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MEDICAL CENTRE

WEBINAR: HEART HEALTH DURING COVID-19 PANDEMIC
BY DATO' DR YAP YEE GUAN
30th April 2020

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Heart Health During COVID-19 Pandemic

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Sunway Medical Centre Webinar

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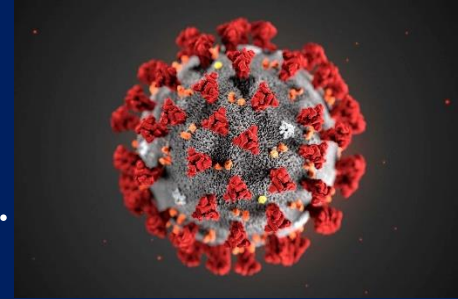
Objectives

- To provide basic background knowledge on COVID-19 infection.
- To discuss specific issues related to the heart in COVID-19 infection.
- To provide advice on heart care during COVID-19 pandemic.

Format

- Factual statements.
- Series of Q's & A's
- Discussion

COVID-19: Background



- COVID-19 causes devastating pandemic levels.
- Netherlands: Total cases: 38,802, total deaths: 4711 (12%).
Malaysia: Total cases: 5945, total deaths: 100 (1.68%).
- SARS-CoV-2 Coronavirus (an enveloped, single-stranded RNA viruses with surface projections that correspond to surface spike proteins, similar to SARS, MERS-CoV viruses).
- Natural reservoir of SARS-CoV-2- chrysanthemum bat, but the intermediate host remains unclear.
- SARS-CoV-2 is highly virulent. Incubation period, mean: 6.4 days (up to 14 days).
- Median duration of viral shedding was 20 days (interquartile range: 17-24) in survivors.
- 30-40% COVID-19 infected patients are asymptomatic/pre-symptomatic.
- 5% will need ICU admission. 50% of these will die.
- Doing COVID-19 test on every suspected case and contact tracing. False negative rate high (10-30%).

COVID-19: vulnerable patients

- Male sex.
- Advanced age.
- Diabetes
- Hypertension.
- Obesity
- Established cardiovascular and cerebrovascular disease.

COVID-19: Patho-mechanism

- Causes inflammation and injury to lungs- pneumonia/ARDS. But can have direct impact on the heart, guts, kidneys.
- The patho-mechanism is likely to be caused by the virus itself, and the body's immunological and inflammatory responses to the virus - Cytokine storm.
- Cytokines promote blood coagulation, can block blood flow and cause heart attacks.
- Infections in the lungs can also cause hypoxia and increase the risk of arrhythmias.
- Fever caused by the virus increases the body's metabolism and the heart's output of blood, with a mismatch of demand and supply of oxygen, leading to heart damage.

COVID-19: Complications

- Co-infection with other respiratory organism is very common (>50%).
- 20% of patients hospitalized with COVID-19 had some evidence of heart damage. Many had no prior heart diseases.
- Cardiac complications: heart attack, hypotension, myocarditis, arrhythmias, and sudden cardiac death.
- Patients with cardiovascular risk factors and established cardiovascular disease more likely to develop severe disease when contracting COVID-19. Patients with CV co-morbidities had 5x higher mortality risk (10.5%).



