วารสารโรคหัวใจ
THAI HEART JOURNAL

วารสารทางวิชาการ
ของสมาคมแพทย์โรคหัวใจ
แห่งประเทศไทย
ในพระบรมราชูปถัมภ์

Official Publication
of The Heart Association
of Thailand under
the Royal Patronage of
H.M. the King

Cardiology 5.1

51st Annual Scientific Meeting

21st-24th March 2019
@ Grand Ballroom, Sheraton Hotel, Hua Hin

Program & Abstracts

Accredited for CME 31 Credit hours

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วิสัยทัศน์ สมาคมแพทย์โรคหัวใจแห่งประเทศไทยในพระบรมราชูปถัมภ์

วิสัยทัศน์ (Vision Thai Heart)

เป็นสมาคมวิชาชีพที่มีการสร้าง พัฒนา และเผยแพร่ องค์ความรู้ เสริมสร้างความชำนาญด้านโรคหัวใจและหลอดเลือดที่ได้รับการยอมรับในระดับสากล

แก่นคุณค่าหลัก (Core Value)

CARDIO Way

C: Commitment & Communication
พัฒนาและเผยแพร่ความรู้เรื่องหัวใจและหลอดเลือดเพื่อสร้างเสริมสุขภาพหัวใจของประชาชนให้แข็งแรง

A: Advancement
มุ่งมั่นก้าวไปข้างหน้าร่วมกัน

R: R & D & Relationship
สร้างสรรผลงานวิชาการ และส่งเสริมความสัมพันธ์ระหว่างกัน

D: Dynamic Optimum
ปรับตัวเองตลอดเวลาให้ทันกับสถานการณ์สิ่งแวดล้อมที่เปลี่ยนแปลง

I: Integrity
ส่งเสริมความน่าเชื่อถือและความไว้วางใจในความเป็นของแพทย์โรคหัวใจ

O: Obsession
รักและภาคภูมิใจในวิชาชีพ

วัตถุประสงค์หลัก (Core Purpose: Reason for Being)

มุ่งมั่นส่งเสริมให้บุคลากรทางการแพทย์พัฒนาความรู้อย่างต่อเนื่อง และ สร้างสังคมให้ความตื่นตัวในเรื่องสุขภาพหัวใจทั้งการป้องกัน และพัฒนามาตรฐานการรักษาดูแลให้ดียิ่งขึ้น

ความสามารถในการมองอนาคต (Envision)

เป็นศูนย์รวมองค์ความรู้ และแหล่งอ้างอิงทางวิชาการด้านโรคหัวใจในระดับสากล และเป็นพลังผลักดันให้เกิดสังคมหัวใจแข็งแรง

พันธกิจ (Mission)

ต่อสมาชิก

1. กระตุ้นให้สมาชิกในการเข้ามีส่วนร่วมในการพัฒนา และส่งเสริมความสัมพันธ์ระหว่างสมาชิกด้วยกัน
2. ให้ข้อมูลความรู้ที่ทันสมัยกับสมาชิกในการพัฒนาศักยภาพ
3. ส่งเสริมความร่วมมือกับองค์การวิชาชีพอื่นในระดับชาติและนานาชาติ

ต่อการให้บริการ

1. เป็นที่ปรึกษาทางวิชาการ
2. สร้าง พัฒนาองค์ความรู้ด้วยการวิจัย การอบรมและสัมมนาทางวิชาการ

ต่อสังคม

1. เผยแพร่ความรู้เพื่อสร้างให้สังคมไทยหัวใจแข็งแรง
2. ให้บริการด้านสุขภาพร่วมกับหน่วยงานอื่นที่เกี่ยวข้อง

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Organizing Committee

คณะกรรมการบริหารสมาคมแพทย์โรคหัวใจแห่งประเทศไทย ในพระบรมราชูปถัมภ์
THE HEART ASSOCIATION OF THAILAND UNDER THE ROYAL PATRONAGE OF H.M. THE KING
(เมษายน 2561- มีนาคม 2563)

นายกสมาคม	***ครรชิต ลิขิตธนสมบัติ***
President	Khanchit Likitthanasombat
อุปนายก	***รุ่งโรจน์ กฤตยพงษ์***
Vice President	Rungroj Krittayaphong
เลขาธิการ	***เกษม รัตนสุมาวงศ์***
Secretary-General	Kasem Ratanasumawong
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กรรมกลาง	***ธีรภัทร ยิ่งชนม์เจริญ***
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	ระพีพล กุญชร ณ อยุธยา
	Rapeephon Kunjara-Na-Ayudhya
	อดิศัย บัวคำศรี
	Adisai Buakhamsri
	วิวรรณ ทังสุบุตร
	Wiwun Tungsubutra
	นิธิมา รัตนสิทธิ์
	Nithima Ratanasith
	สมนพร บุณยะรัตเวช สองเมือง
	Smonporn Boonyaratavet Songmueng

Message from President

Dear Colleagues and Friends,

It is my honor and privilege to welcome you to the 51st Annual Scientific Meeting of The Heart Association of Thailand under the Royal Patronage of H.M. the King, 21st – 24th March 2019 at Sheraton Hotel, Hua Hin, Thailand.

The theme "Cardiology 5.1" aims to bring together the best minds in the field of cardiology to share and exchange views and clinical experiences on the latest research breakthroughs of several complex cardiovascular diseases.

In recognition of our two outstanding cardiac surgeon and cardiologist, this year, we are honored to present the Kasarn Jatikavanit Memorial Lecture on "Stroke prevention in AF: Asian perspective" by Dr. Gregory Yee Lip and the Kamon Sindhvanandha Honorary Lecture on "Big Data Cardiology" by Dr. Piyamitr Sritara.

On behalf of the Heart Association of Thailand under the Royal Patronage of H.M. the King, I would like to express our deep gratitude to everyone participating in this meeting and making it a successful and rewarding event. I would like also to express our sincerest thanks to the conference sponsors, and to all our members and staff for their contribution to the organization of this meeting. I certainly hope this will help strengthen further collaboration among those involved in cardiovascular medicine.

Looking forward to meeting all of you in Hua Hin in March 2019.

Warmest regards,

Khanchit Likittanasombat, MD
President
The Heart Association of Thailand under the Royal Patronage of H.M. the King

Message from Secretary General

Dear Colleagues,

It is my great pleasure to welcome you to the 51st Annual Scientific Meeting of the Heart Association of Thailand under the Royal Patronage of H.M. the King scheduled to take place from 21st – 24th March 2019 in Hua Hin, Thailand.

The mission of the Heart Association of Thailand under the Royal Patronage of H.M. the King, is to address issues in cardiovascular disease and to provide the latest educational knowledge to those involved in the management of patients with complex cardiovascular diseases. We hope, this year's scientific program will attract the interest of not only physicians but also healthcare personnel.

As we are all well aware, cardiovascular disease affects not only the elderly, but also young and middle-aged alike. There are many unrecognized cases of sudden cardiac death claiming their lives. Sessions dedicated to this will hope to improve awareness and help this depressing condition.

Your interaction with your colleagues from many different institutes will stimulate a creative exchange of ideas and will be personally rewarding.

We do look forward to welcoming all of you back to help make this annual cardiology event a successful one.

Yours sincerely,

Kasem Ratanasumawong

Kasem Ratanasumawong, MD
Secretary General
The Heart Association of Thailand under the Royal Patronage of H.M. the King

Message from Scientific Chairman

Dear Friends and Colleagues,

On behalf of the Organizing Committee, it is my great pleasure to welcome you to the 51st Annual Scientific Meeting of the Heart Association of Thailand under the Royal Patronage of H.M. the King scheduled to take place in Hua Hin, Thailand from 21st – 24th March 2019.

Themed "Cardiology 5.1" of this year scientific program has been designed to meet the specific education needs of not only physicians but also allied professionals engaged in cardiovascular care including nurses, pharmacists, medical technicians and scientists. The meeting will serve as a forum for the attendees for sharing and exchanging of ideas on new and emerging approaches to diagnosis, management and treatment of heart diseases with local and internationally renowned experts. A series of state-of-the-art presentations and symposia will also be presented by them.

We strongly believe that the 4 days meeting will serve as an inspiration and to further enrich and equip you in today's management and treatment of several complex cardiovascular diseases. We also hope you will be as excited as we are during the meeting and take part vigorously in all sessions.

We look forward to your active participation in the 51st Annual Scientific Meeting of the Heart Association of Thailand under the Royal Patronage of H.M. the King and to welcoming you in Hua Hin in March 2019.

Yours sincerely,

Tachapong Ngarmukos, MD, FACC, FESC, FACP
Scientific Chairman
The Heart Association of Thailand under the Royal Patronage of H.M. the King

Invited International Faculty list

Gregory YH Lip, MD
Cardiologist, Liverpool Centre for Cardiovascular Science at the University of Liverpool and Liverpool Heart & Chest Hospital, United Kingdom

Koonlawee Nademanee, MD, FACC, FHRS, FAHA Cardiologist,
The Director of Pacific Rim, Electrophysiology Research Institute, LA, USA

Ong Hean Yee, MD
President:Singapore Cardiac Society,
Cardiologist, Mount Elizabeth Novena Hospital, Singapore

Sofian Johar, MD
President: Brunei Cardiac Society,
Cardiologist, RIPAS Hospital / Gleneagles JPMC Brunei Darussalam

Invited Thai Faculty list

Adisai Baukumsri, MD
Cardiologist, Thammasat University, (Rangsit Campus), Prathumtani, Thailand

Adisorn Wongsa, MD
Chest, Critical Care, Pramongkutklao Hospital, Bangkok, Thailand

Anek Kanoksilp, MD
Cardiologist, Central Chest Institute of Thailand, Nonthaburi, Thailand

Apichai Khongphatthanayothin, MD
Pediatric Cardiology, Bangkok Hospital, Bangkok, Thailand

Arisara Suwanagool, MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Boonlawat Homvises, MD
Cardiac Surgeon, Thammasat University, (Rangsit Campus), Prathumtani, Thailand

Bundit Naratrekoon, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Chaisiri Wanlapakorn, MD
Cardiologist, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Charn Sriratanasathavorn, MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Jakrapan Chaipromprasit, MD
Cardiologist, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Kanyalak Vithessonthi,MD
Pediatric Cardiology, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Krisada Sastravaha, MD
Cardiologist, Bhumibol Adulayadej Hospital, Royal Thai Airforce, Bangkok, Thailand

Krissada Meemook, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Mann Chandavimol , MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Nakarin Sansanayudh, MD
Cardiologist, Pramongkutklao Hospital, Bangkok, Thailand

Narathip Chunhamaneewat, MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Nithima Ratanasit, MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Pairoj Chattranukulchai, MD
Cardiologist, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Pantep Angchaisuksiri, MD
Hematology, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Pat Ongcharit, MD
Cardiac Surgeon, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Pattarapong Makarawate, MD
Cardiologist, Khon Kaen University, Khon Kaen, Thailand

Pavit Pienvichit, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Piyamitr Sritara, MD
Dean Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Piyanuj Ruckpanich, MD
Cardiac Rehabilitation, Piyavate Hospital, Bangkok, Thailand

Pranya Sakiyalak, MD
Cardiac Surgeon, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Prin Vathesatogkit, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Rungroj Krittayaphong, MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Rungsrit Kanjanavanich, MD
Cardiologist, Chiang Mai University, Chiang Mai, Thailand

Sarin Lekchuensakul, MD
Pediatric Cardiology, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Sirin Apiyasawad, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Wacin Buddhari, MD
Cardiologist, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Wanwarang Wongcharoen, MD
Cardiologist, Chiang Mai University, Chiang Mai, Thailand

Wattana Wongtheptien, MD
Cardiologist, Chiangrai Prachanukroh Hospital, Chiangrai, Thailand

Wilawan Thirapattarapong, MD
Cardiac Rehabilitation, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Wiwun Tungsubutra, MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Invited Faculty Nurse list

Anong Amaritakomol, RN
Nursing, Heart Failure clinic, Maharaj Nakorn Chiang Mai Hospital, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

Arun Nurake, RN, M.Ed
Nursing, Western University, Kanchanaburi, Thailand

Kanogporn Jamsomboon, RN, PhD. HRD
Nursing, Central Chest Institute of Thailand, Nonthaburi, Thailand

Maream Prousoontorn, RN
Nursing, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Namfon Khatjuang, RN
Nursing, Central Chest Institute of Thailand, Nonthaburi, Thailand

Pataraporn Kheawwa, RN, PhD
Nursing, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Penchun Saenprasarn, RN, *D.B.A*
Nursing, Chancelloe of Shinawatra University, Prathumthani, Thailand

Pranee Thongsai, RN
Nursing, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Sineenart Likitratcharoen, RN
Nursing, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Urasri Imsomboon, RN
Nursing, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Invited Faculty Pharmacist list

Arom Jedsadayanmata, Pharm.D., PhD
Division of Pharmaceutical Care, Faculty of Pharmacy, Thammasat University, Pathum Thani, Thailand

Krittin Bunditanukul, PharmD, FAC, BCPS
Pharmacy Practice Department, Chulalongkorn University, Bangkok, Thailand

Pattamawan Kosuma, Pharm D, BCPS, BCP
Division of Pharmaceutical Care, Faculty of Pharmacy, Naresuan University, Phitsanulok, Thailand

Pornnalat Katekaow, MS
Department of Pharmacy, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Surakit Nathisuwan, PharmD, BCPS
Clinical Pharmacy Division, Department of Pharmacy, Faculty of Pharmacy, Mahidol University, Bangkok, Thailand

Wipharak Rattanavipanon, BSc (Pharm)
Clinical Pharmacy Division, Department of Pharmacy, Faculty of Pharmacy, Mahidol University, Bangkok, Thailand

Invited Moderators

Adisai Buakhumsri, MD
Cardiologist, Thammasat University, (Rangsit Campus), Prathumtani, Thailand

Ankavipar Saprungruang, MD
Pediatic Cardiology, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Arintaya Phromintikul, MD
Cardiologist, Chiang Mai University, Chiang Mai, Thailand

Arisara Suwanagool, MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Charn Sriratanasathavorn, MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Kasem Ratanasumawong, MD
Cardiologist, Police General Hospital, Bangkok, Thailand

Khanchit Likittanasombat, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Mallika Wannakrairot, MD (Khunying)
Cardiologist, Piyavate Hospital, Bangkok, Thailand

Maream Prousoontorn, RN
Nursing, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Namfon Khatjuang, RN
Nursing, Central Chest Institute of Thailand, Nonthaburi, Thailand

Pataraporn Kheawwa, RN, PhD
Nursing, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Pranya Sakiyalak, MD
Cardiac Surgeon, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Prin Vathesatogkit, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Pyatat Tatsanavivat, MD
Cardiologist, Khon Kaen University, Khon Kaen, Thailand

Rapeephon Kunjara Na Ayudhya, MD
Cardiologist, Vichaiyut Hospital, Bangkok, Thailand

Rungroj Krittayaphong, MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Rungsarit Kanjanavanich, MD
Cardiologist, Chiang Mai University, Chiang Mai, Thailand

Sineenart Likitratcharoen, RN
Nursing, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Smonporn Boonyaratavej Songmuang, MD
Cardiologist, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Somkiat Sangwattanaroj, MD
Cardiologist, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Sukit Yamwong, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Surakit Nathisuwan, PharmD, BCPS
Clinical Pharmacy Division, Department of Pharmacy, Faculty of Pharmacy, Mahidol University, Bangkok, Thailand

Tachapong Ngarmukos, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Teerapat Nantsupawat, MD
Cardiologist, Chiang Mai University, Chiang Mai, Thailand

Teerapat Yingchoncharoen, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Thananya Boonyasirinant, MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Treechada Wisaratapong, MD
Cardiologist, Prince of Songkla University, Songkla, Thailand

Vichai Senthong, MD
Cardiologist, Khon Kaen University, Khon Kaen, Thailand

Wiwun Tungsubutra,MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Invited Judges

Young Investigator Award

Sofian Johar, MD
President; Brunei Cardiac Society

Hav Ratneary, MD
Vice-President; Cambodian Heart Association

Jetty Sedyawan, MD
Secretary General; Indonesian Heart Association

Bounhieng PHALIBAY, MD
President; Laos Cardiac Society

Lam Kai Huat, MD
Secretary General; National Heart Association of Malaysia

Aung Zaw Myo, MD
Secretary General; Cardiac Society Myanmar Medical Association

Aurelia Leus, MD
Vice-President; Philippine Heart Association

Ong Hean Yee, MD
President; Singapore Cardiac Society

Khanchit Likittanasombat, MD
President; The Heart Association of Thailand under The Royal Patronage of H.M. the King

Linh Huynh Dinh, MD
Council Member; Vietnam National Heart Association

Invited Judges & Commentators: Cardiology Got Challenge

Khanchit Likittanasombat, MD
Cardiologist, Ramathibodi Hospital, Siriraj Hospital, Mahidol Mahidol University, Bangkok, Thailand

Nakarin Sansanayudh, MD
Cardiologist, Pramongkutklao Hospital, Bangkok, Thailand

Smonporn Boonyaratavej Songmuang, MD
Cardiologist, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Wiwun Tungsubutra,MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Invited Judges: Fellow Poster Presentation

Arintaya Phrominthikul, MD
Cardiologist, Chiang Mai University, Chiang Mai, Thailand

Prin Vathesatogkit, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Pyatat Tatsanavivat, MD
Cardiologist, Khon Kaen University, Khon Kaen, Thailand

Rungroj Krittayaphong, MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Rungsrit Kanjanavanich, MD
Cardiologist, Chiang Mai University, Chiang Mai, Thailand

Smonporn Boonyaratavej Songmuang, MD
Cardiologist, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Sukit Yamwong, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Vichai Senthong, MD
Cardiologist, Khon Kaen University, Khon Kaen, Thailand

Invited Commentators: โต๊ะมหาสนุก

Khanchit Likittanasombat, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Nithima Ratanasith, MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Rungroj Krittayaphong, MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Teerapat Yingchoncharoen, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Waraporn Tiyanon, MD
Cardiologist, Pramongkutklao Hospital, Bangkok, Thailand

Wiwun Tungsubutra, MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Invited Judges: JEOPARDY

Pairoj Chattranukulchai, MD
Division of Cardiology, Department of Medicine, Faculty of Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Teerapat Yingchoncharoen, MD, FAsCC
Assistant Dean for Medical Education, Director, Heart Failure and Cardiomyopathy Clinic, Instructor of Medicine, Cardiovascular Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Wanwarang Wongcharoen, MD
Department of Medicine, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

Invited Presenter:

Pattarapong Makarawate, MD
Cardiologist, Khon Kaen University, Khon Kaen, Thailand

Satchana Prumpruck, MD
Cardiologist, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Tetsuro Takase, MD
Cardiologist, Department of Cardiology, Ayase Heart Hospital, 2-16-7, Yanaka, Adachi, Tokyo, Japan

Invited Panelists:

Adisorn Wongsa, MD
Chest, Critical Care, Pramongkutklao Hospital, Bangkok, Thailand

Pantep Angchaisuksiri, MD
Hematology, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Smonporn Boonyaratavej Songmuang, MD
Cardiologist, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Surapun Sitthisook, MD
Cardiologist, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Thoranis Chantarat, MD
Cardiologist, Pramongkutklao Hospital, Bangkok, Thailand

Curriculum Vitae

Adisai Buakhamsri, MD
Thammasat Heart Center and Cardiovascular Medicine,
Department of Medicine, Faculty of Medicine
Thammasat University Hospital, Klongluang,
Pathumthani, Thailand

Title and/or degrees:
Assistant professor/MD

Education and training:
- MD (Ramathibodi Hospital, Mahidol University)
- Board of Internal Medicine (Ramathibodi Hospital, Mahidol University)
- Board of Cardiology (Ramathibodi Hospital, Mahidol University)
- Research Fellowship in Advance Cardiac Imaging (Cleveland clinic, Ohio, US) Special interests Echocardiography, cardiomyopathy, heart failure in systemic disease

Adisai Buakhamsri, MD, is a staff cardiologist in Thammasat University Hospital and head of echocardiography laboratory of Thammasat Heart Center. Dr. Buakhamsri is board-certified in Thai Board of Internal Medicine, Family Medicine and the Cardiovascular Subspecialty Board. His specialty interest is echocardiography, cardiac diastology, exercise physiology and heart failure.

He received his MD with Honor from Mahidol University and went to practice in rural area of Thailand for three years after graduation. He then completed his residency in internal medicine and a clinical fellowship in cardiology at Ramathibodi hospital, Mahidol University, followed by a research fellowship in Advance Cardiovascular Imaging at The Cleveland Clinic, USA.

Dr. Buakhamsri is an assistant professor and a cardiology faculty in Department of Medicine at Thammasat University. He teaches medical students, medicine residents and cardiology fellows. His clinical researches are mainly in the field of heart failure and cardiac diastology. He has been an invited lecturer to both national and international medical conferences in Thailand.

Dr. Buakhamsri has published many peer-viewed articles in international professional journals (Circulation, European Heart Journal, JASE) and written medical book chapters. His research abstracts were selected for oral presentation session in annual scientific meeting of professional organizations including American Heart Association and American Society of Echocardiography. He also served as a peer reviewer for professional journals including the Circulation.

Dr. Buakhamsri is a member of the following professional societies: the Royal College of Physician of Thailand (RCPT), the Heart Association of Thailand (HAT), the Asian Society of Cardiac Imaging (ASCI), Thai Society of Echocardiography (TSE), Heart Failure Council of Thailand (HFCT), Thai Society of Cardiac Imaging (TSCI). For the latter three, he also serves as a member of executive committee.

Adisorn Wongsa, MD
Pulmonary & Critical Care division,
Department of Medicine,
Phramongkutklao Hospital
Bangkok, Thailand

Title and/or degrees:
Lieutenant General, MD

Qualifications:

M.D.	1st class honor, Phramongkutklao college of Medicine
Dip.	American board of Internal Medicine
Dip.	American board of Pulmonary Medicine
Dip.	American board of Critical Care Medicine
FCCP	

Postgraduate Training:
Medical resident, McGill university Canada
Pulmonary & Critical Care fellowship training , McGill university Canada

Current position:
Lieutenant general
Senior consultant, Pulmonary & Critical Care division, Department of Medicine, Phramongkutklao Hospital

Academic activity:
- Secretary general, The Royal college of Physician of Thailand (2016-18)
- Past President of The Thoracic Society of Thailand (2014-18)
- Past President of The Thai Society of Critical Care Medicine (2003-2005)
- Scientific chairman of The Anti-tuberculosis association of Thailand (2007-2009)
- Scientific chairman of The Thai Asthma Council (2009-2012)

Anek Kanoksilp, MD
Cardiologist, Cardiology Department,
Central Chest Institute of Thailand,
Nonthaburi, Thailand

Title and/or degrees:
Civil officer, Medicine Doctor Level 9/M.D.

Area of Interest & Expertise: Complex Percutaneous Coronary Intervention (esp. LM bifurcation and chronic total occlusion), Intravascular Ultrasonography, Peripheral Vascular Intervention and Congestive heart failure

Academic qualification:
1992 Doctor of Medicine (First Class Hons.), Khonkaen University,Thailand
1996 Thai Board of Internal Medicine
2002 Thai Board of Cardiovascular Medicine
2008 Thai Board of Intervention cardiology

Post Doctoral Training:
1993-1996 Resident in Internal Medicine, Khonkaen University
2000-2002 Fellow in Cardiovascular Medicine, Central Chest Hospital,Thailand
2009-2010 Fellow in Intervention Cardiology, Kurashiki Central Hospital, Kurashiki, Okayama, JAPAN

Memberships: The Heart association of Thailand
The Thai Royal Collage of Physician

Apichai Khongphatthanayothin, MD., MPPM
Department of Pediatrics, LAC/USC Medical Center
Los Angeles, CA, USA

Title and/or degrees:
Professor, MD, MPPM

Education:

High School:	Triam Udom Suksa School, Bangkok, Thailand, 1983 Medical School
Faculty of Medicine:	Chulalongkorn University, Bangkok, Thailand, First Class Honor, 1989
Internship:	LAC/USC Medical Center (Pediatrics), University of Southern California, Los Angeles, CA, July 1990-June 1991
Residency:	LAC/USC Medical Center (Pediatrics), University pf Southern California, Los Angeles, CA, July 1991-June 1993
Chief Residency:	LAC/USC Medical Center (Pediatrics), University pf Southern California, Los Angeles, CA, July 1993-June 1994
Fellowship:	Children's Hospital Los Angeles (Pediatric Cardiology), Los Angeles, CA, July 1994-June 1997 University of Southern California (Research Fellow in Clinical Cardiac Electrophysiology), Los Angeles, CA, June 1997-May 1998 Department of Cardiology, Academic Medical Center, University of Amsterdam, Netherland (Fellow in Cardiogenetics), Amsterdam, Netherland, September 2013-November 2014

Honors and Awards: Young Investigator Award, The Heart Association of Thailand, The 38th Annual Meeting of the Heart Association of Thailand, Pattaya, 2006

Medical Licensure Number: 15508, Thailand, 1989
A49997, California, 1991

Board Certification: American Board of Pediatrics, 1994
American Board of Pediatric Cardiology, 1998

Master Degree: Master of Public and Private Management (M.P.P.M), National Institute of Development Administration, Bangkok, Thailand, 2011

Arom Jedsadayanmata, Pharm.D., PhD
Division of Pharmaceutical Care, Faculty of Pharmacy
Thammasat University, Pathum Thani, Thailand

Title and/or degrees:
Associate Professor/Pharm.D./PhD

Education:

2001	Doctor of Philosophy (Pharmacology), College of Medicine, University of Illinois at Chicago
1995	Doctor of Pharmacy (Honors), College of Pharmacy, University of Illinois at Chicago
1991	Bachelor of Science in Pharmacy (Second Class Honors), Faculty of Pharmaceutical Sciences, Chulalongkorn University

Training & Certification:
In Pharmacy

2001-present	Board Certified Pharmacotherapy (BCP) College of Pharmacotherapy of Thailand
2001-2008	Board Certified Pharmacotherapy Specialist (BCPS.) Board of Pharmaceutical Specialties, USA
2000-2001	Certificate of Residency Training in Pharmacy Practice with Emphasis in Critical Care, College of Pharmacy, University of Illinois at Chicago

Academic Appointment:

2015-Present	Associate Professor, Faculty of Pharmacy, Thammasat University
2013-2015	Associate Professor, Department of Pharmacy Practice, Naresuan University
2005-2013	Assistant Professor, Department of Pharmacy Practice, Naresuan University
1995-2005	Instructor, Department of Pharmacy Practice, Naresuan University

Administrative Appoinment:

2016-present	Associate Dean for Academic Services and Professional Affairs

Faculty of Pharmacy, Thammasat University

2014-2015	Associate Dean for Academic Affairs and Pharmacy Education

Faculty of Pharmacy, Naresuan University

2011-2013	Associate Dean for Policy, Planning and Research Faculty of Pharmacy, Naresuan University
2005-2008	Assistant to the University President, Naresuan University
2005-2008	Chief of Intellectual Property Service, Naresuan University
2002-2004	Associate Dean for Academic Affairs,Faculty of Pharmacy, Naresuan University

Arun Nurake, RN, M.Ed
Faculty of Nursing, Kanchanaburi,
Western University,
Kanchanaburi, Thailand

Title and/or degree
Assistant Professor, RN. , M.Ed.

Education and Training:

1972 Bachelor of Science(Nursing) Faculty of Nursing , Mahidol University
1973 Certificate in Cardio-Thoracic Nursing specialty , Mahidol University
1978 Master of Education(Nursing Administration) , Chulalongkorn University
2003 Certificate in Practice Development , Monash University , Australia

Professional Affiliation:

1979-2005 Clinical instructor in Cardio-Thoracic ward at Siriraj Hospital
1994-1995 Chairman of Thai Cardio-Thoracic Nurses Society
2004-2008 Secretary general of Thai Cardio-Thoracic Nurses Association
2012-Present Consultant of Thai Cardio-Thoracic Nurses Association
2015- Present Research Committee of Thai Cardio-Thoracic Nurses Association

Boonlawat Homvises, MD, FRCST
Department of Surgery, Faculty of Medicine
Thammasat University (Rangsit campus)
Pathumthani Thailand

Title and/or degrees:
Associate Professor/MD

Education And Professional Training:

Jun 1994- Mar 2000	MD (Doctor of Medicine), First class honour Faculty of medicine, Siriraj hospital, Mahidol University, Bangkok, Thailand
May 2002- May 2006	Diplomate Thai Board of General Surgery, Faculty of medicine, Siriraj hospital, Mahidol University, Bangkok, Thailand
May 2006- May 2008	Diplomate Thai Board of Thoracic Surgery Faculty of medicine, Siriraj hospital, Mahidol University, Bangkok, Thailand
Nov 2015- Oct 2017	Clinical Fellow in heart and lung transplantation Transplant unit, Papworth hospital, Cambridge, United Kingdom

Employment:

Jun 2012- present	Assistant Professor of Surgery Department of surgery, Faculty of medicine, Thammasat university [Rangsit campus] Pathumthani, Thailand
Jun 2008- May 2012	Lecturer in Surgery, Department of surgery, Faculty of medicine, Thammasat university [Rangsit campus] Pathumthani, Thailand

Fields Of Interest:
Heart and Lung Transplantation
Mechanical circulatory support
Heart failure surgery
Minimal invasive cardiac surgery
Video-assisted thoracic surgery

Bundit Naratreekoon, MD
Cardiovascular unit,
Department of Internal medicine,
Ramathibodi hospital, Mahidol university,
Bangkok, Thailand

Title and/or degrees:
MD

Education/Training:

2000-2006	Medical degree, Prince of Songkla University, Songkhla, Thailand
2006-2007	Internship, Prince of Songkla University, Songkhla, Thailand
2007-2010	Internal medicine residency, Prince of Songkla University, Songkhla, Thailand
2013-2015	Cardiology fellow, Ramathibodhi hospital, Mahidol University, Thailand
2016-2017	Advance echocardiography fellowship
2016-2017	Advance heart failure, mechanical circulatory support & heart transplantation fellowship

Positions and Employment:

2010-2012	Internist, Bangkok-Hat Yai hospital, Songkhla, Thailand
2012-2013	Internist, Somdech Phra Debaratana Medical Center (SDMC), Bangkok, Thailand
2015-2016	Cardiologist Bangkok-Hat Yai hospital, Songkhla, Thailand
2017-present	Advance echocardiography, advance heart failure, mechanical circulatory support & heart transplantation cardiologist, Cardiovascular unit, Department of internal medicine, Ramathibodi hospital, Mahidol university, Thailand

Certification:

2006 – present	Medical Licensure
2011 – present	Thai board of Internal medicine
2016-2017	Advance echocardiography fellowship
2016-2017	Advance heart failure and transplantation fellowship
2014-present	Thai board of cardiology
2017	99th Percentile rank, Examination of Special Competence in Adult Echocardiography 2017 (ASCeXAM), National Board of Echocardiography, USA

Professional Society Membership:

2006 - present	Member, Medical Council of Thailand
2011 - present	Member, Royal college physician Thailand
2014 - present	Fellow, Thai heart association

Chaisiri Wanlapakorn, MD, MSc
Cardiovascular unit, Cardiac center,
King Chulalongkorn Memorial Hospital
Bangkok, Thailand

Title and/or degrees:
MD, MSc

Education:

2001-2006	Echulalongkorn University Faculty of Medicine, Doctor of Medicine (First Class Honor) Bangkok, Thailand
2010-2012	Chulalongkorn University Faculty of Medicine, higher graduate diploma of clinical science in internal medicine (First Class Honor) Bangkok, Thailand
2013-2014	Chulalongkorn University Faculty of Medicine, Master of Science in Medicine (Cardiology) (Second Class Honor) Bangkok, Thailand
2010-2012	King Chulalongkorn Memorial Hospital Internal medicine residency training, Bangkok, Thailand
2013-2014	King Chulalongkorn Memorial Hospital Cardiology fellowship training, Bangkok, Thailand

Training:

August 2018	The 8th Asia-Pacific Fractional Flow Reserve (FFR) Course (Beijing, China)
September 2018	ACLS Instructor Course (Bangkok, Thailand)
October 2018	Rotational atherectomy and intravascular ultrasound (ROVUS) training, (Miyazaki, Japan)

Licensure:

Since June 2013	Certified Thai Board of Internal Medicine
Since June 2015	Certified Thai Board of Cardiology
Since July 2017	Certified Thai Board of Interventional Cardiology

Charn Sriratanasathavorn, MD
Sirirajpiyamaharajkarun Hospital,
Mahidol Faculty of Medicine, Siriraj Hospital,
Mahidol university, Bangkok, Thailand

Title and/or degrees:
Associate Professor, MD

Education and Training:
1981-87 Mahidol University (Siriraj Hospital), Bangkoknoi, Thailand
1990-91 Internship, Internal Medicine, Detroit Medical Center, Wayne State University, Detroit, Michigan, USA
1991-93 Residency, Internal Medicine, Detroit Medical Center, Wayne State University, Detroit, Michigan, USA
1993-96 Fellowship, Cardiology, Emory University School of Medicine, Atlanta, Georgia, USA
1996-97 Fellowship, Cardiac Electrophysiology, Emory University School of Medicine, Atlanta, Georgia, USA
Current Position: Associate Professor, Her Majesty's Cardiac Center, Siriraj Hospital, Mahidol University, Bangkok, Thailand
Director, Sirirajpiyamaharajkarun Hospital, Mahidol University, Bangkok, Thailand

Medical Affiliation:
- President of The Thai Cardiac Electrophysiology Club, The Heart Association of Thailand under the Royal Patronage of HM the King
- Member of The Heart Association of Thailand under the Royal Patronage of HM the King
- Member of The Royal College of Physicians of Thailand
- Fellow of The American College of Cardiology

Licensure And Certificate:
- The Degree of Doctor of Medicine, Thailand
- Certificate American Board of Internal Medicine
- Certificate American Board of Cardiovascular Disease
- Certificate American Board of Clinical Cardiac Electrophysiology
- Certificate Thai Board of Internal Medicine
- Certificate Thai Board of Cardiovascular Disease

Hornors And Awards:
1981 Ranked 1st in All country University Entrance Examination, Thailand
1987 Award as the best medical graduate in Internal Medicine
1987 Gold Medal Award as the top medical graduate

Gregory YH Lip, MD
Liverpool Centre for Cardiovascular Science,
at the University of Liverpool and Liverpool Heart &
Chest Hospital, United Kingdom

Title and/or degrees:
Professor/MD

Professor Lip, MD, is Price-Evans Chair of Cardiovascular Medicine, at the University of Liverpool, UK – and Director of the Liverpool Centre for Cardiovascular Science at the University of Liverpool and Liverpool Heart & Chest Hospital. He is also Distinguished Professor at Aalborg University, Denmark; and Adjunct Professor, Yonsei University, Seoul, Korea.

Half of his time is spent as a clinical cardiologist, including outpatient clinics (leading large atrial fibrillation and hypertension specialist services) and acute cardiology.

Professor Lip has had a major interest into the epidemiology of atrial fibrillation (AF), as well as the pathophysiology of thromboembolism in this arrhythmia. Furthermore, he has been researching stroke and bleeding risk factors, and improvements in clinical risk stratification. The CHA2DS2-VASc and HAS-BLED scores - for assessing stroke and bleeding risk, respectively – were first proposed and independently validated following his research, and are now incorporated into international guidelines. In 2014, Professor Lip was ranked by Expertscape as one of the world's leading experts in the understanding and treatment of AF [http://bit.ly/2apB1Dt].

Professor Lip was on the writing committee for various international guidelines, including the American College of Chest Physicians (ACCP) Antithrombotic Therapy Guidelines for Atrial Fibrillation, as well as various guidelines and/or position statements from the European Society of Cardiology (ESC) or EHRA. Specifically, he was also on the writing committees of the 2010 ESC Guidelines on Atrial Fibrillation, the 2012 ESC Focused Update Guidelines on Atrial Fibrillation, the 2012 ESC Guidelines on Heart Failure, and the 2014 NICE guidelines on AF. He was Deputy Editor ("content expert") for the 9th ACCP guidelines on antithrombotic therapy for AF (2012), and Chair of the new 2018 ACCP Guidelines on antithrombotic therapy for AF.

Professor Lip has acted as senior/section editor for major international textbooks and at senior editorial level for major international journals, including Thrombosis & Haemostasis (Editor-in-Chief, Clinical Studies); Europace (Associate Editor); and Circulation (Guest Editor).

Jarkarpun Chairpromprasit, MD
Cardiac center,
King Chulalongkorn Memorial Hospital,
Bangkok Thailand

Title and/or degrees:
MD

Title & Affiliation: Interventional cardiologist
Cardiac center King Chulalongkorn Memorial Hospital

Current Position: Attending physician in Cardiovascular medicine unit, Department of Medicine, King Chulalongkorn Memorial Hospital, Bangkok Thailand

Degree and Certification:

1987 Doctor of Medicine, Chulalongkorn University, Bangkok Thailand
1990 Master degree of Business Administration, Thammasart University, Bangkok, Thailand
1991 Diploma in Clinical science in Internal Medicine, Chulalongkorn University, Bangkok, Thailand
1993 Diploma Thai Board of Internal Medicine
1995 Diploma Thai Board of Cardiology
1995 Master Degree of Medical Science in Medicine, Chulalongkorn University, Bangkok Thailand
2000 Certification in Interventional Cardiology, St Luke's-Roosevelt Hospital Center, Columbia University College of Physicians and Surgeons, New York, USA

Working Experience:

1987 - 1990 Medical officer in Bangkok Metropolitan Health Clinic, Bangkok, Thailand
1997 - present Attending physician in Interventional Cardiology, Department of Medicine, King Chulalongkorn Memorial Hospital

Kanogporn Jamsomboon, RN, PhD., HRD
Nursing Director, Nursing Department
Central Chest Institute of Thailand,
Nonthaburi, Thailand

Title and/or degrees:
Expert Nurse/RN/PhD./HRD

Current position: Director of Nursing, Chest Disease Institute of Thailand, Nonthaburi, Thailand

Area of Interest: Cardiothoracic and Vascular nursing. Nursing Administration

Academic qualification:
1985 B.Sc. (Public Health), Sukhothaithamatirat University, Bangkok, Thailand
1990 Certificate in Cardiothoracic and Vascular Nursing, Auckland Area Health Board, New Zealand
1996 M.N. (Master of Nursing), Mahidol University, Bangkok, Thailand
2016 PhD.(Haman Resources Development)

Membership:
Thai Nursing Council
Thai Cardiovascular - Thoracic Nurses Association
The Nurse's Association of Thailand

Kanyalak Vithessonthi, MD
Pediatric Cardiology Division,
Department of Pediatrics,
Faculty of Medicine, Siriraj Hospital
Bangkok, Thailand

Title and/or degrees:
MD

Position:

July 2012-Present	Pediatric Cardiologist at Pediatric Cardiology Surgery Foundation (PCSF) Part-time Pediatric Cardiologist Staff at King Chulalongkorn Memorial Hospital
June 2008-June 2012	Pediatric Cardiologist Staff at King Chulalongkorn Memorial Hospital

Education:

2004-2005	Master of Science Degree in Pediatrics Faculty of Medicine, Chulalongkorn University, Thailand
2003-2004	Graduate Diploma of Clinical Sciences in Pediatrics Faculty of Medicine, Chulalongkorn University, Thailand
1994-2000	Doctor of Medicine (2^{nd} Class Honors) Faculty of Medicine, Chulalongkorn University, Thailand

Postgraduate Training:

May -August 2018	Observership in Adult Congenital Heart Disease, UCLA, USA
Sep 2017- March 2018	Observership and research assistant in Pediatric Cardiology and Adult Congenital Heart Disease, Rikhospitalet, Oslo, Norway
2006-2008	Fellow in Pediatric Cardiology King Chulalongkorn Memorial Hospital, Bangkok, Thailand
2005-2006	Chief Resident in the Pediatric Residency Program King Chulalongkorn Memorial Hospital, Bangkok, Thailand
2003-2006	Residency in Pediatrics King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Board Certifications:
- Thai Subboard of Pediatric Cardiology
- Board of Pediatrics
- Medical Council of Thailand

Koonlawee Nademanee, MD, FACC, FHRS, FAHA
Pacific Rim Electrophysiology Research Institute
Los Angeles, CA, USA

Title and/or degrees:
Professor/MD, FACC, FHRS, FAHA

Education:

High School	Triam-Udomsuksa School, Bangkok, Thailand
University	Chulalongkorn University, Bangkok, Thailand: BSc, 1971
Medical School	Chulalongkorn University: MD, 1973 Bangkok, Thailand , Second Class Honor
Internship	Straight Medical Intern: July 1975-June 1976 Tulane University, Touro Infirmary, New Orleans, Louisiana, USA
Residencies	Medical Resident: July 1976-June 1978 Tulane University, Touro Infirmary, New Orleans, Louisiana, USA
Fellowship	Cardiology Fellow: July 1978-June 1980 West Los Angeles VA Medical Center, Department of Medicine, Los Angeles, California, USA

Royal Thai Decorations:

2007	Knight Grand Commander of the Most Illustrious of Chula Chom Klao
2001	Knight Commander of the Most Illustrious order of Chula Chom Klao
2002	1998 Grand Companion of the Most Illustrious order of Chula Chom Klao

Honors and Awards:

2005	Honorary Doctorate in Medicine: Mahidol University, Bangkok, Thailand
March 19,1999	Outstanding Service Merit Award: 50th Anniversary of Bhumibol Adulyadej Hospital, Royal Thai Air Force-Golden Jubilee Celebration, Bangkok, Thailand
1995	Special Recognition for Excellence in Clinical Consultation of LAAM's Effects on the Human Electrocardiogram: Medications Development Division. National Institute on Drug Abuse, 1995
1994	Honorary Consultation in Cardiology at Bhumibol Adulyadej Hospital, Bangkok, Thailand
1994	Outstanding Service Merit Award from the Division of Cardiology at University of Colorado
1993	Denver Health and Hospitals Senior Faculty Scholarly Achievement Award
1993	Visiting Professor of Cardiology at Her Majesty's Cardiac Centre, Siriraj Hospital, Bangkok, Thailand, for the academic year, Excellence in Cardiology, Touro Infirmary, Tulane University 1978

Patents:
Mapping of Complex Fractionated Atrial Electrograms (CFAE)
US Patent and Trademark Office, Department of Commerce
Patient Number 11/620,370

Licensure:
California, July 1978: No. A 032891
Colorado, April 1990: No. 30166
Hawaii, August 1997: No. MD-9979

Board Certification:

- Diplomate in American Board of Internal Medicine, September 1978
- Diplomate in American Board of Cardiovascular Disease, November 1981
- Diplomate in American Board of Clinical Cardiac Electrophysiology, 1994, Recertified 2004 and 2014.

Professional Background

Academic Appointments

2018- present	Distinguished Professor of Medicine Chulalongkorn University, Thailand
2000- 2015	Clinical Professor of Medicine University of Southern California
1995-2000	Professor of Medicine (Tenure) University of Southern California
1990-1995	Professor of Medicine (Tenure) University of Colorado
1986-1990	Associate Professor of Medicine (Tenure) University of California, Los Angeles School of Medicine
1980-1986	Assistant Professor of Medicine University of California, Los Angeles School of Medicine

Specific Teaching Responsibilities:

January 1995-2000	Electrophysiology Tracing Rounds, Division of Cardiology, Electrophysiology Service, USC School of Medicine
January 1995-2000	Cardiology Conference at Los Angeles County + USC Medical Center for cardiology fellows, medical staff, and medical students
July 1990-Nov 1994	Cardiology Conference at Denver General Hospital for cardiology fellows, medical staff, and medical students
July 1990-Nov 1994	Lecturer in cardiac arrhythmias and electrophysiology for Department of Medicine, Emergency Department and Rocky Mountain Poison Center
1992	Introduction course in pathophysiology of cardiovascular diseases, University of Colorado, USA
1987-1990	"How to Manage Cardiac Arrhythmias" lecture every six weeks to resident staff at West Los Angeles VA Medical Center
1986-1990	EKG lecture for staff and fellows bimonthly at West Los Angeles VA Medical Center
1987-1990	Course in EKG to third-year clerkship medical students, UCLA
1987-1990	Conducting Electrophysiology Conference every Friday at West Los Angeles VA Medical Center

Specific Administrative Responsibilities:

July 2008-Present	Director Heart Rhythm Institute, White Memorial Hospital.
July 2003-June 2008	Director, Heart Rhythm Institute, Centinela Hospital Medical Center
July 2000-Present	Director, Pacific Rim Electrophysiology Research Institute
July 2000-2003	Director of Electrophysiology at Tommy Lasorda Heart Institute, Centinela Hospital, Medical Center
Jan 1995-June 2000	Director of Electrophysiology and Pacing, USC School of Medicine
July 1990-Dec 1994	Chief of Cardiology , Denver General Hospital
July 1984-June 1990	Director of Clinical Electrophysiology, West Los Angeles VA Medical Center
Oct 1981-June 1984	Acting Chief, Coronary Care Unit, West Los Angeles VA Medical Center
July 1980-Present	Staff Physician in Cardiology, West Los Angeles VA Medical Center

Other Professional Activities:

Editorial Boards:

October 2007-Present	The Journal of Cardiology Official Journal for the Japanese College of Cardiology
October 1994-Present	Journal of Cardiovascular Pharmacology and Therapeutics
July 1991-1993	Journal of the American College of Cardiology
July 1991-1994	Circulation

Frequent reviewer for: American Journal of Cardiology; American Journal of Medicine; Annals of Internal Medicine; American Heart Journal; Journal of Cardiovascular Electrophysiology; Euro PACE; Journal of the American Medical Association; and Pacing and Clinical Electrophysiology, Heart Rhythm, Journal of the American College of Cardiology, and Circulation, IEEE, Canadian Journal of Cardiology,

Gp.Capt. Krisada Sastravaha MD
Deputy Director, Medical Operations Center RTAF
Staff physician and former Chief of Cardiology Unit,
Department of Medicine, Bhumibol Adulyadej Hospital, RTAF.
Bangkok, Thailand

Title and/or degrees:
Air Vice Marshal/MD

Education:

Dr. Sastravaha completed his high-school education from Chulalongkorn University Demonstration School and was one of 3 students from whole country whom received King's Scholarship for his college education in 1981. He graduated as a second-class honor medical doctor from Chulalongkorn University Faculty of Medicine in 1987. He has served with The Royal Thai Air Force since then and became a certified flight surgeon in 1988. He completed his Medicine Residency training at Bhumibol Adulyadej Hospital, Bangkok Thailand in 1992. From June 1998- June 1999, he was a clinical cardiology fellow at University of Colorado Health Sciences Center USA. He went to complete his Interventional Cardiology training at University of Arizona Health Sciences Center USA in June 2000. Dr.Sastravaha came back and served as a cardiologist at Bhumibol Adulyadej Hospital from 2001. He had been certified for Thai board of Cardiology in 2001. He has been promoted and served as Chief of Cardiology between 2006-2013. He had certified for Thai board of Interventional Cardiology in 2009. In October 2013, Dr. Sastravaha moved to Directorate of Medical Services RTAF and positioned as Operation Officer of Medical Operations Center, the new agency founded at that date. Currently, Dr. Sastravaha is a Deputy Director of Medical Operations Center, RTAF.

Dr. Sastravaha have been a member of Cardiovascular Interventional Club of Thailand since 1995 and became one of the first administrative committee when the Club became Cardiovascular Intervention Association of Thailand in 2009. He served as administrative committee and became Scientific Chairman in 2014-2016.

Dr. Sastravaha's fields of interest are Coronary Intervention, Acute Coronary Syndrome, Heart Failure and Preventive Cardiology. His other interests are including Computer Technology, Skydiving and Military Technology.

His Professional Military Educations are
Flight Surgeon School in 1988
Sport Skydive and Military Free-Fall Course in 1989
Squadron Leader School in 1993
Air Command and Staff College in 2003
Advance Administration Course for Military Medical Services 2007
Air War College in 2009

Advance Security Cooperation in 2015 and became Asia-Pacific Center for Security Study alumni since October 2015.

