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**CARDIAC PHYSIOTHERAPY AND
REHABILITATION:
A HOLISTIC COMBINATION
FOR ENHANCED
RECOVERY**



**CARDIO-ONCOLOGY CARE:
HEART HEALTH FOR
CANCER SURVIVORS**



**LIVING WELL WITH A
HEART CONDITION**



AGEING AND THE HEART

AGEING AND THE HEART

By Dr Wong Jie Jun, Senior Cardiology Resident,
and Assoc Prof Angela Koh, Senior Consultant, Department of Cardiology



Cardiovascular health is a central tenet of our functional independence, and cardiovascular ageing perpetually affects us all, in one way or another. By 2030, it is estimated that one in four Singaporeans will be aged 65 years and above. In tandem, the prevalence of ageing-related cardiovascular diseases is rising rapidly, bringing about adverse consequences of our personal quality of life, life expectancy, and broader downstream complications on our societal health and economic prosperity.

The conventional approach to cardiovascular disease prevention has traditionally been guided by what we were taught in schools: early detection of cardiometabolic risk factors – such as diabetes, hypertension, high cholesterol, and guideline-directed treatment approach that targets specific risk factors.

However, ageing should deserve the same attention as these traditional risk factors, and not simply viewed as a non-

modifiable risk that inevitably happens to all. From a developmental perspective, the effect of ageing on the cardiovascular system may occur far earlier than anticipated. Fatty streaks in the coronary arteries have been found as early as the second decade of life, while discernible cardiac stiffness have been detected in the fourth decade of life among otherwise healthy adults. In the heart muscle, the cells can undergo changes and scar tissue can build up, making the heart stiffer and less able to relax to fill with blood properly. Heart valves can similarly wear out and harden with calcium deposits, resulting in the inability to function properly. The electrical system can gradually fail to generate or conduct impulses necessary for our hearts to beat in a coordinated manner, which can lead to heart rhythm disorders. All these changes in the cardiovascular system of men and women increase their susceptibility to developing ageing-related diseases. Therefore, given the enormous impact of ageing on the cardiovascular system, addressing cardiovascular ageing ought to start much earlier than we used to think.

Instead of waiting to tackle risk factors, one approach would be to encourage healthy lifestyle behaviours early on, way before any risk factors appear. Recently, the American Heart Association recommended “Life’s Essential 8” checklist¹, a list of lifestyle behaviours to improve heart health. The eight steps include:



Adhering to this checklist has recently been found to impact biological ageing, which refers to the age of the cells in the body². This implies that these lifestyle behaviours can slow down the body’s ageing process; not only reducing risk of heart disease but also improving life expectancy and lowering the risk of death.

Apart from general lifestyle advice, experts also recognise a critical need for tailored approaches for the ageing heart for instance, in women versus men because the hearts of women age differently from men. Older women who generally have longer life expectancies, experience poorer health span in their later years, living through heart failure and its complications. As women age, their heart chambers tend to become smaller and the walls thicken, which can contribute to heart failure. In contrast, men tend to experience sudden heart failure with larger chambers. Some of these alterations have occurred as early as the fourth decade of life among women³. Notably, these cardiac ageing changes correlated with substances that are produced during metabolism, which are crucial for energy production in cells. Older women who had better cellular function (such as when body breaks down fats to produce energy) had healthier hearts. These findings highlight the need for preventive

strategies to start earlier, and shed light on the direction of how we might go about to do so.

To sum up, understanding how the heart ages is crucial for our ageing population. The science is exceedingly promising, with developments such as personalised strategies to combat heart ageing on the horizon. Better cardiovascular health contributes to better overall physical, mental, functional health and independence. We anticipate significant benefits for our current and future populations if we can move forward together to develop impactful strategies based on collective science.

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CARDIAC PHYSIOTHERAPY
AND REHABILITATION:

A HOLISTIC COMBINATION FOR ENHANCED RECOVERY

Physiotherapy and rehabilitation programmes tailored to post-cardiac events are widely recognised for their efficacy in promoting cardiac health and individual well-being. At NHCS, the Department of Cardiac Physiotherapy and Rehabilitation Services uses a holistic approach, utilising evidence-based benefits to help cardiac patients get back on their feet.

A comprehensive, multi-faceted approach

The NHCS Cardiac Physiotherapy and Rehabilitation Services offers seamless care from initial assessment to rehabilitation, throughout the patient journey from pre-operation to post-operation in the inpatient and outpatient settings.

