north, political and health authorities are making incredible efforts to contain a shock wave that is severely testing the health system.

WHO ALL NEEDS ISOLATION?

1. Any person diagnosed with SARS CoV 2 infection by means of laboratory testing at a government recommended testing laboratory.
2. Anyone who has symptoms of fever and respiratory illness, and has a history of close contact of a person who has either been diagnosed as COVID-19, or has a history of travel to a COVID affected region within the last 14 days.
3. Any health care worker with symptoms of fever and respiratory illness who has been involved directly in treating COVID- 19 patients, or has close contact with persons involved in treating COVID- 19 patients during the last 14 days.

IF NEEDED WHERE TO ISOLATE?

Asymptomatic cases with exposure to Covid-19 positive patients can be quarantined at their homes, but to be under strict surveillance by the government authorities suspected patient to be isolated in well ventilated, preferably separate rooms. Symptomatic COVID- 19 positive patients should be hospitalized in isolation room and also should be monitored adequately by medical team

Sputum/BAL samples (if needed) should be collected from isolation rooms or a separate space with HEPA filters/negative pressure ventilation

PREPARATION OF ISOLATION ROOM

- Ensure that appropriate hand washing facilities and hand-hygiene supplies are avail table.
- Stock the sink area with suitable supplies for hand washing, and with alcohol-based hand rub, near the point of care and the room door.
- Ensure adequate room ventilation.
- Post signs on the door indicating that the space is an isolation area.
- All visitors should consult the health-care worker in charge before being allowed into the isolation areas. Keep a roster of all staff working in the isolation areas, for possible outbreak investigation and contact tracing. Some centers have banned all visitors.
- Remove all non-essential furniture and ensure that the remaining furniture is easy to clean.
- Stock the PPE supply and linen outside the isolation room or area (e.g. in the change room). Setup a trolley outside the door to hold PPE. A checklist may be useful to ensure that all equipment is available.
- Place appropriate waste bags in a bin. If possible, use a touch-free bin. Ensure that used

(i.e. dirty) bins remain inside the isolation rooms.

- ❖ Place containers for disposal of sharps inside the isolation room or area.
- ❖ Keep the patient's personal belongings to a minimum.
- ❖ Dedicate non-critical patient-care equipment (e.g. stethoscope, thermometer, blood pressure cuff and sphygmomanometer) to the patient, if possible. Thoroughly clean and disinfect patient-care equipment every time before using in next patient.
- ❖ Adequate equipment required for cleaning or disinfection inside the isolation room should be kept and room should be cleaned on a daily basis
- ❖ Set up a telephone or other method of communication in the isolation room or area to enable patients, family members or visitors to communicate with health-care workers. This may reduce the number of times the workers need to don PPE to enter the room or area.

LEAVING THE ISOLATION ROOM AREA

- Either remove PPE in the anteroom or, if there is no anteroom, make sure that the PPE will not contaminate either the environment outside the isolation room or area, or other people.
- Remove PPE in a manner that prevents self-contamination or self-inoculation with contaminated PPE or hands. General principles are:
- Remove the most contaminated PPE items first;
- Perform hand hygiene immediately after removing gloves
- Remove the mask or particulate respirator last (by grasping the ties and discarding in a rubbish bin
- Discard disposable items in a closed rubbish bin;
- Put reusable items in a dry (e.g. without any disinfectant solution) closed container; an example of the order in which to take off PPE when all PPE items are needed is gloves (if the gown is disposable, gloves can be peeled off together with gown upon removal), hand hygiene, gown, eye protection, mask or respirator, and hand hygiene
- Perform hand hygiene with an alcohol-based hand rub (preferably) or soap and water whenever ungloved hands touch contaminated PPE items.

PATIENT IN ISOLATION ROOM

- Preferably wear face mask as much as time possible in a day
- Restrict movement of patient for chest xays/CT scans/labs as this lead to dissemination of infection to other places
- Attached urinals/wash room facility in all isolation rooms
- Separate portable stethoscopes/xray/CT units/USG machines should be dedicated for patients suffering from COVID-19
- Patient needs to be kept in isolation till his both respiratory samples turns out to be negative.

TREATMENT OPTIONS - COVID 19

There is no specific antiviral treatment recommended for COVID-19, and no vaccine is currently available at time of writing this article.

Mild Disease

These patients usually present with symptoms of

- An upper respiratory tract viral infection
- Low grade fever , cough, malaise, rhinorrhoea, sore throat without any warning signs
- Shortness of breath
- Haemoptysis
- Gastro-Intestinal symptoms: Nausea, vomiting, Diarrhea
- Without change in mental status (ie: confusion, lethargy)
- Non immune compromised

Recommendation: Consider for home isolation in asymptomatic/mild disease

WHO ALL NEEDS ADMISSION IN COVID-19?

Severe Disease (14%)

- Respiratory rate > 30/min
- SPo2- <93%
- PaO2/FiO2 <300
- Lung infiltrates >50% within 24- 48 hours

Critically ill (5%)

- Respiratory failure (need of mechanical ventilation)
- Septic shock
- MODS

Is there a definitive therapy?

- No drug of choice
- Oxygen support
- Oxygen saturation to be maintained above 90%
- Conservative fluid management
- Give empirical antibiotics (As per institution based CAP guidelines)/ anti-viral (Osel tamivir)
- High dependency / ICU care when needed

ANTI-VIRAL THERAPY

No anti-viral therapy has been proven to work for COVID-19 in humans. Multiple RCTs are ongoing; hopefully they will bring us further information soon. **Whenever possible, patients should be enrolled in RCTs.**

- Information is provided below about some of the more popular agents which are being used by some practitioners.
- Inclusion in this chapter is not a recommendation to use one or more of these medications. This information is simply provided as a background to help us understand these therapies.
- A focus is placed on lopinavir/ritonavir and chloroquine since these agents are currently available.
- Practitioners are encouraged to review available evidence and reach their own conclusions regarding whether to use these medications.

INDICATIONS FOR ANTI-VIRAL THERAPY

Retrospective data from SARS suggests that earlier treatment (e.g. within 1-2 days of admission) may be more effective than reserving therapy until severe organ failures occur (Chan 2003). This is consistent with data from influenza that suggests a finite treatment window occurring relatively early in the disease course.

- The vast majority of patients will do fine without any therapy, so in most cases there's no need for antiviral therapy.
- However, waiting until patients are severely ill before initiating therapy could cause us to miss an early treatment window, during which the disease course is more modifiable.
- Predictors of adverse outcome might be useful in predicting who will do poorly and thus who might benefit most from early anti-viral therapy, but data is limited.

