

## COVID - 19

**COVID-19 : PREVENTION AND EDUCATION****\*Sanjay Srirampur  
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**Abstract:** *The novel coronavirus 2019 pandemic has caused an unprecedented global catastrophe. At present there is no known cure, drug or treatment for this disease. Personal hygiene, social distancing, hygienic practices and care of the infected persons (asymptomatic/ mild symptomatic) are the only preventive measures we have at present. Usefulness of hydroxychloroquine as a preventor drug is yet to be proved. At the time of writing, eight vaccines have reached clinical stage of trials and are being evaluated across the world. In the most optimistic timeline that we can anticipate, it will not be less than a year before any of the vaccines will be available for public use. It is also very important that all routine immunisation practices be continued.*

**Keywords:** *Novel coronavirus, SARS-CoV-2, Hydroxychloroquine, Coronavirus vaccine.*

From the time this pandemic has struck across the globe, it has been a catastrophe for almost all nations. There is no definitive treatment or vaccine available at present. Hence movement restriction, general awareness, social distancing and measures to improve personal hygiene will go a long way in mitigating the spread of this disease. The preventive aspects can be considered at the level of an individual, community as a whole and institutions - be it school or hospital or a workplace.

**Prevention at individual level<sup>1</sup>**

Novel Corona virus - SARS-CoV 2 spreads from person to person by means of respiratory droplets and contaminated fomites. The virus is highly infectious and current evidence suggests that it spreads more readily than influenza virus, but not as much as measles. Maintaining good physical distance, preferably more than

6 feet is one of the most important steps in preventing spread of the virus. The following steps will help an individual in preventing spread or minimizing contact with SARS CoV-2.

1. Wash your hands frequently with soap and water for 20 seconds especially after coming back from a public place or after coughing, sneezing or blowing your nose. If soap and water is not available, then using hand sanitizer with minimum 60% alcohol concentration is recommended. Avoid unnecessary touching of nose, mouth or eyes.
2. Maintain social distancing in public places and from household members who are sick.
3. Avoid crowded places and gatherings - this is of paramount importance.
4. Cover your nose and mouth with cloth cover (cloth mask or hand kerchief) when in public or going out for daily errands. Follow cough etiquette. At present, use of medical masks (also known as surgical masks) is not recommended for general public.
5. Cleaning and disinfecting frequently touched surfaces like door knobs, light switches, mobile phones, tablets, laptops, table surface etc. is recommended. Any household level disinfectant can be used. A recent article recommended the use of 70% isopropyl alcohol or Clorox wipes for disinfection of mobile phones. When such a solution is used for disinfection, it is preferable that the mobile phone is in switched off mode.<sup>2</sup>

**Use of masks and gloves by public<sup>1,3,4,5</sup>**

It is known that the novel coronavirus can be transmitted from asymptomatic carriers as well as presymptomatic patients. In the light of this evidence, it is recommended that people should use cloth based coverings or masks when they go out in public places. The intention of cloth based covering is to protect people around the individual. However, the use of such a mask should not give a false sense of security leading one to stray away from social distancing. These masks can be washed with soap and water and reused. Due to shortage, medical masks

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and respirators are not recommended to be used by general public. In the following conditions triple layer surgical mask may be used:<sup>3</sup>

1. When a person develops respiratory symptoms
2. When visiting a healthcare facility
3. When you are caring for someone who is sick at home
4. Close contacts of suspected cases

If used properly, a surgical mask will be protective for 8 hours, unless it gets wet. The mask should be discarded after use by disinfecting with 5% bleach or 1% hypochlorite and then burnt or by deep burial.<sup>3</sup> The routine use of gloves is also not recommended except when caring for a sick patient at home or non-healthcare based setting.