The comprehensive cardiac rehabilitation programme, conducted under the supervision of cardiac physiotherapists and nurses, is designed to improve cardiovascular health, enhance functional capacity, and promote overall quality of life for individuals who have:

- Experienced cardiac-related events or procedures, such as angioplasty, coronary artery bypass surgery, valve surgeries and implantations, mechanical heart device or cardiac device implantations and heart transplantation
- Cardiac conditions such as heart failure and are on medical management
- Undergone thoracic related procedures such as lung surgery or lung transplantation

Early ambulation helps patients recover faster and better

Research has shown that early mobility is vital in preventing post-operative complications, improving functional capacity and reducing length of hospital stay in patients after cardiac surgery¹. Since 2018, NHCS Cardiac Physiotherapy and Rehabilitation Services has introduced the Enhanced Recovery After Surgery (ERAS) programme, which helps to initiate early mobilisation for suitable cardiac and thoracic patients on the same day post-surgery. This is achieved through an evidence-based multidisciplinary team approach involving medical, nursing and physiotherapists.

Nadiah Binte Mohamed Rahim, Senior Physiotherapist, shared, “The team utilises a set of protocols and guidelines to standardise care for patients suitable for ERAS. Patients can safely start gradual mobilisation on the same day after their surgery.”

Another service provided by the department is Prehabilitation (Prehab), where patients are recruited early into an exercise programme before their surgery. With Singapore’s ageing population, the conventional way of starting rehabilitation only after an operation may face more complexities due to co-morbidities, frailty, and psychosocial factors. A research study demonstrated that pre-operative exercise intervention significantly reduced post-operative pulmonary complications and decreased the length of hospital stay in older patients².

THE SERVICES OFFERED INCLUDE:

- ✓ Assessment of functional capacity
- ✓ Exercise testing and prescription
- ✓ Supervised individualised exercise training in inpatient and outpatient settings
- ✓ Cardiovascular risk factor modification
- ✓ Educational talks including diet, and nutrition and pharmacological counselling
- ✓ Assessment and treatment of musculoskeletal conditions

Throwing fun and safety into the mix

Recognising that some patients find it challenging to adhere to standard exercise sessions, the team introduced exergaming to the repertoire of interventions at the outpatient service.

“With exergaming, we inject a fun element into an otherwise ordinary regime. Carefully selected video games were introduced to encourage large muscle activity and rigorous exercise, facilitating balance and strength training with an enjoyable twist compared to traditional methods,” shared Michael Khoo, Physiotherapist.

Benefits of cardiac rehabilitation

After a cardiac event such as a major surgery like coronary artery bypass grafting or smaller procedures like percutaneous coronary interventions (example, stenting), patients enrolled in a cardiac rehabilitation programme would experience a multitude of benefits. It helps to significantly improve their exercise capacity and cardiorespiratory function, and enhance their quality of life including physical functioning, emotional well-being, and social integration.

Research has also evidenced how cardiac rehabilitation is associated with lower cardiovascular mortality rates, fewer recurrent cardiac events, and reduced hospitalisations among patients with coronary artery disease³.



MISCONCEPTIONS OF CARDIAC REHABILITATION

“The exercises seem overly strenuous or unnecessary after a cardiac event.”

Patients will be educated on when and how they can do their exercises and the suitable level of activity after a cardiac event. The intensity of exercises will also progress gradually.

“I am physically well so I do not need cardiac rehabilitation.”

Despite being physically well, patients might still have cardiac risk factors (e.g. hypertension, diabetes) which may be improved through cardiac rehabilitation.

‘One Size Fits All’ so it does not benefit me

The NHCS cardiac rehabilitation programme considers the patient's medical history, current condition, and personal goals to create a customised plan for optimal recovery.

The NHCS cardiac rehabilitation programme is for NHCS patients and by referrals only.

Typical programme for NHCS Cardiac Physiotherapy and Rehabilitation Services Patients:

Exercise sessions at NHCS

- Once or twice weekly for eight weeks
- One-to-one or group exercise class based on medical condition and functional ability
- Guided and supervised rehabilitation, including aerobic, flexibility and resistance exercises

Exercise sessions at home

- Exercise safely and conveniently at home with instructions and guidance from cardiac physiotherapists for suitable patients.