COVID-19: Cardiac Complication Risk

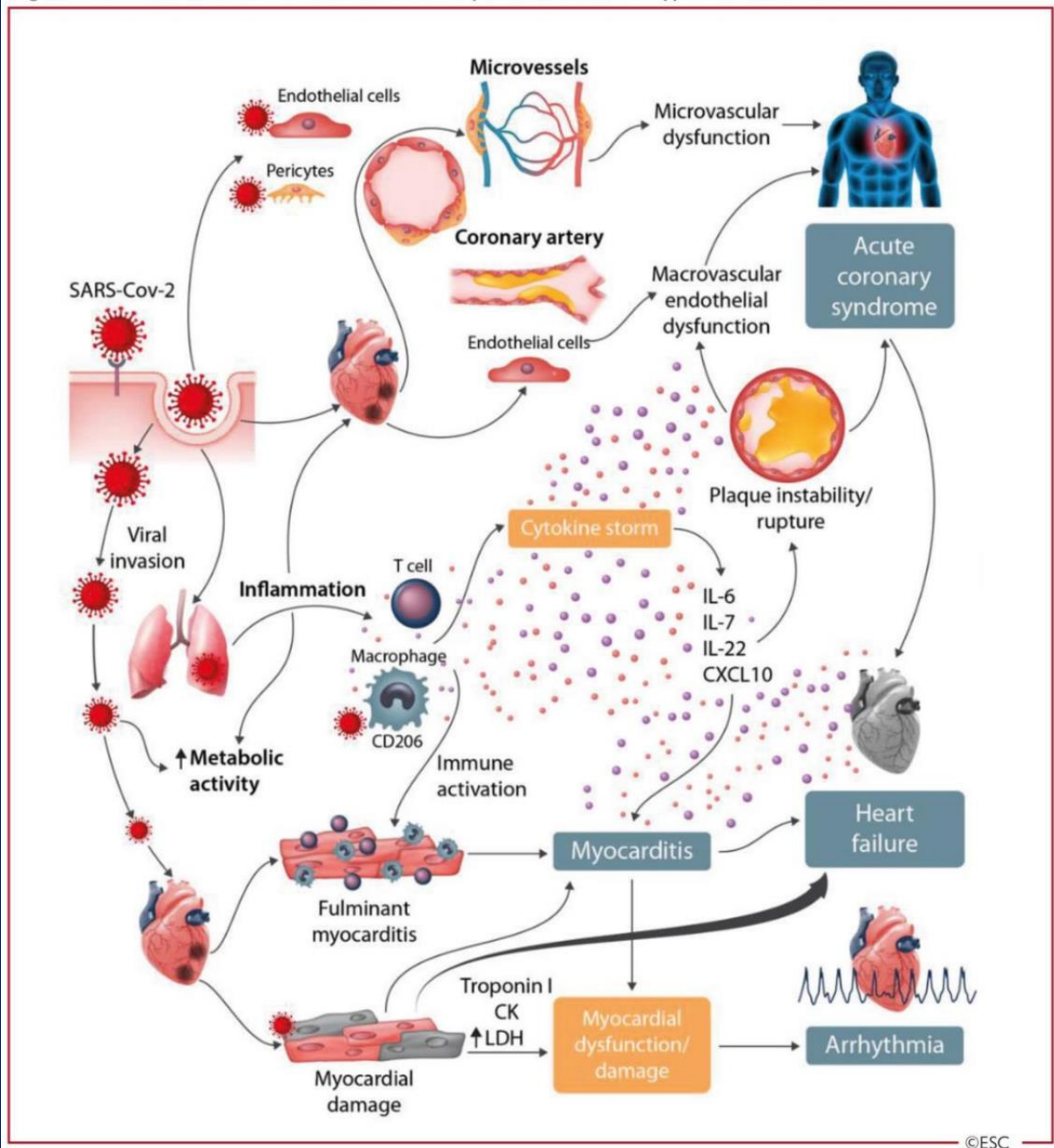
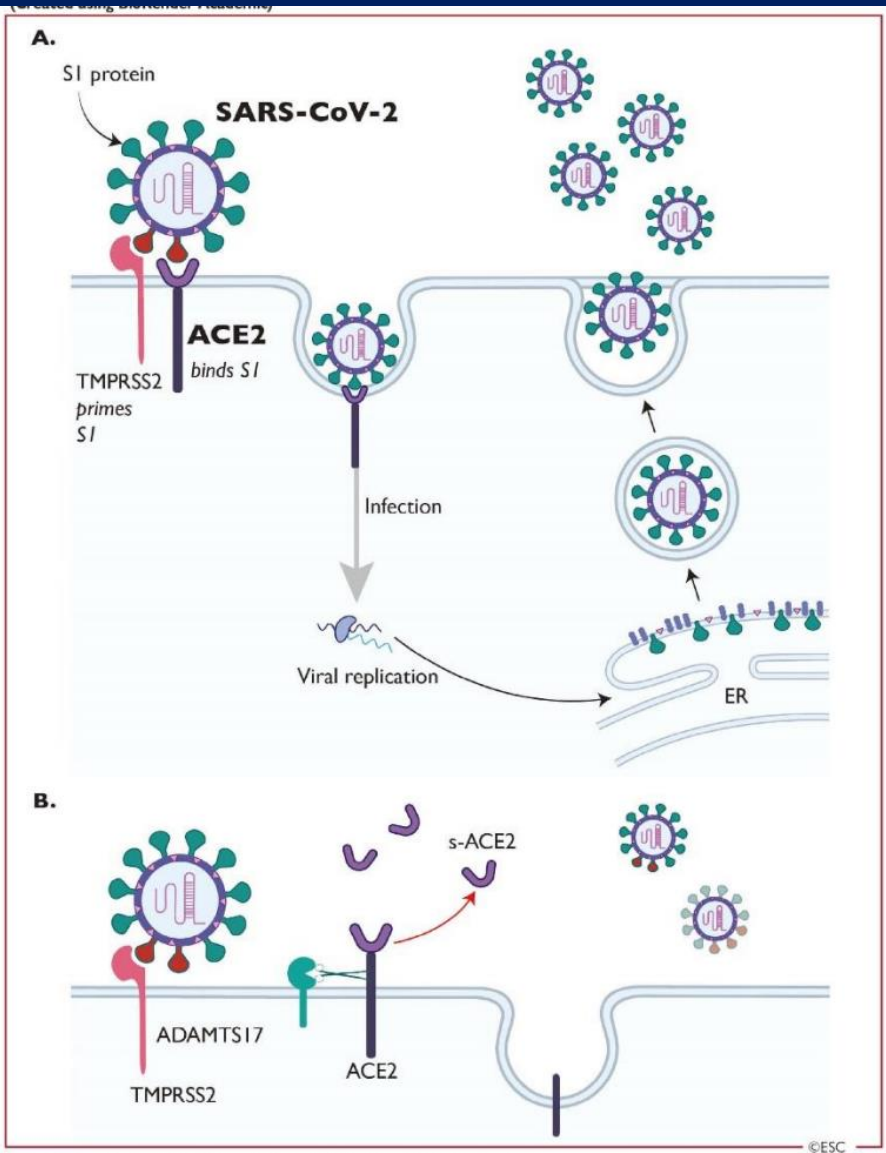
- Patients with cardiac injury in the context of COVID-19 have increased risk of morbidity & mortality.
- Risk of death was 4x higher among these patients compared with patients without heart complications.
- Cardiovascular risk factors and disease correlate with increasing age.
- Increasing age is an important risk factor for severe course of COVID-19 infections.
- In Italy, fatality with COVID-19:
 - 0% below age 30
 - 3.5% for age 60-69
 - 20% for age >80