Relationship Development for Senior Administrator course at Institute of Security Psychology, National Defense Studies Institute, RTARF in 2017

Krissada Meemook, MD
Division of Cardiology, Department of Medicine,
Ramathibodi Hospital, Mahidol University,
Bangkok, Thailand

Title and/or degrees:
MD

Previous Appointments:

6/1/2008–5/31/2009	Staff and Consultant (Internal Medicine), Division of Medicine, Buddhachinaraj Hospital, Phitsanulok, Ministry of Public Health, Thailand
6/1/2008–5/31/2009	Special Lecturer, Faculty of Dentistry, Naresuan University, Phitsanulok, Thailand
6/1/2008–5/31/2009	Tuberculosis Advisory Committee, Buddhachinaraj Hospital, Phitsanulok, Ministry of Public Health, Thailand
6/1/2008–5/31/2015	Special Lecturer, Faculty of Medicine, Naresuan University, Phitsanulok, Thailand
6/1/2012-5/31/2015	Staff and Consultant (Clinical and Interventional Cardiology), Department of Medicine, Buddhachinaraj Phitsanulok Hospital, Phitsanulok, Ministry of Public Health, Thailand
9/1/2014–5/31/2015	Special Lecturer, Faculty of Allied Health Sciences, Naresuan University, Phitsanulok, Thailand

Educational Experiences:

6/1/1996-3/5/2002	Doctor of Medicine, Faculty of Medicine at Ramathibodi Hospital, Mahidol University, Thailand
4/1/2002–4/30/2003	Internship, Buddhachinaraj Hospital, Phitsanulok, Ministry of Public Health, Thailand
5/1/2003–5/31/2005	Senior Intern, Division of Medicine, Buddhachinaraj Hospital, Phitsanulok, Ministry of Public Health, Thailand
6/1/2005-5/31/2008	Residency in Internal Medicine, Department of Medicine, Faculty of Medicine at Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Fellowship training:

1/6/2009 – 31/5/2011	Clinical Cardiology Fellow, Department of Medicine, Faculty of Medicine at Ramathibodi Hospital, Mahidol University, Bangkok, Thailand Interventional
1/6/2011 – 1/6/2012	Cardiology Fellow, Department of Medicine, Faculty of Medicine at Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Certifications:

1/4/2002	Thai Medical License No.28033, The Medical Council of Thailand
1/6/2006	Higher Graduate Diploma Program in Clinical Sciences, Mahidol University, Thailand
10/7/2008	Diplomate, Thai Board of Medicine
1/7/2011	Diplomate, Thai Board of Cardiology
1/7/2013	Certificate in Interventional Cardiology, Royal College of physicians of Thailand

Krittin Bunditanukul, Pharm.D, FAC., BCPS
Pharmacy Practice Department,
Chulalongkorn University,
Bangkok, Thailand

Title and/or degrees:
Pharm.D/FAC./BCPS

Educational Background:

2006 – 2008	Doctor of Pharmacy Chulalongkorn University, Bangkok, Thailand
2001 – 2006	Bachelor of Pharmacy (First class honor) Huachiew Chalermprakiet University, Samutprakarn, Thailand
2009	Exchange visitor at University of Arizona (Tucson, Arizona; USA)
2014	Short-term training for Emergency and Critical care Pharmacotherapy (Kansas, USA)

Licensure:

2012 – present	Fellow of Asian College of Pharmacy (F.A.C.P)
2011 – present	Board certification in pharmacotherapy (BCP) (College of Pharmacy, Thailand)
2009 – 2013	Board certified pharmacotherapy specialist (BCPS) (American Pharmacist Association)

Professional Affiliations:

2013 – present	Committee of College of Pharmacotherapy of Thailand
2012 – present	Committee of Community of Pharmacist for Heart and Vascular Disease of Thailand (Cop:HATHAI)
2012 – 2013	Subcommittee of clinical standard practice for non-essential drug use: statin drugs
2016 - present	Subcommittee of national essential drug list: cardiovascular drugs

Mann Chandavimol, MD, FRCPC, FAPSIC
Division of Cardiology, Department of Internal Medicine
Ramathibodi hospital Mahidol University
Bangkok, Thailand

Title and/or degrees:
MD, FRCPC, FAPSIC

Educational History and Degrees:

2005-2006	Saint Paul's Hospital, Vancouver, BC Heart failure and Heart transplantation Fellowship
June 2005	The Central Examination Board of the Medical Council of Canada The Canadian Medical Register LMCC No. 97820
2003-2005	Saint Paul's Hospital, Vancouver, BC Intervention Cardiology Fellowship
2000-2003	The University of British Columbia, Vancouver, BC Cardiology Fellowship (Chief Cardiology Fellow 2002) Fellow of the Royal College of Physicians and Surgeons of Canada : Specialty in Cardiology The American Board of Internal Medicine, Diplomate in Cardiovascular disease
1997-2000	The University of British Columbia, Vancouver, BC Internal Medicine Residency Fellow of the Royal College of Physicians and Surgeons of Canada: Specialty in Internal Medicine The American Board of Internal Medicine, Diplomate in Internal Medicine
1996-1997	Bannpong Hospital, Thailand Internship
1990-1996	Chulalongkorn University Medical School, Thailand Doctor of Medicine (Honored)

Employment Experiences:

2010	Intervention Cardiologist Ramathibodi Hospital, Mahidol University, Thailand
2006-present	Intervention Cardiologist Samitivej Sukhumvit Hospital, Bangkok, Thailand Thailand Medical License No. 21245
2005- 2006	Cardiologist, attending staff
2010	St. Paul's Hospital, Vancouver, BC, Canada BC Medical Service No. 28788
2005-2006	Clinical Skill Instructor in Cardiology, the University of British, Columbia

Maream Prousoontorn, RN
Cardiovascular Critical care Unit,
Nursing Department,
King Chulalongkorn Memorial Hospital
Bangkok, Thailand

Title and/or degrees:
RN

Current Position: Senior Nurse Manager of Cardiovascular Critical care Unit, Nursing Department, King Chulalongkorn Memorial Hospital

Education:
1988 The degree of Bachelor of Nursing (B.N.S.)The Thai Red Cross Society Collage of Nursing, Thailand
2007 The degree of Master of Nursing Administration(M.N.S.)ChulalongkornUniversity, Thailand

Postgraduate Training:
2001 The Certificate of AdvanceCritical care nursing, Nursing Department, KCMH MSD, Course, The Thai Red Cross Society
2001 The Certificate of of Pediatric Advanced Life Support. Pediatric Department,KCMH, The Thai Red Cross Society
2003 The Certification of Advance CPR,Nursing Department, KCMH MSD Course, The Thai Red Cross Society
2009 The Certificate of Mini MBA in Health, Chulalongkorn University, Thailand.
2010 The Certificate of Supervisor Skill Development Program-SSD4. HRD,The Thai Red Cross Society
2011 The Certificate of Manger skill Development Program-MSD20.HRD, The Thai Red Cross Society
2012 Advance CPR Course, Nursing Department, KCMH MSD Course, The Thai Red Cross Society
2016 The Certificate of EX-Manager Skill Development Program, HRD, The Thai Red Cross Society
2017 The Certificate of Human Resource and Organization Development, School of Human Resource Development (NIDA)

Professional Experience:
1989 Novice Nurse , King Chulalongkorn Memorial Hospital (3 units)
(Hemodialysis Unit , Medical intensive care Unit, and Neuro MedUnit)
1990 Staff Nurse, Surgical Intensive Care Unit, King Chulalongkorn Memorial Hospital
1994 Staff Nurse, Cardiac Catheterization Laboratory, King Chulalongkorn Memorial Hospital
2010 Head Nurse of Cardiovascular Thoracic Intensive care Unit, Nursing Department, King Chulalongkorn Memorial Hospital
2015 Senior Nurse Manager of Cardiovascular Critical care Unit, Nursing Department, King Chulalongkorn Memorial Hospital
- Instructor of Nursing Department King Chulalongkorn Memorial Hospital (Mentorship, Cardiac Catheterization& Nursing Care, Care Management in Acute Myocardial Infarction Patients & CABG)
- Instructor of Nursing Department Rajavithi Hospital
- Instructor of Thai cardio- thoracic nurses association
- Instructor of Central Chest Institute of Thailand

Area Of Expertise:
Cardiac Catheterization and Intensive care unit (CVT-ICU, CCU)

Nakarin Sansanayudh, MD
Cardiology Unit, Department of Internal medicine,
Phramongkutklao Hospital, Bangkok, Thailand

Title and/or degrees:
Assistant Professor/Senior Colonel (Sr.Col.)

Education:

1977-1986	Primary and Junior High School Saint Gabriel College
1986-1988	High school Triam Udom Suksa
1988-1994	Doctor of MedicinenSiriraj Medical School, Mahidol University
1995-1998	Diploma in Internal Medicine Phramongkutklao College of Medicine
1998-2000	Diploma in Cardiology Phramongkutklao College of Medicine
2000-2003	Certificate in Interventional Cardiology Austin and Repatriation Medical Centre, Melbourne, Australia
2003	Certificate in Family Medicine, The Royal College of Family Physicians Thailand
2003	Advance Cardiac Life Support (ACLS) Instructor Certificate: The Heart Association of Thailand

Positions:

1994-1995	Internship, Ananthamahidol hospital, Lopburi
1995-1998	Internal Medicine Residency, Phramongkutklao Hospital
1998-2000	Fellowship in Cardiology, Phramongkutklao Hospital
2000-2003	Fellowship in Interventional Cardiology, Austin & Repatriation Medical Centre, Melbourne, Australia
2003-present	Interventional Cardiology Consultant, Department of Internal Medicine, Phramongkutklao Hospital
2006-present	Research committee, Department of Internal Medicine, Phramongkutklao Hospital
2006-present	Thesis Co-advisor, Degree of Master of Science in Pharmacy Program in Clinical Pharmacy, Department of Pharmacy Practice, Faculty of Pharmaceutical Sciences, Chulalonglorn University,
2006-present	Guess lecturer, Faculty of Pharmaceutical Sciences, Chulalonglorn University,
2008-present	Director, Cardiac Catheterization Laboratory, Cardiology Unit, Department of Internal Medicine, Phramongkutklao Hospital
2010-present	Committee, Cardiac Intervention Society of Thailand

Membership:
- The Medical Council of Thailand
- The Royal College of Physician of Thailand
- The Heart Association of Thailand under the Royal Patronage
- Thai Hypertension Society
- The Nephrology Society of Thailand
- The European Association of Percutaneous Cardiovascular Interventions
- The European Society of Cardiology

Namfon Khatjuang, RN
Central Chest Institute of Thailand

Title and/or degrees:
RN

Position:	Register Nurse , Senior Professional Level Central Chest Institute of Thailand
Education:	
1991	Degree of Bachelor of Nursing Sukhothai Thammathirat open University
2000	Certificate in Cardiothoracic Nursing specialty Faculty of Nursing,Mahidol University
2014	Master of Public Administration (M.P.A) National Institute of Development Administration

Experience:

1992 - January 2006	Staff ICU nurse of Cardiovascular thoracic surgery
2006 - 2014	Head nurse of ICU Cardiovascular thoracic surgery
2014 - Present	Head of Cardiovascular thoracic surgery Department
2009	Visit to St. Andrew s War Memorial hospital, Brisbane, Australia “Nursing Cardiovascular thoracic surgery”

Narathip Chunhamaneewat, MD
Division of Cardiology, Department of Medicine,
Faculty of Medicine, Siriraj Hospital, Mahidol University,
Bangkok, Thailand

Title and/or degrees:
MD

Education:
6/1997-3/2003 Doctor of Medicine (First Class Honor) Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand

Professional Experiences:
4/2003-4/2005 InternThammasat University Hospital, Thailand
8/2014-present Interventional cardiologist, Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand

Postgraduate Medical Education:
7/2006-6/2009 Internal Medicine Resident Albert Einstein Medical Center, Philadelphia, PA, USA
7/2009-6/2012 Cardiology Fellow Geisinger Medical Center, Danville, PA, USA
7/2012-6/2013 Interventional Cardiology Fellow Geisinger Medical Center, Danville, PA, USA

Certification and Licensure:
2003 Medical Practice License, Medical Council of Thailand
2006 Educational Commission for Foreign Medical Graduates Certification
2009 American Board of Internal Medicine
2012 National Board of Echocardiography
2012 American Board of Internal Medicine: Cardiovascular Disease
2013 American Board of Internal Medicine: Interventional Cardiology
2013 Medical Physician and Surgeon License, Commonwealth of Pennsylvania

Honors & Awards:
1998 Professor Tab Neelanithi Award for Academic Excellence
1998 Siriraj Hospital Scholarship for Academic Excellence, Mahidol University
1999 Siriraj Hospital Scholarship for Excellence in Physiology, Mahidol University
2000 Siriraj Hospital Medal for Excellence in Physiology, Mahidol University
2001 Siriraj Hospital Medal for Excellence in Radiology, Mahidol University
2002 Best Performance in Pediatric, Mahidol University
2007 Second place, Resident Research Competition, Albert Einstein Medical Center
2009 Third place, ACP Pennsylvania Chapter Southeastern Region Poster Competition

Nithima Ratanasit, MD
Division of Cardiology, Department of Medicine,
Faculty of Medicine, Siriraj Hospital,
Mahidol University, Bangkok, Thailand

Title and/or degrees:
Associate Professor; MD

Medical Educations
Undergraduate:
1988 – 1994 Medicine, Faculty of Medicine, Chulalongkorn University Bangkok, Thailand

Postgraduate:
1994 – 1998 Rotating Internship and Resident in Internal Medicine Faculty of Medicine, Prince Songklanakarind University, Songkla, Thailand
1998 – 2000 Fellow in Cardiology, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand
2003-2004 Research fellow in Echocardiography Mayo Clinic, Rochester, MN, USA

Degrees:
1994 M.D. (1st class honor) Chulalongkorn University
1998 Diploma of Medical Board in Internal Medicine Thai Medical Council
2000 Diploma of Medical Board in Cardiology Thai Medical Council
2003 Diploma of Medical Board in Family Medicine Thai Medical Council
2004 Certificate in Research Fellowship in Echocardiography Mayo Clinic, Rochester, Minnesota

Academic Appointment:
- Associate Professor of Medicine, Department of Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, July 2009 to present
- Assistant Professor of Medicine, Department of Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, July 2005 to 2009
- Instructor, Division of Cardiology, Department of Medicine and Her Majesty's Cardiac Center, Siriraj Hospital, 2000 to 2005
- Research fellow, Division of Cardiovascular diseases, Mayo Clinic, Rochester, Minnesota, USA, 2003.
- Senior research fellow, Division of Cardiovascular diseases, Mayo Clinic, Rochester, Minnesota, USA, 2004.
- Research collaborator, Echocardiography and Hemodynamic laboratory, Division of Cardiovascular diseases, Mayo Clinic, Rochester, Minnesota, USA, 2004-2008.

Professional Membership:
1994 – present Member, Thai Medical Council
1994 – present Member, Royal College of Physician of Thailand
2000 – present Member, Heart Association of Thailand
2008 – present Member, Thai Society of Echocardiography
2014 – present Fellowship, the ASEAN College of Cardiology (FAsCC)
2014 – present Fellowship, the American Society of Echocardiography (FASE)
2014 – present Fellowship, the American College of Cardiology (FACC)

Ong Hean Yee, MD
President; Singapore Cardiac Society
Cardiologist, Mount Elizabeth Novena Hospital,
Singapore

Title and/or degrees:
Professor, MD

Credentials: MBBCh BAO (Belf), FRCP (UK), FAMS (S'pore), ASCeXAM (US), FESC (EU), FAsCC (ASEAN), FACC (US).

Affiliation: Mount Elizabeth Novena Hospital

Dr Ong is currently a Consultant Cardiologist at Mount Elizabeth Hospital Novena. He graduated in 1994 from Queen's University of Belfast and completed his Advanced Specialty Training in Cardiology at National University Hospital, Singapore in 2004.

He was a Fellow in Advanced Cardiac Imaging at the Cleveland Clinic, USA in 2006. Following that, he set up and was Head of Department of Cardiology in Alexandra Hospital / Khoo Teck Puat Hospital from 2007 - 2016.

He is the current President of Singapore Cardiac Society (2018-2019)

Pairoj Chattranukulchai, MD, MSc
Division of Cardiovascular Medicine,
Department of Medicine, Faculty of Medicine,
Chulalongkorn University, Cardiac Center,
King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Title and/or degrees:
MD/MSc

Specialty: Cardiology

Qualification & Education:

- Chief Resident, Internal Medicine, King Chulalongkorn Memorial Hospital
- Clinical Cardiology Fellowship, King Chulalongkorn Memorial Hospital
- Certificate of Completion in Epidemiology and Advanced Research Practices, Duke University, Durham, North Carolina, USA
- Fellowship in Cardiovascular Magnetic Resonance Imaging, Duke University Medical Center, Durham, North Carolina, USA

Area of Interest:

- Advanced Cardiovascular Imaging (cardiac MRI, echo)
- Hypertension and Atherosclerosis

Pantep Angchaisuksiri, MD
Hematology, Ramathibodi Hospital,
Mahidol University, Bangkok, Thailand

Title and/or degrees:
Professor, MD

Pantep Angchaisuksiri is Professor of Medicine and Chief of the Haemostasis and Thrombosis Unit in the Division of Haematology, Department of Medicine, at Ramathibodi Hospital, Mahidol University in Bangkok, Thailand. He also holds posts of Adjunct Associate Professor of Medicine at the University of North Carolina at Chapel Hill, School of Medicine, North Carolina, and is Associate Director of the Bangkok International Haemophilia Training Centre of the World Federation of Haemophilia. Professor Angchaisuksiri is a medical graduate of Chulalongkorn University in Bangkok, Thailand and was trained in Internal Medicine at Prince of Songkla University and Haematology at Mahidol University. He was also a clinical and postdoctoral fellow in Haematology/Oncology at the Medical College of Virginia in Richmond, Virginia and the University of North Carolina at Chapel Hill, School of Medicine, North Carolina, USA. An active clinician, Professor Angchaisuksiri works with patients with thrombosis, haemophilia and other bleeding disorders, and has authored and co-authored papers relating to haemostasis and thrombosis in several leading international scientific journals. He is a council member of the International Society on Thrombosis and Haemostasis (ISTH) and the Asian-Pacific Society on Thrombosis and Hemostasis (APSTH), an associate editor of the ISTH journal Research and Practice in Thrombosis and Haemostasis (RPTH), an editorial board member of the journal Thrombosis Research, Journal Thrombosis, and Blood Research, and a member of several professional societies, including the American Society of Haematology, and the World Federation of Haemophilia. He is also a vice-chairman of the ISTH Education and Outreach Committee, a member of the ISTH Membership and Communications Committee, the ISTH Curriculum for Training in Thrombosis and Hemostasis Committee, and the ISTH Steering Committee for World Thrombosis Day.

Pantep Angchaisuksiri is Professor of Medicine and Chief of the Haemostasis and Thrombosis Unit in the Division of Haematology, Department of Medicine, at Ramathibodi Hospital, Mahidol University in Bangkok, Thailand. He also holds posts of Adjunct Associate Professor of Medicine at the University of North Carolina at Chapel Hill, School of Medicine, North Carolina, and is Associate Director of the Bangkok International Haemophilia Training Centre of the World Federation of Haemophilia. Professor Angchaisuksiri is a medical graduate of Chulalongkorn University in Bangkok, Thailand and was trained in Internal Medicine at Prince of Songkla University and Haematology at Mahidol University. He was also a clinical and postdoctoral fellow in Haematology/Oncology at the Medical College of Virginia in Richmond, Virginia and the University of North Carolina at Chapel Hill, School of Medicine, North Carolina, USA. An active clinician, Professor Angchaisuksiri works with patients with thrombosis, haemophilia and other bleeding disorders, and has authored papers in several leading international scientific journals. He is a council member of the International Society on Thrombosis and Haemostasis and the Asian-Pacific Society on Thrombosis and Hemostasis (APSTH), an editor of the APSTH newsletter, and an associate editor of the journal Research and Practice in Thrombosis and Haemostasis.

He is also a member of the ISTH Membership and Communications Committee, the ISTH Education and Outreach Committee, the ISTH Curriculum for Training in Thrombosis and Hemostasis Committee, and the ISTH Steering Committee for World Thrombosis Day.

Pat Ongcharit, MD
Attending Physician, Cardiothoracic Surgery unit,
Chulalongkorn University and King Chulalongkorn Memorial
Hospital, Bangkok, Thailand

Title and/or degrees:
MD

Education:

1984 - 1990	Ramathibodi hospital, Mahidol University, Bangkok, Thailand Medical degree
1990 - 1993	Chula hospital/University, Bangkok, Thailand Board of General Surgery
1993 - 1995	Chula hospital/University, Bangkok, Thailand Board of General Surgery
1996 - 1998	Papworth Hospital Cambridge, England Cardiothoracic Transplant Registrar Heart and Lung Transplant
1998 - 2001	Papworth Hospital Cambridge, England General Cardiothoracic Registrar Coronary, valvular, aneurysm and lung surgery
2001 - 2002	Harefield Hospital London, England Cardiothoracic Clinical Research Fellow Endothelium genetic expression research

Work Experience:

1995 - 1996	Chula Hospital/University Bangkok, Thailand Consultant Cardiothoracic Surgeon
Since 2002	Chula Hospital/University Bangkok, Thailand Consultant Cardiothoracic Surgeon Head of Heart Lung Transplant unit

Pataraporn kheawwan, RN
Head of Nursing Professional
Development Center (NPDC), Department of Nursing,
King Chulalongkorn memorial Hospital,
Bangkok, Thailand

Title and/or degrees:
RN

Education:

2014 Doctoral of Philosophy (Ph.D.) in Nursing Science (International Program), Faculty of Nursing, Chulalongkorn University, Thailand
(1 year international student exchange at the University at Buffalo, the State University of New York, USA)
2004 Master of Nursing Science, Faculty of Nursing, Chulalongkorn University, Thailand
1998 Master of Science (Nutrition), Faculty of Medicine, Mahidol University, Thailand
1991 Bachelor of Nursing, The Thai Red Cross College of Nursing, Thailand

Certification:

2016 Manager Skill Development, The Thai Red Cross Society
2016 Supervisor Skill Development, The Thai Red Cross Society
2015 GCP training (Standard Course in Clinical Trials), Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand
2014 Nursing Specialist Programme on Nursing Care /Management, Tan Tock Seng Hospital, Singapore
2013 International Practicum on Quality Improvement and Accreditation, Joint Commission International (JCI), Seoul, South Korea
2013 Certificate of Art & Science of Teaching in Nursing, The Thai Red Cross College of Nursing, Bangkok, Thailand
2013 Lower Mekong Initiative (LMI) English Project: Professional Communication Skills for Leaders, Chulalongkorn University Language Institute, Thailand
2011 Culturally – Specific Frameworks for Chronic Illness Research, Chulalongkorn University
2011 Writing for Publication, Chulalongkorn University
2006 Advanced Nursing Specialty in Pain Management, Singapore General Hospital
2005 Certificate of Advanced Practice Nurse (APN), Thailand Nursing and Midwifery Council

Employment & Work Experience:

2016- present Head of Nursing Professional Development Center, Department of Nursing, King Chulalongkorn Memorial Hospital, Thailand
2015 Advanced Practice Nurse, Human Resource Development, Department of Nursing, King Chulalongkorn Memorial Hospital, Thailand
1994 Critical care nurse, Cardiovascular & Thoracic ICU, King Chulalongkorn Memorial Hospital, Thailand
1992 Critical care nurse, Surgical ICU, King Chulalongkorn Memorial Hospital, Thailand
1991 Staff nurse, Delivery room, King Chulalongkorn Memorial Hospital, Thailand

Pattamawan Kosuma, Pharm D, BCPS, BCP
Division of Pharmaceutical Care,
Faculty of Pharmacy, Naresuan University,
Phitsanulok, Thailand

Title and/or degrees:
Pharm D, BCPS, BCP

Educational Background:
- 2018 BCP (Board Certified Pharmacotherapy) The college of pharmacotherapy of Thailand, Thailand
- 2013 BCPS (Board Certified Pharmacotherapy Specialists), Board of Pharmaceutical Specialists, United States Of America
- 2009 Pharm.D. (Pharmaceutical Care), Naresuan University, Thailand

Field of Experties:
Pharmaceutical care in cardiology

Pattarapong Makarawate, MD, FHRS
Director of Queen Sirikit Heart Center of the Northeast,
Khon Kaen University,
Khon Kaen, Thailand

Title and/or degrees:
Associate Professor/MD/FHRS

Present Position: Assistant Professor, Faculty of Medicine, Khon Kaen University, Thailand
Associate Director of Queen Sirikit Heart Center of The Northeast,
Khon Kaen University,Thailand

Education:

2001 MD (First Class Honor), Faculty of Medicine, Siriraj Hospital, Mahidol University, Thailand 2005 Thai Board Certified in Internal Medicine
2007 MSc (clinical medicine), Faculty of Medicine, Chulalongkorn University, Thailand
2007 Thai Board Certified in Cardiology
2009 Certification for research fellowship in cardiology, Wake Forest University School of Medicine, North Carolina, USA
2013 Certified Electrophysiology Specialist- Adult Cardiology (Physician) from International Board of Heart Rhythm Examiners (IBHRE), USA. Certificate number 217408
2014 Certified Cardiac Device Specialist (Physician) from International Board of Heart Rhythm Examiners (IBHRE), USA.Certificate number 217408 2

Fellowships and Honours:

2015 Fellow of Heart Rhythm Society (FHRS) Professional Societies

Membership:

- Royal College of Physicians of Thailand Thai Medical Association
- The Heart Association of Thailand under the Royal Patronage of H.M. the King
- Thai Electrophysiology Club
- Thai Resuscitation Council
- European Society of Cardiology
- Heart rhythm Society, USA

Pavit Pienvichit, Mbbs
Division of Cardiology, Department of Medicine,
Ramathibodi Hospital. Mahidol University,
Bangkok, Thailand

Title and/or degrees:
Assistant Professor /MD

Education:

1999-2001	Interventional Cardiology and Peripheral Vascular Fellowship Lahey Clinic Medical Center, Massachusetts, USA
1996-1999	Cardiology Fellowship Lutheran General Hospital, Illinois, USA
1993-1996	Residency in Internal Medicine, University of Illinois at Chicago, Illinois, USA
1992-1993	Internship Pramongkutklao Medical College and Hospital, Bangkok, Thailand
1987-1991	Bachelor of Medicine and Bachelor of Surgery, All India Institute of Medical Sciences, New Delhi, India
1982-1987	American Embassy School, New Delhi, India

Work Experience:

2001- Present	Staff, Division of Cardiology, Department of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
2001-Present	Catheterization Laboratory privilege in many private hospitals including Samitivej, Bumrungrad, Phyathai and Vichaiyut Hospitals

CLINICAL Skills

Cardiac Interventions:	Coronary intervention; Percutaneous PFO/ASD/PDA closure; Myocardium biopsy; Alcohol septal ablation for hypertrophic cardiomyopathy;
Peripheral Interventions:	Carotid stenting; Renal artery angioplasty; Lower extremity angioplasty; Subclavian artery angioplasty; AV graft and fistula plasty; Central vein venoplasty; IVC filter insertion; Foreign body retrieval

Certification And Licensure:

2000	American Board of Interventional Cardiovascular Disease
1999	American Board of Cardiovascular Disease
1999	Licensed Physician, State of Massachusetts
1996	American Board of Internal Medicine
1993	Licensed Physician, State of Illinois
1993	FLEX Certificate
1992	ECFMG Certificate
1992	Thailand Medical Licensure

Academic Titles, Honors and Awards:

2008	Organizing committee member, 4th Asian Interventional Cardiovascular Therapeutics 2008
2007-Present	Faculty Senate, Mahidol University
2006-Present	Council Member, Coronary Intervention Society of Thailand
2006	Assistant Professor, Mahidol University, Bangkok, Thailand

2004-Present	Program Director, Cardiology Fellowship Training, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
2004	International Faculty, 13th Singapore Live Course, Singapore
2001	Aventis Fellow Scholarship
1993	Assistant in Medicine, College of Medicine, University of Illinois at Chicago, Chicago, Illinois
1990	Vice President, Students Union, All India Institute of Medical Sciences, New Delhi, India
1987	National Honor Society of Secondary School, American Embassy School, New Delhi, India

Penchun Saenprasarn , RN, D.B.A
Chancelloe of Shinawatra University
Prathumthani, Thailand

Title and/or degrees:
RN/EdM

Present Position:
President: Thai Cardiovascular-Thoracic Nurese Association of Thailand
President: Cardiovascular Thoracic Nurse Association of Thailand
President: Private Nurses Society of Thailand

Education:
1983 Master's Degree: Education Nursing Administrator
1996 Diploma: Ambu Mega Code Trainee System – AHA
2005 Certificate: Understanding Pain Management and Symptom Control in Hospice Palliative Care – Preview Hospice Georgia
2004 Certificate: Nursing Administration – University of Illinois at Chicago
2004 Certificate: Basic Hospice and Palliative Care – Premier Hospice Georgia
2003 Certificate: The Managing Changes with Novel Leadership Concepts – American Management Association
2003 Certificate: Management and Treatment of WMD Mass Casualty Patients – Diplomatic Security Service USA
2002 Certificate: 5th Nursing Academic International Congress
2002 Certificate: 4th Teaching Workshop on Pediatric Gastroenterology, Hepatology, and Nutrition – APPSPGHSN
2001 Certificate: Flagship Course on Health Sector Reform and Sustainable Financing – The World Bank Institute
1995 Certificate: Advances in Pediatric, Cardiology, and Cardiothoracic Surgery
1994 Certificate: 1st Critical Care Nursing Symposium and Workshop – Gleneagles Hospital Singapore
1993 Certificate: Nursing Proem in Critical Care - IABP
1991 Certificate: 6th Congress of Western Pacific Association of Critical Care Medicine
1989 Certificate: 3rd World Congress of Pediatric Cardiology

Certificate: Human and Universal Energy Level 2 IHAUE HC Co. 1

Piyamitr Sritara, MD, FRCP, FACP, FRCP(T).
Dean, Faculty of Medicine
Ramathibodi Hospital, Mahidol University
Bangkok, Thailand

Title and/or degrees:
Professor/MD, FRCP, FACP, FRCP(T).

Prof. Piyamitr Sritara received his Medical Degree from Ramathibodi Hospital Mahidol University in 1982, completed his internship training in 1983 at Ramathibodi Hospital where he was the Chief Intern. Thereafter, he worked as a General Practitioner for two years until 1985.

He was awarded a Diploma in Clinical Science in 1986 and has become a board certified Diplomate the Royal College of Physician of Thailand since 1988. He was then appointed a Lecturer in the Division of Cardiology, Department of Medicine, Faculty of Medicine, Ramathibodi Hospital, Mahidol University.
In July 1990, Dr.Sritara was awarded a Diploma in Cardiology by the Royal Postgraduate Medical School, Hammersmith Hospital, University of London. Subsequently, he became a Research and Clinical Fellow at the Cardiovascular Research Unit of the Royal Postgraduate Medical School, University of London. In July 1991 he received a Certificate and Diploma in Interactive Video and Computer Technology from Birkbeck College of the same university as a Prajatipok-Rampaipanni Scholar.

Dr. Sritara was a Honorary Registrar in Cardiology to Dr.Greenbaum of Edware General Hospital in Middlesex and Dr.Ilsley of Harefield Hospital. In October 1992, Dr.Sritara, has been certified by the Thai Board of Cardiology and has become a member of the Committee of Thai Cardiology Board Examination since 1994. He has been appointed to a Professor in Medicine since 2006 and Chairman of the Department of Medicine, Ramathibodi Hospital, Faculty of Medicine, Mahidol University during 2010-2014. He is appointed as the Dean of Faculty of Medicine, Ramathibodi Hospital, Mahidol University since December 2015.

He received many professional awards, including Top Medical Student Award from Ramathibodi Hospital, Best Resident Clinical Study from the Royal College of Physicians of Thailand, the British Council Scholarship for Diploma Course in Cardiology, the Best Abstract Award during the 1995 International Conference of Nuclear Cardiology in Cannes, France, and the Outstanding Physician of the Royal College of Physicians of Thailand in 2005. He has become Senior Research Scholar of the Thailand Research Fund since 2008. His recent research post is Chairman of Cardiovascular Research Cluster, Mahidol University Research Fund since 2010.

He authored and co-authored of more than hundred research manuscripts published in peer-reviewed Medical Journals and chapters of some Cardiology textbooks. His publications were thrombolysis for the management of myocardial infarction and thrombin inhibition during coronary angioplasty. His recent works involve Cardiovascular Epidemiology in Thailand and Asia Pacific Cohort Studies Collaboration.

He is a member and committee of various Medical Associations and Societies namely, Executive committee of The Heart Association of Thailand, Scientific Chairman of Royal College of Physician of Thailand, Executive Committee of Asia-Pacific Society of Atherosclerosis & Vascular Disease, Scientific Chairman of the 8th Congress of Asia-Pacific Society of Atherosclerosis & Vascular Disease (APSAVD 2012) and Scientific Chairman of the Congress of the Asia-Pacific Society of Cardiology (APSC 2013). He received both fellowships from American College of Physicians and from Royal College of Physicians (London).

Piyanuj Ruckpanich, MD
Medical Director, Cardiac Rehabilitation Center
Perfect Heart Institute, Piyavate Hospital,
Bangkok, Thailand

Title and/or degrees:
MD

Education:

1984 -1989	Faculty of Medicine, Chulalongkorn University
1989-1992	Medical Residency Physical Medicine and Rehabilitation Chulalongkorn University
1994-1995	Research Fellow Cardiac Rehabilitation Cedars-Sinai Medical Center, Los Angeles, California, USA.
2007-2009	Fellowship Program. Integrative Medicine, University of Arizona

Board & Certification:

1989	Doctor of Medicine, Thailand
1992	Thai Board of Physical Medicine and Rehabilitation
1995	Certificate Research Fellow in Cardiac Rehabilitation, Cedars-Sinai Medical Center, USA.
2009	Certificate Integrative Medicine, Program of Integrative Medicine, University of Arizona, USA
2010	Certificate Apply Functional Medicine in Clinical Practice, Institute of Functional Medicine, USA
2010	Certificate Chelation Therapy: Chelation Medical Association, Thai. Thailand
2011	Certificate Homeopathy in Professional Healthcare, University College London Hospitals, UK

Medical Position:

1990-2003	Rehabilitation Medicine Departments Lerdsin General Hospital The Ministry of Public Health, Bangkok, Thailand
1997-2003	Invited Consultant Cardiac Rehabilitation Clinic Heart Institute, Rajvithi Hospital. The Ministry of Public Health, Bangkok, Thailand
2003-2004	Cardiac Rehabilitation Clinic Bangkok Heart Institute Bangkok General Hospital, Bangkok, Thailand
2005-present	Medical Director, Cardiac Rehabilitation Center Perfect Heart Institute, Piyavate Hospital, Bangkok, Thailand
2010-April 2011	General Manager and Executive Medical Director, Tria Integrative Medical Institute and Wellness Center, Piyavate Hospital, Bangkok, Thailand
2014-present	Medical Doctor; Integrative Rehabilitation, Arun Health Garden, Bangkok, Thailand

Pornnalat Katekaew, MS
Clinical Pharmacy Service, Pharmacy Department,
Faculty of Medicine Ramathibodi Hospital
Bangkok Thailand

Title and/or degrees:
MS

Working Experience:

2007 – Present	Clinical Pharmacy Service, Pharmacy Department, Faculty of Medicine Ramathibodi Hospital, Mahidol University.
2011 – Present	Clinical pharmacist at warfarin clinic and anticoagulation clinic
2015 – Present	Clinical Pharmacist at cardiac care unit (CCU)

Education: Bachelor of Science in Pharmacy (2005),
Faculty of Pharmacy, Mahidol University, Bangkok Thailand.
Master of Science in Pharmacy (Clinical Pharmacy) (2009),
Faculty of Pharmacy, Mahidol University, Bangkok Thailand.

Pranee Thongsai, RN
Critical Unit Care (Cardio Vascular Thoracic Unit)
Nursing Department, Faculty of Medicine,
Siriraj Hospital, Mahidol University,
Bangkok, Thailand.

Title and/or degrees:
RN

Position: Senior Professional Nurse

Education & Certification:

2005 Master of Science (Public Health) Program in infectious Diseases and Epidemiology, Mahidol University.
1998 Bachelor of Nursing Science, Mahidol University
2009 Program of Nursing Specialty in Cardiovascular Thoracic, Faculty of Nursing, Mahidol University
2009 Certificate of Teaching Program, Program of Practical Nursing Specialty ,Mahidol University.
2005 Program of Nursing Specialty in Critical Care Nursing (Adult)

Experience:

- The Executive Committee of Nursing Specialty in Critical Care Nursing (Adult) Program
- Nursing Research Committee, Department of Nursing Siriraj Hospital
- Nursing Research Committee for development of Surgical and Orthopidic Nursing
- Committee of Curriculum of Nursing Specialty in Critical Care Nursing (Adult), Thailand Nursing and Midwifery Council.
- Committee of Curriculum of Nursing Specialty in Cardiovascular Thoracic Nursing Program, Thailand Nursing and Midwifery Council.
- Committee of Curriculum of Nursing Specialty in residency Nursing Program, Thailand Nursing and Midwifery Council.

Nursing research and Nursing guide Professional:

- Lecturer of Critical Care Nursing Program in theoretical and practical sections
- Lecturer of Cardiovascular Thoracic Nursing Program in theoretical and practical sections
- Lecturer of Nursing Specialty Program in Siriraj Hospital
- Lecturer of Nursing Care of Post operative Cardiovascular Thoracic patients in critical period

Pranya Sakiyalak, MD
Cardiothoracic Surgery Division,
Department of Surgery, Faculty of Medicine,
Siriraj Hospital, Mahidol University,
Bangkok, Thailand

Title and/or degrees:
MD

Position:
2003-present Attending Staff, Devision of Cardiothoracic Surgery, Department of Surgery, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Education and Training:
1985-1986 Pre-Medical Studies, Faculty of Science, Mahidol University, Salaya, Nakornprathom, Thailand
1985-1991 M.D., Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand
1991-1993 Postdoctoral Research Fellow, Division of Cardiovascular and Thoracic Surgery, Department of Surgery, University of Minnesota, Minneapolis, Minnesota, USA
1995-1997 Postdoctoral Research Fellow, Departments of Surgery and Physiology & Molecular Medicine, Medical College of Ohio, Toledo, Ohio, USA
1993-2000 General Surgery Resident, Medical College of Ohio, Toledo, Ohio, USA
2000-2002 Thoracic Surgery Resident, Loyola University Medical Center, Maywood, Illinois, USA
2002-2003 Lung Transplantation Fellowship, Loyola University Medical Center, Maywood, Illinois, USA

Honors and Awards:
1997 Resident Essay Contest Winner 1st place paper in the Basic Science Category at the 42nd Annual Meeting of the American College of Surgeons, Ohio Chapter
1997 Upjohn Achievement Award Outstanding Surgery Resident of the Year
2000 Resident Teaching Award
2000 Best Teaching Resident of the year vote by class of year 2000, Medical College of Ohio
2001 Best Teaching Resident of the year vote by class of year 2001, Medical College of Ohio

Prin Vathesatogkit, MD
Cardiology division, Faculty of Medicine,
Ramathibodi Hospital, Mahidol University,
Bangkok, Thailand

Title and/or degrees:
MD

Education and Experience:

2010-present	Project manager, The Electricity Generating Authority of Thailand (EGAT) Study
2008-present	Cardiology consultant, Department of Medicine, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
2006-2008	Fellowship in Cardiology, Department of Medicine, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
2003-2006	Resident in Internal Medicine, Department of Medicine, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
2003-2004	Certificate in basic clinical science, Mahidol University,
2002-2003	Research assistant in MRC Molecular Haematology Unit, Weatherall Institute of Molecular Medicine, Oxford, United Kingdom
2001-2002	Clinical Observer in Internal Medicine and Infectious disease unit, John-Radcliffe Hospital and Churchill Hospital, Oxford, United Kingdom
2000-2001	Internship, Surin Hospital, Surin, Thailand
1994-2000	Bachelor degree- Doctor of Medicine (Second class honor with GPA 3.43), Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
1988-1993	Secondary school- Satit Patumwan School, Bangkok, Thailand
1982-1987	Primary school- Anubarn Samsen School, Bangkok, Thailand

Special Training:

January 2008	Advanced Cardiovascular Life Support Program, provider course, by the American Heart Association, Operation Smile International Training Center, Bangkok, Thailand
July 2002	The Oxford Deanery Overseas Doctors Induction Course, NHS professional, General Medical Council UK and Department of Postgraduate Medical & Dental Education, Oxford, United Kingdom
October 1999	Elective in Nephrology unit and Infectious disease unit, Churchill Hospital, Oxford, United Kingdom

Rungroj Krittayaphong, MD, FAsCC, FACC ,FESC ,FACP
Division of Cardiology, Department of Medicine
Faculty of Medicine, Siriraj Hospital
Mahidol University, Bangkok, Thailand

Title and/or Degrees:
Professor/MD/FAsCC/FACC/FESC/FACP

Educations:

Mar 1996 - Oct 1996	Visiting fellow in Cardiac Electrophysiology University of Southern California, Los Angeles California, USA
Sep 1993 - Jan 1996	Fellowship in Research Cardiology, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, USA
Jul 1991 - Sep 1993	Fellowship in Clinical Cardiology Siriraj Hospital, Mahidol University, Bangkok, Thailand
Jul 1987 - Jun 1991	Residency in Internal Medicine Prince of Songkhla University, Songkhla, Thailand
1981 - 1987	MD (Honor), Chulalongkorn University, Bangkok, Thailand

Position:

Sep 1997 - present	Professor of Medicine, Division of Cardiology, Department of Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Honors, Awards & Societies:

2008	Fellowship of the ASEAN College of Cardiology (FAsCC)
2007	Fellowship of the European Society of Cardiology (FESC)
2003	Fellowship of the American College of Cardiology (FACC)
1998	Young Investigator Award, 30-Year Anniversary Meeting, Heart Association of Thailand
1996	Certificate in Research Cardiology, University of North Carolina, US
1993	Certificate of Educational Commission of Foreign Medical Graduates
1993	Diplomat Thai Board in Cardiology
1991	Member of Thai Medical Council
1991	Diplomat Thai Board in Internal Medicine
1989	Physician Award in Internal Medicine, Prince of Songkhla University, Songkhla, Thailand
1987	Extern Award from Department of Pediatrics, Chulalongkorn University, Bangkok, Thailand
1987	Honor in Doctor of Medicine, Chulalongkorn University, Bangkok, Thailand

Rungsrit Kanjanavanit, MD
Cardiology Unit, Department of Internal Medicine,
Faculty of Medicine Chiang Mai University,
Chiang Mai, Thailand

Title and/or Degrees:
MD

Education:

1971-1983	Primary and secondary school: Chulalongkorn University Demonstration School, Bangkok, Thailand
1984-1990	MD (First class honours): Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
1993-2001	Diploma in Clinical Science Internal Medicine, Mahidol University
1993-1996	Board of Internal Medicine: Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
1996-present	Fellow in Cardiology Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand
1998-1999	Diploma in Cardiology Hammersmith Hospital, Imperial College School of Medicine, University of London. UK
2001	Thai Board of Cardiology, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

Honours/Awards:

1983	King's Scholarship (A government scholarship awarded yearly to the country'stop student)
1985	Thap Nilanithi Award (Inter-university award for top students in basic science)
1990	Honour Alumni Award from Chulalongkorn University Demonstration School
1990	Top prize for medical graduate in Internal Medicine, Surgery, OB-GYN, Anesthesiology, Psychiatry, Radiology, Community Medicine and Overall (GPA 3.91)
1999	Professor John Goodwin award for the top student in Diploma in Cardiology , Hammersmith Hospital, Imperial College School of Medicine. University of London
2000	Thai Heart Association Scholarships for passing board cardiology examination with distinction
2007	Green Globe award for conservationist
2009	Best clinical teacher award from Thai Medical Council
2009	National winner of R2R research

Working experiences:

1990-1992	Primary physician, Dansai district hospital, Loei, Thailand
1992-1993	Research assistant, Department of Microbiology, Faculty of Science, Mahidol University, Bangkok, Thailand
1993-1996	Resident of Internal Medicine, Ramathibodi Hospital, Bangkok, Thailand
1996-1998	Fellow in Cardiology, Chiang Mai University, Chiang Mai, Thailand
1999-present	Lecturer and consultant in cardiology , Chiang Mai University, Chiang Mai, Thailand

Sarin Lekchuensakul, MD
Division of Pediatric Cardiology, Department of Pediatrics,
King Chulalongkorn Memorial Hospital,
the Thai Red Cross Society,
Bangkok, Thailand

Title and/or degrees:
MD

Academic Position:

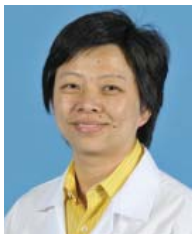
March 2017- present	Pediatric cardiology staff at Division of Pediatric Cardiology, Department of Pediatrics,King Chulalongkorn Memorial Hospital, Bangkok
June 2015-March 2017	Pediatric cardiology staff at Department of Pediatrics, Naresuan University, Phitsanulok

Education:

High school	Triam Udom Suksa School, Bangkok, Thailand
Medical School	Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand First Class of Honor, 2007
Internship	Naresuan University Hospital, 2007-2010
Residency	Department of Pediatrics, Chulalongkorn University, Bangkok, Thailand 2010-2013
Fellowship	Division of Pediatric Cardiology, Department of Pediatrics, Chulalongkorn University, 2013-2015

Awards:

- Awarded Outstanding Student of Chulalongkorn University, academic year 2003
- Awarded Chief Resident of the year, 2013, Department of Pediatrics, Chulalongkorn University
- Awarded Dedicating Resident of the year, 2013, Department of Pediatrics, Chulalongkorn University
- Awarded Outstanding Resident for Academic Excellence, 2013, Department of Pediatrics, Chulalongkorn University
- Awarded Dedicating Fellow of the year, 2015, Department of Pediatrics, Chulalongkorn University



Sirin Apiyasawat, MD
Division of Cardiology, Department of Medicine,
Ramathibodi Hospital, Bangkok, Thailand

Title and/or degrees:
Assistant Professor/MD

- Specialty: Cardiology, Electrophysiology
- Position: Attending Staff

Qualification & Education:
- M.D., Ramathibodi Hospital, Mahidol University
- American Board of Internal Medicine
- American Board of Cardiovascular Medicine
- American Board of Clinical Cardiac Electrophysiology
- National Board of Echocardiography
- Areas of Interest: Electrophysiology

Smonporn Boonyaratavej Songmuang, MD
Division of Cardiology, Department of Medicine.
Faculty of Medicine, Chulalongkorn University
Bangkok, Thailand

Title and/or degrees:
Assistant professor/ MD C.8

Educations and Previous Appointments:

1980-1985	Medical student Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand
1986-1990	Internal Medicine Resident, Department of Medicine, Chiangmai University Hospital, Chiangmai, Thailand
1990-1992	Cardiovascular Fellow Cardiovascular Unit, Department of Medicine,King Chulalongkorn Memorial Hospital, Bangkok, Thailand
1992-1996	Cardiovascular staff, Cardiovascular unit. Department of Medicine, Faculty of Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand
1994-1995	Fellowship in Cardiovascular disease, Mayo Clinic, USA
1996-present	Instructor, Department of Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

Degrees and Certificates:

1986	Doctor of Medicine (1st class honour) Chulalongkorn University
1990	Thai Board of Internal Medicine
1992	Thai Board of Cardiovascular Diseases
1996	Certification for 25-month Research Fellowship in Cardiovascular Diseases, Mayo Clinic Rochester, Rochester, Minnisota, USA

Memberships and Awards:

- Member of The Royal College of Physician of Thailand
- Member of The Thai Medical Council
- Member of The Medical Association of Thailand
- Member of The Thai Heart Association of Thailand
- Member of The Thoracic Society of Thailand
- Member of American Society of echocardiography
- Member of The Thai Coronary Intervention Club
- Member of The Cardiac Rehabilitation Society
- Member of The Infectious disease Society of Thailand

Sofian Johar, MD
President: Brunei Cardiac Society,
RIPAS Hospital/Gleneagles JPMC
Brunei Darussalam

Title and/or degrees:
Professor, MD

Brunei Medical Board No. M-11-0131

Present Post	Consultant Cardiologist
20 October 2012 to present	RIPAS Hospital/Gleneagles JPMC Brunei Darussalam

Education:

1991-1993	Millfield School Somerset
1993-1998	University: Trinity College Cambridge

Examinations & Degrees:

1996	BA (Hons) in Neuroscience Class: II.1 University of Cambridge
1998	MB BChir University of Cambridge
22 Nov 2001	MRCP (UK) Royal College of Physicians London
31 May 2007	PhD in Cardiovascular Medicine Kings College London, UK

Scholarships, Awards & Prizes:

1998	Elective Award - Trinity College, Cambridge
1998	Duke-Elder Prize - Royal College of Ophthalmologists
1998	Dermatology Prize - University of Cambridge Clinical School
2002-2005	British Heart Foundation Clinical PhD Studentship
2004	British Cardiac Society – Judges Choice Abstract
2005	British Cardiac Society – Judges Choice Abstract
2005	BJCA-Cordis International Research Awards – Finalist
2009	British Society of Echocardiography Accreditation in TTE
2012	EHRA Accreditation in Invasive Cardiac Electrophysiology
2012	Certificate of Completion of Training in Cardiology (UK)
2014	Fellow of the Royal College of Surgeons and Physicians of Glasgow
2015	EHRA Accreditation in Cardiac Devices Level 2

Somkiat Sangwatanaroj, MD
Division of Cardiology, Department of Medicine,
Faculty of Medicine, Chulalongkorn University
Bangkok, Thailand

Title and/or degrees:
Assistant Professor C.8/MD

Educations and Previous Appointments:

1976 - 1982	Medical Student Faculty of Medicine, Chulalongkorn University
1982 - 1983	Internship Chonburi Hospital
1983 - 1985	Physician Dankhuntod Community Hospital
1985 - 1988	Resident Training, Internal Medicine, King Chulalongkorn Memorial Hospital
1988 - 1989	Physician Nakornpathom Hospital
1989 - 1991	Clinical Fellowship in Cardiovascular, Department of Medicine King Chulalongkorn Memorial Hospital
1991 - 1993	Staff Cardiovascular Unit, Department of Medicine, King Chulalongkorn Memorial Hospital
1993 - 1995	Instructor, Department of Medicine Faculty of Medicine, Chulalongkorn University
1995 - 1997	Research Fellow, Cardiovascular Unit, Department of Medicine, Brigham and Women's Hospital, Boston MA, USA
1997 - 1998	Research Assistant of Prof. Jonathan G Seidman, Prof. Christine E Seidman Department of Genetics, Harvard Medical School, Boston MA, USA
1998 -Present	Instructor, Department of Medicine Faculty of Medicine, Chulalongkorn University

Degrees and Certificates:

1980	B.Sc. Chulalongkorn University
1982	M.D. Chulalongkorn University
1988	Dip. Thai Board of Internal Medicine
1991	M.Sc. (Medicine) Chulalongkorn University
1991	Thai Board of Cardiovascular Disease
	FRCP (T) Chulalongkorn Hospital

Memberships and Awards:
Member of The Royal College of Physician of Thailand
Member of The Medical Association of Thailand
Member of The Thai Medical Council
Member of The Thai Heart Association of Thailand

Srisakul Chirakarnjanakorn, MD
Attending Physician, Division of Cardiology,
Department of Medicine, Faculty of Medicine,
Siriraj Hospital, Mahidol University, Bangkok, Thailand

Title and/or degrees:
MD

Education:

1994 - 2000	MD (first class honors), Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Postgraduate training:

2003 - 2006	Resident of Internal Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand
2006 - 2008	Fellow in Cardiology, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand
2012 - 2013	Research fellow in Echocardiography, Cleveland Clinic, Ohio, USA
2013 – 2015	Research fellow in Advanced Heart Failure and Transplant Cleveland Clinic, Ohio, USA

Honors/Awards:

2000	Second rank for the highest GPA of medical graduation, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand
2012	Anandamahidol Foundation Scholarship awarded by the Anandamahidol Foundation under the Royal Patronage of His Majesty King Bhumibol Adulyadej of Thailand

Sukit Yamwong, MD
Cardiology Unit, Department of Medicine,
Faculty of Medicine, Ramathibodi Hospital,
Mahidol University, Bangkok, Thailand

Title and/or degrees:
MD

Education & professional career:
1987 Internal Medicine
1992 Cardiovascular disease, Faculty of Medicine, Mahidol University, Bangkok, Thailand
1995 Instructor in Cardiology

Supin Chompoopong, MD, PhD
Department of Anatomy Faculty of Medicine
Siriraj Hospital Mahidol University,
Bangkok, Thailand

Title and/or degrees:
Associate Professor/MD. PhD

Supin Chompoopong (Menayotin) is the past president of the Anatomy Association of Thailand (AAT). She received her PhD in 1988 through the Mahidol University's Anatomy Program).