Education

- Attend virtual educational talks or one-to-one counselling and education sessions with nurses



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CARDIO-ONCOLOGY CARE:

HEART HEALTH FOR CANCER SURVIVORS

By Asst Prof Ng Choon Ta, Senior Consultant, Department of Cardiology

Head disease and cancer are top leading causes of death globally. The situation is same in Singapore where both heart disease and cancer account for almost 50% of the deaths annually¹. While both conditions may seem distinct, emerging evidence highlights the intricate relationship between them. For instance, both heart disease and cancer share similar risk factors such as smoking, ageing, sedentary lifestyle and obesity. Furthermore, cancer treatments such as chemotherapy, targeted therapy, immunotherapy and radiation therapy, can have profound effects on the heart, leading to various cardiac complications which can occur immediately during therapy or even decades after. In fact, cancer survivors

living at least five years after diagnosis have up to three times increased cardiovascular risk as compared with age-matched general population without history of cancer^{2,3}. This led to an increasing interest in multidisciplinary field of cardio-oncology. Cardio-oncology focuses on assessing, monitoring and managing cardiovascular toxicities related to cancer treatments with the aim to reduce morbidity and mortality in patients. With the exponential growth in cancer and cardiovascular diseases in Asia, there is an urgent need for cardio-oncology awareness among patients and physicians to ensure comprehensive care for patients battling cancer.

Common Cardiac Complications from Cancer Therapies

While cancer therapy focuses on eradicating the cancerous cells, the heart can sometimes be affected directly or as a bystander. This can cause a spectrum of cardiovascular complications, collectively termed cardiotoxicity, depending on the type of cancer therapy.

Heart failure or cardiomyopathy (disease of the heart muscle)

Chemotherapy, like anthracyclines (a class of drugs) which are used in treating haematological cancers such as lymphomas, can sometimes weaken the heart pumping function over time. This usually occurs at higher cumulative doses. Breast cancer patients on therapies targeting HER2 (a type of protein) may also experience a transient drop in heart function.

In mild cases of reduced heart pumping function, patients may not experience any symptoms. In more severe cases, patients may develop heart failure symptoms such as severe shortness of breath on exertion, and on lying down, legs swelling or lethargy. Sometimes, these symptoms can be nonspecific and may overlap with cancer-related symptoms, making diagnosis challenging. Hence, the presence of heart failure is best assessed with laboratory blood test and biomarkers and confirmed with imaging modalities such as echocardiography or cardiac MRI.

Arrhythmias (irregular heartbeat) such as atrial fibrillation

Patients with cancer are at an increased risk of arrhythmias, particularly atrial fibrillation (abnormal heart rhythm characterised by irregular and rapid beating of the heart). Certain types of cancer medications can also cause atrial fibrillation. In cancer patients, there are unique considerations such as risks of bleeding and drug interactions that need to be taken into account when considering the treatment of atrial fibrillation.

Patients with atrial fibrillation can sometimes experience palpitations or feel their heart racing. In some instances, patients with ECG smartwatch may get a notification suggesting they have atrial fibrillation despite not having any clinical symptoms. The presence of atrial fibrillation can be confirmed by doing a resting electrocardiogram (which is a surface electrical tracing of the heart) or extended ambulatory ECG monitoring.

Myocardial ischaemia (reduced blood flow to the heart)	<p>Radiation therapy of chest tumours (like those in the mediastinal or left breast) may sometimes affect the heart because of their proximity. In some patients, this can accelerate atherosclerosis (thickening) of the heart vessels, resulting in heart attacks years after radiotherapy. Moreover, some chemotherapy agents may cause vasospasm (narrowing) of the heart vessels, causing chest pain.</p> <p>Patients with myocardial ischaemia often presents with chest discomfort, which is typically described as heaviness in the chest that is worse with exertion and better with rest. This can sometimes be accompanied by cold sweats or breathlessness.</p>
Hypertension (high blood pressure)	<p>Some cancer therapies such as VEGF (Vascular Endothelial Growth Factor) inhibitors, can cause hypertension or worsen pre-existing hypertension in patients. This may require patients to start or temporarily increase anti-hypertensive medications.</p>
Myocarditis (inflammation of the heart muscle)	<p>Certain cancer therapies that help the immune system, such as the immune checkpoint inhibitors, can sometimes lead to over-activation of one's immune system and cause inflammation of the heart muscles, but this is rare.</p>

Strategies or Treatment for Patients on Cancer Therapies:

Risk Assessment and Optimisation:	<p>It is crucial to assess the risk for cardiovascular complications before starting cancer treatment. Patients with pre-existing cardiovascular risk factors or a history of cardiotoxicity should undergo comprehensive cardiac evaluation, including echocardiography and biomarker tests. For prostate cancer patients on hormone therapies, it is important to manage their cardiac risk factors such as high cholesterol, and diabetes.⁴</p>
Multidisciplinary Approach:	<p>Collaborative care among oncologists, haematologist, cardiologists, and other healthcare providers (nurses, pharmacists, physiotherapists) is essential for managing cancer patients with cardiac complications. This approach ensures comprehensive risk assessment, optimising treatments, and keeping a close monitoring on patients throughout their cancer treatment.</p>
Cardioprotective Strategies:	<p>Several cardioprotective strategies can lower the risk of cardiac complications before and during cancer treatment. These strategies may involve the use of cardioprotective agents like statins with anthracyclines before starting chemotherapy for lymphomas, the use of medications such as ACE-inhibitors and beta blockers, or regularly monitoring heart function with serial echocardiography.</p>
Lifestyle Modifications:	<p>Encouraging lifestyle changes such as quitting smoking, eating a healthy diet, exercising regularly, and managing weight can help reduce cardiovascular risk for cancer survivors.</p>
Tailored Treatment Approach:	<p>In some cases, adjusting the cancer treatment plan or using alternative therapies with fewer cardiotoxicity side effects may be necessary to balance the cancer control and the protection of the heart.</p>
Survivorship Screening:	<p>For cancer survivors who were exposed to cardiotoxic cancer therapies (such as high-intensity radiation near the heart or high-dose anthracyclines), regular screening may help detect early signs of cardiovascular disease.</p> <p>The relationship between cancer and heart disease underscores the importance for holistic patient care in cardio-oncology. Cancer survivors have a higher risk of developing cardiovascular complications, necessitating vigilant monitoring and proactive management strategies. With better understanding of the link between cancer and heart disease, doctors and other healthcare professionals can help increase the adherence to cardioprotective measures, and empower their patients with healthier lifestyle changes to bring about better outcomes.</p>

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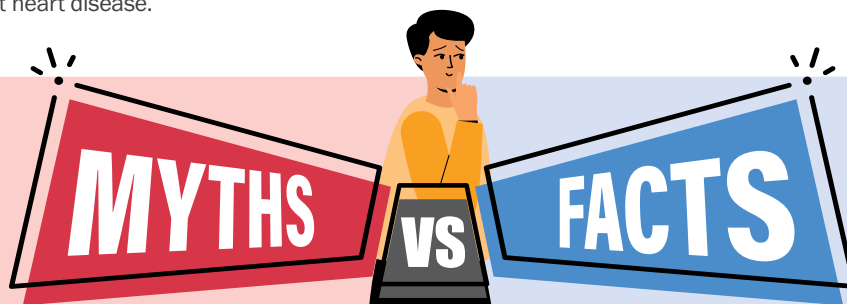
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BEYOND THE BEAT

DEBUNKING MYTHS ABOUT IRREGULAR HEARTBEATS

Maintaining a regular heartbeat is essential for proper blood circulation and overall heart health. Irregular heartbeats, also known as arrhythmias, are changes in the normal rhythm of the heart. These changes can include slow rhythms (bradycardias), fast rhythms (tachycardias), extra beats, or irregular patterns. While age increases the likelihood of arrhythmias, they can occur in anyone, even those without heart disease.

It is also important to note that while irregular heartbeats are common, they do not directly cause heart attacks on their own. Most irregular heartbeats are harmless. However, serious conditions such as ventricular tachycardia and atrial fibrillation can pose significant risks, including life-threatening complications. Let us address some common myths about irregular heartbeats and gain a clearer understanding of when these conditions should be a cause for concern.



"Is a slower heartbeat a symptom of weak heart, and a fast heartbeat a sign of an imminent heart attack?"



Our heart rate varies depending on the time of the day, activity level and mental state. It may also be affected by the presence of any stressors, be it emotional or physical illness, as well as with the use of any medications to regulate heart rate. A slow heartbeat does not mean one has a "weak" heart. In fact, a low heart rate is common among the athletes as their hearts are stronger and more efficient to meet their body requirements, allowing more blood to be pumped with each heartbeat.

