MAY–AUG 2021

ISSUE
40

A publication of
National Heart Centre Singapore (NHCS)

MCI (P) 065/04/2021

National Heart Centre Singapore
SingHealth

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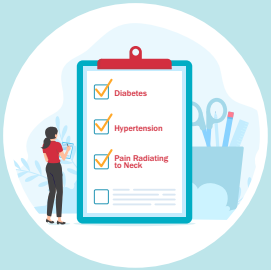

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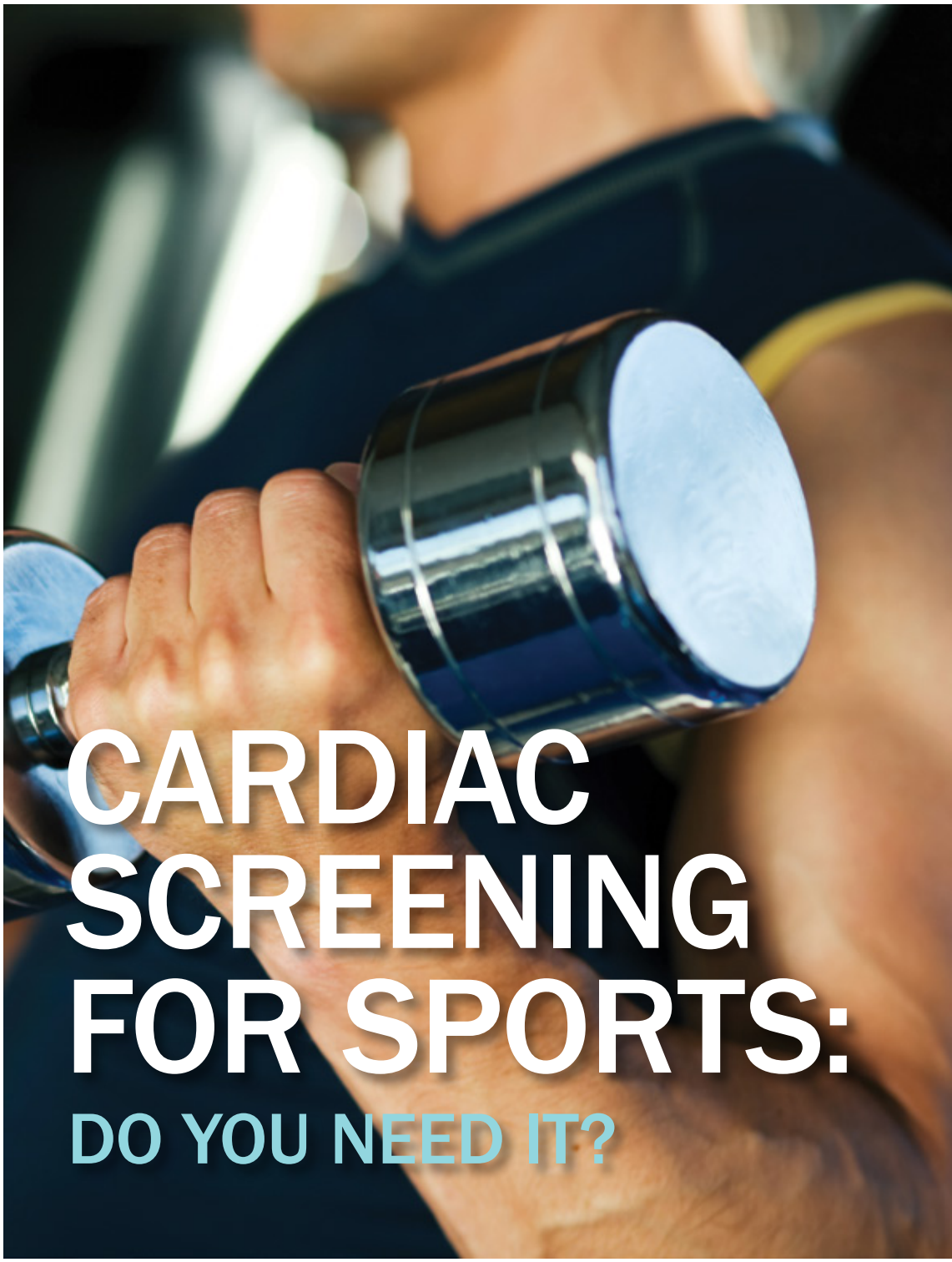


CARDIAC SCREENING FOR SPORTS:

DO YOU NEED IT?

CARDIAC SCREENING FOR SPORTS:

DO YOU NEED IT?