### **Cleaning and disinfection at home<sup>1</sup>**

Novel coronavirus is transmitted by respiratory droplets more readily as compared to fomites. So, apart from precautions against droplets, cleaning and disinfection of contaminated surfaces will also decrease the transmission of virus. Cleaning, basically means removal of the dirt impurities and germs from a surface. It does not kill the microbes. On the other hand disinfection refers to the process of killing the microbiological organisms. Usually disinfection is a process which should be followed after cleaning. Frequently touched surface in the household environment can be cleaned and disinfected by commercially available products. 1% hypochlorite solution is an excellent disinfecting agent, if the surface is compatible. Following manufacturer recommendations and the compatibility of such a procedure with the surface should be kept in mind. Use of gloves, mask if required and good ventilation is needed during the process of disinfection. Electronic devices can be disinfected by 70% isopropyl alcohol based solutions or wipes.

Clothes can be laundered as routine or as per manufacturer recommendations. Use of warm or hot water is preferable. Use of gloves is preferable when handling laundry which is dirty or from an infected person. We should also try to avoid shaking dirty laundry because that may generate aerosols. Clothes from a sick person can be washed along with routine laundry.

If there is a sick person at home, then he should be cared for in a separate room isolating from everybody else at home. It is preferable that the washroom used by the sick person should be separate. If separate washroom is not feasible, then common washroom should be cleaned and disinfected after each use. All the food, linen and other material connected to the sick person should be handled

with gloves. It is to be noted that the gloves used during any of these procedures as mentioned above should be discarded in a sterile manner as discussed before. If reusable gloves are being used, then they should be cleaned and disinfected with 1% hypochlorite after every use.

### **Prevention at schools<sup>6</sup>**

Today's students are tomorrow's global citizens and hence, arming them with the right knowledge about COVID-19 is going to decrease their anxiety and fear about the disease. It will also help them to cope up with the pandemic and decrease the stigmatization of sick amongst teachers and fellow students. Students armed with the right tools of knowledge will help a society in fighting against the disease and also serve to pursue preventive measures at their own homes..

In the event of an extremely high community based transmission, schools are likely to be closed down till the situation ensures safety of students. The discussion below pertains to a situation wherein the schools are eventually going to open. The World Health Organization and UNICEF have released a joint document in March 2020 addressing issues related to prevention of spread of COVID-19 in schools.<sup>6</sup> The detailed document is available on the WHO and UNICEF websites. There is a checklist in this document which the schools can implement to make sure that they are safe. Here is a brief summary of the recommendations.

1. All the personal hygiene, social distancing, cleaning and disinfecting principles mentioned above need to be followed at school very strictly.
2. Regular hand washing and sanitisation should be encouraged and implemented by students and staff alike. Cleaning and disinfection of the school campus, class rooms, cafeteria, office and other frequently touched surfaces should be done on a regular basis - at least once a day. The managements of schools should ensure that the above required facilities, equipment and supplies are adequate at all times.
3. Social distancing in school maybe practiced by staggering the start and the end of the school working hours, avoiding any activity which will involve a gathering, trying to distance the classroom seating areas by one meter and teaching students to avoid unnecessary touching.
4. Sick students and staff should not attend school. The school should have emergency contact numbers of the caretakers of children as well as the local health

authority. This will help in formulating an emergency plan in case someone falls sick at school. Monitoring the pattern of school absenteeism due to respiratory illness can help the local authorities in tracking cases.

5. In the unlikely event of difficulty in reopening the schools, online classes and e-learning should be encouraged.

### **Prevention at workplaces<sup>7</sup>**

The principles of hand hygiene, social distancing, cough etiquette, regular cleaning and disinfecting of the environment have all been discussed earlier and apply in a similar manner to a workplace. Hand hygiene can be promoted by availability of hand sanitizers at all entry and exit gates in the work environment as well as at multiple other places where the likelihood of contamination is high. Posters highlighting these aspects can be obtained from WHO website and pasted across the workplace to promote such activities. Employees should be educated about the disease, recognition of early symptoms and should be instructed to stay at home if they are unwell. Gatherings and meetings should be avoided as far as possible. Use of teleconference should be encouraged to maintain social distancing. If a meeting is mandatory, then all possible precautions should be undertaken. If feasible, social distancing should be maintained even during such meetings. Hand hygiene and respiratory hygiene should be maintained during the course of a meeting. Details of all the people coming to work and especially those attending such close gatherings should be available. In the unlikely event of someone falling sick, this information would be of utmost importance to trace all contacts. Contingency plans and protocols for employees falling ill at work should be available in conjunction with local health authorities.