ANTI-VIRAL MOLECULES UNDER TRIAL (Experimental options)

REMDESIVIR (compassionate use only)

- Investigational antiviral drug with reported in vitro activity against SARS-CoV-2
- No published phase 3 trials
- Mechanism of action: Extrapolated from MERS CoV
- Premature termination of viral RNA transcription
- Has been found to reduce pulmonary pathology in in vitro studies
- Remdesivir cannot be used in combination with other experimental antiviral agents
- Tried in Ebola virus too
- Side effects- Hepatotoxicity
- **Dose: Adult:** 200mg IV on day 1(loading dose) followed by 100mg IV OD x 9 days
- **Pediatric:** < 40 kg: 5 mg/kg IV on day 1, then 2.5 mg/kg IV q24h

Lopinavir/Ritonavir

- In vitro reduces replication by 50% in MERS corona virus
- Definite efficacy not proven
- WHO has mentioned as an agent that can be tried
- May be also tried in combination with Interferon alpha or Ribavirin
- Potent CYP3A4 inhibitor – monitor for drug interactions
- Oral and liquid formulation is available
- Dose: Adult: 400/100mg PO Q12h
- Pediatric: Pediatric (based on lopinavir): Oral solution
- < 15kg: 12mg/kg/DOSE q12h
- 15-40 kg: 10mg/kg/DOSE q12h
- >40 kg: 400mg q12h
- Oral tablet
- ≥15-25kg: 200mg q12h
- ≥25-35kg: 300mg q12h
- >35 kg: 400mg q12h

Ribavirin

- Inhibitor of RNA polymerization
- Studies done in MERS
- Concentration required to inhibit MERS-CoV in vitro exceeds peak levels in the blood after therapeutic doses in humans.
- High risk of toxicity
- Renal dose adjustment is necessary
- Boxed warning for hemolytic anemia
- No study results yet in SARS CoV2
- **Dose (Oral):** 2 grams x 1 dose, then 600mg q8h

Oseltamivir

- Neuraminidase enzyme inhibitor in influenza
- Not seen in SARS CoV2
- No trials on COVID-19
- Many patients with similar presentation of COVID 19 might be influenza
- **Hence better to give the drug to avoid patient worsening due to influenza**

OTHER AVAILABLE TREATMENT OPTIONS

ACE INHIBITORS (ACEi) /ANGIOTENSIN RECEPTOR BLOCKERS (ARBS)

- Off late there is lot of interest in the potential role of ACE-inhibitors (ACEi) / angioten sin receptor blockers (ARBs) in the pathophysiology of this disease since the SARS-CoV-2 virus binds to the ACE2 receptor for cellular entry
- Theoretically it can be blocked by ARBs
- But ACE2 is a negative regulator of RAS(It inactivates angiotensin 2), hence the suggestion might be counterintuitive
- ACE (CD143) appears on the macrophage plasma membrane during activation. Proposed reduction of cytokine storm
- Currently there are no data to support either starting or stopping ACEi/ARBs on any patients with COVID-19.

INTERFERONS

- IFN-α2a, IFN-α2b orIFN-β1 a
- SARS CoV2 attenuates the interferon (IFN) response of the innate immune system
- **Impair the antiviral adaptive type 1 T-helper cell**
- But in vitro effects hasn't been fully shown to be working

CHLOROQUINE/HYDROXYCHLOROQUINE

- Proposed mechanism- Hampers the low pH dependant steps of viral replication
- No renal or hepatic dose adjustments necessary
- Has been even proposed for prophylaxis- however lacks evidence
- Side effects: QT prolongation
- **Dose (Adult) :** 400mg PO Q12h x 1 day, 200mg PO Q12h x 4 days
- **Pediatric:** 6.5mg/kg/DOSE PO q12h x 1 day, then 3.25mg/kg/DOSE PO q12h x
- 4 days (up to adult maximum dose)

TOCILIZUMAB (optional)

- IL-6 inhibitor
- Proposed to reduce the cytokine storm in COVID-19
- Reports of tocilizumab use in COVID-19 infections have been mostly anecdotal from Italy or case series data from China.
- Adverse effects: elevation of liver enzymes, Increased risk of re-activation of other Respiratory infections.
- **Dose: 4-8 mg/kg (max 400mg) IV x 1**

CORTICOSTEROIDS

- Not indicated in treating SARS CoV2 as per available evidence
- Might prolong viral shedding
- Use as per indicated in septic shock/if patient has other indications for steroid use

ASCORBIC ACID

- Ascorbic acid did appear to improve mortality in the multi-center CITRIS-ALI trial.
- Extremely limited evidence suggests that ascorbic acid could be beneficial in animal models of corona virus (Atherton 1978).
- Administration of a moderate dose of IV vitamin C could be considered (e.g. 1.5 grams IV q6 ascorbic acid plus 200 mg thiamine IV q12). This dose seems to be safe. However, there is no high-quality evidence to support ascorbic acid in viral pneumonia.

ANTI BACTERIAL THERAPY

Initial empirical antibiotics

- COVID-19 itself is not an indication to start antibiotics.
- However antibiotics can be initiated to treat secondary bacterial pneumonia.
- Broad spectrum antibiotics to be initiated according to the institution based guide lines

Delayed bacterial super infection

- Bacterial pneumonia can emerge during the hospital course (especially ventilator-associated pneumonia in patients who are intubated).
- This may be investigated and treated similarly to other ventilator-associated pneumonias, or hospital-acquired pneumonias.

OTHER AGENTS

- Baricitinib Darunavir/Cobicistat
- Umifenovir (Arbidol)- 200 mg TDS
- Favilavir- first approved drug in china
- Galidesivir
- Leronlimab
- Brilacidin
- Combination of monoclonal antibody
- Traditional medicines in different countries

WHAT WE CAN ADOPT FOR TREATMENT?

- Patient to be classified as mild/severe/critical
- Decide whether he/she requires only home isolation
- Assess oxygenation on room air
- Consider referral to a nodal center if requiring admission
- Home care advise in mild/asymptomatic cases

COVID -19 MANAGEMENT IN A NUT SHELL

SEVERITY OF ILLNESS	PLAN
Mild illness without any risk factors/ Co-morbidities	• Outpatient care • Strict Home Quarantine monitored by government/health authorities • Supportive care • Assess patient's clinical condition via telephonic conversation/ using telemedicine facility
Moderate Illness: • Dyspnoea • Hypoeximia • Infiltrates/ consolidation on chest xray/ CT scan	• Admit in Hospital isolation room • Supportive care • Start empirical antibiotics as per local community acquired pneumonia treatment guidelines • Oseltamivir 75/150mg BD • Consider starting Hydroxychloroquine Or Lopinavir/Ritonavir (If evident risk factors for progression of disease are present)
Critical Illness: • Mechanically ventilated patient's • Multi lobar/ bilateral lung consolidation *Careful using these drugs in patients with multi-organ damage*	• Remdesivir (for compassionate use only) • **Tocilizumab** can be considered (check IL-6 level prior to starting Tocilizumab). Especially in patients with evidence of cytokine release syndrome. • Continue IV antibiotics and supportive care • Rule out ventilator associated pneumonia/ catheter related infections and other secondary bacterial/viral/fungal infections • Always keep in mind the to rule out differentials of non –resolving pneumonia • In ventilated patients: follow ARDS NET protocol strategy • Consider ECMO if need arises • Refractory or progressive cases in ICU: **Interferon beta B1** can be considered. However it should be combined with an anti-viral (Lopinavir/Ritonavir) and hydroxychloquine

There are no proven or approved treatments for COVID-19. The following treatment plan is suggested on the on the basis of information available till date on various investigational treatment approaches.