By Dr Koh Choong Hou, Consultant, Department of Cardiology

Pre-participation cardiac screening helps identify underlying cardiac conditions or cardiovascular diseases that may be aggravated by exercise, or predispose a person to injury or sudden cardiac death[1].

The COVID-19 pandemic has upended lives and social norms across the globe, bringing about devastating impact on the economy and population health.

In spite of this, a silver lining has emerged from the imposed lockdowns and safe distancing measures – the rise of outdoor exercises. Now, outdoor exercises to the general public are not only means of getting out of their homes, but also ways to keep themselves physically active and healthy. With this rising prevalence in sports participation, there is also an increasing interest in cardiovascular safety during exercise, especially with the sporadic reports of sudden death in young individuals who appeared to be in seemingly good health.

Why the need for pre-participation cardiac screening?

When news reports on sudden deaths of healthy and young individuals during sports are commonly in the spotlight and of public interest when they occur, such events are exceedingly rare amongst the multitudes that regularly exercise daily. Events like these should not deter the general population from engaging in appropriate levels of physical activities, as it is a well-known fact that physical exercise improves overall well-being and prolongs healthy years. That being said, individuals with undetected or silent cardiovascular conditions may be at risk when engaging in heavy physical activities, and adequate precautions should be taken prior to their commencement of intense sports.

Principle	Elaboration
Prevention 	Engage in the appropriate level of exercise for your age group and general physical condition[2,3]
	Ensure appropriate pre-exercise preparations (hydration, warming up) and environments (heat, humidity, apparels)
	Maintain healthy lifestyle and diet
Detection 	Undergo pre-participation cardiac screening, if required, after considering factors such as age, type and intensity of sports, and underlying cardiac conditions (if any)
	Seek medical attention for red flag symptoms such as chest pain, palpitations and breathlessness
Intervention 	Treat any underlying cardiac condition and ensure condition is stable before commencing sports
	Consult your physician or cardiac specialist if in doubt, or when you plan to escalate to higher intensities of activities

Sudden cardiac death or collapse during sports is consequent to an acute failure of the heart to maintain the circulatory system for blood flow to vital organs, and may be contributed by any one of the following mechanisms: electrical heart issues (unstable heart rhythms), structural heart issues (abnormal or weakened heart muscles), or inadequate blood supply to the heart muscles. If such conditions exist in an individual, intense physical activities may act as a trigger to cause any underlying heart conditions to unmask and suddenly deteriorate, leading to life threatening situations. The key to avoiding such devastating consequences is hence centred on the following principles – prevention, detection and intervention – succinctly summarised in the table above.

Who needs pre-participation cardiac screening?

Most individuals who are healthy, or with well-controlled chronic medical conditions such as hypertension, hypercholesterolemia, and diabetes, may proceed to take part in light to moderate intensity exercises without cardiac screening. However, if they have more complicated conditions, for example, prior heart attacks, previous stenting or bypass graft surgeries, weakened heart function, heart muscle disease, heart valve disease, and heart rhythm problems, it is best to consult their medical providers or cardiac specialists, before engaging in sports, especially those of moderate or high aerobic intensities. As a simple rule of thumb, high intensity aerobic activities usually result in heart rates exceeding 75% of the predicted maximum heart rate (maximum heart rate is estimated by deducting the age from 220), with the person not being able to speak even a few words during the activity; moderate intensity aerobic activities usually result in heart rates exceeding 65% of the predicted maximum heart rate, with the person generally still being able to speak in short phrases or sentences during the activity.

How is pre-participation cardiac screening performed?

In general, most doctors are able to provide basic advice and screening via comprehensive history taking and physical examination. In addition, sports participants may also perform simple self-screening questionnaires available online (an example is the Physical Activity Readiness Questionnaire, or "PAR-Q"[3]), and seek further medical advice if there are abnormal responses to the questionnaires.

Broadly, the following groups of sports participants may require referrals to specialists (cardiologists or sports medicine practitioners) for further assessment:

1. **Sedentary or high cardiovascular risk individuals planning to take part in high intensity sports or competitions**
2. **Individuals with known cardiovascular conditions (chronic heart failure, ischaemic heart disease, valvular heart disease, etc)**
3. **Individuals with abnormal clinical findings (such as an abnormal electrocardiogram) or ongoing symptoms (palpitations, chest pain, unusual breathlessness)**

Depending on the clinical circumstances, your doctor or cardiologist may perform any of the following cardiac tests before further advice:

1. **Electrocardiogram (ECG). This records the electrical activity of the heart, including the heart rate and rhythm, as well as displays any potential underlying structural heart conditions.**
2. **Exercise Treadmill Test (ETT). This is essentially an ECG performed while undergoing a run on the treadmill machine, and allows the detection of any underlying heart conditions that can be unmasked with physical stress.**
3. **Echocardiogram. This is an ultrasound study of the heart and records live moving images at rest, and reflects any structural or functional abnormalities of the heart.**
4. **Advanced functional cardiac imaging. These are second line scans available only in the hospitals that combine stress testing together with an imaging modality (ultrasound / CT scan / MRI) to assess for potential ischaemic heart disease.**
5. **CT coronary angiogram. This is a non-invasive form of imaging using a CT scanner, assisted by an intravenous dye, to detect any blockages of the heart arteries.**
6. **Cardiopulmonary Exercise Test. This is similar to the ETT, but with added components to measure both heart and lung functions to comprehensively assess overall cardiopulmonary health and fitness.**

The specialist may then recommend whether it is safe for you to proceed with sports participation, or if further clinical interventions are required, based on the findings of tests.

Conclusion

Exercise plays an important role in our overall well-being, but selected individuals who may have predisposing cardiac conditions may require further cardiovascular assessment before they undertake physical activities of moderate to high intensities, to prevent the risks of triggering any potential cardiac events during these activities. It is recommended to always seek medical advice when in doubt, before embarking on higher levels of exercise, especially if they experience disconcerting symptoms.

1 Mont L, Pelliccia A, Sharma S, et al. Pre-participation cardiovascular evaluation for athletic participants to prevent sudden death: Position paper from the EHRA and the EACPR, branches of the ESC. Endorsed by APHRS, HRS, and SOLAECE. European Journal of Preventive Cardiology. 2016/11/04 2016;24(1):41-69. doi:10.1177/2047487316676042

2 World Health Organization Fact Sheet: Physical Activity. https://www.who.int/news-room/fact-sheets/detail/physical-activity

3 Ministry of Health, Health Hub – Different Types of Physical Activities. https://www.healthhub.sg/live-healthy/387/TypesOfActivities

4 www.sportsingapore.gov.sg/Sports-Education/Sports-Safety/Sports-Safe-U-Guide

PREDICTING RISK OF CORONARY ARTERY DISEASE

What do you do when you have a chest pain? With the exception of emergent scenarios, often times one would first turn to his family doctor for help. In primary care setting, earlier studies[1] have shown the usefulness of risk calculators in aiding physicians to assess patients' risk of heart disease.

SingHealth Polyclinics, in collaboration with NHCS and Duke-NUS Medical School, developed a diagnostic risk calculator - PRECISE (Predictive Risk scorE for CAD In Southeast Asians with chEst pain) which can be potentially used as a decision support tool at the primary care level to predict Coronary Artery Disease (CAD) in patients presenting with stable chest pain (typically those exhibiting stable or atypical symptoms).

Understanding Cardiac Risk Scores

Cardiac risk calculators or scores are commonly used by physicians to assess a patient's baseline cardiac risk, and predict the probability of having CAD or cardiac events based on certain key risk factors. Different cardiac risk calculators are used in different scenarios, for example, in patients without symptoms versus in those with chest pain. Taking into account the patients' risk factors such as age, gender, smoking status, and underlying health conditions like blood pressure and cholesterol levels, the risk score generated shows an estimation of one's risk of having CAD.

Dr Chee Fang Yee, Associate Consultant, Department of Cardiology, shares that there are typically two types of common risk scores used in the clinical setting. "The Framingham Risk Score is applicable to patients without previous cardiac events, who are between the ages of 30 and 79 and non-diabetic. The other tool, CAD Consortium

Score, is used to determine the probability of CAD in patients with stable chest pain prior to diagnostic investigations."

The Framingham Risk Score can be used in asymptomatic patients to calculate their risk of heart attack or death in 10 years' time. Patients can input their blood pressure and cholesterol figures into the calculator found online, to get a result instantly.

Dr Chee explained that the risk score is useful in the clinic setting where doctors can refer to the risk score to help patients better understand how certain risk factors impact their risk levels. "If the score reveals an increased risk in CAD, the doctor can discuss the next steps with the patient – such as risk factors modification and/or starting a medication like statin or aspirin. For instance, we can show how the patient's risk profile changes if smoking is taken off the equation – usually resulting in a substantial reduction in cardiac events."

For patients without symptoms, what you should do if you have a higher risk score?

Doctors advise that patients could start with risk modification, such as adopting the following:

Regular exercise (e.g. brisk walking for 150 minutes a week)

Healthy, balanced diet (e.g. eating foods rich in potassium, calcium and magnesium, and low in saturated fat and sodium)

Quit smoking

Control risk factors such as diabetes, high blood pressure and high cholesterol levels

Patients are advised to seek medical attention early if they develop chest pain.