### **Precautions during home isolation<sup>8</sup>**

As per the revised guidelines from Government of India published on 10th May 2020, it has been recommended to isolate pre symptomatic or mildly symptomatic cases at home itself. Precautions at home for the sick person as well as the caretakers involved are described. The following are the prerequisites for home isolation:

1. Diagnosis of COVID positivity in asymptomatic patients as well as categorising as mild when they have symptoms should have been done by a qualified doctor.
2. There should be a facility for home isolation for the patient and the caregivers or family members.

3. Caregiver should be available 24/7 and there should be smooth and convenient source of communication with the healthcare system at any given point of time.
4. The caregivers and close contacts will be on hydroxychloroquine prophylaxis as per recommendations of Indian Council of Medical Research (ICMR).
5. The patient will regularly monitor his health and update the status to district surveillance officer.
6. The patient will download “Arogya Setu” app which will remain active via internet and bluetooth at all given times.
7. The patient has to give an undertaking as per Annexure I in the guidelines. He is liable for legal action if he fails to follow home isolation guidelines.

In addition, ANNEXURE II is available which outlines the precautions the caregiver needs to take at home. The caregiver has to be explained the important warning signs for immediate consultation to the hospital. Home isolation is for a period of 17 days after the onset of symptoms, provided the patient is afebrile for 10 days.

The following is a summary from Annexure II

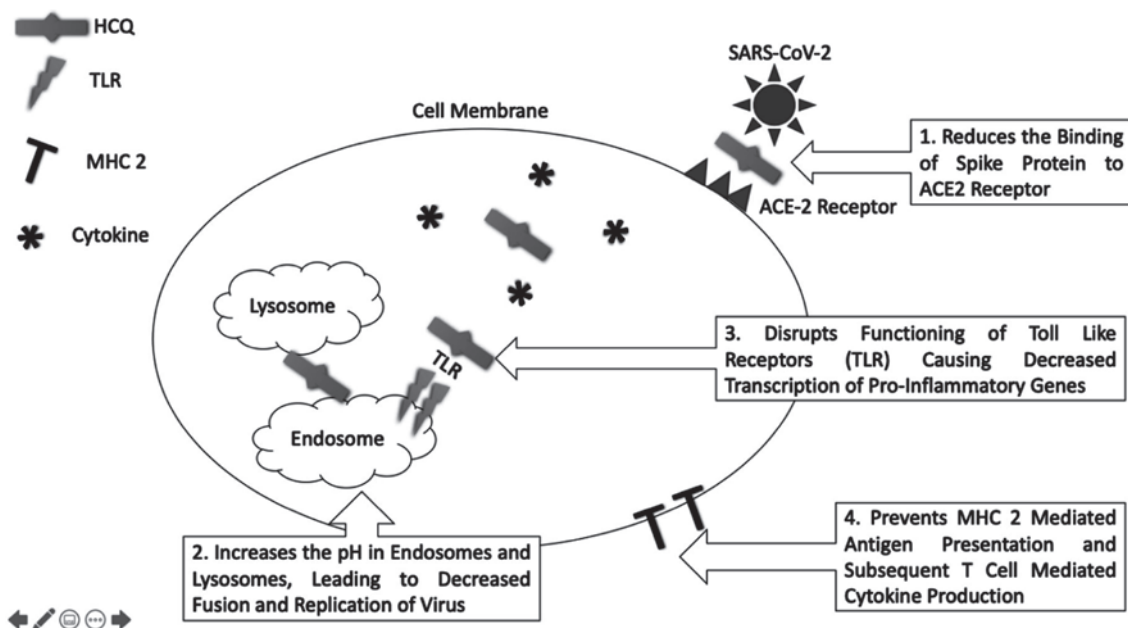
1. The patient should stay in a separate room away from all other family members. It is preferable to have a separate washroom for the patient. He should wear a triple layer surgical mask at all given times. The mask should be discarded after 6 hours or whenever it is soiled or wet. The patient should follow hand hygiene, respiratory etiquette and social distancing at all times. He should maintain nutrition, hydration, monitor temperature regularly and inform health authorities if any warning signs develop.
2. The caregiver should always wear triple layer surgical mask when entering the room of the patient. He should not unnecessarily touch his face, nose or mouth. The mask of the caregiver and the patient should be discarded only after disinfection with 1% hypochlorite solution.
3. All kinds of contact in the patient area should be done by using gloves. This includes touching of anything in the patient room like beddings, clothes, food, surfaces, etc. Frequent disinfection of the patient care area should be done at all times.
4. The caregiver will also monitor his as well as other family members' health which includes temperature monitoring and reporting to health authorities, if there is a problem. They may need to be tested for COVID when they become symptomatic