COVID-19: complications

- Viral pneumonia. Secondary bacterial pneumonia.
- Myocarditis.
- Other cardiac complications:
- Arterial thrombotic complication: heart attack
- Venous thrombotic complication: DVT/PE
- Arrhythmias

COVID-19: Mechanism of Disease In Relation With The Cardiovascular System

- COVID-19 virus binds to host ACE2 receptor to mediate entry into cells.
- ACE2 expressed in lungs, heart, vessels, gut, etc. and a key enzyme in RAS in pathophysiology of CVD.
- CVD associated with COVID-19, likely involves dysregulation of ACE2 system by the virus and due to comorbidities, such as hypertension.



Q's & A's

Q: I have a heart condition. Am I at more risk of getting COVID-19 than somebody who doesn't have a heart condition?

- No - the infection can be caught by anyone.
- However, people with underlying heart conditions might be more likely to show symptoms of the infection or to have a more severe infection than others including pneumonia, just like with other viruses such as flu.
- So far, most people that get COVID-19 have a mild viral illness including fever, breathlessness, cough, sore throat, and aches and pains and loss of smell/taste, but some people (up to 5%) develop severe chest infection/pneumonia.

Q: Is the risk of developing severe COVID-19 symptoms similar for all patients with a heart condition or are there differences?