Developing a Diagnostic Risk Calculator More for Local Population

The Framingham Risk Score and CAD Consortium Score were developed largely for the Western population. "The tools currently available, though useful in assisting physicians in predicting the probability of CAD in patients with stable chest pain at the primary care setting, have not been validated for use in our local population," said Assoc Prof Jonathan Yap, Consultant, Department of Cardiology.

To address this gap, SingHealth Polyclinics, together with NHCS and Duke-NUS Medical School, embarked on a study to recruit more than 1,600 patients with symptoms of stable chest pain from various SingHealth polyclinics, to develop a risk score for the local population. All patients were clinically stable and referred to NHCS for further cardiac evaluation. About 10% of patients were eventually diagnosed with CAD and the rest, assessed not to have CAD. For the latter group, less than 1% developed major adverse cardiovascular events.

THE PRECISE ALGORITHM

The clinical variables in this risk calculator are:

Age

Gender

Underlying chronic conditions

Smoking status

Type of chest pain

Pain radiating to the neck

Electrocardiographic (ECG) changes

Using the key predictors of CAD in the study, the PRECISE diagnostic risk calculator was developed and compared against existing risk prediction tools[2].

"PRECISE showed excellent ability to differentiate those with and without CAD. This tool will help primary physicians to better assess a patient's risk for heart disease and in doing so, enable patients to receive appropriate and timely care at our specialist centre," shared Assoc Prof Yap, who is also a co-author of the study. He added that this would potentially help to streamline referral processes for those who require more in-depth investigations.

Work is currently in progress to introduce the PRECISE risk score in SingHealth Polyclinics.

[1] Goff DC Jr, Lloyd-Jones DM, Bennett G, et al. 2013 ACC/AHA guideline on the assessment of cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation 2014; 129:S49.

[2] The prediction tools used for comparison in the study are the Duke Clinical Score, CAD Consortium Score and Marburg Heart Score.

UNDERSTANDING BLOOD PRESSURE AND HYPERTENSION

By Dr Mohammed Rizwan Amanullah, Consultant, Department of Cardiology

Hypertension is the leading cause of cardiovascular disease. About 9.4 million deaths worldwide are due to hypertension[1]. In Singapore, about one in four persons have been diagnosed with hypertension, and there is a higher prevalence in persons above 40 years of age[2].

Our circulatory system comprises the heart as the central pumping organ which pumps blood into the arteries. This blood column moves forward in arterial system and reaches capillaries at tissue-level where nutrient and oxygen exchange occur and finally returns to the heart via the venous system. Blood pressure (BP) refers to pressure exerted by the column of blood on the vessel walls. Clinically, it is the arterial BP which is important, and this is recorded by either direct or indirect measurements.

Recording of Blood Pressure

i) **Direct measurements:** Invasive monitoring devices using an intra-arterial monitoring line connected to a transducer. This is performed in intensive care units where a constant monitoring of BP is needed.

ii) **Indirect measurements:** Using different types of sphygmomanometers. These include the mercury sphygmomanometers, automated BP devices and ambulatory BP recording devices.

When BP is elevated beyond the acceptable physiological limits, then a diagnosis of high BP or hypertension is made. However, elevated BP readings must be confirmed on at least a minimum of two separate occasions and at least 1 to 4 weeks apart. BP is measured in units of millimeters of mercury (mmHg) and the readings are always in pairs, with the upper (systolic) value and the lower (diastolic) value.

Guide to Measuring BP

BP monitoring devices are readily available and do not need a prescription. It is important to know the proper steps to taking BP to ensure an accurate measurement of BP and manage high BP.

General Principles to Measuring BP:

i) Stay well rested for at least 5 to 10 minutes prior to taking BP. If you had just exercised, you are recommended to rest for at least 30 minutes.

ii) Preferably no smoking, consumption of heavy meals or caffeinated drinks within 30 minutes preceding the measurement.

iii) Empty your bladder before taking BP.

iv) Take the measurement in a sitting position, with arm rested by the side on a table, and feet on the floor with legs uncrossed.

An example of BP reading showing systolic and diastolic values in mmHg.

v) The BP cuff should be tied against the bare skin, and it should fit tightly.

vi) Arm should be rested at the same level as the heart (figure 1).

Measure your BP at least 2 to 3 times at one-minute intervals for accurate readings.