Summary of currently available drugs which can be potentially used for treatment of COVID-19

Disclaimer: *The options listed below are NOT licensed for the treatment of COVID-19*

Agen t	Classification	Mechanism of action	Dosage	Side effects
Hydroxychloroquine	Off label use	Hampers low PH dependant steps of viral replication	400 mg BID x 2 doses, then 200 mg BID for 5 days	QT prolongation
Oseltamivir	No trials on COVID-19	Neuraminidase enzyme inhibitor in influenza	150mg BID for 5 days	GI intolerance Headache Insomnia
Remdesivir	Investigational (can be used only on compassionate basis)	RNA dependent RNA polymerase inhibitor	200 mg IV loading dose, then 100 mg IV daily, up to 10 days	GI intolerance Hepatotoxicity
Lopinavir/Ritonavir	Off label use	3CLpro (viral protease) inhibitor	400/100 mg BID for up to 10 days	QT prolongation Hepatotoxicity
Ribavirin	Off label use	Inhibitor of RNA polymerization	2 grams (loading dose) then 600mg TID	High risk of toxicity Boxed warning for haemolytic anaemia
Interferon Beta B1	Off label use	Immunomodulatory; enhancement of innate and adaptive viral immunity		Flu like syndrome depression
Tocilizumab	Off label use	Monoclonal antibody to IL6 receptor / treats cytokine release syndrome		Elevation of liver enzymes Increased risk of re-activation of other Respiratory infections
Antibiotics (Broad spectrum)	Initiate as per institution based CAP/VAP policy	Secondary bacterial infection (CAP)/VAP	-	-
Corticosteroids	Not indicated in treating SARS CoV2 a s per availabl e evidence. Might prolong v iral shedding. Use as p er indicated in septic shock/if patient has other indications for steroid use			
IV Immunoglobulin (IVIG)	Off label use	Antibodies from convalescent plasma might suppress viraemia. Theoretically: Better to start at early stage of disease	Consider IVIG at standard dose of 1 gm/kg daily x 2 doses	Might interact with antivirals/

A) CRITICAL CARE MANAGEMENT OF ICU PATIENTS AND THOSE WHO NEED MECHANICAL VENTILATION

Role of Noninvasive positive pressure ventilation (NIPPV):

- NIPPV have Limited role as patients are usually very much tachypneic / hypoxic and starting and maintaining NIPPV with frequent interruption by patient may cause more aerosolization of the virus with the consequent risk to medical personal.
- Avoid high flow Nasal Oxygen (HFNO) or NIPPV for the above mentioned reasons unless individualized patient's related factors exists such as (e.g. COPD, Do Not Intubate / Do Not Resuscitate status etc
- If use of NIPPV cannot be avoided (less ICU beds / or non-availability of mechanical ventilator then use NIPPV with helmet mask interface (Preferred)
- NIV use has been found to be associated with worse outcome

Patients who require intubation and Mechanical Ventilation

Caution while Intubation / resuscitation the patient

- Try to do with the minimum possible number of people (high aerosol generation risk) with full PPE precautions
- Standard intubation and resuscitation protocols to be followed with utmost importance of prevention of infection.
- Intubate early under controlled conditions if possible / Low threshold for watchful wait
- Need a separate cubicle/patient room for intubated patients
- Continuous hemodynamic and oxygenation monitoring
- Use a conservative fluid management strategy for ARDS patients who are not in shock to shorten the duration of mechanical ventilation.
- early appropriate empiric Broad spectrum antibiotics

Ventilation Strategy: Manage as per ventilator management in ARDS NET protocol

- Lung Protective ventilation (Low Tidal Volume, Low Plateau pressure, High PEEP for getting adequate Spo2 targets and Permissive Hypercarbia to protect lung ventilation from ventilation induced injury and follow ARDS protocol
- Implementing a low-volume, low-pressure ventilation strategy/protocol, which targets a tidal volume of 6 ml/kg (predicted body weight), a plateau airway pressure (Pplat) of ≤ 30 cm H2 O and SpO2 88–93% or PaO2 55–80 mm Hg (7.3–10.6 kPa) has been shown to reduce mortality in a heterogeneous population of ARDS patients.
- Sedation and Paralytics to relax patient and facilitate ventilation with daily interruption of sedation and paralytics. Administration of neuromuscular blockade for initial 48 hours has been associated with improved survival and increased time off the ventilator without causing significant weakness
- Prone positioning (Take care of accidental removal of line, tubes, and catheter)

• Inhaled prostacyclins may be tried

• In selected cases ECMO can be an option too (unclear who are the ideal candidate, however can be used for refractory hypoxemia).

• Investigational therapies should be continued despite lack of significant evidence

Corticosteroids may reduce inflammation. None of these investigational therapies are of proven benefit but literature is evolving rapidly and we hope that specific medicines would be available soon.

RISK OF VIRAL SHEDDING

• Exact dynamics unknown

• First COVID 19 case was detected in USA on the 4 of patient's illness. It is suggestive of high viral loads and potential for transmissibility. They also detected 2019-nCoV RNA in a stool specimen collected on day 7 of the patient's illness.

• However, extra pulmonary detection of viral RNA does not necessarily mean that infectious virus is present, and the clinical significance of the detection of viral RNA outside the respiratory tract is unknown at this time

• As a precautionary measure treated/isolated patient should be discharged only after 2 samples are negative (more than 24 hours apart)

WHEN TO DISCHARGE PATIENT

- Resolution of symptoms
- Radiological improvement
- Documented virological clearance in 2 samples at least 24 hours apart

Critical Patient on plasma therapy also recovered. There is a trial going on at various hospital in India on Plasma Therapy for management of critical patient with encouraging results. However, authentic reports are still awaited. The statement of our Hon'ble Health Minister is stated as

Home / Delhi News / Critical patients on plasma therapy 'almost recovered': Delhi health minister

Critical patients on plasma therapy 'almost recovered': Delhi health minister

Before this, Delhi chief minister Arvind Kejriwal had urged people who have recovered from Covid-19 in the city to donate plasma to treat people in hospital with severe forms of the infection.

B) GUIDELINES FOR DIALYSIS WITH REFERENCE TO COVID-19

Infection

COVID-19, a disease caused by a novel corona virus (SARS CoV-2), is currently a pandemic, which produces high morbidity in the elderly and in patients with associated comorbidities. Chronic kidney disease stage-5 (CKD-5) patients on dialysis maintenance hemodialysis (MHD)or continuous ambulatory peritoneal dialysis (CAPD)] are also vulnerable group because of their existing comorbidities, repeated unavoidable exposure to hospital environment and immunosuppressed state due to CKD-5. These patients are therefore not only more prone to acquire infection but also develop severe diseases as compared to general population.

Patients on regular dialysis should adhere to prescribed schedule and not miss their dialysis sessions to avoid any emergency dialysis.

There will be three situations of patients who require dialysis; patients already on maintenance dialysis, patients requiring dialysis due to acute kidney injury (AKI) and patients critically ill requiring continuous renal replacement therapy (CRRT).