- The basis of contracting the infection is the same for all individuals.
- The virus is transmitted via droplets in the air from an infected person coughing, sneezing or talking; or through touching contaminated surfaces as the virus can survive for several hours or even days on surfaces such as tables and door handles.
- Once the virus enters the body it causes direct damage to the lungs and triggers an inflammatory response which places stress on the cardiovascular system in two ways. Firstly, by infecting the lungs and the blood oxygen levels drop. Secondly, the inflammatory effects of the virus itself can cause damage to the heart resulting in low blood pressure and impairment of oxygen supply to major organs including the heart itself. Vicious cycle and spiral downhill...
- Particularly at risk are the following groups.....

- Individuals with heart conditions, such as hypertension, coronary artery disease, heart failure, hypertrophic or dilated cardiomyopathy, arrhythmogenic right ventricular cardiomyopathy and patients with congenital cyanotic heart disease are at highest risk.
- There is no evidence that the virus infects implanted devices such as pacemakers and cardioverter-defibrillators or causes infective endocarditis in those with valvular heart disease.
- Individuals who are immunosuppressed (transplant, cancer/chemotherapy/radiotherapy, leukaemia/lymphoma who have concomitant heart disease are theoretically) at greatest risk of contracting and succumbing to the effects of the virus).
- Other high-risk groups include diabetic, elderly and frail people, pregnant women with concomitant cardiovascular disease.

Q: I have atrial fibrillation. Am I at greater risk of getting Coronavirus infection?

- Atrial fibrillation by itself does not increase the risk of infection but the infection may make AF worse.
- Nevertheless, many atrial fibrillation patients are older and have other conditions, such as heart failure, hypertension and diabetes, which make them more likely to have a more severe disease, if infected.
- All patients are advised to take general protective measures such as social distancing and washing hands frequently and appropriately to prevent infection.

Q: I have read that the Coronavirus can cause heart problems such as heart attack or arrhythmias, is this true?

- Based on the inflammatory effects of the virus, there are theoretical risks that the viral infection could cause rupture of atherosclerotic plaques (fatty deposits) in the coronary arteries, leading to unstable angina or heart attack. Individuals who experience severe chest discomfort during symptoms of coronavirus should consider heart attack.
- Severe systemic inflammatory conditions may cause myocarditis, aggravate arrhythmias or even trigger atrial fibrillation in some individuals.
- The acute inflammation caused by the virus infection can worsen both cardiac and kidney function.
- Ensure that your cardiac problems and risk factors are optimally controlled and treated. Strictly follow the recommendations to prevent becoming infected such as personal distancing, self-isolation, frequent hand washing, etc.

Q: Are cardiac patients who also have diabetes and/or hypertension at greater risk?

Data from China showed a significant proportion on **non-survivors** and those who developed **severe** disease had comorbidities such as diabetes and hypertension.

The exact reason for this remains unclear. It is likely both hypertension and diabetes are prevalent in the general population particularly in the age group (over 70 years) where the mortality from COVID-19 infection is highest.

There has been an article linking this observation to the use of Angiotensin converting enzyme (ACE) inhibitors and angiotensin II receptor blockers (ARB) which are common medications used to treat high blood pressure. It is important to emphasise that this is a theory but not proven by evidence.

One should continue these medications (since their beneficial effects are well known) whilst monitoring the disease progress of patients with hypertension and diabetes.

Q: There are reports that COVID-19 may induce myocarditis or pericarditis. If you have had myocarditis/pericarditis previously, are you more vulnerable to contracting it a second time?

- There is no evidence that an individual who has suffered from myocarditis or pericarditis in the past is at higher risk of developing the same complication with COVID-19.
- It is recognised that some cases of myocarditis have a relapsing and remitting course.
- To date there is no evidence that the virus responsible for COVID-19 directly infects the heart though possible; however, the acute inflammatory response (Cytokines storm) caused by the infection may worsen cardiac function and exacerbate symptoms in patients with heart failure.

Q: Are people with heart disease more likely to die of COVID-19 than those without?

- So far, older age and the presence of underlying conditions - including heart conditions - have been risk factors for death.
- Nevertheless, it is important to emphasise that most patients, even those with underlying heart disease, have had mild infections and have fully recovered.

