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FREQUENTLY ASKED QUESTIONS :

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Are reusable masks useful?

My answer is that reusable masks are better than no mask. The virus is spread by droplets. When an infected patient coughs, the droplets fly a distance of 3 meters and settle on surfaces. The virus is protected by the mucus envelope. On most surfaces, the mucus dries in 30 to 60 minutes and the virus dies. If one touches the droplet and then touches one's face, the virus will stay on the face and enter via mucus membranes of the eyes, nose and mouth. Touching or flicking the hair will allow the droplet to stay on the hair ensuring its prolonged viability. Headgear will protect the droplet viability further.

The surgical mask has three layers; the outer hard layer, the middle layer that filters viruses and the inner layer for comfort. Wearing a surgical mask properly and making sure that it is well fitted is very protective. If the mask is wet, dispose it. You don't need an N95 mask unless you are a healthcare worker. Breathing through an N95 mask is hard work and you get fatigued after wearing it for long hours.

Aerosol or Droplet?

If someone asked if it was aerosol or droplet, we still maintain it is droplet spread as the infectivity ratio is still 2 to 2.5. That is to say, one infected person infects ***two*** to ***two and a half*** persons. If it was indeed aerosol, one would infect ***fifteen*** persons as in the case of measles. You have heard many articles on the internet that talks about how long the virus can stay intact on surfaces. The virus can be detected by swabbing surfaces and using DNA amplification methods but whether the virus is viable and can infect a patient is not likely.

How infectious is the virus?

If you look at the mean incubation period, it is short at 4 days. The median serial interval is another important measurement. This is where A spreads to B and then to C. If you have good contact tracing you can figure out when A met and infected B and when B met and infected C. The period is called median serial interval and is about 4 days. If both mean incubation period and median serial interval is 4 days, this all means that there is ***presymptomatic*** spread of the virus.

There is also data that shows that the viral load in our local patients is highest in the first few days of symptoms and gradually reducing to very low levels on the eighth day. Now the viral load does not appear high by magic on the first day of symptoms, it also means the viral load starts climbing very rapidly on the couple of days before the patient becomes symptomatic. That is why this virus is spreading like wild fire across the globe. Hence it is important to have universal masking, hand hygiene and social distancing to break the transmission.

How far apart do we social distance?

In Singapore, we are using a guide of one meter apart for social distance. This distance came from our experience with SARs in 2003. We had situations where hospital beds were one meter apart and the well patient in the next bed did not catch SARs from the infected patient. However when the relative of the well patient came and stood in between the two beds, the relative caught SARS. Hence we use one meter as the social distance.

Do we need alcohol to disinfect?

We know that our tap water in Singapore can kill the virus and the soap will disable the mucus envelope. Hence soap and water is good enough. Cleaning surfaces with water is good enough but one must ensure that the mucus droplets are wiped off surfaces thoroughly. Doctors use alcohol rubs in between patients due to convenience but there is no need for the alcohol rubs at home.

Is running outside without masks safe?

I would answer this question with the idea of air exchanges. Our isolation rooms in public hospital and NCID (National Centre for Infectious Disease) exchange the air in the rooms entirely about 12 to 15 times an hour. Modern aircraft today will have air exchanges of 20 to 25 times an hour. This is equal to standards for clean rooms in wafer fab plants. If we are running outside, the air exchange is very high and hence it is safe. However we must still social distance and go out running or brisk walking at times when the parks or park connectors are not too busy. When I run outside, I make sure I keep my distance between myself and others. Wearing a mask when you are running or brisk walking may be difficult and may even trigger heart conditions due to relative lack of oxygen during increased demand by the body.

Why are we keeping our elderly at home and told not to visit them?

We have found out that if you are thirty years and younger; if you get COVID 19 infection, your chance of needing oxygen is only half a percent and your chance of going into ICU is zero. However this risk starts to rise with age and if you are 60 to 69 year old, your chance of needing oxygen is 55 percent and your chance of entering ICU is 37 percent. Furthermore the critically ill spend occupy an ICU bed for a month before they perish. This explains why

healthcare systems in Italy, Spain, France and New York are overwhelmed. Even if you are younger and have chronic disease like hypertension, diabetes and obesity you have a higher risk.

Antibody test kits

We are swabbing patients and detecting the viral RNA. The RNA is picked up and we make a copy of the RNA with DNA building block components. RNA and DNA are very similar in structure with exception of one out of four building blocks. We then amplify the DNA copy infinite times and we detect the virus this way. The process is laborious and takes 6 to 8 hours to perform.

On the other hand an antibody kit that detects antibodies to the virus in the blood, is rapid and easy to use. However the antibody can only be detected 11 to 14 days after the patient develops symptoms. Hence it is not useful in early diagnosis of the disease.

Is there a better antibody test?

The recent publicity in the news on 15 May 2020 talks about an antibody test that is developed by Duke NUS medical school in Singapore. This test is detecting a special type of antibody. When a patient is infected, the body will produce thousands of antibodies. There is **binding antibody** that acts like a homing beacon, homes in on the virus and attaches to the target. This beacon then summons all the inflammation forces that attacks and destroys both the beacon and the target. There is another type of antibody that is called **neutralizing antibody** that acts like a cruise missile that homes in and disables the virus. This new kit seems to be able to detect these neutralizing antibodies early on in the course of the illness and may be useful for diagnosis as it is easy to use with a rapid turnaround time.

Treatment and cure

In Singapore our ICU care is excellent ; we have not used hydroxychloroquine and azithromycin in patients; we are not impressed with the data and the hype. We were using lopinavir/ritonavir (Kaletra) in ill patients with addition of Beta interferon in selected cases but has stopped since as the outcomes do not show benefit. The drug Remdesivir by Gilead looks promising but the clinical trial was trying to show that it saved lives but it did not. Instead the outcome was that it shortens recovery period from 15 days to 11 days. It is not a miracle cure or magic bullet. My personal opinion is that to take an off the shelf drug and re purpose it to treat COVID 19 is a big ask and we probably need to build an antiviral drug from scratch. As our ICU care is excellent, any drug has to show a result much better than our ICU care or prevent patients from going into ICU.

Vaccine?

As for the vaccine, it will be a long struggle as so many things can go wrong in clinical trials. You start with publishing the genome that was done very early on this year on 10th of January. The vaccine makers started development since the publishing of the genome. If you look at the WHO list (15 May 2020), there 110 vaccine projects on the WHO list and 8 have moved into early human trials currently. There are so many approaches for vaccines; the traditional way is to use a killed virus or a weakened live virus. These days we are engineering the key protein known also as the ***spike*** protein on the viral surface or taking the gene for the ***spike*** protein and splicing it into harmless common cold viruses, messenger RNA, DNA fragments or even into harmless bacteria that can bring the gene into the host.

On the topic of vaccine clinical trials, there are 3 phases; the first involve 10 to 30 patients and you are looking for immune response and safety, the second phase is with larger numbers of 100 to 300 patients and you are still looking for safety and immune response. The third phase is real world deployment with placebo controlled randomized trials. Realistically this will take 12 to 18 months and then anything can go wrong during the three phases. If so it will back to the drawing board.