## Hydroxychloroquine (HCQ) prophylaxis

The COVID-19 pandemic has put the medical community across the globe in a very precarious situation. At the time of writing this article, there is no known definitive treatment or prophylaxis available against SARS-CoV-2. This has let the scientific community to find quickly a safe and effective drug for this virus resulting in a flurry of publications on various possible therapeutic options. The antimalarials chloroquine and hydroxychloroquine have shown some promise against the virus in laboratory studies<sup>9</sup>. In fact, according to a recent report, there is no evidence of in vitro viral activity of HCQ.<sup>10</sup> The published data available so far do not include any high quality studies and there is hardly any evidence based information about the efficacy of HCQ in prophylaxis. Fig.1 demonstrates the possible mechanism of HCQ in SARS-CoV-19 infection.

Data from Gautret, et al<sup>12</sup>, with 36 patients of COVID-19 treated with HCQ and azithromycin revealed higher percentage of negative nasal swabs between day 3 to day 6 in the treatment group. This study used 600 mg of HCQ per day for 10 days in the treatment group. The shortfalls of this study were – a very small number of which only 8 cases actually had pneumonia, lack of any randomisation, extremely short observation period, inclusion of asymptomatic cases, and lack of data on clinical efficacy. A second study<sup>13</sup> from the same author had a larger patient cohort (80 cases). Similar to the earlier data, rapid nasopharyngeal viral clearance was noted-83%

were negative at day 7 and 93% were negative at day 8. However, clinically relevant outcomes were not described, there was no control group and majority of the patients had early warning scores less than 4, indicating that they were not that sick, leading to a possible bias in the results. Another observational study<sup>14</sup> from France in 11 patients with COVID-19, did not report any benefit in nasopharyngeal clearance of the virus even after 5 - 6 days of treatment. In this study, the cohort of patients were more sick as compared to the studies by Gautret et al. In a pilot trial of 30 cases from China<sup>15</sup>, Jun Chen and colleagues did not find any difference in the viral clearance in the HCQ treated group as compared to the control group. However, concomitant use of other antiviral drugs was also there in both the groups which could have confounded the results. HCQ was used in a dose of 400 mg per day in the study. Another Chinese randomised parallel group trial<sup>16</sup> was conducted in 62 patients, out of which 31 received HCQ in addition to standard care. Time to clinical recovery, defervescence of fever and cough remission were significantly lower in the treatment arm. Most of the patients had mild to moderate disease and whether these results can be directly extrapolated in sicker patients is not clear. In another observational study<sup>17</sup> of 1376 patients, out of which 811 received HCQ, the investigators did not find a benefit in the composite endpoint of decreased risk for intubation or death. However, in this study, the treatment arm had significantly more sick patients at baseline as compared to the control arm. So far, there is no published data on the effectiveness of HCQ as prophylaxis.