Q: Should I go to the hospital if I think I am infected, and when should I seek medical attention especially if I have a pre-existing heart condition?

- If you think you have COVID-19 infection, particularly if you have fever, cough & shortness of breath, you should seek immediate medical help.
- "Trace, Test, Treat".
- There are news reports, suggesting that medications such as ibuprofen (so called non-steroidal anti-inflammatory medicines or NSAIDs) used to lower fever and treat pain could worsen COVID-19.
- Based on currently available information, the World Health Organization (WHO) and the European Medicines Agency (EMA) do not recommend against the use of ibuprofen as there is, at the moment, no scientific evidence establishing a link between ibuprofen and worsening of COVID. In practice, paracetamol is recommended instead.

Protection

Are there any additional measures that I should take to limit my risk of getting sick, as I have a heart condition?

Country specific. In general:

- Avoid people who are sick.
- Keep a two-metres distance from other individuals whenever possible.
- Wash hands thoroughly with soap and warm water for at least 20 seconds.
- Use hand sanitiser (with at least 60% ethanol)
- Cover your mouth with a tissue when you cough or cough into the inside of your elbow.
- Cover your nose with a tissue when you sneeze or use the inside of your elbow.
- Avoid touching your eyes, nose and mouth.
- Clean often touched surfaces like doorknobs, handles, steering wheels, or light switches, with a disinfectant to remove the virus.
- Stay at home as much as possible, including working from home if this is feasible.
- If you have symptoms of fever (a temperature of 37.8° C or above), cough, breathlessness or a chest infection you should seek medical help.
- In some countries you may be asked to follow a stricter isolation (MCO, lockdown, circuit breaker etc.)

I had the flu and pneumococcal vaccine this year, am I protected from this virus?

- No. Vaccines against pneumonia, such as pneumococcal vaccine, and flu vaccine, do not provide protection against the new coronavirus.
- The virus is so new and different that it needs its own vaccine. COVID-19 vaccine trials are ongoing now. Availability unclear.
- Although the flu and pneumococcal vaccines are not effective against COVID-19, vaccination against respiratory illnesses is highly recommended by World Health Organization (WHO) to protect your health.

Should I wear a mask to protect myself from the virus?

Definitely:

- For the general population, wearing a mask is only recommended if you are experiencing symptoms, such as a cough or a fever, or if you are caring for someone with these symptoms.

Probably:

- If you have a heart condition and demographic risk groups and are concerned about catching COVID-19.
- Community cluster groups.

Possibly:

- Low demographic groups (country specific). To prevent shortages of face masks it is important to only use them if needed. Use of mask of very prevalent in Asian countries compared with the West.
- When wearing a mask, it is important to use and dispose of them in the correct way.

**Can I take vitamins or other food supplements? Which ones?
Any effective drugs or anti-viral medicines?**

- Taking formulated vitamins will not protect you against COVID-19.
- Several agents (hydroquinone and Remdesivir antiviral) are currently being tested for their effects in COVID-19, but preliminary results so far showed none is effective. **DO NOT EVER ingest/inject disinfectant (e.g. Dettol) into your body!**



**And now,
a message from one of the lead members of
the White House Coronavirus Task Force,**

Can I take vitamins or other food supplements? Which ones? Do they protect me against the COVID-19?

- A diet rich in fresh vegetables and fruit is generally recommended at all times - not just during COVID-19 - to help your body maintain a working immune system. Fresh vegetables and fruits contain a much broader range of necessary nutrients than vitamin pills.
- Therefore, it is always better to eat a lot of fresh vegetables and fruit than trying to compensate with formulated nutrients.
- However, some individuals might indeed lack specific vitamins (Vit-D or iron) or (micro-)nutrients. In this case, see your Dr for advice.
- If you do take formulated vitamins, please make sure your intake does not exceed the recommended daily dosage. Some vitamins might harm you if taken in too high doses (causing cancer), and some supplements can interact negatively with your heart medicines (Vit K).

Can I catch COVID-19 from my pet?