From 1998 to present she has worked as Associate Professor in Department of Anatomy, Faculty of Medicine Siriraj Hospital, Mahidol University.

Her neuroscience research interests are anti-inflamation, anti-apoptotic and anti-oxidant property of herbal medicine, Cerebral Ischemia of Hippocampus and cognitive impairment in rats, Schwann cell culture and Spinal cord injury animal model, Estrogen and Phytoestrogen as Neuroprotection as follows:
Thong-asa K, Chompoopong S, Tantisira MH, Tilokskulchai K. Reversible short-term and delayed long-term cognitive impairment induced by chronic mild cerebral hypoperfusion in rats. J Neural Transm. 120:1225-1235, 2013.

Sukakul T, Kettawan A, Chompoopong S, Rungruang T . Topical application of Terminalia chebula extract helps croton oil-induced dermatitis in mice. International Food Research Journal. 20 (5): 2269-2272, 2013.

In addition, she has also published concerning Anatomical researchs especially in Thai dry bones, Cadaveric heart and Peripheral nerves.

Chompoopong S, Apinhasmit W, Amornmettajit N, Charoenwat B, Rattanathamsakul N, Supachutikul K, Sangvichien S. Anatomical Considerations of the Deep Peroneal Nerve for Biopsy of the Proximal Fibula in Thais. Clin Anat 22(2): 256-260, 2009.

Her ongoing research is to study the neurological role of Thai medicinal plant.

Awards:
2016 Siriraj Award in Excellency, Faculty of Medicine Siriraj Hospital
2011 Siriraj Award in Excellency, Faculty of Medicine Siriraj Hospital
2001 Professor Elizabeth C Crosby's Award, The Anatomy Association of Thailand
1993 Professor Elizabeth C Crosby's Award, The Anatomy Association of Thailand

Workingexperiences/Position:

Year	Position	Institution
1981-1997	Associate Professor	Department of Anatomy, Pramongkutklao College of Medicine
1998-present	Associate Professor	Department of Anatomy, Faculty of Medicine Siriraj Hospital, Mahidol University

Membership In Professional Societies:
President Electron Microscopy Society of Thailand.(2010-2014)
President The Association of Anatomists of Thailand (2014-2016)
Treasurer The Thai Neuroscience Society

Surakit Nathisuwan, PharmD, BCPS
Clinical Pharmacy Division, Department of Pharmacy,
Faculty of Pharmacy, Mahidol University,
Bangkok, Thailand

Title and/or degrees:
Associate Professor/Pharm.D/BCPS

Academic Background:

2000	Board Certified Pharmacotherapy Specialist (BCPS), Board of Pharmaceutical Specialties, American Pharmacists Association
2001	Specialized Residency in Pharmacotherapy, University of Texas Health Science Center, San Antonio, TX, USA
2000	Pharmacy Practice Residency, Florida Hospital, Orlando, FL, USA
1999	Doctor of Pharmacy, University of Florida, Gainesville, FL, USA
1994	Bachelor of Science in Pharmacy, Mahidol University, Bangkok, Thailand

Professional Experience:

2001 - 2002	Medical Intensive Care/Cardiac Care Unit Pharmacist, University of Utah Hospital and Clinics, Salt Lake City, UT
1999 - 2000	Clinical Pharmacist, Florida Hospital, Orlando, FL
1996 - 1997	Assistant Manager and Staff Pharmacist, Pharma 9 Community Pharmacy, Co.Ltd., Surin, Thailand
1994 - 1996	Head of Pharmacy Department, Sanom Community Hospital, Surin, Thailand

Academic Appointment:

2015 - present	Associate Professor, Department of Pharmacy, Faculty of Pharmacy, Mahidol University
2005 - 2015	Assistant Professor, Department of Pharmacy, Faculty of Pharmacy, Mahidol University
2002 - 2005	Instructor, Department of Pharmacy, Faculty of Pharmacy, Mahidol University
2001 - 2002	Senior Instructor, Department of Pharmacy Practice, College of Pharmacy, University of Utah
1999 - 2000	Clinical Instructor, Division of Pharmacotherapy, College of Pharmacy, University of Texas Health Science Center at San Antonio, University of Texas at Austin
1998 - 1999	Visiting Instructor, School of Nursing, University of Central Florida

Administrative Appointment:

2015 - present	Deputy Dean (Planning and Quality Development), of Pharmacy, Mahidol University
2011 - 2014	Vice President (International Relation), Mahidol University
2010 - 2011	Deputy Dean (International Relation), Faculty of Pharmacy, Mahidol University
2008 - 2010	Assistant Dean (International Relation), Faculty of Pharmacy, Mahidol University
2007 - 2008	Assistant Dean (Educational Affairs), Faculty of Pharmacy, Mahidol University
2007 - 2009	Chairman, Scientific Committee, Association of Hospital Pharmacists (Thailand)
2007 - 2008	Secretariat, The Fifth Indochina Conference on Pharmaceutical Sciences, (Pharma Indochina V)
2005 - 2006	Secretariat, 6th Asian Conference on Clinical Pharmacy (ACCP)
2004 - 2006	Secretary, College of Pharmacotherapy of Thailand, Pharmacy Council
2005 - 2006	Scientific Committee, The Association of Hospital Pharmacists (Thailand)
2003 - 2004	Committee, National Essential Drug List: Cardiovascular Drugs, Ministry of Public Health

International Administrative Appointment:

2012 - 2014 Board Member, Asia-Pacific Association of International Education (APAIE)
2011 - 2016 Chair, US-Thai Pharmacy School Consortium Steering Committee

Professional Affiliations:

1999 - present American College of Clinical Pharmacy (ACCP)
1994 - present Pharmacy Council of Thailand
1993 - present Pharmaceutical Association of Thailand

Sutin Sriussadaporn, MD
Division of Endocrinology & Metabolism,
Department of Medicine, Faculty of Medicine, Siriraj Hospital
Bangkok, Thailand

Title and/or degrees:
Professor/MD

Education:

1981	MD., Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand
1987	Certificate in Proficiency in Internal Medicine, The Royal College of Physicians of Thailand
1993	Certificate of Completion in the Clinical Management of the Patients with Osteoporosis, The National Osteoporosis Foundation, USA
1994	Certificate in Bone, Vitamin D and Mineral Research, The University of Chicago, USA
1994	Certificate in Proficiency in Endocrinology, The Royal College of Physicians of Thailand

Academic position:

1987	Instructor, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand
1990	Assistant professor, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand
1998	Associate professor, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand
2007-Present	Professor, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand

Tachapong Ngarmukos, MD, FACC
Cardiology Unit, Department of Medicine,
Faculty of Medicine, Ramathibodi Hospital,
Mahidol University, Bangkok, Thailand

Title and/or degrees:
MD, FACC

Education, Training and Professional Experience:

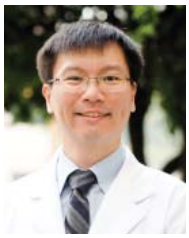
June1985-March1991	MD, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand
July1992- June1993	Pediatric Residency, Seton Hall University, Department of Pediatrics, Jersey City Medical Center Jersey City, New Jersey, USA Program Director: Oradee Chandavasu, MD
July1993- June1996	Internal Medicine Residency, University of Medicine and Dentistry of New Jersey Department of Internal Medicine, Newark, New Jersey, USA Program Director: George Lodi, MD
July1996-June1999	Cardiovascular Disease Fellowship, University of Medicine and Dentistry of New Jersey, Division of Cardiovascular Disease, Newark, New Jersey, USA Program Director: Hillel Ribner, MD, Edward Dwyer, MD
July 1999-June 2000	Electrophysiology and Cardiac Pacing Fellowship, University of Massachusetts, Electrophysiology and Cardiac Pacing Section, Worcester, Massachusetts, USA Program Director: Robert Mittleman, MD, Lawrence Rosenthal, MD, PhD
July 2000 - April 2001	Clinical Instructor, University of Massachusetts Memorial Healthcare System, Electrophysiology and Cardiac Pacing Section, Department of Cardiology, Worcester, Massachusetts, USA
April 2001-March 2002	Assistant Professor of Medicine, University of Massachusetts Memorial Healthcare System, Electrophysiology and Cardiac Pacing Section, Department of Cardiology, Worcester, Massachusetts, USA
April 2002-January 2003	Electrophysiologist , Pacific Rim Electrophysiology Research Institute, Inglewood, California, USA

Qualification:

Educational Commission for Foreign Medical Graduate Examination	ECFMG # 444-613-4,
Federal licensure Examination, June 1993Pennsylvania,	FLEX # 680122001
American Board of Internal medicine, Cardiovascular Disease Examination, November 1999	Candidate # 170519
American Board of Internal medicine, Clinical Cardiac Electrophysiology, November 2001	Candidate # 170519

Licensure:

Thailand: #16891	
United States of America:	California: #A063456
	Massachusetts: #160131
	New Jersey: #063941



Tanop Srisuwan, MD
Department of Radiology, Faculty of Medicine,
Chiang Mai University,
Chiang Mai, Thailand,

Title and/or degrees:
Assistant Professor, MD

Education:
1999 Medical Degree (First Honor). Faculty of Medicine, Siriraj Hospital, Mahidol University, Thailand

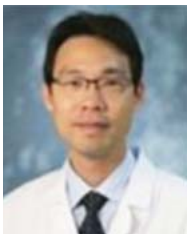
Post-graduate Training:
1999-2000 Internship Maharaj Nakorn Chiang Mai Hospital, Faculty of Medicine. Chiang Mai University, Thailand
2002-2005 Radiology residency Faculty of Medicine, Ramathibodi Hospital. Mahidol University, Thailand
2005-2006 Fellowship in body interventional radiology Ramathibodi Hospital. Mahidol University, Thailand
2007 Observership in interventional radiology (April) Monash Medical Centre, Victoria, Australia
2009 Observership in interventional radiology (March-May) Nara Medical University, Nara, Japan
2009 Observership in interventional radiology (November) Asan Medical Center, Seoul, Korea
2013 Observational fellowship in cardiothoracic Imaging Mallinckrodt Institute of Radiology, Washington University in St. Louis, Missouri, USA
2014 Observational fellowship in interventional radiology (April-June) Mallinckrodt Institute of Radiology, Washington University in St. Louis, Missouri, USA

Board Certification:
2005 Thai Board of Diagnostic Radiology, Diagnostic Radiology

Awards & Honor:
1999 First honour of Medical Degree
2003 Award of Radiation Biology examination

Active Professional Membership:
- Membership of Medical Association of Thailand. (1999 to present)
- Membership of Royal College of Radiologists of Thailand. (2007 to present)
- Membership of Thai Society of Vascular and Interventional Radiology. (2007 to present)
- Membership of Radiology Society of North America (2013 to present)
- Membership of Society for Cardiovascular Magnetic Resonance (2014 to present)
- Membership of European Society of Thoracic Imaging (2016 to present)

Field of Interest:
- Cardiovascular imaging & Doppler ultrasonography
- Vascular & oncologic interventional radiology



Teerapat Nantsupawat, MD
Cardiologist, Sriphat Medical Center,
and Maharaj Nakorn Chiang Mai Hospital,
Chiang Mai, Thailand

Title and/or degrees:
/MD

Education:

2000-2006	Doctor of Medicine, First Class Honors, Chiang Mai University, Thailand

Postgraduate Training:

7/2016-6/2018	Clinical Cardiac Electrophysiology Fellowship, University of Minnesota, Minneapolis, MN, USA
7/2013-6/2016	Cardiovascular Disease Fellowship, Texas Tech University Health Sciences Center, Lubbock, TX, USA
7/2010-6/2013	Internal Medicine Residency, Texas Tech University Health Sciences Center, Lubbock, TX, USA
2006-2008	Internal Medicine Residency, Lampang hospital, Thailand

Work Experiences:

2018-present	Cardiac Electrophysiologist/Cardiologist, Sriphat Medical Center and Maharaj Nakorn Chiang Mai Hospital, Chiang Mai, Thailand
2008-2010	General practice, Theppanya hospital, Chiang Mai, Thailand General practice, McCormick hospital, Chiang Mai, Thailand

Honors & Awards:

2012	Trainee research award, The Southern Section-American Federation for Medical Research (SAFMR) and the Southern Society for Clinical Investigation (SSCI), USA
2006	First class honors, Doctor of Medicine, Chiang Mai University Medical School, Thailand
2004	Nara Medical School exchange program scholarship, Japan

Teerapat Yingchoncharoen, MD
Division of Cardiology, Department of Internal Medicine,
Ramathibodi hospital, Mahidol University,
Bangkok, Thailand

Title and/or degrees:
MD

Professional Experience:

Sep 2014- Present	Instructor, Division of Cardiology, Department of Internal Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
July 2013 - June 2014	Clinical Fellowship, Heart Failure/Transplantation Cleveland Clinic, OH, USA
July 2012 - June 2013	Clinical Fellowship, Advanced Cardiac Imaging (Echocardiography/MRI) Cleveland, Clinic, OH, USA
July 2011- June 2012	Research Fellowship, Echocardiography Cleveland Clinic, OH, USA
June 2010- June 2011	Clinical Fellowship, Advanced Cardiac Imaging, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
June 2008- May 2010	Fellowship, Cardiology, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
June 2005- May 2008	Residency, Internal Medicine, Prince of Songkla University, Songkhla, Thailand
Apr 2004- May 2005	Internship, Internal Medicine, Prince of Songkla University, Songkhla, Thailand

Education:

1998- 2004	Doctor of Medicine, graduated with honors Faculty of Medicine, Chulalongkorn University, Bangkok,Thailand

Honors and Awards:

September 2013	Caregiver Appreciation Award, Awarded by Cleveland Clinic for outstanding clinical care
2012-present	Invited Reviewer, Heart Asia (BMJ) Journal
April 2010	First Prize of the Fellow Research Award Awarded by the Royal College of Physician of Thailand
March 2010	Young Investigator Award Awarded by the Heart Association of Thailand under Royal Patronage H.M. of the King
December 2009	Distinguished Fellow of the Year 2009m Awarded by Department of Internal Medicine, Ramathibodi hospital, Thailand
April 2007	Outstanding Internal Medicine Resident Award Awarded by Faculty of Medicine, Prince of Songkla University, Thailand

Thananya Boonyasirinant, MD
Division of Cardiology, Department of Medicine
Faculty of Medicine, Siriraj Hospital, Mahidol University,
Bangkok, Thailand

Title and/or degrees:
Professor/MD

Position:

2013 Associate Professor
2011 Assistant Dean of Academic Affairs, Faculty of Medicine, Siriraj Hospital, Mahidol University
2010 Assistant Professor
2005 Instructor, Division of Cardiology, Siriraj Hospital

Education:

2009 Fellowship in Pediatric Cardiovascular Magnetic Resonance Imaging, Children Hospital Boston, Harvard University, Boston, USA
2009 Diplomate of the Certification Board of Cardiovascular Computed Tomography, Society of Cardiovascular Computed Tomography (SCCT), USA
2009 Certificate of level 3 training in Cardiovascular Magnetic Resonance Imaging, Cleveland Clinic, Ohio, USA, according to Society of Cardiovascular Magnetic Resonance (SCMR) criteria
2009 Certificate of level 3 training in Cardiovascular Computed Tomography, Cleveland Clinic, Ohio, USA, according to Society of Cardiovascular Computed Tomography (SCCT) criteria
1995 MD, Siriraj Hospital, Mahidol University (Honor)
2001 Diploma of Thai board of Internal Medicine, Siriraj Hospital, Mahidol University
2003 Diploma of Thai board of Cardiology, Siriraj Hospital, Mahidol University
2004 Diploma in Family Medicine, Siriraj Hospital, Mahidol University
2008 Fellowship in Cardiovascular Magnetic Resonance Imaging and Computed Tomography, Cleveland Clinic, Ohio, USA

Thoranis Chantrarat, MD
Cardiac Electrophysiology, Department of Internal Medicine,
Phramonkutklao Medical College Hospital,
Bangkok, Thailand

Title and/or degrees:
MD

Current Position:
- Consultant Cardiologist and Electrophysiologist, Phramongkutklao College of Medicine
- Secretary of Thai Cardiac Electrophysiology Club of Thai Heart Association
- Member of Resuscitation Council of Thailand
- ACLS instructor of the American Heart Association

General education:

1992	Nakhonsawan High School, Thailand
1990	Certificate of Proficiency in English, Cambridge University, U.K.

Medical education:

1998	MD. (first class honour), Chiangmai university, Thailand
1997	Certificate of appreciation of visiting medical student at Nippon Medical School, Tokyo, Japan
2002	Certificate of appreciation of visiting doctor at Tripler Army Medical Center, Hawaii, USA
2003	Diploma of Thai board of Internal Medicine at Pramongkutklao Medical College, Bangkok, Thailand
2004-2008	Certificate in Cardiology and Electrophysiology, University of Southampton, United Kingdom

Degree and Qualifications:
MD. Member of Royal College of Physician of Thailand

Awards:

2002	Rotary Foundation Career Award GSE, District 3350, Thailand
2003	Chief Resident of Internal Medicine Department at Pramongkutklao Medical College, Bangkok, Thailand
2010-2011	Senior Lecturer at Phramongkutklao College of Medicine

Clinical experiences:

1999-2000	Internship at Jiraprawat Army Hospital, Royal Thai Army
2000 (April)	Visiting Physician at Armersfort Hospital, Armersfort, The Netherland, under the Rotary Foundation Program
2000-2003	Residency Training in Internal Medicine at Pramongkutklao Medical College, Bangkok, Thailand
2003	Visiting Physician at Perth General Hospital, Perth, Australia
2003-2004	Staff Physician in Internal Medicine at Pramongkutklao Medical College Hospital, Thailand
2004-2008	Fellowship in Cardiology and Electrophysiology at Southampton University Hospital, Southampton, UK
2007	Registra in Interventional Cardiology at the Royal Brompton and Harefield Trust, Imperial College, London, UK

Treechada Wisaratapong, MD
Cardiology unit, Department of Internal Medicine,
Songklanagarind hospital, Prince of Songkla University,
Hatyai, Songkhla, Thailand

Title and/or degrees:
MD

Education experience:

2011-2012	Electrophysiology training in Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
Oct-Nov 2006	Pacemaker implantation training at Chang Gung Memorial Hospital, Taipei, Taiwan
2005-2010	Cardiology Unit, Department of Internal Medicine, Songklanagarind Hospital, Prince of Songkla University, Hatyai, Songkhla, Thailand
2001-2004	Residency in Internal Medicine, Department of Medicine, Songklanagarind Hospital, Prince of Songkla University, Hatyai, Songkhla, Thailand
1994-2000	Doctor of Medicine (M.D.), Faculty of Medicine, Prince of Songkla University, Hatyai, Songkhla, Thailand

Licenses and Certifications:

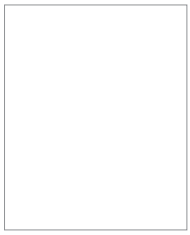
2014	Certification Examination for Competency in Cardiac Rhythm Device Therapy for the Physician (CCDS), International Board of Heart Rhythm Examiners
2012	Certification Examination for Competency in Cardiac Electrophysiology for the Physician (CEPS), International Board of Heart Rhythm Examiners
2010	Diplomate, Thai Board of Cardiology
2004	Diplomate, Thai Board of Internal Medicine
2000	Doctor of Medicine (M.D.)

Previous Medical Experiences:

- Clinical Electrophysiologist, Cardiology Unit, Songklanagarind Hospital, Prince of Songkla University: electrophysiologic study and radiofrequency ablation both conventional and 3D mapping procedures, CIEDs implantation and pacemaker clinic
- Clinical cardiologist, Cardiology Unit, Songklanagarind Hospital, Prince of Songkla University: echocardiography, coronary angiography and diagnostic cardiac catheterization
- Teaching Medical Staff, Department of Internal Medicine, Songklanagarind Hospital, Prince of Songkhla University since 2005

Awards, Scholarships and Honors:

March 2012	The third prize winner of Yong Investigator Award, 44th Annual Scientific Meeting of The Heart Association of Thailand under the Royal Patronage of H.M. the King, Bangkok
2004	Best Resident Award for Third Year Resident, Department of Medicine, Songklanagarind Hospital, Prince of Songkla University
2000	First Class Honor for Doctor of Medicine, Department of Medicine, Prince of Songkla University



Urasri Imsomboon, RN
Faculty of Medicine Ramathibodi Hospital,
Mahidol University
Bangkok, Thailand

Title and/or degrees:
RN

Education History:

1995-1998	Bachelor of nursing science (2nd class honor), Faculty of Medicine, Ramathibodi Hospital, Mahidol University
2004-2006	Master of business administration, Faculty of commerce and accountancy, Thammasat University
2004	Critical care nursing (adult and aging), Faculty of Medicine, Ramathibodi Hospital, Mahidol University
2011	Critical care nursing, Rajavithi Hospital and Parkway College, Singapore

Work Experience:

1999-2010	CCU RN, Faculty of Medicine, Ramathibodi Hospital, Mahidol University
2011-present	Head nurse of CCU, Somdech Phra Debaratana medical center, Faculty of Medicine, Rama thibodi Hospital, Mahidol University

Vichai Senthong, MD
Cardiovascular Unit, Department of Medicine,
Faculty of Medicine, Khon Kaen University,
Khon Kaen, Thailand

Title and/or degrees:
MD

Education:

Jul-Dec 2015	Clinical Fellow in Cardiovascular Medicine, Heart and Vascular Institute at the Cleveland Clinic, Cleveland, USA.
2014-2015	Certificate in Cardiovascular Medicine (Advanced Heart Failure and Transplant Cardiology), Heart and Vascular Institute at the Cleveland Clinic Foundation, Cleveland, OH, USA
2011-2012	Board of Interventional Cardiology: Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand.
2007-2009	Board of Cardiology: Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand.
2003-2007	Board of Internal Medicine: Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand
1997-2003	Doctor of Medicine (M.D.): Faculty of Medicine, Khon Kaen University, Thailand

Professional Appointment:

2010-present	Lecturer, Interventional Cardiologist and Heart Failure Cardiologist in the Cardiovascular Unit, Department of Medicine Faculty of Medicine, Khon Kaen University,Khon Kaen, Thailand.

Honours and Awards:

2016	First prize winner in "Cardiology Got Challenge" in 48th HAT Annual Scientific Meeting, Bangkok, Thailand.
2014	First prize winner in "Clinical Research and Proposal Development Award" for Fellowship Research Proposal, Lerner Research Institute, Cleveland Clinic, Ohio, USA.
2014	First prize winner in "Young Radialist, TRI Case Presentation" in The Second Transradial Intervention Club Seminar (T-TRICS), Pattaya, Thailand.
2012	First prize winner in "You did it, You fix it symposium" in The Third Annual Conference of Cardiovascular Intervention Association of Thailand (CIAT), Bangkok, Thailand.
2008	First prize winner in Thai Heart Association Award for Thai Cardiology Fellowship Research Proposal.

Presentations at International Meetings:

2015	Annual Scientific Session, American College of Cardiology (ACC.15) California, USA.
2014	Annual Scientific Sessions, EuroPCR 2014 Paris-France: "PCI of the ostial LAD coronary artery".
2013	9th Asian Interventional Cardiovascular Therapeutics (AICT), Bangkok, Thailand: "STEMI from Coronary Embolism".
2013	9th Asian Interventional Cardiovascular Therapeutics (AICT), Bangkok, Thailand: "Clinical Outcomes after PCI for ACS in patients presented with Left main Coronary Artery Disease".
2011	Annual Scientific Sessions, European Society of Cardiology (ESC) Congress 2011 Paris – France: "Effects of metoprolol tartrate versus carvedilol on clinical outcomes and central aortic pressure in patients with chronic heart failure".

Voravut Rungpradubvong, MD., MSc.
Division of Cardiology, Department of Medicine,
Faculty of Medicine, Chulalongkorn University
Bangkok, Thailand

Title and/or degrees:
Associate Professor/MD

Education:
2015 University of Michigan Cardiovascular Center, USA Research and Clinical Cardiac Electrophysiology Fellowship Certified Clinical Cardiac Electrophysiology Certified Electrophysiology Research
2012 National Cerebral and Cardiovascular Center, Japan Japan International Cooperation Agency, JICA scholarship 2012

Certified Advanced Clinical Electrophysiology:
2010 King Chulalongkorn Memorial Hospital, Thailand Certified Thai Board of Cardiology
2010 Chulalongkorn University, Faculty of Medicine, Thailand Master of Science
2008 King Chulalongkorn Memorial Hospital, Thailand Certified Thai Board of Internal Medicine
2006 Chulalongkorn University, Faculty of Medicine, Thailand Graduate Diploma of Clinical Sciences Degree
2002 Chulalongkorn University, Faculty of Medicine, Thailand Doctor of Medicine, MD (Hons) 1996 Yannawate Wittayakom School, Bangkok, Thailand High School Certificate (equivalent to Grade 12)
1993 Yannawate Wittayakom School, Bangkok, Thailand Junior High School Certificate (equivalent to Grade 9)
1990 Viriyalai School, Bangkok, Thailand Elementary School Certificate (equivalent to Grade 6)

Training Experience:
2015 Spectranetics Laser System Laser Lead Extraction Simulation Training
2012 Taipei Veterans General Hospital, Taiwan Ablation of complex arrhythmia using 3-D mapping and navigation systems
2012 Shanghai Zhongshan Hospital, China Permanent Pacemaker Implantation Experts of Asia Pacific Joint Program (TAIJI)
2012 Institut Jantung Negara – The National Heart Institute of Malaysia Cardiac Resynchronization Therapy

Cardiac Electrophysiology Experience:
2009-present Electrophysiology study and Radiofrequency ablation More than 1,500 cases
- Assisted about 200 cases (including ablation of complex arrhythmias such as AF, VT)
- Performed about 800 cases (about 150 cases for AF)
- Supervised more than 500 cases
- Cardiac Device Implantation More than 1,200 cases
- Assisted about 100 cases (about 20 cases for CRT)
- Performed about 700 cases (about 120 cases for CRT)
- Supervised more than 400 cases

Professional Qualifications:
2017-present Treasurer and committee of Thai Electrophysiology Club
2014-present Member of Heart Rhythm Society (HRS)
2012-present Member of Asia Pacific Heart Rhythm Society (APHRS)

2012-present Member of Thai Electrophysiology Club
2010-present Member of European Society of Cardiology (ESC)
2010-present Member of The Heart Association of Thailand under the Royal Patronage of H.M. the King
2009-present Member of The Royal College of Physician of Thailand 2002-present Member of The Medical Council of Thailand

Work Experience:

2012-present Cardiac Center, King Chulalongkorn Memorial Hospital Attending in Cardiac Electrophysiology Unit, Division of Cardiovascular medicine, Department of Medicine, Faculty of Medicine, Chulalongkorn University
2010-2011 Taksin Hospital, Bangkok Metropolitan Administration Full-time Cardiologist
2006-2013 Bumrungrad International On call physician in Medicine and Emergency Division
2004-2005 Taksin Hospital, Bangkok Metropolitan Administration Full-time General Physician in Medicine Division
2003 Namyun Hospital, Ubonratchathani, Ministry of Public Health Full-time General Physician in Community Hospital
2002-2003 Sappasittiprasong Hospital, Ubonratchathani, Ministry of Public Health Internship in Tertiary Care Centre

Awards & Recognition:

2015 Electrophysiology Cornerstone Course, Minnesota, USA By Prof.George J. Klein Electrophysiology quiz's top scorer
2014 Research Poster presentation at HRS2014, San Francisco, USA Outcomes of Early and Delayed Removal in Patients with Cardiac Implantable Electronic Device Infection
2012 Association of Yannawate Wittayakom School Alumni Outstanding Alumnus Award
2007-2008 Department of Medicine, Faculty of Medicine, Chulalongkorn University Chief Resident & Outstanding Resident Award
2004-2005 Taksin Hospital, Bangkok Metropolitan Administration Team leader in Information Management of Division of Medicine
2004 Namyun Hospital, Ubonratchathani, Ministry of Public Health Team leader in Information Management (Hospital Accreditation) Head Auditor in Medical Record
2002 Chulalongkorn University, Faculty of Medicine, Thailand Doctor of Medicine, MD (Hons)

Wacin Buddhari, MD, FACC
Division of Cardiovascular Medicine,
Department of Medicine
King Chulalongkorn Memorial Hospital.
Bangkok, Thailand

Title and/or degrees:
MD, FACC

Present appointments Director, Cardiac Catheterization Laboratory Cardiac Center King Chulalongkorn Memorial Hospital Bangkok, Thailand

Faculty; Interventional Cardiology Division of Cardiovascular Medicine, Department of Medicine Faculty, of Medicine, Chulalongkorn University Bangkok, Thailand

Consultant cardiologist Bumrungrad International Hospital Bangkok, Thailand
Consultant cardiologist Theptarin Hospital Bangkok, Thailand Consultant cardiologist BNH Hospital Bangkok, Thailand

Education & Postdoctoral Training:

1981 – 1987 Medical Diplomas (Second Class Honor) Faculty of Medicine (Medical School), Chulalongkorn University Bangkok, Thailand
1987 - 1989 Postdoctoral internship: Internal Medicine (Government obligation) Department of Medicine, Chonburi Hospital Chonburi, Thailand
1989 – 1992 Residency training: Internal Medicine Emory University School of Medicine Atlanta, Georgia, USA
1992 - 1993 Clinical research fellow: Cardiology Carlyle Fraser Heart Center Crawford Long Hospital of Emory University Atlanta, Georgia, USA
1993 – 1996 Fellowship: Cardiology Emory University School of Medicine Atlanta, Georgia, USA
1996 - 1997 Fellowship: Interventional Cardiology Andreas Greuntzig Cardiovascular Center Emory University School of Medicine Atlanta, Georgia, USA

Certifications:

1987 Medical Diploma (Second class honor)
1992 American Board of Internal Medicine
1997 American Board of Internal Medicine: Added Qualification in Cardiovascular Disease
1997 Thai Board of Internal Medicine
1997 Thai Board of Cardiology
1999 American Board of Internal Medicine: Added Qualification in Interventional Cardiology

Membership:

Member: Medical Council of Thailand
Member: The Medical Association of Thailand
Member: The Coronary Intervention Club of Thailand
Member: The Royal College of Physician of Thailand
Member: The Heart Association of Thailand
Fellow: American College of Cardiology (FACC)

Offices/Committees:

2002 – 2004 Scientific Chairman, the Coronary Intervention Club of Thailand
2004 – 2006 Secretary General, the Coronary Intervention Club of Thailand
2005 – 2010 Secretary General, Executive Committee, National PCI Registry
2008 – 2010 Scientific Chairman, The Heart Association of Thailand under the Royal Patronage
2010 – 2012 Secretary General, The Cardiovascular Intervention Association of Thailand
2011 – 2014 Treasurer, ASEAN Federation of Cardiology (AFC)
2014 – 2016 Vice President, The Cardiovascular Intervention Association of Thailand
2014 – 2018 Vice President, The Cardiovascular Intervention Association of Thailand (CIAT)
2018 – To date President, The Cardiovascular Intervention Association of Thailand (CIAT)

Wanwarang Wongcharoen, MD
Northern Cardiac Center, Maharaj Nakorn Chiang Mai Hospital,
Faculty of Medicine, Chiang Mai University,
Chiang Mai, Thailand

Title and/or degrees:
Associate Professor/MD

Present Position: Associate Professor in Division of Cardiology, Department of Internal Medicine, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand
Staff in Northern Cardiac Center, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

Education:

1998	MD (First Class Honor), Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand
2002	Thai Board Certified in Internal Medicine
2004	Thai Board Certified in Cardiology

Honors/Awards:

2004	First prize in fellowship investigators award at the Royal College of Physicians of Thailand Annual Scientific Meeting
2004	Thai Heart Association Scholarships for Top score of Cardiology Board examination

Working Experiences:

1999 - 2000	Resident of Internal Medicine, Maharaj Nakorn Chiang Mai, Chiang Mai University,
1999 - 2001	Chiang Mai, Thailand
2002 - 2004	Fellow in Cardiology, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand
Jan 2005 - December 2006	Electrophysiology fellow at Taipei Veteran General Hospital, Taipei, Taiwan (Prof. Shih-Ann Chen)
February 2007 - July 2007	Electrophysiology and device fellow at Austin Hospital, Melbourne, Victoria, Australia
2004 - Present	Staff in Department of internal medicine, Faculty of Medicine, Chiang Mai University,
	Chiang Mai, Thailand
2004 - Present	Member, Cardiac Electrophysiology Research Unit (directed by Dr. Nipon Chattipakorn), Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

Wilawan Thirapattarapong, MD
Cardiac Rehabilitaion Division
Department of Rehabilitation Medicine,
Faculty of Medicine, Siriraj Hospital,
Mahidol University, Bangkok, Thailand

Title and/or degrees:
Associate Professor/MD

Education:

2000 Medical Degree, Faculty of Medicine, King Chulalongkorn University, Bangkok, Thailand
2004 Graduate Diploma in Clinical Science (Rehabilitation Medicine) Mahidol University, Bangkok, Thailand
2007 Diploma Board of Rehabilitation Medicine, Royal College of Physiatrists of Thailand
2011 Certificate of fellowship training in cardiopulmonary rehabilitation from New York Presbyterian Hospital, Columbia University, New York City, New York, USA
2013 Certificate of fellowship training in cardiopulmonary rehabilitation from Mayo Clinic Hospital, Rochester, Minnesota, USA

Wipharak Rattanavipanon, BSc (Pharm)
Clinical Pharmacy Division,
Department of Pharmacy, Faculty of Pharmacy,
Mahidol University,
Bangkok, Thailand

Title and/or degrees:
BSc

Academic Background:
2016 – 2018 Cardiology research fellow
College of Pharmacotherapy of Thailand, ThailandMonash University Malaysia (visiting researcher)
2014 - 2015 Specialized residency in cardiology pharmacotherapy
College of Pharmacotherapy of Thailand
2013 College of Pharmacotherapy of Thailand
2011 Bachelor of Science in Pharmacy (1st Honors) Mahidol University, Bangkok, Thailand

Professional Experience:
2018 Professional training exchange in cardiology
UK Healthcare, University of Kentucky, Lexington, USA
College of Pharmacy, University of Kentucky, Lexington, USA
UI Hospital and Health Science System, Illinois, USA
College of Pharmacy, University of Illinois at Chicago, Illinois, USA
2016 – 2017 Cardiology research fellow, Monash University Malaysia (visiting researcher) Faculty of Pharmacy, Mahidol University
2014 - 2015 Cardiology Pharmacy Resident
2013 – 2014 Pharmacotherapy Training Resident

Academic Appointment:
2011 - 2018 Assistant Lecturer
Department of Pharmacy, Faculty of Pharmacy, Mahidol University, Bangkok, Thailand

Academic Awards/Achievements:
2007 Scholarship, Residency program
granted by Faculty of Pharmacy, Mahidol University

Professional Affiliations:
2011 – present Pharmacy Council of Thailand
2017 – present Thai Resuscitation Council ACLS Provider

Wiwun Tungsubutra, MD
Division of Cardiology, Department of Medicine,
Faculty of Medicine, Siriraj Hospital, Mahidol University,
Bangkok, Thailand

Title and/or degrees:
Associate Professor/MD

Current Position:

2012-present	Associate Professor of Medicine, Division of Cardiology, Department of Medicine,Siriraj Hospital Faculty of Medicine, Mahidol University, Bangkok, Thailand
2004	Assistant Professor of Medicine
2002-2004	Instructor of Medicine

Education and Professional Training:

2000- 2001	Interventional Cardiology Fellowship, University of Maryland Medical Center, Baltimore, MD
1998-1999	Echocardiography Research Fellowship, Duke University Medical Center, Durham, NC
1995-1998	Cardiology Fellowship, University of Chicago Hospitals, Chicago, IL
1992-1995	Internal Medicine Residency & Internship, University Hospitals of Cleveland, Case Western Reserve University, Cleveland, OH
1990-1992	Medicine - National Service Program, Mahidol University, Siriraj Hospital, Bangkok, Thailand
1984-1990	Doctor of Medicine 1st Class Honors, Mahidol University Siriraj Hospital, Bangkok, Thailand

51st Annual Scientific Meeting The Heart Association of Thailand under the Royal Patronage of H.M. the King

Theme "Cardiology 5.1"

21st-24th March 2019
@ Grand Ballroom, Sheraton Hotel, Hua-Hin

Day 1; Thursday: 21st March 2019

Date	21st March 2019	21st March 2019	21st March 2019	21st March 2019
Venue	Chandelier 2	Grand Ballroom	InAzia	@ Black
Time/	Internist	Cardiologist	Allied Healthcare Professional	Research
14:00-15:30	Cardiology board review for internist 1 (Thai)	The bare necessity of cardiology I (Thai)	High value care: CVT nursing Thai)	
15:30-15:45	Coffee Break and Visit Exhibition @ foyer Chandelier 2 & Grand Ballroom			
15:45-17:45	Cardiology board review for internist 2 (Thai)	The bare necessity of cardiology II (Thai)	Excellence cardiovascular nursing care (Thai)	
18:00-19:00	Dinner Symposium sponsored by Biotronic (Thailand) Co.,Ltd (Limit 100 Seats) (Thai)			Fellow poster presentation
19:00-20:30	Night time Cardiology Got Talent 6 Cases (Thai)			

Venue: Chandelier 2 (room 1)
Time: 14:00-20:30

14:00-15:30 Cardiology board review for internist 1 (Thai)

- Practical points and common pitfalls in the management of acute coronary syndrome
Speaker: *Chaisiri Wanlapakorn, MD (45 mins)*
- Valvular Heart Diseases: From physical signs to practice guidelines
Speaker: *Rungsrit Kanjanavanich, MD (45 mins)*

Moderator: *Khanchit Likittanasombat, MD*

15:30-15:45 Coffee Break and Visit Exhibition
Venue: @ foyer Chandelier 2 & Grand Ballroom

15:45-17:45 Cardiology board review for internist 2 (Thai)
-Essential arrhythmias that every internist needs to know (30 mins)
Speaker: Thoranis Chantrarat, MD
-Approach to heart failure and cardiomyopathy (30 mins)
Speaker: *Teerapat Yingchoncharoen, MD*

Moderator: *Khanchit Likittanasombat, MD*

Virtual case discussion with Experts
(Participants will experience real-life clinical cases on an interactive patient simulator with debriefing and feedback from expert cardiologists in the field) (60 mins)

(Chaisiri, Rungsrit, Thoranis, Teerapat, Kanchit)

18:00-19:00 **Dinner Symposium 1** sponsored by Biotronic (Thailand) Co.,Ltd (Limit 100 Seats) (Thai)
"Innovative technology for pacemaker patients with Atrial arrhythmia and vasovagal syncopy"
Speakers: *Tachapong Ngarmukos, MD*
Voravut Rungpradubwong, MD

19:00-20:30 Night time Cardiology Got Talent 6 Cases (Thai)
Judges & Commentators:
Khanchit Likittanasombat, MD
Wiwun Tungsubutra, MD
Smonporn Boonyaratavej Songmuang, MD
Nakarin Sansanayudh, MD

Venue: Grand Ballroom (room 2)
Time: 14:00-17:45

14:00-15:30 **The bare necessity of cardiology I (Thai)**
Anatomy correlation with CXR & cardiac imaging
Speakers: *Supin Chompoopong, MD*
Sukit Yamwong, MD
Nithima Ratanasit, MD
Tanop Srisuwan, MD

Moderator: *Smonporn Boonyaratavej Songmuang, MD*

15:30-15:45 Coffee Break and Visit Exhibition
Venue: @ foyer Chandelier 2 & Grand Ballroom

15:45-17:45 The bare necessity of cardiology II (Thai)
Anatomy correlation with CXR & cardiac imaging
Speakers: *Supin Chompoopong, MD*
Pairoj Chattranukulchai, MD

Thananya Boonyasirinant, MD
Rungroj Krittayaphong, MD

Moderator: *Rungroj Krittayaphong, MD*

Venue: **In Azia (room 3)**
Time: **14:00-17:45**

14:00-15:30 **High value care: CVT nursing (Thai)**
- High value care for CVT nurse: concept
Speaker: *Penchun Saenprasarn, RN, D.B.A*
- Health Literacy in CVT nursing
Speaker: *Kanogporn Jamsomboon, RN, PhD.HRD*
- CVT nursing assessments: IT
Speaker: *Maream Prousoontorn, RN*

Moderator: *Maream Prousoontorn, RN*

15:30-15:45 Coffee Break and Visit Exhibition
Venue: **@ foyer Chandelier 2 & Grand Ballroom**

15:45-17:45 **Excellence cardiovascular nursing care (Thai)**
- Humanized health care in CVT nursing
Speaker: *Arun Nurake, RN, M.Ed*
- CVT nursing in critical care
Speaker: *Pranee Thongsai, RN*
- CVT nursing in chronic care
Speaker: *Namfon Khatjuang, RN*

Moderator: *Namfon Khatjuang, RN*

Venue: **@ Black (room 4)**
Time: **18:00-19:00**

18:00-19:00 **Fellow poster Presentation**
Judges: *Pyatat Tatsanavivat, MD*
Sukit Yamwong, MD
Smonporn Boonyaratavej Songmuang, MD
Rungroj Krittayaphong, MD
Rungsrit Kanjanavanich, MD
Arintaya Phrominthikul, MD
Prin Vathesatogkit, MD
Vichai Senthong, MD

Sponsor Symposium by Pharmaceutical

Day 1; **Thursday: 21 March 2019**

Venue: **Chandelier 2 (room 1)**
Time: **18:00-19:00**

18:00-19:00 **Dinner Symposium 1 (Thai)**
"Innovative technology for pacemaker patients with Atrial arrhythmia and vasovagal syncopy"
Speakers: *Tachapong Ngarmukos, MD*
Voravut Rungpradubwong, MD

Sponsored by Biotronic (Thailand) Co. Ltd (Limit 100 Seats)

Day 2; Friday: 22 March 2019

Date	22nd March 2019	22nd March 2019	22nd March 2019	22nd March 2019
Venue	Chandelier 2	Grand Ballroom	InAzia	@ Black
Time/	Internist /Cardiologist	In Dept/FIT	Allied Healthcare Professional	Research
07:00-08:00	Breakfast Symposium sponsored by AstraZeneca (Thailand) Co.Ltd			
08:00-09:00	Preoperative Management for non Cardiac Surgery in: (Thai)	Cardiac Surgery for Fellow Pre & Post operative management (Thai)	Cardiology for Allied Healthcare Professional (Thai)	
09:00-10:00	The latest evidence in CAD (Thai) Cardiology (Thai)	Advanced Interventional	Outpatient care (Thai)	09.00-10.30 Young Investigator Award oral presentation (English)
10:00-10:45	Coffee Break and Visit Exhibition @ foyer Chandelier 2 & Grand Ballroom			
10:45-11:15 (Thai)	Educational symposium sponsored by A. Menarini Co.,Ltd			10.45-11.45 Abstract presentation I: "Miscellaneous"
11:15-12:00	Lunch Symposium 1 sponsored by AstraZeneca (Thailand) Co.,Ltd (Thai)			
12:00-12:30	Lunch delivery			
12:30: 13:15	Lunch Symposium 2 sponsored by Pfizer (Thailand) Co.,Ltd (English)			
13:15-14:45		AF afternoon (English)	Pharmacology for Pharmacist 1 Common Pitfalls (Thai)	Abstract presentation II: "CAD and ACS"
14:45-15:30	Coffee Break and Visit Exhibition @ foyer Chandelier 2 & Grand Ballroom			
15:30-17:00		"โต๊ะมหาสนุก"	Critical care & cath lab (Thai)	
17:00-18:00	Dinner Symposium sponsored by Amgen (Thailand) Co.,Ltd (Thai)			
18:00- 19:30	Educational nighttime Symposium hosted by the EP club ECG, EP tracing & CRM trouble shooting			

Venue: **Chandelier 2 (room 1)**
Time: **07:00-19:30**

07:00-08:00 **Breakfast Symposium 1** sponsored by AstraZeneca (Thailand) Co.Ltd
"Setting the New standard of National ACS Management"
Speakers: *Wacin Buddhari, MD*
Narathip Chunhamaneerat, MD

Moderator: *Rapeephon Kunjara Na Ayudhya, MD*

08:00-09:00 **Preoperative Management for non Cardiac Surgery in: (Thai)**
Diabetes mellitus
Speaker: *Sutin Sriussadaporn, MD*
Hypertension
Speaker: *Prin Vathesatogkit, MD*
Valvular heart diseases
Speaker: *Nithima Ratanasith, MD*

Moderator: *Kasem Ratanasumawong, MD*

09:00-10:00 **The latest evidence in CAD (Thai)**
EST, CAG, CAC & CTA
Speaker: *Nakarin Sansanayudh, MD*
Revascularization in stable CAD
Speaker: *Pavit Pienvichit, MD*
DAPT 2019
Speaker: *Wiwun Tungsubutra, MD*

Moderator: *Wiwun Tungsubutra, MD*

10:00-10:45 Coffee Break and Visit Exhibition
Venue: **@ foyer Chandelier 2 & Grand Ballroom**

10:45-11:15 **Educational symposium 1** sponsored by A. Menarini Co.,Ltd (Thai)
"Role of Ranolazine in Coronary Artery Disease"
Speaker: *Kriengkrai Hengrussamee, MD*

11:15-12:00 **Lunch Symposium 1** sponsored by AstraZeneca (Thailand) Co.,Ltd (Thai)
"Declaring Paradigm Shift in T2DM Management"
Speakers: *Pattarapong Makarawate, MD*
Kajohnsak Noppakun, MD

Moderator: *Charn Sriratanasathavorn, MD*

12:00-12:30 Lunch delivery

12:30: 13:15 **Lunch Symposium 2** sponsored by Pfizer (Thailand) Co.,Ltd (English)
AUGUSTUS Trial, what we are waiting for?
Speakers: *Professor Rebert Hatala, MD*
Thanawat Benjanuwattra,MD

14:45-15:30 Coffee Break and Visit Exhibition
Venue: @ foyer Chandelier 2 & Grand Ballroom

17:00-18:00 **Dinner Symposium 2** sponsored by Amgen (Thailand) Co., Ltd (Thai)
"Targeting new lipid therapies for dyslipidemia with high risk patients"
Speakers: *Narathip Chunhamaneerat, MD*
Kriengkrai Hengrussamee, MD

Moderator: *Prin Vathesatogkit, MD*

18:00-19:30 **Educational nighttime Symposium** hosted by the EP club
ECG, EP tracing & CRM trouble shooting (Thai)
(limited seats)
By: Boston Scientific, Medtronic, Johnson & Johnson
Speakers: *Thoranis Chantarat, MD*
Wanwarang Wongcharoen, MD
Arisara Suwanagool, MD
Teerapat Nantsupawat, MD
Treechada Wisaratapong, MD
Voravut Rungpradubvong, MD

Moderators: *Charn Sriratanasathavorn, MD*
Tachapong Ngarmukos, MD

Venue: Grand Ballroom (room 2)
Time: 08:00-17:00

08:00-09:00 **Cardiac Surgery for Fellow**
Pre & Post operative management (Thai)
Coronary revascularization
Speaker: *Boonlawat Homvises, MD*
Transplant/ ECMO
Speaker: *Pat Ongcharit, MD*
Valve surgery
Speaker: *Pranya Sakiyalak, MD*

Moderator: *Pranya Sakiyalak, MD*

09:00-10:00 **Advanced Interventional Cardiology (Thai)**
Valve: TAVI or SAVR in low risk AS
Speaker: *Wacin Buddhari, MD*
Valve: Transcatheter MV intervention, where are we now?
Speaker: *Krissada Meemook, MD*
What can we offer in acute myocardial infarction with shock?
Speaker: *Narathip Chunhamaneewat, MD*

Moderator: *Rapeephon Kunjara Na Ayudhya, MD*

10:00-10:45 Coffee Break and Visit Exhibition
Venue: @ foyer Chandelier 2 & Grand Ballroom

13:15-14:45 **AF afternoon (English)**
Novel risk stratification in AF
Speaker: *Gregory YH Lip, MD*
SPAF, how are we doing in Thailand?
Speaker: *Rungroj Krittayaphong, MD*
Catheter ablation for AF where are we after 20 years?
Speaker: *Koonlawee Nademanee, MD*

Moderators: *Lam Kai Huat, MD*
Khanchit Likittanasombat, MD

14:45-15:30 Coffee Break and Visit Exhibition
Venue: **@ foyer Chandelier 2 & Grand Ballroom**

15:30-17:00 “โต๊ะมหาสนุก”
Khanchit Likittanasombat, MD
Rungroj Krittayaphong, MD
Wiwun Tungsubutra, MD
Nithima Ratanasith, MD
Teerapat Yingchoncharoen, MD
Waraporn Tiyanon, MD

Venue: **In Azia (room 3)**
Time: **08:00-17:00**

08:00-09:00 **Cardiology for Allied Healthcare Professional (Thai)**
Heart failure
Speaker: *Bundit Naratreekoon, MD*
Arrhythmia
Speaker: *Arisara Suwanagool, MD*
CAD
Speaker: *Anek Kanoksilp, MD*

Moderators: *Arisara Suwanagool, MD*
Sineenart Likitratcharoen, RN

09:00-10:00 **Outpatient care (Thai)**
Heart failure clinic nursing care
Speaker: *Anong Amaritakomol, RN*
Anticoagulation management
Speaker: *Pornnalat Katekaew, MS*
Pacemaker clinic trouble shooting
Speaker: *Teerapat Nantsupawat, MD*

Moderator: *Teerapat Nantsupawat, MD*

10:00-10:45 Coffee Break and Visit Exhibition
Venue: **@ foyer Chandelier 2 & Grand Ballroom**

13:15-14:45 **Pharmacology for Pharmacist 1 Common Pitfalls (Thai)**
Vasopressors in CCU
Speaker: *Pattamawan Kosuma, PharmD, BCPS*
Pharmacology review of NOACs antidotes
Speaker: *Wipharak Rattanavipanon, BSc (Pharm)*
Real world experience in NOAC use: Case-based learning
Speaker: *Pornnalat Katekao, MS*

Moderators: *Adisai Buakhumsri, MD*
Surakit Natheesuwan, PharmD, PhD

14:45-15:30 Coffee Break and Visit Exhibition
Venue: **@ foyer Chandelier 2 & Grand Ballroom**

15:30-17:00 **Critical care & cath lab (Thai)**
Post open heart surgery nursing care
Speaker: *Pataraporn Kheawwan, RN, PhD*
Management of postoperative arrhythmias
Speaker: *Treechada Wisaratapong, MD*
Hemodynamic & angiogram
Speaker: *Vichai Senthong, MD*
EP & CIED implantation
Speaker: *Voravut Rungpradubvong, MD*