An inaccurate measurement of BP may occur in the following situations:

i) When you are feeling anxious

ii) BP taken immediately after a meal or caffeine intake

iii) Improper body position

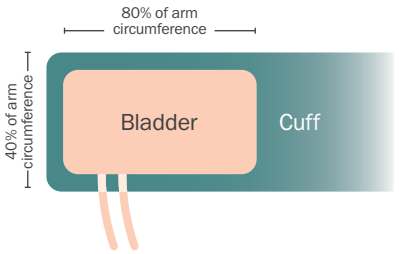
iv) Inappropriate cuff size

v) Faulty BP monitoring device

Figure 1: Correct positioning of measuring BP

Choosing the Right BP Cuff:

There are different sizes of BP cuffs. Most of the readily available home BP monitors come with standard adult-sized cuffs. A rough guide used is that the length of bladder of the cuff should encircle at least 80% of circumference of upper arm, and its width should be at least 40% of upper arm circumference (table 1).



Arm circumference (cm)	Cuff size (cm)
16 – 21	9 X 18, Child
21 - 26	12 X 22, Small Adult
27 – 34	16 X 30, Adult
35 – 44	16 X 36, Large adult
45 – 52	16 X 42, Adult Thigh

Table 1: Recommended BP cuff sizes based on arm circumference [3, 5]

A medium-sized cuff should suffice for most adults. A large-sized cuff should be considered for those who are obese. Improper cuff size will lead to erroneous measurements of BP.

Monitoring BP with Acceptable BP Variations

BP readings are recommended to be measured and recorded at the same timing daily, for those who are advised to monitor their BP. BP is lowest on waking up in the morning and tends to increase with physical activity during daytime. During sleep, there is a physiological reduction in BP by 10 – 15% of the daytime readings and this is referred as nocturnal dipping.

Hypertension: Primary and Secondary

Hypertension rarely causes symptoms and hence it is often picked up incidentally upon screening. Occasionally, some persons may manifest late with uncontrolled hypertension and have symptoms of breathlessness, headaches, blurring of vision and nose bleeding.

There are mainly two types of hypertension – primary and secondary hypertension. Primary (essential) hypertension is the most common type and has no underlying cause. Secondary hypertension, on the other hand, is caused by underlying conditions or use of certain medications.

The cut-off readings for the hypertension diagnosis have become more stringent in the recent years (as depicted in table 2) because early diagnosis and treatment of hypertension helps to reduce the complications. If only systolic or diastolic reading is elevated, BP is graded based on the higher reading among the two. Note that the cut-off readings for ambulatory BP are slightly different for diagnosis of hypertension.

Evaluating and Treating Hypertension

A detailed history and physical examination are necessary to assess for any symptoms or complications of organ damage. Additional tests such as electrocardiogram (ECG), urine tests, kidney function tests would also be required to screen for other concomitant risk factors like diabetes mellitus, high cholesterol (hyperlipidemia). Depending on the suspected secondary causes, more detailed investigations are needed.

It is important to treat hypertension. Untreated hypertension can lead to organ damage and cause complications like stroke, heart attack, retinopathy (affecting eye vessels and vision), lower limb peripheral arterial disease, and kidney damage. Managing and keeping good control of BP can reduce the incidence of coronary artery disease and stroke in the long term. The physician will assess and recommend the appropriate medication options based on age, other associated risk factors, and any pre-existing end organ damage. Besides medications, diet and lifestyle modifications are important in managing the condition.

Systolic BP (mmHg)	Diastolic BP (mmHg)	JNC 7 criteria (2007)[4]	ACC/AHA (2017)[5]
< 120	< 80	Normal	Normal
120 – 129	< 80	Pre-Hypertension	Elevated
130 – 139	80 – 89	Pre-Hypertension	Stage 1 Hypertension
140 – 159	90 – 99	Stage 1 HT	Stage 2 Hypertension
> 160	> 100	Stage 2 HT	Stage 2 Hypertension

Table 2: International criteria for diagnosis of hypertension

Locally, the definition of hypertension as per Ministry of Health[6] depicted as below:

Systolic BP (mmHg)	Diastolic BP (mmHg)	Category
< 130	< 85	Normal
130 – 139	85 – 89	High normal
140 – 159	90 – 99	Grade 1 Hypertension
160 – 179	100 – 109	Grade 2 Hypertension
> 180	> 110	Grade 3 Hypertension

1 Lim SS, Vos T, Flaxman AD, Danaei G, Shibuya K, Adair-Rohani H et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet 2013; 380:2224-2260.

2 Epidemiology and Disease Control Division Ministry of Health Singapore. National Health Survey 2010 Report.

3 M. Halm. Arm circumference, shape, and length: how interplaying variables affect blood pressure measurement in obese persons. American journal of critical care. 2014.