**Fig. 1. Proposed mechanisms of action of HCQ in a simplified manner. (Action 1 and 2 disrupt viral infectivity and multiplication. Action 3 and 4 reduce cytokine storm.)<sup>11</sup>**

At the time of writing this article, 175 trials on HCQ in various combinations as well as monotherapy are going on; 50 studies out of these are evaluating the role of HCQ as prophylaxis.<sup>18</sup> Large scale multicentre trials, such as the Discovery study (NCT04315948) and the Solidarity study (EudraCT Number 2020-000982-18), will give us answers in due course of time. There is a risk of prolongation of QT interval with HCQ, especially if combined with azithromycin. The current data, albeit very less and our historical experience with this drug tell us that the risk is very small. The National Task Force for COVID-19 constituted by the ICMR<sup>19</sup> recommends the use of HCQ as prophylaxis against SARS-CoV-2 in high risk groups. This chemoprophylaxis is recommended for:

1. Asymptomatic healthcare workers involved in the care of suspected or confirmed COVID-19 cases.
2. Asymptomatic household contacts of lab confirmed COVID-19 cases.

A loading dose of 400 mg twice on the first day is recommended. The weekly maintenance dose is 400 mg to be given for 7 weeks in the case of healthcare workers and 3 weeks in the case of household contacts. The use of

prophylaxis should not undermine the need for personal hygiene and other mitigating measures explained above. Prophylaxis should not give one, a false sense of security and is to be taken only under prescription from an authorised medical authority/doctor. It is not recommended for children less than 15 years of age and those with retinopathy or hypersensitivity.

### Vaccines for COVID-19

At the time of writing this article there are 102 vaccines in pre-clinical trials and 8 vaccines in phase 1 and phase 2 clinical trials.<sup>20</sup> Table I lists vaccines that are in clinical trials. The detailed document can be obtained from WHO website.

**ChAdOx1 nCoV-19** (Vaccine 1 in Table.I): The vaccine being developed by the University of Oxford's Jenner Institute and Oxford Vaccine group in UK (ChAdOx1 nCoV-19) has taken the lead and is currently the forerunner amongst the COVID-19 vaccines. Human trials have begun as of April 2020. Human adenovirus is used in this vaccine. The genetic material for expression of the spike glycoprotein of novel coronavirus has been inserted into the weakened adenovirus to make this vaccine candidate.

**Table I. Candidate vaccine in clinical trials against COVID-19<sup>20</sup>**

S.No.	Vaccine	Platform	Developer	Current stage of clinical trials
1	ChAdOx1 nCoV-19	Non-replicating viral vendor	University of Oxford	Phase 1/2 NCT04324606
2	Adenovirus Type 5 vector recombinant vaccine	Non-replicating viral vendor	CanSino Biological Inc./Beijing Institute of Bioechnology	Phase 2 ChiCRT2000031781 Phase 1 CHiCTR2000030906
3	LNP encapsulated mRNA-1273	RNA based vaccine	Moderna/NIAID	Phase 2 (IND accepted) Phase 1 NCT04283461
4	Inactivated vero cell vaccine	Inactivated vaccine	Wuhan Institute of Biological Products/Sinopharm	Phase 1/2 ChiCTR2000031809
5	Inactivated vero cell vaccine	Inactivated vaccine	Beijing Institute of Biological Products/Sinopharm	Phase 1/2 ChiCTR2000032459
6	Inactivated coronavirus vaccine + Alum	Inactivated vaccine	Sinovac	Phase 1/2 NCT04352608
7	BNT16a1, BNT162b1, BNT162b2, BNT162c2	RNA based vaccines	BioNTech/Fosun Pharma/Pfizer	Phase 1/2 2020-001038-36 NCT04368728
8	DNA plasmid vaccine with electroporation (INO-4800)	DNA based vaccine	Inovio pharmaceuticals	Phase 1 NCT04336410

