FACT SHEET:

What Cardiovascular Disease Patients Need to Know About COVID- 19

What we know:

1. Infection with the SARS-CoV-2, or novel coronavirus, can present with or without symptoms. People can transmit the virus even though they themselves have no symptoms. This is why social distancing measures are so important.

2. Most patients that develop the coronavirus disease, or COVID-19, have mild symptoms, while approximately 20% of people will require hospitalization.

3. The risk factors for becoming more ill with this infection include advanced age (more than 65 years old), diabetes, hypertension, and established cardiovascular or chronic obstructive pulmonary disease.

4. Based on early studies, about 10% of patients with pre-existing cardiovascular disease (CVD) who contract COVID-19 will die, compared with only 1% of patients who are otherwise healthy. Increased risk has also been seen in people with high blood pressure (hypertension) and coronary artery disease (CAD), though it is not clear why?

5. Patients who currently have, or previously have had, cardiomyopathy (weakened heart muscle) appear to be at risk for abrupt worsening of the cardiomyopathy and/or return of it with SARS-CoV-2 infection.

6. The chance of death and/or hospitalization with this infection increases with age but it can impact adults at any age. Given the inability to recognize asymptomatic carriers, it would be wise to treat everyone as though they have the virus.

7. The most common presentation of COVID-19 is fever and cough (80%). However, about 10-30% of patients may present with cardiac problems with or without the pulmonary involvement. The **primary mechanisms** by which COVID-19 appears to impact the heart are:

    a. Direct viral toxicity to the heart leading to a weakened heart muscle (acute congestive heart failure and/or cardiogenic shock)

b. The negative impact of the bodies hyperimmune response on the heart (so-called cytokine storm)

c. Induction of a supply-demand mismatch from the lack of oxygen that the virus is causing in the lungs as well as the marked increases in metabolic demand (increases in heart rate) such that the heart itself is not getting enough oxygen

d. The impact of the stress of the infection causing a stress-induced cardiomyopathy (weakening of the heart muscle)

e. Induction of electrical disturbances (arrythmias)

8. **Cardiac presentations** in patients with COVID-19 include:

a. Some COVID-19 patients appear to be having a heart attack as assessed by an electrocardiogram. Their electrocardiograms mimic a type of heart attack called ST segment elevation myocardial infarction (STEMI) which normally is caused by a blocked coronary artery. Instead, in these patients either due to the virus infecting the heart directly or the body's immune response there is marked inflammation of the heart muscle or the sac around the heart (pericardium), called myocarditis or myopericarditis (inflammation of both the heart and the pericardium). The electrocardiograms in these patients show changes suggestive of a major heart attack, and blood tests reveal elevated levels of troponin, a cardiac enzyme that is released when heart muscle is damaged. Deciphering between these is challenging as the treatment of myocarditis differs greatly (mainly supportive) from that of an abruptly occluded coronary artery (usually treated with placement of a stent or clot-busting medications).

b. Weakening of the heart muscle abruptly which can lead to the heart being unable to pump effectively. This in turn leads to the buildup of fluid on the lungs (pulmonary edema) which can make the often concomitant COVID-19 pulmonary issues even harder to treat and/or diagnose. This abrupt deterioration of the heart's ability to pump results in a condition called acute systolic heart failure which in the most extreme of cases can lead to the inability to maintain a blood pressure adequate enough to perfuse the organs of the body, a condition called cardiogenic shock. The treatment for this condition is through the use of certain medications and/or devices to support the heart until it recovers.

c. A weakened and/or inflamed heart muscle can result in electrical disturbances of the heart called arrythmias. These can manifest by having too slow or too fast or a heartbeat leading to passing out, palpitations and or chest pain. Many of the drugs that are being used to treat COVID-19 may actually precipitate these arrythmias, especially if you are already taking medications which may alter the hearts natural electrical system, specifically the QT interval. **You should not take medications such as hydroxychloroquine (plaquenil) or azithromycin (which have no documented benefit in COVID-19) without your physicians being aware** of this given the potential for drug side effects and drug-drug interactions.

Recommendations:

1. Perform **proper hand washing** with soap and water for at least 20 seconds.

2. Adhere to **social distancing** and try to 'shelter-in' to limit exposure. Limiting face-to-face contact with others is the best way to reduce the spread of coronavirus disease.

3. **Wear a face covering out in public**, if possible. If you cannot obtain a face covering consider making one at home: this is the CDC guidance regarding non-medical face coverings and there are several excellent examples on YouTube as well.

4. **Patients with known heart disease should avoid close contact with children ages 18 and under,** because although children rarely develop serious illness from COVID-19, they may be asymptomatic carriers who can transmit disease to vulnerable family members. There are estimates that as many as 40-50% of those with Coronavirus may be asymptomatic.

5. If you have cardiac disease and/or high blood pressure, you may be on a class of medications called ACE inhibitors (drugs ending in the suffix -pril such as ramipril, lisinopril etc.) or ARBs (drugs ending in the suffix -artan such as losartan, irbesartan etc). There is a theoretical concern that these medications may increase your susceptibility to the virus however we have no data to suggest this actually occurs. As of today, there is insufficient evidence of either harm or benefit of ACE inhibitors/ARBs. The American College of Cardiology, American Heart Association, and Heart Failure Society of America therefore recommend **not to stop the use of ACE inhibitors or ARBs in patients already taking them**.

6. In addition to these recommendations, it remains vitally important to exercise (outdoors when possible while keeping safe distance from others), get enough **sleep**, **manage stress**, and eat a **balanced diet**.

7. One of the unfortunate issues of the COVID-19 pandemic is the fact that it may be hard for patients to see their doctor for their regular cardiac care. Healthcare providers across the nation are trying to limit outpatient visits to prevent the transmission of the virus in the waiting room or to/from staff. Many physicians are performing telemedicine where patients can have a 'virtual' visit. For those unable to do virtual visits, many offices are offering telephone visits as well. Available at-home devices like a heart rate monitor, pulse oximeters and blood pressure cuffs can greatly assist healthcare providers in assessing patients current cardiovascular health as they provide concrete numbers by which cardiologists can make recommendations. All of these items are available at the local pharmacy or online. **Contact your doctor's office immediately with any questions or concerns regarding your regular cardiac care**.

8. Patients who are experiencing symptoms should always **seek immediate medical attention**.