Moderators: *Treechada Wisaratapong, MD*
Pataraporn Kheawwan, RN, PhD

Venue: **@ Black (room 4)**
Time: **09:00-14:45**

09:00-10:30 **Young Investigator Award (English)**
Judges: *Sofian Johar, MD (Brunei)*
Hav Ratneary, MD (Cambodian)
Jetty Sedyawan, MD (Indonesian)
Bounhieng PHALIBAY, MD (Laos)
Lam Kai Huat, MD (Malaysia)
Aung Zaw Myo, MD (Myanmar)
Aurelia Leus, MD (Philippines)
Ong Hean Yee, MD (Singapore)
Khanchit Likittanasombat, MD (Thailand)
Linh Huynh Dinh, MD (Vietnam)

Moderators: *Pyatat Tatsanavivat, MD*
Prin Vathesatogkit, MD

10:30-10:45 Coffee Break and Visit Exhibition
Venue: **@ foyer Chandelier 2 & Grand Ballroom**

10.45-11.45 **Abstract presentation I: "Miscellaneous"**

Moderators: *Arintaya Phromintikul, MD*
Rapeephon Kunjara Na Ayudhya, MD

13:15-14:45 **Abstract presentation II: "CAD and ACS"**

Moderators: *Sukit Yamwong, MD*
Rungsrit Kanjanavanich, MD

Sponsor Symposium by Pharmaceutical

Day 2; Friday: 22 March 2019
Venue: Chandelier 2 (room 1)
Time: 07:00-11:30

07:00-08:00 **Breakfast Symposium 1**
"Setting the New standard of National ACS Management"
Speakers: *Wacin Buddhari, MD*
Narathip Chunhamaneerat, MD

Moderator: *Rapeephon Kunjara Na Ayudhya, MD*

Sponsored by AstraZeneca (Thailand) Co., Ltd

10:45-11:15 **Educational symposium 1 (Thai)**
"Role of Ranolazine in Coronary Artery Disease"
Speaker: *Kriengkrai Hengrussamee, MD*

Sponsored by A. Menarini Co., Ltd

11:15-12:00 **Lunch Symposium 1** (Thai)
"Declaring Paradigm Shift in T2DM Management"
Speakers: *Pattarapong Makarawate, MD*
Kajohnsak Noppakun, MD

Moderator: *Charn Sriratanasathavorn, MD*
sponsored by AstraZeneca (Thailand) Co., Ltd

12:00-12:30 Lunch delivery

12:30: 13:15 **Lunch Symposium 2** (English)
AUGUSTUS Trial, what we are waiting for?
Speakers: *Professor Rebert Hatala, MD*
Thanawat Benjanuwattra, MD

Sponsored by Pfizer (Thailand) Co., Ltd

18:00- 19:30 Educational nighttime Symposium hosted by the EP club
ECG, EP tracing & CRM trouble shooting (Thai)
(limited seats)
Speakers: *Thoranis Chantarat, MD*
Wanwarang Wongcharoen, MD
Arisara Suwanagool, MD

Teerapat Nantsupawat, MD
Treechada Wisaratapong, MD
Voravut Rungpradubvong, MD

Moderators: *Charn Sriratanasathavorn, MD*
Tachapong Ngarmukos, MD

Sponsored by Boston Scientific, Medtronic, Johnson & Johnson

Day 3; Saturday: 23 March 2019

Date	23rd March 2019	23rd March 2019	23rd March 2019	23rd March 2019
Venue	Chandelier 2	Grand Ballroom	InAzia	@ Black
Time/	Internist /Cardiologist	In Dept/FIT	Allied Healthcare Professional	Research
07:30-08:30	Breakfast symposium sponsored by Boehringer Ingelheim (Thai) Co.,Ltd (Thai)			
08:30-09:30	Cardiovascular Disease Screening (English)	SCD 2019 (Thai)	Medical –Surgical Issues in Adult with Tetralogy of Fallot	09.00-10.00 Research Highlights 2Poster During Break
09:30-10:00	Educational symposium sponsored by Novartis (Thailand) Co.,Ltd (Thai)			
10:00-10:30	Coffee Break and Visit Exhibition @ foyer Chandelier 2 & Grand Ballroom			10.30-11.30 Abstract Presentation III
10:30-11:30		Welcome address Kasarn Jatikavanij Memorial Lecture Kamol Sindhvanandha Honorary Lecture		
11:30-12:15	Lunch Symposium 3 sponsored by			
	Diichi Sankyo (Thailand) Co.,Ltd (English)			
12:15-12:45	Lunch delivery			
12:45-13:30	Lunch Symposium 4 sponsored by			
13:30-15:00	Bayer Thai Co.,Lt Practical pharmacology for internist (Thai) Antiplatelets, antithrombotic & fibrinolytic (Thailand)	Heart Failure afternoon (English)	Practical non-invasive investigations for Allied Healthcare Professional Ambulatory ECG (Thai)	13.30-15.00 Cohorts/Registries in Thailand: Data that will impact Thai guidelines
15:00-16:00	Coffee Break and Visit Exhibition	**HAT Business Meeting**		
16:00-17:30	Case based decision making (Thai)	Jeopardy: (English)		
17:30-18:00	Award & Prize			
18:00-19:00	Dinner symposium sponsored by Zuellig Pharma (Thailand) Co., Ltd (English)			

Venue: **Chandelier 2 (room 1)**
Time: **07:30-19:00**

07:30-08:30 **Breakfast symposium 2** sponsered by Boehringer Ingelheim (Thai) Co., Ltd (Thai)

08:30-09:30 **Cardiovascular Disease Screening (English)**
AF screening
Speaker: *Sofian Johar, MD*
Athlete screening
Speaker: *Pattarapong Makarawate, MD*
Fit to fly
Speaker: *Krisada Sastravaha, MD*

Moderator: *Khunying Mallika Wannakrairot, MD*

09:30-10:00 **Educational symposium 2 sponsored by Novartis (Thailand) Co., Ltd (Thai)**
"Seize the moment to optimize treatment for Heart Failure patient"
Speaker: *Arintaya Phromintikul, MD*

10:00-10:30 Coffee Break and Visit Exhibition
Venue: @ foyer Chandelier 2 & Grand Ballroom

11:30-12:15 **Lunch Symposium 3** sponsored by Diichi Sankyo (Thailand) Co.,Ltd (English)
"Cerebrovascular Risk and Anticoagulation in NVAF Patients – Recent Insights into NOAC Studies and Real World Evidence"
Speakers: *Gregory YH Lip, MD*
Pattarapong Makarawate, MD

Moderator: *Rapeephon Kunjara Na Ayudhya, MD*

12:15-12:45 Lunch delivery

12:45-13:30 **Lunch Symposium 4** sponsored by Bayer Thai Co., Ltd
"State of the Art in Managing Multi-Morbid AF Patient with NOAC"
Speakers: *Wanwarang Wongcharoen, MD*
Wacin Buddhari, MD

Moderator: *Charn Sriratanasathavorn, MD*

13:30-15:00 **Practical pharmacology for internist (Thai)**
Antiplatelets, antithrombotic & fibrinolytic (Thailand)
Speaker: *Surakit Natheesuwan, Pharm.D, PhD*
Anti-Hypertension
Speakers: *Krittin Bunditanukul, Pharm.D, PhD*
Lipid lowering agents
Speaker: *Arom Jedsadayanmata, Pharm.D, PhD*

Moderator: *Khanchit Likittanasombat, MD*

15:00-16:00 Coffee Break and Visit Exhibition
Venue: **@ foyer Chandelier 2 & Grand Ballroom**

16:00-17:30 **Case based decision making (Thai)**
Chronic amiodarone toxicity
Presenter: *Satchana Prumpruck, MD*
Acute amiodarone toxicity
Presenter: *Pattarapong Makarawate, MD*
NOAC Bleed
Presenter: *Tetsuro Takase, MD*
Panelists: *Adisorn Wongsa, MD*
Pantep Angchaisuksiri, MD
Surapan Sitthisook, MD
Thoranis Chantarat, MD
Smonporn Boonyaratavej Songmuang, MD
Amiodarone pulmonary toxicity
Speaker: Adisorn Wongsa, MD (15 mins)
NOAC bleed
Speaker: *Pantep Angchaisuksiri, MD (15mins)*

Moderator: *Tachapong Ngarmukos, MD*

17:30-18:00 Award & Prize

18:00-19:00 **Dinner symposium 3** sponsored by Zuellig Pharma (Thailand) Co., Ltd (English)
"Rethinking Hypertension, Resetting Expectations"
Speakers: *Ong Hean Yee, MD*
Wacin Buddhari, MD

Moderator: *Apichard Sukonthasarn, MD*

Venue: Grand Ballroom (room 2)
Time: 08:30-16:00

08:30-09:30 **SCD 2019 (Thai)**
Basic science of SCD
Speaker: *Apichai Khongphatthanayothin, MD*
Primary Prevention, which patients?
Speaker: *Charn Sriratanasathavorn, MD*
Catheter ablation for PMVT/VF: Yes we can!
Speaker: *Koonlawee Nademanee, MD*

Moderators: *Khanchit Likittanasombat, MD*
Tachapong Ngarmukos, MD

10:00-10:30 Coffee Break and Visit Exhibition
Venue: **@ foyer Chandelier 2 & Grand Ballroom**

10:30-11:30 Welcome address by
Khanchit Likittanasombat, MD
President the Heart Association of Thailand under the Royal Patronage of H.M. the King (10 mins)

Kasarn Jatikavanij Memorial Lecture (25 mins)
"Stroke prevention in AF: Asian perspective"
Speaker: *Gregory YH Lip, MD*

Kamol Sindhvanandha Honorary Lecture (25 mins)
"Big Data Cardiology"
Speaker: *Piyamitr Sritara, MD*

Moderator: *Rungroj Krittayaphong, MD*

13:30-15:00 **Heart Failure afternoon (English)**
Treat the cause
Speaker: *Srisakul Chirakarnjanakorn, MD*
Medical therapy concoction
Speaker: *Ong Hean Yee, MD*
Beyond medical therapy: CIED in HF
Speaker: *Thoranis Chantarat, MD*

Moderator: *Teerapat Yingchoncharoen, MD*

15:00-16:00 **HAT Business Meeting for Member of HAT**

16:00-17:30 **Jeopardy: (English)**
Wanwarang Wongcharoen, MD
Teerapat Yingchoncharoen, MD
Pairoj Chattranukulchai, MD

Venue: In Azia (room 3)
Time: 08:30-15:00

08:30-09:30 **Medical –Surgical Issues in Adult with Tetralogy of Fallot (Thai)**
Speaker: *Kanyalak Vithessonthi, MD*
Sarin Lekchuensakul, MD

Moderator: *Ankavipar Suprungruang, MD*

13:30-15:00 **Practical non-invasive investigations for Allied Healthcare Professional**
Ambulatory ECG (Thai)
Speaker: Urasri Imsomboon, RN
Echo
Speaker: *Adisai Baukumsri, MD*
MRI
Speaker: *Thananya Boonyasirinant, MD*
Stress test
Speaker: *Rungsrit Kanjanavanich, MD*

Moderator: *Thananya Boonyasirinant, MD*

Venue: @ Black (room 4)
Time: 09:00-15:00

09:00-10:00 **Research Highlights**
Local to Global: Interesting Published articles from Thai Cardiovascular Society
Speakers: *Rungroj Krittayaphong, MD*
Vichai Senthong, MD
Wipharak Bunmark, BS

Moderators: *Smonporn Boonyaratavej Songmuang, MD*
Arintaya Phromintikul, MD

Poster During Break

10.30-11.30 **Abstract Presentation III**

Moderators: *Pyatat Tatsanavivat, MD*
Vichai Senthong, MD

13.30-15.00 **Cohorts/Registries in Thailand: Data that will impact Thai guidelines**
Warfarin clinic
Speaker: *Wattana Wongtheptien, MD*
PCI Registry
Speaker: *Nakarin Sansanayudh, MD*
Cool AF
Speaker: *Rungroj Krittayaphong, MD*
I-Valve
Speaker: *Smonporn Boonyaratavej Songmuang, MD*

Moderators: *Rungroj Krittayaphong, MD*
Kasem Ratanasumawong, MD

Sponsor Symposium by Pharmaceutical

Day 3; Saturday: 23 March 2019

Venue: Chandelier 2 (room 1)
Time: 07:30-19:00

07:30-08:30 **Breakfast symposium 3** (Thai)
Sponsored by Boehringer Ingelheim (Thai) Co.,Ltd

09:30-10:00 **Educational symposium 2 (Thai)**
"Seize the moment to optimize treatment for Heart Failure patient"
Speaker: *Arintaya Phromintikul, MD*
Sponsored by Novartis (Thailand) Co., Ltd

11:30-12:15 **Lunch Symposium 3** (English)
"Cerebrovascular Risk and Anticoagulation in NVAF Patients – Recent Insights into NOAC Studies and Real World Evidence"
Speakers: *Gregory YH Lip, MD*
Pattarapong Makarawate, MD

Moderator: *Rapeephon Kunjara Na Ayudhya, MD*
Sponsored by Diichi Sankyo (Thailand) Co., Ltd

12:15-12:45 Lunch delivery
12:45-13:30 **Lunch Symposium 4**
"State of the Art in Managing Multi-Morbid AF Patient with NOAC"
Speakers: *Wanwarang Wongcharoen, MD*
Wacin Buddhari, MD
Sponsored by Bayer Thai Co., Ltd

18:00-19:00 **Dinner symposium 2** (English)
"Rethinking Hypertension, Resetting Expectations"
Speakers: *Ong Hean Yee, MD*
Wacin Buddhari, MD

Moderator: *Apichard Sukonthasarn, MD*
Sponsored by Zuellig Pharma (Thailand) Co., Ltd

Day 4; Sunday: 24 March 2019

Date	24th March 2019	24th March 2019	24th March 2019	24th March 2019
Venue	Chandelier 2	Grand Ballroom	InAzia	@ Black
Time/	Internist /Cardiologist	In Dept/FIT	Allied Professional	Research
07:30-08:30	Breakfast symposium sponsored by Boehringer Ingelheim (Thai) Co.,Ltd (Thai)			
08:30-10:00	Fight the social media! How to advise your patient to their heart in a good shape (Thai)	Cardiology Debate (Thai) HTN: Renal denervation is not dead!		
10:00-11:30	Brunch symposium sponsored by Thai Otsuka Co.Ltd (Thai)			
11:30-13:00	Latest & Greatest news from ACC.19 & EHRA (Thai)			

Venue: Chandelier 2 (room 1)
Time: 07:30-13:00

07:30-08:30 **Breakfast symposium 3** sponsored by Boehringer Ingelheim (Thai) Co., Ltd (Thai)
"Anticoagulation and your AF patients: Bring it all together in clinical practice"
Speaker: *Krisada Sastravaha, MD*

Moderator: *Tachapong Ngarmukos, MD*

08:30-10:00 **Fight the social media!**
How to advise your patient to their heart in a good shape (Thai)
Clearing controversies in diet & supplements
Speaker: *Somkiat Sangwattanaroj, MD*
Do and don't exercise in heart disease
Speaker: *Wilawan Thirapattarapong, MD*
Chelation Therapy, way to go?
Speaker: *Piyanuj Ruckpanich, MD*

Moderator: *Somkiat Sangwattanaroj, MD*

10:00-11:30 **Brunch symposium sponsored by Thai Otsuka Co.Ltd (Thai)**
"Challenges in management of Acute Heart Failure: Tolvaptan, The Earlier the Better"
-How challenges in management of Acute Heart Failure (Past Present and Perspective)
-Role of Tolvaptan in Acute Heart Failure
Speaker: *Teerapat Yingchoncharoen, MD*
-Benefit of Early Treatment with Samsca in Heart Failure management
-Real world practice of Samsca
(Case sharing: HF with Normonat, Early treatment, Long term treatment)
-Practical point and summary
Speaker: *Sarinya Puwanant, MD*

Moderator: *Rapeephon Kunjara Na Ayudhya, MD*

11:30-13:00 **Latest & Greatest news from ACC.19 & EHRA (Thai)**
Speakers: *Krisada Sastravaha, MD*
Tachapong Ngarmukos, MD
Mann Chandavimol, MD

Moderators: *Khanchit Likittanasombat, MD*
Tachapong Ngarmukos, MD

Venue: **Grand Ballroom (room 2)**
Time: **08:30-10:00**

08:30-10:00 **Cardiology Debate (Thai)**
HTN: Renal denervation is not dead!
Speakers: *Jakrapan Chaipromprasit, MD (pro)*
Krisada Sastravaha, MD (con)
SPAF: LAAO should replace OAC in patient with high bleeding risk
Speakers: *Mann Chandavimol, MD (pro).*
Voravut Rungpradubvong, MD (con)
His bundle pacing is a must for complete heart block with decreased LVEF
Speakers: *Sirin Apiyasawad, MD (pro)*
Wanwarang Wongcharoen, MD (con)

Moderator: *Adisai Buakhumsri, MD*

Sponsor Symposium by Pharmaceutical

Day 4; Sunday: 24 March 2019

Venue: Chandelier 2 (room 1)
Time: 07:30-11:30

07:30-08:30 **Breakfast symposium 3** (Thai)
"Anticoagulation and your AF patients : Bring it all together in clinical practice"
Speaker: *Krisada Sastravaha, MD*

Moderator: *Tachapong Ngarmukos, MD*

Sponsored by Boehringer Ingelheim (Thai) Co., Ltd

10:00-11:30 **Brunch symposium** (Thai)
"Challenges in management of Acute Heart Failure: Tolvaptan, The Earlier the Better"
-How challenges in management of Acute Heart Failure (Past Present and Perspective)
-Role of Tolvaptan in Acute Heart Failure
Speaker: *Teerapat Yingchoncharoen, MD*
-Benefit of Early Treatment with Samsca in Heart Failure management
-Real world practice of Samsca
(Case sharing: HF with Normonat, Early treatment, Long term treatment)
-Practical point and summary
Speaker: *Sarinya Puwanant, MD*

Moderator: *Rapeephon Kunjara Na Ayudhya, MD*

Abstracts

Day 1; Thursday, March 21, 2019

@ Room 1: Chandelier 2
14:00-15:30 Cardiology board review for internist 1

Practical points and common pitfalls in the management of Acute Coronary Syndrome

Chaisiri Wanlapakorn, MD
Cardiologist, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

1. The troponin
   The problem is not the accuracy of the test, but how is it used.

2. The EKG
   The triple R rules

3. The medication
   Think of morphine think twice
   Think of nitrate think thrice

4. NSTEMI
   NSTEMI is NOT a benign disease

5. The P2Y12 inhibitors
   Right one, right dose, right duration

6. Time
   Time is muscle

7. The Great Mimicker
   Do Not Miss it

@ Room 2: Grand Ballroom
14:00-17:45 The bare necessity of cardiology I-II

Anatomy correlation with CXR & cardiac imaging

SupinChompoopong, PhD,
Associate Professor, Department of Anatomy, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkoknoi, Bangkok10700, Thailand.

In many cardiovascular diseases, following a clinical history and examination, imaging of chest and the heart may be required. The choice of chest X-ray (CXR) and cardiac imaging modality depends on the indication, individual patient characteristics and local accessibility, and both are integral aspects in the diagnosis and monitoring of cardiovascular disease. Based on the understanding of anatomical relation of heart, cardiac imaging used to monitor patients with known pathology such as CXR, echocardiography, CT coronary angiography and cardiac MRI, can provide extremely valuable and additive information. To understand cardiac imaging, the location of each heart chamber and its component parts including cardiac valves should be firstly reviewed.The fibrous tissue of heart or cardiac skeletonlocated at the base of the ventricular mass, its three main components include the interventricular septum,annuli fibrosior fibrous ring and fibrous trigones. It provides electrical insulation at the atrioventricular (AV) septal junction. The leaflets of the mitral valve, aortic valve, and tricuspid valve meet at the central fibrous body, with the membranous septum and the tendon of Todaro being part of it. The right atrium receives blood that is oxygen depleted from the body by way of the inferior (IVC) and superior vena cava (SVC) and from the coronary sinus (CS). Thebesian valve and Eustachian valve guard the mouth of CS and IVC, respectively. The ridge called christa terminalis separates the smooth portion of the right atrium from the rough pectinate muscle.The sinuatrial node is within the upper part of the crista terminalis. Thetrueatrial septum or mid septum corresponds roughly to the location of triangle of Koch. This triangle is of great value to the electrophysiologist because it marks the approximate location of the AV node and bundle of His. Bounded by the tendon of Todaro (linear tissue that runs from the central fibrous body tothe eustachian ridge), the tricuspid annulus, and the orifice of CS, the AV node is situated at the apex of the triangle. To image the heart utilizing ultrasound, two traditional imaging planes for cardiac anatomic structures are transverse (short axis) and sagittal (long axis) planes. Both planes are shown with the probe direction for subxiphoid and parasternal views. Long axis parasternal view, the heart is obliquely in the left chest with the apex pointing toward the left hip. The short axis focuses on obtaining an image of the left ventricle in a circular pattern and then angling through the various positions to interrogate the respective wall segments. Therefore, an exact knowledge of the complex anatomy of the cardiac septum, including the posteroseptal space, the aortic cusp region, and the proximity of the AV conduction system and coronary vessels are also correlated for understanding cardiac imaging.

@ Room 3: In Azia (room 3)
14:00-15:30 High value care: CVT nursing

High value care for CVT nurse:

Kanogporn Jamsomboon, RN,PhD.HRD
Nursing, Central Chest Institute of Thailand, Nonthaburi, Thailand

Health Literacy is the ability to access and use reliable health information to make decisions. (Mayberry,2018) It is the use of a wide range of skills that improve the ability of people to act on information in order to live healthier lives. These skills include reading, writing, listening, speaking, numeracy, and critical analysis, as well as communication and interaction skills. (Calgary charter, 2008) According to World Health Organization, health literacy is linked to literacy and entails people's knowledge, motivation and competences to access, understand, appraise and apply health information in order to make judgements and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life during the life course. (Kickbusch et al, 2013)

Health literacy has a prominent role in primary and secondary prevention of CVD. It has the important role in NCD such as hypertension, DM, obesity, coronary disease, ACS, HF by impact in readmission, hospitalization, medication and treatment adherence. (AHA,2018) The current analysis shows that inadequate health literacy is highly prevalent in patients with coronary artery disease. Patients with low health literacy had significantly worse CVD risk profiles. (Peters, 2017) Moreover, patients hospitalized with a cardiovascular event are more likely to die with in one year if they have low health literacy. (Vanderbilt University Medical Center, 2018).

According to the RESPONSE 1 study, the nurse-led prevention program significantly improved adherence to guideline-based preventive treatments, and reduced the (calculated) overall risk of clinical events. (Jorstad et al, 2013) Nurse led care in secondary prevention is now recommended in European cardiology guidelines. (Massimo, 2016) Nurses and other medical professionals, play an important role in ensuring that patients understand varying health-related issues and concerns, particularly those related to their health and well-being.

14:00-15:30 High value care: CVT nursing

CVT Nursing Assessments: Information Technology

Maream Prousoontorn, MSN., RN
Senior nurse manager, Cardiovascular Intensive Care unit, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Nursing care for cardiac surgery/coronary patients in intensive care units needs an effective tool that can improve patient safety and reduce errors. Nurses need to quickly process information to form clinical judgments, communicate with the multidisciplinary team and guide optimal patient care. A powerful tool that can help nurses to reduce non-essential activity, improving multidisciplinary communication, and increasing time spent with patients; therefore, are interested and needed.

The IntelliVue Critical Information Portfolio (ICIP), an electronic health record has been first adopted in Cardiovascular and Thoracic Intensive Care unit, King Chulalongkorn Memorial Hospital since 2009, which is the first electronic health record implementation in critical setting in Thailand. Using ICIP, nursing documentation has been automatically combined between flowsheets, vital signs, critical events and interventions. The flowsheet can be imported automatically or manually sonurses only need to add data once. Highlights values outside the limits defined for the patient also useful for quickly decision management. Therefore, ICU nurses have more time spent with patient and less time at nurse station. The ICIP also provides scores such as SAPS II, TISS-28, Braden and the Glasgow Coma Scale. Scores are calculated automatically from parameters in the routine documentation. This function provides quickly clinical decision support and nursing administrative, thus improve quality control and nursing management.

In summary, implementing an electronic health record such as ICIP offers advantages for enhancing quality of nursing care in intensive care unit by: 1) supporting timely clinical decisions, 2) improving the quality of patient care through better communication among healthcare team, 3) reducing paperwork, and 4) freeing time for direct patient care. Currently, ICIP is expanding to cover 4 ICUs and CVT- ICU development to IntelliSpace Critical Care and Anesthesia (ICCA) setting and operating theater in KCMH, which support data linkage among each other.

@ Room 3: In Azia (room 3)
15:45-17:45 Excellence cardiovascular nursing care

Humanized health care in CVT nursing

Arun Nurake, RN, M.Ed
Faculty of Nursing Science, Western University, Kanchanaburi Thailand

Humanized health care in CVT nursing consist of ability to give holistic care, ability to realize of human being, and the last ability to understand the suffer of the patient.

Humanized health care in CVT patients could be devided into two major themes as follows:

1. Providing care with the heart and getting to know about physically, psychology and religion for spiritual healing.
2. Value of the work start with mind, not a reward but realizing the value of life and work.

15:45-17:45 Excellence cardiovascular nursing care

CVT nursing in critical care

Pranee Thongsai, RN
Nursing, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Cardiovascular and thoracic surgery is performed complex procedure more than others operation. Cardiopulmonary bypass; CPB (Heart-Lung machine) is commonly used to maintaining circulation of blood and oxygen during open-heart surgery. After surgery, Using CPB also causes adverse effects on physical harm and cognitive decline. There are complications of pulmonary dysfunction, hemodynamic instability, hematologic disorders, cardiac arrhythmia, acid-base imbalance, renal dysfunction, neurologic disorders, gastrointestinal problems and psychosocial stress. Additionally, improving of medical technology is increased focus on quality and safety in critical care include extracorporeal membrane (ECMO) to provide support heart and lungs function, ventricular assist devices (VAD) helps to support heart function and assist cardiac circulation. These machines are also working complex system and lead to multiorgan system injury.

The goal of critical care in postoperative cardiovascular and thoracic surgery patients is to recovery multiorgan function rapidly. Therefore, care team will be challenging especially intensive care unit (ICU) nurses who approach patient 24 hours must expertly early detection on pre-arrest signs and clinical risks in physical and mental health to make appropriate clinical decision. Also use nursing skills to predict clinical outcomes and worth in nursing management within high-medical technology based on humanity. ICU nurses should be initiate clinical leadership to develop quality of critical nursing care, making clinical practice guideline to be best practice and beyond excellence in nursing care, improve nursing knowledge update to new medical technology, coordinate with care team to increase efficiency and effectiveness healthcare system, provide patients equal reach their healthcare services by respond to patient and family decision.

15:45-17:45 Excellence cardiovascular nursing care

CVT nursing in chronic care

Namfon Khatjuang, RN
Head of Cardiovascular thoracic surgery Department, Central Chest Institute of Thailand

Most of cardiovascular disease patients, after passing the crisis of life, normally involve in recovery stage unitl discharge .However,some patients are still having chronic illness which causes long length of stay, risk of complications, increase for expenses and some may return to critically ill patients. Thus, nurse role is not only important in critical care but also substantial in chronic care. Discharge planning process is essential for patients and families to handle on self-care when return home or to get a continuing care by the community. During terminal illness of some patients, palliative care would assist them to live happily and left peacefully. Therefore, nurse who take care patients with chronic heart disease must have knowledge and best practice to provide patients with a better quality of life.

Day 2; Friday, March 22, 2019

@ Room 1: Chandelier 2
08:00-09:00 Preoperative Management for non Cardiac Surgery in:

Perioperative Management of Hypertension

Prin Vathesatogkit, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Perioperative hypertension is commonly encountered in patients that undergo surgery. Despite the large number of studies, which have demonstrated an increased perioperative morbidity and mortality in hypertensive patients, there remains a lack of consensus guidelines regarding treatment thresholds and appropriate therapeutic targets, creating a major challenge for the physicians, anesthetists and surgeons. Nevertheless, perioperative hypertension requires careful management. When treatment is necessary, therapy should be individualized for the patient. This topic will discuss and review the pharmacologic agents and strategies commonly used in the management of perioperative hypertension.

@ Room 2: Grand Ballroom
13:15-14:45 AF afternoon

Novel risk stratification in Atrial Fibrillation

Gregory Y. H. Lip, MD
Liverpool Centre for Cardiovascular Science, University of Liverpool and Liverpool Heart & Chest Hospital, Liverpool, United Kingdom; and Aalborg Thrombosis Research Unit, Department of Clinical Medicine, Aalborg University, Aalborg, Denmark.
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Patients with atrial fibrillation (AF) are at high risk of stroke but this risk is not homogeneous and depends on the presence or absence of various stoke risk factors. The more common and validated risk factors have been used for formulate risk stratification schemes, the most common one in use in guidelines and clinical practice being the CHA2D2VASc score(1).

All clinical scores only perform modestly in identifying the high risk patients that sustain events(2). More complex clinical scores have been proposed, but only show marginal (at least statistical) improvement on simple, practical scores like the CHA2D2VASc score. Addition of biomarkers (whether blood, urine, imaging) will always improve on clinical risk stratification to identify high risk patients, but this would be at the cost of reduced simplicity, practicality and costs. In addition, real world studies have not proven benefit of biomarker based scores, and many biomarkers are non-specific by being predictive of both cardiovascular and non-cardiovascular outcomes.

Given the limitations of complex clinical schemes and biomarkers, and since the default is to offer stroke prevention with oral anticoagulation unless the patient is 'low risk', the initial step should be to identify low risk patients who do not need any antithrombotic therapy(3). The subsequent step is to offer OAC to those with 1 or more stroke risk factors.

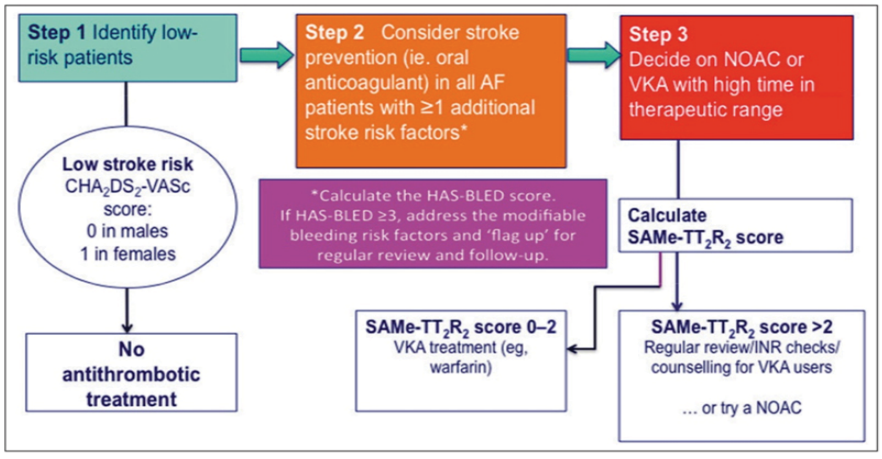

Figure 1: The Birmingham '3-step'. Management pathway to streamline decision-making for stroke prevention in patients with atrial fibrillation.

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13:15-14:45 AF afternoon

"Catheter ablation for AF where are we after 20 years?"

Koonlawee Nademanee, MD, FACC, FHRS, FAHA
Distinguished Professor of Medicine, Chulalongkorn University, Bangkok Thailand

Since the Bordeaux group highlighted the contribution of pulmonary veins (PVs) as the triggering foci of atrial fibrillation (AF), PV isolation (PVI) has been hitherto the main approach to AF ablation in patients with paroxysmal AF. Furthermore, because PV antra is known to contribute in AF perpetuation; thus, when wide antral PVI is carried out, the AF substrates around PV antra are also removed. As a result, PVI not only eliminate AF trigger (s) but also AF substrates. So PVI, either alone or in combination with other adjuvant ablation techniques i.e. posterior wall isolation, complex fractionated atrial electrogram (CFAE) ablation or linear lesions etc, has now also been performed in patients having persistent and permanent AF, with variable success. In short, PVI has given electrophysiologists a new tool to treat AF with catheter approach instantly became a cornerstone and almost synonymously with AF ablation.

The popularity of PVI has brought inventors and expertise, from many disciplines including bioengineer, electrophysiologists and software developers, together to make better ablation tools for PVI to minimize electrical reconnection and ease the procedure for general electrophysiologists. Interestingly however, despite better tools such as cryoballoon, contact force catheters and many mapping tools, the long-term outcomes od PVI have not improved over the past 20 years. This fact coupling with disappointing results of several randomized clinical trials (e.g., STAR AF II, BOCA, and CHASE-AF) showing no benefit to adding either CFAE or linear ablation to pulmonary vein isolation (PVI) compared with PVI alone in patients with persistent atrial fibrillation (AF) has put electrophysiologists in quandary as to what would be the best ablation strategy for persistent AF and for those paroxysmal AF with recurrent arrhythmias after successful PVI.

Over the past 2 decades, our centers have been performing CFAE ablation alone, without PVI for both paroxysmal and persistent AF patients, with great success in maintaining sinus rhythm (SR) and improving key clinical outcomes such as stroke and mortality reduction. Based on our experience, we are confident that ablation targeting CFAE sites without the need for PVI is indeed effective for maintaining SR. In my talk, I will discuss 1) values and limitations of various ablation AF approaches and why CFAE ablation is still relevant; (2) describe how I select appropriate CFAE sites, which result in a high rate of AF termination with good long-term outcomes when ablated; and (3) discuss the controversies of CFAE ablation for treatment of AF and the differences between our ablative approach and others that combine CFAE and PVI. 4) future research and direction of AF ablation.

@ Room 3: In Azia (room 3)
08:00-09:00 Cardiology for Allied Healthcare Professional

Heart failure

Bundit Naratreekoon, MD
Cardiologist, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Heart failure is a complex clinical syndrome associate with multiple morbidity and mortality that we can prevent by anti-heart failure medication and medical devices. Not only heart failure, they also had multiple co-morbidies combined with a lot of barriers to achieve adequate treatment which make its more complicated and difficult to manage. To solve complex problems of complicate heart failure patient, we need multidisciplinary teams include nurse, pharmacist, dietician, rehabilitation etc. Purpose of the team are solving multiple problem in HF patient by provide education, teaching, training, give an appropriate treatment to improve overall outcome.

09:00-10:00 Outpatient care

Heart failure clinic nursing care

Anong Amaritakomol, RN
Heart Failure clinic, Maharaj Nakorn Chiang Mai Hospital, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

Heart failure (HF) is a chronic illness that has become a major public health problem with statistics showing an increased incidence of heart failure every year. Nowadays, heart failure is highly prevalent in Thailand. The hospital readmission is common among heart failure patients with the rates of 35.2% within three months of their initial discharge. (Dharmarajan et al., 2013) Past studies have found that a structured multidisciplinary approach to HF treatment which adheres to evidence based guidelines improves outcomes. Heart failure nurse has important multiple roles as a program coordinator, case manager, educator, counselor and outcome assessor.

HF clinic nursing also should play a primary role in the ongoing assessment of HF patient. The assessment of the patient with HF should be based on the patient's need. Fluid status is usually assessed with following indicators: orthopnea, peripheral edema, weight gain and the need to increase baseline diuretic dose. Additionally, dietary behavior change, decreased activity amount, worsening thirst, increases of fluid intake, and adherence to medication should also be evaluated for HF patients. (Ogunneye O, et al., 2014) The important HF clinic nurses' role is patient education such as ; advising patients on life-style changes that would be advantageous to their condition, encouraging patients, families, and carers to be actively involved in managing and monitoring their own care, and being readily available to patients, families, and carers in order to detect and treat early clinical deterioration before symptoms become severe.

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13:15-14:45 Pharmacology for Pharmacist 1 Common Pitfalls

Vasopressor and inotropes in Intensive Care Unit (ICU): Common Pitfalls

Pattamawan Kosuma, Pharm D, BCPS, BCP
Division of Pharmaceutical Care, Faculty of Pharmacy, Naresuan University, Phitsanulok, Thailand

Critically ill patients in ICU may suffer from several complications and comorbidity. For this purpose, several medications, including Inotrope and vasopressor drugs, are often administered and prescribed for patients. These are essential medications for the management of cardiogenic shock and treatment in hemodynamic instability.

Inotrope and vasopressor are high alert drugs (HAD). If misused, including medication error, HAD can significantly increase the risk of causing serious injury to patients. Healthcare professionals should have knowledge and awareness about inotropes and vasopressor drugs. It is essential to understand the basis knowledge and need for using inotrope and vasopressor, the optimum therapeutic dosage, safe administration and potential effects. To avoid any of these adverse and unwarranted impacts on the patient, due collaboration between attending physicians, nurses, pharmacists and other health care professional is a pre-requisite.

13:15-14:45 Pharmacology for Pharmacist 1 Common Pitfalls

Pharmacology review of NOACs antidotes

Wipharak Rattanavipanon, BSc (Pharm)
Department of Pharmacy, Faculty of Pharmacy, Mahidol University, Bangkok, thailand

Usage rate of new oral anticoagulants (NOACs) has been increasing steadily worldwide owing to several reasons including ease of use, favorable efficacy, and better safety profiles compared to warfarin. Nevertheless, because of its inherited ability to cause abnormal bleeding, many clinicians have been looking forward to the availability of effective antidotes of these agents to ensure that NOAC-induced bleeding can be efficiently managed.

Idarucizumab, a first-in-class monoclonal antibody against dabigatran, has recently received full approval from USFDA in April 2018 after the publication of full cohort analysis of REVERSE-AD trial. Idarucizumab possesses very high affinity to dabigatran and almost irreversibly binds to both free drug and thrombin-bound drug. Idarucizumab immediately reverses anticoagulant effect of dabigatran in patients suffering major bleeding and in patients whom urgent procedure is necessary. Adverse reactions and other safety concerns namely thrombotic potential and immunologic reactions are low.

More recently, andexanet alfa, a modified factor Xa decoy protein, has been approved for patients using factor Xa inhibitors (apixaban, edoxaban and rivaroxaban). According to the Annexa-4 trial, andexanet alfa effectively reversed major bleedings with very low rate of immunologic reactions. However, there was some concern regarding a transient increase in thrombin generation after andexanet alfa infusion.

Another NOAC antidote currently in pipeline is ciraparentag. Ciraparentag is an intravenously administered synthetic small molecule designed to be a universal antidote for both thrombin inhibitors and factor Xa inhibitors. Data from in vitro, in vivo and healthy volunteer showed that ciraparantag can completely and sustainably reverse edoxaban, apixaban and rivaroxaban. This agent is currently undergoing advanced phases of clinical trials and results will soon be available.

In conclusion, significant advancement has been made in the development of antidotes for NOAC. Currently, two agents have undergone advanced phase III trial with promising results. More agents may be introduced into the market soon. While the availability of these agents is a promising advancement, attempts to prevent bleeding of NOACs through adherence to NOAC prescribing guidelines and close patient monitoring and education should be implemented.

Day 3; Saturday, March 23, 2019

@ Room 1: Chandelier 2
08:30-09:30 Cardiovascular Disease Screening (English)

AF screening

Sofian Johar, MD
President: Brunei Cardiac Society,
Cardiologist, RIPAS Hospital/Gleneagles JPMC Brunei Darussalam

Atrial fibrillation (AF) is the most common type of arrhythmia. AF is related to approximately 1/3 of ischaemic strokes and about 2/3 of AF-related strokes can be prevented if AF is detected early and appropriate treatment initiated. Current guidelines recommend opportunistic AF screening with pulse taking or ECG rhythm strips in patients >65 years of age. Systematic screening for AF at the community level with smartphone-based single-lead ECG has been studied and shown to pick up undiagnosed AF. This lecture will discuss the evidence base behind cardiovascular screening for AF.

13:30-15:00 Practical pharmacology for internist

Practical Pharmacology for Internist: Antiplatelets, Antithrombotic & Fibrinolytic Therapies

Surakit Nathisuwan, PharmD, BCPS
Department of Pharmacy, Faculty of Pharmacy, Mahidol University, Bangkok, Thailand

Thrombus formation is one of the key pathophysiologic mechanism causing a variety of cardiovascular diseases. Understanding the mechanism of clot formation in various vascular beds along with key relevant pathways is a necessity to understand how to use drugs treating these diseases. Fibrinolytic drugs along with antithrombotic therapies (consisting of antiplatelets and anticoagulants) play instrumental roles in the management of diseases caused by thromboembolic phenomenon. Important differences exist among each member of each therapeutic class both in terms of its pharmacokinetics and pharmacodynamics profiles. This talk will be a succinct overview of key pharmacological profiles of important drugs belonging to fibrinolytic drugs and antithrombotic therapies. These information should be useful for internists and general practitioners when considering prescribing these agents in clinical practice.

13:30-15:00 Practical pharmacology for internist

"Anti-Hypertension"

Krittin Bunditanukul, PharmD, FAC, BCPS
Pharmacy practice Department, Chulaongkorn University, Bangkok, Thailand

Worldwide, hypertension is the leading modifiable risk factor for cardiovascular (CV) events and mortality. Hypertension is a major risk factor for CV events and mortality in adults. Hypertension is present in 69% of adults with a first myocardial infarction (MI), in 77% of adults with a first stroke, in 74% of adults with heart failure (HF), and in 60% of older adults with peripheral arterial disease (PAD). Hypertension is also a major risk factor for development of sudden cardiac death, a dissecting aortic aneurysm, angina pectoris, left ventricular (LV) hypertrophy, thoracic and abdominal aortic aneurysms, chronic kidney disease (CKD), atrial fibrillation, diabetes mellitus, the metabolic syndrome, vascular dementia, Alzheimer's disease, and ophthalmologic disease. A meta-analysis of 61 prospective studies including 1 million adults without prior CV disease (CVD) showed that CV risk increases progressively from a blood pressure (BP) level of 115/75 mmHg with a doubling of the incidence of coronary heart disease (CHD) and of stroke for every 20/10 mmHg increase in BP. Numerous randomized, double-blind, placebo-controlled clinical trials have also shown that treatment of hypertension with antihypertensive drug therapy in adults decreases CV events and mortality. Achieving target blood pressure remains a big challenge despite the availability of different classes of drugs and most patients need more than one medication to control their blood pressure. Multiple medical conditions have been shown to contribute to drug related problems (DRPs). DRPs may lead to increased morbidity, mortality, healthcare costs, and recurrent hospital admissions and prolonged hospitalization. Cost of DRPs related morbidity and mortality exceeds the cost of the medications themselves. However, DRPs are preventable in most cases. Hence understanding the anti-hypertensive medication would be important for the practitioner in the process of hypertension management. This topic will present some information about common practical points and pitfall issues about major anti-hypertensive drug classes.

16:00-17:30 Case based decision making

Amiodarone pulmonary toxicity

Adisorn Wongsa, MD
Chest, Critical Care, Pramongkutklao Hospital, Bangkok, Thailand

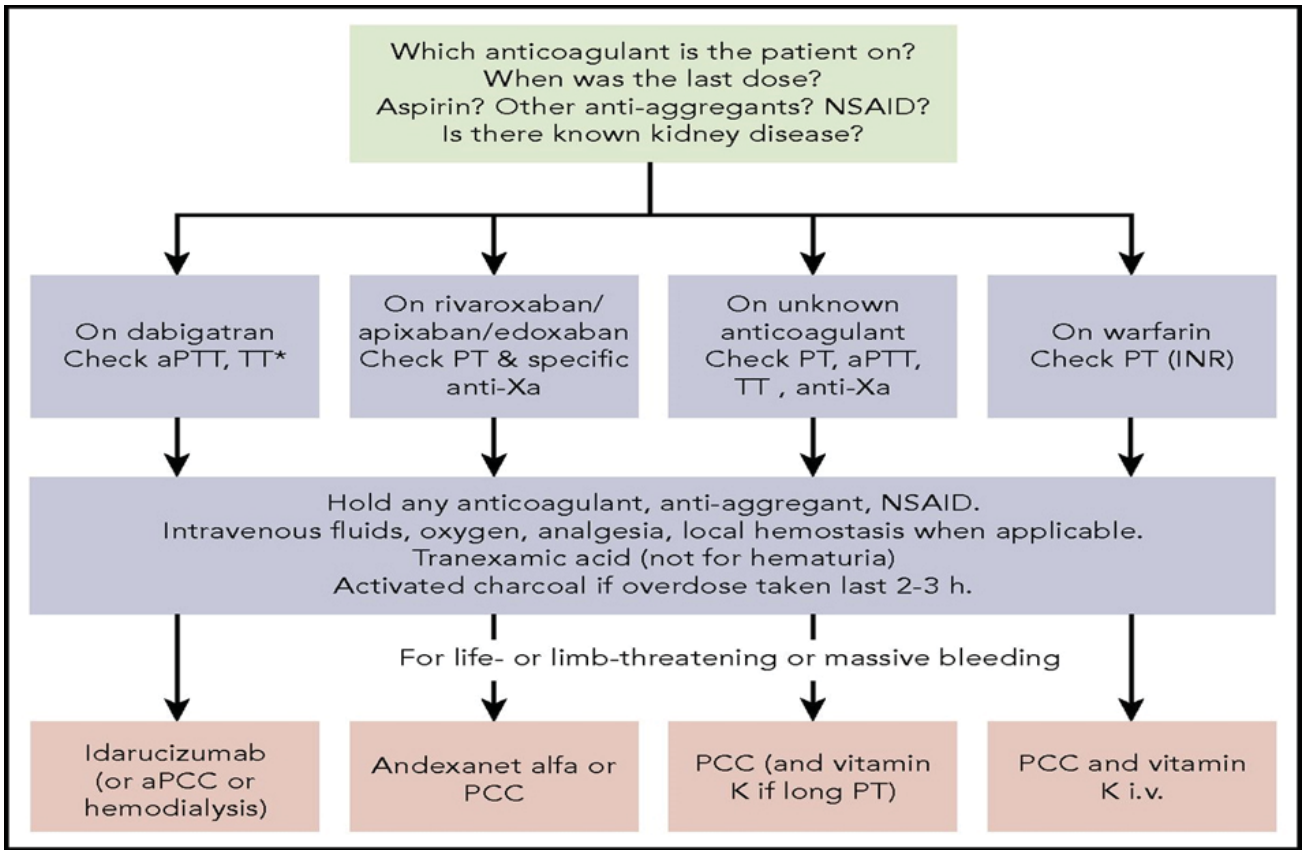
Pulmonary toxicity from amiodarone has an incidence from 3.8-10.7% with the wide range of clinical manifestation from asymptomatic to non productive cough and dyspnea(50-75%) and acute respiratory failure(ARDS).The radiographic finding can be pulmonary nodules, interstitial pneumonitis (most common), organizing pneumonia ,diffuse alveolar hemorrhage, acute respiratory distress syndrome and pleural effusion. The presentation onset is vary to the manifestation as ARDS is within day to week and for Interstitial pneumonitis is usually around 6-12 month. The risk factor for pulmonary toxicity are age> 50 year, high doses>400 mg/ day(as well as with the total cumulative dose), preexisting lung disease. The diagnostic evaluation is by exclusion with the history of exposure to amiodarone and lung biopsy shown a presence of numerous lipid-laden, "foamy" macrophages in the air spaces is a characteristic finding in all patients exposed to this medication. The treatment is stopping amiodarone. , supportive and corticosteroid therapy (prednisone 40 to 60 mg per day,) can be use in severe cases.

16:00-17:30 Case based decision making

Non-vitamin K Oral Anticoagulants Associated Bleeding

Pantep Angchaisuksiri, MD
Division of Hematology, Department of Medicine, Ramathibodi Hospital, Bangkok, Thailand

Non-vitamin K oral anticoagulants (NOACs) dabigatran, rivaroxaban, apixaban, and edoxaban are approved for the prevention and treatment of thromboembolism in several clinical settings. Bleeding is the major complication of anticoagulant therapy. The most frequent type of major bleeding is gastrointestinal, but intracranial hemorrhage has the worst prognosis. Management of these complications in patients on anticoagulants should follow the same routines as for non-anticoagulated patients. In addition, for life-threatening or massive hemorrhages, reversal of the anticoagulant effect is also crucial. Adequate reversal requires information on which anticoagulant the patient has taken and when the last dose was ingested. Laboratory data can be of some help in the emergency setting. Specific antidotes for thrombin and factor Xa inhibitors, idarucizumab and andexanet alfa, are becoming available, but supportive care and non-specific support for hemostasis with anti-fibrinolytic agents or prothrombin complex concentrates (PCC) should be kept in mind. Algorithm for management of NOACs-associated bleeding is shown below.



@ Room 2: Grand Ballroom
08:30-09:30 SCD 2019

Basic Sciences of Sudden Cardiac Death

Apichai Khongphatthanayothin, MD
Pediatric Cardiology, Bangkok Hospital, Professor of Pediatrics, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

Sudden cardiac death from ventricular tachyarrhythmia is one of the most common mode of death in modern societies. Although rare, sudden arrhythmic death in children and young adults with structurally normal heart often occurs as a result of inherited abnormality in the genes that control ion movements across the cell membrane. At the turn of the century, discoveries of genetic defect(s) in young patients with long QT syndrome (LQTS), catecholaminergic polymorphic ventricular tachycardia (CPVT) and Brugada syndrome led to better understanding of the basic pathophysiology of sudden arrhythmic death. Abnormal cardiac depolarization and/or repolarization as well as abnormal interaction between cardiac cells are common pathophysiologic processes in this condition. While congenital long QT syndrome and CPVT are generally monogenic diseases caused by rare genetic variants with high deleterious effect, Brugada syndrome tends to follow oligogenic or polygenic mode of inheritance. Unlike LQTS and CPVT which occur in setting of a structurally normal heart, recent studies demonstrated a high incidence of minor structural abnormalities in Brugada syndrome. The etiology of these structural abnormalities is still a subject for future research. Sudden cardiac death in the setting of ischemic heart disease also demonstrates familial tendency although with lesser influence from the genes than in sudden cardiac death in children and young adults. Multiple genetic and environmental factors are likely taking part in the pathophysiologic process of sudden cardiac death in this group.