General Guidelines for Administration

1. State/UT should identify and earmark at-least one hemodialysis facility with adequate number of dialysis machines, trained staff, reverse osmosis (RO) water system and other support equipment as preparatory fixed-point dialysis unit in case of rise of Covid-19 epidemic.

2. Health departments may issue directives to the district administrations allowing easy movements of these patients (with one attendant) to dialysis facility. Patients who do not have private vehicles, government run transport system should be organized for facilitating transport of these patients. Patients should use their hospital papers as pass to commute to the dialysis unit.

3. District administration should ensure that service providers for the dialysis consumables, both for MHD and CAPD should be allowed to deliver the material to the hospital or home as the case may be.

General Guidance for Dialysis Unit

1. Adequate medical supplies such as dialysate, dialyzers and tubing, catheters, fistula needles, disinfectant and medicines etc. must be ensured in adequate quantity
2. A sign board should be posted prominently in the local understandable language as well as Hindi and English asking patients to report any fever, coughing or breathing problem in dialysis unit and waiting area. The information including images for education can be obtained on the International Society of Nephrology website https://www.theisn.org/covid-19
3. All hemodialysis units should educate their personnel in hemodialysis units; including nephrologists, nurses, technicians, other staff and all patients undergoing MHD along with their care givers about COVID 19
4. All universal precautions must be strictly followed.
5. All staff should strictly follow hand hygiene (seven steps) with soap and water for 20 second before handling any patient and in between two patients. If soap and water are not readily available, use a hand sanitizer that contains at least 60% alcohol. If hands are visibly soiled or dirty, they should be first washed with soap and water and then an alcoholic hand rub used. Avoid touching your eyes, nose, and mouth with unwashed hands.
6. Medical and support staff treating infected patients should be monitored for COVID infection at the dialysis facility and should take necessary action if found infected.
7. Dialysis units should organize healthcare workers shift duties in a way that work of dialysis unit is not affected.
8. All hemodialysis units should be aware of the testing, triage and notification policy recommended by the Union Ministry of health and Family welfare and those by State/ UT Health Departments as well as District health authorities.
9. The dialysis unit staff should be trained for donning and doffing of Personal Protective Equipment (PPE) to be used for dialysis of COVID-19 positive patients.
10. All staff should be trained for cough etiquette, hand hygiene and proper use and disposal of mask, gown and eye glassesand the need to protect themselves.
11. All patients on dialysis, suspected of COVID – 19 should be tested with RT – PCR test as per Government of India protocol.
12. Patients with suspected or positive COVID-19 should be referred to COVID-19 care team as per local guidelines.

GUIDELINES FOR HEMODIALYSIS

I. For Patients

a. Before Arrival to Dialysis Unit

1. All units should instruct their patients to recognize early symptoms of COVID-19 (recent onset fever, Sore throat, Cough, recent Shortness of breath/dyspnea, without major interdialytic weight gain, rhinorrhea, myalgia/bodyache, fatigue and Diarrhea)and contact dialysis staff before coming to dialysis center. The unit needs to make necessary arrangement for their arrival in the screening area.
2. Patients, who are stable on MHD may be encouraged to come to the unit alone without any attendant

b. Screening Area

1. We recommend that dialysis unit should have a designated screening area, where patients can be screened for COVID-19 before allowing them to enter inside dialysis area. Where this is not possible, patients may wait away from the dialysis unit until they receive specific instructions from the unit staff.
2. The screening area should have adequate space to implement social distancing between patients and accompanying persons while waiting for dialysis staff. In screening area, every patient should be asked about:

   - Symptoms suspected of COVID-19 as above.
   - History of contact with a diagnosed case of COVID 19
   - History of contact with person who has had recent travel to foreign country or from high COVID-19 prevalence area within our country as notified by the Central and State/ UT governments respectively.
3. Patients with symptoms of a respiratory infection should put on a facemask before entering screening area and keep it on until they leave the dialysis unit. Dialysis unit staff should make sure an adequate stock of masks is available in screening area to provide to the patients and accompanying person if necessary.
4. There should be display of adequate IEC material (posters etc.) about COVID – 19 in the screening area.

c. Inside Dialysis Unit

1. Suspected or positive COVID-19 patients should properly wear disposable three-layer surgical mask throughout dialysis duration.
2. Patients should wash hands with soap and water for at least 20 seconds, using proper method of hand washing. If soap and water are not readily available, a hand sanitizer containing at least 60% alcohol can be used.
3. Patients should follow cough etiquettes, like coughing or sneezing using the inside of the elbow or using tissue paper.
4. Patients should throw used tissues in the trash. The unit should ensure the availability of plastic lined trash cans appropriately labeled for disposing of used tissues. The trash cans should be foot operated ideally to prevent hand contact with infective material.
5. There should be display of adequate IEC material (posters etc.) about COVID – 19 in the dialysis area.

II. For Dialysis Staff

a. Screening Area

1. The unit staff should make sure an adequate stock of masks and sanitizers are available in screening area to provide to the patients and accompanying person if necessary.

b. During Dialysis

1. It should be ensured that a patient or staff in a unit does not become the source of an outbreak.

2. Each dialysis chair/bed should have disposable tissues and waste disposal bins to ensure adherence to hand and respiratory hygiene, and cough etiquette and appropriate alcohol based hand sanitizer within reach of patients and staff.

3. Dialysis personnel, attendants and caregivers should also wear a three-layer surgical facemask while they are inside dialysis unit.

4. Ideally all patients with suspected or positive COVID-19 be dialyzed in isolation. The isolation ideally be in a separate room with a closed door, but may not be possible in all units. The next most suitable option is the use of a separate shift, preferably the last of the day for dialyzing all such patients. This offers the advantage of avoiding long waiting periods or the need for extensive additional disinfection in between shifts. The next suitable option is to physically separate areas for proven positive and suspected cases. Where this is also not possible, we suggest that the positive or suspected patient may be dialyzed at a row end within the unit ensuring a separation from all other patients by at least 2 meters.

5. Staff caring for suspected or proved cases should not look after other patients during the same shift.

6. Dialysis staff should use of all personal protective equipment (PPE) for proven or strongly suspected patients of COVID-19. Isolation gowns should be worn over or instead of the cover gown (i.e., laboratory coat, gown, or apron with incorporate sleeves) that is normally worn by hemodialysis personnel. If there are shortages of gowns, they should be prioritized for initiating and terminating dialysis treatment, manipulating access needles or catheters, helping the patient into and out of the station, and cleaning and disinfection of patient care equipment and the dialysis station. Sleeved plastic aprons may be used in addition to and not in place of the PPE recommended above.

7. Separating equipments like stethoscopes, thermometers, Oxygen saturation probes and blood pressure cuffs between patients with appropriate cleaning and disinfection should be done in between shifts.

8. Stethoscope diaphragms and tubing should be cleaned with an alcohol-based disinfectant including hand rubs in between patients. As most NIBP sphygmomanometer cuffs are now made of rexine they should also be cleaned by alcohol or preferably hypochloritebased (1% Sodium Hypochlorite) solutions however the individual manufacturer's manuals should be referred to.