On the other hand, fast heartbeat can happen when one is exercising, excited or ill and does not mean that there is impending heart attack. As such, if there is an isolated low or fast heartbeat episodes coupled with symptoms of giddiness, chest pain, breathlessness or fainting, please seek medical advice.

"A normal heart rate means my blood pressure is normal?"



Heart rate refers to the number of times a heart contracts within a minute. Blood pressure is the measure of the force of blood pushing against the blood vessel walls. While heart rate does affect the blood pressure, they are still two separate measurements and indicators of health. A normal heart rate does not necessarily mean that your blood pressure is normal. A person can have a normal heart rate and still have high blood pressure.

"I have a naturally higher heart rate, so I can burn fat faster."



Fat metabolism is not affected by a higher heart rate. Generally, our body burns carbohydrates and fats for fuel and use them as energy. It is important to keep to a physically active lifestyle in order to maintain a healthy weight.

"My pulse is fast, it means I'm always under stress!"



A fast pulse may be partially accounted by stress. However, if it is always persistent despite the removal of stress and even occurs at rest, this could be a sign of possible underlying conditions such as hormonal or cardiac disorders. Please seek advice from your healthcare provider.

"I cannot drink coffee/ tea if I have palpitations or irregular heartbeat."



Recent studies in major medical journals have shown that consumption of caffeine does not lead to increased risk in heart rhythm abnormalities. As such, there are no strong reasons to abstain from caffeine completely. However, some people may be more sensitive to caffeine and feel palpitations or irregular heartbeats just after consumption of caffeine. For these individuals, reducing caffeine consumption to the minimum may help alleviate their symptoms.

Irregular heartbeat is seldom life-threatening, but sometimes the palpitations could indicate underlying coronary artery disease. Seek immediate medical help if heart palpitations are accompanied by:

- Severe chest pain
- Unusual sweating
- Shortness of breath
- Loss of consciousness

A video version of the contents on how Dr Julian Tay, Consultant, Department of Cardiology, debunked myths on irregular heartbeats, is available here.



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CARDIAC INTERVENTIONAL PROCEDURES

Interventional cardiology involves treating patients with diseases of the heart vessels (coronary artery) and valves. The interventional cardiology programme is supported by catheterisation laboratories which are equipped with features such as biplane or single plane detectors with algorithm to reduce radiation exposure to patients. The catheterisation laboratories are operational round-the-clock, ensuring that patients with heart attack admitted to NHCS will receive timely acute angioplasty to clear up the blocked arteries, which leads to better clinical outcomes and survival rates.

- Coronary angiography/ Left and Right heart catheterisation/ Percutaneous coronary interventions, which include balloon angioplasty, drug coated balloon, atherectomy and stent implantation
- Percutaneous device closure of atrial septal defect, ventricular septal defect, patent foramen ovale, and patent ductus arteriosus
- Percutaneous balloon valvuloplasty of mitral, aortic and pulmonary valves
- Transcatheter aortic valve replacement (TAVR)
- Intraaortic balloon counter pulsation (IABP) and other percutaneous mechanical circulatory support device
- Intravascular imaging - IVUS and OCT
- Pressure wire measurement
- Percutaneous cardiopulmonary bypass (ECMO)
- Intravascular Lithotripsy (IVL)
- Balloon pulmonary angioplasty for treatment of chronic thromboembolic pulmonary hypertension
- Pulmonary vein angioplasty for pulmonary vein stenosis
- Electrophysiology procedures, including ablation, pacemaker/CRT/ ICD implantation



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OUR INTERVENTIONISTS IN PERCUTANEOUS CORONARY INTERVENTION

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LIVING WELL WITH A HEART CONDITION



Living with a heart condition often involves challenges that extend beyond physical health. From managing symptoms to coping with emotional and social adjustments, individuals frequently face a complex journey that requires holistic support. Drawing on insights from Ms Jan Koh, our Principal Medical Social Worker from the Medical Social Services, here are some practical advice on enhancing well-being while living with a heart condition.

The 'Heart' Impact

It is crucial to understand that a heart condition doesn't just affect the body; it impacts the mind and social life as well. Referencing the **Bio-Psycho-Social-Spiritual (BPSS) framework** can help understand the impact of a heart condition on each patient.

Biological

This includes managing physical symptoms like breathlessness and chest pains, which can significantly impact day-to-day activities.