10:30-11:30 Kasarn Jatikavanij Memorial Lecture

"Stroke prevention in AF: Asian perspective"

Gregory Y. H. Lip, MD
Liverpool Centre for Cardiovascular Science, University of Liverpool and Liverpool Heart & Chest Hospital, Liverpool, United Kingdom; and Aalborg Thrombosis Research Unit, Department of Clinical Medicine, Aalborg University, Aalborg, Denmark.
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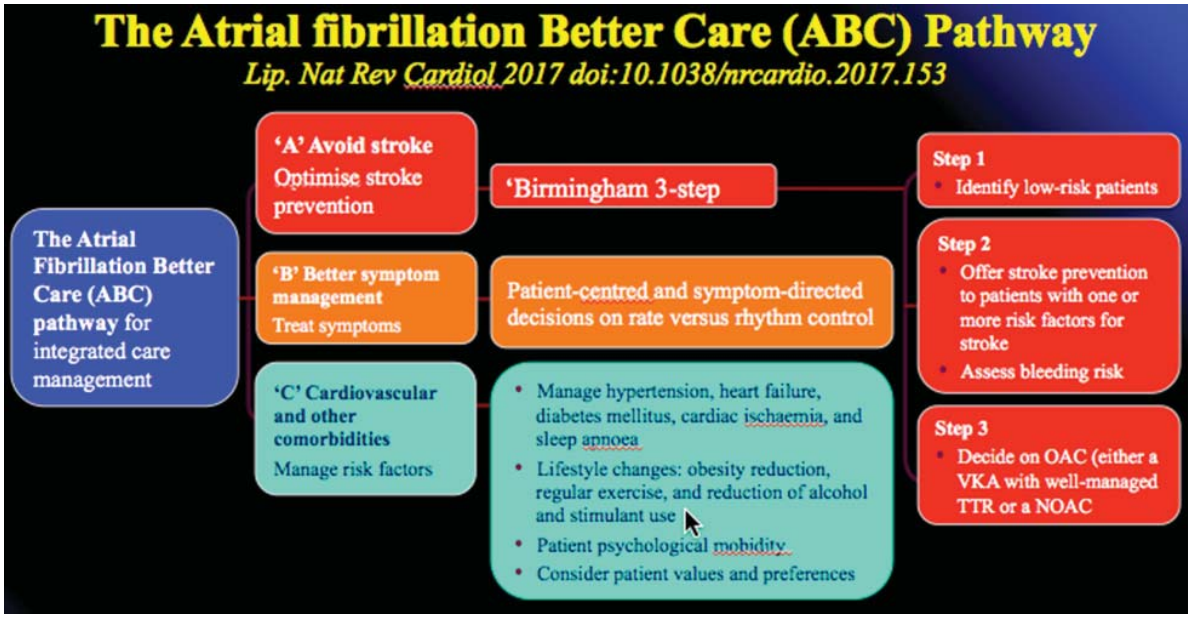
Stroke prevention is the cornerstone of management of patients with atrial fibrillation (AF). Nevertheless, AF independently increases all-cause mortality and hospitalisations from associated comorbidities, such as heart failure. Of note, stroke only accounts for 1 in 10 deaths related to AF, whereas cardiovascular mortality for approx. 7 in 10.

To streamline decision making for a holistic approach to AF management in an integrated manner, we have proposed the ABC (Atrial Fibrillation Better Care) Pathway, as follows: 'A' Avoid stroke (with Anticoagulation, whether with well-managed warfarin (TTR>65-70%) or a non-Vitamin K antagonist oral anticoagulant (NOAC)); 'B' Better symptom management with patient-centred symptom-directed decisions on rate or rhythm control; and 'C' Cardiovascular and comorbidity risk management, with attention to optimising treatments (blood pressure control, heart failure, cardiac ischaemia, sleep apnoea, etc) as well as lifestyle changes (attention to obesity, regular exercise, reducing alcohol/stimulants, patient psychological morbidity, etc)(1).

This integrated care approach ('AF management is simple as ABC …') has been adopted by guidelines. The key aspect is to particularly reassure colleagues in primary care, that a holistic approach to management of patients with AF can be streamlined across primary and secondary care, and really need not be regarded as complex, but is 'as simple as ABC …'

This approach can be implemented in Asia, where there remains a large burden associated with AF. Aspects such as the higher risk of intracranial bleeding with warfarin, and issues such as blood pressure management, diabetes, sleep apnoea and obesity should be comprehensively addressed in a holistic manner.



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13:30-15:00 Heart Failure afternoon

Medical therapy concoction

Ong Hean Yee, MD
Cardiologist, Mount Elizabeth Novena Hospital, Singapore

We live in exciting times for progress in medical treatment for Heart Failure. Treatment for heart failure got off to an exciting start in the 1980's with the ACEis, but since then improvements have been incremental. We will discuss what works and what is on the horizon.

@ Room 3: In Azia (room 3)
13:30-15:00 Practical non-invasive investigations for Allied Healthcare Professional

Ambulatory Electrocardiography: AECG

Urasri Imsomboon, RN
Nursing, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Ambulatory Electrocardiography (AECG) has been used to evaluate and diagnose patients presenting with symptoms such as palpitations or syncope, who suspect cardiac arrhythmia[1]. AECG allows patients to record abnormal cardiac activity during ordinary daily activities which may not frequently occur or occurs temporarily while sleeping, exercising or emotional disturbance[2].

In 1947, pioneering work by Norman J. Holter led to the first prototype of "mobile" cardiac telemetry device, requiring 85 pounds of equipment, worn on his back and used a small transmitter with antenna connected to body surface electrodes and a portable self-powered receiver-recorder that could be carried to record cardiac rhythms on magnetic tape[1, 3] and later developed into a tape recorder and digital recording system. The 24-hour Holter AECG recorder was first introduced in 1957 and is designated as a standard for detecting cardiac arrhythmias especially concomitant with palpitation and syncope[2]. Later, it was developed to be smaller, lighter, a number of leads, larger memory capacity and longer battery life[2-4]. Two recording modalities for AECG monitoring are intermittent and continuous recordings. Firstly, intermittent AECG recordings especially not frequent episode are obtained either by typical "event recorders", that can memorize only few seconds of ECG tracing so that patient have to had symptom for a while and good consciousness, or by external or insertable "loop recorders" which monitor ECG signals in a continuous mode, but memorize only patient- or event-activated (auto-triggered) ECG tracings before and after the recorded event[2, 5]. The stored ECG tracings can be transmitted by remote monitoring to centralized analysis centers by phone which called "Transtelephonic". Secondly, Continuous AECG recordings, Holter, monitor 12 simultaneous leads for 24–72 hours up to 60 days in case of 1-2 leads monitoring with newer mode[2] when symptoms frequent enough to be detected within period of monitoring[6]. During prolonged recording, the classic wired adhesive electrode systems, inexpensive but often poorly tolerated during prolonged recording. Therefore, modern adhesive patches, Zio leadless patch, is developed to solve this issue as well as vest or belt textile systems with embedded electrodes, providing good quality recording and high patient compliance, albeit being still rather expensive[2]. The mobile cardiac outpatient telemetry, continuous recording, is also available for high-risk cardiac patients, providing long-term continuous long-distance telemetric surveillance by on-line mobile telephonic transmission of ECG data to dedicated call centers[1].

According to rapidly growth of digital health society, improving of biosensor technology in term of accuracy, sensitivity and specificity expand usage in cardiovascular management. Smart watch and various wearable devices with applications on mobile phones are being used in health promotion campaign to reduce the risk of heart disease and detect cardiac arrhythmia especially both of symptomatic and asymptomatic atrial fibrillation. Since, these gadgets record routine daily electrocardiography assisting early diagnosis and treatment[7]. For example, Alive core's Kardia wristband, used in conjunction with Apple watch, can record single leads ECG real time and send back to physician. Cardiio rhythm, application that uses photoplethysmography (PPG) to measure heart rate by using the finger to tap on the mobile camera, and Verily Study watch, which used to measure continuous photoplethysmography (PPG) and display for electrocardiography[7, 8], are the future model of AECG monitoring that will be in our everyday life.

Bilbilography:

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Day 4; Sunday, March 24, 2019

@ Room 1: Chandelier 2
08:30-10:00 Fight the social media!

How to advise your patients to their heart in a good shape (in Thai) Clearing controversies in diet & dietary supplements

Somkiat Sangwatanaroj, MD.
Division of Cardiovascular Medicine, Faculty of Medicine, Department of Medicine, Chulalongkorn University, Bangkok, Thailand

Many Thai people misunderstood the meaning of dietary supplement as medicine, which intended to diagnose, treat, cure or prevent diseases. In fact, dietary supplement cannot substitute for diet in daily life or any medicine, therefore the purposes of using dietary supplements were not to diagnose, treat, cure or prevent any disease as labeled in every dietary supplement.

The controversies in diet and dietary supplement came from the different "Beliefs". If I belief in conventional western medicine, please show me the Randomized Controlled Trials(RCTs) or cohort studies of effectiveness and side effects of diet and supplements to make me belief and use them. If I belief in traditional Thai culture, please show me the evidence of ancient Thai people diet and supplement. If I belief in religion, please show me the Buddha's words on diet and supplement. But many Thais belief in themselves "like" or "dislike" to make a decision of use or not use diet and supplements. It's quite difficult to clearing controversies in different beliefs. Therefore, the first thing I did, when I tried to advise my patients on diet and supplements, was their beliefs and provide "the best evidence" according to their beliefs or in every belief that I knew. We, doctors and nurses, are coaches, not game players.

For example, fish and fish-oil supplement controversies: eat fish or fish-oil supplement, take omega-3 or EPA supplement. American Heart Association recommended eat fatty fish at least 2 servings per week, the same as Thai traditional eating pattern, but fish-oil supplement may not benefit in cardiac patients in Statin-users. Recent study showed that high EPA supplement (for lowering triglyceride) may reduce cardiovascular risk but omega-3 fatty acid supplement not. However, Buddha' teachings of the purpose of eating (not for joy, not for fondness, not for decoration and not for ornament), are not support the use of any dietary supplement.

08:30-10:00 Fight the social media!

Chelation Therapy, way to go?

Piyanuj Ruckpanich, MD
Cardiac Rehabilitation, Piyavate Hospital, Bangkok, Thailand

Chelation therapy is a treatment using chelating agent which has the ability to bind molecules such as mineral or toxic metal. Chelation has been used for various medical condition for decades such as iron overload and lead poisoning. In terms of Coronary Artery Disease (CAD)treatment, chelation therapy has been used for treatment of unstable angina and post-MI since 1950's by using chelating agent disodium EDTA (ethylene diamine tetra-acetic acid) intravenously[1].Considering as complimentary medicine treatment, it is still controversial whether or not chelation therapy should be advice as CAD treatment in conventional medicine.

TACT trial (Trial to Access Chelation Therapy)[2], first powered randomised controlled trial comparing chelation with placebo in post MI patients. The study primary end point is death, myocardial infarction, stroke, coronary revascularization, hospitalisation for angina. There was 18% risk reduction comparing between chelation and placebo group. Subgroup analysis of diabetes patients has the greater effects of relatively risk reduction of 41 %. Despite the benefit especially in diabetes patients, TACT investigators group did not recommend chelation as the routine treatment for CAD.

However, American Heart Association and the American College of Cardiology guideline 2014 upgraded recommendation of Chelation treatment for stable ischemic heart disease patient from 3C to a 2B.[3]. TACT2 trail which emphasis to study the effects of chelation in post MI with diabetic patients is currently going on.[4]

The possible mechanisms of chelation therapy are by directly removal of heavy metal level which related to CAD especially lead and cadmium. These heavy metal induces oxidative stress, inflammation, endothelial dysfunction and also associated with risk factors of CHD such as hypertension, diabetes. Another possible mechanism is causing by relative hypocalcemia and parathyroid hormone stimulation which effect to calcium homeostasis.[5]

This presentation will be covered the story of chelation therapy from past to present, from theory to practice and also the possible future of chelation therapy.

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Young Investigator Award

22nd March 2019

09:00-10:30 Young Investigator Award (English)

Moderators: *Pyatat Tatsanavivat, MD*
Prin Vathesatogkit, MD

Judges: *Sofian Johar, MD (Brunei)*
Hav Ratneary, MD (Cambodian)
Jetty Sedyawan, MD (Indonesian)
Bounhieng PHALIBAY, MD (Laos)
Lam Kai Huat, MD (Malaysia)
Aung Zaw Myo, MD (Myanmar)
Aurelia Leus, MD (Philippines)
Ong Hean Yee, MD (Singapore)
Khanchit Likittanasombat, MD (Thailand)
Linh Huynh Dinh, MD (Vietnam)

(YIA 01)
09.00-09.12 **Prevalence of early repolarization in Thailand and long term risk of cardiac mortality**
Watchara Lohawijarn, MD
Division of Cardiology, Department of internal medicine, Faculty of medicine, Ramathibodi hospital, Mahidol University, Bangkok, Thailand

(YIA 02)
09.12-09.24 **Effect of Resistance Exercise With Rubber band in Chronic Heart Failure With Preserved Ejection Fraction Patients**
Wongwaris Aphijirawat, MD
Cardiovascular Division, Department of Internal Medicine Phramongkutklao Hospital, Bangkok, Thailand

(YIA 03)
09.24-09.36 **Cardiac evaluation in adults with dengue infection by serial echocardiography**
Chayasin Mansanguan, MD
Department of Clinical Tropical Medicine, Faculty of Tropical Medicine, Mahidol University, Bangkok, Thailand.

(YIA 04)
09.36-09.48 **The effects of CLIMATE and air pollutants on Heart Failure hospitalizations and mortality in Thailand (CLIMATE-HF Study)**
Wattanachai Ngampongpan, MD
Department of Cardiology, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

(YIA 05)

09.48-10.00 **Balloon assisted technique in transcatheter closure of large atrial septal defects.**

Thitima Limjaroen, MD
Division of cardiovascular medicine, Department of Medicine, Faculty of Medicine, Chulalongkorn university, Bangkok, Thailand

(YIA 06)

10.00-10.12 **The use of spot urine sodium measurement to evaluate the prevalence of high-level of sodium intake in hypertensive patients at Vajira Hospital**

Sirinart Chulawongsawat, MD
Division of Cardiology, Department of Medicine Vajira hospital, Navamindradhiraj University, Bangkok, Thailand

(YIA 07)

10.12-10.24 **Electrocardiographic Model to Predict Cardiac Resynchronization Therapy Response Among Chronic Heart Failure Patients**

Pattranee Leelapatana, MD, MSc
Department of Medicine, Division of Cardiology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand

(YIA 08)

10.24-10.36 **frAgmenteD QRS in preDictiON of ischemic heart disease diagnosed by stress Cardiovascular Magnetic Resonance imaging The ADD-ON CMR Study**

Pimpimol Yooprasert, MD,
Department of Cardiology, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

(YIA 01)

Prevalence of early repolarization in Thailand and long term risk of cardiac mortality

Watchara Lohawijarn, MD 2, Songkeat Yodteerug, MD1, Prin Vathesatogkit, MD 2, Tachapong Ngamukos, MD 2, Sirin Apiyasawat, MD 2 , Pakorn Chandanamattha, MD 2
1Department of internal medicine, Faculty of medicine, Ramathibodi hospital, Mahidol University, Bangkok, Thailand, 2Division of Cardiology, Department of internal medicine, Faculty of medicine, Ramathibodi hospital, Mahidol University, Bangkok, Thailand

Background: Early repolarization electrocardiogram pattern known to be associated with cardiovascular mortality in the western world. However, there is no study of this association in Southeast Asian population. This study aimed to determine the prevalence of early repolarization pattern (ERP) and the association with mortality in Thai population.

Methods: A total of 2,756 individuals from the electricity generating authority of Thailand (EGAT) study during 1997 to 2015 were included in this study. ERP was defined by either "notching" or "slurring" at the end of QRS complex observed in inferior leads, lateral leads, or both of standard 12-lead electrocardiogram (ECG). Primary endpoint was a total mortality which will be classified into specific cause of death including sudden cardiac death. Multivariable Cox-proportional hazard model, adjusted for all major cardiovascular risk factors, was used to determine the association between ERP and outcomes.

Results: There were 2,689 participants who had complete ECGs and risk factor profiles for analysis. Most of them were male (80%) with a mean age of 55 years (47, 66). The mean follow-up duration was 11.2 ± 6.7 years. There were 444 cases (16.5%) found to have ERP (slur 54.3%, notching 38.3% and both 7.4%). ERP mostly detected in inferior ECG leads (49.8%), followed by lateral leads (35.6%) and both (14.6%). Five-hundred and sixty-six participants died during the follow-up time frame. Of these, 21 were sudden death. ERP was not associated with a higher likelihood of all-cause death (20.5% in ERP and 21.2% in non-ERP group; hazard ratio (HR),1.04; 95% confidence interval (CI), 0.81 to 1.34; p=0.75). Coronary artery disease was the cause of death in 7.2% in ERP group and 7.6% in non-ERP group (HR, 1.06; 95% CI, 0.71 to 1.56; p=0.79). The cardiovascular mortality was 11.7% vs 12.0% in ERP and non-ERP group respectively (HR, 1.03; 95% CI, 0.75 to 1.41; p=0.872) There was no difference in sudden cardiac death between both groups (1.2% in ERP group and 1.4% in non-ERP group).

Conclusion: The prevalence of early repolarization pattern is remarkably higher in Thai population compared to other Asian population previously published. During 18-year follow up, there was no difference in mortality between population with and without early repolarization pattern. ERP does not increase the risk of death in this middle-aged Thai population.

(YIA 02)

Effect of Resistance Exercise with Rubber band in Chronic Heart Failure with Preserved Ejection Fraction Patients

Wongwaris Aphijirawat, MD; Waraporn Tiyanon, MD; Prasart Laothavorn, MD; Chumpol Piamsomboon, MD; Sopon Sanguanwong, MD; Charnnarong Naksawadi, MD; Preecha Uerojanaungkul, MD; Nakarin Sansanayudh, MD; Thoranis Chantrarat, MD; Verapon Pinphanichakarn, MD; Hutsaya Prasitdumrong, MD; Tanyarat Aramsareewong, MD
Cardiovascular Division, Department of Internal Medicine, Phramongkutklao Hospital

Background: Heart failure with preserved ejection fraction (HFpEF) is a common disease in elderly population with multiple comorbidities. Exercise intolerance and easily fatigue were important problems in this population leading to poor quality of life (QoL). Despite increasing incidence, there is no evidence-based effective therapy for these patients. Resistant exercise, by weight-training, can improve QoL but it is not suitable for all patients. Rubber band is safe and easy access home-based exercise which can improve frailty in HFrEF. We sought to evaluate the effect of rubber band exercise to improve exercise capacity in HFpEF population.

Methods: We conducted a prospective, randomized, open-labeled, blinded endpoints (PROBE) design to determine whether 3-month of resistance exercise using rubber band can improve exercise capacity in stable HFpEF patients compared with standard usual care. The co-primary outcome measured by peak oxygen consumption and 6-minute walk distance were evaluated. The secondary endpoint is the change in NT-proBNP level.

Results: A total of 32 patients underwent randomization in 1:1 ratio. Baseline characteristics were not different between groups. The overall adherence to exercise was excellent (93%). Exercise capacity were improved in both groups. There was no significant different in peak O2 consumption (+2.2 vs +2.9 ml/kg/min, p=0.68) and 6-MWD (+38 vs +23 m, p = 0.65) but tend to reduction in NT-proBNP level (-357 vs -54, p =0.3) in rubber band exercise group when compared with standard usual care.

Conclusion: Effect of resistance exercise using rubber band tend to reduced NT-proBNP level after 3-month exercise but not peak oxygen consumption and 6-MWD when compared with standard usual care.

Keywords: Heart failure with preserved ejection fraction , Resistance exercise , Rubber band , Exercise capacity.

Original articles:

1. Background
   Heart failure is a common disease and increase incidence, nowadays. Most of population in this groups is elderly with multiple comorbidities leading to increase rate of hospitalization and mortality as well as medical cost. The classification of chronic heart failure

(YIA 03)

Cardiac evaluation in adults with dengue infection by serial echocardiography

Chayasin Mansanguan, MD.,
Department of Clinical Tropical Medicine, Faculty of Tropical Medicine, Mahidol University, Bangkok, Thailand

Background: Dengue viral infection has been a major health problem worldwide. The clinical spectrum of dengue infection is broad ranging from asymptomatic to dengue infections to a severe disease. Although cardiac involvement has been reported in dengue infection, the incidence and cardiac involvement are not well established. A better understanding of cardiac involvement in dengue infections is required.

Methods: From Jan 2016 to Dec 2018, patients hospitalized at Bangkok Hospital for Tropical Diseases with dengue confirmed by positive NS1 antigen or positive dengue IgM. We characterized the incidence and change in cardiac function by serial echocardiography, troponin T and CK - MB level at the day of admission, day of defervescence, day of hypotension (if the patient develop hypotension) and two – weeks follow up.

Results: Seventy – three patients were evaluated and 5 patients (%) presented with elevated biomarker levels. There was no difference in clinical presentation between dengue (DF), dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). Cardiac involvement were found 21% in this present study including left ventricular systolic dysfunction 4 (5.5%), transient diastolic dysfunction 3 (4.1%), increased levels of at least 1 cardiac biomarker (Troponin T, CK-MB) 5 (6.85%) and small pericardial effusion 6 (8.2%), respectively. Only one case that suspected myocarditis in DHF patient. Three patients develop DSS during admission and transfer to intensive care unit (ICU). We found that dengue hemorrhagic fever was the associate risk factor to develop cardiac involvement with clinically significant ($p < 0.006$).

Conclusion: Cardiac involvement in adults with dengue infection was found 21% ranging from elevated cardiac biomarker, transient left ventricular systolic and diastolic dysfunction and pericardial effusion. The functional abnormality spontaneously resolved at the day of follow up without specific treatment. Myocarditis in dengue infection patients were uncommon.

(YIA 04)

The effects of CLIMATE and air pollutants on Heart Failure hospitalizations and mortality in Thailand (CLIMATE-HF Study)

Wattanachai Ngampongpan, MD, Piyamitr Sritara, MD, Wichai Aekplakorn, MD, PhD, Sukit Yamwong, MD, Prin Vathesatogkit, MD, Hathaichon Boonhat, MSc, Oraluck Pattanaprateep, PhD, Teerapat Yingchoncharoen, MD, FASE
Department of Cardiology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Study design
Observation clinical research: Retrospective cohort study

Background: The data on the effect of temperature change on acute heart failure (HF) in tropical countries is limited. Temperature range between summer and winter in Thailand is comparably narrower than other countries in the previous studies. We sought to explore the effect of temperature change on HF hospitalization and in-hospital mortality.

Methods: Data from 266,648 patients with primary HF admissions and daily meteorological parameters between 2011 and 2016 were collected. The meteorological parameters were daily temperature, atmospheric pressure, relative humidity, vapor pressure, wind speed and rainfall unit. Generalized additive regression models and non-linear distributed lag functions were performed.

Results: 460,502 hospital admissions occurred with strong seasonal variation with peaked in winter. Minimal daily temperatures 3 days prior to admission date was associated with relative risk (RR) (95% confidence interval (CI)) of 1.07 (1.06-1.08, p value) for HF hospitalization after adjusting with age, other HF comorbidities (DM, CKD, AF, COPD, CAD,PAD and Cancer) as well as meteorological parameters. The association with cold weather was stronger base on greater seasonal temperature variations, corresponding to greatest RR (95% CI) of 1.15 (1.14-1.17)) in Northern Thailand.

Conclusion: HF hospitalizations were associated with preceding cold temperature exposure especially in the area with greater seasonal temperature variations. Reducing exposure to cold temperatures among those at risk for HF may be the potential prevention of HF hospitalizations.

Keywords: Climate, Air pollutants, Incidence, Mortality, Heart failure

(YIA 05)

Balloon assisted technique in transcatheter closure of large atrial septal defects.

Thitima Limjaroen MD, Msc, Suphot Srimahachota MD, Msc, Pornthep Lertsapcharoen MD, Vorarit Lertsuwunseri MD, Msc, Siriporn Athisakul MD, Msc,
*Division of cardiovascular medicine, Department of Medicine, Faculty of Medicine, Chulalongkorn university, Bangkok, Thailand

Background: Atrial septal defect (ASD) is a common congenital heart disease in adults. Modified techniques such as balloon assisted technique (BAT) may be increase the success rates. The aim of this study was to evaluate the efficacy and safety of balloon assisted technique in transcatheter closure of large atrial septal defects compared to conventional (CT).

Methods: We retrospectively reviewed consecutive patients diagnosed with large atrial septal defect size ≥ 25 mm. who underwent transcatheter closure with conventional technique (CT) and balloon assisted technique (BAT) in King Chulalongkorn Memorial Hospital of Thailand from January 2007 to December 2018. Patient characteristics, clinical outcomes, complications, and transthoracic echocardiography (TTE) before hospital discharge, at one month, and one-year were evaluated. T-test, Chi-square and multivariate analysis were used to analyze the results.

Result: A total of 135 patients was included; 102 patients were initially used CT and 33 patients were used BAT. The patients underwent BAT had higher prevalence of absent aortic rim, deficient aortic rim, deficient or floppy posteroinferior rim and deficient or floppy IVC rim. The mean defect size by transesophageal echocardiogram was 27.82 ± 3.28 mm. in CT group and 31.91 ± 3.75 mm. in BAT group ($p < 0.001$). Transcatheter closure was successful in 86 patients in CT group (84.3%) and 31 patients in BAT group (93.9%) (odds ratio [OR] 2.88; 95% confidence interval [CI] 0.63,13.27; p 0.157). In 14 of 16 patients with failed CT, BAT was successful. Three patients had device embolization; 1 (1%) in CT group and 2 patients (6.1%) in BAT group (p 0.094). One patient successfully retrieved by endovascular approach and two of them had requiring surgical removal. Most of device embolization occurred in the previous era.

Conclusion: In this single-center experience, balloon assisted device closure of large atrial septal defects is offers substantial chances of success in transcatheter closure when CT fails.

(YIA 06)

The use of spot urine sodium measurement to evaluate the prevalence of high-level of sodium intake in hypertensive patients at Vajira Hospital

Sirinart Chulawongsawat, MD, Thaveekiat Vasavakul, MD,
Division of Cardiology, Department of Medicine, Vajira hospital, Navamindradhiraj University, Bangkok, Thailand

Background: Excessive sodium consumption is one of the risk factors that contribute to hypertension. Hypertensive patients were advised to limit sodium intake to less than 2300 mg per day as in the guidelines for management of hypertension1. In Thailand, many Thai people enjoy eating salty food.2 Kawasaki formula was invented by Kawasaki et al.3 for estimating 24-hour urine sodium excretion from spot urine sodium. The correlation between the estimated and the measured 24-hour urine sodium values was highly statistically significant with the correlation coefficient of 0.728. The aim of this study was to determine the prevalence of excessive sodium consumption in hypertension patients at Vajira hospital by using the estimated 24-hour urine sodium excretion from Kawasaki's spot urine method.

Methods: This cross-sectional study was performed from October 2018 to January 2019. The morning spot urine sodium and urine creatinine from informed consent patients were analyzed. We asked whether patients thought they had too much dietary salt consumption and then categorized them into two groups - the "excessive salt consumption" perception group and the "normal salt consumption" perception group. The inclusion criterion was outpatient department patients with hypertension. Exclusion criteria was diuretic use, edema, chronic kidney disease, and history of diarrhea or vomiting within 24 hours. Epidemiological data were collected. Patients were considered having excessive sodium consumption if their estimated 24-hour urine sodium excretion exceeded 2300 mg. The prevalence of excessive sodium consumption was determined. Analysis of the relationship between the perceived salt intake and the estimated 24-hour urine sodium excretion was done by Fisher's exact test.

Results: Total 110 patients were enrolled. Mean estimated 24-hour urine sodium excretion was 3987.9 ± 1388.66 mg. 98 patients (89.1%) had estimated 24-hour urine sodium excretion more than 2300 mg, 12 patients (10.9%) had estimated 24-hour urine sodium excretion less than 2300 mg. From the survey, 82 patients (74.5%) had the "normal salt consumption" perception, and 28 patients (25.5%) had the "excessive salt consumption" perception. Analysis of the relationship between the perceived salt intake and the estimated 24-hour urine sodium excretion found that 72 patients (87.8%), who believed that they were doing well at staying away from excessive salt consumption, had estimated 24-hour urine sodium excretion more than 2300 mg.

Conclusions: There is high prevalence (89.1%) of excessive sodium consumption in hypertensive patients at Vajira hospital. Most of the patients in this study thought that they were doing well at avoiding salty food, but the truth was they were not.

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(YIA 07)

Electrocardiographic Model to Predict Cardiac Resynchronization Therapy Response Among Chronic Heart Failure Patients

Pattranee Leelapatana, MD, MSc,1 Porntera Sethalao, MD,1 Arisara Suwanagool, MD1
From the 1Department of Medicine, Division of Cardiology, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Background: Despite contemporary restrictive clinical and electrocardiographic selection criteria, up to one-third of chronic heart failure patients with implanted cardiac resynchronization therapy (CRT) are non-responders. Previous studies reported that some electrocardiographic patterns, such as the longer the intrinsicoid deflection (ID) in lead I, the higher the R wave amplitude in V6, and so on may be helpful for CRT response prediction.

Objective: Our study aims to establish a simplified model using electrocardiographic parameters as predictors of CRT response among chronic heart failure patients.

Material and Methods: Eighty chronic heart failure patients meeting current guideline recommendation for CRT implantation were enrolled in this retrospective cohort study. Clinical and electrocardiographic parameters at the time of CRT implantation and during follow up were analyzed. Response to CRT was evaluated after 6 months of implantation, defined as a decrease in left ventricular end systolic volume (LVESV) of ≥ 15% or an increase in left ventricular ejection fraction (LVEF) of ≥ 10%.

Results: During a median follow-up period of 34 months, there were 45 (56.3%) responders. In multivariate analysis, the independent predictors for CRT response were as follows: the more the reduction of the QRS complex duration after implantation (QRS pre – QRS post), the higher the time to ID in lead I/QRS ratio (ID I/QRS), and the higher the difference in amplitude of R and S wave in lead V1 and V6 [(S1+R6) – (S6+R1)] (QRS pre – QRS post: Adjusted odds ratio [OR] 0.97, 95% CI 0.94 – 0.99, p = 0.004, ID I/QRS: OR 18.65, 95% CI 1.02 – 342.64, p = 0.049, (S1+R6) – (S6+R1): OR 1.1, 95% CI 1.04 – 1.17, p = 0.002). The new equation for calculating predictive CRT response model, generated from multiple logistic regression analysis, was -3.414 - 0.035(QRS pre – QRS post) + 2.926(ID I/QRS) + 0.097[(S1+R6) – (S6+R1)]. The area under the receiver operating characteristic (ROC) curve for the new model in predicting CRT response was 0.853 (95%CI 0.767-0.939). A model of more than 0.3 showed sensitivity of 85.7%, specificity of 80% for prediction of CRT response.

Conclusions: The new electrocardiographic model gives high sensitivity and specificity for prediction of CRT response among chronic heart failure patients, who meet current guideline recommendation for CRT implantation.

Keywords: Cardiac resynchronization therapy, Electrocardiography, Heart failure, Responders, Model

(YIA 08)

frAgmenteD QRS in preDictiON of ischemic heart disease diagnosed by stress Cardiovascular Magnetic Resonance imaging The ADD-ON CMR Study

Pimpimol Yooprasert, MD, Prin Vathesatogkit, MD, Varinsawat Thirawuth, MD, Watcharee Prasertkulchai, MD, Tarinee Tangcharoen MD,
Division of Cardiovascular Medicine, Department of Internal Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Background: Fragmented QRS complex (fQRS) on 12-lead EKG is not uncommon in general population. Previous studies found an association between fQRS and prior myocardial infarction, myocardial scar, heart failure, and increased cardiac mortality. However, data in adults without history of coronary artery disease is limited. We aimed to evaluate whether there is an association between fQRS and ischemic heart disease (IHD) diagnosed by stress cardiac MRI testing.

Method: We retrospectively reviewed data from 604 patients who underwent stress cardiac MRI, in which 50 patients were excluded due to known history of coronary artery disease or incomplete stress test. A positive result was defined as stress-induced perfusion defect in at least 2 contiguous myocardial segments corresponding to epicardial coronary territory, or presence of ischemic scar (subendocardial or transmural pattern of late gadolinium enhancement). The 12-lead EKG done on the same day with MRI, prior to stress testing, were analyzed. Fragmented QRS was defined as the presence of additional R wave (R'), notching in the nadir of R or S wave, or the presence of more than one R' in any EKG leads. Both cardiac MRI and EKG were analyzed by two independent observers.

Result: Final analysis included 554 patients, 39% were male, with mean age of 67.8 ± 11.1 years. There was positive stress cardiac MRI in 219 patients (39.5%). Older age, diabetes mellitus, and hypertension were more frequent in the positive group ($p < 0.05$). fQRS was identified in 300 patients (54.2%). Baseline characteristic did not differ significantly between patients with and without fQRS. There is an association between fQRS and IHD, OR 1.605 (95% CI 1.136-2.269), $p = 0.007$. Using linear regression, number of leads with presence of fQRS also showed an association with IHD (OR 1.204, $p = 0.005$). After adjustment for age, diabetes, hypertension, renal function, and left ventricular ejection fraction, the strong association between fQRS and IHD was still presence, OR 1.709 (95% CI 1.182-2.470), $p = 0.004$.

Conclusion: In patients without known history of coronary artery disease, fragmented QRS is independently associated with ischemic heart disease diagnosed by stress cardiac MRI.

Free Paper
"Miscellaneous"

Abstract presentation I
22nd March 2019
Time: 10.45-11.45
Venue: @ Black

Moderators: *Arintaya Phromintikul, MD*
Rapeephon Kunjara Na Ayudhya, MD

(FP 01)
10.45-10:55 **Clinical and Echocardiographic Similarities and Differences Between Patients with Isolated Mitral Stenosis and Regurgitation**
Nithima Ratanasit, MD
Division of Cardiology, Department of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

(FP 02)
10.55-11.05 **Ten-year Survival and Factors Associated with Increased Mortality in Patients Admitted for Acute Decompensated Heart Failure in Thailand**
Rungroj Krittayaphong, MD
Division of Cardiology, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand

(FP 03)
11.05-11.15 **Medication Use Evaluation of Non-vitamin K Antagonist Oral Anticoagulants (NOACs) and Their Relationship to Clinical Outcomes in Thailand: A Multicenter, Observational Study**
Phannita Wattanaruengchai,
Pharmacy Department, Siriraj Hospital, Mahidol University, Bangkok, Thailand.

(FP 04)
11.15-11.25 **Cardiovascular Outcomes in Patients with Non-ST-Elevation Acute Coronary Syndrome Undergoing Noninvasive Stress Test**
Parita Bunditboondee, MD
Division of Cardiology, Department of Internal Medicine, Faculty of Medicine, Chiang Mai University, Chiang Mai,Thailand

(FP 05)
11.25-11.35 **Cut-off pulmonary artery to aorta ratio as a prognosticator for cardiovascular events: Novel insight from cardiac magnetic resonance**
Wongsaput Boonyakiatwattana, MD
Division of Cardiology. Department of Internal Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand

(FP 01)

Clinical and Echocardiographic Similarities and Differences Between Patients with Isolated Mitral Stenosis and Regurgitation

*Nithima Ratanasit, MD.a**, Khemajira Karaketklang, M.P.H.b
a Division of Cardiology, Department of Medicine
b Department of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand

Background: Mitral valve diseases (MVD), including mitral stenosis (MS) and mitral regurgitation (MR), remain a common cardiovascular disease worldwide, including Thailand. Pathophysiologic consequences in both MS and MR involve pressure and volume overload of left atrium (LA), respectively, and lead to increased LA pressure, atrial arrhythmias, pulmonary hypertension (PH) and heart failure. The objectives of the study were to determine the clinical and echocardiographic similarities and differences between MS and MR and predictors of PH among patients with MVD.

Methods: Patients with isolated hemodynamically significant MS or MR were prospectively enrolled. Severity of MS was graded using valve area and mean transvalvular pressure gradient. Severity of MR was assessed using proximal isovelocity surface area method. Severe MVD was defined in patients with MS as mitral valve area < 1.0 cm2 and mean transvalvular gradient > 10 mmHg and in patients with MR as an effective regurgitant orifice area > 40 mm2. PH was defined as pulmonary artery systolic pressure > 50 mmHg. Patients with mild disease, prior cardiac intervention/surgery, known causes of PH or left ventricular systolic dysfunction were excluded.

Results: There were 318 patients enrolled in the study (66.7% and 33.3% of patients with MR and MS, respectively). Patients in MR group were significantly older and more male than in MS group. Severe MVD was reported in 245 (77.0%) patients and more common in MR group (69.8% and 80.7% in patients with MS and MR, respectively; p = 0.03). Dyspnea, atrial fibrillation and history of cerebrovascular diseases were significantly more prevalent in patients with MS. LA diameter, LA volume index, mean pulmonary pressure, pulmonary artery systolic and end-diastolic pressure were significantly higher in patients with MS. Among subgroups of both MS and MR, dyspnea, severe disease, higher LA volume index were more significantly common in patients with PH and remain independent predictors of PH.

Conclusion: In patients with MVD, both MS or MR, the presence of dyspnea, severe disease, and LAVI were independent predictors of PH.

(FP 02)

Ten-year Survival and Factors Associated with Increased Mortality in Patients Admitted for Acute Decompensated Heart Failure in Thailand

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Introduction: Data relative to the long-term outcome of patients admitted for acute decompensated heart failure among Asians are scarce. The objectives of this study were to determine short-term, intermediate-term, and long-term survival among patients admitted for acute decompensated heart failure in Thailand, and to identify factors independently associated with increased mortality.

Methods: Patients who were admitted with a primary diagnosis of heart failure were enrolled in the Thai ADHERE registry from 18 hospitals located across Thailand during 2006. Medical record data were collected according to ADHERE protocol. Mortality data were collected from death certificates on file at the Thailand Bureau of Registration Administration.

Results: A total of 1,451 patients were included. The mean age of patients was 63.7 ± 14.4 years, and 49.7% were male. The 1-year, 5-year, and 10-year mortality rates in Thai patients admitted for acute decompensated heart failure in this study were 28.0%, 58.2%, and 73.3%, respectively. Independent predictors of increased mortality were identified. There were more cardiovascular-related deaths than non-cardiovascular-related deaths (54.6% vs. 45.4%, respectively).

Conclusions: The 10-year mortality rate in Thai patients admitted for acute decompensated heart failure was 73.3%. Seven factors were found to be independently associated with increased mortality including left ventricular ejection fraction.

Keywords: Thailand, mortality, acute decompensated heart failure, ADHERE Registry

(FP 03)

Medication Use Evaluation of Non-vitamin K Antagonist Oral Anticoagulants (NOACs) and Their Relationship to Clinical Outcomes in Thailand: A Multicenter, Observational Study

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Objective: This study aimed to evaluate the usage pattern of non-vitamin K antagonist oral anticoagulants (NOACs) compared to clinical guidelines and labeling. The impact of NOACs dosing on clinical outcomes was also assessed.

Method: A retrospective chart review was conducted during January 2013 - December 2017 in 10 tertiary care hospitals. We performed a simple-stratified randomization to obtain 100-120 patients per each study site. Detail information on NOACs use, clinical information and outcomes (stroke/systemic embolism, major bleeding and hospitalization from bleeding) were extracted using a standard case record form. Thai medical labeling was used as the standard reference for dosing evaluation while international guidelines were used as the reference for NOAC selection.

Results: A total of 1,186 patients were included into the data analysis. Prescribing of NOACs were consistent with guidelines in 1,118 patients (94.3%). However, 68 patients (5.7%) received NOACs despite having contraindications or with off-label use. Overall, 637 patients (53.7%) received dosing that were consistent with Thai medical labeling. Under-dosing and over-dosing occurred in 211 (17.8%) and 112 (9.4%) patients, respectively. Data was inadequate for evaluation in 226 patients (19.1%). Multivariate analysis showed that under-dosing led to a significant increase in the risk of stroke or systemic embolism (adjusted HR: 2.513; 95% Cl: 1.099-5.746; p 0.029). Overdosing led to a significant increase in the risk of bleeding hospitalization (adjusted HR: 1.998; 95% CI, 1.072 -3.725; p 0.029).

Conclusion: NOACs use was mostly consistent with guidelines except on dosing. Such dosing deviation may lead to increased adverse outcomes.

Keywords: medication use evaluation, non-vitamin K antagonist oral anticoagulants (NOACs), stroke and systemic embolism, bleeding

(FP 04)

Cardiovascular Outcomes in Patients with Non-ST-Elevation Acute Coronary Syndrome Undergoing Noninvasive Stress Test

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Background: International guidelines recommend that patients with intermediate to high risk non-ST-elevation acute coronary syndrome (NSTE-ACS) should undergo coronary angiography (CAG) and coronary revascularization within 72 hours in order to achieve the better cardiovascular outcomes. Due to the policy of universal coverage in Thailand, patients with intermediate to high risk NSTE-ACS patients who did not received CAG within 72 hours require the evidence of myocardial ischemia from noninvasive stress test to perform CAG. The primary objective was to determine 1-year major adverse cardiovascular event (MACE) in patients with positive and negative noninvasive stress test.

Methods: The NSTE-ACS patients admitted during January 2017 to June 2018 at Chiangrai Prachanukroh hospital and Maharaj Nakorn Chiang Mai Hospital who did not receive CAG within 72 hours and underwent non-invasive stress test were enrolled. The primary outcome was 1-year MACE which was the composite of cardiovascular death, non-fatal myocardial infarction and ischemic driven revascularization.

Results: Of 226 enrolled patients, 88 patients underwent EST and 140 patients underwent dobutamine stress echocardiogram and 2 patients received both test. The incidence of 1-year MACE did not differ between patients with positive and negative stress test (14.9% vs. 18.2%, P=0.545, respectively). The independent factors associated with 1-year mortality in negative stress test were age, low body mass index, impaired left ventricular ejection fraction and higher level of Grace or TIMI score.

Conclusions: Among patients with NSTE-ACS underwent noninvasive stress test, the incidence of 1-year MACE was high and was not different between positive and negative test. The policy of noninvasive test in this group of patients should be reconsidered.

(FP 05)

Cut-off pulmonary artery to aorta ratio as a prognosticator for cardiovascular events: Novel insight from cardiac magnetic resonance

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Background: Pulmonary artery (PA) to aorta (Ao) ratio can be easily measured using cardiac magnetic resonance (CMR). There are scarce data regarding CMR-derived pulmonary artery to aorta ratio and cardiovascular events. Further, optimum cut-off value has never been studied.

Objective: To investigate prognostic power and optimum cut-off values of CMR-derived pulmonary artery to aorta ratio for predicting future major adverse cardiac events (MACE).

Methods: A total of 460 patients (50.7% men, mean age 68.8 ± 10.5 years) referred for cardiac magnetic resonances imaging were consecutively enrolled. Diameters of the PA and AO were measured in cross-section image at the level of PA bifurcation using black blood imaging technique. Clinical data including comorbidities and medications were collected. The occurrence of MACE was defined as cardiovascular death or hospitalization and unplanned coronary revascularization were retrospectively reviewed, blinded to CMR data. Kaplan Meier analysis was then applied. ROC analysis for the optimum cut-off was used for predicting MACE.

Results: During a median follow-up of 44.5 months, 106 patients (23%) experienced a MACE. The mean PA-to-AO ratio in patients who experienced a MACE was significant higher than one without events (0.93 ± 0.13 versus 0.81 ± 0.13, $p < 0.001$). Using ROC analysis, the optimum cut-off values of PA: AO ratio for predicting future MACE was 0.9. In a complete multivariate analysis, the PA: Ao ratio of 0.9 or greater was an independent predictor of MACE (hazard ratio: 2.81 [95% confidence interval: 1.73 to 4.57], $p <0.001$).

Conclusions: The PA-to-aortic ratio evaluated by CMR at cut-off 0.9 or greater provides an independent prognostic value for the prediction of future MACE. Routinely report the PA: AO ratio might be part of standard CMR protocol.

Keywords: Cardiovascular magnetic resonance (CMR), Major adverse cardiac events (MACE), prognosis, PA: Ao ratio.

Free Paper
"CAD and ACS"

Abstract presentation II
22nd March 2019
Time: 13.15-14.45
Venue: @ Black

Moderators: *Sukit Yamwong, MD*
Rungsrit Kanjanavanich, MD

(FP 06)
13.15-13:25 **The spoke-and-hub model improved the quality reperfusion and rapidly reduced in-hospital mortality of STEMI patients in a regional hospital of northern Thailand**
Bhuritat Muangboon, MD
Sawanpracharak Cardiovascular Center of Excellent, Sawanpracharak Regional Hospital, Nakorn Sawan, Thailand

(FP 07)
13.25-13.35 **Effect of streptokinase on treatment of ST-segment elevation myocardial infarction at Queen Sirikit Heart Center of the Northeast**
Atchara Kruengpatee, MD
Department of Cardiology, Faculty of Medicine, KhonKean University, Khon Kean, Thailand

(FP 08)
13.35-13.45 **Comparison of efficacy and safety between standard and accelerated half dose streptokinase in acute ST-segment elevation myocardial infarction**
Wate Wijarnpreecha. MD
Division of Cardiology, Department of Internal Medicine, Faculty of Medicine, Chiang Mai University, Chiang Mai,Thailand

(FP 09)
13.45-13.55 **Off-Pump coronary artery bypass grafting as routine practice in Provincial Hospital of Thailand**
Nuttapon Arayawudhikul, MD
Division of Cardiothoracic Surgery, Lampang Hospital, Lampang, Thailand

(FP 10)
13.55-14.05 **Effects of High-intensity statin on cardiovascular events in patient with acute ST-Elevation Myocardium Infarction: A propensity score matched analysis.**
Yotsaya Kunlamas
Department of Pharmacy Practice, Faculty of Pharmaceutical Sciences, Chulalongkorn University, Bangkok, Thailand.

(FP 11)
14.05-14.15 **Prevalence of Microvascular Dysfunction Detected by Adenosine Stress Cardiac Magnetic Resonance in Patients who Presented with Angina and Non-significant Coronary Artery Disease in Phramongkutklao Hospital**
Torkiat Tantiwiwat, MD,
Cardiovascular Division, Department of Internal Medicine Phramongkutklao Hospiatal

(FP 06)

The spoke-and-hub model improved the quality reperfusion and rapidly reduced in-hospital mortality of STEMI patients in a regional hospital of northern Thailand

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Background: Primary PCI and pharmacoinvasive strategy are standard of reperfusion for the STEMI patients. However, the decision and implemented which strategies confronted the patients is still problematic and resulted low the quality reperfusion many regions. We conducted spoke-and-hub model to assist the system increased the reperfusion.

Methods: The hub is the cardiac center which on-site primary PCI back up. The spoke hospitals are classified into 3 zones as A, B or C, depending on duration for patients transported to the hub within 60 minutes. The quality reperfusion rate is collected and CV-related in-hospital mortality compared to before and after the strategy is implemented by student t-test.

Results: Between October 2017 through September 2018, prospectively cohorts of 278 STEMI patients are enrolled mostly male (69.2%) and average age is 62.2 year-old, who had intended into primary PCI of 50.3%. The compared quality reperfusion with primary PCI is 42.4% ($p<0.01$), in the other hand the quality fibrinolytic time within 30 min is 29.2% ($p=0.032$). The pharmacoinvasive patients whom performed completely angiogram within 24 hours is 77.6%. The compared CV-related in-hospital mortality between groups demonstrated lower in the intervened group (7.9% vs 16.7%, $p<0.01$). There is no evidence statistically significant of adverse events following by neither the reperfusion strategies (0.9% vs 1.1%) nor depending on the quality reperfusion (1.3% vs 1.3%).

C**onclusion:** The spoke-and-hub model improved the standard quality reperfusion and reduced CV-related in-hospital mortality, thereby promising to make decision the proper strategy according to affected regional potential.

Keyword: spoke-and-hub model, STEMI, reperfusion

(FP 07)

Effect of streptokinase on treatment of ST-segment elevation myocardial infarction at Queen Sirikit Heart Center of the Northeast

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Background: Streptokinase (SK) is currently used broadly for initial revascularization of ST-segment elevation myocardial infarction (STEMI) in our region. However, some patients failed from such initial treatment. We therefore aimed to study the effects of SK in our service area.

Methods: Patients with STEMI and initially received SK before referring to Queen Sirikit Heart Center of the Northeast, Khon Kaen, between January 2017 and August 2018 were consecutively recruited. All patients underwent coronary angiography (CAG). Patients whom CAG did not perform or was performed >24 hours after SK administration were excluded. Efficacy of SK was determined by 1) fibrinolytic effect (coagulogram), and 2) revascularized effect (TIMI flow II-III), which correlation between both effects was studied. Safety of SK was determined as bleeding.

Results: Among 189 eligible patients, mean age (standard deviation; SD) was 62.8 (10.9) years, 142 (75%) patients were male, 95 (51%) and 88 (47%) patients presented with STEMI anterior wall and inferior wall, respectively. 14 (7%) patients had cardiogenic shock. Resolution of ST-segment ≥50% was achieved in 123 (65%) patients. Median (interquartile range; IQR) of time from onset symptoms to SK was 2.6 (1.5-4.4) hours. Median (IQR) of partial thromboplastin time (PTT) among subgroup of SK-to-PTT time of 0-3, >3-6, and >6 hours were 51.4 (46.3-56.0), 40.9 (37.2-45.5), and 36.6 (33.1-40.1) seconds, respectively. Baseline TIMI flow grade II-III of infarct-related artery was achieved in 105 (55.6%) patients. Correlation between fibrinolytic and revascularized effect of SK was not demonstrated. In-hospital mortality occurred in 10 (5.3%) patients, in which 9 patients had baseline TIMI flow 0-I and 1 patient had baseline TIMI flow II-III ($p = 0.006$), and intracranial hemorrhage occurred in 1 (0.5%) patient.

Conclusions: In patient with STEMI, SK appropriately exerted fibrinolytic effect. However, proper revascularized effect was unfavorable and correlation between fibrinolytic activity and revascularized effect was absence.

Keywords: ST-segment elevation myocardial infarction (STEMI), streptokinase, fibrinolysis, TIMI flow, coagulogram

(FP 08)

Comparison of efficacy and safety between standard and accelerated half dose streptokinase in acute ST-segment elevation myocardial infarction

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Background and objectives: Previous studies showed that accelerated dose of streptokinase (SK) (0.75 M.U./10 min, repeated after 50 min if no electrocardiographic criteria of reperfusion) had higher rates of coronary reperfusion and similar bleeding rate and in-hospital mortality, compared to standard-dose SK regimen. Majority of patients received only one dose of SK (accelerated half-dose regimen) in that study. Due to the concern of bleeding, we aimed to compare the efficacy and safety between standard-dose and accelerated half-dose SK regimens.