As of date, 1090 participants aged 18-55 years have been planned to be enrolled in the clinical trial which will utilise quadrivalent meningococcal vaccine in the control group. The vaccine will be studied in a single as well as two dose schedules. Efficacy of the vaccine as well as occurrence of serious adverse events are the primary outcomes of this study. Serum Institute of India plans to produce 60 million doses of this vaccine. Astra Zeneca has tied up with the University for production and global distribution of the vaccine. The preliminary completion date and data collection is expected to be completed by May 2021.

**Recombinant adenovirus vaccine** (Vaccine 2 in Table I): This vaccine has been registered for a phase 2 trial on the Chinese clinical trials registry. It has been proposed to use two different inoculation doses of the vaccine in the trial and a placebo in control group. 250 subjects will be enrolled in medium dose group, 125 in low dose group and 125 in placebo. Trial details and completion of data collection is expected by January 2021.

**LNP encapsulated mRNA-1273 vaccine** (Vaccine 3 in Table.I): This is a novel lipid nanoparticle (LNP)-encapsulated mRNA vaccine that encodes for a prefusion stabilized form of the spike protein of SARS-CoV-2. It is being developed by Kaiser Permanente Washington Health Research Institute (KPWHRI) in Seattle, and is funded by the National Institute of Allergy and Infectious Diseases (NIAID). The phase 1 trial is evaluating the safety and immunogenicity of the vaccine in 105 subjects. The participants aged 18 years and older will receive 2 doses, 28 days apart; in 1 of the 3 concentrations - 25mcg, 100mcg or 250mcg. It has also received an FDA approval for phase 2 trial. Phase 2 will enrol 600 subjects with 3 groups receiving placebo or 50mcg vaccine or 250mcg vaccine in adults 18 years and older. The primary completion of phase 1 is expected to be around September 2021.

**Inactivated coronavirus vero cell vaccine** (Vaccine 4 and 5 in Table. I): Inactivated vero cell based novel coronavirus vaccine is being evaluated by Wuhan Institute of Biological Products and Beijing Institute of Biological Products into separate phase 1 / 2 trials. The vaccine manufactured by Sinovac Research and Development Company will be inoculated in 2 doses, 28 days apart. The Wuhan trial will enrol subjects more than 6 years of age where as the Beijing trial will enrol subjects from the age of 3 years onwards. The initial data is expected 6 months after the completion of the trial. At the time of writing, no other timelines are available from the Chinese clinical trial registry.

**Inactivated coronavirus vaccine with alum** (Vaccine 6 in Table. I): The parent company manufacturing the inactivated corona virus vaccine is doing its own phase 1/2 randomised double blind placebo controlled trial. Study is enrolling adults aged 18-59 years to receive 2 doses of the vaccine or a placebo. The vaccine will be studied at 2 different inoculation doses of 600 SU or 1200 SU. 144 subjects are expected to be enrolled for phase 1 and 600 subjects will be enrolled in phase 2. The estimated date of completion is expected to be December 2020.

**BNT162a1, BNT162b1, BNT162b2 & BNT162c2 RNA based vaccine candidates** (Vaccine 7 in Table. I): This phase 1/2 randomized, placebo controlled and observer blind trial is being conducted by Biontech and Pfizer. One of the four vaccines will be given in a 1 or 2 dose schedule. The control group will receive a placebo vaccine. The vaccine will be evaluated at 3 different doses in 7600 participants aged 18 – 85 years. It is expected to be completed by March 2023.