9. Staff using PPE should be careful of the following issues:
   - While using PPE, they will not be able to use wash room so prepare accordingly
   - After wearing eye shield, moisture appears after some time and visibility may become an issue. Therefore, machine preparation can be done in non-infected area before shifting to

near the patient

- If dialysis is to be done bed-side in the hospital, portable RO should be properly disinfected with hypochlorite (1% Sodium Hypochlorite) solution between use of two patients

DISINFECTION AND DISPOSAL PRACTICES IN DIALYSIS UNIT

- Bed linen should be changed between shifts and used linen and gowns be placed in a dedicated container for waste or linen before leaving the dialysis station. Disposable gowns should be discarded after use. Cloth gowns should be soaked in a 1% hypochlorite solution for 20 minutes before sluicing and then be transported for laundering after each use.

- Inside dialysis unit, clean and disinfect frequently touched surfaces at least thrice daily and after every shift. This includes bedside tables and lockers, dialysis machines, door knobs, light switches, counter tops, handles, desks, phones, keyboards, toilets, faucets, and sinks etc.

- It is recommended that solutions for disinfection be composed either of hypochlorite, alcohol, formaldehyde or glutaraldehyde for disinfection of surfaces in accordance with the manufacturer's instructions. Almost all common disinfectant solutions are effective in killing the virus on surfaces, the key is effective and frequent cleaning.

- **Bleach solution** o Mix 1 liter of Medichlor with 9 liters of water. This solution can be used for upto 24 hours after which it should be discarded and a fresh solution prepared. o As an alternative 10 Grams of household bleaching powder can be dissolved in a liter of water and used for a period of 24 hours.

▪ Alcohol based solutions

- Ensure solution has at least 60% alcohol. Appropriate commercially available solutions include Aerodosin a mixture of isopropanol, glutaraldehyde and ethanol or lysoformin a mixture of formaldehyde and glutaraldehyde can be used.

- Wear unsterile but clean disposable gloves when cleaning and disinfecting surfaces. Gloves should be discarded after each cleaning. If reusable gloves are used, those gloves should be dedicated for cleaning and disinfection of surfaces for COVID-19 and should not be used for other purposes. Clean hands by above method immediately after gloves are removed.

- For soft (porous) surfaces such as carpeted floor, rugs, and drapes, remove visible contamination if present and clean with appropriate cleaners indicated for use on these surfaces. After cleaning, launder items as appropriate in accordance with the manufacturer's instructions. If possible, launder items using the warmest appropriate water setting for the items and dry items completely.

- Wear disposable gloves when handling dirty laundry from an ill person and then discard after each use. Do not shake dirty laundry. This will minimize the possibility of dispersing virus through the air.

- Clean and disinfect clothes buckets or drums according to guidance above for surfaces. If possible, consider placing a bag liner that is either disposable (can be thrown away) or can be laundered.

DIALYSIS OF COVID – 19 PATIENT WITH ACUTE KIDNEY INJURY (AKI)

A small proportion of patients (~5%) of COVID – 19 develops AKI. The disease is usually mild but a small number may require RRT (Renal Replacement Therapy). In addition, even smaller proportion of patients with secondary bacterial infection will have septic shock, drug nephrotoxicity or worsening of existing CKD severe enough to require RRT (Renal Replacement Therapy).

- It is suggested that all modalities of RRT may be used for patients with AKI depending on their clinical status.
- Patient admitted in other ward of the hospital with AKI should be preferably given bed-side dialysis rather than shifting patient in main dialysis unit.
- In such situation portable reverse osmosis water in a tank will serve the purpose for the dialysis.
- If more dialysis is expected in selected area, dialysis machine may be left in the same area for future dialysis.
- Ideally, this procedure should happen in COVID – 19 dedicated hospital/ ward.

CONTINUOUS RENAL REPLACEMENT THERAPY (CRRT)

▪ CRRT machines are free standing and can function anywhere in the hospital using sterile bagged replacement fluid and dialysate, but operating costs are high.

OTHER EXTRACORPOREAL THERAPY FOR COVID-19

- Use of cytokine removal therapies with Cytosorb, Oxiris and other similar devices is unproven and is not recommended except in the context of a clinical trial.
- Cytokine storm associated with elevated levels of IL-6, IL-18 and IFN gamma are associated with more severe disease and higher mortality. Extracorporeal therapies using high volume hemofiltration or adsorption to decrease cytokine levels may theoretically be expected to confer benefit and 1 study of HVHF at 6L/hr showed cytokine reduction and improvement in SOFA scores in septic patients.

PERITONEAL DIALYSIS

1. Patients already on CAPD

- Patients who are already receiving peritoneal dialysis (PD) treatment have the relative advantage over patients who are receiving hospital or satellite-based haemodialysis treatment as they will not be exposed to hospital environment. This will reduce their exposure to infection. However, they should arrange their delivery of supply well in time to avoid missing dialysis exchanges.
- Used dialysis bags and tubing should be properly disposed using 1% hypochlorite solution first and disposed in a sealed bag. Used dialysis fluid should be drained in the flush.

2. New patient planned for CAPD

▪ It will be difficult to maintain a service that can commence new patients on PD, mainly through a lack of healthcare worker to insert PD catheter and to provide the intensive training required. Therefore, initiation of new patient should be avoided, unless the resources are available and the facility is equipped.

3. Acute PD

▪ Use of acute peritoneal dialysis can be lifesaving and should be used as and when required and, in the setting, where hemodialysis facility is not available. Health care worker should use all precautions while initiating acute PD and discard used consumables properly.

PROGNOSTIC FACTORS

General prognosis

The vast majority of infected patients (e.g. >80%) don't get significantly ill and don't require hospitalization.

- Among hospitalized patients (Guan et al 2/28)
- 10-20% of patients are admitted to ICU.
- 3-10% requires intubation.
- 2-5% dies.

Longer term outcomes: Prolonged ventilator stay? As the epidemic progresses, an issue which may arise is a large volume of patients unable to wean from mechanical ventilation.

Epidemiological risk factors

- Older Age
- Male sex
- Medical comorbidities
- Chronic pulmonary diseases
- Cardiovascular disease
- Chronic kidney disease
- Diabetes

REGULAR HAND WASHING

The CDC recommends regular hand washing with soap and water for at least 20seconds.

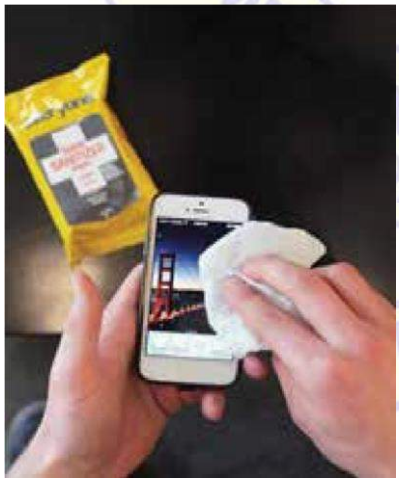
Prioritize washing prior to eating and after being out. Regular hand washing dries the hands, which at an extreme, may make them vulnerable to infection. To mitigate this, regularly use a glycerin based moisturizer with pump or squeeze mechanism.