Methods: We obtained the data of 326 patients who were admitted at the cardiac care unit, Maharaj Nakorn Chiangmai hospital and Nakornping hospital, due to acute ST-segment elevation myocardial infarction from January 2017 to December 2018. The primary outcome was coronary perfusion rate. The secondary outcomes were major bleeding and in-hospital mortality rates.

Results: Baseline characteristics were similar between 2 groups, except higher prevalence of chronic kidney disease and diabetes was demonstrated in accelerated half-dose group. Mean age was 62 years (Male 64%). The rate of coronary reperfusion was not different between accelerated half-dose and standard-dose regimens (63.1% vs. 59.9%, p = 0.546, respectively). In-hospital mortality rate was similar between two groups (3.4% vs 3.4% p = 0.98). Incidence of major bleeding was also comparable between 2 groups (0.6% vs. 2.0%, P=0.226). Only 1 patient in each group developed intracranial hemorrhage. However, hypotension occurred more frequently in accelerated half-dose group than standard-dose group (35.8% vs 21.1%, p = 0.004).

Conclusions: The accelerated half-dose SK regimen gave similar efficacy and safety compared to standard-dose SK regimen. Further larger studies are needed to confirm our results.

Keywords: acute myocardial infarction, accelerated streptokinase

(FP 09)

Off-Pump coronary artery bypass grafting as routine practice in Provincial Hospital of Thailand

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Conflict of Interest Statement: The authors have no conflicts of interest to disclose.

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4 tables and 2 figures

Central message: Routine off-pump coronary artery bypass grafting without patient selection can be feasible with well-trained surgical teams, who gain experience by the frequent use of this method in daily practice.

Background: Our department has a policy of routinely performing off-pump coronary artery bypass grafting (CABG) without patient selection, to hasten the recovery of the patient's systemic condition. Here we summarized our results to assess the validity of this practice for patients with coronary artery diseases.

Methods: In this study, 750 patients who underwent off-pump CABG at our institution from April 2011 to November 2017 were retrospectively reviewed. The primary outcome was in-hospital mortality. Secondary outcomes were any major adverse cardiac or cerebrovascular event (MACCE). Risk factors for in-hospital mortality and prognostic factors for MACCE were identified and analyzed by risk regression.

Results: The number of anastomoses was 3.4 ± 0.9. Off-pump CABG with multiple arterial grafts was performed in 290 cases (38.7%). The postoperative follow-up rate was 100%, and median follow-up time was 25.7 (14.5-42.8) months. In-hospital mortality was 1.5%. Thirteen patients (1.7%) underwent on-pump conversion and 8 (1.1%) suffered from postoperative stroke. The rates of survival and freedom from MACCE 3 years after the operation were 92.5%, and 90.7%, respectively. The risk factors for in-hospital mortality included on-pump conversion (RR 55.38, 95% CI= 6.30-487.15, $p<0.001$) and postoperative new dialysis dependence (RR 109.51, 95% CI= 13.65-878.17, $p< 0.001$).

Conclusion: Off-pump CABG as a routine practice provided favorable results in the early and midterm period. Frequent use of off-pump CABG may enable surgical teams to obtain the considerable experience and surgical skill that are required to routinely perform this challenging procedure.

(FP 10)

Effects of High-intensity statin on cardiovascular events in patient with acute ST-Elevation Myocardium Infarction: A propensity score matched analysis.

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Background: Patients with ST-Elevation myocardial infarction (STEMI) are high risk of further cardiovascular events. The present guidelines recommend the high-intensity statin for these patients; however, this is not commonly prescribed in Thai population. Furthermore, the benefit of high-intensity statin was unknown in Thai population.

Objective: To compare the effectiveness between moderate-intensity and high-intensity statin in Thai patients with STEMI.

Methods: This is a retrospective-cohort study of Thai patients with STEMI who were undergone primary PCI at the tertiary care academic hospital between January 2005 and July 2015. The primary outcome was 1-year incidence of composite of death, myocardium infarction, stroke and unstable angina requiring hospitalization. The propensity score matching was used to minimize confounding effects. Survival analysis was used for statistical analyses.

Results: Of 983 screened patients, 686 patients were enrolled. Of these, 563 patients (82.1%) and 123 patients (17.9%) received moderate- intensity and high-intensity statin, respectively. Before propensity score matching, primary composite endpoints occurred 89 patients in moderate-intensity and 13 patients in high-intensity statin (Hazard ratio, 1.60; 95% CI 0.90-2.87; P=0.112). After matching, 242 patients (121 each for moderate- and high-intensity) were include in analysis. High-intensity statin had significantly lower risk (adjusted Hazard ratio, 2.01; 95% CI 1.02-3.95; P= 0.043).

Conclusion: In this single center experiences, minority of patients who underwent PCI received high-intensity statin but associated with reduction in composite cardiovascular events compared to those with moderate-intensity. This is the first study to show the relationship in Thai population. Further prospective study to confirm the results is needed.

(FP 11)

Prevalence of Microvascular Dysfunction Detected by Adenosine Stress Cardiac Magnetic Resonance in Patients who Presented with Angina and Non-significant Coronary Artery Disease in Phramongkutklao Hospital

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Background: Among patients who presented with angina chest pain and normal coronary angiography or non-significant coronary artery disease, microvascular dysfunction was proposed as one of the etiology of this abnormality and may harbor worsening clinical outcome. Adenosine stress cardiac magnetic resonance imaging is an accurate non-invasive modality to detect microvascular dysfunction. However this condition is usually left unaware and the data in Asian population is very limited.

Objective: To evaluate the prevalence of microvascular dysfunction.

Methods: Patients who had angina chest pain, either stable or acute chest pain and non-significant coronary artery disease from coronary angiography were enrolled. Standard protocol of adenosine stress CMR was performed and prevalence of microvascular dysfunction was evaluated as primary objective.

Results: The total of 51 Patients were enrolled in this study. Mean age was 60 years and 31(55%) were male. Stable chest pain subgroup and acute chest pain subgroup were 31(61%) and 20(39%), respectively. Prevalence of microvascular dysfunction was 21(41%). For subgroup analysis, the prevalence of microvascular dysfunction among stable chest pain group was 10(32%) and 11(52%) in acute chest pain group. Factor that may be associated with coronary microvascular dysfunction was smoking (OR 1.84 [1.10-3.78] P=0.01).

Conclusion: The prevalence of coronary microvascular dysfunction among patients who presented with chest pain and non-significant coronary artery disease was 41.18%.

Keyword: Microvascular dysfunction, adenosine stress cardiac magnetic resonance, non-significant coronary artery disease.

Free Paper

Abstract presentation III
23rd March 2019
Time: 10.30-11.30
Venue: @ Black

Moderators: *Pyatat Tatsanavivat, MD*
Vichai Senthong, MD

(FP 12)
10.30-10.40 **Development and Validation of a Bleeding Risk Prediction Score for Patients with Valvular Atrial Fibrillation or Mechanical Heart Valves Receiving Warfarin Therapy**
Sararat Phetroong,
Pharmacy Department, Buriram Hospital, Buriram, Thailand.

(FP 13)
10.40-10.50 **Safety and tolerability of renin-angiotensin-aldosterone system inhibitors in chronic heart failure patients.**
Pattamawan Kosuma,
Pharmacy practice, Faculty of pharmaceutical science, Naresuan university, Thailand

(FP 14)
10.50-11.00 **Renoprotective effect of high versus moderate intensity statin therapy in Ischemic heart disease pateints with reduced eGFR.**
Pattamawan Kosuma,
Pharmacy practice, Faculty of pharmaceutical science, Naresuan university, Thailand

(FP 15)
11.00-11.10 **Relationship of Anemia and Clinical Outcome in Thai Patients with Heart Failure with Preserved versus Reduced Ejection Fraction**
Kittayaporn Chairat,
Pharmacy Department, Buriram Hospital, Buriram, Thailand.

(FP 16)
11.10-11.20 **Transcatheter Aortic Valce replacement Experience at Ramathibodi Hospital: An ongoing process**
Mann Chandavimol, MD
Cardiology Unit, Department of Internal medicine, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

(FP 17)
11.20-11.30 **Correlation of left ventricular diastolic dysfunction and peripheral arterial disease in patients with coronary artery disease**
Naruepon Yamsai, MD,
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(FP 12)

Development and Validation of a Bleeding Risk Prediction Score for Patients with Valvular Atrial Fibrillation or Mechanical Heart Valves Receiving Warfarin Therapy

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Objective: This study aimed to develop and validate a new bleeding risk score to predict warfarin-associated major bleeding (WAMB) for patients with valvular atrial fibrillation (VAF) or mechanical heart valves (MHV).

Method: A multi-center, retrospective cohort study was conducted at 3 tertiary hospitals. Adult patients with VAF or MHV receiving warfarin for > 3 months during 2011-2015 (derivation cohort from Maharat Nakhon Ratchasima Hospital, validation cohort from Buriram Hospital and Chonburi Hospital) were identified. Data collection and case validation were performed electronically and manual chart reviews were conducted when necessary. Risk score was developed using multivariate logistic regression. Predictive discrimination was assessed using area under the receiver operating characteristic (AUROC) curve.

Results: For the derivation cohort, there were 216 patients with WAMB, and 1,365 patients without WAMB. Using this cohort, a new bleeding risk score termed HEARTS-60+3 (Hypertension/History of bleeding; External factors i.e., alcohol/drugs [aspirin or NSAIDs]; Anemia/hypoalbuminemia; Renal/hepatic insufficiency; Time in therapeutic range of <60%; Stroke; aged>60 years; Target INR 3.0 [2.5-3.5]) was developed and showed a good predictive performance (C-statistic 0.868). When tested in 811 patients of the validation cohort, the HEARTS-60+3 score showed a good predictive performance (C-statistic 0.857), and was significantly superior to the HAS-BLED score (C-statistic 0.750), with the difference between the AUROC curves of 0.107 ($p < 0.001$).

Conclusion: The HEARTS-60+3 score shows a strong potential as a tool to predict WAMB risks in patients with VAF and MHV. This score may be useful in developing countries with high burden of VAF and MHV.

Keywords: warfarin, major bleeding, risk score, valvular atrial fibrillation, mechanical heart valve

(FP 13)

Safety and tolerability of renin-angiotensin-aldosterone system inhibitors in chronic heart failure patients.

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Background: With a view to reduce ejection fraction among patients who have heart failure Renin-angiotensin-aldosterone system inhibitors (RAAS inhibitors) should be provided. The appropriate medications titrated to the target dose can reduce the probability of hospitalization and mortality. Some of the major adverse effects, including hyperkalemia, is acute kidney injury (ARF) resulting from discontinuation of RASS inhibitors.

Method: We examined the incidences of hyperkalemia and acute kidney injury in chronic heart failure patients who received RAAS inhibitors after first-diagnosed Second, the maximum tolerate dose of RAAS inhibitors within a year after initiate.

Result: A total of 955 patients were categorized into six groups; ACEIs (47.54%), ARBs (31.94%), aldosterone antagonists (7.64%), ACEIs plus aldosterone antagonists (6.07%), ARBs plus aldosterone antagonists (8.38%) and ACEIs plus ARBs (0.31%). Furthermore, the incidences of hyperkalemia and renal failure were observed in 19 cases (1.99%) and 20 cases (2.09%), respectively. Doses of the single RAAS inhibitor without any adverse effect during the follow-up were reported as following; the mean of enalapril, losartan and spironolactone were 16.26 ± 12.24 mg, 66.05 ± 26.55 mg and 32.57 ± 12.17 mg, respectively.

Conclusion: Chronic heart failure patients treated with RAAS inhibitors showed statistically lower incidences of hyperkalemia or acute renal failure that cause of drug discontinuation about 3.45 percent within a year. The tolerated dose of enalapril and spironolactone is not different to targeted therapeutic dose and the dose of losartan is lower than the targeted therapeutic dose.

(FP 14)

Renoprotective effect of high versus moderate intensity statin therapy in Ischemic heart disease pateints with reduced eGFR.

Pattamawan Kosuma1, Kerataya Moonmuang2, Jiraporn Anantanasan2, Duangkamon Poolpun3
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25th year pharmacy student, Faculty of pharmaceutical science, Naresuan university
3 Pharmacy department, Buddhachinaraj Hospital

Background: Statins are used to lower serum cholesterol and reduce mortality rates among all ischemic heart disease patients. Statins also have a renoprotective effect on chronic renal disease stage 3-5 patients who are not receiving dialysis.

Objective: This study aims to assess the renoprotective effects of high-intensity statin compared to moderate intensity statin by observing the decreased eGFR and LDL levels in ischemic heart disease patients.

Method: This is a retrospective cohort study. Data is collected from Ischemic heart disease patients with eGFR 30-89 ml/min/1.733m2. Multivariable linear regression method was used to analyze the effects of reduced eGFR and LDL levels within three years after discharge between high and moderate intensity statin groups.

Results: A total of 158 patients were analyzed, of which 92 patients were prescribed with high-intensity and remaining 66 patients with moderate intensity statin. The eGFR and LDL levels in patients who were prescribed with moderate intensity statin reduced to 2.42 ml/min/1.733m2 and 33.53 mg/dl, respectively. In comparison, eGFR and LDL levels among patients who were prescribed with a high-intensity statin decreased to 1.93 ml/min/1.733 m2 and 45.74 mg/dl, respectively. After adjusting for potential confounding factors, there is no significant difference in reduced estimate GFR and LDL levels between patients from the two groups (eGFR; p-value=0.702, 95%CI -5.20 to 3.21, LDL; p-value=0.136, 95%CI -2.33 to 17.05).

Conclusion: The renoprotective effects among ischemic heart disease patients with eGFR 30-89 ml/min/1.733m2 was not much different between high and moderate intensity statin. However, the LDL levels were observed to be lower among patients receiving high intensity statin.

(FP 15)

Relationship of Anemia and Clinical Outcome in Thai Patients with Heart Failure with Preserved versus Reduced Ejection Fraction

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1 Pharmacy Department, Buriram Hospital, Buriram, Thailand.
2 Clinical Pharmacy Division, Department of Pharmacy, Faculty of Pharmacy, Mahidol University, Bangkok, Thailand.

Objective: This study aimed to evaluate relationship of anemia and clinical outcome in Thai HF patients with preserved (HFpEF) and reduced (HFrEF) ejection fraction.

Method: A retrospective cohort study was conducted among HF patients admitted to the Buriram Hospital during July 2010 - June 2015. Demographic variables, medical history, medication use, relevant laboratory values and ejection fraction along with clinical outcome during 1 year follow-up were extracted using a standard case record form. Descriptive data were analyzed by student's t-test, Pearson's chi square test as appropriate. Cox regression models were used to assess the relationship of anemia and survival.

Results: A total of 424 patients, including 297 HFpEF (70%) and 127 HFrEF (30%), were included in the data analysis. Mean age was 63 years and 56% of patients were female. The overall prevalence of anemia was 63 %, where 69% and 51% of HFpEF and HErEF patients were found to have anemia. Anemic patients were significantly older and with lower glomerular filtration rate than non-anemic patients regardless of HF types. Overall, 1-year all-cause mortality was significantly higher in HF patients with anemia than those without anemia (19.7% vs 12.26%, p=0.049). After adjustment for relevant clinical factors, anemia was associated with an increase in the risk of death (HR 2.56; 95%CI: 1.2-5.6) in HFpEF but not in HFrEF (HR 0.8; 95%CI: 0.32-2.0). Among anemic patients, only 50.5% of patients received anemia treatment.

Conclusion: Anemia is highly prevalent in HF patients and may lead to an increased risk of death, particularly among HFpEF.

Keywords: anemia, heart failure, mortality

(FP 17)

Correlation of left ventricular diastolic dysfunction and peripheral arterial disease in patients with coronary artery disease

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Cardiovascular Division, Department of Internal Medicine ,Phramongkutklao Hospital, Bangkok, Thailand

Background: The coexistence of peripheral arterial disease (PAD) in patients with coronary artery disease (CAD) has been associated with worse clinical outcomes. Abnormal echocardiographic findings which was commonly used to evaluate the presence of CAD was left ventricular (LV) dysfunction. However, correlation of diastolic dysfunction and PAD in this group is still unclear.

Objectives: To determine which abnormal echocardiographic findings (especially diastolic dysfunction) will be correlated with PAD in CAD patients.

Methods: All patients with CAD were evaluated with transthoracic echocardiogram (TTE) and ankle-brachial index (ABI). The patients were divided according to the ABI. PAD group for ABI < 0.9 and non-PAD group for ABI > 0.9. Cardio-ankle vascular index (CAVI) was also evaluated. CAVI > 9 and ABI > 0.9 were defined as atherosclerosis.

Results: Of 159 CAD patients were enrolled in the study, 106 patients had LVEF > 50%. There was significantly more LV diastolic dysfunction in PAD group (OR 3.92 [1.45-10.63], P=0.007). There was no difference between the composites of important echocardiographic findings (LVEF < 40%, TAPSE < 1.7 cm, moderate to severe MS, moderate to severe AS and severe valvular regurgitation). Interestingly, we found that the LA volume index > 34 ml/m2 was an independent predictor for PAD (OR 2.63 [1.23-5.62], P=0.013). The E' (lateral) < 10 cm/sec had the best negative predictive value (NPV) for PAD of 88.9%. Age > 60 years old has a strong correlation with CAVI > 9 in non-PAD group. (OR 4.1 [1.64-10.29], P=0.03).

Conclusion: In patients with CAD, there is significant correlation between LV diastolic dysfunction and PAD. LA volume index > 34 ml/m2 is a strongly predicted parameter for PAD. The E' (lateral) < 10 cm/sec yields the best NPV for PAD. Moreover, age > 60 years old predicted CAVI > 9 in non-PAD patients.

Keyword: Peripheral arterial disease (PAD), LV diastolic dysfunction, Coronary artery disease (CAD), Abnormal echocardiographic finding, Cardio-ankle vascular index (CAVI)

Night time Cardiology Got Talent

21st March 2019
Venue: @ Chandelier 2
Time: 19:00-20.30

Judges & Commentators:
Khanchit Likittanasombat,MD
Smonporn Boonyaratavej Songmuang,MD
Wiwun Tungsubutra,MD
Nakarin Sansanayudh,MD

19.00-19.10 **Case 1: Something Should Not Be There!**
Present by *Thinnakrit Sasiprapha, MD*
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University

19.10-19.20 **Case 2: Focusing only on the heart is not absolutely enough**
Present by *Sarunpong Pibalyart, MD*
Cardiovascular Division, Department of Internal Medicine, Prapokklao Hospital, Chanthaburi

19.20-19.30 **Case 3: How to save two lives?**
Present by *Nithi Summashipvitsavakul, MD*
Cardiovascular Unit, Department of Medicine, King Chulalongkorn Memorial Hospital

19.30-19.40 **Case 4: The second chance?**
Present by *Piyapat Chunharas, MD*
Cardiovascular Unit, Department of Medicine, Maharat Nakhon Ratchasima hospital, Nakhon Ratchasima

19.40-19.50 **Case 5: Better three hours too soon than a minutes too late**
Present by *Sasinee Srimachai, MD*
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University

19.50-20.00 **Case 6: Vanishing of bullet from the heart**
Present by *Weerapat Kositanurit, MD*
Cardiovascular Unit, Department of Medicine, King Chulalongkorn Memorial Hospital

20.00-20.10 **Case 7: A man with recurrent syncope**
Present by *Kultida Lertthanaphol, MD*
Nakornping Hospital, ChiangMai

20.10-20.20 **Case 8:**
Present by *Jindaporn Chaiyakhot, MD*
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University

JEOPARDY2019

23rd March 2019
Venue: @ Ballroom (room 2)
Time: 16:00-17:30

Judges: *Teerapat Yingchoncharoen, MD*
Pairoj Chattranukulchai, MD
Wanwarang Wongcharoen, MD

1. Siriraj Hospital
2. King Chulalongkorn Memorial Hospital
3. Pramongkutklao Hospital
4. Thammasart University
5. Chiang Mai University
6. Ramathibodi Hospital
7. Police General Hospital and Vajira Hospital

Research by Fellow

Group 1

Poster Presentation
Friday 21st March, 2019
Time: 18.00-19.00
Venue: @ Black

Judges: *Pyatat Tatsanavivat, MD*
Rungsrit Kanjanavanich, MD

RF01 **Prevalence of diastolic heart failure when using Mitral E/e' during treadmill exercise echocardiogram**
Settapong Phetkua, MD
Cardiovascular Division, Department of Internal Medicine, Phramongkutklao Hospital, Bangkok, Thailand

RF02 **Change of INR level after smoking cessation in warfarin-used patients**
Apitch Apiwattanaporn, MD
Cardiology Division, Department of Internal Medicine, Police General Hospital

RF03 **Effect of streptokinase on treatment of ST-segment elevation myocardial infarction at Queen Sirikit Heart Center of the Northeast**
Atchara Kruengpatee, MD
Department of Cardiology, Faculty of Medicine, KhonKean University, Khon Kean,Thailand

RF04 **Clinical outcomes of patients with heart failure treated with different medical regimen regarding to Khon Kaen Medical Classifications (KKMC)**
Kesaree Singhayotaka, MD
Department of Cardiology, Faculty of Medicine, KhonKean University, KhonKean,Thailand

RF05 **Prospective external validation of PRECISE-DAPT score for prediction of bleeding complication after coronary stent implantation in Thai population (Preliminary study)**
Archons Jaspattananon, MD
Division of Cardiology, Department of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

RF06 **Prevalence of different doseof new oral anticoagulants in Thai patients: A retrospective descriptive study.**
Pitchayathinan Jiratchayachote, MD
Division of Cardiovascular Medicine, Department of Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

RF07 **One year outcomes of NSTEMI patients according to types of management at Central Chest Institute of Thailand**
Pirathut Rojanapanthu, MD
Cardiology fellow, Division of cardiology, Central Chest Institute of Thailand, Nonthaburi

RF08 **Left ventricular global longitudinal stains of patients with type 2 diabetes withoutprior history of cardiac disease**
Tanit Layangkool, MD
Cardiology Unit, Department of Medicine, Faculty of Medicine, Thammasat University (Rangsit Campus), Pathumtani, Thailand

RF09 **Correlation of left ventricular diastolic dysfunction and peripheral arterial disease in patients with coronary artery disease**
Naruepon Yamsai, MD
Cardiovascular Division, Department of Internal Medicine, Phramongkutklao Hospital, Bangkok, Thailand

RF10 **Tenting area as the predictor of secondary mitral regurgitation in patients with impaired systolic function: Insight from cardiac magnetic resonance imaging**
Doungjai Sangpan, MD
Division of Cardiology, Department of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

RF11 **Thiamine level and health outcome in chronic ambulatory heart failure patients.**
Sasinee Srimachai, MD
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

RF12 **Prevalence, clinical characteristics and associated factors of thyrotoxic cardiomyopathy in hospitalized patients with heart failure**
Weerapat Kositanurit, MD
Division of Cardiovascular Medicine, Department of Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

RF13 **Cardiovascular Outcomes in Patients with Non-ST-Elevation Acute Coronary Syndrome Undergoing Noninvasive Stress Test**
Parita Bunditboondee, MD
Division of Cardiology, Department of Internal Medicine, Faculty of Medicine, Chiang Mai University, Chiang Mai,Thailand

RF 14 **Comparison of efficacy and safety between standard and accelerated half dose streptokinase in acute ST-segment elevation myocardial infarction**
Wate Wijarnpreecha, MD
Division of Cardiology, Department of Internal Medicine, Faculty of Medicine, Chiang Mai University, Chiang Mai,Thailand

(RF 01)

Prevalence of diastolic heart failure when using Mitral E/e' during treadmill exercise echocardiogram

Settapong Phetkua, MD, Chumpol Piamsomboon, MD Sopon Sanguanwong, MD, Charnnarong Naksawadi, MD, Preecha Uerojanaungkul,MD Nakarin Sansanayudh, MD, Verapon Pinphanichakarn, MD, Thoranis Chantrarat, MD, Hutsaya Prasitdumrong, MD, Tanyarat Aramsareewong, MD, Waraporn Tiyanon, MD
Cardiovascular Division, Department of Internal Medicine, Phramongkutklao Hospital, Bangkok, Thailand

Introduction: Heart failure is an important public health problem in Thailand and worldwide. It results from cardiac structural or functional abnormalities that cause a mismatch in the supply and demand of oxygen, resulting in myriad of abnormal signs and symptoms. Heart failure can be categorized into 2 groups, HFrEF and diastolic heart failure {HFmrEF,HFpEF}. From recent guidelines, we can diagnose diastolic heart failure when patients have the following of typical signs and symptoms, NT-proBNP more than 125pg/ml, LVEF more than 40 and other abnormal echocardiographic findings, which included Mitral E/e' during resting or exercise.

Objective: To study the prevalence of diastolic heart failure, using Mitral E/e' during treadmill exercise echocardiogram and during resting echocardiogram.

Method: We reviewed the data of 500 patients who had signs or symptoms of heart failure, and LVEF more than 40 during November 2016 to November 2018. We excluded patients who had NT-proBNP of less than 125pg/ml and those who met other exclusion criteria. A total of 287 patients were studied, resting and exercise treadmill echocardiogram were performed to diagnose diastolic heart failure.

Results: A total of 277 [96.52%] patients were diagnosed diastolic heart failure. The mean age was 75-year-olds and 52.74% of patients were female. The mean of NT-proBNP was 1277.55pg/ml and the mean of LVEF was 63.45%. Two hundred and sixty-five patients were diagnosed with diastolic heart failure by resting echocardiogram which was accounted for 92.3% of the total population. After exercise echocardiogram, the additional 12[4.18%] patients were diagnosed with diastolic heart failure. From this study, mitral E/e' was the most sensitive parameter for diagnosis of diastolic heart failure with 73.58% sensitivity. The prevalence of diastolic heart failure was increased in the subgroup of the female sex, age of more than 70 years old and BMI more than 25 kg/m2.

Conclusion: The treadmill exercise echocardiogram, by measuring mitral E/e', is a useful tool to increase the diagnosis of diastolic heart failure by 4.18% on top of standard resting echocardiogram.

Keywords: Diastolic heart failure, Treadmill exercise echocardiogram, Mitral E/e'

(RF 02)

Change of INR level after smoking cessation in warfarin-used patients

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Background: Anticoagulants are the mainstay of treatment for venous thromboembolism (VTE). Moreover, it can be used for prevention of post-surgical prostatic valve thrombosis, ischemic stroke in the patients who have atrial fibrillation (AF) and massive pulmonary embolism (PE) in the patients with VTE, etc. Thus, anticoagulants are known for life-saving benefits in decreasing morbidity and mortality among these patients.

To date, warfarin remains first-line effective therapy for the prevention of thromboembolism when administrated during adequate therapeutic range (TTR) above 65%. However, difficulty in controlling TTR occurs according to several factors such as narrowing therapeutic range of warfarin, genetic susceptibility, and food-drug interaction.

Smoking has been reported to increase international normalized ratio (INR) in some patients, therefore, warfarin dosage should be adjusted. However, there is no established evidence to support this theory.

Methods: We collected a prospective cohort study at Police General Hospital, with recruitment of data from 1,470 patients who had been currently taking warfarin with known history of habitual smoking. The patients were interviewed about their current smoking habits. Fifteen patients were selected for further study process. Written informed consent was completed by all participants once they had agreed to enroll the study.
Demographic data including baseline INR during smoking, warfarin dosage, underlying disease, indication for anticoagulant and current medication were recorded. Then, the patients were asked to stop smoking and serial blood test for sequential INR levels were performed at 2, 4, and 8 weeks after smoking cessation. Primary outcome aims to evaluate the effect of smoking cessation on INR level in warfarin-used patients.

Results: Indication for warfarin among the participants are the followings; AF (60%), prosthetic valve (13.4%), left ventricular (LV) thrombus (6.7%), coronary aneurysm with thrombosis (6.7%), deep vein thrombosis (DVT) (6.7%). Mean baseline INR before stop smoking was 1.85 ± 0.55. After smoking cessation for 2 weeks, mean baseline INR significantly increased to 2.07 ± 0.54 (P value = 0.044). The overall increasing INR level is 12% from baseline but there was no correlation between average number of cigarettes per day and difference in INR level after stop smoking. One participant required warfarin dose reduction after stop smoking.

Conclusion: Smoking cessation demonstrates statistically significant correlation with elevated level of INR. However, correlation between amount of daily cigarette use before stop smoking with difference of INR level after smoking is not identified. There were several limitations in this study according to small study population, food interaction, compliance of smoking cessation during follow up, and short follow-up duration.

(RF 03)

Effect of streptokinase on treatment of ST-segment elevation myocardial infarction at Queen Sirikit Heart Center of the Northeast

*Atchara Kruengpatee, MD.*1, Chaiyasith Wongvipaporn, MD.1
1.Cardiology unit,Queen Sirikit Heart Center of the Northeast,faculty of medicine, Khon Kaen University, Khon Kaen, Thailand

Background: Streptokinase (SK) is currently used broadly for initial revascularization of ST-segment elevation myocardial infarction (STEMI) in our region. However, some patients failed from such initial treatment. We therefore aimed to study the effects of SK in our service area.

Methods: Patients with STEMI and initially received SK before referring to Queen Sirikit Heart Center of the Northeast, Khon Kaen, between January 2017 and August 2018 were consecutively recruited. All patients underwent coronary angiography (CAG). Patients whom CAG did not perform or was performed >24 hours after SK administration were excluded. Efficacy of SK was determined by 1) fibrinolytic effect (coagulogram), and 2) revascularized effect (TIMI flow II-III), which correlation between both effects was studied. Safety of SK was determined as bleeding.

Results: Among 189 eligible patients, mean age (standard deviation; SD) was 62.8 (10.9) years, 142 (75%) patients were male, 95 (51%) and 88 (47%) patients presented with STEMI anterior wall and inferior wall, respectively. 14 (7%) patients had cardiogenic shock. Resolution of ST-segment ≥50% was achieved in 123 (65%) patients. Median (interquartile range; IQR) of time from onset symptoms to SK was 2.6 (1.5-4.4) hours. Median (IQR) of partial thromboplastin time (PTT) among subgroup of SK-to-PTT time of 0-3, >3-6, and >6 hours were 51.4 (46.3-56.0), 40.9 (37.2-45.5), and 36.6 (33.1-40.1) seconds, respectively. Baseline TIMI flow grade II-III of infarct-related artery was achieved in 105 (55.6%) patients. Correlation between fibrinolytic and revascularized effect of SK was not demonstrated. In-hospital mortality occurred in 10 (5.3%) patients, in which 9 patients had baseline TIMI flow 0-I and 1 patient had baseline TIMI flow II-III ($p = 0.006$), and intracranial hemorrhage occurred in 1 (0.5%) patient.

Conclusions: In patient with STEMI, SK appropriately exerted fibrinolytic effect. However, proper revascularized effect was unfavorable and correlation between fibrinolytic activity and revascularized effect was absence.

Keywords: ST-segment elevation myocardial infarction (STEMI), streptokinase, fibrinolysis, TIMI flow, coagulogram

(RF 04)

Clinical outcomes of patients with heart failure treated with different medical regimen regarding to Khon Kaen Medical Classifications (KKMC)

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Background: Patients with heart failure have high mortality and re-hospitalization rate. Guideline directed medical therapy (GDMT) including 3 major class of medication; renin-angiotensin inhibitor, beta-blocker (BB) and mineralocorticoid antagonist (MRA) have significantly improved clinical outcomes in patients with heart failure. However, a significant proportion of patients with heart failure do not achieve the target dose of GDMT. The aim of this study is therefore to evaluate the clinical outcomes of patients with heart failure treated with different regimens of GDMT.

Materials and Methods: Between January 2016 and September 2018, all patients with chronic heart failure follow- up in heart failure clinic at Queen Sirikit Heart Center were retrospectively included in this study. Baseline characteristics, laboratory, echocardiographic data, 6 minute-walk and EQ5D-5L were reviewed and recorded. The patients were divided into 3 group; group I, patients taking only 1 class of GDMT; group II: patients taking 2 classes of GDMT; and group III patients taking all 3 classes of GDMT.

Results: Of the 41 patients included in the study, 16 patients (39%) died during 1 year follow up period. The mean age of patients was 59 years; 20 patients (49%) were in NYHA class III, mean LVEF was 26%. Ischemic cardiomyopathy was identified in 22 patients (54%) of the patients and 4 patients (9.7%) were treated with devised therapy. Hypotension bradycardia and renal failure were the major limitations for up-titration of GDMT in patients in group I and II. The all cause of mortality trends to be lower in group III compared to group II and group I but not statistically significant. The patients in group III, however, have significantly higher 6-MT compared to those in group II and group I.

Conclusions: Patients with heart failure patients who achieve target dose of GDMT trend to have a favorable outcomes compared to those who do not tolerate the target dose of GDMT.

Key word: heart failure, guideline directed medical therapy, all-cause mortality

(RF 05)

Prospective external validation of PRECISE-DAPT score for prediction of bleeding complication after coronary stent implantation in Thai population (Preliminary study)

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Aim: Optimal duration of dual antiplatelet therapy depends on thrombosis and bleeding risk in individual patient. PRECISE-DAPT score is recommended for adjusting of optimal dual antiplatelet therapy (DAPT) duration. We aim to access incidence of out of hospital bleeding and to validate of PRECISE-DAPT score for prediction of bleeding complication after coronary stent implantation in Thai population in prospective manner.

Method: We prospectively enrolled 136 patients who were undergoing coronary stent implantation received DAPT at Faculty of Medicine Siriraj hospital during June 2018 through January 2019. One-year bleeding and thrombosis events were accessed. PRECISE-DAPT score were validated to predict bleeding and thrombosis events.

Results: The mean age was 62.9±11.9 years and 80.1% were male. Acute coronary syndrome was 63.2%; STEMI was 44.9%, NSTEMI/UA were 16.2% and SCAD were 36.8%. Prevalence of high precise DAPT score (Score ≥ 25) was 65 patients (47.8% and 95% CI: 39.2% - 56.5%). Median follow-up were 27 days (7-222 days), Bleeding events were occurred in two cases (1.5%); One case is major lower GI bleeding with high PRECISE-DAPT score and another case is minor lower GI bleeding with low PRECISE-DAPT score. 3P-MACE (CV death, MI, stroke) were 4.6% in high PRECISE-DAPT score populations and 0% in low PRECISE-DAPT score populations (P-value= 0.107). Composites of all cause death, MI, stroke, HF hospitalization and major bleeding were 9.2% in high PRECISE-DAPT score populations and 1.4% in low PRECISE-DAPT score populations (P-value 0.054).

Conclusion: In Thai patients underwent coronary stent implantation received DAPT, high PRECISE-DAPT score has a trend to increase composites of all cause death, MI, stroke, HF hospitalization and major bleeding compare with low PRECISE-DAPT score. However, this is a preliminary data with small sample size and short follow-up period, magnitude of clinical significance are underestimated.

Keywords: PRECISE-DAPT score, Bleeding, Dual antiplatelet therapy, coronary stent implantation

(RF 06)

Prevalence of different dose of new oral anticoagulants in Thai patients: A retrospective descriptive study.

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Background: New oral anticoagulant (NOACs) is indicated in patients with deep vein thrombosis, pulmonary embolism, atrial fibrillation and DVT prophylaxis in orthopedics surgery. According to retrospective medical record over 5 years, we found that there were many patients receive non-standard dose of NOACs. The reasons are possibly bleeding risk, old age and multiple comorbidity, etc.

Objectives: The aim of this study is to investigate NOACs non-standard dosage patterns receiving by patients and factors which determine those drug administrations.

Methods: This study is single center, retrospective descriptive study. All medical database is collected from patients who were receiving NOACs (dabigatran, rivaroxaban, apixaban) due to DVT prophylaxis in orthopedics surgery between January 1st, 2017 to December 31th, 2017. Prevalence of non-standard dosage was presented by percentage. Multiple regression analysis was performed to investigate factors affecting to adjustment of NOACs non-standard dosage.

Results: During January 1st, 2017 to December 31th, 2017. There were 267 patients receiving NOACs due to DVT prophylaxis in orthopedics surgery. Only 209 patients of them were indicated in NOACs treatment (78%). There was 4 percent which were underdose of treatment and 2 percent were too short duration group whereas 70 percent of them were both short duration and underdose of treatment. No patient was in overdose group. Only 3% of patients were categorized in optimal dose group of NOACs. There was no affecting factor correlate to these therapeutic dose adjustments. Patients would receive NOACs 24-72 hours after surgery in average. No patient received NOACs prophylaxis and then had symptomatic DVT or PE. 6 patients were stopped taking NOACs due to minor bleeding per surgical wound. There was not any patient categorized in major bleeding group. According to our study, there was no difference in complication after surgery among every type of NOAC administration.

(RF 07)

One year outcomes of NSTEMI patients according to types of management at Central Chest Institute of Thailand

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Cardiovascular and Intervention Department, Central Chest Institute of Thailand

Background: NSTEMI is the most common type of acute coronary syndrome in clinical practice. Current ESC guideline 2015 for management of NSTEMI has recommended that invasive strategy in intermediate, high risk and very high risk patients improve major adverse cardiac outcomes. However, Thai ACS registry showed 1-year mortality rate of NSTEMI of 25%.

Objective: To compare one year outcomes between invasive and conservative treatment in NSTEMI patients.

Method: We retrospective studied consecutive patients who admitted for treating NSTEMI at Central Chest Institute between 1st January 2015 and 31st December 2015. The patients were categorized into conservative treatment group and invasive treatment group. Both groups were compared in terms of mortality rate, CV mortality, rehospitalization and unplanned coronary angiogram. Factors that influencing mortality rate in each group was analyzed by using univariate, multivariate and survival analysis.

Results: There were two hundred and forty patients with 68(28%) patients in conservative group and 172(72%) patients in invasive group. Mean age of the patients was 67±12 years old. Majority of them had dyslipidemia (n=212, 88.3%) and high risk patients (n=156, 65%) according to 2015 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation. Mean GRACE score and LVEF were 145.4±40.3 and 52.4±16.5% respectively. Baseline characteristic showed that the patients in conservative group had older age 73.1±12.3($p<0.001$), more CKD patients(n=33,48.5%,$p<0.001$), more prior CABG patients(n=14,20.6%,$p=0.001$), lower LVEF (45.06±16.6%,$p<0.001$), more patients in very high risk group(n=43,63.2%,$p<0.001$) and higher Grace score(168±43.19,$p<0.001$). Overall 1-year mortality rate was 54.4% in conservative group whereas 5.2% in invasive group. Multivariate analysis revealed that GRACE score (OR1.04, CI95; 1.02-1.07, $p<0.001$) and patients who received coronary angiography or coronary intervention (OR 0.09, CI95; 0.01-0.75, $p<0.001$) had affected to 1-year mortality. The study also showed that the patients in conservative group had higher rate of CV mortality (48.5%), rehospitalization(67.6%) and unplanned coronary angiogram(11.9%).

Conclusion: Conservative treatment in NSTEMI patients had higher mortality rate as compared to invasive treatment. Factors that influence mortality rate were GRACE score and coronary angiography or intervention.

Keywords: NSTEMI, mortality, invasive management, conservative management

(RF 08)

left ventricular global longitudinal stains of patients with type 2 diabetes without prior history of cardiac disease

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Background: Subclinical left ventricular systolic dysfunction may be present in patient with diabetes. It can be determined by using a novel deformation parameter i.e. systolic global longitudinal strain(GLSs) derived from speckle-tracking 2D-echocardiography. Our study aimed to assess LV global longitudinal strain(GLSs) in Thai patients with type 2 diabetes in Thammasat hospital who had no clinical cardiac disease and preserved left ventricular ejection fraction(LVEF).

Methods: Patients with diabetes and no recorded history of cardiac disease from a general medicine outpatient clinic were screened. They underwent thorough history taking, rigorous physical examination and initial investigations including electrocardiogram and chest film. The patients who had no clinical cardiac disease were included to this study after giving informed consent. Comprehensive transthoracic echocardiogram (TTE) was then performed in all subjects. All clinical and echocardiographic data were then compared to age- and sex-matched healthy normal subjects

Results: Thirty-eight diabetic patients were included. Patients and control subjects aged 62±10 years (both groups, p= 0.57) Female was predominant(61%). Duration of diabetes were 7±4 years with HbA1C level of 7.7±2.0 %. Hypertension is highly prevalent (84%) with mean SBP/DBP of 137 ±16 / 75 ±11 mmHg. LVEF was 65± 5%. LVH and LA enlargement(LAVI> 34 ml/m2) were present in 42% and 39% of patients, respectively. There was no between-group difference in LVEF, and indexed LV volumes. GLSs were significantly lower in patients than age- and sex-matched control subjects(-18.7±1.9 vs. -19.6±1.3, p=0.022). Adjusted univariate regression analysis has demonstrated a trend of correlation between GLSs and presence of LVH in patient group(p=0.06).

Conclusions: Subclinical LV systolic dysfunction as determined by GLSs is present in patients with type 2 diabetes with preserved LVEF. Deformation parameter(GLSs) derived from speckle-tracking 2D-echocardiography is more robust in detecting this condition when comparing to conventional echocardiographic parameters.

(RF 09)

Correlation of left ventricular diastolic dysfunction and peripheral arterial disease in patients with coronary artery disease

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Background: The coexistence of peripheral arterial disease (PAD) in patients with coronary artery disease (CAD) has been associated with worse clinical outcomes. Abnormal echocardiographic findings which was commonly used to evaluate the presence of CAD was left ventricular (LV) dysfunction. However, correlation of diastolic dysfunction and PAD in this group is still unclear.

Objectives: To determine which abnormal echocardiographic findings (especially diastolic dysfunction) will be correlated with PAD in CAD patients.

Methods: All patients with CAD were evaluated with transthoracic echocardiogram (TTE) and ankle-brachial index (ABI). The patients were divided according to the ABI. PAD group for ABI < 0.9 and non-PAD group for ABI > 0.9. Cardio-ankle vascular index (CAVI) was also evaluated. CAVI > 9 and ABI > 0.9 were defined as atherosclerosis.

Results: Of 159 CAD patients were enrolled in the study, 106 patients had LVEF > 50%. There was significantly more LV diastolic dysfunction in PAD group (OR 3.92 [1.45-10.63], P=0.007). There was no difference between the composites of important echocardiographic findings (LVEF < 40%, TAPSE < 1.7 cm, moderate to severe MS, moderate to severe AS and severe valvular regurgitation). Interestingly, we found that the LA volume index > 34 ml/m2 was an independent predictor for PAD (OR 2.63 [1.23-5.62], P=0.013). The E' (lateral) < 10 cm/sec had the best negative predictive value (NPV) for PAD of 88.9%. Age > 60 years old has a strong correlation with CAVI > 9 in non-PAD group. (OR 4.1 [1.64-10.29], P=0.03).

Conclusion: In patients with CAD, there is significant correlation between LV diastolic dysfunction and PAD. LA volume index > 34 ml/m2 is a strongly predicted parameter for PAD. The E' (lateral) < 10 cm/sec yields the best NPV for PAD. Moreover, age > 60 years old predicted CAVI > 9 in non-PAD patients.

Keyword: Peripheral arterial disease (PAD), LV diastolic dysfunction, Coronary artery disease (CAD), Abnormal echocardiographic finding, Cardio-ankle vascular index (CAVI)

(RF 10)

Tenting area as the predictor of secondary mitral regurgitation in patients with impaired systolic function: Insight from cardiac magnetic resonance imaging

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Background: Secondary mitral regurgitation (MR) related with increase mortality rate and heart failure hospitalization. Knowledge regarding parameters which contributed to secondary mitral valve regurgitation is limited. Cardiac magnetic resonance (CMR) is non-invasive test with high accuracy in the evaluation of MR severity, left ventricular (LV) geometry and tissue characterization.

Materials and methods: A total of 221 patients with LV systolic dysfunction (LV ejection fraction; LVEF <40%) who underwent delayed enhancement CMR during 2013-2014 at Siriraj hospital were consecutively enrolled. Presence or absence of MR was assessed by difference in stroke volume from LV geometry and Q flow techniques. , LV geometry, wall motion abnormality, myocardial scar, mitral valve morphologic parameters were assessed, independent with the results of MR volume and fraction. The predictors of secondary MR were analyzed using univariate and multivariate logistic regression analysis.

Results: Mean age was 67+14 years and 79 (35.7%) were female. Mean LV ejection fraction (LVEF) was 27.84 +8.63% . MR was found in 84 patients (38%). LV ejection fraction (LVEF), LVEDV, tenting area, and commissure to commissure diameter were associated with the presence of MR were correlated with secondary MR. Using multivariate analysis, only tenting area, mean tenting area = 3.20+1.03, 3.76+1.24 sq.cm in no MR, MR group respectively (Odds ratio = 1.40, 95% CI 1.07-1.82, p = 0.013) was independent predictors for secondary MR.

Conclusion: Secondary MR was found in 35.7% in patients with reduced EF. Tenting area was independent predictors of secondary MR.

Keywords: secondary mitral regurgitation , cardiac MRI, myocardial scar, tenting area, reduced ejection fraction

(RF 11)

Thiamine level and health outcome in chronic ambulatory heart failure patients.

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Background: Thiamine deficiency is a known cause of heart failure. Treatment of heart failure may also reduce blood thiamine level. Whether this complex association has detrimental effect on mortality in heart failure patients is unknown.

Objective: to examine association of blood thiamine level and clinical consequence in chronic heart failure patient.

Method: Between January to November 2018, all patients in Ramathibodi hospital's heart failure clinic were invited to join the study. Blood thiamine level, measured by ETKA method, was collected in those who gave consent. Thiamine deficiency was defined as ETKA level > 1.25. Mortality outcome, heart failure hospitalization and all cause hospitalization within 1 year of blood test was collected as a primary composite endpoint. Multiple logistic regression analysis was used to determine the effect of thiamine level on outcomes.

Results: A total number of 50 patients entered the study, mean age was 60.58±15.11 years and 48% were female. Mean ETKA level was 0.97±0.23. Furosemide users had a significantly lower ETKA level compared to non-users. (0.93±0.15 vs 1.11±0.37, P 0.022) Thiamine deficiency was detected in 2 patients (4%). Three deaths occurred during the study, 1 (50%) in thiamine deficiency group and 2 (4%) in normal group. In univariable analysis, mean ETKA level was significantly higher in those who met primary composite endpoint (1.07±0.31 vs 0.93±0.16, P 0.045). After adjusted for age-sex, the association disappeared.

Conclusion: Low prevalence of thiamine deficiency was observed in our study population. Unlike previous observation, furosemide was related with a lower level of ETKA. Higher ETKA level was related to negative outcome. Further study to evaluate an appropriate ETKA cut-point in Thai population is needed.

(RF 12)

Prevalence, clinical characteristics and associated factors of thyrotoxic cardiomyopathy in hospitalized patients with heart failure

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Background: The prevalence of thyrotoxic cardiomyopathy (TCM) in hospitalized patients with heart failure and its recovery are unknown.

Objectives: To determine the prevalence of TCM and reversible TCM in hospitalized patients with heart failure and to determine factors associated with TCM.

Methods: We retrospectively reviewed 92 consecutive patients who were hospitalized with heart failure and thyrotoxicosis between 2002 and 2017. We excluded 7 patients because of significant coronary artery disease (n=2), severe aortic stenosis (n=1), and severe primary mitral valve diseases (n=4). Eighty-five patients were included in the study. TCM was defined as LV ejection fraction (LVEF) ≤ 55%. Complete reversible TCM was defined as LVEF > 55%. Partial reversible cardiomyopathy was defined as improvement of LVEF > 10% and LVEF ≤ 55%.

Results: Of 85 hospitalized patients with heart failure and thyrotoxicosis, 63 patients had complete echocardiographic studies for analysis. Of 63 patients, 12 (19%) patients had heart failure with reduced EF (HF-rEF) and 32 (70% female, age 49 ±16 years) patients (51%) had thyrotoxic cardiomyopathy (TCM). In those with TCM, a mean LVEF =41% Of 32 patients with TCM, 15 had follow-up complete echocardiographic studies for analysis. Of 15 patients, 9 patients (60%) had reversible TCM over a median follow-up of 18 (1-79) months. Of 9 patients, 7 had complete recovery (LVEF>55%) while 2 had partial recovery. Age, hemoglobin, and serum creatinine were associated with reduced LV systolic function (Odd ratio = 0.897 (95% CI 0.84-0.95; p=0.001), 1.35 (95% CI 1.003-1.82; p=0.048), and 18.09 (95% CI 1.98-164.93; p=0.01), respectively).

Conclusions: To our knowledge, this report is the largest study in hospitalized patients with thyrotoxicosis and heart failure. Thyrotoxicosis cardiomyopathy (TCM) was present in half of patients who were hospitalized with heart failure and thyrotoxicosis. About 60% of those patients with TCM had recovery of LV systolic function over a median follow-up of 18 months. These findings underscore the importance of identifying hyperthyroid or thyrotoxicosis state in patients with heart failure since anti- thyroid therapy significantly lead to reversible heart failure syndrome and LV systolic dysfunction.

(RF 13)

Cardiovascular Outcomes in Patients with Non-ST-Elevation Acute Coronary Syndrome Undergoing Noninvasive Stress Test

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Background: International guidelines recommend that patients with intermediate to high risk non-ST-elevation acute coronary syndrome (NSTE-ACS) should undergo coronary angiography (CAG) and coronary revascularization within 72 hours in order to achieve the better cardiovascular outcomes. Due to the policy of universal coverage in Thailand, patients with intermediate to high risk NSTE-ACS patients who did not received CAG within 72 hours require the evidence of myocardial ischemia from noninvasive stress test to perform CAG. The primary objective was to determine 1-year major adverse cardiovascular event (MACE) in patients with positive and negative noninvasive stress test.

Methods: The NSTE-ACS patients admitted during January 2017 to June 2018 at Chiangrai Prachanukroh hospital and Maharaj Nakorn Chiang Mai Hospital who did not receive CAG within 72 hours and underwent non-invasive stress test were enrolled. The primary outcome was 1-year MACE which was the composite of cardiovascular death, non-fatal myocardial infarction and ischemic driven revascularization.

Results: Of 226 enrolled patients, 88 patients underwent EST and 140 patients underwent dobutamine stress echocardiogram and 2 patients received both test. The incidence of 1-year MACE did not differ between patients with positive and negative stress test (14.9% vs. 18.2%, P=0.545, respectively). The independent factors associated with 1-year mortality in negative stress test were age, low body mass index, impaired left ventricular ejection fraction and higher level of Grace or TIMI score.