4 The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7). US dept of Health and Human services, NIH: December 2003 in Hypertension. 2003;42:1206

5 Paul K. Whelton, Robert M. Carey, Wilbert S. Aronow, Donald E. CaseyJr, Karen J. Collins, Cheryl Dennison Himmelfarb, Sondra M. DePalma, Samuel Gidding, Kenneth A. Jamerson, Daniel W. Jones, Eric J. MacLaughlin, Paul Muntner, Bruce Ovbiagele, Sidney C. SmithJr, Crystal C. Spencer, Randall S. Stafford, Sandra J. Taler, Randal J. Thomas, Kim A. Williams Sr et al. ACC/AHA/AAPA/ABC/ACPM/AGS/AphA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Hypertension. 2018;71:e13–e115

6 MOH clinical practice guidelines on Hypertension - November 2017

ENHANCING CARE IN ANTICOAGULATION CLINIC

Anticoagulation Clinic in National Heart Centre Singapore (NHCS) rolled out two initiatives to improve patient care and care experience for patients requiring long-term anticoagulant treatment.

Anticoagulants, also known as blood thinners, are medications prescribed for the prevention or treatment of blood clots by slowing down the formation of the blood clots. The most commonly prescribed anticoagulant is warfarin.

For patients who are on anticoagulants, it is crucial to regularly check and monitor their international normalised ratio (INR) – a test that measures the time it takes for blood to clot. NHCS Anticoagulation Clinic (ACC) provides various programmes to patients on warfarin therapy who require INR monitoring.

Caring remotely and effectively

Since 2016, NHCS ACC started a pilot telehealth service for selected patients who are on follow-up care. Comprising home INR monitoring and phone consultation, this telehealth service allows the care team to render care to patients in an effective and safe manner, while reduces the need for patients to make a physical visit the clinic at NHCS. This helps save patients and their caregivers' time and money from travelling and waiting at the clinic.

Patients who have unstable INR and require frequent monitoring are encouraged to sign up for this telehealth service, which is run by a team of trained Advanced Practice Nurses and Pharmacists. Prior to enrolment, the care team will assess the patients' suitability for the programme. Patients will be required to have their own portable 'point-of-care' (POC) INR test devices (for home-based use). They will be taught on how to perform INR self-test at home and send their results via a secured web application.

Upon receiving the INR results, the care team will call the patients the next working day to conduct a routine check on patients' well-being such as symptoms, bleeding signs, lifestyle, diet and medications. Patients will also be advised on the appropriate adjusted warfarin dosage, if necessary, and the next self-test

schedule and appointment. The entire phone consultation will be documented and assessed clinically.

NHCS ACC had successfully enrolled more than 100 patients for the Home INR monitoring service since its official launch in July 2020.

Developing predictive model for self-titration

Recognising the need to further enhance INR monitoring, the ACC team began to research and study past prescribing data, so as to develop a predictive model for warfarin titration and validate an algorithm for self-titration. Till date, the team has identified more than 7,000 patients who had undergone clinic-based warfarin titration, and with the analysis of over 253,000 INR values and 285,000 warfarin prescriptions, the team hopes to be able to establish a predictive model and algorithm in three years, which could potentially help patients to perform self-titration of the warfarin dosages more effectively.

Empowering self-management INR care

While these initiatives were recently rolled out, brainstorming and discussions for ideas began as early as five years ago when the ACC team saw the need to provide an alternative to the standard face-to-face treatment at the clinic, "We hope that such initiatives will empower patients to better manage their own health at home and bring about improved health outcomes. We are happy to see many patients who could self-test more frequently at home, and are taking a faster time to reach therapeutic range," shared Asst Prof Fam Jiang Ming, Senior Consultant from the Department of Cardiology at NHCS, who is also currently leading the ACC team.

The team plans to transit selected patients from a traditional clinic-based model to a home-based patient-led (self-management) model, which can lead to both cost and time savings for both patients and the healthcare institution.

While the ACC service is in the process of evolving into a full-fledged clinical service, the team foresees a demand for such telemedicine services in the near future. Visualising on advancement in clinical care, the team envisaged that patients would be transited from a semi-autonomous care model, in which they perform INR self-testing followed by warfarin dose titration guided by the healthcare professionals remotely, to a fully-autonomous care model where patients are able to self-test and self-titrate, with the help of a software-based algorithm that can recommend warfarin dosages and intervals. In this model, healthcare professionals can monitor the progress of these patients remotely at predetermined intervals and actively manage their conditions only when necessary.

Patients who are interested in Home INR Monitoring may speak to their care team.