Psychological

Many individuals may experience stress, fear of sudden death, or a loss of control over their lives. Some may adopt a perspective that focuses on meaningful relationships and personal goals.

Social

Relationships and social roles can be affected, leading to changes in interactions with loved ones and adjustments in social roles.

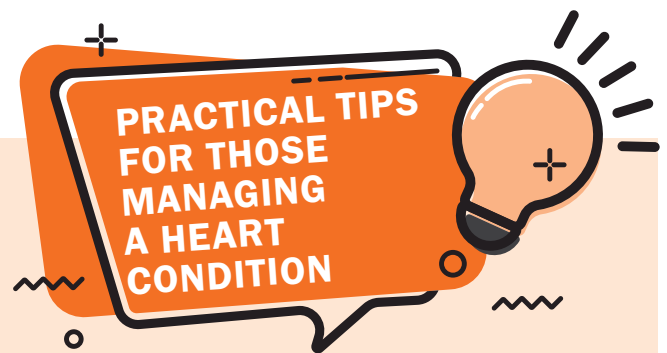
Spiritual

Beyond religious beliefs, this can involve finding meaning and purpose in life, especially after a diagnosis. Some may start addressing existential questions and the path towards acceptance.

Poor mental health, including depression, can worsen heart disease risks. Conversely, maintaining good mental health supports overall well-being and heart condition management. Indeed, a recent study published in the *Journal of the American Heart Association*¹ found that young adults with depression or frequent poor mental health days had significantly higher rates of cardiovascular disease, heart attacks, and strokes. This highlights the importance of prioritising mental health to improve overall heart health outcomes.

What Does 'Living Well' Mean?

Living well with a heart condition varies from person to person. Referencing the BPSS framework to define what living well means for each individual, Jan explained "Everyone copes differently in stressful situations. For some, it's maintaining physical independence and managing daily activities. For others, it can be nurturing meaningful relationships and finding clarity in life's purpose." Ultimately, it requires tailored strategies to meet individual needs.



Staying Active and Independent

Manage your daily routine by controlling symptoms. This includes taking medications as prescribed, exercising regularly, and eating a balanced diet.



Building a Support Network

Surround yourself with supportive friends and family who have different ways of coping. This can greatly improve your emotional well-being. Building strong relationships and participating in social activities can also help keep a positive outlook.



Finding Joy and Coping

Explore hobbies, personal goals, or volunteering. Knowing how you naturally cope—whether you're good at solving problems or finding meaning—can help you manage stress effectively. And don't hesitate to seek professional help if you need it.

Living well with a heart condition is about more than just managing symptoms—it's about thriving in every aspect of life. By prioritising self-care, building a supportive network, and pursuing meaningful activities, patients can navigate their journey with resilience and optimism. It is a personal path of adaptation and growth, where each day presents opportunities to embrace life fully. With these strategies in place, life with a heart condition can be approached confidently, focusing on what truly matters.

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9th Coronary Care Symposium 2024 (For Healthcare Professionals/ Students)

This basic course in coronary intensive care provides comprehensive training in the managing cardiac patients and using essential ICU equipment and modalities. Participants will engage in interactive case discussions and quizzes to explore crucial topics, with hands-on stations to enhance in-depth learning for daily ICU work.

Date: 21 September 2024
Time: 8.30am – 5.30pm
Venue: National Heart Centre Singapore, Level 7

Cost: Physician Track

Physician / Dr-in-Training:
SGD \$240 nett

Medical Students: SGD \$55 nett

Nurses Track

Nurses / Allied Health: SGD \$130 nett
Nursing Students: SGD \$55 nett

18th Cardiovascular Update 2024 (For Healthcare Professionals)

The course provides cardiologists and medical practitioners with the latest updates relevant to general cardiology practice. It targets at general cardiologists, internists, cardiology fellows, doctors-in-training and general physicians with interest in cardiology.

Date: 2-3 November 2024
Time: 9am
Format: Online via zoom (free)

APPOINTMENTS & PROMOTIONS



Asst Prof Tan Teing Ee
Deputy Chief Executive Officer
(National Cardiac Services
and Quality)



Asst Prof Fam Jiang Ming
Deputy Chief
Medical Informatics Officer



Asst Prof Priscilla Phoon Hui Yi
Head & Senior Consultant,
Department of Cardiothoracic
Anaesthesiology



Dr Teo Hooi Khee
Consultant,
Department of Cardiology



Dr Tham Yi Chuan
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