Hand Hygiene Technique

Alcohol Based Hand Sanitizer

– The CDC recommend that if soap and water are not available, use an alcohol-based hand sanitizer with **at least 60% alcohol.** Leave to air dry.

SANITIZE YOUR PHONE



Given how often we use our phones, this seems like the next logical priority to be sanitized. Using antibacterial wipes or alcohol swabs (typically 70% alcohol) to clean your phone and other items is a good option. If the antibacterial wipes claim to be able to kill the flu virus (H1N1) – that's a good sign they may be able to do similar for the corona virus. Once finished wiping, leave to air dry.

SANITIZE OTHER ITEMS YOU TOUCH REGULARLY, INCLUDING:

- Computer keyboard and mouse
- House and car keys
- Re-usable water bottles
- Car steering wheel
- Clothing pockets
- Door handles

KEEP YOUR IMMUNE SYSTEM HEALTHY

Examples of action you can take to maintain a healthy immune system:

Sleep – Get adequate, high quality sleep. For most people 'adequate' means 7-8 hours. It's no coincidence that "burning the candle at both ends" increases risk of illness. A 2004 literature review concluded that "sleep deprivation has a considerable impact on the immune response" and "should be considered a vital part of the immune system"

Exercise – Exercise regularly, but don't overdo it. To quote a 2007 study on exercise and the immune system – "moderate exercise seems to exert a protective effect, whereas repeated bouts of strenuous exercise can result in immune dysfunction

VACCINES FOR SARS COV 2

- Altimmune's intranasal coronavirusvaccine
- INO-4800 by InovioPharmaceuticals
- mRNA-1273 vaccine byModerna
- Avian Corona virus Infectious Bronchitis Virus (IBV) vaccine by MIGAL and many more
- All vaccines are in developing stage only

IMPORTANT STEPS FOR PREVENTING TRANSMISSION IN THE COMMUNITY

- Diligent hand washing, particularly after touching surfaces in public. Use of hand sanitizer that contains at least 60 percent alcohol is a reasonable alternative if the hands are not visibly dirty.
- Respiratory hygiene (e.g.: covering the cough or sneeze).
- Use triple layer disposable surgical mask if you have any Respiratory symptoms.
- Avoiding crowds (particularly in poorly ventilated spaces) if possible and avoiding close contact with ill individuals. Also try to maintain a safe distance of 2 meters.
- Avoid handshakes, hugs and kisses
- Avoid non-essential travels/gatherings
- Avoid holding on railings of steps
- May use pens for switching on lights in common areas, lift buttons
- At hospitals, avoid keeping patients files on the bed
- Use gloves
- Used mask and other personal protective equipments should be considered as a potentially infected material and it should be disposed separately in an infectious waste disposable bag.

Conclusion

- Corona virus disease 2019 (COVID-19) was reported as cluster of disease in China in December 2019
- It has since spread to all continents except Antarctica and WHO declared COVID-19 as a pandemic.
- Elderly persons with co-morbidities are more affected
- It spreads mainly via Respiratory droplets
- Pneumonia is the most common complication
- Severe cases have a mortality rate of 2.3 to 5%
- Presently there is no standardized treatment or vaccine available for COVID-10
- Containment and prevention is the best option

SPARRC
Sports & Fitness Medicine Centre

PROTOCOLS OF HOME ENTRY

STAY SAFE

FOR YOUR HYGIENE

When you return home, try not to touch anything

Take off your shoes

Disinfect your pet's paws if you take him out for a walk

Take off your outer clothing and put it in a laundry bag

Leave bag, wallet, keys, etc. in a box at the entrance

Shower or if you can't, wash all exposed areas well

Wash your phone and glasses with soap and water or alcohol

Clean the surfaces of what you have brought from the outside with bleach before storing

Take off your gloves carefully, throw them away and wash your hands

Remember that it is not possible to do a total disinfection, the objective is to reduce the risk

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PROTOCOLS OF COEXISTENCE WITH PEOPLE AT RISK

STAY SAFE

FOR YOUR HYGIENE

Sleep in separate bed

Use different baths and disinfect it with bleach

Do not share towels, cutlery, glasses, etc.

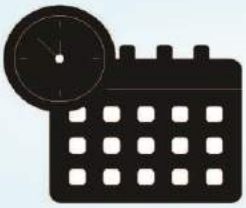
Clean and disinfect high contact surfaces daily (Switches, tables, chair backs, handles, etc)

Wash clothes, sheets and towels very frequently

Keep distance, sleep in separate rooms

Ventilate your room often

Call the designated telephone number if fever and difficulty breathing occur more than 38^0



Do not break the quarantine for 2 weeks. Each exit from home is a reset of the counter

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SPARRC
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PROTOCOLS OF HOME EXIT

STAY SAFE

FOR YOUR HYGIENE

When you go out, wear a long-sleeved jacket

Put your hair up, Don't wear earring, bracelets or rings

If you have mask, put it on at the end, just before leaving

Try not to use public transportation

if you go with your pet, try not to rub against surfaces on the outside

Take disposable cloths, use them to cover your fingers when touching surfaces.

Wrinkle the handkerchief and throw it in a box and put in garbage can

if you cough sneeze, do it on your elbow, not your hands or in the air.

Try not to pay in cash, if you use cash disinfect your hands

Wash your hands after touching any objects and surface or carry disinfectant gel.

Don't touch your face until you have clean hands

Stay away from people

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ADVISORY FOR SENIOR CITIZEN WHO ARE MOBILE

Do's	Don'ts
• Stay within the house all the time • Avoid having visitors at home • If meeting is essential, maintain a distance of 1 meter • If living alone, one can consider depending on healthy neighbours for acquiring essentials for home • Avoid small and large gatherings at all cost Remain actively mobile within the house • consider doing light exercise and yoga at home Maintain hygiene by washing hands. Especially • before having meals and after using the washroom. This can be done by washing hands • with soap and water for at least 20 seconds Clean frequently touched objects such as spectacles Sneeze and cough into tissue paper/handkerchief. • After coughing or sneezing dispose of the tissue paper • in a closed bin/wash your handkerchief and hands Ensure proper nutrition through home cooked fresh hot meals, hydrate frequently and take fresh juices to boost immunity • Take your daily prescribed medicines regularly. Monitor your health. If you develop fever, cough and/or breathing difficulty or any other health issue, immediately contact nearest health care • facility and follow the medical advice Talk to your family members (not staying with • you), relatives, friends via call or video conferencing, take help from family members if needed •	• Come in close contact with someone who is displaying symptoms of coronavirus disease (fever/cough/breathing difficulty). • Shake hands or hug your friends and near ones • Go to crowded places like parks, markets and religious places • Cough or sneeze into your bare hands • Touch your eyes, face and nose • self-medicate • Go to hospital for routine checkup or follow up. As far as possible make teleconsultation with your healthcare provider • Invite family members and friends at home
• Due to Summer, avoid dehydration. Consume an adequate amount of water. (Caution for individuals with pre-existing Heart and Kidney disease)	