- There is currently no evidence that humans can catch the disease from common household animals such as cats and dogs.
- No bats, pangolin, civet cats



Can people catch COVID-19 more than once?

- The current research suggests that immunity to COVID-19 develops after the first infection, so it is not possible to catch it again immediately.
- However, the degree and duration of immunity are unclear.
- There are examples of viruses, like flu and the common cold, which can be caught more than once because of the way the virus changes over time. We won't know for a while whether this can happen with COVID-19.
- COVID-19 virus mutates (30 mutations discovered so far!).

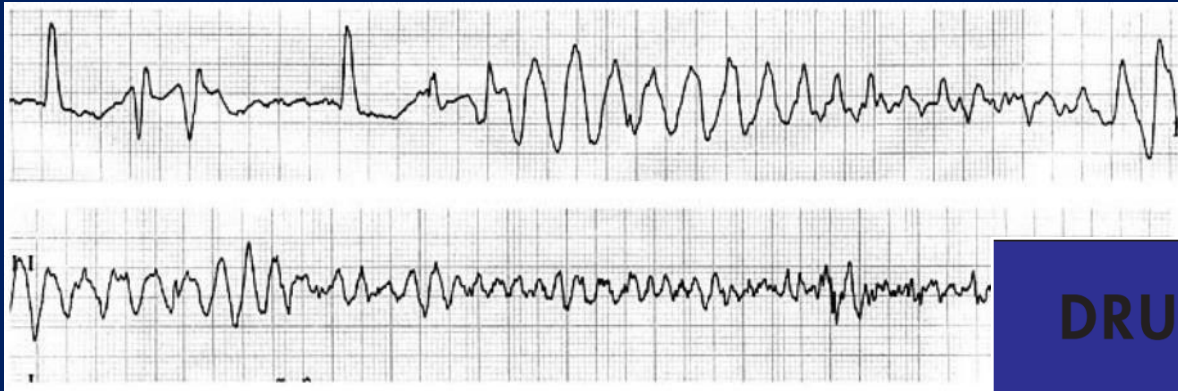
Medications

Should I change any of my heart medication doses?

- No. Stopping or changing your medication could be very dangerous and could make your heart condition(s) worse. These drugs are very effective for heart failure, and to control high blood pressure to help prevent a heart attack or stroke, and so on.
- Any changes to your treatment that have not been recommended by a healthcare professional could put you at higher risk of a flare-up of your heart condition(s).
- There have been reports in the media suggesting that some commonly used drugs to treat high blood pressure (so called ACE-Inhibitors and Angiotensin Receptor Blockers) may increase both the risk of infection and the severity of an infection with the Coronavirus. However, this warning does not have a sound scientific basis or evidence to support it.
- Therefore, please continue to take your blood pressure medication and others exactly as prescribed. If in doubt, please contact your cardiologist but do not make any changes before having spoken to them.

There have been news reports about a medication given to some COVID-19 patients which could cause dangerous arrhythmias. What do I need to know?

- Some of the experimental drugs that are being assessed for treating COVID-19 patients may lengthen the "QT interval" on ECG and cause fatal arrhythmias in some individuals. These drugs include chloroquine, an anti-malarial agent, and anti-retroviral drugs.
- Additionally, there are many, many other drugs including those used to treat, for instance, atrial fibrillation, depression, etc, etc, which may lengthen a person's QT interval and cause sudden cardiac death. Therefore, it is important for your doctor to be aware of all the medications you are taking.



ELECTROPHYSIOLOGY

DRUG INDUCED QT PROLONGATION AND TORSADES DE POINTES

Yee Guan Yap, A John Camm

Heart 2003;89:1363-1372

Should I be worried about medication shortages?

- Everything is being done to ensure that the supplies of essential medications are maintained. There is no cause for concern.
- Pharmacies across the country are open during MCO though varieties and quantities of medicines may be limited.
- Most private hospitals such as Sunway Medical Centre have sufficient stocks and provide home delivery.

Going to Hospital & Leaving Home after MCO

Should I go ahead with scheduled appointments or should I avoid going to medical centres or hospitals?