**INO 4800** (Vaccine 8 in Table. I): This is a one of a kind DNA plasmid based vaccine presently being evaluated in a phase 1 trial in 40 subjects. The vaccine is administered intradermally on day 0 and day 28. Electroporation is a technique where permeability of cells is increased to enhance the uptake of DNA. This DNA then leads to transcription inside the cells, causing an immune reaction which will generate protective immunity against novel coronavirus. CELLECTRA is a patented hand held device made by Inovio Pharmaceuticals which helps in electroporation following vaccination. The initial trial is expected to be completed by April 2021.

### **Routine vaccination in COVID-19 pandemic<sup>21</sup>**

Immunisation has been recognised as a core essential healthcare service, and needs to be continued in a safe manner even during the pandemic. A healthy child undergoing immunisation does not have any additional risk due to the pandemic. On the other hand, immunisation is going to protect the child against vaccine preventable communicable diseases. Immunisation should be done in separate or segregated OPDs at all levels, be it a private clinic, nursing home or a multi-speciality hospital. The birth dose of vaccines needs to be given before discharge from the hospital. All the vaccines in the first year of life are a priority and should not be postponed. Influenza and varicella vaccines also need to be given. Other vaccines and boosters may be postponed only if logistics do not permit. All mass immunisation activities should be postponed to maintain social distancing measures.

## Points to Remember

- *Individual level prevention of COVID-19 by general public depends on social distancing, frequent hand washing, wearing of cloth masks and periodic decontamination of surfaces.*
- *Schools, when they start functioning and work places should constantly educate the students and employees respectively, on maintaining adequate distance, avoiding crowding and hand hygiene and make it possible by provision of facilities. They must also encourage to report early if any symptoms develop in them.*
- *The patient and care giver must strictly follow all the norms laid down for home isolation of pre symptomatic or mildly symptomatic cases.*
- *The role of hydroxychloroquine in prevention and treatment await robust published results. Till then, the recommendations of ICMR are to be followed for chemoprophylaxis with hydroxychloroquine by high risk contacts only under prescription from an authorised medical authority/doctor.*
- *There are eight RNA or DNA based inactivated vaccines in phase I/II stages of development.*
- *Immunization services especially the primary doses of vaccines should be administered to all the eligible children.*

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**Annexure I**

**Undertaking on self-isolation**

I ..... S/W of ..... resident of .....

being diagnosed as a confirmed/suspect case of COVID-19, do hereby voluntarily undertake to maintain strict self-isolation at all times for the prescribed period. During this period I shall monitor my health and those around me and interact with the assigned surveillance team/with the call center (1075), in case I suffer from any deteriorating symptoms or any of my close family contacts develops any symptoms consistent with COVID-19. I have been explained in detail about the precautions that I need to follow while I am under self-isolation.

I am liable to be acted on under the prescribed law for any non-adherence to self-isolation protocol.

Signature \_\_\_\_\_

Date \_\_\_\_\_

Contact Number \_\_\_\_\_

**Annexure II**

**Instructions for care-givers**

- **Mask:** The caregiver should wear a triple layer medical mask appropriately when in the same room with the ill person. Front portion of the mask should not be touched or handled during use. If the mask gets wet or dirty with secretions, it must be changed immediately. Discard the mask after use and perform hand hygiene after disposal of the mask.
- He/she should avoid touching own face, nose or mouth.
- Hand hygiene must be ensured following contact with ill person or his immediate environment.
- Hand hygiene should also be practiced before and after preparing food, before eating, after using the toilet, and whenever hands look dirty. Use soap and water for hand washing at least for 40 seconds. Alcohol-based hand rub can be used, if hands are not visibly soiled.
- After using soap and water, use of disposable paper towels to dry hands is desirable. If not available, use dedicated clean cloth towels and replace them when they become wet.
- **Exposure to patient:** Avoid direct contact with body fluids of the patient, particularly oral or respiratory secretions. Use disposable gloves while handling the patient. Perform hand hygiene before and after removing gloves.
- Avoid exposure to potentially contaminated items in his immediate environment (e.g. avoid sharing cigarettes, eating utensils, dishes, drinks, used towels or bed linen).
- Food must be provided to the patient in his room
- Utensils and dishes used by the patient should be cleaned with soap/detergent and water wearing gloves. The utensils and dishes may be re-used. Clean hands after taking off gloves or handling used items.
- **Use triple layer medical mask and disposable gloves** while cleaning or handling surfaces, clothing or linen used by the patient. Perform hand hygiene before and after removing gloves.
- The care giver will make sure that the patient follows the prescribed treatment.
- The care giver and all close contact will self-monitor their health with daily temperature monitoring and report promptly if they develop any symptom