CONTACT US

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NON-INVASIVE CARDIAC IMAGING, ECHOCARDIOGRAPHY AND NUCLEAR CARDIOLOGY

NHCS offers a comprehensive range of investigations to detect cardiovascular problems including the latest gamma camera technology for heart scans which reduces scanning time by 75 per cent, and a 320-slice cardiac computed tomography which reduces radiation exposure in heart scan machine by 90 per cent.

OUR SPECIALISTS

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Assoc Prof Ding Zee Pin	Senior Consultant, Advisor of Echocardiography
Assoc Prof Ewe See Hooi	Senior Consultant, Director of Echocardiography
Assoc Prof Sahlen Anders Olof	Senior Consultant, Director of Echocardiography Core Laboratory
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Asst Prof Go Yun Yun	Consultant
Asst Prof Khoo Chun Yuan	Consultant
Asst Prof Lee Phong Teck	Consultant
Asst Prof Lohendran Baskaran	Consultant
Asst Prof Ng Choon Ta	Consultant
Asst Prof See Chai Keat	Consultant
Dr Audry Lee Shan Yin	Consultant
Dr Huang Weiting	Consultant
Dr Huang Zijuan	Consultant
Dr Ignasius Aditya Jappar	Consultant
Dr Koh Choong Hou	Consultant
Dr Mohammed Rizwan Amanullah	Consultant
Dr Muhammad Bin Idu Jion	Consultant
Dr Natalie Koh Si Ya	Consultant
Dr Ruan Wen	Consultant
Dr Alex Tan Weixian	Associate Consultant
Dr Iswaree Devi D/O Balakrishnan	Associate Consultant
Dr Keh Yann Shan	Associate Consultant

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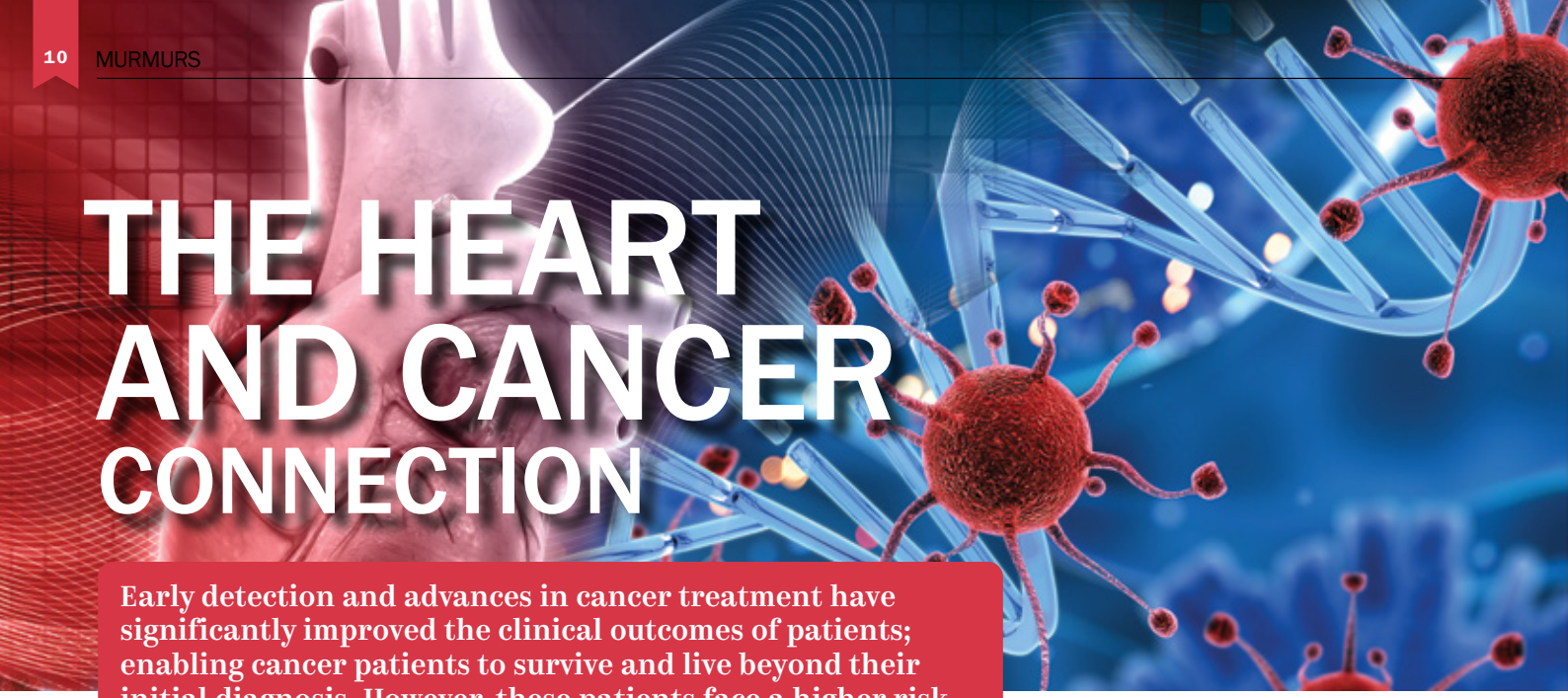