- If your hospital is still running scheduled outpatient appointments, it would be a good idea to contact them and ask if you should still attend.
- Some public hospitals are canceling routine appointments as they have been turned into COVID-19 treatment hospitals (KL General Hospital, Sungai Buloh Hospital, UMMC, etc.)
- Private hospitals such as Sunway Medical Centre remains fully operational to see patients in person or conducting them via video online/tele-consultation (first in Malaysia).
- There are certain conditions where face-to-face visits are still required and you should not miss the visit without first consulting your cardiologist or other healthcare provider. For instance, some patients may need physical examination, stress test, echo, CT scan or coronary angiogram examinations. Some patients will need urgent treatment such as coronary angioplasty or bypass operation.

Am I safe outside of the house, e.g. can I go to the park or walk outside? Is it safe for me to go to hospital?

- Yes. The virus is caught from people who have the infection (droplets) and so there is no problem in going outside by yourself.
- What is important is to avoid contact with anyone who might be ill.
- Avoid crowded areas. No gathering events. If you have to leave your home (e.g., for food shopping), please keep a two-metre distance between yourself and others. Wear a mask. Frequent use of hand sanitiser.
- Private hospitals are generally very safe since they are not COVID-19 hospitals. Strict precautionary measures have been put in place to mitigate cross-infection between patients and HCWs.



Can I still travel or use public transport?

- Please pay attention to the latest Malaysian governmental guidelines on its Movement Control Order.
- Non-essential travel is forbidden and citizens have been asked to stay/work at home. No outdoor exercise. No public gathering/events.
- Ideally, one should avoid using public transport. If necessary and possible, to keep at least a distance of 2 metres from other passengers.
- Certain essential travels are allowed such as food/medicine shopping, hospital visits.
- Key workers and certain occupations are exempted from the MCO.
- Penalty for violation: RM 1000 fine and/or 6 months jail-term.

Emotional well-being

I feel very anxious. Is there anything I can do to feel better?

Eat well, regularly and healthily.

Eat whole grains, fruit and vegetables .

Avoid cakes, biscuits and chocolate (only occasionally).

Keep alcohol to a minimum.

Drink plenty of water.

A nice cup of tea or coffee in a quiet place

Exercise: If you have a garden, walking round the garden, performing gentle (or not so gentle, depending on your ability) aerobic exercises, skipping with a rope, stepping up and down on a low step to music, gardening etc. If you haven't got a garden, think of a route you can take from your home where you will not have to be in close proximity to others. E.g. Yoga.

Use virtual methods of socialising: Facetime/Skype/call friends and family. Do this even once a day, to the same or a different person each day, to take your mind off your anxiety/boredom during MCO. It will give you a plan - something to look forward to - and will keep you in touch with your world. Thinking of others, listening to what's happening to them and offering support works surprising well in helping to reduce your own anxiety.

Stay busy with chores: Make a list of things you can do. i.e. Clear out that cupboard, rearrange the room, declutter the wardrobe, weed the garden, etc.

You do not have to do everything on the list, and not all at once, but it gives you further plans for you to tackle when you are feeling anxious. The feel good factor when you have achieved something on your list is priceless.

Recreational activity: Listen to music, read a book, tackle crosswords, knit, sew, paint, draw, etc., etc. Any of the things which you enjoy doing but often haven't the time to do. Anything which will either provide an escape from anxious thoughts or will require concentration, will help you.

Avoid excessive negative messaging: Listen to the news, watching the news on TV or phone/laptop just once a day. Whilst we all need to know the latest advice regarding coronavirus and self-isolation, it is seriously anxiety-provoking to have it constantly in our ear. All you need to know will be available in one news-read. Please do not put yourself through more than this daily.

Breathing exercise: Sit or stand in a relaxed position. Concentrate on your breath and breathe in deeply to a count of 5 and breath out slowly to a count of 10. Do this several times, until you start to feel the anxiety subside enough for you to do one of the above activities

The New Norm?

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Delayed Cardiac Treatments During COVID-19 Pandemic

- Re-distribution of healthcare resources.
- Delayed presentation of cardiovascular symptoms and emergencies as patients are afraid to seek medical attention during pandemic.



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the White House Coronavirus Task Force,**