suggestive of COVID-19 (fever/cough/difficulty in breathing).

### Instructions for the patient

- Patient should at all times use triple layer medical mask. Discard mask after 8 hours of use or earlier if they become wet or visibly soiled.
- Mask should be discarded only after disinfecting it with 1% sodium hypochlorite.
- Patient must stay in the identified room and away from other people in home, especially elderlies and those with co-morbid conditions like hypertension, cardiovascular disease, renal disease etc.
- Patient must take rest and drink lot of fluids to maintain adequate hydration.
- Follow respiratory etiquettes all the time.
- Hands must be washed often with soap and water for at least 40 seconds or clean with alcohol based sanitizer.
- Don't share personal items with other people.
- Clean surfaces in the room that are touched often (tabletops, door knobs, handles, etc) with 1% hypochlorite solution.
- The patient must strictly follow the physician's instructions and medication advice.
- The patient will self-monitor his/her health with daily temperature monitoring and report promptly to the health authorities, if develops any deterioration of symptom.

## CLIPPINGS

### ***Soluble urokinase plasminogen activator receptor (suPAR) predicts who needs higher levels of respiratory support.***

Soluble urokinase plasminogen activator receptor (suPAR) is a biomarker for activation of the inflammatory and immune systems. Blood levels of suPAR are positively correlated with pro-inflammatory biomarkers, such as tumor necrosis factor- $\alpha$ , leukocyte counts, and C-reactive protein.

Since March 1, 2020, 57 patients with at least two signs of the systemic inflammatory response syndrome with community-acquired pneumonia and molecular documentation of SARS-CoV-2 in respiratory secretions were enrolled.

Patients were followed up daily for 14 days; the development of Severe respiratory failure (SRF) defined as  $PO_2/FiO_2$  ratio less than 150 requiring mechanical ventilation (MV) or continuous positive airway pressure treatment (CPAP) was recorded. suPAR was measured by an enzyme immunoassay in duplicate.

The study endpoint was the prognostic performance of suPAR admission levels for the development of SRF within 14 days.

Admission levels of suPAR were significantly greater among patients who eventually developed SRF. Receiver operator characteristics curve analysis identified levels  $\geq 6$  ng/ml as the best predictor for SRF. At that cutoff point, the sensitivity, specificity, positive predictive value and negative predictive value for the prediction of SRF was 85.7%, 91.7%, 85.7% and 91.7%, respectively.

The time to SRF was much shorter among patients with suPAR  $\geq 6$  ng/ml.

An analysis of the TRIAGE III trial in 4420 patients admitted at the ED in Denmark revealed that suPAR ranged between 2.6 and 4.7 ng/ml in 30-day survivors and between 6.7 and 11.8 ng/ml in 30-day nonsurvivors.

Findings suggest that suPAR may early trace patients who need intensified management probably in need of anti-inflammatory treatment.

***Rovina N, Akinosoglou K, Eugen-Olsen J, Hayek S, Reiser J, Evangelos J. Soluble urokinase plasminogen activator receptor (suPAR) as an early predictor of severe respiratory failure in patients with COVID-19 pneumonia. Critical Care 2020; 24:187. <https://doi.org/10.1186/s13054-020-02897-4>.***