Conclusions: Among patients with NSTE-ACS underwent noninvasive stress test, the incidence of 1-year MACE was high and was not different between positive and negative test. The policy of noninvasive test in this group of patients should be reconsidered.

(RF 14)

Comparison of efficacy and safety between standard and accelerated half dose streptokinase in acute ST-segment elevation myocardial infarction

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Background and objectives: Previous studies showed that accelerated dose of streptokinase (SK) (0.75 M.U./10 min, repeated after 50 min if no electrocardiographic criteria of reperfusion) had higher rates of coronary reperfusion and similar bleeding rate and in-hospital mortality, compared to standard-dose SK regimen. Majority of patients received only one dose of SK (accelerated half-dose regimen) in that study. Due to the concern of bleeding, we aimed to compare the efficacy and safety between standard-dose and accelerated half-dose SK regimens.

Methods: We obtained the data of 326 patients who were admitted at the cardiac care unit, Maharaj Nakorn Chiangmai hospital and Nakornping hospital, due to acute ST-segment elevation myocardial infarction from January 2017 to December 2018. The primary outcome was coronary perfusion rate. The secondary outcomes were major bleeding and in-hospital mortality rates.

Results: Baseline characteristics were similar between 2 groups, except higher prevalence of chronic kidney disease and diabetes was demonstrated in accelerated half-dose group. Mean age was 62 years (Male 64%). The rate of coronary reperfusion was not different between accelerated half-dose and standard-dose regimens (63.1% vs. 59.9%, p = 0.546, respectively). In-hospital mortality rate was similar between two groups (3.4% vs 3.4% p = 0.98). Incidence of major bleeding was also comparable between 2 groups (0.6% vs. 2.0%, P=0.226). Only 1 patient in each group developed intracranial hemorrhage. However, hypotension occurred more frequently in accelerated half-dose group than standard-dose group (35.8% vs 21.1%, p = 0.004).

Conclusions: The accelerated half-dose SK regimen gave similar efficacy and safety compared to standard-dose SK regimen. Further larger studies are needed to confirm our results.

Keywords: acute myocardial infarction, accelerated streptokinase

Research by Fellow

Group 2

Poster Presentation
Friday 21st March, 2019
Time: 18.00-19.00
Venue: @ Black

Judges: *Smonporn Boonyarattavej,MD*
Rungroj Krittayaphong,MD

RF15 **Effect of long and short interdialytic interval of chronic hemodialysis on heart rate variability in patients with end-stage renal disease**
Phasakorn Putchagarn, MD
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RF16 **Effect of 1-hour TR band compression versus 4-hour conventional TR band compression after transradial catheterization on the incidence of radial artery occlusion at Thammasat Hospital**
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RF 17 **Achieved serum LDL-C with High-Intensity and Non High-Intensity Statin in Acute coronary syndromE patients with or without coronary interVention in the PolicE General Hospital (ACHIEVE study)**
Pinyada Srithanalarp, MD
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RF18 **Anti-factor Xa activity of standard dose and Japanese dose of rivaroxaban in Thai patients with non-valvular atrial fibrillation**
Phongsathon Pacharasupa, MD
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RF19 Association between antihypertensive medication and 5-year progression of arterial stiffness
Jindaporn Chaiyakhot, MD
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

RF20 **Alteration of left ventricular structure and function after treatment with angiotensin receptor-neprilysin inhibitor in patients with heart failure with reduced ejection fraction (ALLEVIATE-HF)**
Chanakarn Jirathiyut, MD
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

RF21 **Effect of Resistance Exercise With Rubber band in Chronic Heart Failure With Preserved Ejection Fraction Patients**
Wongwaris Aphijirawat, MD
Cardiovascular Division, Department of Internal Medicine, Phramongkutklao Hospital, Bangkok, Thailand

RF22 **Association between High-sensitive Troponin I and Subclinical Coronary Atherosclerosis in Well-controlled HIV-infected Adults.**
Manasawee Vassara, MD
Division of Cardiovascular Medicine, Department of Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

RF23 **The use of spot urine sodium measurement to evaluate the prevalence of high-level of sodium intake in hypertensive patients at Vajira Hospital**
Sirinart Chulawongsawat, MD
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RF24 **Radial artery occlusion after transradial interventions at Vajira hospital**
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RF25 **Use of modified Peguero-Lo Presti criteria to improve sensitivity in the ECG diagnosis of left ventricular hypertrophy**
Wongsakorn Luangphiphat, MD
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RF26 **Comparison 2-D and 3-D echocardiography to measure right atrial pressure by estimate of Inferior Vena Cava**
Wasan Choomyod, MD
Cardiovascular Unit, Department of Medicine, Prince of Songkla University, Songkla, Thailand

RF27 **frAgmenteD QRS in preDictiON of ischemic heart disease diagnosed by stress Cardiovascular Magnetic Resonance imaging The ADD-ON CMR Study**
Pimpimol Yooprasert, MD
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RF28 **Effects of salt and fluid restriction on dyspnea in patients with acute decompensated heart failure**
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(RF 15)

Effect of long and short interdialytic interval of chronic hemodialysis on heart rate variability in patients with end-stage renal disease

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Background: Previous studies showed that long interdialytic interval of chronic hemodialysis is associated with increased risk of sudden cardiac death compared to short interdialytic interval. In addition, diabetes mellitus (DM) and autonomic dysfunction are the strong predictors of survival in ESRD patients. However, the difference of autonomic function between long and short interdialytic intervals of chronic hemodialysis has never been studied in DM and non-DM patients. We aimed to compare autonomic function between long and short interdialytic interval of chronic hemodialysis in patients with and without DM.

Methods: The 200 patients receiving chronic hemodialysis were enrolled whom 82% received hemodialysis thrice weekly and 18% received hemodialysis twice weekly. The 10-minute electrocardiogram recording was performed twice in each patient before hemodialysis at long and short interdialytic intervals to assess short-term heart rate variability (HRV).

Results: The mean age was 61.5±14.2 years (male 54.5%) with mean LVEF of 63.0±12%. In 96 (48%) patients with DM, the HRV parameters did not differ between long and short interdialytic interval. However, in 104 (52%) non-DM patients, the HRV parameters indicating parasympathetic activity was significantly greater at short interdialytic interval than those at long interdialytic interval, including high frequency (8.1±7.2 vs. 6.5±4.6, P=0.016), rMSSD (19.6±17.7 milliseconds vs. 16.2±9.0 milliseconds, P=0.020) and pNN50 (4.1±11.9% vs. 1.8±5.8%, P=0.019).

Conclusions: The higher parasympathetic activity was demonstrated at short interdialytic interval before hemodialysis compared to that at long interdialytic interval in non-DM patients with chronic hemodialysis. However, this finding was not observed in DM patients.

(RF 16)

Effect of 1-hour TR band compression versus 4-hour conventional TR band compression after transradial catheterization on the incidence of radial artery occlusion at Thammasat Hospital

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Background: Radial artery occlusion (RAO) can be found after performing cardiac catheterization via transradial access. Having a dual blood supply often obscures its clinical signs and symptom, therefore it is often neglected. There are several ways to prevent the occurrence of RAO after the procedure. The duration of puncture site compression is one of the most important factors affecting in RAO. The aim of this study was to evaluate the effect of 1-hour versus 4-hour conventional TR band® compression after transradial catheterization on the incidence of RAO.

Methods: Patients underwent transradial catheterization at Thammasat University hospital during August – December 2018 were randomly assigned to 2 groups, 1-hour (group 1) and 4-hour (group 2) conventional TR band® compression after obtaining an informed consent. Baseline clinical characteristics, procedural technique including catheter size and duration of procedure, and complications were collected. The primary endpoint was incidence of acute RAO at 1 day post-procedure diagnosed by Allen's test and duplex ultrasonography. The secondary endpoints were chronic RAO at 30 days and bleeding complication.

Results: This was the preliminary result of 78 patients (37 and 41 patients (47.4% and 52.6%) in group 1 and 2, respectively). Both baseline and procedural characteristics were well balance, except dyslipidemia that was higher in group 1 (89.2% vs 68.3%, p=0.03). No patient in groups 1 developed acute RAO (0%), while 3 patients (7.3%) in group 2 had acute RAO (p=0.21). There was no significant difference in bleeding complication (2 for each group (all in grade 1); 5.4% vs 4.9%, p=1.00). Univariate analyses showed that there was no significant predictive factor for acute RAO and post-compression bleeding.

Conclusion: Comparing 1-hour to the conventional 4-hour radial compression, there was no difference in the occurrence of RAO and bleeding complications.

(RF 17)

Achieved serum LDL-C with High-Intensity and Non High-Intensity Statin in Acute coronary syndromE patients with or without coronary interVention in the PolicE General Hospital (ACHIEVE study)

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Background: Early initiation of intensive lipid lowering therapy with high-intensity statin is recommended for acute coronary syndrome patients to achieve a target serum LDL-C of less than 70 mg/dL or a reduction of at least 50 percent from baseline. There is limited evidence supporting benefits of high-intensity statin therapy in Asian population which may contribute to its underuse.

Objectives: Our study sought to assess a difference in the proportion of serum LDL-C goal achievement between high-intensity and non high-intensity statin therapy in acute coronary syndrome Thai patients admitted in our cardiac center and to analyse whether statin intensity is associated with all-cause mortality or major cardiovascular outcomes.

Methods: We conducted a 5-year retrospective cohort study involving 861 patients who had been hospitalized for acute coronary syndrome (STEMI, NSTEMI or Unstable Angina) either undergone invasive or conservative strategy from Janurary 2012 to December 2016. Patients were eligible for inclusion if they had been using stable dose of statin for at least 6 months without other lipid lowering agents. High-intensity statins including atorvastatin 40 to 80 mg and rosuvastatin 20 mg were compared with non high-intensity statins prescribed during index hospitalization for acute coronary syndrome. Primary endpoint was a difference in percentage of serum LDL-C goal achivement at 6 and 12 months. Secondary endpoints were all-cause mortality and composite outcome of non-fatal myocardial infarction, non-fatal stroke and hospitalization for heart failure 12 months after initiation of statins.

Results: Among 861 acute coronary syndrome patients, 391 met the inclusion criteria. 242 out of 391 patients (61%) had been prescribed high-intensity statin. Percentage of serum LDL-C goal attainment was significantly higher in high-intensity compared to non high-intensity statin at 6 months (33.1% versus 15.4%, $p \leq 0.001$) and 12 months (29.4 % versus 17.4 %, $p \leq 0.001$). Mean serum LDL-C at baseline were 124.72 ± 43.24 mg/dL and 104.11 ± 39.08 mg/dL in high and non high-intensitty statin group. At 12 months, mean serum LDL-C were 78.31 ± 26.46 mg/dL and 87.36 ± 28.14 mg/dL respectively in both groups. All-cause mortality was lower in high-intensity statin group (7.9% versus 18.8%, odds ratio 2.71 [1.45 - 5.06]; $p = 0.001$). Multivariable analysis indicated that hypertension was the strongest predictor of mortality followed by chronic kidney disease, history of dyslipidemia, STEMI (versus NSTEMI or Unstable Angina) and prior statin use. Adjusted odds ratio for hypertension was 3.597 [1.187 - 10.904], $p = 0.024$. Composite outcome of non-fatal myocardial infarction, non-fatal stroke and hospitalization for heart failure was also lower in high-intensity statin group (12.3% versus 17.4%; odds ratio 2.11 [1.15 - 3.87]; $p = 0.014$). History of dyslipidemia was the strongest predictor from multivariable analysis. Adjusted odds ratio for dyslipidemia was 3.023 [1.07 - 8.539]; $p = 0.037$.

Conclusions: Acute coronary syndrome Thai patients admitted in our cardiac center using high-intensity statin achieved greater percentage of serum LDL-C goal at 6 and 12 months compared to low/moderate-intensity statin therapy. All-cause mortality and composite cardiovascular outcome tended to be lower at 12-month follow up. Our study result supports clinical benefits of high-intensity statin in high risk Asian population.

Keywords: high-intensity statin, acute coronary syndrome, LDL-C, Asian population

(RF 18)

Anti-factor Xa activity of standard dose and Japanese dose of rivaroxaban in Thai patients with non-valvular atrial fibrillation

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Background: The recommended dose of rivaroxaban for stroke prevention in atrial fibrillation (SPAF) is 20 mg/day and 15 mg/day in normal and reduced renal function (20/15-mg dose). The expected median (5th-95th percentile range) anti-factor Xa (anti-FXa) activity at maximum concentration (Cmax) of 20/15-mg dose reported in Caucasians was 270(189-419) µg/L. However, the lower dose (15/10-mg dose) has been tested in J-ROCKET study and approved in Japanese population for SPAF. Whether the 15/10-mg dose is appropriate for other Asian population is unknown.

Methods: We aimed to examine anti-FXa activity of rivaroxaban at 20/15-mg dose and 15/10-mg dose in Thai population. The 60 Thai patients with non-valvular AF who had been receiving rivaroxaban were enrolled. Anti-FXa activity of 20/15-mg dose of rivaroxaban was measured at Cmax and at trough concentration (Ctrough) at the steady state. The dose of rivaroxaban was reduced to 15/10-mg dose and anti-FXa activity was re-measured in the same fashion.

Results: The mean age, body weight, and creatinine clearance was 69.3±9.1 years, 64.6±14.1 kg, and 59.2±22.7 ml/min (Male 65%). The median anti-FXa activity at Cmax of 20-mg dose with normal renal function, 15-mg dose with normal renal function, 15-mg dose with reduced renal function and 10-mg dose with reduced normal renal function was 363(177-654) µg/L, 311(174-474) µg/L, 331(246-656) µg/L and 238(70-435) µg/L, respectively.

Conclusion: The anti-FXa activity at Cmax of 20-mg dose of rivaroxaban in Thai population appeared to be higher than the expected range reported in Caucasians. The 15/10-mg dose of rivaroxaban may be appropriate in Thai population.

Keywords: Atrial fibrillation, Anti-factor Xa activity, Rivaroxaban

(RF 19)

Association between antihypertensive medication and 5-year progression of arterial stiffness

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Background: Cardio-ankle vascular index (CAVI) is a novel marker of atherosclerosis. Different antihypertensive drug groups demonstrate different effect on arterial stiffness. Renin-angiotensin-aldosterone (RAS) blockade and calcium channel blocker can improve arterial stiffness but there are inadequate data on beta blocker.

Objectives: To assess the association between different antihypertensive drugs and progression of arterial stiffness, estimated by CAVI.

Methods: Data are based on the EGAT study. Those who visited the survey in 2012-2013 and 2017-2018 were included. Use of antihypertensive medication, general characteristic and CAVI were recorded at baseline. CAVI were recorded again at 5 year follow up. This analysis will look at those who are on single similar type of antihypertensive medication at both timepoints.

Results: 130 patients (102 males, 28 females) were eligible in the analysis. There were no significant differences in clinical characteristics between each groups. At baseline, mean CAVI was not significantly different between those who receive RAS blockade, CCB and beta blockade. After 5 years of treatment, the change in CAVI was no significantly different in each antihypertensive groups treatment. The change in systolic blood pressure was no significantly different in each antihypertensive groups treatment.

Conclusion: In our observational data, there is no substantial difference in progression of arterial stiffness according to antihypertensive medication types used over 5 years period.

Key Words: arterial stiffness,ACEI,ARBs,calcium channel blocker,beta blocker cardio-ankle vascular index(CAVI).

(RF 20)

Alteration of left ventricular structure and function after treatment with angiotensin receptor-neprilysin inhibitor in patients with heart failure with reduced ejection fraction (ALLEVIATE-HF)

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Background: There is robust evidence that Angiotensin receptor-neprilysin inhibitor (ARNI) can reduce death and heart failure hospitalization in patients with heart failure with reduced ejection fraction (HFrEF). However, the improvement of function and reverse remodeling of the left ventricle after ARNI have not been established.

Method: In this single-center retrospective cohort study of 47 patients with HFrEF, we reviewed the clinical and echocardiographic data collected prior to the initiation of ARNI treatment compared to the one collected after maximal tolerated ARNI dose. Paired sample T-test was used for normally distributed data, while Wilcoxon Signed Rank test for non-normally distributed data.

Results: The mean left ventricular ejection fraction (LVEF) significantly improved from 30.23% to 42.15% (mean difference 11.92% ± 1.84, $p < 0.001$), left ventricular end diastolic diameter decreased by 5.02 mm ($p = 0.001$), left ventricular end systolic diameter decreased by 8.23 mm ($p < 0.001$), and LV mass index decreased by 20.45 g/m2 ($p= 0.01$) The mean duration from maximal tolerated ARNI dose to echocardiographic follow up was 17.98 ± 14.04 weeks. There were 30 patients (64.83%) whose LVEF improved ≥ 5% from baseline. Although the prognostic factor of improved LVEF was not identified, there were positive trend in those who had been up-titrated the ARNI dose and negative trend in those with left ventricular end diastolic diameter at baseline of more than 60 mm.

Conclusion: There were significant improvement of LVEF and other parameters of reverse remodeling of the left ventricle after treatment with ARNI.

(RF 21)

Effect of Resistance Exercise With Rubber band in Chronic Heart Failure With Preserved Ejection Fraction Patients

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Background: Heart failure with preserved ejection fraction (HFpEF) is a common disease in elderly population with multiple comorbidities. Exercise intolerance and easily fatigue were important problems in this population leading to poor quality of life (QoL). Despite increasing incidence, there is no evidence-based effective therapy for these patients. Resistant exercise, by weight-training, can improve QoL but it is not suitable for all patients. Rubber band is safe and easy access home-based exercise which can improve frailty in HFrEF. We sought to evaluate the effect of rubber band exercise to improve exercise capacity in HFpEF population.

Methods: We conducted a prospective, randomized, open-labeled, blinded endpoints (PROBE) design to determine whether 3-month of resistance exercise using rubber band can improve exercise capacity in stable HFpEF patients compared with standard usual care. The co-primary outcome measured by peak oxygen consumption and 6-minute walk distance were evaluated. The secondary endpoint is the change in NT-proBNP level.

Results: A total of 32 patients underwent randomization in 1:1 ratio. Baseline characteristics were not different between groups. The overall adherence to exercise was excellent (93%). Exercise capacity were improved in both groups. There was no significant different in peak O2 consumption (+2.2 vs +2.9 ml/kg/min, p=0.68) and 6-MWD (+38 vs +23 m, p = 0.65) but tend to reduction in NT-proBNP level (-357 vs -54, p =0.3) in rubber band exercise group when compared with standard usual care.

Conclusion: Effect of resistance exercise using rubber band tend to reduced NT-proBNP level after 3-month exercise but not peak oxygen consumption and 6-MWD when compared with standard usual care.

Keywords: Heart failure with preserved ejection fraction , Resistance exercise , Rubber band , Exercise capacity.

Original articles

2. Background

Heart failure is a common disease and increase incidence, nowadays. Most of population in this groups is elderly with multiple comorbidities leading to increase rate of hospitalization and mortality as well as medical cost. The classification of chronic heart failure

(RF 22)

Association between High-sensitive Troponin I and Subclinical Coronary Atherosclerosis in Well-controlled HIV-infected Adults.

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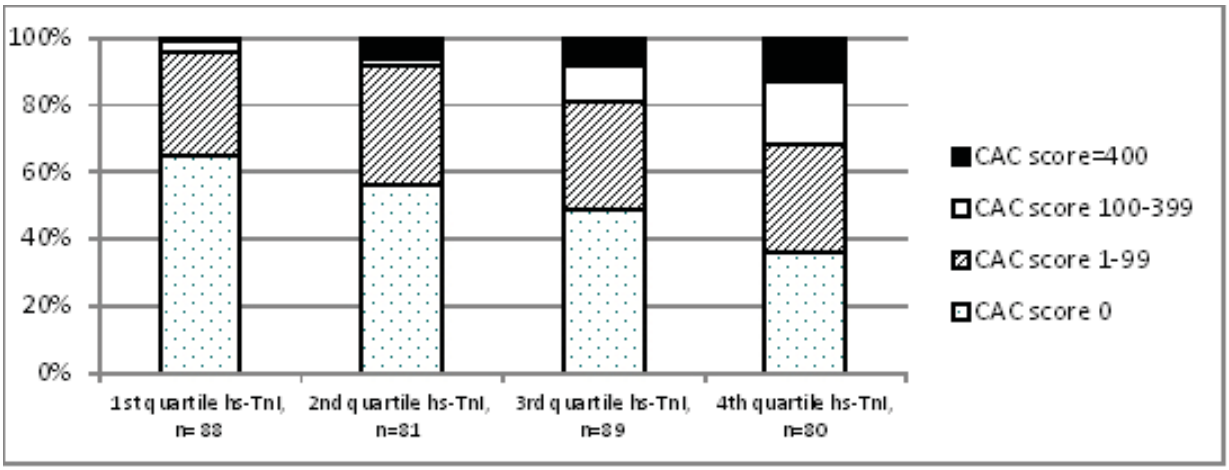
Background and objectives: Patients with human immunodeficiency virus (HIV) infection live longer and the prevalence of coronary heart disease is increasing among them. High-sensitive troponin I (hs-TnI) is associated with coronary artery calcification as determined by non-contrast cardiac computed tomography (CT) in general population without established cardiovascular disease (CVD). Nevertheless, the relationship in well-controlled HIV-infected patients has not been validated.

Design and methods: A cross-sectional study among HIV-infected adults aged > 50 years free from known CVDs. All subjects underwent non-contrast cardiac CT and blood test for serum hs-TnI was concomitantly performed. Relationship between Agatston score, a parameter used to quantify coronary artery calcification and serum hs-TnI level was analysed using spearman correlation and logistic regression models.

Results: A total of 338 HIV-infected adults (median age 54 years, 62% men) were included. All of them were in antiretroviral therapy with a median 18 years of exposure. The median CD4 cell count was 614 cell/mm3, 98% were virologically suppressed. Hs-TnI was correlated with coronary artery calcification with the correlation coefficient of 0.287 ($p<0.0001$). Multivariated logistic regression analysis demonstrated that serum hs-TnI concentration was associated with an increased odd of coronary artery calcification (Agatston score>0) (OR 1.65; 95% CI, 1.06 – 2.60, $p=0.027$). To detect coronary artery calcification, using the hs-TnI in addition to Thai CV risk score slightly increased the ROCAUC from 0.6827 to 0.692 ($p=0.45$).

Conclusion: Among well-controlled HIV-infected patients without established CVDs, hs-TnI concentration was associated with coronary artery calcification. This could be a potential biomarker for an early risk stratification of subclinical coronary atherosclerosis in this population. The association with long-term adverse cardiovascular outcome needs to be validated in the future study.

Keywords: High-sensitive troponin I, coronary artery calcification, subclinical atherosclerosis, HIV-infected patients



CAC; coronary artery calcium.

(RF 23)

The use of spot urine sodium measurement to evaluate the prevalence of high-level of sodium intake in hypertensive patients at Vajira Hospital

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Background: Excessive sodium consumption is one of the risk factors that contribute to hypertension. Hypertensive patients were advised to limit sodium intake to less than 2300 mg per day as in the guidelines for management of hypertension1. In Thailand, many Thai people enjoy eating salty food.2 Kawasaki formula was invented by Kawasaki et al.3 for estimating 24-hour urine sodium excretion from spot urine sodium. The correlation between the estimated and the measured 24-hour urine sodium values was highly statistically significant with the correlation coefficient of 0.728. The aim of this study was to determine the prevalence of excessive sodium consumption in hypertension patients at Vajira hospital by using the estimated 24-hour urine sodium excretion from Kawasaki's spot urine method.

Methods: This cross-sectional study was performed from October 2018 to January 2019. The morning spot urine sodium and urine creatinine from informed consent patients were analyzed. We asked whether patients thought they had too much dietary salt consumption and then categorized them into two groups - the "excessive salt consumption" perception group and the "normal salt consumption" perception group. The inclusion criterion was outpatient department patients with hypertension. Exclusion criteria was diuretic use, edema, chronic kidney disease, and history of diarrhea or vomiting within 24 hours. Epidemiological data were collected. Patients were considered having excessive sodium consumption if their estimated 24-hour urine sodium excretion exceeded 2300 mg. The prevalence of excessive sodium consumption was determined. Analysis of the relationship between the perceived salt intake and the estimated 24-hour urine sodium excretion was done by Fisher's exact test.

Results: Total 110 patients were enrolled. Mean estimated 24-hour urine sodium excretion was 3987.9 ± 1388.66 mg. 98 patients (89.1%) had estimated 24-hour urine sodium excretion more than 2300 mg, 12 patients (10.9%) had estimated 24-hour urine sodium excretion less than 2300 mg. From the survey, 82 patients (74.5%) had the "normal salt consumption" perception, and 28 patients (25.5%) had the "excessive salt consumption" perception. Analysis of the relationship between the perceived salt intake and the estimated 24-hour urine sodium excretion found that 72 patients (87.8%), who believed that they were doing well at staying away from excessive salt consumption, had estimated 24-hour urine sodium excretion more than 2300 mg.

Conclusions: There is high prevalence (89.1%) of excessive sodium consumption in hypertensive patients at Vajira hospital. Most of the patients in this study thought that they were doing well at avoiding salty food, but the truth was they were not.

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(RF 24)

Radial artery occlusion after transradial interventions at Vajira hospital

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Background: Radial artery occlusion (RAO) is a clinically silent complication of transradial catheterization, the incidence varied from 0.8% to 30% in the previously published data. Once the radial artery is occluded, it cannot be used as an access site for percutaneous coronary intervention (PCI) or as a conduit for coronary bypass grafting. There are multiple factors associated with this condition such as the diameter of catheters, the dose of heparin, the volume of radial artery compression device and diabetes mellitus. However, there is no current data on this subject in Thailand. This study evaluates the incidence and the risk factors of radial artery occlusion after transradial interventions at Vajira hospital.

Methods: Patients undergoing transradial catheterization under standard study protocol from February 2017 to March 2018, with the use of ultra-low volume of air (10 ml) in radial artery compression device (TR Band®) to achieve hemostasis. The presence of RAO was evaluated at 7-14 days after the procedure by the reverse Barbeau test which was interpreted as negative when there was a loss of pulse waveform and negative oximetry without recovery after two minutes of compression of ulnar artery. Post procedure complications include bleeding, hematoma or bruising after sheath removal and pain score were evaluated.

Results: The study group included 95 patients, 31.6% were female and 44.2% had diabetes. The incidence of RAO was only 5 in 95 patients (5.3%). There was no statistically significant difference between risk factors between RAO and non-RAO groups with regards to age (59.60 ± 6.35 and 63.13 ± 1.15 years), body mass index (28.41 ± 1.93 and 24.68 ± 0.45), smoking history (60% and 49%), dose of heparin (91.49 ± 21.68 and 102.37 ± 20.44), sheath duration (81.20 ± 21.50 and 72.67 ± 5.04). All patients with RAO had acute coronary syndrome who had emergency/urgency indication for coronary angiography. There were some post-procedure complications such as mild bruising (16.8%), access site bleeding (4.2%) and pain (approximate pain score 3/10).

Conclusion: The incidence of radial artery occlusion after the radial procedures in our study was 5.3%, which is similar to the published data. The patients who presented with acute coronary syndrome may influenced the incidence of RAO. Ultra-low volume of air in TR Band may reduce pain after the procedure without increasing complications.

(RF 25)

Use of modified Peguero-Lo Presti criteria to improve sensitivity in the ECG diagnosis of left ventricular hypertrophy

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Background: There are several electrocardiographic (ECG) criteria for the diagnosis of the left ventricular hypertrophy (LVH). Those have a high specificity; however there were limitations of their sensitivity. To date, Peguero-Lo Presti (PLP) criteria has a higher sensitivity and non-significant difference of specificity compared to previous criteria. However, PLP criteria still has a sensitivity of only 57%.

Objective: To improve a sensitivity of LVH diagnosis with modified Peguero-Lo Presti criteria.

Methods: This retrospective study recruited patients with available echocardiography were obtained the ECG in Central Chest Institute of Thailand from January 2017 to December 2017. All patients were estimated left ventricular mass index (LVMI) by echocardiography. Those were categorized into patients with LVH and no LVH. Modified PLP criteria were calculated by dividing PLP criteria with body surface area (BSA). A sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were calculated in all proposed ECG criteria. The McNemar test was used to confirm the agreement of all proposed ECG criteria against LVMI. The AUC analysis was used to assess the performance of those criteria. Other accepted LVH ECG criteria such as Sokolow-Lyon voltage criteria and Cornell voltage criteria were also used to compare with modified PLP criteria.

Results: A total of 317 patients with available echocardiography were enrolled. Of these, nearly half had hypertension, one-fifth had atrial fibrillation and one-fourth had valvular heart diseases. The mean age and body surface area (BSA) were 57.20 ± 16.54 years and 1.69 ± 0.22 m2 respectively. LVH determined by LV mass index was found in 164 patients (51.74%). A sensitivity and a specificity of modified PLP criteria were 50.60% (95% confidence interval [CI] 42.70% to 58.50%) and 88.20% (95% CI 82.00% to 92.90%) respectively. This criterion (modified PLP) had the best sensitivity and similar specificity compared to Peguero-Lo Presti criteria, Sokolow-Lyon voltage criteria and Cornell voltage criteria. Accuracy of PLP criteria and modified PLP criteria were comparable with an area under the curve (AUC) of 0.67 (95%CI 0.61% to 0.73%; p-value < 0.01).

Conclusion: Modified Peguero-Lo Presti criteria can improve the sensitivity with similar specificity for the diagnosis of LVH as compared to Peguero-Lo Presti criteria, Sokolow-Lyon voltage criteria and Cornell voltage criteria.

Keywords: Left ventricular hypertrophy, Modified Peguero-Lo Presti criteria, Peguero-Lo Presti criteria, Left ventricular mass index

(RF 26)

Comparison 2-D and 3-D echocardiography to measure right atrial pressure by estimate of Inferior Vena Cava

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Introduction: Standard 2-D echocardiography is being used in worldwide and well accepted about accuracy value in estimation of right atrial pressure (RAP) from IVC size. Currently, 3-D echocardiography is the new technology that has been shown superior to 2-D echocardiography in multiple aspect especially in estimation of diameter in a non- circular structure like IVC. The diameter derived by 2 D echocardiography always have significant variability depend on angulation of ultrasound probe and elliptic shape of IVC. we hypothesized that using 3 D echo would help to correct measurement error from malalignment of ultrasound probe and might have a better correlation with measured RAP. However, there have been no clinical study compared between 2-D echocardiography and 3-D echocardiography about accuracy in measuring right atrial pressure from IVC size.

Objectives: To compare the accuracy of 2-D and 3-D echocardiography in estimation right atrial pressure from IVC size

Method: A prospective study was conducted in Songklanagarind hospital between 1 January 2018 to 31 January 2019. we enrolled patients who underwent to right heart catheterization and monitored with central line in CCU or ICU. Exclusion criteria were the patients who received mechanical respiratory ventilation and poor imaging quality. We measured the IVC diameter by using both 2 D and 3 D parameter simultaneous with measuring the RAP in the ICU or CCU setting or within 30 minutes before right heart catheterization. We used both standard evaluation matrix from the American society of echocardiography (ASE) and the following formula RAP = (minimal IVC diameter x 4.6)+ 4.8 for estimation of RAP from echocardiography either from 2D or 3D echo derived parameter. Perimeter and area from 3D technique were measured in both maximum and minimum during spontaneous respiration. the test of statistical significance of correlation was conducted by using Pearson and Spearman correlation.

Results: There were 23 patients recruited in this study, 9 patients from elective right heart catheterization group and 13 patients from ICU or CCU setting. Mean age of the patients was 52.54 ± 19.485 years Mean right atrial pressure was 10.136 ±5.61 mmHg. 9 patients (40%) were female and 13 patients (60%) were male. All parameters derived from 2D and 3D echocardiography have significant correlation with measured RAP (Correlation coefficient 0.455 p=0.003 , 0.624 p =0.002 , 0.476 p – 0.025 for estimated RAP by 2-D echocardiography, 3-D echocardiography and measured area by tracing technique respectively)

Conclusion: Both 2 D and 3 D estimation technique have significant correlation with measured RAP. 3 D echocardiography has slightly better accuracy compare to 2 D technique.

Keyword: Right atrial pressure, Echocardiography, Comparison , Formula , 3D echocardiography

(RF 27)

frAgmenteD QRS in preDictiON of ischemic heart disease diagnosed by stress Cardiovascular Magnetic Resonance imaging The ADD-ON CMR Study

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Background: Fragmented QRS complex (fQRS) on 12-lead EKG is not uncommon in general population. Previous studies found an association between fQRS and prior myocardial infarction, myocardial scar, heart failure, and increased cardiac mortality. However, data in adults without history of coronary artery disease is limited. We aimed to evaluate whether there is an association between fQRS and ischemic heart disease (IHD) diagnosed by stress cardiac MRI testing.

Method: We retrospectively reviewed data from 604 patients who underwent stress cardiac MRI, in which 50 patients were excluded due to known history of coronary artery disease or incomplete stress test. A positive result was defined as stress-induced perfusion defect in at least 2 contiguous myocardial segments corresponding to epicardial coronary territory, or presence of ischemic scar (subendocardial or transmural pattern of late gadolinium enhancement). The 12-lead EKG done on the same day with MRI, prior to stress testing, were analyzed. Fragmented QRS was defined as the presence of additional R wave (R'), notching in the nadir of R or S wave, or the presence of more than one R' in any EKG leads. Both cardiac MRI and EKG were analyzed by two independent observers.

Result: Final analysis included 554 patients, 39% were male, with mean age of 67.8 ± 11.1 years. There was positive stress cardiac MRI in 219 patients (39.5%). Older age, diabetes mellitus, and hypertension were more frequent in the positive group ($p < 0.05$). fQRS was identified in 300 patients (54.2%). Baseline characteristic did not differ significantly between patients with and without fQRS. There is an association between fQRS and IHD, OR 1.605 (95% CI 1.136-2.269), $p = 0.007$. Using linear regression, number of leads with presence of fQRS also showed an association with IHD (OR 1.204, $p = 0.005$). After adjustment for age, diabetes, hypertension, renal function, and left ventricular ejection fraction, the strong association between fQRS and IHD was still presence, OR 1.709 (95% CI 1.182-2.470), $p = 0.004$.

Conclusion: In patients without known history of coronary artery disease, fragmented QRS is independently associated with ischemic heart disease diagnosed by stress cardiac MRI.

(RF 28)

Effects of salt and fluid restriction on dyspnea in patients with acute decompensated heart failure

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Background: In patients with acute decompensated heart failure, lungcongestion and fluid retention lead to dyspnea. Apart from adequate diuretics, salt and fluid restriction may reduce dyspnea more effectively but appropriate amount of salt and fluid intake for the patients are still unknown.

Objective: To compare difference change of dyspnea score in patients with acute decompensated heart failure between different sodium and fluid restriction by using visual analog scale.

Methods: Since November 2018, 29 hospitalized patients with acute decompensated heart failure were randomized and assigned to received sodium 1.5 g and fluid 1,000 ml per day restriction (Group A) and sodium 3 g and fluid 2,000 ml per day restriction (Group B). Other treatments depended on physician as guided by guideline-directed therapy. Each patient was evaluated at 0, 24, 48 hours and day 30 of the study. Primary outcome, difference change of dyspnea at 0 and 48 hours, was done to compare two groups by using visual analog scale. Mann-Whitney U test was used for statistical analysis.

Results: This is the preliminary analysis of the first 10 patients with acute decompensated heart failure (mean age 60.9 ± 14.99 years, 50% male). There was no significant difference of visual analog scale change between Group A and B (-0.6, -2.6 to 2 cm (median, range) versus -1, -3.5 to 1.4 cm, respectively; p=0.465). Significant level for interim analysis was $p < 0.01$. All secondary outcomes also had no significant differences including change of body weight (0, -1 to 0 kg versus -1.3, -5.7 to 2.1 kg; p=0.576), change of NTproBNP (7.6, -4563 to 955 pg/ml versus -6183, -7003 to 460 pg/ml; p=0.347), change of serum creatinine (0.14, -0.03 to 0.22 mg/dl versus 0.12, -0.09 to 0.51 mg/dl; p=0.6), change of urine sodium (-11, -25 to 31 mEq/L versus -43, -110 to -16 mEq/L; p=0.076), total furosemide use (80, 60 to 2000 mg versus 700, 0 to 1000 mg; p=0.528) and length of stay (7, 4 to 14 day versus 4, 3 to 15 day; p=0.338). Besides, incidence of treatment failure and cardiorenal syndrome was 20% (1 of 5 patients) in each group.

Conclusion: According to the interim analysis, salt and fluid restriction may not affect the treatment outcomes for patients with acute decompensated heart failure.

Research by Fellow

Group 3

Poster Presentation
Friday 21st March, 2019
Time: 18.00-19.00
Venue: @ Black

Judges: *Prin Vathesatogkit,MD*
Aekarach Ariyachaipanich,MD

RF29 **Major adverse cardiac event and clinical characteristics of asymptomatic atrial fibrillation patients in Siriraj hospital**
Withaya Tragulmongkol, MD
Division of Cardiology, Department of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

RF30 **Prevalence of Microvascular Dysfunction Detected by Adenosine Stress Cardiac Magnetic Resonance in Patients who Presented with Angina and Non-significant Coronary Artery Disease in PhramongkutklaoHospital**
Torkiat Tantiwiwat, MD
Cardiovascular Division, Department of Internal Medicine, Phramongkutklao Hospital, Bangkok, Thailand

RF31 **A Comparison of Efficacy between Crystalline and Amorphous form of Atorvastatin**
Kesinee Wanichang, MD
Department of Cardiology, Faculty of Medicine, KhonKean University, KhonKean,Thailand

RF32 **The effects of CLIMATE and air pollutants on Heart Failure hospitalizations and mortality in Thailand (CLIMATE-HF Study)**
Wattanachai Ngampongpan, MD
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

RF33 **Comparison of in-hospital mortality between acute inferior wall STEMI patients with right ventricular infarction and without right ventricular infarction undergoing a primary PCI in KCMH.**
Sumet Preechawuttidej, MD
Division of Cardiovascular Medicine, Department of Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

RF34 **Comparison of a combination of inhaled nebulized nitrite and sildenafil versus sildenafil alone in the treatment of thalassemia patients with pulmonary hypertension**
Thinnakrit Sasipraph, MD
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

RF35 **Mortality rate and hospitalization in cardiac resynchronization therapy in patient severe heart failure in Rajavithi hospital in 2012 to 2017**
Thanaphum Phongkitpaisarn, MD
Division of Cardiology, Department of Medicine, Rajavithi Hospital, Bangkok, Thailan

RF36 **Short term outcomes after switching from the new P2Y12 inhibitor (prasugrel or ticagrelor)to clopidogrel at 30 days in elderly patients after coronary intervention in acute coronary syndrome: Interim Analysis**
Isara Narapiromsuk, MD
Cardiology Unit, Department of Medicine, Faculty of Medicine, Thammasat University (Rangsit Campus), Pathumtani, Thailand

RF37 **Using Incremental High-Sensitivity Cardiac Troponin T to Increase the Diagnostic Accuracy of Exercise Stress Test.**
Sarawut Sriprasarn, MD
Department of Cardiology, Faculty of Medicine, KhonKean University, KhonKean,Thailand

RF38 **In-hospital and 1-year outcomes of primary percutaneous coronary intervention in the elderly patients with acute ST-elevation myocardial infarction**
Aphirak Pussawiro, MD
Cardiology fellow, Division of cardiology,Central Chest Institute of Thailand ,Nonthaburi

RF39 **lDL-c goal achievement before and after implementation of standing order in patients with acute myocardial infarction**
Chokechai Saelim, MD
Division of Cardiovascular Medicine, Department of Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

RF40 **A Comparison of Mitral Valve Calcification Score Detection by Multidetector Computed Tomography (MDCT) between Successful and Unsuccessful Percutaneous Transvenous Mitral Commissurotomy (PTMC)**
Montawan Vechanuntanuruck, MD
Cardiology fellow, Division of cardiology,Central Chest Institute of Thailand, Nonthaburi, Thailand

RF41 **Reclassified Intensity of 20 mg-Simvastatin in Thai population (RIST study): The preliminary study**
Pichanun Potranun, MD
Division of Cardiology, Department of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

RF42 **Prevalence of diastolic dysfunction in end-stage renal disease patients in Rajavithi hospital**
Vee Chavapong, MD
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(RF 29)

Major adverse cardiac event and clinical characteristics of asymptomatic atrial fibrillation patients in Siriraj hospital

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Background: A large proportion of patients with atrial fibrillation (AF) are asymptomatic. Data about the clinical characteristics and prognostic outcome of asymptomatic AF patients were limited and diversity from previous studies.

Objective: This study was to investigate clinical characteristics and prognostic outcomes of patients with asymptomatic AF in Siriraj hospital.

Method: Patients who was diagnosed with AF at outpatient department, Siriraj hospital and followed up between January 2014 and December 2018 were enrolled. Baseline clinical characteristics and clinical outcome of symptomatic and asymptomatic AF were collected. The primary outcome was 5-years survival free of the composite of all-cause mortality, cardiovascular related mortality, ischemic stroke, systemic embolism and heart failure hospitalization.

Results: A total of 459 patients (male 277, 60.3%), mean age 69.9 ± 10.8 years old were enrolled. Mean follow up duration 4.1 ± 1.0 years. One hundred and ninety two patients (41.8%) were asymptomatic AF. Male gender, BMI, persistent AF type, non-ischemic cardiomyopathy, history of ischemic stroke prior to enrollment, peripheral arterial disease, history of smoking, high CHA2DS2VASc score (5-8) and HAS-BLED score were significantly associated with asymptomatic AF patients (all $p < 0.05$). The primary outcome occurred in 34 (17.7%) asymptomatic AF patients and 48 (18%) in symptomatic AF patients. After Multivariate analysis, no significantly difference in 5-years survival free of the primary outcome ($p = 0.374$) in patients with asymptomatic AF compared to symptomatic AF. (Cox regression analysis, Hazard ratio 1.1 (95% CI 0.71 – 1.71), $p = 0.657$).

Conclusions: Patients with asymptomatic AF were more male gender and associated with previous cardiovascular comorbidity, previous ischemic stroke history and higher CHA2DS2VASc score. No significantly difference in 5-year survival free of the composite outcome of all-cause mortality, cardiovascular related mortality, ischemic stroke, systemic embolism and heart failure hospitalization in asymptomatic compared to symptomatic AF patients.

Keywords: Atrial fibrillation, AF, Nonvalvular atrial fibrillation, NVAF, Asymptomatic atrial fibrillation, Asymptomatic AF, Symptomatic atrial fibrillation, Symptomatic AF, Thromboembolic complication, Stroke.

(RF 30)

Prevalence of Microvascular Dysfunction Detected by Adenosine Stress Cardiac Magnetic Resonance in Patients who Presented with Angina and Non-significant Coronary Artery Disease in Phramongkutklao Hospital

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Background: Among patients who presented with angina chest pain and normal coronary angiography or non-significant coronary artery disease, microvascular dysfunction was proposed as one of the etiology of this abnormality and may harbor worsening clinical outcome. Adenosine stress cardiac magnetic resonance imaging is an accurate non-invasive modality to detect microvascular dysfunction. However this condition is usually left unaware and the data in Asian population is very limited.

Objective: To evaluate the prevalence of microvascular dysfunction.

Methods: Patients who had angina chest pain, either stable or acute chest pain and non-significant coronary artery disease from coronary angiography were enrolled. Standard protocol of adenosine stress CMR was performed and prevalence of microvascular dysfunction was evaluated as primary objective.

Results: The total of 51 Patients were enrolled in this study. Mean age was 60 years and 31(55%) were male. Stable chest pain subgroup and acute chest pain subgroup were 31(61%) and 20(39%), respectively. Prevalence of microvascular dysfunction was 21(41%). For subgroup analysis, the prevalence of microvascular dysfunction among stable chest pain group was 10(32%) and 11(52%) in acute chest pain group. Factor that may be associated with coronary microvascular dysfunction was smoking (OR 1.84 [1.10-3.78] P=0.01).

Conclusion: The prevalence of coronary microvascular dysfunction among patients who presented with chest pain and non-significant coronary artery disease was 41.18%.

Keyword: Microvascular dysfunction, adenosine stress cardiac magnetic resonance, non-significant coronary artery disease.

(RF 31)

A Comparison of Efficacy between Crystalline and Amorphous form of Atorvastatin

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Background: Atorvastatin is a widely used statin. Currently, there are two available forms of Atorvastatin, crystalline (original) form, and amorphous (generic) form. Pharmacologic studies showed the similarity between both forms, however, lipid-lowering effectiveness of amorphous form was still uncertain.
Objective: To compare the effectiveness between crystalline and amorphous Atorvastatin.

Methods: We retrospectively collected data during January 1st, 2016 to December 31st, 2017, in patients whom crystalline Atorvastatin was replaced by amorphous Atorvastatin at the same dose at Queen Sirikit Heart Center of the Northeast, where both forms must be prescribed for at least 6 weeks. The lipid profiles, closest taken before and after the switching point were used. The primary outcome was changes of low-density lipoprotein (LDL) level. The secondary outcomes were changes of total cholesterol (TC), triglyceride (TG), and high-density lipoprotein (HDL) levels, and comparison of LDL levels in patients with tablet splitting.

Results: A total of 826 patients were included in this study. The mean age was 63.7 years, 567 patients (68.6%) were male, and 736 patients (89.2%) were treated as secondary prevention. The mean (standard deviation; SD) LDL levels during crystalline and amorphous form use were 92.4 (39.0) and 91.8 (41.0) mg/dl, respectively (mean difference 0.6; 95% confidence interval (CI) -1.02 to 2.24; p = 0.4). The mean (SD) TC, TG, and HDL levels during crystalline and amorphous form use were 153.1 (43.3) and 152.0 (48.6) mg/dl (p = 0.46), 153.4 (129.0) and 155.0 (148.3), (p = 0.74), 43.5(11.9) and 44.2 (12.0) (p = 0.004), respectively. Among the patients with tablet splitting, the mean (SD) LDL levels during crystalline and amorphous form use were 89.2 (28.3) and 91.0 (30.8) mg/dl (p =0.27), respectively. Side effects were recorded in 9 patients, which 1 was rhabdomyolysis.

Conclusions: The lipid-lowering effectiveness of amorphous Atorvastatin was comparable to crystalline Atorvastatin, and the use of amorphous Atorvastatin was generally tolerable.

Key words: Atorvastatin, crystalline, amorphous, lipid-lowering, low-density lipoprotein

(RF 32)

The effects of CLIMATE and air pollutants on Heart Failure hospitalizations and mortality in Thailand (CLIMATE-HF Study)

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Background: The data on the effect of temperature change on acute heart failure (HF) in tropical countries is limited. Temperature range between summer and winter in Thailand is comparably narrower than other countries in the previous studies. We sought to explore the effect of temperature change on HF hospitalization and in-hospital mortality.

Methods: Data from 266,648 patients with primary HF admissions and daily meteorological parameters between 2011 and 2016 were collected. The meteorological parameters were daily temperature, atmospheric pressure, relative humidity, vapor pressure, wind speed and rainfall unit. Generalized additive regression models and non-linear distributed lag functions were performed.

Results: 460,502 hospital admissions occurred with strong seasonal variation with peaked in winter. Minimal daily temperatures 3 days prior to admission date was associated with relative risk (RR) (95% confidence interval (CI)) of 1.07 (1.06-1.08, p value) for HF hospitalization after adjusting with age, other HF comorbidities (DM, CKD, AF, COPD, CAD,PAD and Cancer) as well as meteorological parameters. The association with cold weather was stronger base on greater seasonal temperature variations, corresponding to greatest RR (95% CI) of 1.15 (1.14-1.17)) in Northern Thailand.

Conclusion: HF hospitalizations were associated with preceding cold temperature exposure especially in the area with greater seasonal temperature variations. Reducing exposure to cold temperatures among those at risk for HF may be the potential prevention of HF hospitalizations.

Study design: Observation clinical research: Retrospective cohort study

Keywords: Climate, Air pollutants, Incidence, Mortality, Heart failure

(RF 33)

Comparison of in-hospital mortality between acute inferior wall STEMI patients with right ventricular infarction and without right ventricular infarction undergoing a primary PCI in KCMH.

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Background: Patients with acute inferior wall ST elevation myocardial infarction, if there is a right ventricular myocardial infarction involvement, they have pretended a worse prognosis with hemodynamic and electrophysiologic complications causing higher in-hospital morbidity and mortality. However most patients in previous studies were mainly treated with intravenous fibrinolysis and also studied in the Caucasian populations.

Objectives: To compare the in-hospital mortality rate of patients with acute inferior wall ST elevation myocardial infarction with and without right ventricular infarction involvement, whom were treated with primary percutaneous coronary intervention (PPCI).

Methods: The study was a retrospective descriptive study which enrolled patients with acute inferior wall ST elevation myocardial infarction who were treated with PPCI in Chulalongkorn Hospital from 1 January 2007 - 31 December 2016.

Results: Among 262 acute inferior wall ST elevation myocardial infarction patients treated with PPCI, there were 54 patients who had right ventricular myocardial infarction involvement, the in-hospital mortality rate was 34.7%, mainly due to cardiogenic shock, compared with 5.8 % in patients who had no right ventricular myocardial infarction ($p < 0.001$). Patients with right ventricular myocardial infarction had a significantly higher incidence of cardiogenic shock (44.4% versus 13.9%, $P < 0.001$), the lower number of left ventricle ejection fraction (49.66 ± 16.41% versus 54.5 ± 13.23%, $p = 0.045$), the higher incidence of complete heart block (33.3% versus 13.9%, $p = 0.002$) and ventricular tachycardia (14.8% versus 4.3%, $p < 0.011$). After adjustment for age, female sex, diabetes, hypertension, previous myocardial infarction, cardiogenic shock on admission, left ventricular ejection fraction, ventricular tachycardia and complete heart block, right ventricular infarction remained a predictor of in-hospital death but not significantly (adjusted hazard ratio, 1.74; 95% confidence interval, 0.24 to 12.9). However, the only significant predictor of in-hospital death was ventricular tachycardia (adjusted hazard ratio, 9.84; 95% confidence interval, 1.34 to 72.34).

Conclusion: In-hospital mortality and other complications rate of patients with acute inferior wall ST elevation myocardial with right ventricular infarction involvement whom were treated with PPCI were higher than who were without right ventricular infarction.

Keywords: Acute inferior wall STEMI, right ventricular infarction, mortality.