ADVISORY FOR CAREGIVERS OF DEPENDENT SENIOR CITIZENS

Do's	Don'ts
• Wash your hands before helping the older individual • Cover nose and mouth adequately using a tissue or cloth while attending on the senior citizen Clean the surfaces which • are frequently used. These include a walking cane, walker, wheel-chair, bedpan etc • Assist the older individual and help her/him in washing hands Ensure proper food and water intake by senior • citizens Monitor his/her health •	• Go near senior citizens if suffering from fever/cough/breathing difficulty • Keep senior citizens completely bed-bound • Touch the Senior Citizen without washing hands □
• Contact help-line if the older adult has the following symptoms: o Fever, with or without body ache o New-onset, continuous cough, shortness of breath o Unusually poor appetite, inability to feed	

ADVISORY FOR SENIOR CITIZENS ON MENTAL WELL-BEING

Do's	Don'ts
• Communicate with relatives at home • Communicate with neighbours, provided social distancing is followed, and gathering of people is avoided Provide a peaceful • environment • Rediscover old hobbies like painting, listening to music, reading • Make sure to access and believe only the most reliable sources of information Avoid • tobacco, alocohol and other drugs to avoid loneliness or boredom If you have an • already existing mental illness, call helpline (08046110007)	• Isolate yourself • Confine oneself in a room • Follow any sensational news or social media posts. • Spread or share any unverified news or information further
• Contact helpline in case of o Change in mental status, such as excessively drowsy during the day, not responding, speaking inappropriately o New onset of inability to recognise relative which he/she could do before	

ADVISORY FOR MINISTERIAL/TECHNICAL/NON TECHNICAL STAFF

All the staff members working in this office are requested to follow the advisory below in letter and spirit:-

For Office

1. Administrative block should be sanitized with Sodium Hypochlorite at 08:30AM, 11:30 AM, 03:30PM daily and whenever required.
2. Everybody should wash their hand with soap & water after every 2hrs & use sanitizer frequently.
3. Don't shake hands.
4. Sanitize door handle frequently after every entry.
5. Don't touch your eyes, nose and mouth.
6. Maintain personal hygiene and a safe distance (more than one meter) from persons during interaction.
7. Cover nose and mouth with tissue or elbow while sneezing and coughing.
8. Don't participate in gatherings, including sitting in groups at canteens/any other places. Follow physical distancing principle in all meetings.
9. Avoid sitting in groups.

While going back home

1. Ring up home when you start from office.
2. Someone at home should keep the front door open (so that you don't have to touch the calling bell or door handle) and a bucket of water with washing soap powder or bleaching powder added to it in the front door.
3. Keep things (car keys, pen, sanitizer bottle, and phone) in box outside the door.
4. Wash your hands in the bucket and stand in the water for a few minutes. Meanwhile use tissue and sanitizer and wipe the items you have placed in the box.
5. Wash your hands with soap water again.
6. Now enter the house without touching anything.
7. The bathroom door is kept open by someone and bucket of detergent soap water is ready. You take off all your clothes including innerwear and soak inside the bucket.
8. Then take a head bath with a shampoo and body bath with soap.

Wash your clothes / put in washing machine with high temperature settings and dry clothes in direct sunlight.

FREQUENTLY ASKED QUESTIONS

In this era of Corona panic and fear, there are lot of confusions and misconceptions existing regarding the use of mask, not only amongst the laypersons but also among the health care providers. On one hand masks are not available for the risk group while on other hand, who are not at risk, spending unnecessary money and energy to procure these masks.
This provoke me to write this blog, hope this would improve the understanding about the various types of commonly used masks and clarify the proper indications of use.

Q1 ... What are the common types of masks
Ans...
1 Cloth mask
2 Surgical mask

Q2... What are the Respirators
Ans.
N- 95
N- 99
N- 100
are the respirators

Q3.. what is the difference between mask and respirator
Ans..
Mask has loose fit, it doesn't seal nose and mouth snugly.
During respiration air moves along the edges of the mask, while respirator has tight seal and most of the times air passes only through its material after filtration.

Q4... Are all respirator masks are same
Ans...
No, respirators are graded according to their filtration efficiency.
According to the used filter type
According to the type of materials used
And additional features
They are of different types.

Q5... what is the efficiency grading
Ans...
According to the efficiency of filtration these are usually graded as-
95, 99 and 100
Means these respirator masks are capable of traping 95%, 99% and 99.9% of particles, smaller up to the 0.3 micron size.
This grading can also be done as
P1 (FFP1) - 80%
P2 (FFP2) - 95%
P3 (FFP3) - 99.95%
Filtration efficiency.

Q.6.. what is the N,R or P meaning written over mask
Ans...
N - not oil proof

R- oil resistant
P- oil proof
(Eg. N 95 is not oil proof).

Q7. Few repirator masks have valve, what is that.
Ans..
That valve is nothing but a simple exhalation port with one way valve mechanism, it reduces effort of expiration, reduce heat inside the mask, dissipate humidity and reduce co2 the amount of from the dead space of mask.

Q.8.. When to use surgical masks.
Ans... Surgical mask or procedure mask is the most common mask used by health workers.
It is not designed to protect wearer from inhaling the air born bacteria and viruses.
It is used to block only large particle droplets, splashes, sprays or splatter.
It also reduce the exposure of wearer's saliva and respiratory secretions to others. Surgical mask also remind wearer not to touch their mouth/nose which could otherwise transfer virus/bacteria after having touched a contaminated surface.

Q9... what is the filtration capacity of surgical mask
Ans... It can vary between 10-90% according to the manufacturer.

Q..10.. how one can assure about the quality of mask
Ans..
Mask should be certified by the
NIOSH (National institute for occupational safety and health)
Or
NPPTL (National personal protective technology laboratory)

Q.11... Does cloth mask effective?
Ans.
Cloth is a wooven material thus pore size is bigger than surgical mask which is made up of non wooven polypropylene material thus cloth mask is less effective than surgical mask in terms of filtration efficiency.

Q..12 ... Does extra layer improve efficacy of cloth mask
Ans.. No, it's not advisable. Each extra layer adds only 2% of extra protection on the cost of comfort .

Q.13... Can surgical/cloth mask be used routinely
Ans.
Yes these can be used routinely.
Few studies done on normal population concluded that the use of simple mask can decrease the incidence of flu up to 75%.
Few east asian countries following this practice of routine use of mask.

Q.14.. Can mask be reused?
Ans. -Cloth mask can be reused after washing
- Surgical mask should be discarded after single use or after soiled
- Respirator mask should be discarded when resistance of breathing get increased or get solied.
Viruses/bacterias can grow and flourish inside the reused mask.

Q..15.. what are the WHO recommendations for using masks?
Ans...
- For the normal population, any type of mask is not required, maintaining the social distance and hand hygiene are the sufficient.
- Sick person should wear surgical mask
- Any person who is taking care of sick person should also wear the surgical mask.
- N 95 mask should be used by the person who is potential to get expose with the respiratory secretions of the infected patient eg. During the Endotracheal intubation, CPR, Ventilation, Bronchoscopy and Tracheostomy etc.

Q.16 What can we do as Dental Professionals?

a) Access reliable information
b) Avoid panic and rumors
c) Take the recommendations from the local, state and government public health officials
d) Heed the call to temporarily suspend all non-urgent dental treatment until this crisis is over.