THE HEART AND CANCER CONNECTION

Early detection and advances in cancer treatment have significantly improved the clinical outcomes of patients; enabling cancer patients to survive and live beyond their initial diagnosis. However, these patients face a higher risk of cardiac complications.

About 5 million adult patients with cancer suffered from pre-existing or incident cardiovascular disease worldwide, with Asia accounting for 50% of global cancer burden[1,2]. Research has shown that cancer patients are at higher risk of dying from heart disease and stroke[3]. Cardiovascular disease and cancer also have common risk factors that can lead to increased cardiac disease burden in patients with cancer. There have been many research studies on the long-term cardiovascular side effects of cancer treatments, also known as cardiotoxicities.

Dr Chong Jun Hua, Consultant from the Department of Cardiology at NHCS, is the first cardiologist in Asia to be board-certified in cardio-oncology from the International Cardio-Oncology Society. In this issue, she shares more about cardio-oncology - an emerging cardiology subspecialty that investigates cardiac complications of cancer and cancer therapy.

Q What kind of patients are usually referred for cardio-oncology review?

A Patients with primary and secondary cardiac tumours, and those suffering from cardiac complications of breast or other tumours, and blood cancer are usually referred to us by oncologists or haematologists across various cancer centres and hospitals in Singapore.

In NHCS, we see about an average of 30 new cardio-oncology referrals each month, of which about 50% of the referrals are from breast cancer while the remaining from blood cancer and immunotherapy-related cardiotoxicity. Around 10% of all breast cancer patients will experience cardiotoxicity secondary to cancer therapy, and can be referred for cardio-oncology review. Breast cancer patients on potentially cardiotoxic medications are also referred to the echocardiography service for screening and surveillance. As more novel therapies in cancer are developed, the range of cardio-oncology presentations will become more diversified.

Q What are the common cardiac complications?

A The complications from cancer therapy are diverse. Most commonly, patients may develop left ventricular dysfunction (a condition where the left ventricle of the heart – which main function is to pump blood to the rest of the body - is damaged) from anthracyclines, a common drug used in cancer chemotherapy. Other complications include therapy-induced hypertension, myocarditis (inflammation of the heart muscle), coronary artery spasm or heart rhythm abnormalities, and radiotherapy-induced coronary artery calcification (calcium build-up). Patients may also develop other cardiopulmonary-related complications such as pulmonary hypertension, pulmonary or systemic embolism (blockage in artery) and loss of cardiorespiratory fitness (body's ability to supply oxygen to the muscles during physical activity).

Q How is treating this group of patients different from the typical cardiac patients?

A Patients with co-existing cancer may be less tolerant of cardiac medication side-effects. The time course of disease may also be different. For instance, they may develop sudden deterioration from radiation-induced coronary artery disease many years after exposure. The cardiac complications may also be less predictable as newer cancer therapy agents are prescribed. It is thus vital for cardiologists to keep abreast of the latest literature and evidence in the cancer field so that they are aware of the various cardiac complications to look out for.

Q Are there specific care or strategies to help control the cardiac complications?

A Cardio-oncology patients are in many ways at the crossroads of the various cardiology subspecialties and diagnostics, and hence multidisciplinary teams are involved to better manage the treatment for these patients. Early clinical suspicion and screening will help in early detection of subclinical cardiac diseases (asymptomatic or mild symptoms). Most importantly, patients must make major lifestyle changes to control and minimise key cardiovascular risk factors such as high blood pressure, high cholesterol, diabetes, obesity and smoking.

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NHCS GP CME Webinar:
CT Angiogram and Calcium Scoring - Updates for Primary Care (For General Practitioners)

Date: 26 March 2022, Saturday
Time: 1.30pm
Registration: Free

CT angiogram is an imaging test typically done to assess blockages in our heart's arteries. Plaque inside the arteries can accumulate and measurement of calcified plaque is important to identify risk of severe artery blockage. Join us as we share the latest updates in CT Angiogram and Calcium Scoring.

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