(RF 34)

Comparison of a combination of inhaled nebulized nitrite and sildenafil versus sildenafil alone in the treatment of thalassemia patients with pulmonary hypertension

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Background: Pulmonary hypertension is the major morbidity and mortality in patients with thalassemia. Recent studies have found that inhaled nebulized nitrite can significantly decrease pulmonary pressure in immediate response, but data are needed to determine its clinical benefits.

Methods: We conducted a multicenter, randomized, double-blind, placebo-controlled trial including thalassemia patients with symptomatic pulmonary hypertension, diagnosed by right heart catheterization and were currently treated with sildenafil. Patients continued there optimum dose of sildenafil and were randomly assigned into 2 groups; the treatment group and the control group. The treatment group was given 30 mg of inhaled nebulized nitrite twice a day for 3 months while the control group was given inhaled normal saline. The primary outcome was the improvement of 6-minute walk distance and the secondary outcomes were the differences in echocardiographic parameters and NT-proBNP.

Results: A total of 12 patients were recruited, 5 were assigned to the treatment group and 7 to the control group. In the treatment group, the median 6-minute walk distance was significantly increased from 380 m to 427 m. at 1 month (P= 0.043) but there was no significant difference in the median change of 6-minute walk distance when compared to control group at 3 months (+48 m. in treatment group vs +17.5 m. in control group, P=0.286). Treatment with the combination of sildenafil and inhaled nebulized nitrite significantly reduced the mean pulmonary artery pressure at 3 months when compared to placebo (median -7.30 mmHg in treatment group vs +2.30 mmHg in control group, P = 0.016). No significant difference in NT-proBNP change between the two groups was detected. There was neither hypotension nor major adverse effect in the treatment group.

Conclusions: The combination of sildenafil and inhaled nebulized nitrite has a tendency to improve 6-minute walk distance in thalassemia patients with pulmonary hypertension.

(RF 35)

Mortality rate and hospitalization in cardiac resynchronization therapy in patient severe heart failure in Rajavithi hospital in 2012 to 2017

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Background: Cardiac resynchronization therapy(CRT) is standard treatment in heart failure patient with ventricular dyssynchrony and left ventricular ejection fraction less than 35 percent. Because of CRT is new technology and expensive device. There was a little study about CRT in Thailand. Rajavithi has been performed CRT for many years. Our study evaluate about mortality rate and hospitalization in CRT patient in Rajavithi hospital.

Method: In this retrospective study, We searching medical record all patient who performed CRT in Rajavithi hospital since 1 January 2012 to 31 December 2017. The primary outcome was rate of dead and unplanned hospitalization with heart failure in 1 year after performed CRT. The secondary endpoint was rate of dead in 1 year, rate of unplanned hospitalization with heart failure in 1 year and factor associated with rate of dead and unplanned hospitalization with heart failure in patient who performed CRT.

Result: There is 66 patients who performed CRT in Rajavithi hospital since 1 January 2012 to 31 December 2017. 13 patiens missing medical record or not complete in 1 year. Total 53 patients were enrolled in study. The primary endpoint was reached by 12 patients were dead and/or unplanned hospitalization with in 1 year after performed CRT.(22.6%) There were 7 deaths after performed CRT in 1 year.(13.2%) 10 were unplanned hospitalization with heart failure in 1 year after performed CRT.(18.9%) Factor associated with dead and unplanned hospitalization in 1 year after perform CRT was ischemic dilated cardiomyopathy(DCM) and New York Heart Association functional class(NYHA Fc) before performed CRT. There were 24 patients in the ischemic DCM group were dead or unplanned hospitalization in 1 year after performed CRT,as compred with 3 patients in the non-ischemic DCM group. (37.5% vs 10.3%;P=0.021) There were 7 pat ents in the NYHA Fc IV group were dead or unplanned hospitalization in 1 year after performed CRT(71.4%),as compred with 11.1% in NYHA Fc II and 16.2% in NYHA Fc III. (P=0.004) Other factor,sex,age,body mass index,heart rate,blood pressure,left ventricular ejection fraction,atrial rhythm,QRS complex duration,QRS complex morphology,Glomerular filtration rate,hemoglobin,diabetes millitus,neurohormonal blockage,blockage, furosemide dose and mode of CRT were not significant associated with dead and unplanned hospitalization in 1 year after performed CRT.

Conclusion: Mortality rate and hospitalization in cardiac resynchronization therapy in patient severe heart failure in Rajavithi hospital was similar from other study and factor associated with mortality rate and hospitalization was ischemic dilated cardiomyopathy and New york heart association functional class IV.

(RF 36)

Short term outcomes after switching from the new P2Y12 inhibitor (prasugrel or ticagrelor) to clopidogrel at 30 days in elderly patients after coronary intervention in acute coronarysyndrome: Interim Analysis

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Background: Acute coronary syndrome (ACS) is one of the most severe disease with high mortality rate even with the recent innovation of new anti-platelet agents (P2Y12 inhibitiors such as ticagrelor and prasugrel). This study aimed to comparison short term composite outcomes including major cardiac event and bleeding risk between patient who switching from the new P2Y12 inhibitor (prasugrel or ticagrelor) to clopidogrel at 30 days versus non drug switching patient.

Methods: This study was a randomized, open-label non-inferiority trial at Thammasat university hospital. Patients (age > 65 years old) with a diagnosis of ACS undergoing coronary angiography were randomly assigned (1:1) into 2 groups, group A: to receive dual anti-platelet therapy with new P2Y12 inhibitors and then continued with the new P2Y12 inhibitors for 6 months, group B, switched from new P2Y12 inhibitors to clopidogrel after 30 days and continued for 6 months. Primary composite outcomes are all-cause mortality, recurrent myocardial infarction, unplanned revascularization, and significant bleeding (BARC classification: 2,3 and 5). A clinical follow-up were scheduled at 1, 3 and 6 month after enrolled. The study was planned to have interim analysis with patient enrolled at 50% and followup for 3 months.

Results: Between August 1,2018, and January 20, 2019, 50 participants were randomly assigned, 25 to group A and 25 to group B (estimated to have total 82 patients by the end of the study). At 3 month, 3 (12%) patients in group A had died or recurrent myocardial infarction, unplanned revascularization, and significant bleeding, compared with 7 (28%) patients in group B (HR 0.22 95% CI 0.036-0.899, p-value 0.037). None of the patient in group A had died, compared with 3 (12%) patients in group B (HR 0.02 95% CI, 0.00-1.58*10^2; p-value 0.37). None of the patient in group A had urgent repeat revascularization, compared with 1 (4%) patient. In group B (HR 0.01 95% CI, 0.00-1.36*10^5; p-value 0.60). 3 (12%) patients in group A had significant bleeding, compared with 3 (12%) patients in group B (HR 0.46 95% CI, 0.07-2.89; p-value 0.41).

Conclusion: In elderly patients with ACS, switching new P2Y12 inhibitor to clopidogrel at 30 days was not superior to continue new P2Y12 Inhibitor for 6 months ini reduction composite outcomes of all-cause mortality, recurrent MI, unplanned repeat revascularization, and significant bleeding.

(RF 37)

Using Incremental High-Sensitivity Cardiac Troponin T to Increase the Diagnostic Accuracy of Exercise Stress Test.

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Using Incremental High-Sensitivity Cardiac Troponin T to Increase
the Diagnostic Accuracy of Exercise Stress Test.

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Background: Exercise stress test (EST) is the most practical method in diagnosis of coronary artery disease (CAD). Although it has high negative predictive value (NPV) but the positive predictive value (PPV) is very low. This study aimed to increase the diagnostic accuracy of EST by using the delta-change of high-sensitive cardiac troponin T (hs-cTnT) level during stress exercise.

Methods: We conducted a diagnostic study in patients presented with chest pain, who had intermediate pretest probability of CAD, underwent EST at Queen Sirikit Heart Center of the Northeast, Thailand from July 2018 through January 2019. Two blood samples were collected to measure hs-cTnT at 5 minutes before and 1 hour after exercise. The diagnosis of CAD was defined as more than 70% luminal narrowing of one or more major epicardial arteries or more than 50% luminal narrowing of the left main coronary artery according to coronary angiogram (CAG) or coronary computed tomography angiography (CTA). A receiver operating characteristic (ROC) curve was created from the delta-change of hs-cTnT, the value which had high sensitivity was selected in combination with the EST result to improve the PPV predicting CAD.

Results: A total of 81 patients were included in this study. 31(38.3%) patients had positive EST, 47(58.0%) patients had negative EST and 3(3.7%) patients had inconclusive results. To confirm diagnosis of significant CAD, CAG were performed in 33(40.8%) patients, coronary CTA were sent in 7(8%) patients and 41(50.6%) patients were excluded from significant CAD solely by negative EST results, which revealed 16(19.8%) patients in the CAD group and 65(81.2%) patients in the non-CAD group. Average hs-cTnT at baseline of patients in the CAD group was significantly higher than those in the non-CAD group (7.18 ± 3.62 ng/L and 4.83 ± 2.97 ng/L respectively, p-value < 0.001). In addition, mean hs-cTnT at 1-hour after EST of patients in the CAD group was also greater than those in the non-CAD group (9.21 ± 4.41 ng/L and 4.94 ± 2.97 ng/L respectively, p-value =). Delta-change of hs-cTnT was 17.99% in the CAD and 9.18% in the non-CAD group. When we chose 3% delta-change of hs-cTnT as a cut point in combination with the EST result for diagnosis of CAD, The PPV increased from 48% when using EST alone to 63.2%.

Conclusion: Combining the delta-change of hs-cTnT level during EST to the EST result could rise positive predictive value in diagnosis of CAD in patients presented with chest pain and had intermediate pretest probability.

Keywords: Exercise stress test (EST), exercise treadmill, CAD, Diagnosis, high sensitivity troponin T

(RF 38)

In-hospital and 1-year outcomes of primary percutaneous coronary intervention in the elderly patients with acute ST-elevation myocardial infarction

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Background: Aging society is a growing problem in Thailand and worldwide. Increasing age is an important predictor of poor outcomes among Thai patients undergoing PCI. Limited data exist on results of primary and emergency PCI among elderly population in our country.

Objective: To evaluate in-hospital and 1-year outcomes of primary PCI in the elderly patients with acute STEMI.

Methods: From December 2012 to December 2014, clinical data of patients with diagnosis of STEMI who undergoing primary PCI at Central Chest Institute of Thailand were reviewed. Subjects were classified into two groups according to their age. The elderly group was defined as patients with older than or equal 75-year old while patients with younger than 75-year old were assigned in the non-elderly group. Baseline characteristics and clinical outcomes were compared between two groups. Primary outcomes were in-hospital and all-cause first-year mortality. Secondary outcomes were in-hospital and one-year major adverse cardiac events (MACE) including all cause death, myocardial infarction and repeated coronary revascularization.

Results: There were 265 patients with 43 patients (16%) in the elderly group. Compared to the non-elderly group, patients in the elderly group were more likely to have DM, HT, dyslipidemia, COPD, chronic kidney disease, previous MI, multivessel coronary artery disease and left main coronary artery involvement. In-hospital mortality and all-cause mortality at one year between the elderly and non-elderly group were 9.3 % vs. 3.2% (p=0.084) and 11.6 % vs. 4.1% (p=0.057) respectively. Patients in the elderly group experienced significantly higher MACE during hospitalization. (18.6% vs. 7.2%; p=0.036) but MACE at one-year was not statistically significant between two groups (23.3% vs. 14.4%; p=0.170). Using univariate analysis, age at presentation, impaired LV systolic function (LVEF<40%) and chronic kidney disease were factors associate with higher in-hospital MACE. However impaired LV systolic function was the only predictor of in-hospital MACE by multivariate analysis.

Conclusion: In STEMI patients who undergoing primary PCI, the older age was not a factor statistically related to in-hospital and one-year mortality but it was associated with in-hospital MACE .

Keywords: STEMI, primary percutaneous coronary intervention, the elderly, MACE

(RF 39)

Ldl-C Goal Achievement Before And After Implementation Of Standing Order In Patients With Acute Myocardial Infarction.

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Background: Aggressive LDL cholesterol (LDL-C) reduction with high intensity statin has been proved to reduce cardiovascular events in patients with acute coronary syndromes. However, target LDL-C of less than 70 mg/dL is rarely achieved.

Objective: To study the impact of using a discharge standing order on LDL-C goal achievement after discharge in patients with acute myocardial infarction (AMI)

Method: After implementation of discharge standing order, all patients with AMI had lipid profile performed 2 – 6 months after discharge. The data is compared with that of all patients with AMI from 1st Jan 2017 to 30th Sep 2018, the period before standing order was used, who had lipid profile data at 2-6 months during follow-up.

Results: 134 patients in pre-standing-order period had LDL-C data at follow-up. 97 percents (n = 130) of patients were discharged on atorvastatin with an average dose of 37.4 ± 9.8 mg/day. The mean LDL-C on admission and at follow-up were 116.43 ± 42.83 mg and 81.37 ± 25.17 mg, respectively (50.55 ± 59.23 % reduction). In standing-order period, 34 patients had complete lipid data. 100 percents of the patients were discharged on atorvastatin with an average dose of 40 mg/d. The mean LDL-C on admission and at follow-up were 121 ± 44.19 mg and 85.76 ± 29.93mg, respectively (47.81± 50.84 % reduction). The LDL-C goal achievement of less than 70 mg/dL were 41.22 percent before and 38.24 percent after implementation respectively (p = 0.752).

Conclusion: In patients with acute myocardial infarction, the implementation of standing order alone during the time when most physician already used high intensity statin did not improve LDL-C goal achievement. Other measures such as diet and lifestyle counselling or more aggressive lipid lowering regimen immediately after AMI might be necessary.

Thai Heart Journal

(RF 40)

A Comparison of Mitral Valve Calcification Score Detection by Multidetector Computed Tomography (MDCT) between Successful and Unsuccessful Percutaneous Transvenous Mitral Commissurotomy (PTMC)

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Background: Detection of mitral valve (MV) calcification using echocardiography is limited due to operator-dependent variability and cardiac echogenicity of the patients. The determination of MV calcium score using CT not only yields better results but also provide additional data on the calcification at mitral annulus or leaflets. Echocardiographic scores obtained before PTMC are only weakly predictive of the increase in mitral valve area (MVA) after PTMC. However, there are no existing studies on the relationship between mitral valve calcification score detected by MDCT in Agaston score and the changing of MVA after PTMC.

Objective: To compare the MV calcification score detected by MDCT between successful and unsuccessful PTMC.

Methods: This prospective cohort study involved patients who underwent PTMC at Central Chest Institute of Thailand from November 2017 to December 2018. Each patient had echocardiography performed and Agaston score evaluated via MDCT prior to PTMC. During the PTMC procedure, fluoroscopy was used to determine the severity of calcification in numerical value ranging from 0 to 4. Another echocardiography was done 1 month after PTMC to evaluate whether the procedure was successful or unsuccessful. Successful PTMC is defined as an increase of MVA by planimetry equal to or more than 1.5 cm2, and no mitral regurgitation of moderate severity or higher detected.

Results: This study included a total of 34 patients, 18 of which had successful PTMC (52.9%) whereas the other 16 patients were unsuccessful (47.1%). Successful PTMC group comprised of 14 female patients (77.8%) while unsuccessful group also had 14 female patients (87.5%) (p=0.66). Mean age was 49±12 years in successful group and 54±11 years in unsuccessful group (p=0.227). There were 12 cases of AF in successful group (66.7%) and 10 cases in unsuccessful group (62.5%) (p=1). The median MV calcification score by MDCT of the successful group was significantly lower than that of the unsuccessful group (18.35 versus 259.5; p=0.007). When the MV calcification exceeded 122, it may lead to unsuccessful PTMC (the area under the curve (ROC) equals to 0.796, 95%CI 0.592-0.946, cut-off point above 122, sensitivity 68.8%, specificity 88.9%). The location of calcification at the mitral valve either the annulus or leaflets were not associated with the success of PTMC (p=0.172). In addition, absence of calcification at mitral valve by fluoroscopy had statistically significant association with successful PTMC (p=0.015).

Conclusion: The study has shown association between higher level of calcification at MV detected by MDCT and higher rate of unsuccessful PTMC. When the calcification at Mitral Valve exceeded 122, unsuccessful PTMC may ensue.

Keywords: Mitral valve calcification score, percutaneous transvenous mitral commissurotomy, multidetector computed tomography, Wilkins mitral valve scores

(RF 41)

Reclassified Intensity of 20 mg-Simvastatin in Thai population (RIST study): The preliminary study

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Introduction: In Thailand, 20 mg-simvastatin is most usually prescribed statin drug group because of cost-effectiveness and safety of medication. 20 mg-simvastatin is classified to moderate-intensity of statin drug group by 2018 ACC/AHA blood cholesterol management guideline. From previous data, Response of statin drug group in Thai population may be better than western population, which equivalent to high intensity of statin. Limitation of previous study were not shown specific efficacy data of 20 mg-simvastatin, compliance of medication and duration of intake.

Objective: To evaluate efficacy of 20 mg-simvastatin of blood LDL-C reduction in Thai population and reclassified intensity of 20 mg-simvastatin for Thai population

Methodology: Prospectively, 35 patients from Siriraj's outpatient department who was started simvastatin 20 mg/day were consecutively enrolled. The results of LDL-C level before 20 mg-simvastatin intake and at least 6-8 weeks after 20 mg-simvastatin intakes was calculated to percentage of LDL-C blood level reduction. Compliance to medication intake was evaluated by pill count method. Then, Intensity of 20 mg-simvastatin was reclassified to low (<30% of LDL-C reduction), moderate (30-49% of LDL-C reduction) and high intensity (≥50% of LDL-C reduction) as 2018 ACC/AHA blood cholesterol management guideline.

Results: For preliminary results, 7 patients were enrolled to the study. 3 patients were excluded from study due to loss of laboratory data after 20 mg-simvastatin intakes, poorly drug compliance (5% of drug intake) and one of the enrolled patients, the blood LDL-C level was not reduce and the history of other lipid lowering agent which was intake before enrolled was not clarified. The mean age was 57.0 ± 7.9 years and 50 % were female. The mean of drug compliance in this study was 79%. The mean of initial blood LDL-C level 163.9 ± 52 mg/dl. The mean of blood LDL-C level reduction is 28.9 ± 19.2 % compare with the baseline.

Conclusion: Intensity of 20 mg-simvastatin in our study is low to moderate intensity of statin which was less than previous study (Thongthang.N et al.'s data was show low to moderate-intensity of statin drug group can reduce 49.6 - 54.4% of blood LDL-C level compare with baseline.) However, this is preliminary data and sample size is too low to evaluate the efficacy of 20 mg-simvastatin in Thai population, but the data is continuing collection. This study is first study that was clarify the drug compliance of 20 mg-simvastatin in Thai population.

Keyword: 20 mg-simvastatin, Intensity of statin, Thai population

(RF 42)

Prevalence of diastolic dysfunction in end-stage renal disease patients in Rajavithi hospital

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Introduction: End-stage renal disease (ESRD) patients have high risk of cardiovascular disease. These patients trend to have sodium and water retention that affect volume and pressure overload, cause left ventricular stiffness and left ventricular hypertrophy. The diastolic dysfunction can found in early stage of these pathological process, we would like to study diastolic function in ESRD patients.

Objective: Primary objective was prevalence of diastolic dysfunction in ESRD patients compare between 2009 criteria and 2016 criteria. Secondary objective was factors that correlated with diastolic dysfunction in ESRD patients.

Material and method: Cross-sectional study. ESRD patients who received renal replacement therapy were eligible. Baseline demographic data, blood test, ECG and CXR were collected. Echocardiography were performed and diastolic dysfunction was diagnosed by 2009 criteria and 2016 criteria. The subject were enrolled during August 2018 – November 2018 and ethic committee was approved.

Results: 50 ESRD patients were enrolled and 27 (54%) patients were female. The mean age was 50.14±14.67 years. Cause of kidney failure were unknown (42%), hypertension (24%) and diabetes mellitus (18%). Duration of renal replacement therapy was 6.24±6.28 years and hemodialysis was 82%. Prevalence of diastolic dysfunction by the 2009 criteria was 88% (grade1= 54%, grade2=32%, grade3= 2%) and prevalence of diastolic dysfunction by the 2016 criteria was 60% (grade1= 26%, grade2=32%, grade3= 2%). There was a good consistent between 2009 and 2016 criteria (kappa = 0.61). Factors affect diastolic dysfunction were age (35.33±8.05 vs. 55.03±13.78 year, $p<0.001$), systolic blood pressure (121.55±17.36 vs. 146.6±22.28 mmHg, $p=0.004$) and left ventricular mass index (102.76±22.64 vs. 163.29±50.4 gm/m2, $p=0.001$).

Conclusion: Prevalence of diastolic dysfunction in ESRD patients was 88% by the 2009 criteria and 60% by the 2016 criteria. Factors that affect diastolic dysfunction were age, systolic blood pressure and left ventricular mass index.

Keyword: Diastolic dysfunction, end-stage renal disease

Research by Fellow

Group 4

Poster Presentation
Friday 21st March, 2019
Time: 18.00-19.00
Venue: @ Black

Judges: *Arintaya Phrominthikul, MD*
Vichai Senthong, MD

RF43 **Effect of ranolazine in reduction of PVCs burden in symptomatic outflow-tract premature ventricular contractions when compared to beta-blocker**
Paramee Bespinyowong, MD
Division of Cardiology, Department of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

RF44 **Complication in patients who on anticoagulant and undergo cardiac implantable electronic devices in Bhumibol Adulyadej Hospital**
Suyanee Mansanguan, MD
Division of cardiology, Medical department, Bhumibol Adulyadej Hospital RTAF, Bangkok, Thailand

RF45 **Yield of transesophageal echocardiography (TEE) for detecting lead and valve endocarditis in cardiovascular implantable electronic device(CIED) infected patients undergoing lead extraction, a single center study**
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RF54 **The Association of Pericardial fat and positive stress cardiac magnetic resonance**

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RF55 **Effect of fluroscopy time in coronary angiographic procedure by using transradial or transulnar artery single catheter technique for complete diagnosis compare with transfemoral two catheters technique at Vajira hospital.**

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RF56 **The bleeding incidence of coronary artery disease patient who received DAPT after PCI in Rajavithi Hospital**

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RF57 **Evaluating coronary artery calcium score and risk of coronary artery disease using Multi-Ethnic Study of Atherosclerosis: 10-years coronary heart disease estimator in Thai patients at Vajira hospital**

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(RF 43)

Effect of ranolazine in reduction of PVCs burden in symptomatic outflow-tract premature ventricular contractions when compared to beta-blocker.

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Background: Patients with frequent premature ventricular contractions (PVCs) are often symptomatic with significantly reduced quality-of-life. Drug therapy with beta-blockers has limited efficacy and not well tolerated.

Objective: To compare the effect of suppressing outflow-tract premature ventricular contractions between ranolazine and atenolol by holter monitoring for PVCs reduction.

Method: A randomized open cross-over study was performed in Siriraj hospital from 1st July 2018 to 1st Febuary 2019. Patients with symptomatic outflow-tract PVCs were randomized to receive ranolazine first group (phase 1: ranolazine for 2 weeks; phase 2: atenolol for 2 weeks) or receive atenolol first group (phase 1: atenolol for 2 weeks; phase 2: ranolazine for 2 weeks) with 2 weeks wash out period between phases. The main outcome measures were different in PVCs count and percent of PVCs from 24 hour Holter monitoring after receiving each medication for 2 weeks. The side effects and blood pressure during receiving medication were collected.

Result: Four patients were randomized to ranolazine first group and four patients to atenolol first group. The mean age of patients was 56 years and 87.5 % were female. Mean PVCs reduction after atenolol and ranolazine was 3,336 (0.75 %) and 3,715 (3.05%) respectively. The different between mean PVCs count and percent PVCs reduction of ranolazine and atenolol were 379 PVCs/24hour (95%CI [-11,597 – 10,839]) and 2.3 % (95%CI [-12.08 – 7.48). Mean MAP at baseline compared to mean MAP after atenolol and mean MAP ranolazine were 95, 89 and 95 respectively. Five patients reported side effect (palpitation, fatigue and dizziness) after receive atenolol. Two patients reported palpitation after received ranolazine. No torsade de points was observed in holter monitoring.

Conclusion: Ranolazine has tendency in reduction of PVCs burden for treatment of symptomatic outflow-tract premature ventricular contraction when compared to atenolol without statistically significant. Further study is needed.

Keyword: Ranolazine, premature ventricular contraction, delayed after depolarization.

(RF 44)

Complication in patients who on anticoagulant and undergo cardiac implantable electronic devices in Bhumibol Adulyadej Hospital

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Introduction: The most common complication after cardiac implantable electronic devices implantation is bleeding complication and pocket hematoma especially in patients who are on anticoagulant. This condition leading to rehospitalization, device removal and cause of death. Therefore the study about complication can help to prevent complication and effective care of patient.

Objective: To determine the complication in patients who on anticoagulant and undergo cardiac implantable electronic devices in Bhumibol Adulyadej hospital.

Patients and Methods: This study was a prospective observational study enrolled patient who on anticoagulant and undergo cardiac implantable electronic devices followed up at Bhumibol Adulyadej Hospital during July 2017 to November 2018. There were clinical parameters including demographic data, laboratory result, complication were collected.

Results: A total number of 35 patients were eligible for the enrollment. ; eighteen were female (51.4%), seventeen were male (48.6%). Average mean age of case 76 ± 10.22 years old, 25 cases (71.4%) on warfarin and 10 cases (28.6%) on NOAC. Total complication were 7 cases (20%); the serious bleeding complication were 4 cases (11.4%) in warfarin group and 1 cases (2.8%) in NOAC group, wound infection and device removal 1 case (2.8%) in NOAC group.

Conclusion: The serious complication was found 14.8% in this study. No different in the incidence of wound complication between warfarin and NOAC group.

Keywords: cardiac implantable electronic devices, warfarin, NOAC, complication, hematoma

(RF 45)

Yield of transesophageal echocardiography (TEE) for detecting lead and valve endocarditis in cardiovascular implantable electronic device(CIED) infected patients undergoing lead extraction, a single center study

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Objectives: To evaluate yield of transesophageal echocardiogram (TEE) compare with transthoracic echocardiogram (TTE) for detecting lead and valve endocarditis in CIED infected patients.

Background: The world's prevalence of CIED implantation has increased therefore the rate of CIED infection has consequently risen in current practice. According to 2017 Heart Rhythm Society (HRS) Expert Consensus Statement on CIED Lead Management and Extraction, TEE is recommended in all patients' prior lead extraction. However the yield of TEE compares with TTE for detecting lead and valve endocarditis in right sided heart structure is still unknown.

Methods: This study is a retrospective chart review. There were 44 cases undergone lead extraction in Siriraj hospital between January 2009 and July 2018 who met the inclusion criteria (Extracted cases in CIED infection which undergone both TTE and TEE). The result of hemoculture and the extracted leads culture in each individual were analyzed and compare with the results from TEE and TTE prior the extraction.

Results: Among 44 cases; mean age was 61 years, 33 (75%) were male. There were 22 (50%) who had positive lead culture, 18 (40.9%) has been detected with mobile mass either on the lead or endocardium which all were seen by TEE but only 2 were also been detected by the TTE and 7 (15.9%) had positive hemoculture. In those positive lead cultures, mass were seen in 9 cases (40.9%) which 2 were also detected by TTE. In the other hands, there were 9 (40.9%) TEE detected mass cases but had negative lead cultures. Regarding the positive hemoculture, there were 6 (85.7%) cases that the mass were seen by the TEE which include 2 (28.5%) TTE cases.

Conclusion: TEE had a higher yield than TTE in detecting lead and valve endocarditis regardless of culture result.

Keywords: transesophageal echocardiography, TEE, transthoracic echocardiography, TTE, cardiovascular implantable electronic device infection, lead extraction

(RF 46)

Comparison of the left distal radial artery access in the anatomical snuffbox to standard radial artery for cardiac catheterization

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Introduction: Right radial artery approach is more appreciated by operator due to standard bed and fluoroscope set up. In some situations, operator has to access on left radial artery because of right radial artery occlusion, right forearm arteriovenous shunt or Allen's test negative. Moreover, meta-analysis suggested that left radial approach have lower fluoroscopy time and contrast used. Cardiac catheterization via new access site at left distal radial artery in anatomical snuff box area (left snuff box) is more convenient than standard left radial artery due to favorable patient position. There is a lack of data regarding comparison between these access sites on safety, effectiveness and patients' satisfaction.

Objectives: The aim of this study was to compared procedure success rate, patient's satisfactions and access site complications between the left distal radial artery in anatomical snuffbox approach and the standard right radial artery approach.

Methods: Between November 2017 to January 2019. One hundred patients were enrolled with 53 patients in left snuffbox approach group and 47 patients in standard right radial artery group. Access site complications were assessed by investigator on the next day post procedure. Patient satisfaction was evaluated using visual analogue scale (VAS) questionnaire.

Result: No significant different in baseline characteristics on both groups. There was no statistically significant difference in all outcomes. Successful catheterizations were 41 of 53 (77.4%) in the left snuffbox approach and in 41 of 47 (87.2%) in the transradial approach (p= 0.20). Percutaneous coronary intervention(PCI) was performed 43.4% in left snuffbox group and 66% in standard radial group. Minor access site complication occurred in 15 patients (28.3%) and 12 patients (25.5%), respectively (p=0.824). There was 1 doppler ultrasound confirmed radial artery occlusion in the standard radial approach group (2.1%). The patients satisfaction were similar in both group, median total score of 10 (6, 17) and 7 (5, 14), (p=0.10)

Conclusion: Left distal radial artery is a new potential access site for cardiac catheterization with similar safety, effectiveness and patient satisfaction compared to standard radial approach

(RF 47)

One –year outcomes after AICD implantation in left ventricular dysfunction patients in Rajvithi hospital.

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Background: Patients with heart failure reduced ejection fraction (HFrEF), any caused are risk for life threatening ventricular arrhythmias. Medication such as neuro-hormonal blockade agents can reduced all caused mortality ,but some patients were death form sudden cardiac arrest, who recived OMT therapy. This research was designed to evaluated outcomes of an automatic implantable cardiovertor defibrillation in HFrEF groups.

Objectives: To study about one- year outcomes after automatic implantable cardiovertor defibrillation implantation in Rajvithi hospital.

Methods: Retrospective descriptive statistics study was performed between January 2012 to June 2018. All patients were undergoing AICD implantation at the cardiac unit, Rajvithi hospital and record information at medical recorder .

Results: The median LVEF in patients was 30 percent; 70 perccent were in NYHA class II, and 30 percent were in class III CHF. The cause of most heart failure was ischemic processed; no significant death, severe infection or life threatening arrhythmias outcomes after AICD implantation in 12 month follow up.

Conclusions: Post AICD implantation outcomes in patients with reduced ejection fraction ,improved survival, and decrease death from arrhythmias, and no significant serious complication after implantation.

(RF 48)

Modifying factors affecting mortality and hospitalization In patients with non-ischemic dilated cardiomyopathy

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Background: Non-ischemic dilated cardiomyopathy is common throughout the world, causing death and hospitalization. Treatments of symptomatic patients are according to heart failure guidelines.

Objective: The present study aimed to study modifying factors which related to all deaths and heart failure hospitalization in non-ischemic dilated cardiomyopathy patients with services of the outpatient department.

Methods: Retrospective descriptive study was conducted using data from non-ischemic dilated cardiomyopathy outpatients of Central Chest Institute of Thailand between January 2013 and December 2014. The following modifying factors are firstly, follow up clinics; heart failure clinic vs. usual cardiology clinic; secondly, heart rate; control heart rate ≤ 70 bpm.vs. more than 70 bpm. thirdly lipid lowering medications; statin vs. no statin and finally neurohormonal blockers; ACEI, ARB and beta-blocker dosage at least 50% of target dose vs. less than 50% of target dose. Univariate and multivariate analysis were used to analyze their correlation with mortality and heart failure hospitalization outcomes during 60 months follow up.

Results: There were 139 heart failure patients with mean age 56±12.6 years and mean LVEF 27.1±8.8 %. Of these, ACEI (or ARB) and β blocker were given in 93.5%, and 98.6% respectively. Number of patients received ACEI (or ARB) and beta-blocker to at least 50% of target drug dose was 41% and 61.9%, and those who reached target dose of drug were 12.9% and 43.2% respectively. Proportion of patients followed-up in heart failure clinic was 49.6% whereas 50.4% in usual cardiology clinic. The controlled heart rate to ≤ 70 bpm. was 20.1%. After 60 months of follow up, the mortality rate was 28% and admission for treatment with heart failure was 0.48 times/person/year (0.3 times/person/year in heart failure clinic group vs. 0.68 times/person/year in usual cardiology clinic group). The heart failure hospitalization rate reduced significantly in patients receiving treatment and follow-up in heart failure clinic (adjusted B coefficient -1.14, 95%CI -1.78 to -0.51, P=0.001) and in those who control the heart rate to ≤ 70 bpm. (adjusted B coefficient -0.7, 95% CI -1.38 to -0.02, P=0.043).

Conclusion: Factors which related to reduction of heart failure hospitalization in non-ischemic DCM patients were treatment and follow-up with multidisciplinary team in heart failure clinic and heart rate not more than 70 beats per minute.

Keywords: Non-ischemic dilated cardiomyopathy, heart failure clinic, modifying factors

(RF 49)

Comparison Of Metoprolol In Combination With Ivabradine And Metoprolol Alone For Heart Rate Reduction Before Coronary Computed Tomography Angiography at Siriraj hospital

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Background and Objective: Metoprolol or Ivabradine is commonly used in reducing heart rate before the CT coronary angiography for reduction of motion artifact and better-quality image. However, some people are unable to achieve at targeted heart rate, this study was designed to test if the use of Metoprolol in combination with Ivabradine can improve achieving targeted heart rate.

Methods: This is a randomized control open-labeled trial. 80 patients, who was sent for coronary CTA, were randomized into 2 groups of pre-medication with oral Metoprolol in combination with Ivabradine and Metoprolol alone. Heart rate and blood pressure were measured intermittently until completion of protocol. The result of achievement in targeted heart rate would be analyzed.

Results: Percentage of people who achieved targeted heart rate during scan were not different between combination group and Metoprolol alone group (41.5% and 46.2% respectively, P-value = 0.67). Heart rate reduction, systolic blood pressure reduction and diastolic blood pressure reduction were not different in combination and Metoprolol alone groups (-11.32 vs. -12.82 bpm, P-value = 0.53 [SD = 8.38, 12.78], 2.32 vs. 6.28 mmHg, P-value = 0.19 [SD = 13.83, 12.63], -0.56 vs. 1.62 mmHg, P-value = 0.47 [SD = 9.20, 16.57]). The mean heart rate during coronary CTA scanning between combination and Metoprolol alone groups were not different (63.4 vs. 61.1 bpm, P-value = 0.55). The average dose of Metoprolol used in both groups is not different (83.5 vs. 92.9 mg, for combination and Metoprolol alone protocols respectively, P-value = 0.55). There was no serious side effect from both protocols.

Conclusion: Combination of Metoprolol with Ivabradine failed to demonstrate the benefit in achieving targeted heart rate during CTA coronary protocol when compare to Metoprolol alone.

Keywords: Ivabradine, Metoprolol, Computed tomography coronary angiography, targeted heart rate.

(RF 50)

Cut-off pulmonary artery to aorta ratio as a prognosticator for cardiovascular events: Novel insight from cardiac magnetic resonance

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B**ackground:** Pulmonary artery (PA) to aorta (Ao) ratio can be easily measured using cardiac magnetic resonance (CMR). There are scarce data regarding CMR-derived pulmonary artery to aorta ratio and cardiovascular events. Further, optimum cut-off value has never been studied.

Objective: To investigate prognostic power and optimum cut-off values of CMR-derived pulmonary artery to aorta ratio for predicting future major adverse cardiac events (MACE).

Methods: A total of 460 patients (50.7% men, mean age 68.8 ± 10.5 years) referred for cardiac magnetic resonances imaging were consecutively enrolled. Diameters of the PA and AO were measured in cross-section image at the level of PA bifurcation using black blood imaging technique. Clinical data including comorbidities and medications were collected. The occurrence of MACE was defined as cardiovascular death or hospitalization and unplanned coronary revascularization were retrospectively reviewed, blinded to CMR data. Kaplan Meier analysis was then applied. ROC analysis for the optimum cut-off was used for predicting MACE.

Results: During a median follow-up of 44.5 months, 106 patients (23%) experienced a MACE. The mean PA-to-AO ratio in patients who experienced a MACE was significant higher than one without events (0.93 ± 0.13 versus 0.81 ± 0.13, $p < 0.001$). Using ROC analysis, the optimum cut-off values of PA: AO ratio for predicting future MACE was 0.9. In a complete multivariate analysis, the PA: Ao ratio of 0.9 or greater was an independent predictor of MACE (hazard ratio: 2.81 [95% confidence interval: 1.73 to 4.57], $p <0.001$).

Conclusions: The PA-to-aortic ratio evaluated by CMR at cut-off 0.9 or greater provides an independent prognostic value for the prediction of future MACE. Routinely report the PA: AO ratio might be part of standard CMR protocol.

Keywords: Cardiovascular magnetic resonance (CMR), Major adverse cardiac events (MACE), prognosis, PA: Ao ratio.

(RF 51)

Prevalence of inherited arrhythmia in Maharat Nakhonratchasima hospital and current clinical status

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Objective: To know the prevalence of inherited arrhythmia in Maharat Nakhonratchasima hospital and current clinical status. To make a guideline management in patients who has risk for sudden cardiac events.

Background: Inherited arrhythmia are Brugada syndrome, Long QT syndrome, Short QT syndrome, Catecholaminergic polymorphic ventricular tachycardia, Early repolarization. There are abnormality of ion channel caused arrhythmia and sudden cardiac events. Brugada syndrome have high prevalence in Northeast of Thailand. Currently not much data about Brugada syndrome and other inherited arrhythmia. To know prevalence, to give guideline management for patient and first degree relative, to put defibrillator in patient who had history of malignant arrhythmia or history of sudden cardiac events are important.

Method: A Prospective cross-sectional study of patients who had electrocardiography in outpatient department of Maharat Nakhonratchasima hospital from March 1, 2018 until August 31, 2018 and telephone call to ask for symptom.

Result: Of 464 patients, prevalence of Early repolarization syndrome was 0.03 % (Male 14, Female 3, Age 40.12 years). Two patients have symptom of palpitation. Prevalence of Long QT syndrome 0.02 % (Male 5, Female 7, Age 48.33 years). One patient has symptom of palpitation. Not found patient with Brugada syndrome and short QT syndrome.

Conclusion: Prevalence of Early repolarization syndrome was 0.03 %, prevalence of Long QT syndrome 0.02 %. Not found patient with Brugada syndrome and short QT syndrome.

(RF 52)

The appropriate method for QT interval measurement to predict Ventricular tachyarrhythmia in atrial fibrillation patients

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Background: Atrial fibrillation is a common arrhythmia in critical care units and treatment of atrial fibrillation can lead to ventricular arrhythmia due to QT prolongation. There is still no standard method for QT measurement in atrial fibrillation to prevent ventricular arrhythmia to happen.

Methods: Patients with ICD10 records from 1st January 2014 to 30 September 2018 was identified from all in-hospital atrial fibrillation patients in four critical care units at King Chulalongkorn Memorial Hospital, excluding patients with acute coronary syndromes within 7 days with atrial fibrillation. QT interval was measured from 12-lead EKGs mainly in lead II and V3 by using Fredericia's QT correction and tangent method. Four intervention methods were used in all patients. 1. Average of QTc intervals following the longest and shortest RR intervals (Long & short method) 2. Average of 3 QTc intervals where the middle QTc interval follows right after the longest RR interval (3 consecutive beats method) 3. Average of QTc intervals for 10 beats that include QTc interval that follows the longest RR interval (10 consecutive beats method) 4. Automated QTc interval from Fredericia's QT correction method by Phillips DXL-12 lead algorithm. Primary outcome was the accurate QTc measurement method to predict ventricular tachyarrhythmia events in atrial fibrillation patients.

Results: 160 from 409 atrial fibrillation patients were included in the study (only 59 have adequate automated 12-lead EKGs). The accuracy to predict ventricular arrhythmia at QT $\geq$ 500 milliseconds is 80.6% for Long & short method (ICC 0.575; 95% CI 0.252, 0.758), 82.5% for 3 consecutive beats method (ICC 0.404; 95% CI -0.03, 0.658), 82.9% for 10 consecutive beats method (ICC 0.617; 95% CI 0.215, 0.804) and 69.5% for Automated QTc interval.

Conclusions: Among 4 methods for QT interval measurement in atrial fibrillation to predict VA showed that 3 and 10 consecutive beats method have acceptable accuracy to predict ventricular tachyarrhythmia event in atrial fibrillation patients. The reproducibility of all methods were acceptable. Automated QT interval is easy to use but still need more evidences to be implemented in clinical practice.

(RF 53)

Renal Outcomes of Oral Anticoagulants in Patients with Atrial Fibrillation at PMK Hospital

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Background: Anticoagulants either with warfarin or non-vitamin K oral anticoagulants (NOACs) are indicated in patients with atrial fibrillation (AF) who are at risks for stroke and systemic thromboembolism. Recent evidences suggested that NOACs may be associated with better renal outcomes.

Objectives: To study renal outcomes in patients with atrial fibrillation who took oral anticoagulant for stroke prevention at PMK hospital, either warfarin or NOACs (Dabigatran, Rivaroxaban, and Apixaban). The primary objectives are significant GFR decline, defined as a drop in GFR more than 30%, doubling of serum creatinine and renal failure requiring renal replacement therapy (RRT). The secondary objective is to calculate the rate of GFR decline per year.

Methods: Retrospective study using data from PMK hospital electronic database. Authors identified 700 patients with non-valvular AF who regularly took oral anticoagulation for stroke prevention between 1st January 2011 to 31st December 2017. Patients who took oral anticoagulant for at least 1 year were included in this study. Serum creatinine and GFR were collected.

Results: Cumulative risk of significant GFR decline in 2 years was 12.46% in warfarin group and 7.21% in NOACs group. NOACs were not associated with lower rate of significant GFR decline (HR 0.92, 95%CI 0.54-1.56, p 0.762) when compared with warfarin. There was no patient who had doubling of serum creatinine or required RRT. However, the rate of GFR decline was significantly lower in NOAC group (4.2% in 1 year and 7.1% in 2 years), compared with 7.08% and 12.46% in warfarin group respectively ($p<0.001$).

Conclusion: Among patients with AF who were receiving oral anticoagulants, the rate of significant GFR decline was comparable between NOACs and warfarin.

(RF 54)

The Association of Pericardial fat and positive stress cardiac magnetic resonance

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Introduction: Pericardial fat had been associated with increased risk of cardiovascular diseases from previous studies. Adenosine stress cardiac magnetic resonance (CMR) is one of the investigation-of-choice in the evaluation of coronary artery diseases. Nevertheless, there is limited data for the association between pericardial fat and positive ischemia from CMR.

Objection: To evaluate the association between the amount of pericardial fat and positive adenosine stress CMR

Methods: A total of 231 patients who were undergoing adenosine stress CMR were prospectively enrolled. Pericardial fat area was measured manually in 4 chamber view during end systolic phase. Adenosine stress CMR was interpreted as positive and negative for ischemia along with the number of ischemic segment. The association between pericardial fat area and positive adenosine stress CMR was analyzed.

Results: The mean age was 66.3 (±11.76) years and 68.6% was male. Adenosive stress test cardiac MRI was positive in 76 patients (32.9%). The mean pericardial fat area index was 1138.53 (±356) mm2/m2. Pericardial fat area index was not significantly different between patients with positive and negative for ischemia (1141 (±353) mm2/m2 versus 1131 (±365) mm2/m2, p-value 0.84 (r=0.495 p-value= 0.907)).

In addition, pericardial aft area index in patients with positive adenosine stress cardiac MRI for 0-2 segment versus 3 or more than 3 segment was not different (1137 (±350) mm2/m2 versus 1140 (±372) mm2/m2 p-value 0.323 (r=0.507 p-value= 0.874)).

Conclusions: Pericardial fat area index is not associated with positive adenosine stress CMR.

Keyword: Pericardial fat, Adenosine stress CMR, Coronary artery disease.

(RF 55)

Effect of fluroscopy time in coronary angiographic procedure by using transradial or transulnar artery single catheter technique for complete diagnosis compare with transfemoral two catheters technique at Vajira hospital.

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Background: Diagnostic coronary angiography procedure, is a necessary procedure to evaluate coronary anatomy. In the present the multipurpose catheter such as Tiger, or new technique such as use single Judkins left catheter as a multipurpose catheter is more often used nowadays, Literature data showed that multipurpose Tiger catheter have a trend to lower fluoroscope time, While a data about using Judkins Left as a multipurpose catheter had a vary result of fluoroscope time and contrast media using, The objective of this study was to determine the difference of fluoroscopy time of single catheter technique via both radial or ulnar artery and standard specific coronary catheters technique via femoral in Vajira hospital.

Methods: This is a retrospective cohort study that collected data from July 2017 to May 2018. Review data from medical records, Inclusion criteria was the patients more than 18 years old who undergo for a diagnostic coronary angiogram, Exclusion criteria was single side coronary angiography, percutaneous coronary intervention that was done in the same procedure. Data about fluoroscopy time, contrast media volume, interventionist experience, route of assessment, and baseline characteristics of patients were collected. Mean fluoroscope time difference between a single catheter via both left or right radial and ulnar artery, and two catheter via femoral was analyzed by linear regression analysis method.

Result: Total 291 patients were enrolled, 208 patients (71.47%) was in a single catheter group while 83 patients (28.52%) was in a transfemoral two catheters group. Mean fluoroscope time was non-significant greater in a single catheter approach via radial or ulnar artery compared with two catheters approach via femoral artery (351.98 + 28.57 VS 310.99 + 42.92 seconds, p = 0.425), On the other hand contrast volume was non-significant greater in two catheters approach via femoral artery group (39.59 + 2.25 VS 36.70 + 1.32 ml, p = 0.265).

Conclusion: Single catheter via radial or ulnar artery technique was a trend to be greater fluoroscope time but lower contrast media volume using compared with two catheters via femoral artery technique for coronary angiography but no statistical significant.

(RF 56)

The bleeding incidence of coronary artery disease patient who received DAPT after PCI in Rajavithi Hospital

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Background: Coronary artery disease is a major problem of global health. The duration of dual antiplatelet therapy (DAPT) with aspirin plus a P2Y12 inhibitor after PCI was recommended at least 1 year, but the bleeding incidence was increased. New guideline was supporting to shorten the duration of DAPT to 3-6 months by using Precise DAPT score to weigh bleeding risk before treatment. The present study was to evaluated the bleeding incidence of coronary artery disease patient who received DAPT after PCI.

Objective: The primary objective was the bleeding incidence of coronary artery disease patient who received DAPT after PCI in Rajavithi Hospital. The secondary objective was the factor associated to the bleeding.

Materials and Methods: CAD patients were enrolled by using ICD10 code I251 and medical record were reviewed. Baseline characteristic were collected and laboratory investigation were performed for calculated Precise DAPT score. The primary and secondary endpoints were calculated by SPSS version 22.

Results: 719 patients were enrolled in this study from 1 January 2010 to 31 December 2018.Baseline characteristics are sex, age, BMI, nationality, diagnosis, type of PCI and number of stent. Bleeding events occur in 23 patients (3.2%). 250 patients (34.8%) classified as high risk group, 469 patients (65.2%) classified as low risk group. Bleeding events occur in 17 patients (6.8%) of high risk group and in 6 patients (1.28%) of low risk group (P-Value < 0.01). Mostly characteristics were male 498 patients (69.3%), age under 65 years 376 patients (52.3%), normal BMI 362 patients (50.3%), Thai 708 patients (98.5%), Triple vessels disease 328 patients (45.6%), secondary PCI 644 patients (89.6%) and one stent deploy 283 patients (39.4%).

Conclusion: The incidence from this study showed 23 patients with bleeding events. From 719 patients were classified by Precise-DAPT score as high risk group associated with more significant bleeding event without any of baseline characteristics associated.

Keyword: Bleeding, Coronary artery disease, Dual antiplatelet therapy, Incidence, Myocardial infarction, Percutaneous coronary intervention.

(RF 57)

Evaluating coronary artery calcium score and risk of coronary artery disease using Multi-Ethnic Study of Atherosclerosis: 10-years coronary heart disease estimator in Thai patients at Vajira hospital

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Background: According to The Framingham heart study, predicting risk of coronary heart disease in 10-years (The 10-years Framingham risk score, FRS), some patients can't used FRS for predicted CHD risk. The Multi-Ethnic Study of Atherosclerosis, addition of coronary calcium scores (CACs) to a prediction model based on traditional risk factors significant improved the classification of risk, net reclassification improvement (NRI) 0.25, 95% CI 0.16-0.34%, p 0.001. This study was designed to evaluate coronary artery calcium score and risk of coronary artery disease using Multi-Ethnic Study of Atherosclerosis in Thailand population could be carefully applied to current practice, and determine the association between MESA with CACs and traditional risk score of Thailand (RAMA-EGAT).

Methods: This study was prospective study which enrolled the participants who had scheduled to evaluate chest computer tomography scan and had informed consent in Faculty of Medicine, Vajira Hospital from July to December 2018. The coronary calcium scores measeurement and the baseline characteristic data were collected.

Results: Total 84 patients war enrolled in this study. The demographic showed that 65.5% (55 patients) of all participants were females and mean aged was 55.04 years. There were participants with no underlying disease 51.2% (43 patients), hypertension 39.3% (33 patients), hyperlipidemia 34.5% (29 patients), and diabetes 11.9%% (10 patients). The coronary heart disease risk estimated by Framingham risk score(FRS) only compared with FRS with CACs had near-perfect agreement correlation, overall agreement 86.9%(K=0.302; $p < 0.001$), which decreasing risk from intermediate to low 11.9% (10 patients), increasing risk from low to intermediate : 1.2% (1 patient). Compared RAMA-EGAT(Laboratory-based) with FRS with CACs, total agreement 87.5%(K=0.415; $p< 0.001$) which changing risk from intermediate or high to low 14.3%(12 patients), changing risk from low to intermediate: 2.4% (2 patients). Precipitating factor for high CACs (≥300) was old aged (≥ 60 years); OR 28.9 (95% CI 1.92-420.09) and diabetic mellitus; OR 38.26 (95% CI 3.76-389.49)

Conclusion: Although strong correlation between FRS only and FRS+CACs, RAMA-EGAT and FRS+CACs, but CHD risk predicted by FRS only trend to lower than FRS+CACs, and CHD risk predicted by RAMA-EGAT trend to higher than FRS+CAC.

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