Q.17 Why do we need to stop elective procedures?

- At this stage we cannot reliably identify who are asymptomatically infected
- We need to limit our contact with people outside our immediate circle for some time, and make sure as health professionals that people do not leave their houses for purposes which are not the essential need of the hour
- Many Dental procedures produce aerosols, known to increase exposure, if the patient is infected.
- Supplies of PPE's for treating sick people in hospitals is low right now, if we use this for non-urgent treatment, we contribute to the risk of the front line health workers being left unprotected.

Covid 19-What should a dentist do?

There are a lot of perplexing questions dentist are facing.
These are my solutions for the same...

1) When should I resume work?

Preferably wait till the entire thing blows over. Do not be in a hurry to start clinical practice. Remember you are in high risk category.
Some of us might feel we have EMI s running and we are in good health, so max I will fall ill for a few days.. sorry to burst your bubble, you run the risk of transmitting it to your near and dear ones especially THE ELDERS who are most susceptible.

2) Should I use PPE ?

Yes without any doubts and so should your staff working with you.

3)Should i change after every patient?

Ideally you and your staff should change after every case as fomites can be spread through you to next patient

4) Will my patients pay for it?
Yes, Unless you are willing to act like the government and subsidize it for them... of course they have to. It's for their safety too.

5) Do I need to fumigate the clinic?

Yes you do unless your operatory and consulting/ reception are well ventilated from both sides. Even then once a day is mandatory as the fomites can settle on surfaces and stay for upto 3 days (in some studies they stayed for 17 days)

6) At what interval should it be done?

After every patient.

7) Do I check the patient for covid 19 before we start any treatment?

If tests are available you can but reports as of today suggest that you need 2 consecutive negative tests with a time interval between them (also you can't quarantine the patient till 2nd test so I am not too sure about this)

8) Do I run the risk of being sued if patient tests positive after dental work?

In today's world you do. Hence the PPE and fumigation after every patient.

9) Should I wait for the vaccine?

Yes you can, if you are willing to wait for atleast 12 to 18 months.

10) How do I charge existing patients whose work is on hold?

You have to tell them that circumstances have changed and it is for their benefit.
You are charging only for material cost

11) What about new cases?

You have to charge them for the loss of EFFICIENCY (read reduced working hours due to fumigation) in addition to cost incurred for the PPE. So charges have to be upped substantially eg you did 10 patients in one session in 2 operatories. Now you can do only 4. So you have to bill the four for the 10 you would have done. Then only you would maintain the same paycheck at the end of the month.

12) Do I need to make changes in my operatory?

Yes. if your two chairs are in one room then you can't work simultaneously on two patients. Similarly consulting should not be shared with operatory.

13) What about lab work?
You need to disinfect the lab work before you send it to the lab.

Most importantly you need to train your assistants for the massive changes involved.
Protocols will need to be put in place before you start work.
Practice runs need to be undertaken before you see a single patient.
If your assistant goofs up all the PPE will be of no use. Imagine you have done a crown prep and made impressions with PPE. After the patient has left the assistant comes to take away impression material without disinfecting it 😳 and she keeps it with bare hands with other materials. What just happened is not fiction but quite possible.

POINTS TO REMEMBER

1. Postpone travel abroad for 2 years.
2. Do not eat outside food for 1 year.
3. Do not go to unnecessary marriage or other similar ceremony.
4. Do not take unnecessary trips.
5. Do not go to a crowded place for at least 1 year.
6. Completely follow social distancing.
7. Stay away from a person who has cough.
8. Keep the mask on..
9. Be very careful in the current one week.
10. Do not let the mess around you.
11. Prefer vegetarian food.
12. Do not go to the cinema, mall, crowded market for 6 months now. If possible, park, party, etc. should also be avoided.
13. Increase immunity.
14. Be very careful while at Barber shop or at beauty parlor.
15. Avoid unnecessary meetings, keep in mind social distancing.
16. The threat of corona is not going to end soon.

TAKE HOME MESSAGE

* The virus is not a living organism, but a protein molecule (RNA or DNA) covered by a protective layer of lipid (fat), which, when absorbed by the cells of the ocular, nasal or buccal mucosa, changes their genetic code (mutation) and convert them into aggressor and multiplier cells.
* Since the virus is not a living organism but a protein molecule, it is not killed, but decays on its own. The disintegration time depends on the temperature, humidity and type of material where it lies.
* The virus is very fragile; the only thing that protects it is a thin outer layer of fat. That is why any soap or detergent is the best remedy, because the foam CUTS the FAT (that is why you have to rub so much: for 20 seconds or more, to make a lot of foam).
By dissolving the fat layer, the protein molecule disperses and breaks down on its own.
* HEAT melts fat; this is why it is so good to use water above 25 degrees Celsius for washing hands, clothes and everything. In addition, hot water makes more foam and that makes it even more useful.
* Alcohol or any mixture with alcohol over 65% DISSOLVES ANY FAT, especially the external lipid layer of the virus.
* Any mix with 1 part bleach and 5 parts water directly dissolves the protein, breaks it down from the inside.
* Oxygenated water helps long after soap, alcohol and chlorine, because peroxide dissolves the virus protein, but you have to use it pure and it hurts your skin.
* NO BACTERICIDE OR ANTIBIOTIC SERVES. The virus is not a living organism like bacteria; antibodies cannot kill what is not alive.
* NEVER shake used or unused clothing, sheets or cloth. While it is glued to a porous surface, it is very inert and disintegrates only
-between 3 hours (fabric and porous),
-4 hours (copper and wood)
-24 hours (cardboard),
-42 hours (metal) and
-72 hours (plastic).
But if you shake it or use a feather duster, the virus molecules float in the air for up to 3 hours, and can lodge in your nose.
* The virus molecules remain very stable in external cold, or artificial as air conditioners in houses and cars.
They also need moisture to stay stable, and especially darkness. Therefore, dehumidified, dry, warm and bright environments will degrade it faster.

* UV LIGHT on any object that may contain it breaks down the virus protein. For example, to disinfect and reuse a mask is perfect. Be careful, it also breaks down collagen (which is protein) in the skin.
* The virus CANNOT go through healthy skin.
* Vinegar is NOT useful because it does not break down the protective layer of fat.
* NO SPIRITS, NOR VODKA, serve. The strongest vodka is 40% alcohol, and you need 65%.
* LISTERINE IF IT SERVES! It is 65% alcohol.
* The more confined the space, the more concentration of the virus there can be. The more open or naturally ventilated, the less.
* You have to wash your hands before and after touching mucosa, food, locks, knobs, switches, remote control, cell phone, watches, computers, desks, TV, etc. And when using the bathroom.
* You have to HUMIDIFY HANDS DRY from so much washing them, because the molecules can hide in the micro cracks. The thicker the moisturizer, the better.
* Also keep your NAILS SHORT so that the virus does not hide there.
* Corona Virus - 19 can be prevented by maintain Vitamin D level, weekly dose of 60,000 IU is recommended for 3 months and to maintain normal 40-60 Nano gram/ml of Vitamin-D level daily requirement.
* Vitamin D is not a nutrient but also an immune moderator and harmone.

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